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India: Effects of Tariffs and Nontariff Measures on U.S. Agricultural Exports

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Abstract

This report describes and analyzes policies and other factors that affect U.S. agricultural exports to India. The findings suggest that India's high agricultural tariffs are a significant impediment to U.S. agricultural exports and that certain Indian nontariff measures (NTMs), including sanitary and phyosanitary measures, substantially limit or effectively prohibit certain U.S. agricultural products. Agriculture is vital to India's economy, accounting for a substantial share of employment (60 percent) and GDP (17 percent). Since India is largely self-sufficient in agricultural production, agricultural imports represent a small share of Indian consumption and are concentrated in a few products. Broad intervention by the Indian government in the agricultural sector, including restrictive and variable trade policies, are designed to protect domestic producers and consumers. The study provides an overview of Indian agricultural production, imports, and consumption during 2003–08; Indian tariffs and NTMs; the Indian food marketing and distribution system; and Indian government regulations relating to the agricultural market, including foreign direct investment and intellectual property rights policies. The study also provides economic modeling analysis of the effects of Indian tariffs and certain NTMs on U.S. agricultural exports.

Executive Summary

Indian economic and demographic indicators suggest a market with strong potential for U.S. agricultural exports. India has a large and expanding population (1.2 billion consumers, or one-sixth of the world's population), and its annual gross domestic product (GDP) growth rate of more than 8 percent over the past five years is among the highest in the world. India also has a sizable and growing middle class, expected to reach 500 million by 2025, which includes many affluent urban consumers interested in Western-style foods. Yet, despite robust U.S. agricultural exports worldwide, U.S. exports to India are limited, both in value and in the range of products. In 2008, India received less than one-half of 1 percent of total U.S. agricultural exports and ranked 39th among overseas markets for U.S. agricultural products. Moreover, U.S. agricultural goods accounted for only 6 percent of the Indian agricultural import market in 2008, compared to an 18 percent share of global markets.

This report responds to a request by the Senate Committee on Finance (Committee) for information and analysis on the effects of Indian tariffs and nontariff measures (NTMs) on U.S. agricultural exports and U.S. agricultural firms operating in India. Specifically, the Committee requested that the report provide (1) an overview of the Indian agricultural market, including recent trends in consumption, imports, and domestic supply; (2) a description of the principal measures affecting Indian agricultural imports, including tariffs, sanitary and phytosanitary measures, food regulations, packaging and labeling requirements, pricing policies, intellectual property policies, and customs procedures; (3) information on Indian government regulations, including state regulations, covering agricultural markets and foreign direct investment (FDI) affecting U.S. agricultural products in India; (4) an evaluation of the impact of India's food marketing and distribution system, including market structure, transportation infrastructure, and cold-storage capacity, on U.S. agricultural products in the Indian market; and (5) a quantitative analysis of the economic effects of tariffs and, to the extent possible, NTMs on U.S. agricultural exports to India. The major findings of this report are summarized below.

Major Findings and Observations

Indian Tariffs and Nontariff Measures

Very high Indian agricultural tariffs are a substantial impediment to U.S. agricultural exports.

Indian bound tariff rates on agricultural products average 114 percent, with the majority of bound tariff rates between 50 and 150 percent. These rates are among the highest in the world and are much higher than the average bound rates of other major developing countries, such as Brazil (36 percent) and China (16 percent), or for the top 10 U.S. agricultural export markets (34 percent). Product groups with the highest average bound and applied tariff rates are generally those considered to be import sensitive by the Indian government (table ES.1).

Indian applied tariff rates on agricultural products range from 10 to 150 percent and are levied almost exclusively on an ad valorem basis. Average applied tariff rates have

TABLE ES.1 India: Average bound and applied tariffs by selected product groups, as of April 2009 (percent)

Product groups	Bound tariff	Applied tariff
Vegetable fats and oils	227	24
Alcoholic beverages	150	133
Oilseeds	130	30
Grains	113	40
Processed fruits and vegetables	111	30
Fresh and dried fruits, vegetables, and nuts, excluding almonds	100	30

Sources: Government of India, Ministry of Finance, Central Board of Excise and Customs, *Customs Tariff 2008/09*; Government of India, Ministry of Finance, Central Board of Excise and Customs, various *Notifications of Customs*.

Note: Averages are rounded to whole numbers.

declined significantly from 113 percent in 1991, prior to Indian economic liberalization, to approximately 34 percent in 2007, but they remain among the highest in the world.

The wide gap between high WTO bound and lower applied tariff rates allows India to vary its rates frequently and substantially, which creates uncertainty for U.S. agricultural exporters.

For many agricultural products, India's WTO bound tariff levels are much higher than its applied rates. These gaps allow the Indian government to modify its tariff rates in response to domestic and international market conditions. The Indian government frequently changes its rates on heavily traded international commodities, such as wheat, rice, sugar, and vegetable oils, to mitigate food price inflation, depending on market conditions. If domestic agricultural prices rise, tariff rates are lowered to create downward pressure on those prices to minimize the impact on consumers; when prices fall, the rates are often increased to protect farmers by raising the overall cost of imports. This tariff rate variability and the complex notification process for announcing tariff-rate changes create uncertainty and are an additional impediment for U.S. agricultural exporters.

A wide array of Indian NTMs substantially limits or effectively prohibits certain U.S. agricultural exports.

Indian NTMs raise the cost of exporting U.S. agricultural products to India and, in some cases, effectively prohibit U.S. products from the Indian market (table ES.2). India also links NTMs to domestic policies by relaxing NTMs when imports are required to alleviate food price inflation or food shortages. For example, certain phytosanitary requirements on key commodities such as wheat are reportedly adjusted by the Indian government when imports are needed to control prices and adjust buffer stocks.

Indian Agricultural Imports

Indian agricultural imports are relatively small and concentrated in a few bulk commodities.

Indian agricultural imports accounted for just 1 percent of global agricultural trade in 2008 and supplied only 3 percent of Indian agricultural demand. The limited range of

TABLE ES.2 India: Nontariff measures facing certain U.S. agricultural exports, 2009

Measure	Application	Product
Sanitary/phytosanitary measures		
Health standards	Exceed internationally accepted standards	Poultry, swine, dairy
Contamination standards	Inconsistent with international practices	Wheat, barley
Rules for genetically modified organisms	Effectively ban imports because of burdensome approval process	Corn, certain processed foods
Fumigation requirements	Require destructive or unavailable treatment processes	Pulses, certain fruits
Quality standards	Exceed internationally accepted standards	Certain processed foods, hides and skins, bovine semen
Labeling and packaging rules	Preclude agricultural product distribution without mandated disclosures	Processed foods
Bans, monitoring, and licensing requirements	Place restrictions on free movement of imports	Beef, poultry, edible oils, cereals, nuts, corn
State trading enterprises	Restrict imports to certain state-sanctioned entities	Food grains
Customs procedures	Create uncertainty regarding paperwork and valuation	All
Notice and comment procedures	Hinder information dissemination about rules affecting imports	All
Corruption	Raises costs through payment of bribes	All

Source: Compiled by Commission staff.

Indian agricultural imports tends to consist of staple foods, such as vegetable oils and pulses (peas, beans, and lentils), of which there is chronic undersupply from domestic production (table ES.3). In 2008, vegetable oils (mostly palm oil and soybean oil), pulses and nuts accounted for 60 percent of all Indian agricultural imports. Notably, Indian imports of food grains (excluding wheat), feed grains, oilseeds, meat, dairy products, sweeteners, and processed foods were negligible in 2008. India is self-sufficient in many of these products.

TABLE ES.3 India: Agricultural imports at a glance

	United States	World
Indian agricultural imports, 2008	$497 million	$8,533 million
Indian agricultural import average annual growth, 2003–08	14.5%	12.7%
Top five Indian agricultural imports, 2008	Almonds, cotton, peas, apples, soybean oil	Palm oil, soybean oil, peas, cashews, beans
Top five Indian agricultural suppliers, 2006–08 average	([a])	Indonesia, Argentina, Burma, EU-27, Canada

Source: GTIS, World Trade Atlas Database (accessed June 8, 2009).

[a]Not applicable

U.S. agricultural products face strong competition in the Indian import market from low-cost international suppliers.

For certain products, limited Indian imports from the United States reflect market competition from other global suppliers. Indian traders and consumers are reportedly very price sensitive and, in many cases, will not pay a premium for higher-quality U.S. products.

Indian Agricultural Policy Objectives

Restrictive Indian agricultural trade policies should be viewed in the context of three core domestic policy objectives: food security, food self-sufficiency, and income support for farmers.

Indian agricultural trade policies are consistent with the government's long-standing policies of protecting domestic producers from foreign competition and consumers from domestic and global price fluctuations for food staples such as wheat, rice, and vegetable oils. The Indian government explicitly links tariffs and NTMs to its domestic policies to meet these objectives. The tension between the desire to raise food prices for the benefit of farmers and the desire to lower them for the benefit of consumers has caused the Indian government to intervene heavily in the farm sector with multiple policy instruments.

Broad government intervention in the agricultural sector responds to current and historical challenges faced by Indian policymakers and contributes to the low level of U.S. agricultural exports.

Significant challenges faced by India include a history of food shortages, a large segment of the population dependent on the agricultural sector for its livelihood, and hundreds of millions of poor Indians who spend most of their incomes on food. More than one-third of the population, mostly rural Indians, still lives on less than $1 per day. Indian farmers are a politically powerful voting bloc that has a major influence on Indian domestic and international trade policies.

Indian agricultural support policies promote domestic production at the expense of imports. These policies include input support programs, output price support programs, and farmer income programs. Input supports focus primarily on fertilizer, irrigation water, electricity, diesel fuel, and seeds. Output price supports consist largely of minimum support prices for certain staple crops. Farmer income programs lower the cost of borrowing to farmers and boost wages for farm laborers.

Agricultural Consumption

Indian per capita caloric consumption, centered on staple foods, is low compared to that of other developing countries, but is rising with income growth.

Indian food consumption primarily consists of grains (wheat and rice), pulses, edible oils, and potatoes. Grains account for almost two-thirds of Indian daily caloric intake. In recent years, per capita consumption of many food products has risen owing to GDP

growth, and Indians have added more nonstaple food items, such as fruits and vegetables, dairy products, and meat, to their diet. Despite the rise in caloric intake over time, Indians still consume fewer calories per capita than people in many other developing countries.

Rising incomes among middle-class Indians are driving increased consumption of nonstaple foods.

The rapid development of the Indian economy and strong income growth has led to an increase in the variety of foods consumed, particularly among India's growing middle class of 200–300 million consumers. Middle- and upper-class Indians, mainly in urban areas, are increasingly consuming imported foods or multinational-branded foods produced domestically.

Agricultural Sector Characteristics

Agriculture is vital to the Indian economy.

Indian agricultural production, valued at $176 billion in 2007, represented 17 percent of Indian GDP. In contrast, agricultural production in the United States accounted for 1 percent of U.S. GDP. Agriculture provides livelihoods for more than 60 percent of the population, and millions of small-scale, poor farmers account for more than one-half of total agricultural production.

India is a major global producer of agricultural products and is largely self-sufficient.

India has the second-largest arable land base after the United States and is endowed with the full spectrum of the world's climates. As a result, India produces a wide variety of agricultural products and is a major global producer of grains (wheat, rice, and corn), dairy, fruits and vegetables, and livestock. Domestic production supplies more than 97 percent of Indian agricultural consumption. Food self-sufficiency has been a focus of the Indian government since the Green Revolution in the 1960s.

Indian Marketing and Distribution System

Despite the size of the Indian market, inefficiencies in India's marketing and distribution system make it less attractive for U.S. agricultural products.

Marketing and distribution inefficiencies result from high levels of government intervention, poor quality and limited availability of storage and transportation infrastructure, a lack of alternative sales outlets for farmers, several layers of middlemen, limited access to marketing information, inadequate grades and standards, and few tools for risk management. These inefficiencies discourage the entry of U.S. firms into the Indian market and increase the costs for firms already in the market. However, Commission research suggests that for most products, these market and distribution inefficiencies do not disproportionately affect U.S. exports or U.S. agricultural firms operating in India.

U.S. Foreign Direct Investment

U.S. firms are active participants in the Indian food sector through FDI.

U.S. FDI in India, most prominently in food and beverage processing, alcoholic beverage industries, and quick-service restaurants, permits U.S. agricultural firms to access Indian consumers directly, while bypassing many trade barriers. U.S. firms report that the Indian government encourages FDI and that they generally have not experienced market access or national treatment barriers. Many U.S. firms prefer to operate in India through joint ventures rather than wholly owned affiliates. Local partners can be particularly useful in helping U.S. firms navigate through central and state government bureaucracies and the intricacies of local business customs.

The Indian market offers incentives and disincentives for U.S. agriculture-related FDI.

Incentives for U.S. FDI include access to the large and growing Indian consumer market, an enhanced ability to adapt products to local needs and requirements, and the ability to bypass tariffs and NTMs that may inhibit U.S. exports. The Indian government also provides some regulatory FDI incentives, such as tax rebates linked to Special Economic Zones. Disincentives to FDI include a ban on FDI in most farming activities, occasionally difficult relations with joint venture partners, complex licensing and regulatory systems, and a disjointed national market in which it is difficult to achieve economies of scale because of logistical constraints and widely varying state regulations.

Intellectual Property Rights

Indian intellectual property rights (IPR) policies reportedly are of critical importance to U.S. seed firms operating in India, but U.S. firms in most other agricultural sectors did not identify IPR as a significant trade or investment barrier.

Three factors identified by U.S. and global seed firms as critical to participation in the Indian market are strong and effective IPR laws, market-based pricing, and science-based regulatory review of new seed technologies. India recently enacted a plant variety protection law and patent provisions for seed biotechnology inventions, but broad exceptions in the laws, delayed implementation, and uncertainty about enforcement undermine the effectiveness of these IPR protections. State-level restrictions on seed prices and time-consuming and unpredictable regulatory review also hinder the commercialization of new seed technologies. In the absence of effective regulatory review and IPR enforcement, illegal and counterfeit seed markets have flourished, to the detriment of legitimate products.

Quantitative Findings

Indian tariffs are estimated to have reduced U.S. agricultural exports by as much as $291 million in 2007.

Economic simulations suggest that Indian agricultural tariffs reduced U.S. agricultural exports to India by $200–291 million in 2007. In the absence of Indian tariffs, total U.S. exports to India would have been 42–61 percent higher (table ES.4).

TABLE ES.4 India: Simulated effects of removing Indian tariffs on selected U.S. food and agricultural exports, 2007

Items	Average tariff rate	Simulated change in U.S. exports
	Percent	Million $
Almonds, fresh or dried, inshell	20	27–33
Soybean oil	40	17–22
Fresh apples	50	17–21
Cotton	10	3–26
Fresh grapes	30	4–5
All other	([a])	132–184
Total	24	200–291

Source: Commission economic modeling simulations.

[a]Not applicable

In the absence of Indian tariffs and in the span of a few years, U.S. exports could expand more rapidly than modeling simulations indicate because of the possible additional effects of economic growth in India and market development by U.S. exporters, two factors not included in the simulation.

Economic simulations suggest that Indian NTMs restricted U.S. exports of wheat by more than $146 million in 2007.

Economic simulations were conducted on a set of U.S. agricultural product sectors for which (1) Indian import prices were higher than world prices and (2) Commission research indicated that specific NTMs were impeding U.S. agricultural exports. These sectors include dairy products (lactose, whey products, and nonfat dry milk); beverages (wine and spirits); cereal grains, other than wheat (corn and other grains); and meat products (pork and poultry), which have positive NTM price gaps. Simulations were also conducted for wheat, for which U.S. exports to the world are large but U.S. exports to India were zero in 2007 owing to NTM restrictions. The estimated increase in U.S. exports of wheat following removal of Indian NTMs would have been $146–334 million in 2007. The increase in other U.S. exports following NTM removal would have been significantly smaller (table ES.5).

TABLE ES.5 India: Simulated effects of removing certain NTMs on selected U.S. food and agricultural exports, 2007

Items	Estimated tariff equivalent of NTMs	Simulated change in U.S. exports
	Percent	Million $
Wheat	([a])	146–334
Dairy products	27	15–20
Beverages	75	6–9
Other cereal grains[b]	151	2–8
Meat products	8	0.08–0.10

Source: Commission economic modeling simulations.

[a]Because there were no U.S. wheat exports to India in the 2007 base year, there is no estimated tariff equivalent.

[b]Grains other than wheat and rice, such as corn, sorghum, and oats.

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ACRONYMS AND TERMS

AAY	Antodaya Anna Yojana, a support program for the poorest households
Agmark	Grading system of the Directorate of Marketing and Inspection of the Ministry of Agriculture
AI	Avian influenza
AP	State of Andhra Pradesh, India
APHIS	Animal and Plant Health Inspection Service, USDA
APL	Above poverty line
APMC	Agricultural Product Marketing Commission
APMRA	Agricultural Product Marketing Regulation Act
APTA	Asia-Pacific Trade Agreement
ASEAN	Association of Southeast Asian Nations
ASTA	Average ship turn-around time
BPL	Below poverty line
Bt	*Bacillus thuringiensis*
CAGR	Compound annual growth rate
CCI	The Cotton Corporation of India
CES	Constant elasticity of substitution
CET	Constant elasticity of transformation
c.i.f.	Cost, insurance, and freight
Codex	Codex Alimentarius Commission
cold chain	Temperature-controlled storage and transportation
CONCOR	Container Corporation of India
crore	10,000,000
CVD	Countervailing duty
CY	Crop year
DUS	Distinctiveness, uniformity, and stability
ECA	Essential Commodities Act
e-Choupal	Online source of price, credit, and transportation information for India's farmers
EPA	U.S. Environmental Protection Agency
ERS	Economic Research Service, USDA
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	FAO's online statistical database
FAS	Foreign Agricultural Service, USDA
FCI	Food Corporation of India
FDA	U.S. Food and Drug Administration
FDI	Foreign direct investment
f.o.b.	Free on board
FSSA	Food Safety and Standards Authority, Ministry of Health and Family Welfare, Government of India
FTA	Free trade agreement
FY	Fiscal year
GDP	Gross domestic product
GE	General equilibrium
GFCF	Gross fixed capital formation
GM	Genetically modified

ACRONYMS AND TERMS—*Continued*

GMO	Genetically modified organism
Golden Quadrilateral	National highways linking Delhi, Mumbai, Chennai, and Kolkata
GTAP	Global Trade Analysis Project
GTIS	Global Trade Information Services
HCI	Hindi Times, CNN, and IBN
HRI	Hotel, restaurant, and institutional
HS	WTO Harmonized Tariff System
HS6	Six-digit level of the Harmonized System
IFPRI	International Food Policy Research Institute
IPR	Intellectual property rights
jowar	Sorghum
kirana	Small, "mom and pop"store
lakh	100,000
levy rice	A specified portion of the rice procured from farmers that millers are required to sell to the central government at a set price
MAcMapHS6	Market Access Map at the HS6 level
mandi	Regulated market into which most raw agricultural products in India are sold
MEP	Minimum export price
Mercosur	Common Market of the South
MFN	Most favored nation
MIS	Marketing Intervention Scheme
MMB	Mahyco-Monsanto Biotech
mmt	Million metric tons
Model Act	State Agricultural Produce Marketing (Development and Regulation) Act of 2003
MOFPI	Ministry of Food Processing Industries, Government of India
Mother Dairy	A farmer cooperative, and the largest brand of milk in India
MSP	Minimum support price
mt	Metric ton
NAFED	National Agricultural Marketing Federation
n.d.	No date
n.e.c	Not elsewhere classified
n.e.s.o.i	Not elsewhere specified or indicated
NREGA	National Rural Employment Guarantee Act
NTM	Nontariff measure
OECD	Organisation for Economic Co-operation and Development
OIE	World Organization for Animal Health (also known by its original name, International Organization for Epizootics; OIE reflects French acronym).
OPV	Open-pollinated variety
PDS	Public Distribution System
PE	Partial equilibrium
PFA	Prevention of Food Alteration Act
PPV&FR	Protection of Plant Varieties and Farmers' Rights Act, 2001
PSD	Production, supply, and distribution
PSS	Price Support Scheme
PTA	Preferential trade agreement
ragi	Finger millet

ACRONYMS AND TERMS—*Continued*

RGGVY	Rajiv Gandhi Grameen Vidyutikaran Yojana rural electrification program
RoW	Rest-of-the-world
Rs.	Indian rupees
rythu bazaars	Type of direct market established in Andhra Pradesh
SAFTA	South Asian Free Trade Agreement
SEZ	Special economic zone
SPS	Sanitary and phytosanitary
SSI	Small-scale industries
STE	State trading enterprise
TBT	Technical barrier to trade
TRAINS	Trade Analysis and Information System
TRIPS	Trade-Related Aspects of Intellectual Property Rights Agreement
TRQ	Tariff-rate quota
UAE	United Arab Emirates
UNCTAD	UN Conference on Trade and Development
UP	State of Uttar Pradesh, India
UPOV	International Convention for the Protection of New Varieties of Plants
USDA	U.S. Department of Agriculture
USITC	U.S. International Trade Commission
USTR	U.S. Trade Representative
UT	Union territories
uzhavar sandhai	Type of direct market established in Tamil Nadu
VAT	Value-added tax
WITS	World Integrated Trade Solution

CHAPTER 1
Introduction

The economic prosperity of the U.S. agricultural sector is highly dependent on access to foreign markets. As the leading global supplier of agricultural products, the United States exported $116 billion in goods in 2008, representing more than one-third of U.S. farm cash receipts.[1] Between 2003 and 2008, U.S. agricultural exports almost doubled in value. During this period, the value of U.S. agricultural exports to developing countries increased almost twice as fast as the value of exports to developed countries, and the share of U.S. agricultural exports sent to developing countries rose from about one-half to two-thirds.[2] Growth in U.S. agricultural exports was particularly strong to many developing Asian countries, such as China, Indonesia, and Vietnam—countries characterized by rapid rates of per capita income growth and a high propensity to spend rising incomes on food.

The Indian market holds significant sales potential for U.S. agricultural products. India's annual gross domestic product (GDP) growth rate, averaging more than 8 percent during the last five years, is among the highest in the world.[3] India has a large and expanding population (1.2 billion consumers, or one-sixth of the world population), with a middle class expected to reach 500 million by 2025.[4] Its population is among the youngest in the world and includes many affluent urban consumers interested in Western-style foods, as evidenced by the substantial recent growth for U.S.-based firms such as McDonald's, KFC,[5] and Domino's Pizza in the Indian quick-service restaurant sector.

Although India experienced rapid population and income growth during the last two decades, its trade and agricultural policies have resulted in only about 3 percent of Indian food and agricultural demand being met by imports.[6] Of these imports, the share from the United States is small. U.S. agricultural goods accounted for only 6 percent of the Indian import market in 2008, compared to 18 percent of global markets. U.S. agricultural exports to India were $497 million in 2008, accounting for less than 0.5 percent of total U.S. agricultural exports.[7] India currently ranks as the 39th-largest U.S. agricultural export market. Many leading U.S. export commodities, such as wheat, corn, soybeans, pulses (peas, beans, and lentils), edible oils, and processed products, are not exported to India or are shipped only in small quantities. Furthermore, during 2003–08, U.S. agricultural exports to India were concentrated in a small number of products. A summary of key Indian agricultural trade information comparing the United States with the world is provided in table 1.1.

[1] USDA, ERS, *Amber Waves*, "Rural and Natural Resources Indicators," June 2009.
[2] USDA, FAS, online trade statistics.
[3] EIU, *Country Report: India*, September 2009.
[4] U.S. Department of State, Bureau of South and Central Asian Affairs, *Background Note: India*, January 2009.
[5] KFC Corporation is also known as Kentucky Fried Chicken.
[6] Narayanan and Walmsley, *Global Trade, Assistance, and Production*, 2008. The share of food demand met by imports for Asia as a whole is 13 percent.
[7] GTIS, World Trade Atlas Database (accessed June 8, 2009).

TABLE 1.1 India: Agricultural trade at a glance

	United States	World
Indian agricultural imports, 2008	$497 million	$8,533 million
Indian agricultural import average annual growth, 2003–08	14.5%	12.7%
Top five Indian agricultural imports, 2006–08 average	Almonds, cotton, peas, apples, soybean oil	Palm oil, soybean oil, peas, cashews, beans
Top five Indian agricultural import suppliers, 2006–08 average	([a])	Indonesia, Argentina, Burma, EU-27, Canada
Indian agricultural exports, 2008	$1,282 million	$20,150 million
Indian agricultural export average annual growth, 2003–08	17.3%	27.0%
Top five Indian agricultural exports, 2006–08 average	Cashews, gum and thickeners, pepper, dairy, rice	Rice, soybean meal, cotton, sugar, frozen beef
Top five Indian agricultural export markets, 2006–08 average	([a])	EU-27, China, UAE, United States, Bangladesh

Source: GTIS, World Trade Atlas Database (accessed June 8, 2009).

[a]Not applicable.

The low level of U.S. agricultural exports to India is a concern to the U.S. agricultural community, business representatives, and policymakers. In general, these groups view high Indian tariffs and burdensome nontariff measures (NTMs) as principal reasons impeding U.S. products from entering the Indian market.[8] For example, the U.S.-India Business Council (USIBC), whose members include several food and agricultural companies and trade associations, identified a number of tariffs and NTMs impeding U.S. exports of such products as pistachios, chocolate and confectionery, frozen poultry, cheese, frozen French fries, and soybean oil.[9] The U.S. Department of Agriculture (USDA) and United States Trade Representative (USTR) have held several consultations with the Indian government in an attempt to open the market to U.S. products.

In its letter requesting this investigation, the Senate Committee on Finance (Committee) asked the U.S. International Trade Commission (Commission) to examine and report on the effects of Indian tariffs and NTMs on U.S. agricultural exports. The Committee asked that the report cover the period 2003 through 2008, or through the latest year for which data are available. Noting the potential importance of export markets such as India to the U.S. agricultural sector, the Committee pointed out that the extent to which Indian trade and investment measures depress the U.S. share of India's agricultural imports remains largely undocumented. More specifically, the Committee asked that the report include the following:

- an overview of the Indian agricultural market, including recent trends in consumption, imports, and domestic supply;
- a description of the principal measures affecting Indian agricultural imports, including tariffs, sanitary and phytosanitary (SPS) measures, food regulations,

[8] USTR, *2009 National Trade Estimate Report on Foreign Trade Barriers*, 2009, 235. See appendix D of this report, which summarizes the views of interested parties.

[9] USIBC, written submission to the USITC, June 26, 2009, 8.

packaging and labeling requirements, pricing policies, intellectual property rights (IPR) policies, and customs procedures;

- information on Indian government regulations, including state regulations, covering agricultural markets and foreign direct investment (FDI) affecting U.S. agricultural products in India;

- an evaluation of the impact of India's food marketing and distribution system, including market structure, transportation infrastructure, and cold-storage capacity, on U.S. agricultural products in the Indian market; and

- a quantitative analysis of the economic effects of Indian tariffs and, to the extent possible, NTMs on U.S. agricultural exports to India.

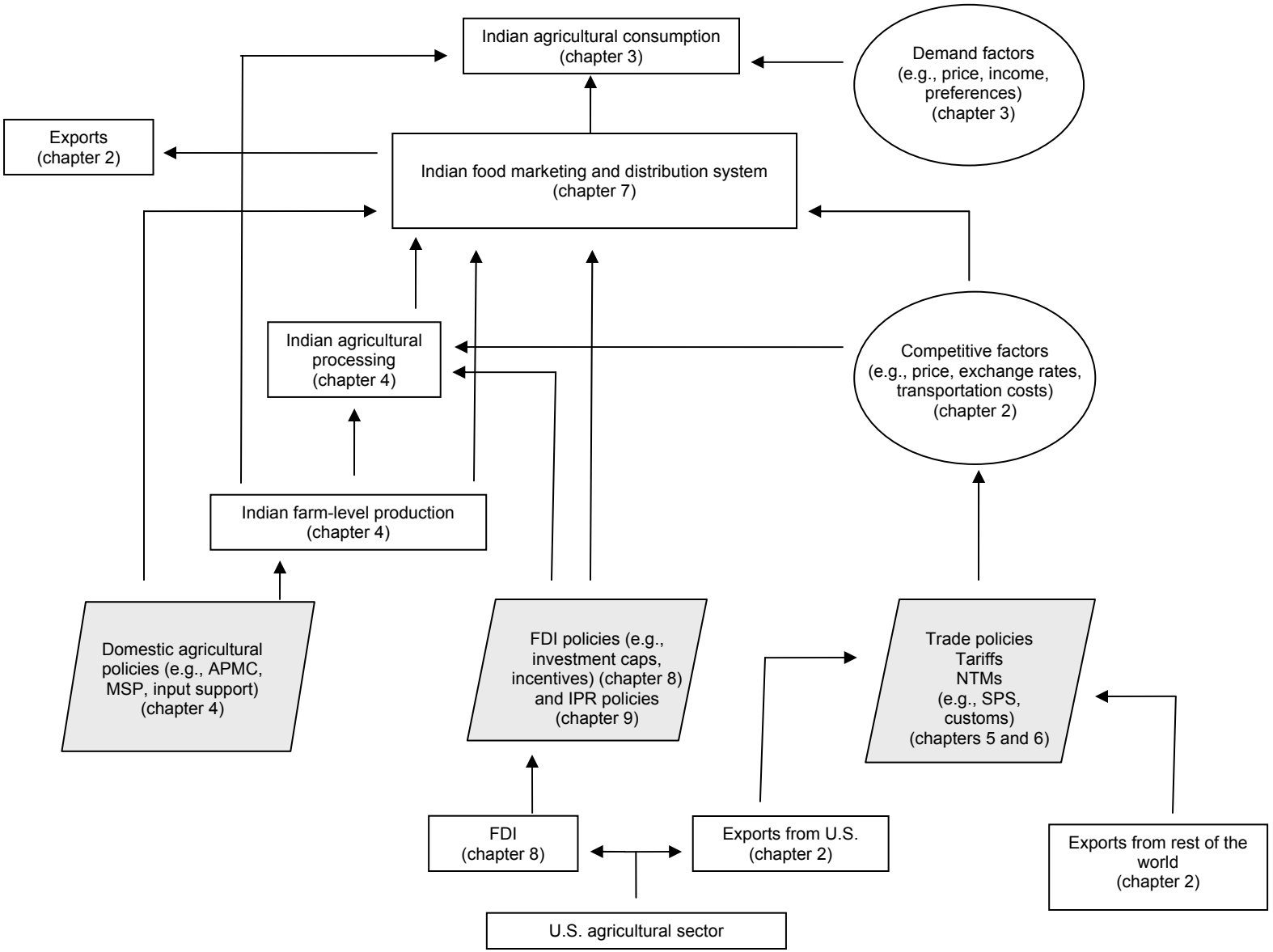
Scope of the Report

In response to the Committee's request, this study examines the effects of Indian tariffs and NTMs on U.S. agricultural exports. As shown in figure 1.1, U.S. agricultural exporters and food companies reach Indian consumers primarily by two routes: the export of agricultural goods and FDI. U.S. agricultural exports face Indian tariffs and NTMs before they enter that country's food processing sector and marketing and distribution system. Besides competing with other exporters, U.S. firms must compete with Indian domestic agricultural production, which is highly regulated and supported by the government. In addition, U.S. agricultural firms access the Indian market through FDI, by establishing facilities in the processing sector or by operating in certain segments of the food marketing and distribution system. In either case, investment decisions by U.S. firms are heavily influenced by Indian policies covering FDI and IPR.

As requested by the Committee, the report provides two types of information: (1) background information on India's production, consumption, and trade in agricultural products, and (2) information on the factors that directly impact U.S. exports and firms, including tariffs, NTMs, market and distribution conditions, FDI, and IPR. Factors described and analyzed in this report are included in the framework provided in figure 1.1. The figure identifies principal Indian agricultural policies (shaded parallelograms) that affect the system, including those bearing on domestic production and marketing, trade, investment, and IPR. Also shown are relevant market factors (ovals) that affect consumption and imports.

Background information is covered in chapters 2–4 of the report. Indian agricultural trade trends are presented in chapter 2, focusing on trade with the United States and the U.S. competitive position in the Indian market vis-à-vis other global suppliers. Indian agricultural consumption is discussed in chapter 3, including a description and analysis of Indian consumption patterns, preferences, and trends, which are the ultimate drivers of current and potential demand for U.S. agricultural products. Indian farm-level production, agricultural processing, and domestic agricultural policies are examined in chapter 4. This chapter explains how highly regulated domestic production, supported by trade restrictions, is a major factor behind the very low share of imports, including U.S. imports, in the Indian market.

FIGURE 1.1 India: Flowchart of the agricultural system



Source: Compiled by Commission staff.

Information on the factors that directly affect U.S. agricultural exports and firms is covered in chapters 5–8 of the report. Chapter 5 describes India's tariff rates and tariff policies and provides quantitative estimates of what U.S. agricultural exports to India would have been in 2007 in a tariff-free environment. NTMs are described and analyzed in chapter 6, including quantitative estimates of what selected U.S. agricultural exports to India would have been in 2007 if certain NTMs had not been present. The Indian food marketing and distribution system is covered in chapter 7, focusing on market and distribution conditions and deficiencies that affect the Indian agricultural market, including U.S. agricultural exports and FDI. Chapter 8 provides an overview and analysis of current U.S. FDI in India, including regulations and other factors affecting U.S. agricultural firms operating in India. Indian IPR policies and regulations, which primarily affect the U.S. seed industry, are described and analyzed in chapter 9.[10]

Products covered in this investigation include all existing or potential U.S. agricultural product exports to India. Agricultural products in this study are defined to match those products covered in the World Trade Organization (WTO) Agreement on Agriculture, part XIII, article 21. These include 768 six-digit product codes classified in the World Customs Organization harmonized system (HS)—specifically, HS chapters 1 to 24, excluding fish and fish products (HS chapter 3),[11] plus certain additional products in other HS chapters, such as milk proteins (HS chapter 35); hides, skins, and furs (HS chapters 41 and 43); wool (HS chapter 51); and cotton (HS chapter 52).

As requested by the Committee, certain information presented in this report, including trends in trade, production, and consumption, covers the period 2003–08 or the period from 2003 to the latest year for which data are available. Longer-term data are used to explain important long-term trends. The descriptive and quantitative analysis of the effects of Indian trade measures and market conditions is based on the latest available information and data.

India's Policy Framework

The Government of India's Eleventh Five Year Plan, covering the period 2007–12, identifies three core domestic agricultural policy objectives: food security,[12] food self-sufficiency,[13] and income support for farmers.[14] In order to meet these objectives, the Indian government actively regulates the agricultural sector, including production, marketing, and consumption, in addition to international agricultural trade.[15] Broad government intervention in the agricultural sector is a response to substantial challenges facing Indian policymakers. These challenges, as well as India's responses to them, are described in more detail below.

[10] Firms in other agricultural sectors did not identify IPR policies as critical to their trade or investment decisions.

[11] Processed fish products classified in HS chapter 16 are also excluded from the WTO definition of agricultural products.

[12] Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 3–5, 25, 34, 26, 39, 51, 91.

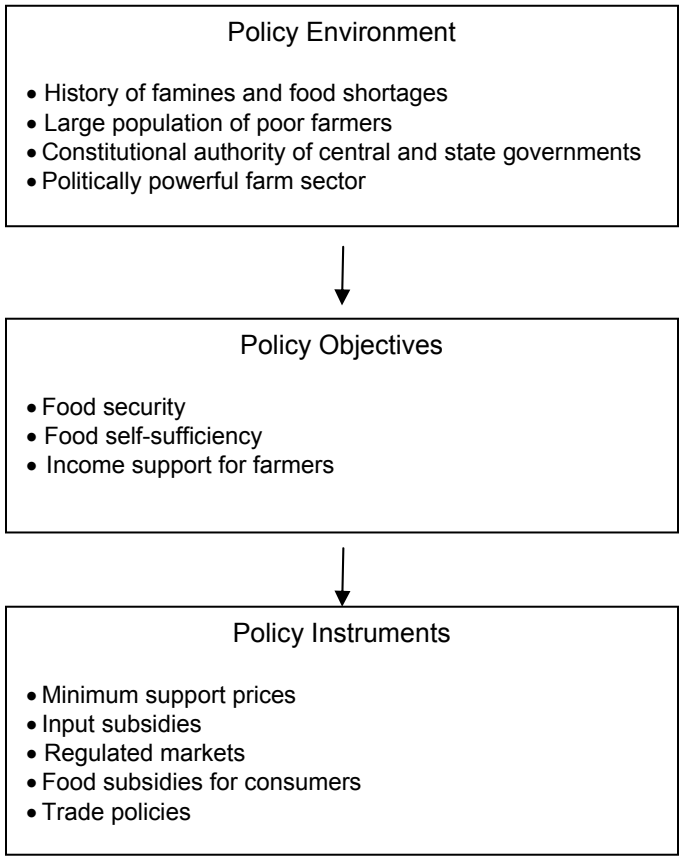
[13] Ibid., 17, 157.

[14] Ibid., 4, 37.

[15] The Government of India maintains highly interventionist agricultural policies, which include price support, insulation from world markets, rigorous trade restrictions, and support for the purchase of agricultural inputs. Mittal and Mukherjee, *Food for Policy: Reforming Agriculture*, 2008, 78.

India's central and state governments formulate policies (in this case, agricultural policies) in response to a policy environment linked to historical events and current social, demographic, and political factors. This environment leads Indian officials to articulate broad policy objectives, which in turn generate specific policy instruments influencing either macroeconomic factors (e.g., inflation rates, interest rates, and trade deficits) or microeconomic ones (e.g., industrial sectors and business investment). Indian trade policies are only one set of those policy instruments. A simplified framework for Indian domestic and trade policies in the agricultural sector appears in figure 1.2; the diagram flows from the policy environment to policy objectives and finally to India's specific policy instruments.[16]

FIGURE 1.2 India: Agricultural policy framework



Source: Compiled by Commission staff.

[16] The examples in figure 1.2 are intended to be illustrative, not comprehensive.

Policy Environment

As figure 1.2 shows, India's agricultural policy is based on a number of historical economic, social, and legal considerations.[17] They include a history of famines, a large population dependent on the agricultural sector for its livelihood, millions of poor people who must spend most of their incomes on food, a strong farm lobby with millions of rural voters, and a constitutional structure that vests certain powers over agricultural policy in state governments.

India's agricultural policies are based, in part, on a history of periodic famines, such as the famine of 1943 and chronic food shortages after independence in 1947 and into the 1950s.[18] The response of the Indian government was to achieve greater security in food supply, especially food grains. The set of policy instruments employed for these efforts, and the resulting expansion in Indian agricultural production, is generally known as the Green Revolution.[19]

More than one-half of India's population of 1.2 billion depends on farming for its livelihood. Although the overall Indian economy has grown significantly, most of the rural population has not benefited.[20] The Indian farm sector has very low labor productivity,[21] about one-sixth the level of other sectors of the economy, which the Organisation for Economic Co-operation and Development (OECD) has identified as a major factor contributing to low living standards and poverty in rural areas.[22] Although overall poverty has declined nationwide, more than one-third of the population, mostly rural Indians, still live on less than $1 per day.[23] This persistent poverty is a major factor driving government agricultural policy.

The Indian constitution provides the states with primary authority over the agricultural sector. The role of the central government is to develop overarching policies and regulatory guidelines, while the states hold most of the legislative and implementation authority so that they can address local needs.[24] This constitutional structure is the result of historical factors, including the desire of states to have control over the local food supply. Central government and state jurisdiction over Indian agricultural matters are described in appendix G.

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[17] Throughout most of India's history as an independent country, starting in 1947 and continuing until 1991, India's economy was dominated by central planning characterized by extensive regulation, trade protectionism, and public ownership of heavy industry. India's first government under Prime Minister Jawaharlal Nehru fashioned the economy on a Soviet socialist model and similar to other planned economies. Vestiges of central planning can be found in India's economy. For example, India's government still produces five-year plans for major portions of the economy, including agriculture. Lalwani, August 15, 2007, 1–2; Poddar, 4.

[18] The famine of 1943 is widely known as the Bengal Famine; an estimated 4 million people died in eastern India.

[19] Information on the Green Revolution's effect on India's agricultural production can be found in chapter 4.

[20] Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 3.

[21] World Bank, *Agriculture for Development: World Development Report, 2008*, 2007, 141, 202.

[22] OECD, *Agricultural Policies in Emerging Economies 2009*, 98.

[23] European Commission, India's Role in World Agriculture, 2; OECD, *Agricultural Policies in Emerging Economies 2009*, 98.

[24] WTO, *Trade Policy Review*, 2007.

Despite their weak economic profile, Indian farmers represent an enormous voting bloc, and political parties require the backing of these voters to help win elections.[25] According to numerous Indian sources, for fear of being voted out of office, Indian politicians are reluctant to set policies that may negatively affect farmers.[26] Out of this political reality, a deeply held view has taken hold among Indian policymakers that farmer incomes should be increased through targeted government spending.[27]

Policy Objectives

Emerging from this environment are three broad government objectives for India's agricultural domestic and trade policy: food security, food self-sufficiency, and income support for farmers.[28] Ensuring that millions of poor citizens have access to food staples at affordable prices is a primary objective of India's central government, which has chosen to coordinate domestic food production and international trade policies to meet this objective.[29]

Food security is defined by the World Bank as "access by all people at all times to enough food for an active, healthy life";[30] its components are often listed as food availability, access, and use.[31] Of the three, only availability and access will be addressed in this investigation. Food availability can be met with domestic production, imports, or a combination of the two. Food access can be achieved through government policies that lower prices to affordable levels for the poor or through payment schemes that cover the full cost of the food. In all cases, however, food security requires that food be available in sufficient volumes at prices consumers can afford.

Food self-sufficiency is defined as the extent to which a country can satisfy its food needs from domestic production.[32] In seeking food self-sufficiency, India focuses on staple crops, primarily food grains such as wheat and rice. The concepts of food self-sufficiency and food security differ in that food self-sufficiency encompasses only national food production for sources of supply, while food security takes imports into account.[33] Indian

[25] Chatterjee, "BJP Goes One Step Ahead of Cong in Dangling Sops," *The Times of India*, April 4, 2009; Bykere, "In India, Populism is the Real Electoral Winner," *The Wall Street Journal Asia*, June 10, 2009.

[26] Birner et al., *The Political Economy of Agricultural Policy Reform in India*, 16, 18, 40, 45; industry representative, interview by Commission staff, New Delhi, India, May 26, 2009.

[27] Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 3–4.

[28] Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008.

[29] Ibid., 15.

[30] The U.S. Agency for International Development (USAID) and the United Nation's Food and Agriculture Organization (FAO) have similar definitions. USAID, "Policy Determination: Definition of Food Security," April 13, 1992.

[31] More formally, the terms are defined as the following: "food availability" is having enough food consistently available; "food access" is having enough resources to obtain foods needed for a nutritious diet; and "food use" is the appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation. WHO, "Food Security." For a more detailed discussion of food security and citations to several studies on the issue, see FAO, *Trade Reforms and Food Security*, 2003.

[32] Thompson, *Implications of Economic Policy for Food Safety*, 1999.

[33] Ibid.

policymakers seek to achieve food security by attaining food self-sufficiency,[34] as observed in India's most recent five-year plan for agriculture.[35]

Income support for farmers is the third major policy objective of the central and state governments. Raising farmer incomes is important to the government because many of India's poor reside in rural areas, and the bulk of the nation's employment is based in smallholder agriculture.[36]

India's policy objectives in agriculture are contradictory. For example, policy interventions that support producer incomes by increasing crop prices may lead to higher food prices that negatively affect poor consumers. India's policy objectives of food security and food self-sufficiency also face inherent conflicts. Food security requires low and stable prices of food staples for poor consumers. On the other hand, the drive for food self-sufficiency requires sufficiently high crop prices to expand domestic food production.

Policy Instruments

The tension between the goals of increasing farm incomes and lowering consumer food prices has caused the Indian government to intervene heavily in the farm sector with multiple policy instruments. Some policies focus on supporting producers by boosting incomes, achieved through minimum support prices and what the Indian government refers to as "input subsidies" that artificially lower the cost of agricultural production inputs, including fertilizer, irrigation water, electricity, diesel fuel, and seeds.[37] These are partially offset by government regulations that limit the number of potential buyers for farm products, resulting in lower farmgate prices.[38] Other policies are designed to lower purchase prices for consumers and maintain price stability. India's Public Distribution System provides staple foods (e.g., rice and wheat) to the poor at below-market prices. The Essential Commodities Act permits the states to maintain adequate local stocks and to control prices for certain crops (e.g., wheat, rice, corn, sugar, and seeds).[39] Because Indian policymakers seek to achieve food security through domestic production, imports (to drive prices down for consumers) and exports (to drive prices up for farmers) are viewed as second-best policy instruments to achieve these objectives.[40] Tariffs and NTMs are used to raise or lower food prices and increase or decrease food supply when domestic policy instruments fail.[41]

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[34] The World Bank and other organizations acknowledge that India significantly increased its prospects for food security through the development of domestic agricultural production. This has encouraged efforts by Indian government officials to link the two policy objectives. But these groups also note that external trade is a more useful tool for dealing with food production surpluses and shortfalls. World Bank, *India Foodgrain Marketing Policies*, 1999, 1–2; Thompson, *Implications of Economic Policy for Food Safety*, 1999.

[35] Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008.

[36] Landes, "Indian Agriculture and Policy in Transition," 2008, 20.

[37] Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008; The Times of India, "Farmers to Get Diesel Subsidy of Rs. 15 a litre," September 20, 2008; Government of India, Press Information Bureau, "Centre to Give Financial Assistance to States introducing diesel subsidy to farmers in deficit rainfall affected areas," August 3, 2009; and Industry representative, interview by Commission staff, Mumbai, India, May 12, 2009.

[38] Market controls are discussed in greater detail in chapters 4 and 7.

[39] Government of NCT of Delhi, Department of Planning, *Economic Survey of Delhi, 2008–09*, Ch. 19 Public Distribution System, 1.

[40] Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 5, 25, 34, 36, 51.

[41] Tariff measures are addressed in chapter 5 and nontariff measures are addressed in chapter 6 of the report.

Current Indian agricultural trade policy is consistent with the government's long-standing attempts to strictly regulate trade to protect domestic producers from foreign competition and consumers from global price fluctuations.[42] In short, Indian agricultural trade policies should be viewed in the context of India's three core domestic policy objectives. The Indian government explicitly links tariffs to its domestic policies by stating that agricultural import duties should be carefully calibrated with domestic support prices to meet price stability goals.[43] Under India's WTO obligations, agricultural tariffs are bound at very high levels.[44] For many agricultural products, however, applied rates are much lower than high bound levels, and this disparity allows the government to modify tariffs to counter domestic and international market conditions.[45] In practice, the government raises and lowers tariffs in response to changes in world commodity prices and domestic supply and demand.[46] India also appears to link NTMs to domestic policies by relaxing NTMs when policymakers determine that imports are needed to relieve food price inflation or food shortages. For example, the government has reportedly adjusted certain phytosanitary requirements on key commodities (or eased their enforcement) to control prices and adjust buffer stocks.[47]

Approach

As requested by the Committee, this report contains qualitative and quantitative information and analysis examining a broad range of trade, market, and regulatory factors, including information on Indian agricultural production and consumption, trade measures, government regulations, and investment and IPR policies. The qualitative analysis consists of two parts: (1) a general discussion and examination of Indian policies and their effect on U.S. agricultural exports and U.S. firms, and (2) case studies by product, sector, or issue, in text boxes, to highlight the effect of specific Indian tariff and NTM policies and market conditions on U.S. agricultural products.

The descriptive information and data analyzed in this report were obtained from a variety of sources, focusing on primary sources whenever possible. Commission staff sought information from U.S. agricultural trade associations and U.S. firms with operations in India, contacting more than 120 commodity- and sector-specific agricultural trade associations and companies. Commission staff held extensive meetings with U.S. government and private-sector officials, including the Office of the USTR; the USDA Economic Research Service (ERS), Foreign Agricultural Service (FAS), and Animal and Plant Health Inspection Service (APHIS); the USIBC; the Grocery Manufacturers Association; and the American Farm Bureau Federation, as well as international

[42] Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 7, 15.

[43] The government reportedly also uses certain nontariff measures in response to domestic market conditions. For example, certain SPS requirements have been relaxed when India needs to import certain commodities. Government official, interview by Commission staff, New Delhi, India, June 2, 2009.

[44] India was an active participant in the WTO Uruguay Round trade negotiations setting upper limits ("binding") on all agricultural tariffs, albeit at very high levels. By 2001, India eliminated all quantitative restrictions on agricultural imports, consistent with its WTO commitments, but kept very high bound levels on most products.

[45] OECD, *Agricultural Policies in Emerging Economies 2009*, 95. Indian wholesale market prices were largely insulated from world price increases during the global rise of commodity prices in 2007–08. Ibid., 101.

[46] For example, when the domestic and international prices of wheat increased substantially in 2007, India lowered tariffs to replenish depleted buffer stocks and moderate domestic prices, while at the same time restricting exports. Support prices for wheat were increased, but set at prices below world prices.

[47] Government official, interview by Commission staff, New Delhi, India, June 2, 2009.

organizations such as the International Food Policy Research Institute. Staff also traveled to India to meet with relevant Indian government officials, USDA officials, U.S. and Indian private-sector officials, academic researchers, importers, and market and logistics officials.

Commission staff conducted extensive literature and data research on Indian trade and domestic policies that affect U.S. agricultural products in the Indian market. Relevant trade and production data were obtained from Global Trade Information Services; the Commission's DataWeb; Indian government websites, including those of the Ministries of Agriculture and Statistics; the United Nations' Food and Agriculture Organization; and the USDA. Information on Indian tariffs and NTMs was obtained from the WTO, UN Conference on Trade and Development, OECD, World Bank, and USDA (FAS, ERS, and APHIS), as well as many private-sector and academic sources.

In addition to descriptive information, the Committee requested that the Commission provide quantitative analysis of the economic effects of Indian tariffs and, to the extent possible, NTMs on U.S. agricultural exports to India. Quantitative analysis of the potential effects of removing Indian tariffs was based on a simulation framework that consists of a partial equilibrium (PE) model and a general equilibrium (GE) model. The PE model focused on bilateral trade in food and agricultural products at the HS six-digit level among the United States, India, and the rest of the world. The GE model used for the analysis was the Global Trade Analysis Project model, an economy-wide computable GE model of world trade specified at an aggregate product and sector level. The PE model was used to simulate the effects of removing Indian tariffs and tariff-rate quotas on U.S. food and agricultural exports. The GE model was then used to simulate the economy-wide effects of those border measures. The two models were linked to provide consistent estimates of effects. A similar approach was applied in the Commission's recent investigatory report on U.S. beef exports.[48]

Quantitative analysis of the potential effects of NTMs was completed in a three-step process. First, price gap data were developed. The existence of NTMs would likely raise Indian import prices and restrict the quantities imported. Thus, the differences between the prices of goods imported by India and the export prices of countries that sell agricultural goods to India were estimated at a disaggregated level (HS six-digit level) using unit values of imports from 2005–07. These were estimated separately for U.S. exports to India and third countries' exports to India taken as a group, adjusting for observable quality differences between exporters and for transportation costs. Second, a subset of products was identified for which available information indicated the presence of NTMs that may increase prices or restrict quantities. For these products, positive price gaps were treated as representing the economic effects of NTMs. Third, these price gaps were introduced into the simulation-modeling framework as being equivalent to tariffs, and the effects of their removal were estimated. In the case of wheat, NTMs have reduced U.S. exports to India to zero or near-zero levels. Because estimating a wheat price gap was not possible, analysts developed a plausible market share for U.S. exports in the absence of an Indian NTM, and the effects of NTM removal were estimated by inserting that market share directly into the analysis.

[48] USITC, *Global Beef Trade*, 2008.

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CHAPTER 2
Indian Agricultural Trade

Overview

India is a minor participant in global agricultural markets. In 2008, Indian agricultural imports and exports accounted for just 1 percent and 3 percent, respectively, of global agricultural trade.[1] Agriculture's share of total Indian merchandise imports and exports was 3 percent and 11 percent, respectively.[2] Only about 3 percent of Indian food and agricultural demand is met by imports, compared with 13 percent for Asia as a whole.[3]

During 2003–08, India experienced an increasingly positive trade balance in agricultural products, reaching $11.6 billion in 2008 (fig. 2.1).[4] Much of this growth occurred in 2007 and 2008, mostly reflecting significantly higher global commodity prices. Between 2003 and 2008, Indian agricultural imports increased at an annual average rate of about 13 percent, reaching a record $8.5 billion in 2008. Indian agricultural exports increased more than threefold, from $6.1 billion in 2003 to $20.2 billion in 2008, representing annual average growth of 27 percent.

Imports

Imports by Product

Indian agricultural imports from the world are highly concentrated in a few major product categories (table 2.1 and fig. 2.2) in which domestic supply is unable to meet domestic demand. These categories include edible oils (mostly palm and soybean oils), pulses (peas, beans, and lentils), and nuts, which together accounted for 60 percent of all agricultural imports in 2008. Imports of hides and skins, wool, and cotton accounted for 13 percent of imports during 2006–08. With the exception of wheat, animal feed, and alcoholic beverages, all other product categories each accounted for less than 1 percent of total agricultural imports during this period. Notably, Indian imports of food grains (excluding wheat), feed grains, oilseeds, meat, dairy products, sweeteners, and processed foods were negligible in 2008. As outlined in chapter 1, low levels of trade in agricultural products are an outcome of Indian government policies aimed at food security, food self-sufficiency, and income support for farmers, implemented through domestic agricultural production support, tariffs and nontariff measures (NTMs), and export restrictions.[5] Consequently, many trade trends can be explained more by domestic and trade policy initiatives, such as tariff changes, than by changing market factors, such as weather.

[1] GTIS, World Trade Atlas Database (accessed June 8, 2009).

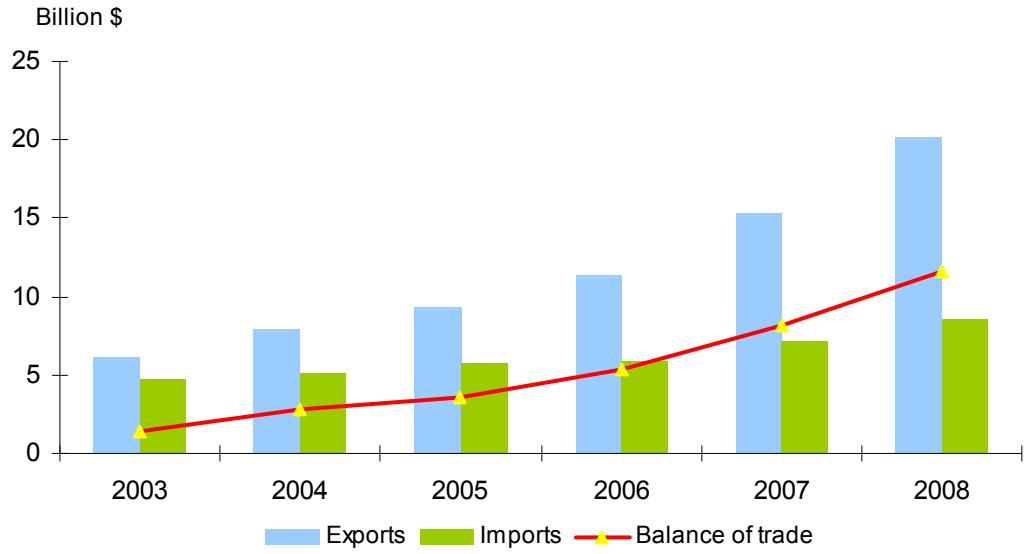
[2] In 2008, Indian total merchandise imports and exports amounted to $293 billion and $178 billion, respectively. Ibid.

[3] Narayanan and Walmsley, *Global Trade, Assistance, and Production*, 2008.

[4] For the purposes of this chapter, agricultural products are those covered by the WTO Agreement on Agriculture. They include products in Harmonized System (HS) chapters 1–24 (excluding fish and fish products) and several manufactured agricultural products covered in HS chapters 35, 41, 51, and 52. In this chapter, information on trade trends is provided for 2003–08; information describing the most recent trade environment is presented in terms of a 2006–08 average.

[5] Chapters 5 and 6 provide a detailed discussion of tariffs and nontariff measures affecting India's agricultural imports.

FIGURE 2.1 India: Agricultural trade balance, 2003–08



Source: GTIS, World Trade Atlas Database (accessed June 8, 2009).

TABLE 2.1 India: Agricultural imports from the world and the United States by product, 2003–08 (million $)

Product	Source	2003	2004	2005	2006	2007	2008
Animal products							
Live animals	World	1	1	2	3	4	9
	United States	0	0	0	1	0	1
Meat	World	0	0	1	1	2	3
	United States	0	0	0	0	0	0
Dairy	World	29	15	9	24	17	18
	United States	1	0	1	1	3	3
Eggs	World	1	0	1	1	1	0
	United States	0	0	0	0	1	0
Grains							
Wheat	World	0	0	0	306	401	293
	United States	0	0	0	0	0	0
Other grains	World	0	1	3	6	5	8
	United States	0	0	0	0	0	0
Animal feed	World	72	80	104	84	103	126
	United States	2	2	3	4	4	6
Fats and oils							
Oilseeds	World	12	15	19	25	45	67
	United States	0	0	0	0	0	0
Soybean oil	World	609	569	822	793	699	336
	United States	45	10	20	20	15	2
Palm oil	World	1,601	1,670	1,205	1,184	1,483	2,379
	United States	0	0	0	0	0	0
Other fats and oils	World	161	177	316	323	418	379
	United States	1	4	5	2	0	3

TABLE 2.1 India: Agricultural imports from the world and the United States by product, 2003–08 (million $)—*Continued*

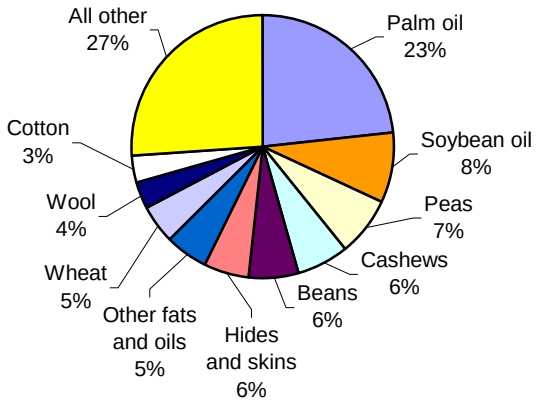
Product	Source	2003	2004	2005	2006	2007	2008
				Vegetables			
Peas	World	186	149	195	284	556	720
	United States	2	1	13	26	69	90
Beans	World	227	167	211	432	445	447
	United States	1	0	1	2	0	1
Lentils	World	15	14	14	21	117	30
	United States	0	0	0	1	10	1
Other vegetables	World	172	150	181	144	184	265
	United States	3	2	3	3	5	6
				Nuts			
Cashews	World	286	379	477	400	369	617
	United States	0	0	0	0	0	0
Almonds	World	68	100	163	171	211	220
	United States	52	80	133	131	162	158
Pistachios	World	24	27	23	33	48	49
	United States	1	2	0	0	4	6
Other nuts	World	7	18	16	25	13	21
	United States	0	0	0	0	0	0
				Fruit			
Dates	World	31	39	53	69	74	77
	United States	0	0	0	0	0	0
Figs	World	1	4	9	23	32	32
	United States	0	0	0	0	0	0
Apples	World	13	10	21	23	53	66
	United States	4	3	11	11	21	19
Other fruit	World	13	21	24	35	43	59
	United States	1	2	4	3	6	9
				Beverages and products			
Coffee	World	5	9	41	21	37	55
	United States	0	0	0	0	0	0
Tea	World	12	31	24	29	30	39
	United States	0	0	0	0	0	0
Alcoholic beverages	World	13	25	44	54	80	112
	United States	0	1	1	2	2	4
Nonalcoholic beverages	World	17	25	34	38	54	53
	United States	0	1	1	2	2	2
Ethanol	World	6	103	157	19	12	53
	United States	0	0	0	0	0	0
Sugar, sweeteners, confectionery	World	22	215	271	24	46	69
	United States	2	3	2	4	5	4
Cocoa products	World	15	18	23	28	41	58
	United States	0	0	0	0	0	0
				Spices			
Cloves	World	21	30	43	40	39	45
	United States	0	0	0	0	0	0
Pepper	World	23	21	29	34	38	51
	United States	0	0	0	0	0	0
Other spices	World	36	42	63	51	65	79
	United States	0	1	1	1	1	1
				Other			
Miscellaneous processed foods	World	22	26	32	34	27	39
	United States	9	12	13	14	5	8
Gum and thickeners	World	21	30	39	52	47	60
	United States	0	0	0	0	0	0

TABLE 2.1 India: Agricultural imports from the world and the United States by product, 2003–08 (million $)—*Continued*

Product	Source	2003	2004	2005	2006	2007	2008
	Other—*Continued*						
Seeds for sowing	World	18	20	28	31	46	51
	United States	3	4	4	4	5	5
Tobacco	World	9	24	18	26	13	17
	United States	0	0	1	1	1	1
Hides and skins	World	219	255	304	344	421	479
	United States	7	6	8	8	8	10
Wool	World	178	195	211	220	271	271
	United States	2	2	1	2	2	5
Cotton	World	351	214	160	153	188	340
	United States	121	58	39	57	71	112
All other	World	219	227	304	312	376	441
	United States	21	23	26	24	33	39
Total	World	4,735	5,115	5,696	5,918	7,151	8,533
	United States	278	215	290	323	435	497

Source: GTIS, World Trade Atlas Database (accessed June 8, 2009).

FIGURE 2.2 India: Agricultural imports from the world by product share, 2006–08 average



Average total imports – $7.2 billion

Source: GTIS, World Trade Atlas Database (accessed June 8, 2009).

In spite of U.S. export competitiveness worldwide,[6] Indian agricultural imports from the United States are limited, both in value and in the range of products. In 2008, agricultural imports from the United States totaled $497 million and accounted for just 6 percent of total Indian agricultural imports that year. In 2008, agricultural exports to India represented less than 0.5 percent of total U.S. agricultural exports, and India ranked 39th among leading overseas markets for U.S. agricultural products. Although the United States is considered to be among the world's most competitive exporters of wheat, corn, soybeans, and meat, Indian imports of these products from the United States amounted to less than $0.5 million in 2008.

During 2006–08, Indian imports of U.S. agricultural products were highly concentrated in a few product categories (fig. 2.3 and table 2.1), but in different categories than imports from the rest of the world. Almonds, cotton, and peas accounted for 70 percent of Indian agricultural imports from the United States during 2006–08; apples, soybean oil, hides and skins, and processed foods represented an additional 11 percent, while most other products each contributed less than 1 percent. Limited imports from the United States reflect, in part, competition in the Indian market from other suppliers for certain products. For example, although the United States is considered highly competitive in the global soybean oil market, it faces strong competition from Argentina, which can supply the Indian market at a lower price, in part, due to Argentine government policies.[7] For other products, however, low import levels reflect high tariffs and tariff-rate quotas (milk powder, corn) and sanitary and phytosanitary (SPS) measures (wheat, pork, poultry, corn).

By far, India's largest agricultural import category is vegetable oils.[8] In 2008, India was the world's fourth-largest importer behind the EU-27,[9] China, and the United States.[10] Because imports are needed to satisfy domestic demand,[11] applied tariff rates on vegetable oils have been significantly lower than the bound rates that range from 40 to 300 percent.[12] Moreover, vegetable oil imports are not subject to specific NTMs.[13] During 2006–08, palm oil and soybean oil imports accounted for 23 percent and 8 percent, respectively, of total Indian agricultural imports (fig. 2.2). During this period, imports of palm oil increased sharply at the expense of soybean oil, largely because of relative price movements[14] and favorable tariff treatment for palm oil.[15] More than

[6] The United States is the largest agricultural exporting country in the world, accounting for about 18 percent of global agricultural exports in 2008. It ranks among the world's most competitive and leading exporters of several commodities, including soybeans, corn, wheat, poultry, and cotton. The competitive advantage of U.S agricultural products in global markets is based on highly efficient production, marketing, and distribution systems coupled with supportive domestic policies. The United States exports its agricultural products worldwide and is a major supplier to several Asian countries, such as Indonesia and Thailand.

[7] NOPA, written submission to the USITC, April 1, 2009.

[8] Vegetable oils are classified in HS headings 1507–1515.

[9] The EU-27 is composed of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, The Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom.

[10] GTIS, World Trade Atlas Database (accessed June 8, 2009).

[11] Vegetable oils are a staple food product in India, and imports consisting mostly of palm oil and soybean oil reportedly accounted for more than 50 percent of Indian consumption of vegetable oils in 2008/09. Aradhey, *India: Oilseeds*, April 16, 2009.

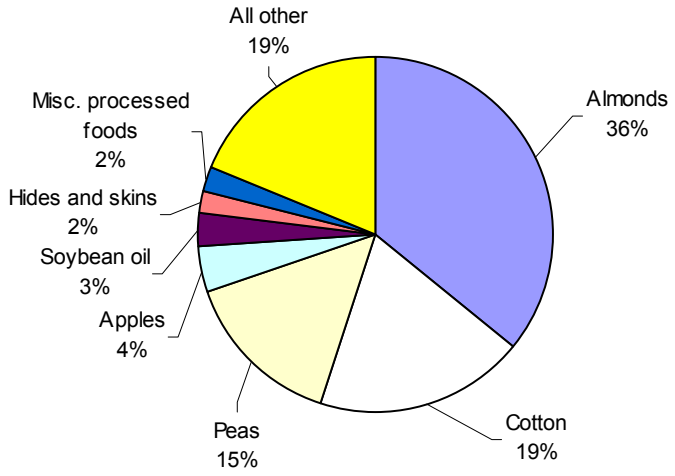
[12] For example, as of April 1, 2008, the applied tariffs on crude palm oil and on refined soybean oil were lowered to zero and 7.5 percent, respectively. Aradhey, *India: Oilseeds and Products*, May 19, 2008.

[13] Industry representative, interview by Commission staff, New Delhi, India, May 7, 2009.

[14] During 2006–08, India's import unit value for soybean oil was on average 24 percent higher than for palm oil. GTIS, World Trade Atlas Database (accessed June 8, 2009).

[15] Industry representative, interview by Commission staff, New Delhi, India, May 6, 2009.

FIGURE 2.3 India: Agricultural imports from the United States by product share, 2006–08 average



Average total imports $418 million

Source: GTIS, World Trade Atlas Database (accessed June 8, 2009).

80 percent of Indian palm oil imports are sourced from Indonesia, with the remainder mostly supplied by Malaysia (fig. 2.4). For soybean oil, Argentina is the largest supplier to the Indian market, accounting for 76 percent of Indian soybean oil imports during 2006–08, followed by Brazil with 18 percent. During this period, the United States accounted for only 2 percent of India's soybean oil imports.[16] Indian buyers reportedly buy soybean oil principally on the basis of price, and in recent years, Argentine soybean oil was priced lower than the U.S. product (box 2.1).[17]

After vegetable oils, the largest agricultural import category is pulses (table 2.1), which accounted for 14 percent of all agricultural imports during 2006–08.[18] Even though India is a large producer of pulses, demand exceeds domestic supply, and India is now the leading importer of pulses in the world.[19] Imports receive favorable tariff treatment but face certain SPS requirements associated with fumigation.[20] During 2006–08, the United States accounted for 6 percent of Indian pulse imports. U.S. government and industry sources attribute the relatively low U.S. share to competitive factors that favor other suppliers: (1) lower prices (U.S. pulses tend to be high quality and command a price

[16] From 2005 to 2007, U.S. soybean oil producers have shipped $11–20 million of refined soybean oil annually to India and much less crude soybean oil, which is notable primarily because of India's long-time desire to import crude edible oils as feedstock for their underutilized refining capacity. Government officials, interview by Commission staff, New Delhi, India, May 26, 2009; industry representatives, interviews by Commission staff, Mumbai, India, May 28, 2009; and industry representative, interview by Commission staff, Mumbai, India, June 1, 2009.

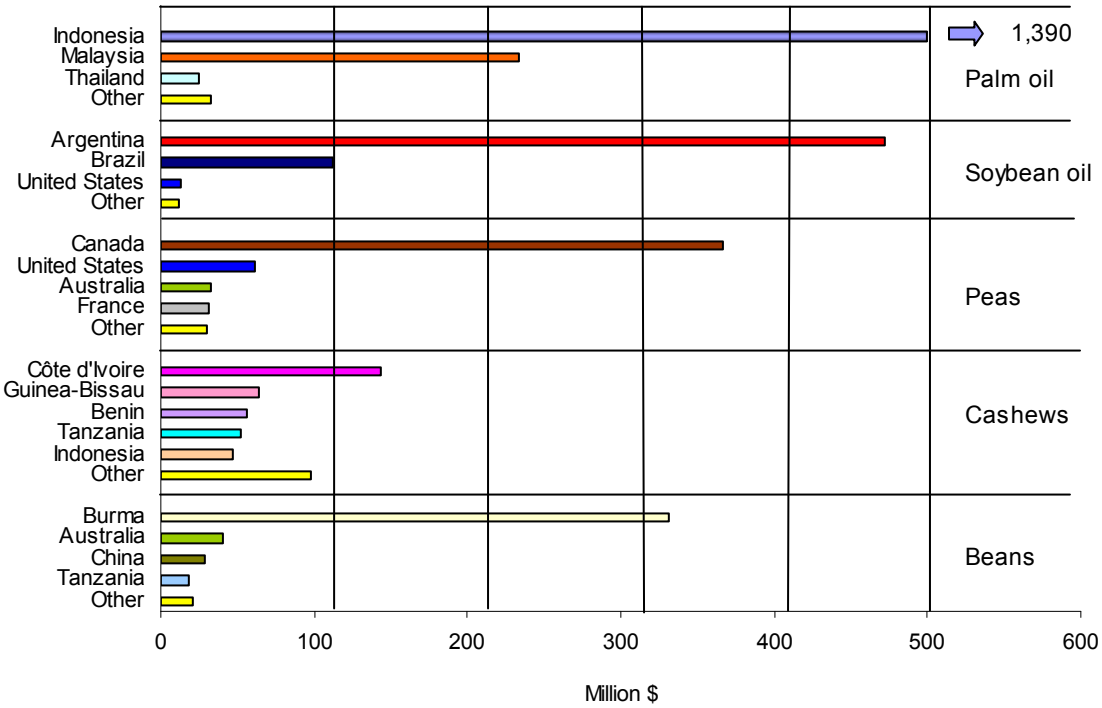
[17] Industry representative, interview by Commission staff, Mumbai, India, May 28, 2009.

[18] Pulses play an important role in the Indian diet and are the major protein source for a large segment of the population. Aradhey, *India: Grain and Feed; Pulses Situation and Outlook*, December 14, 2007.

[19] GTIS, World Trade Atlas Database (accessed June 8, 2009).

[20] Aradhey, *India: Grain and Feed; Pulses Situation and Outlook*, December 14, 2007. See chapter 6 for more details.

FIGURE 2.4 India: Major agricultural imports by trading partner, 2006–08 average



Source: GTIS, World Trade Atlas Database (accessed June 8, 2009).

BOX 2.1 Soybean Oil

India is one of the largest edible oil markets in the world, and domestic producers are unable to satisfy Indian demand. Several factors—soybean industry fragmentation; government policies that encourage small-scale activity and favor grain production instead of oilseed production; marketing and distribution inefficiencies; and irregular water supplies—negatively affect vegetable oil production in India.[a] As a result, India imports roughly one-half of its annual consumption.

With India's lagging domestic supply, low tariffs, and few specific nontariff measures, U.S. soybean oil producers could be in a good position to supply the Indian market except for two cost factors: prices for soybean oil substitutes and a global competitor's export tax structure. India satisfies the overwhelming share of its vegetable oil import needs with low-cost palm oil from Indonesia and Malaysia because the Indian vegetable oil market is fairly price sensitive. When India does import soybean oil, it turns first to Argentine and Brazilian sources, as those producers have certain shipping cost and seasonal advantages. Consequently, despite India lowering its tariffs to encourage additional edible oil imports in 2008, U.S. soybean oil exports to India have fallen to almost zero.[b] More important for U.S. soybean processors, however, is Argentina's use of a differential export tax scheme, which taxes raw soybean exports at a higher rate (35 percent) than soybean oil exports (32 percent). Although the tax on Argentine soybean oil exports raises their price on world markets, taxing raw material exports at a higher rate than processed product exports results in an export subsidy for Argentina's oilseed processors. This export subsidy confers a competitive advantage for this commodity product over U.S. soybean oil in the Indian market.[c]

[a] NOPA, written submission to the USITC, April 1, 2009; industry representative, e-mail message to Commission staff, June 24, 2009.

[b] In early 2009, because of the increase in U.S. soybean oil stocks, the decrease in U.S. soybean oil usage, and the dearth of supply in South America, U.S. soybean oil producers recorded sales to India of 60,000 tons. Industry representative, telephone interview by Commission staff, May 1, 2009.

[c] NOPA, written submission to the USITC, April 1, 2009.

premium); (2) Indian consumption patterns favoring certain pulses, such as desi chickpeas, pigeon peas, mung beans, and black matpe, of which the United States is not a major producer;[21] and (3) the ability of producers in other countries to ship larger volumes than their counterparts in the United States.[22]

Among pulses, peas are the largest import item, with Indian imports growing from $149 million in 2004 to $720 million in 2008, in response to strong consumer demand during this period. Canada is the leading supplier of peas to the Indian market, accounting for about 70 percent of all pea imports during 2006–08 (fig. 2.4). In 2007, the United States became India's second-largest supplier of peas, and in 2008, its share of Indian pea imports was 12 percent.[23] Indian imports of beans, the second-largest pulses import item, increased during 2004–08 (table 2.1). Three-quarters of Indian bean imports were supplied by Burma during 2006–08 (fig. 2.4), which benefits from close proximity to the Indian market and produces the types of beans in high demand by India.[24]

India is a large importer of nuts, and during 2006–08, cashews alone accounted for 6 percent of Indian agricultural imports, mostly supplied by several African countries (fig. 2.4). Most of the cashews imported into India are "in-shell" and manufactured into higher-value processed cashews and cashew products, many of which are exported to the United States, EU-27, Japan, and the Middle East. [25]

Almonds are the largest Indian agricultural import from the United States, accounting for 36 percent of all imports from the United States during 2003–08. With limited domestic production,[26] strong domestic demand growth,[27] and low tariffs,[28] Indian almond imports have risen rapidly in recent years, increasing from about 21,000 mt in 2003 to 51,000 mt in 2008.[29] The United States is by far the largest supplier, accounting for about 85 percent of Indian almond imports during this period, although since 2007, the United States has faced increasing competition from Australia.

Certain imported agricultural products are used as inputs for the Indian textile and apparel industry, including cotton, wool, and leather. During 2006–08, these products accounted for 13 percent of Indian agricultural imports. India is a major cotton-producing country, but its production is not sufficient to meet the demand from its textile mills. Cotton is the second-largest Indian agricultural import from the United States, accounting for 19 percent of all agricultural imports during 2006–08 (fig. 2.3). Egypt is the other major supplier, mostly of long and extra-long staple cotton. Certain sub-Saharan African countries also supply cotton to the Indian market.[30]

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[21] Industry representative, interview by Commission staff, Mumbai, India, May 28, 2009.

[22] The United States reportedly does not have large exportable surpluses. Moreover, U.S. pulse exporters ship in costlier containers rather than bulk vessels. Industry representatives, interviews by Commission staff, Mumbai, India, May 26 and May 30, 2009.

[23] Pea imports from the United States are green peas, which are not grown in India and are eaten largely as snacks. Industry representative, interview by Commission staff, Mumbai, India, May 28, 2009.

[24] Aradhey, *India: Grain and Feed; Pulses Situation and Outlook*, December 14, 2007.

[25] GTIS, World Trade Atlas Database (accessed June 8, 2009).

[26] Indian almond production accounted for about 3 percent of domestic consumption in 2008. Aradhey, *India: Tree Nut*, September 17, 2008.

[27] Almonds are very popular in India and have special significance in the Indian diet. Industry representative, interview by Commission staff, Mumbai, India, May 11, 2009.

[28] In 2008, the Indian tariff on imported in-shell almonds was Rs. 35 per kilogram (about 18–20 percent ad valorem equivalent).

[29] U.S. almonds are imported "in-shell."

[30] Singh, *India: Cotton and Cotton Products*, December 5, 2008.

During 2006–08, India's imports of fruit averaged $195 million annually; dates, figs, and apples accounted for about three-quarters of this amount. Of these three, the United States exports only apples to India, consisting mostly of the Red Delicious variety from Washington state. Apples accounted for 4 percent of Indian agricultural imports from the United States during 2006–08.[31] Although facing strong competition from Fuji apples from China, Indian demand for U.S. apples has grown in recent years, increasing from $2.5 million in 2004 to about $20 million in 2008.[32]

India imported wheat in 2006 following shortfalls in domestic production and problems pertaining to domestic procurement.[33] Imports were encouraged by lowering tariffs and easing phytosantiary barriers.[34] During 2006–08, wheat imports averaged $333 million, sourced mostly from Russia, Canada, and Argentina. As discussed in chapter 6, certain SPS trade measures prevented the import of U.S. wheat. Even without these measures, however, U.S. wheat exports to India may have faced competition from other suppliers on the basis of delivery price.

Imports by Major Trading Partner

In terms of major suppliers, Association of Southeast Asian Nations (ASEAN) countries accounted for 35 percent of Indian agricultural imports during 2006–08. Indonesia, a major supplier of palm oil, was by far the largest supplier, accounting for close to one-quarter of Indian imports during this period (table 2.2 and fig. 2.5). Other leading ASEAN suppliers were Burma (dry beans) and Malaysia (palm oil, certain cocoa products), accounting for 7 percent and 4 percent of total Indian agricultural imports, respectively. During this period, imports of soybean oil from Argentina fell sharply, from $661 million to $222 million, as India sourced more competitively priced palm oil from Indonesia. These losses were somewhat offset by Argentine exports of wheat as India resumed importing in 2006 after several years of being a net wheat exporter.[35] During 2006–08, the EU-27 supplied a wide range of products, led by alcoholic beverages (mostly whiskies), peas, fibers (wool and flax), and hides and skins. Indian agricultural imports from Canada increased sharply during 2003–08, such that by 2008, Canada became the second-largest agricultural supplier behind Indonesia. Canada's exports to India were almost exclusively peas and lentils.

Exports

The competitiveness of Indian agricultural exports is based on low costs associated with abundant labor and subsidized inputs, including fertilizer, electricity, and seeds.[36] India's proximity to ASEAN and Middle Eastern markets provides India with a transportation cost advantage over other suppliers. Other factors affecting Indian agricultural exports

[31] Industry representative, interview by Commission staff, New Delhi, India, May 27, 2009.

[32] Although apples can be supplied more cheaply by China and Chile, U.S. Red Delicious apples are considered to have superior color and shape and, when available out of season, can command a price premium. Industry representative, interview by Commission staff, Mumbai, India, June 1, 2009.

[33] Govindan, *India: Grain and Feed*, February 21, 2007.

[34] Industry representative, interview by Commission staff, New Delhi, India, June 2, 2009.

[35] Govindan, *India: Grain and Feed*, February 20, 2008.

[36] Eighty percent of Indian agricultural production is reportedly competitive in world markets. Industry representative, interview by Commission staff, New Delhi, India, June 4, 2009.

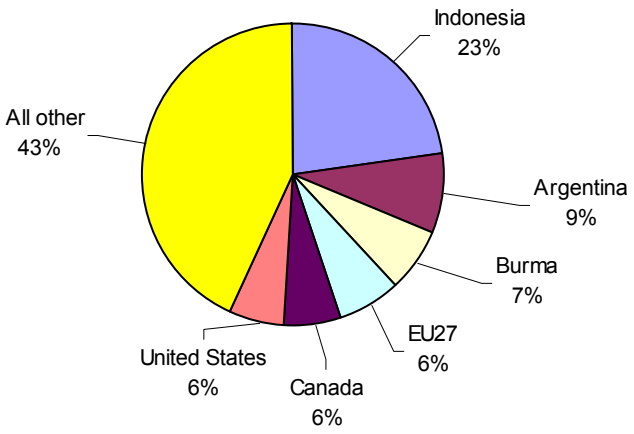
include government export restrictions aimed at curtailing food price inflation (box 2.2),[37] a minimum export price program that makes certain Indian exports less competitive in world markets,[38] and the use of export subsidies when government buffer stocks become too large.

TABLE 2.2 India: Agricultural imports by major trading partner, 2003–08 (million $)

Trading partner	2003	2004	2005	2006	2007	2008
Indonesia	1,119	1,423	1,195	1,160	1,469	2,315
Canada	127	110	169	194	601	566
EU-27	283	255	295	391	478	528
Burma	216	199	210	455	478	512
United States	278	215	290	323	435	497
Argentina	511	450	608	745	631	486
Malaysia	615	439	289	230	185	390
China	193	198	270	299	341	388
Australia	151	164	158	298	270	322
Brazil	145	405	530	123	164	240
Côte d'Ivoire	53	89	117	127	118	203
All other	1,043	1,167	1,566	1,574	1,980	2,088
Total	4,735	5,115	5,696	5,918	7,151	8,533

Source: GTIS, World Trade Atlas Database (accessed June 8, 2009).

FIGURE 2.5 India: Agricultural imports by major trading partner, 2006–08 average



Average total imports – $7.2 billion

Source: GTIS, World Trade Atlas Database (accessed June 8, 2009).

[37] USDA, FAS, *India: Trade Policy Monitoring*, March 15, 2009.
[38] Govindan, *India: Grain and Feed*, February 20, 2009.

BOX 2.2 Indian Agricultural Export Restrictions[a]

Export restrictions are one of several policy instruments the central government uses to address food price inflation and maintain stockpiles of food to feed the poor through the Public Distribution System. Export restrictions are of three types—export bans, minimum export prices (MEPs), and export taxes. Export bans prohibit the export of products, regardless of international and domestic price levels. MEPs are prices below which exporters cannot sell their product, making Indian goods less competitive overseas. Export taxes are levied on the value of exports, again making Indian product less competitive.

In 2007, the Indian government began significantly restricting exports of essential commodities as global food prices increased and Indian strategic food reserves, or stocks, declined below government target levels. Reportedly, these export restrictions were also imposed because of the government's desire to keep food prices low in the run-up to the national elections in early 2009. Recent export restrictions for major commodities are described below.

Wheat. On February 9, 2007, the government banned exports of wheat and wheat products until December 31, 2007, a prohibition that was later extended indefinitely.

Nonbasmati rice. Effective October 9, 2007, the government banned exports of all nonbasmati rice to ensure adequate rice availability in the domestic market. On October 31, 2007, however, because of the demands of rice exporters, the outright ban on exports was replaced by an MEP of $425 per ton, which was later increased to $1,000 per ton on March 27, 2008. On April 1, 2008, the government again banned exports.

Basmati rice. Effective March 5, 2008, an MEP of $950 per ton was imposed, which was gradually increased to $1,200 per ton on April 1, 2008. In addition, an export tax of Rs. 8,000 per ton was imposed at that time. On January 20, 2009, the MEP was lowered to $1,100 per ton, and the export tax was abolished.

Corn. On March 5, 2007, the government banned exports of corn by the private sector and channeled exports only through state trading enterprises for a period of six months. Effective July 3, 2008, the government banned exports of corn through October 15, 2008.

Vegetable oils. On March 17, 2008, the government banned exports of vegetable oils. This prohibition was extended to March 16, 2010.

Pulses. Effective June 22, 2006, the government imposed a ban on the export of pulses, with the exception of *kabuli chana* (garbanzos).

Milk and milk products. On February 9, 2007, the government imposed a ban on exports of skimmed milk powder, skimmed milk food for babies, whole milk, whole milk for babies, and other milk products until September 30, 2007.

[a] Aradhey, *India: Oilseeds and Products*, April 16, 2009, 22; Govindan, *India: Grain and Feed*, February 20, 2009, 15; Govindan, *India: Grain and Feed*, February 20, 2008, 7; and Dhankhar, *India: Dairy and Products*, November 5, 2008.

Exports by Product

Between 2003 and 2008, Indian agricultural exports to the world grew more than threefold, increasing from $6.1 billion in 2003 to $20.2 billion in 2008. Similarly, Indian agricultural exports to the United States increased steadily from $585 million in 2003 to about $1.3 billion in 2008 (table 2.3). Indian global agricultural exports are concentrated in a few major commodities. During 2006–08, rice, soybean meal, and cotton represented one-half of Indian global agricultural exports, with sugar and frozen beef (mostly buffalo meat) accounting for an additional 20 percent (fig. 2.6). Tobacco, nuts (mostly cashews and peanuts), beverages (tea and coffee), and spices are also exported by India. Agricultural products exported by India to the United States include nuts and a wide range of specialty products supplying ethnic grocery stores and restaurants.

TABLE 2.3 India: Agricultural exports to the world and the United States by product, 2003–08 (million $)

Product	Source	2003	2004	2005	2006	2007	2008
Animal products							
Live animals	World	4	5	5	10	10	11
	United States	0	0	0	0	0	0
Frozen beef[a]	World	268	392	553	656	804	1,091
	United States	2	0	0	0	0	0
Other meat	World	43	31	31	44	48	96
	United States	0	0	0	0	0	1
Concentrated/sweetened dairy	World	17	39	124	89	108	171
	United States	0	4	3	1	0	0
Other dairy	World	24	49	89	64	178	192
	United States	13	30	62	34	78	64
Eggs	World	46	60	76	57	101	109
	United States	0	0	0	0	0	0
Grains							
Rice	World	885	1,173	1,763	1,460	2,360	2,784
	United States	22	20	31	33	51	45
Corn	World	27	187	73	105	325	953
	United States	0	0	0	0	0	0
Other grains	World	442	451	216	28	109	148
	United States	0	0	0	0	0	1
Animal feed							
Soybean meal	World	389	767	638	1,070	1,303	2,337
	United States	0	0	0	0	0	2
Other animal feed	World	61	156	165	198	314	462
	United States	0	0	0	0	0	0
Fats and oils							
Oilseeds	World	163	242	199	205	367	553
	United States	20	28	24	29	34	63
Castor oil	World	106	184	229	199	275	380
	United States	21	34	31	30	32	48
Other fats and oils	World	69	129	90	116	149	207
	United States	8	24	5	9	8	11
Vegetables							
Onions and shallots	World	109	162	157	232	263	326
	United States	0	0	0	0	0	0
Chickpeas	World	1	5	22	49	126	94
	United States	0	0	0	1	1	1
Pickled vegetables	World	35	40	68	87	94	127
	United States	6	6	9	13	16	22
Other vegetables	World	183	214	378	374	249	298
	United States	8	9	12	16	1	1
Nuts							
Cashews	World	351	491	620	546	532	667
	United States	170	234	251	211	191	221
Peanuts	World	82	126	109	166	238	283
	United States	3	17	0	0	0	0
Other nuts	World	26	29	35	34	38	54
	United States	14	18	25	33	37	47

See footnotes at end of table.

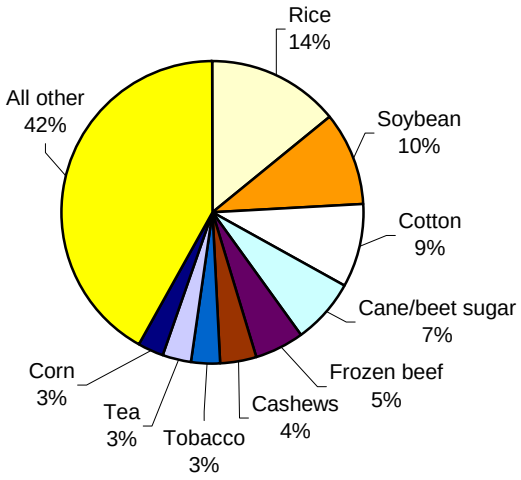
TABLE 2.3 India: Agricultural exports to the world and the United States by product, 2003–08 (million $)—*Continued*

Product	Source	2003	2004	2005	2006	2007	2008
				Fruit			
Guava/mango	World	70	93	116	153	164	211
	United States	2	3	3	4	5	6
Grapes	World	24	20	44	55	58	101
	United States	0	-	0	0	0	0
Other fruit	World	443	588	745	704	708	906
	United States	10	9	8	12	21	26
				Beverages and products			
Coffee	World	155	156	238	317	294	397
	United States	2	6	4	6	6	4
Tea	World	307	380	386	415	441	541
	United States	18	22	24	24	27	35
Alcoholic beverages	World	21	24	33	38	57	96
	United States	1	1	1	1	1	2
Nonalcoholic beverages	World	8	9	14	12	14	11
	United States	1	2	1	2	4	2
				Sugar, sweeteners, confectionery			
Cane/beet sugar	World	370	52	38	620	1,024	1,511
	United States	5	3	1	5	5	1
Other sugars/sweeteners	World	39	38	55	84	111	133
	United States	9	9	13	16	6	24
				Spices			
Pepper	World	87	124	124	194	396	353
	United States	24	27	30	43	84	76
Cumin	World	10	16	17	49	76	174
	United States	1	2	2	8	13	16
Other spices	World	88	98	112	123	149	206
	United States	13	17	15	18	20	27
				Miscellaneous processed products			
Instant coffee	World	68	68	99	111	124	152
	United States	1	2	1	3	4	5
Other processed foods	World	84	102	142	161	186	274
	United States	11	14	20	25	28	40
Gum and thickeners	World	243	284	403	402	380	471
	United States	89	90	146	164	139	208
Seeds for sowing	World	11	13	18	26	35	28
	United States	2	3	2	3	4	3
Tobacco	World	220	265	299	366	455	666
	United States	14	15	13	15	20	27
				Fibers			
Cotton	World	36	176	323	978	1,655	1,560
	United States	0	0	0	-	3	0
Other fibers	World	18	34	18	34	22	31
	United States	1	2	1	1	1	1
All other	World	504	476	440	700	967	989
	United States	92	102	122	160	169	253
Total	World	6,135	7,949	9,310	11,330	15,307	20,150
	United States	585	754	862	917	1,008	1,282

Source: GTIS, World Trade Atlas Database (accessed June 8, 2009).

[a]Frozen beef is mostly buffalo meat.

FIGURE 2.6 India: Agricultural exports to the world by product share, 2006–08 average



Average total exports — $15.6

Source: GTIS, World Trade Atlas Database (accessed June 8, 2009).

During 2006–08, cashews were the leading Indian export to the United States, accounting for 19 percent of all Indian agricultural exports, followed by gum and thickeners at 16 percent (fig. 2.7).[39] Other important exports include pepper, certain dairy products (mostly casein), and rice.

Rice is the largest Indian agricultural export, accounting for 14 percent of all agricultural exports to the world in 2006–08. Rice exports consist of parboiled rice and basmati rice, which are highly competitive in the global market.[40] High-quality basmati rice is exported principally to the Middle East and the EU-27 and competes with U.S. exports of basmati rice.[41] With the aim of curbing food price inflation, the government has imposed a series of export restrictions on rice, beginning in October 2007, including an export ban on nonbasmati rice, a minimum export price, and an export tax.[42] As a result, the volume of rice exports fell from 6.2 million metric tons (mmt) in 2007 to 3.5 mmt in 2008.[43]

[39] Natural gums and resins (HS 1301), such as gum arabic, and vegetable saps/extracts, pectates, and other thickeners (HS 1302), such as carrageenan, are commonly used as food additives, typically displaying thickening properties. However, both HS 1301 and 1302 include a wide variety of vegetable gums, resins, and extracts, such as turpentine (used as a solvent), and anesthetic or therapeutic substances, such as poppy straw extract.

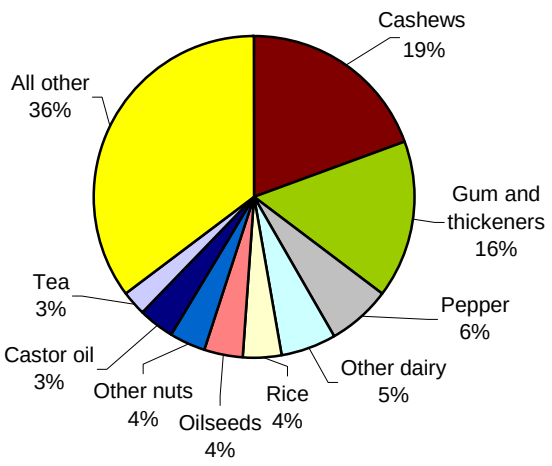
[40] Govindan, *India: Grain and Feed*, February 21, 2007.

[41] Low-quality parboiled rice is exported mainly to Bangladesh and several African countries.

[42] Govindan, *India: Grain and Feed*, February 20, 2009.

[43] The value of rice exports increased, however, owing to the doubling of global rice prices between 2007 and 2008. Between 2007 and 2008, the world price of rice (FOB Bangkok) increased from $332 per metric ton to $700 per metric ton. IMF, Commodity Prices, 2009. Wheat is another product impacted by export controls. In 2003, India exported about 3 mmt of wheat, mainly to Bangladesh and other Southeast Asian countries. The government banned the export of wheat beginning in February 2007 because of very low levels of government-held stocks in 2006. In 2006, government-held wheat stocks were down to 2 mmt compared with the desired buffer stock level of 4 mmt. Govindan, *India: Grain and Feed*, February 21, 2007. As a result, there were no wheat exports during 2007 and 2008, except for small amounts for food aid to neighboring countries.

FIGURE 2.7 India: Agricultural exports to the United States by product share, 2006–08 average



Average total exports — $1.1 billion

Source: GTIS, World Trade Atlas Database (accessed June 8, 2009).

Soybean meal, used as a protein source in animal feed, was the second-largest agricultural export by India during 2006–08, accounting for 10 percent of all agricultural exports. In 2008, soybean meal exports reached $2.3 billion, compared with $389 million in 2003, reflecting both increasing prices and strong demand by the expanding livestock, dairy, and poultry industries across Asia.[44] Indian cotton exports increased from negligible levels in 2003 to about $1.6 billion in 2008. This growth stemmed from the rapid increase in cotton production following the introduction of Bt cotton into India.[45] In 2008, India was the world's second-largest cotton exporting country behind the United States and is increasingly competing with the United States as a supplier of cotton in several markets.[46]

[44] Aradhey, *India: Oilseeds and Products*, May 19, 2008.

[45] Genetically modified cotton was developed by Monsanto and sold under the brand names Bollgard and Bollgard 2 (both are Bt cotton). From 2001 to 2007, production increased from 16 million bales to 31 million bales produced from the same acreage. According to Monsanto officials, no agricultural technology since the Green Revolution has had a bigger impact on Indian agriculture. Industry representative, interview by Commission staff, New Delhi, India, May 11, 2009.

[46] Singh, *India: Cotton and Cotton Products*, December 5, 2008. Exports of sugar also increased rapidly in recent years, from $38 million in 2005 to $1.5 billion in 2008. This increase can be explained partly by government assistance provided to sugar mills in the form of a payment on internal as well as ocean transportation costs during April 2007–April 2008. USDA, FAS, *India: Trade Policy Monitoring Annual*, March 15, 2009. Major markets purchasing Indian sugar are in the Middle East (mostly the United Arab Emirates and Saudi Arabia) and Asia (mostly Bangladesh and Sri Lanka).

Exports by Major Trading Partner

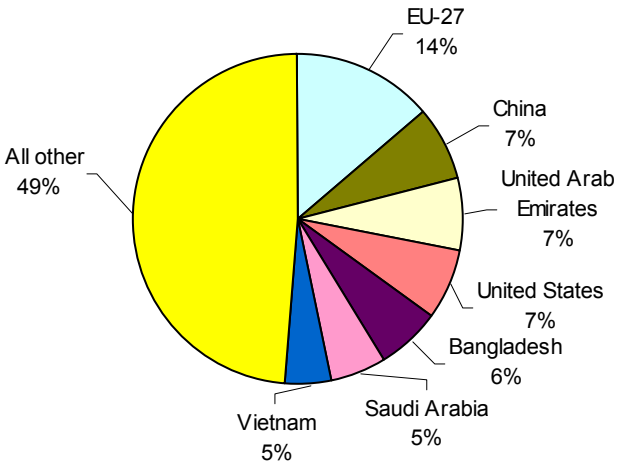
Indian agricultural exports are dispersed among a large number of destination markets (table 2.4). During 2006–08, the EU-27 was India's largest agricultural export market, accounting for 14 percent of the total, followed by the United Arab Emirates (UAE), China, and the United States each with a 7 percent share (fig. 2.8). Other important markets include Bangladesh, Saudi Arabia, and Vietnam. During 2003-08, growth in Indian agricultural exports to the UAE, China, Vietnam, and Pakistan was particularly strong, led by sharply higher exports of rice, cotton, meat, and animal feed.

TABLE 2.4 India: Agricultural exports by major trading partner, 2003–08 (million $)

Trading partner	2003	2004	2005	2006	2007	2008
EU-27	1,144	1,377	1,604	1,780	2,122	2,658
United Arab Emirates	368	467	503	553	989	1,702
Bangladesh	583	633	649	568	949	1,322
United States	585	754	862	917	1,008	1,282
Saudi Arabia	323	576	612	550	748	1,271
China	105	169	389	896	1,277	1,178
Vietnam	104	167	229	368	659	1,158
Malaysia	297	337	295	349	596	952
Indonesia	251	265	233	378	495	653
Pakistan	49	124	154	655	611	648
Japan	144	232	298	326	383	604
All other	2,181	2,848	3,481	3,988	5,469	6,723
Total	6,135	7,949	9,310	11,330	15,307	20,150

Source: GTIS, World Trade Atlas Database (accessed June 8, 2009).

FIGURE 2.8 India: Agricultural exports by major trading partner, 2006–08 average



Average total exports – $15.6 billion

Source: GTIS, World Trade Atlas Database (accessed June 8, 2009).

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CHAPTER 3
Domestic Consumption

Overview

The Indian diet centers around staple foods such as grains, pulses, edible oils, and potatoes.[1] Of these staples, grains account for almost two-thirds of caloric intake on a daily basis, and per capita consumption of grains (mainly rice and wheat) has remained fairly constant over the past six years. In recent years, total Indian food consumption as well as per capita consumption of many food products has increased, including nonstaple food items, such as fruits, vegetables, dairy foods, and meat. Despite the rise in caloric intake over time, Indians still consume fewer calories than people in many other developing countries.[2]

Indian food consumption is influenced by factors such as population size and demographics, income, price, cultural preferences, and availability. India has a large and diverse population that historically has been poor and has spent a relatively large share of its income on food.[3] The recent rise in Indian incomes has resulted in an increase in the size of India's middle class, with increased disposable income available for spending on food. Rising incomes typically lead to a diversification of diets from those high in food grains to ones with increasing amounts of nongrain food items, and this trend is occurring in India.[4]

Looking beyond income and cultural practices, the availability of certain foods clearly affects consumption patterns.[5] Indian consumers have only limited access to imported foods or to Western-type foods produced in India,[6] but as in other countries, when new foods become available in India, certain market segments readily develop preferences for them. Middle- and upper-class Indians, who mainly live in urban areas, are more likely to buy imported foods or multinational brand foods produced domestically. Over time, the growth of the Indian middle class and urban dwellers with diversified food preferences should not only increase overall consumption but also increase demand for different types of foods, including varied imports.[7]

Consumption

Food Consumption Patterns

Total Indian consumption of food products has increased in recent years. Available data for consumption of a number of foods, including grains, meat, dried fruit and nuts, dairy,

[1] Comprehensive consumption data, including per capita consumption are not available for many food products in India. The available, albeit limited, consumption data are presented later in this chapter.

[2] FAO, Country Profiles: Brazil, China, and India, *FAO Statistical Yearbook*, 2005.

[3] EIU, *India Food*, November 11, 2008.

[4] Chatterjee, Rae, and Ray, "Food Consumption, Trade Reforms, and Trade Patterns in Contemporary India," n.d., 7.

[5] Chapter 2 covers India's imports and chapter 4 agricultural production.

[6] The barriers to agricultural imports are discussed primarily in chapters 5 and 6.

[7] Industry representatives, interviews by Commission staff, New Delhi and Mumbai, India, various dates.

edible oils, and sugar, show that total consumption of these products increased approximately 12 percent in volume from marketing year (MY) 2003/04 to MY 2008/09 (table 3.1). India is currently the 12th-largest food consumer in the world, and one source predicts it could grow to be the 5th-largest consumer food market by 2025, depending on India's population growth projections and per capita spending on food.[8]

TABLE 3.1 India: Total domestic consumption of select commodities, MYs 2003/04–2008/09 (1,000 mt)

Commodity	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Grains	189,538	186,939	188,868	192,585	202,311	199,200
Beef and veal (carcass weight equivalent)	1,528	1,638	1,633	1,694	1,735	1,845
Poultry, broiler	1,498	1,648	1,899	2,000	2,239	2,489
Almonds, shelled basis	25	27	24	33	40	43
Walnuts, in-shell basis	16	17	18	20	19	20
Raisins	4	8	9	7	10	11
Dairy	86,635	90,838	94,418	99,496	105,722	108,989
Edible oils	11,165	11,563	12,114	11,988	12,518	13,438
Sugar, centrifugal	20,750	18,600	19,500	21,235	22,425	23,550

Source: USDA, FAS, Production, Supply and Distribution (accessed July 2, 2009).

According to an Indian government survey, per capita food consumption increased 5.1 percent annually from fiscal year (FY) 2003/04 to FY 2007/08, a significant increase from the 2.6 percent average annual growth during the previous 11 years.[9] U.S. government data for certain food items in India also show strong growth rates in per capita consumption during the same period (table 3.2); per capita consumption increased 51 percent for dried fruit, 17 percent for dairy, and 12 percent for edible oils. However, these higher growth rates were partially offset by a decline in the consumption of grains for most years after MY 2003/04. For the period per-capita grain consumption declined 2 percent.

Caloric Intake

Indians consumed fewer calories per day (approximately 2,240) in 2001–03 than the average person in China, Brazil, or the United States (fig. 3.1).[10] Yet, the Indian caloric amount represented an increase of approximately 17 percent over the past quarter-century (from the 1979–81 annual average to the 2001–03 annual average).[11] The majority of daily calories (1,354) for Indians came from grains: rice and wheat together accounted for 53 percent of daily total caloric intake (fig. 3.2).[12] The next largest sources of calories for Indians were sugar, edible oils, and milk. Indians consumed very small amounts of meat compared to other foods and to meat consumption in other developing countries, such as Brazil and China, because of cultural and economic factors.[13] Unidentified "other foods,"

[8] McKinsey Global Institute, "The 'Bird of Gold,'" May 2007, 10 and 14.

[9] Government of India, Ministry of Finance, *Economic Survey 2007–08*, n.d., 3. The Indian fiscal year is April 1–March 31.

[10] The most recent data available are for 2003. FAO, Country Profiles: Brazil, China, India, and the United States, *FAO Statistical Yearbook*, 2005.

[11] FAO, Country Profile: India, *FAO Statistical Yearbook*, 2005.

[12] This information is based on the *FAO Statistical Yearbook*, which provides daily caloric information for a basket of food items including food grain, certain types of oil, and some animal products averaged over the years 2001–03. FAO, Country Profiles: Brazil, China, India, and the United States, *FAO Statistical Yearbook*, 2005.

[13] Ibid.

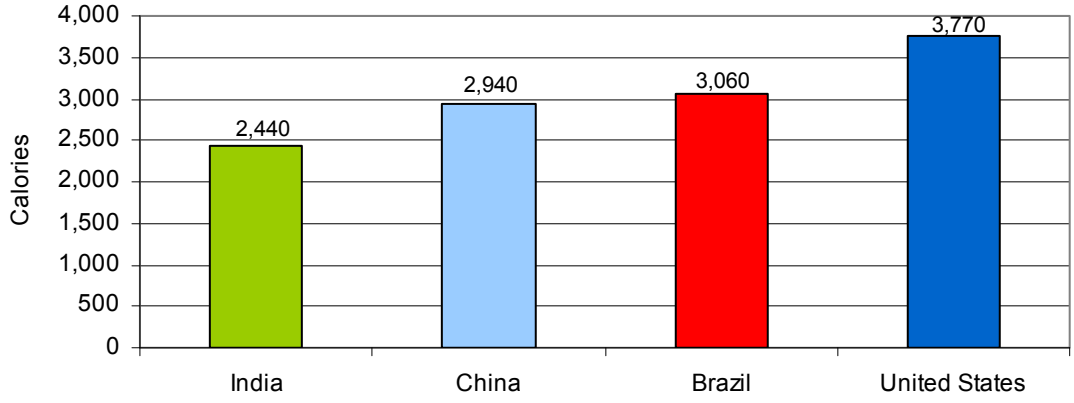
TABLE 3.2 India: Per capita consumption of select commodities, MYs 2003/04–2008/09 (kilograms)

Commodity	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
			Grains			
Rice, milled	77.53	72.07	74.69	74.99	77.12	77.67
Wheat	60.84	64.92	61.43	63.45	65.08	59.09
Corn	12.22	12.39	12.47	12.02	12.11	13.70
Other grains	20.05	17.24	17.21	16.10	18.16	16.98
All grains	170.64	166.62	165.79	166.57	172.47	167.44
			Meat			
Beef and veal	1.38	1.46	1.43	1.47	1.48	1.55
Poultry, broiler	1.36	1.47	1.67	1.73	1.91	2.09
			Dairy			
Butter	2.22	2.32	2.41	2.64	2.86	3.10
Fluid milk	76.05	78.43	80.28	83.20	87.03	88.25
Nonfat dry milk	0.17	0.21	0.20	0.21	0.23	0.26
All dairy	78.44	80.96	82.88	86.05	90.13	91.61
			Edible oil			
Oil, palm	3.26	3.04	2.74	3.26	3.93	4.27
Oil, soybean	1.71	2.34	2.57	2.25	1.96	1.88
Other edible oil	5.14	4.93	5.32	4.86	4.78	5.14
All edible oil	10.11	10.31	10.63	10.37	10.67	11.30
			Other			
Sugar, centrifugal	18.79	16.58	17.12	18.37	19.12	19.80
Dried fruit	0.04	0.05	0.04	0.05	0.06	0.06
Population (millions)	1,104.53	1,121.95	1,139.19	1,156.21	1,173.04	1,189.68

Source: USDA, FAS, Production, Supply and Distribution (accessed July 2, 2009); and International Monetary Fund, *International Financial Statistics*, July 2009.

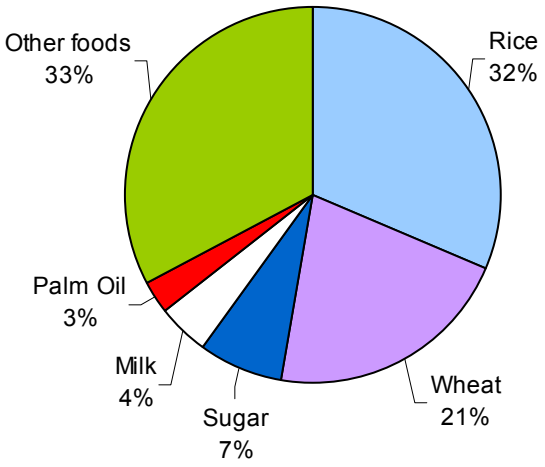
Note: For each crop, per capita consumption was calculated by dividing total domestic consumption by the estimated population. Indian population data for 2003 through 2008 were available from International Monetary Fund*, International Financial Statistics*, July 2009. From 2003 to 2008, the IMF population estimates reflected the expectation that India's population growth rate would decline 0.04 percent per year. Therefore, to calculate a population estimate for 2009 and 2010, the previous year's population was inflated by that year's growth rate less 0.04 percent. The estimated marketing year population (e.g., 2003/04) is based on the simple average of the population for the two calendar years making up that marketing year (2003 and 2004).

FIGURE 3.1 India and selected countries: Per capita daily consumption of calories, average 2001–03



Source: FAO, Country Profiles, Brazil, China, India, and the United States, *FAO Statistical Yearbook* , 2005.

FIGURE 3.2 India: Share of per capita daily calorie consumption by food item, average 2001–03



Source: FAO, Country Profiles, India, *FAO Statistical Yearbook* , 2005.

which represented almost one-third of Indian caloric intake, likely included fruits, pulses, vegetables, dried fruits, and processed foods.

Factors Affecting Consumption

Generally, the factors that affect food consumption in India are those that influence food consumption globally, namely population size and demographics, income levels, food prices, and consumer food preferences. Rapid changes in the Indian economy and corresponding changes to Indian society and demographics are likely not only to increase the amounts of traditional foods that Indians eat, but also to change the mix of foods Indians consume, including the addition of new food types to their diets, such as higher-value processed foods and imported food products.

Population Size and Demographics

India's population is currently 1.2 billion, approximately one-sixth of the world's population and second in size only to China. The population is spread across 28 states and 7 union territories (UTs). From MY 2003/04 to 2008/09, the Indian population is estimated to have grown approximately 8 percent (table 3.2). Such rapid population growth translates into a much larger consumer market for food products, whether traditional Indian staple foods or foods new to the Indian diet. Furthermore, India's large population is young and ethnically diverse. India's median age is 25, which is young even compared to that of other large developing countries, such as China and Brazil.[14] The changing demographics of the Indian population will likely have an impact on the types of foods Indians eat. Young people, especially young professionals in urban areas, are

[14] China and Brazil have median ages of 34 and 29, respectively. CIA, *The World Factbook: India*, updated June 1, 2009; CIA, *The World Factbook: China*, updated May 14, 2009; and CIA, *The World Factbook: Brazil*, updated May 14, 2009.

more likely to have been exposed to Western culture and have an affinity for Western-style foods, whether produced in India or imported.[15]

Religion is also an important factor that can influence the types of food Indians consume. For example, certain meats are forbidden or strongly discouraged by Hinduism (e.g., cow meat) and Islam (e.g., pork) (box 3.1). The Indian population practices a number of religions, but the majority of the population (81 percent) is Hindu. Muslims are the second-largest religious group (13 percent), followed by Christians (2.3 percent) and Sikhs (1.9 percent). [16]

BOX 3.1 Indian Pork Consumption[a]

Pork consumption in India is small for cultural and religious reasons. Pork is generally viewed as a poor man's meat, in part because pigs in India roam free and are viewed as feral scavengers. In addition, practicing Muslims are prohibited from eating pork. However, pork is consumed in somewhat larger quantities in Christian communities in the northeastern and southwestern areas of India, including in Goa, where it was introduced by the Portuguese when Goa was a colony of Portugal. It is also consumed in hotels and restaurants in India that feature or sell Western food, but generally not in Chinese restaurants (which are popular in India), notwithstanding its widespread use in Chinese cooking outside of India.

[a] USMEF, "India's Pork Market:" March 2007; FAO, Country Profile: India, *FAO Statistical Yearbook*, 2005.

Income and Expenditure

Income Levels

Most of the Indian population historically has been poor. Consequently, most Indians are very price sensitive with respect to food purchases (box 3.2). Even today, about 34 percent of the population lives on $1 per day or less, and 80 percent of Indians live on $2 per day or less.[17] By national standards, however, not all these individuals are considered impoverished; only 29 percent of Indians live below the national poverty line. Moreover, recent economic growth has caused incomes to rise, with a corresponding rise in spending, including food expenditures. Between FY 2003/04 and FY 2007/08, Indian per capita incomes grew 7.2 percent annually, which has allowed considerable numbers of Indians to move into the middle class.[18]

[15] Singh, *India: Retail Food Sector,* December 21, 2006, 5; Govindan and Dhankar, *India: Exporter Guide*, October 1, 2008, 5; and Bryant Christie Inc., *India Research Study*, January 31, 2008, 14.
[16] CIA, *The World Factbook: India,* updated June 1, 2009.
[17] UNDP, *Human Development Report 2007/2008,* 2007, 239.
[18] Government of India, Ministry of Finance, *Economic Survey 2007–08,* n.d., 3.

BOX 3.2 Indian Consumers and Price

Indian consumers are considered to be price sensitive, carefully planning their food purchases[a] and buying food in small quantities. This price sensitivity makes "[p]ackage size an important element of demand"[b] in India. Many food items, such as almonds, fruits, and pulses, are sold loose so consumers can buy only what they need for a few days' consumption. Low-income customers can avoid paying a markup on such items as pulses by cleaning and sorting them at home.[c] Edible oils are also sold from bulk containers, requiring customers to bring their own bottles to be filled at the shop—often of a branded oil mixed with a cheaper oil.[d]

Indian consumers value quality, but all but the upper classes are often reluctant or unable to pay for higher quality food.[e] Nonetheless, a recognized high-quality brand may command some brand loyalty and thus a price premium.[f] For example, U.S. products reportedly command a 5–10 percent premium because of their high quality and brand names. Affluent urban customers who are aware of quality and international brands and may have traveled abroad are more willing to pay a premium for quality food products, including imports.[g]

[a] Bryant Christie Inc., "India Research Study," January 31, 2008, 15.
[b] EIU, *India Food,* November 11, 2008.
[c] Approximately 90 percent of purchases are preplanned. USDA, ERS, *Indian's Pulse Sector*, May 2003, 9.
[d] Industry official, interview by Commission staff, Washington, DC, April 30, 2009.
[e] Singh, *India: Retail Food Sector*, December 21, 2006, 5; Govindan, *India: Exporter Guide,* October 1, 2007, 5; and Govindan and Dhankhar, *India: Exporter Guide,* October 1, 2008, 5.
[f] Government official, interview by Commission staff, New Delhi, India, May 26, 2009.
[g] EIU, *India Food,* November 11, 2008; Industry official, interview by Commission staff, New Delhi, India, May 26, 2009.

The middle class is India's most rapidly growing segment, and one source estimates that 583 million Indians will be considered middle class by 2025.[19] The middle class in India includes approximately 200–300 million people, with most located in urban areas.[20] This demographic grouping includes Indians with annual incomes of $2,000 or more (roughly equivalent to a daily income of $5.50 or more), or approximately 17–25 percent of the 2008 population.[21] One study estimates that the urban middle class will account for more than 75 percent of total food spending by 2025.[22] Research has shown that, generally, as incomes rise, Indians increasingly consume more nongrain food items such as fruits, vegetables, and nuts (boxes 3.3 and 3.4).[23] Because middle class Indians already meet their basic food needs, it is expected that they will increasingly buy higher-value foods, including nontraditional items such as processed foods, organic or premium foods, foreign foods, and meals in restaurants.

[19] Chatterjee, Rae, and Ray, "Food Consumption, Trade Reforms, and Trade Patterns," 7; Bryant Christie Inc., *India Research Study*, January 31, 2008, 3.
[20] Singh, *India: Retail Food Sector*, December 21, 2006, 4.
[21] The growing middle class in India is difficult to define precisely because its definition depends on the income levels used. One study divides Indians into five groups based on income (from low to high): deprived, aspirers, seekers, strivers, and global. According to this study, only seekers and strivers—about 5 percent of the population—qualify as middle class. McKinsey Global Institute, "The 'Bird of Gold,'" May 2007. Several other studies use a lower income criterion and would consider aspirers to belong to the middle class as well.
[22] McKinsey Global Institute, "The 'Bird of Gold,'" May 2007, 120.
[23] Chatterjee, Rae, and Ray, "Food Consumption, Trade Reforms, and Trade Patterns," 7.

BOX 3.3 Indian Consumption of Imported Fruits and Vegetables

India imports a wide variety of fresh fruits and vegetables. Fruit imports are dominated by apples, but relatively large imports of pears, citrus, dates, and grapes have been recorded as well.[a] Navel oranges are in high demand.[b] Smaller quantities of durians, kiwi, apricots, cherries, and plums are also imported into India.[c] Imported vegetables include potatoes, tomatoes, garlic, and mushrooms.[d]

As a result of their high cost—said to be up to 10 times the price of local produce[e]—the primary Indian consumers of imported fruits and vegetables are higher-income Indians, hotels, and catering businesses.[f] Reportedly, in the off-season, Indian consumers are willing to pay a premium for U.S. fruit exports.[g] For example, although Chinese apples are lower priced, approximately one-third of Indian apple imports are from the United States, primarily Red Delicious from Washington State. A survey conducted in six major Indian cities found that imported fruits and vegetables are generally consumed at higher rates in major port cities than in interior cities.[h] Imported fruits are more commonly consumed than imported vegetables, probably because vegetables are more perishable. The reasons most commonly cited by Indian consumers for buying imported fruits and vegetables varied among the six cities in question, although nutrition ranked as the number one reason in five cities. The second most common reason was the country of origin of the produce.

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[a] Dhankhar, *India: Product Brief*, December 16, 2008, 5.

[b] Industry official, interview by Commission staff, New Delhi, India, May 27, 2009; Dhankhar, *India: Product Brief*, December 16, 2008, 11.

[c] Dhankhar, *India: Product Brief*, December 16, 2008, 18.

[d] Florida Department of Agriculture and Consumer Services, *India: Road to Success,* August 2007, 38.

[e] Dhankhar, *India: Product Brief*, December 16, 2008, 4; Florida Department of Agriculture and Consumer Services, *India: Road to Success,* August 2007, 24

[f] Dhankhar, *India: Product Brief*, December 16, 2008, 4 and 11.

[g] Industry official, interview by Commission staff, New Delhi, India, May 27, 2009.

[h] Consumption of imported fruit was especially high in Chennai, Bangalore, and Mumbai, while imported vegetable consumption was highest in Chennai and Mumbai. Florida Department of Agriculture and Consumer Services, *India: Road to Success,* August 2007, 31.

BOX 3.4 Indian Almond Consumption

Almonds play a special role in Indian culture. The preference for almonds in northern India, especially in Delhi, stems from historical patterns of importing almonds and many dried fruits from Iran over several generations.[a] Almonds, not commercially grown in India, remain most popular in the north, although they are reportedly also enjoyed in Mumbai and the west coast, and their consumption is expanding into the south.[b] Indians consume almonds primarily as food, although they are also used in cosmetic and health care products.[c] Almonds are viewed as "high energy" and "brain" food and are recommended for children, pregnant women, recuperating patients, and athletes.[d] Reportedly, it is traditional for children to be given seven almonds soaked in milk or water for overall good health. Lower-income Indians aspire to eat almonds, and for the many who consider them a luxury item, they are reserved for holidays.[e]

The demand for almonds in India is filled almost exclusively through imports, of which the United States supplies roughly 85 percent.[f] Indians like the large size, even shape, and taste of the California nonpareil almond variety. Reportedly the California "brand" is highly regarded in India, and California exporters feel it is important to emphasize their almonds' origin.[g] However, in certain regions, such as Gujarat and Rajasthan, people prefer Iranian almonds (Mamra/qumi) and pay a price premium for them.[h] Indians are particular when purchasing almonds, preferring only those that have no chips or marks.[i] For this reason, most almonds are shipped whole to India, where they are hand-shelled. The majority of almonds are sold loose in small stores; only about 5 percent are sold in retail-sized packages.[j]

[a] Industry official, interview by Commission staff, Mumbai, India, May 11, 2009; Government official, interview by Commission staff, New Delhi, India, May 4, 2009.
[b] Industry official, interview by Commission staff, Mumbai, India, May 11, 2009.
[c] Aradhey, *India: Tree Nuts*, September 11, 2008, 4.
[d] Ibid., Industry official, interview by Commission staff, Mumbai, India, May 11, 2009; and USITC, hearing transcript, April 21, 2009, 23 (testimony of Mr. Heron, Blue Diamond Growers).
[e] Industry official, interview by Commission staff, Mumbai, India, May 11, 2009.
[f] Aradhey, *India: Tree Nuts*, September 11, 2008, 4.
[g] Industry official, interview by Commission staff, Mumbai, India, May 11, 2009; USITC, hearing transcript, April 21, 2009, 125–126, (testimony of Mr. Gore, JBC International; Mr. Zion, the California Pistachio Export Council; and Mr. Heron, Blue Diamond Growers).
[h] Aradhey, *India: Tree Nuts*, September 11, 2008, 4.
[i] Industry official, interview by Commission staff, Mumbai, India, May 11, 2009; Aradhey, *India: Tree Nuts*, September 11, 2008, 4.
[j] Aradhey, *India: Tree Nuts*, September 11, 2008, 4; Industry official, interview by Commission staff, Mumbai, India, May 11, 2009.

Income Distribution

Income growth has been more rapid in some regions of India than in others, and as a result, certain states and UTs have a higher concentration of wealth than others (table 3.3 and fig. 3.3). Five states (Punjab, Himachal Pradesh, and Haryana in northern India; Kerala and Andhra Pradesh in southern India) have 16 percent or fewer of households below the national poverty line.[24] Punjab, Himachal Pradesh, and Haryana, which border each other, were also among the 10 states and UTs with the highest per capita income in FY 2005/06, while Kerala and Andhra Pradesh were in the top 15.[25] The combination of high population density and high per capita income make Indian centers such as Delhi and Maharashtra the most likely regions to be targeted for the marketing of new, higher-value, nontraditional foods, according to one California study.[26]

[24] Government of India, Ministry of Finance, *Economic Survey 2007–08*, n.d., 28–29 and table 2.3.
[25] Government of India, PIB, press release, November 25, 2007.
[26] Bryant Christie Inc., *India Research Study*, January 31, 2008, 4.

TABLE 3.3 India: Ten highest per capita income states and union territories, FY 2005/06

State/UT	2005/06 average annual per capita income (US $)	Average per capita daily income (US $)	Total population (1,000 persons) (2001)	Pop. density (per sq. km) (2001)
Chandigarh	1,726	4.73	901	7,900
Delhi	1,250	3.42	13,851	9,340
Goa	1,207	3.31	1,344	363
Puducherry	925	2.53	974	2,030
Haryana	760	2.08	21,145	478
Maharashtra	739	2.03	96,752	314
Punjab	727	1.99	24,359	484
Andaman and Nicobar Islands	694	1.90	356	43
Himachal Pradesh	690	1.89	6,078	109
Gujarat	675	1.85	50,671	258

Sources: Government of India, PIB, “Per Capita Income,” November 25, 2007. Originally expressed in U.S. dollars for FY 1999/2000 (for FY 2005/06 year) and converted to U.S. dollars for FY 2005/06 using IMF, International Financial Statistics (online) (accessed May 2009). Government of India Web site, *Know India: States and Union Territories*, reviewed February 22, 2008 (accessed May 2009); Government of India Web site, "Districts of India," reviewed February 22, 2008 (accessed May 2009).

FIGURE 3.3 India: States and union territories

Note: Italics indicate union territories and the national capital territory.

The rise in the number of urban dwellers, with their faster-growing incomes, is likely to increase per capita food consumption and consumption of nontraditional food in Indian cities. Currently, Indians live mainly in rural areas; only about 29 percent of Indians, or approximately 342 million people, lived in urban areas in 2008.[27] By 2015, however, 32 percent of the population is expected to be urban.[28] Indians living in urban areas tend to have higher incomes than those in rural areas; in 2001 the population living in the eight largest cities accounted for 40 percent of India's disposable income.[29] Urban households

[27] CIA, *The World Factbook: India,* updated June 1, 2009; International Monetary Fund, *International Financial Statistics*, July 2009.

[28] UNDP, *Human Development Report 2007/2008*, 2007, 345.

[29] They are Mumbai (Bombay), Delhi, Kolkata (Calcutta), Chennai, Bangalore, Hyderabad, Ahemdabad, and Pune. McKinsey Global Institute, "The 'Bird of Gold,'" May 2007, 74.

are expected to see income growth of 5.8 percent per year from 2005 to 2025, while rural incomes are forecast to grow at a rate of only 3.6 percent per year.[30]

Spending on Food

Regardless of where they live, Indians spend a substantial share of their disposable income on food relative to other countries. For example, Indians' average food expenditures as a share of their total spending were estimated to be 8 percentage points higher than those of residents of China in 2008.[31] However, the share of household expenditures that both rural and urban dwellers spent on food fell in FY 2006/07 to 52 percent for rural households and 39 percent for those in urban areas (table 3.4).[32] In some regions of India, there is a pronounced difference between urban and rural households' food expenditures. For example, in Maharashtra the absolute amount of money that urban households spent on food was more than double that spent by rural households in FY 2006/07.[33] Higher urban incomes provide one likely explanation for this disparity; five times as many rural households as urban ones face food inadequacy for some months of the year.[34]

TABLE 3.4 India: Share of household consumer expenditures spent by rural and urban consumers on food and beverages, FYs 2004/05–2006/07 (%)

July 2004–June 2005		July 2005–June 2006		July 2006–June 2007	
Rural	Urban	Rural	Urban	Rural	Urban
55	43	53	40	52	39

Sources: Government of India, NSSO, *Household Consumer Expenditure Among Socio-Economic Groups India*, *FY 2004/05,* August 2007; *Household Consumer Expenditure in India*, *FY 2006/07,* January 2008; and *Household Consumer Expenditure in India*, *FY 2006/07,* October 2008.

The portion of income that rural and urban households allocate to certain foods also differs. A greater percentage of rural households' expenditures is allocated to staple food items. Food grains were the biggest food expenditure for rural and urban dwellers, constituting 32 percent and 23 percent, respectively, of food expenditures in FY 2006/07 (figs. 3.4 and 3.5).[35] Expenditure on dairy for urban households was 18 percent, compared to 15 percent for rural households. The greater income of urban households allows for greater shares of nonstaple foods. For example, urban households spent about 15 percent of their food budget on beverages, refreshments, and processed foods, while rural households spent slightly less than 8 percent on these items in FY 2006/07.

[30] McKinsey Global Institute, "The 'Bird of Gold,'" May 2007, 11.

[31] Estimates included consumer expenditures of food, beverages, and tobacco. EIU, *India Food,* November 11, 2008.

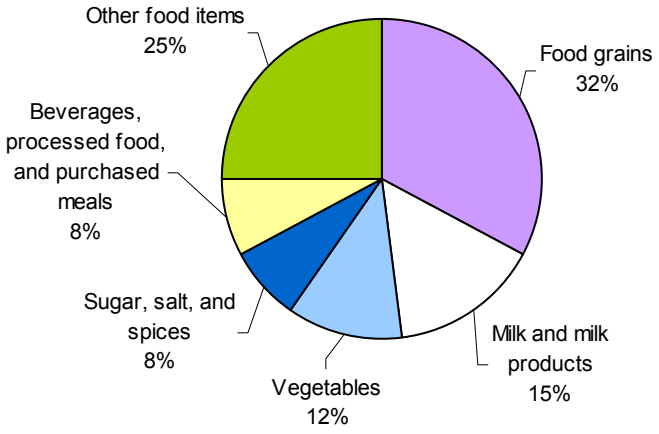
[32] The survey covered the period July 2006 through June 2007. Government of India, NSSO, *Household Consumer Expenditure in India, FY 2006/07*, October 2008.

[33] Government of India, NSSO, *Household Consumer Expenditure in India, 2006/07*, October 2008.

[34] In FY 2004/05, according to the government of India, 2 percent of India's rural households faced food inadequacy, compared with 0.4 percent of urban households. Government of India, Ministry of Finance, *Economic Survey 2007–08,* n.d., 246. By international standards, however, India's rates of food inadequacy are much higher. For example, the World Food Programme recently reported that 35 percent of Indians are food insecure and 20 percent are undernourished. World Food Programme, "Countries: India," 2009. It is likely that more of these food-insecure and undernourished individuals live in rural areas than in urban areas.

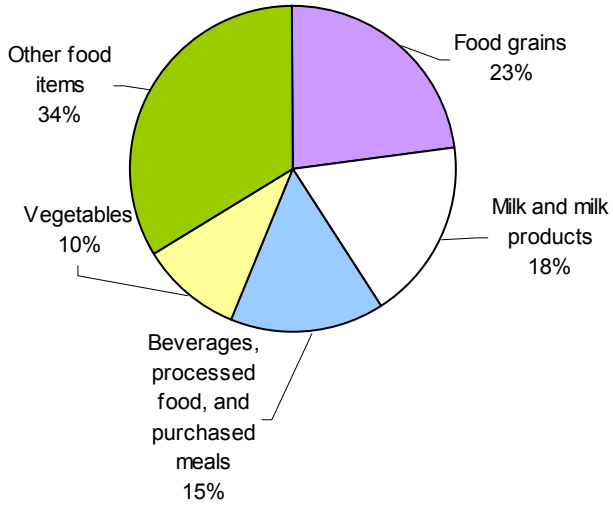
[35] Government of India, NSSO, *Household Consumer Expenditure in India, 2006/07*, October 2008.

FIGURE 3.4 India: Share of food expenditure by food item in rural areas, fiscal year 2006/07



Source: Government of India, NSSO, *Household Consumer Expenditure Among Socio-Economic Groups, 2006/07*, October 2008.

FIGURE 3.5 India: Share of food expenditure by food item in urban areas, fiscal year 2006/07



Source: Government of India, NSSO, *Household Consumer Expenditure Among Socio-Economic Groups, 2006/07*, October 2008.

Food Preferences

India is a country of diverse food preferences that vary by region, religion, and income group.[36] One Indian industry official stated that "there are different consumer preferences every 50 kilometers." [37] Indians typically consume unprocessed fresh foods with traditional ingredients, such as food grains, pulses, potatoes, edible oils, and Indian spices.[38] Many fresh foods are seasonal, and consumers adjust their diets to what is available.[39] A preference for fresh foods also applies to items such as meat, which is usually bought freshly slaughtered. Anecdotal evidence suggests that Indians, even those with financial means, regularly tend to eat a relatively narrow variety of foods.[40]

Indian food consumption patterns generally change for holidays, which include festivals such as Diwali,[41] and special occasions, such as weddings. During the fall festive season, demand peaks for specialty and high-value foods.[42] These special foods include Indian sweetmeats as well as a variety of imported foods, such as chocolates, nuts, baked goods, and exotic fruits and juices. Outside of special occasions, as noted earlier, rising incomes have driven a generally steady rise in the consumption of nonstaple items, such as fruit, vegetables, and meat.[43]

Although Indians may be slow to change their traditional diets, some multinational food companies are finding gradual success in the Indian market.[44] Generally, Western-style foods have been slow to penetrate the Indian market because of consumer preferences for fresh products and traditional ingredients. [45] Some multinational franchises (e.g., McDonald's, Pizza Hut, and Subway) have expanded their presence in India, with menus often altered for Indian tastes. For example, these restaurants serve no beef and little, if any, pork in their Indian outlets.[46] Other adjustments include giving higher prominence to dairy products and spicy foods, as well as developing unique products specifically for the Indian market.[47] The trend toward higher incomes and the large number of young adults

[36] Industry representative, interview by Commission staff, Washington DC, April 30, 2009.
[37] Industry representative, interview by Commission staff, Mumbai, India, June 1, 2009.
[38] EIU, *India Food*, November 11, 2008; Singh, *India: Retail Food Sector*, December 21, 2006, 5; and Govindan and Dhankar, *India: Exporter Guide*, October 1, 2008, 5.
[39] Singh, *India: Retail Food Sector*, December 21, 2006, 5; Govindan and Dhankar, *India: Exporter Guide*, October 1, 2008, 5.
[40] Industry official, interview by Commission staff, New Delhi, India, May 9, 2009; government official, interview by Commission staff, New Delhi, India, May 26, 2009.
[41] Diwali (the festival of lights) is one of the most important Hindu holidays and occurs in October or November.
[42] Singh, *India: Retail Food Sector*, December 21, 2006, 5; Govindan, *India: Exporter Guide*, October 1, 2007, 5; and Govindan and Dhankar, *India: Exporter Guide*, October 1, 2008, 5.
[43] USDA, ERS, *Prospects for India's Emerging Apple Market*, January 2006, 5.
[44] Reportedly, Indian consumer preferences are slow to change, and it can take five to seven years for them to do so. Industry official, interview by Commission staff, Mumbai, India, May 12, 2009.
[45] Singh, *India: Retail Food Sector*, December 21, 2006, 5; Govindan and Dhankar, *India: Exporter Guide*, October 1, 2008, 5.
[46] Industry representatives, interview by Commission staff, Mumbai, India, May 12, 2009, and June 2, 2009; industry representative, interview by Commission staff, New Delhi, India, May 8, 2009.
[47] Industry representative, interview by Commission staff, Mumbai, India, May 12, 2009; industry representative, interview by Commission staff, New Delhi, India, May 8, 2009.

(ages 20 to 34) who are less inclined to cook is also contributing to the popularity of Western-style restaurants.[48]

Consumption of processed foods in India is low but growing. Some of the prepared and packaged foods commonly consumed are sauces, spice mixtures, snacks, confectionery, and packaged noodles.[49] Similar to dining in restaurants, acceptance of processed and packaged products by the middle class is growing because of rising incomes, growing urbanization, and the increased number of working women.[50] Additionally, growth in processed food consumption comes with increased exposure to Western culture, especially by young professionals, including fast food restaurants, cafés, and Western products introduced by multinational food companies.[51] The middle class reportedly is especially open to processed foods,[52] but the higher cost of some processed foods constrains their consumption.[53] In addition, wealthy households that employ domestic help to cook reportedly have less need to buy processed foods in order to save time.[54]

Consumption preferences are also influenced by Indians' adoption of the global trend toward health consciousness and the corresponding increase in demand for healthier foods.[55] In a recent survey of Indian consumers with above-average incomes, 52 percent of respondents reported nutrition was the primary reason for trying imported produce.[56] Other information indicates, however, that some Indian consumers choose their food mainly on the basis of taste, rather than for safety or nutrition reasons.[57]

Additionally, consumption in India is influenced by access to food items, whether from domestic or import sources. For example, oats are not produced in India and had not been available to Indian consumers, but once they entered the marketplace, Quaker brand oats found success as a healthy breakfast food.[58] Many other food products not currently available in India may have the potential for acceptance by Indian consumers. This potential could be met, at least in part, by global export suppliers.

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[48] Bryant Christie Inc., *India Research Study*, January 31, 2008, 13. According to a 2007 study, only about 2.5 to 3 percent of all Indians' food expenditures were for meals in restaurants or hotels. USDA, FAS, *India: HRI Food Service Sector*, December 14, 2007, 3. In urban areas, only 23 percent of city dwellers ate out at all in 2006; around 12 percent ate out once a month, and 4.5 percent of Indians dined out weekly. Yadav and Kumar, "The Food Habits of Nation," August 14, 2006.

[49] EIU, *India Food*, November 11, 2008; Govindan, *India: Exporter Guide*, October 1, 2007, 5; Govindan and Dhankar, *India: Exporter Guide*, October 1, 2008, 5; Singh, *India: Retail Food Sector*, December 21, 2006, 5; and DATAMONITOR, "Confectionery in India," November 2008.

[50] Singh, *India: Retail Food Sector*, December 21, 2006, 5; Govindan, *India: Exporter Guide*, October 1, 2007, 5; and Govindan and Dhankar, *India: Exporter Guide*, October 1, 2008, 5.

[51] Singh, *India: Retail Food Sector*, December 21, 2006, 5; Govindan and Dhankar, *India: Exporter Guide*, October 1, 2008, 5.

[52] Industry representatives, interview by Commission staff, New Delhi, India, May 26, 2009.

[53] Basu, "Indian's Food Sector Poised for Rapid Growth," March 2008, 16.

[54] Government official, interview by Commission staff, New Delhi, May 26, 2009.

[55] Dhankhar, *India: Product Brief*, December 16, 2008, 4; industry representative, interview by Commission staff, Mumbai, India, May 29, 2009.

[56] Florida Department of Agriculture and Consumer Services, *India: Road to Success*, August 2007, 29 and 51.

[57] Industry representative, interview by Commission staff, Mumbai, India, May 12, 2009.

[58] Industry representative, interview by Commission staff, New Delhi, India, May 26, 2009.

Regional Variation

Geographic and historical factors influence food preferences and preparation methods in India and are an important factor in Indian food consumption patterns. Regional cuisine tends to draw heavily on food crops that have historical patterns of cultivation in a particular region.[59] This effect is perhaps most clearly demonstrated by the regional consumption of wheat and rice. Northern states and UTs, such as Delhi, Haryana, and Punjab, produce wheat and consume it in greater quantities than other food grains. The same pattern holds for rice in southern states such as Andhra Pradesh, Karnataka, and Tamal Nadu, while Maharashtra, which lies between these regions, has almost equal consumption of wheat and rice. [60]

Some of the differences in regional food preferences can be traced to the influence of other cultures with a present or past physical presence in the region. For example, current heavy use of dairy and tandoor (clay oven) cooking in Northern India is based on the Mughal culture.[61] The Portuguese, through their colony in Goa established in the 16th century, are believed to have introduced potatoes, now considered a staple of the Indian diet. Similarly, one study found that when Indians relocate within the country, they bring their regional food preferences with them and will even pay higher prices to buy these foods in their new home, compared to locally available foods.[62] Thus, regional taste patterns may be blurred by internal migration, especially in areas with large migrant populations. For example, wheat consumption is increasing in southern areas such as Bangalore, a city that attracts a large migrant population.[63]

Vegetarianism

India is known for its tradition of vegetarianism linked to Hinduism.[64] According to a prominent 2006 Indian survey, however, 60 percent of individuals and 44 percent of families are nonvegetarian,[65] and the pervasiveness of vegetarianism varies by location and social group. Coastal states have the lowest levels of vegetarian families (approximately 2–8 percent), while western and northern states have the highest (approximately 33–63 percent). Additionally, the survey found that more upper-caste Hindus, such as Brahmins,[66] were vegetarian than other groups, including lower-caste Hindus. Muslims and Christians are the least likely to be vegetarian, with 3 percent and 8 percent rates of vegetarianism, respectively. Neither Islam nor Christianity forbids consumption of meat in general, although there are restrictions on consumption of certain types of meat, such as pork, in Islam. Many Indians are vegetarian not for religious reasons but because they cannot afford meat.[67] Yet, even for those who eat meat, beef (cow meat) consumption is low because Hindus consider cows to be sacred.

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[59] Atkin, "Trade, Taste, and Nutrition in India," January 2009.

[60] Government of India, NSSO, *Household Consumer Expenditure in India, 2006/07*, October 2008.

[61] Venkatraman, "India (Cuisine)," May 16, 2000; Whitecomb, "An Overview of India's Regional Cuisines," August 5, 2008.

[62] Atkin, "Trade, Taste, and Nutrition in India," January 2009.

[63] Government officials and industry representative, interview by Commission staff, New Delhi, India, May 26, 2009.

[64] As used here, "vegetarians" are Indians who do not eat meat, fish, or eggs but may consume dairy products. Yadav and Kumar, "The Food Habits of Nation," August 14, 2006.

[65] Yadav and Kumar, "The Food Habits of Nation," August 14, 2006.

[66] A Brahman is a Hindu of the highest caste, traditionally assigned to the priesthood.

[67] Govindan, *India: Exporter Guide*, October 1, 2007, 5; Govindan and Dhankar, *India: Exporter Guide*, October 1, 2008, 5.

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CHAPTER 4
Indian Agricultural Production and Policies

Overview

India's agricultural production, valued at $176 billion[1] and representing 17 percent of Indian gross domestic product (GDP) in 2007,[2] has been heavily influenced by domestic government policies emphasizing food security, food self-sufficiency, and income support for farmers. Indian food consumption is overwhelmingly supplied by domestic production, with imports playing a minor role for most commodities.

Agriculture is an important sector of India's economy. It employs more than 60 percent of the population,[3] dominated by millions of extremely poor farmers working small to marginal landholdings, who account for more than one-half of total Indian agricultural production. India is a leading global producer of a number of commodities—including various grains, dairy, fruits, and vegetables—because of its significant natural resource base. The country has the world's second-largest arable land base after the United States [4] and is endowed with all of the world's major climates.[5] While grains remain the foundation of the Indian diet, production has recently increased for other foods, such as milk, meat, fruits, and vegetables, in response to increasing Indian demand.[6] The value-added food processing sector of the Indian economy is small but growing.

During marketing years (MYs) 2003/04–2007/08, Indian production volumes of many commodities increased, some with annual double-digit growth rates. Many of the increases were aided by favorable weather and prices, increased planted area, and rising yields. Yet growth in the overall value of agricultural production slowed relative to past performance[7] and lagged behind the growth in population.[8] The 2.5 percent growth recorded during fiscal years (FYs) 2002/03–2006/07 (the years covered by the government's Tenth Five-Year Plan) is not considered by the Indian government sufficient to sustain food security objectives.[9] Consequently, the government is currently looking for ways to improve performance in the sector, which suffers from fragmented landholdings, an incentive program that distorts crop planting decisions, the overuse of fertilizer and groundwater, inadequate postharvest treatment, and inefficient market channels.[10]

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[1] U.N. Food and Agriculture, FAOSTAT, "Gross Production," 2007.

[2] Government of India, Ministry of Agriculture, *Agricultural Statistics at a Glance*, 2008. In contrast, agriculture accounts for 1.2 percent of U.S. GDP. CIA, *The World Factbook: India*, updated June 1, 2009.

[3] Government of India, Ministry of Agriculture, *National Policy for Farmers 2007*, 1.

[4] Agriculture and Agri-Food Canada, *India Agricultural Policy Review*, September 2008, 1.

[5] USIBC, written submission to the USITC, June 26, 2009, 2.

[6] The World Bank, "From Competition at Home to Competing Abroad," June 28, 2005, 1; McKinsey Global Institute, "The 'Bird of Gold,'" May 2007, 87.

[7] National five-year average growth rates for agriculture were in the 3.5–3.7 percent range during the 1980s and 1990s, but slowed to 2.5 percent during fiscal years 1997/98–2001/02 and 2002/03–2006/07. Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 4.

[8] In FY 2006/07, per capita output of some major crops, such as cereals, pulses, oilseeds, and some fruits and vegetables, was below FY 1996/97 levels. Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 5.

[9] Ibid., 5.

[10] Indian agricultural market channels and postharvest treatment are discussed in chapter 7.

The central government has created agricultural support policies intended to promote its food security and economic goals. These programs intensified during the Green Revolution, laying the foundation for the large increases in agricultural production that followed. Today, India's support for the farm sector can largely be subdivided into three groups: input support programs, output price support programs, and farmer welfare funds. Input support programs focus primarily on fertilizers, rates for irrigation water, electricity rates, diesel prices, and seeds. Output price support programs consist of minimum support prices (MSPs) for certain staple crops produced in India. Farmer welfare funds refer to a suite of government payments that lower the cost of borrowing to farmers (via below-market loan rates or debt write-offs) or boost wages for farm laborers. Each of the three groups of Indian government support programs affects U.S. agricultural exports differently. In the aggregate, however, India's intervention policies in the farm sector, in combination with trade measures, restrict U.S. agricultural exports.[11]

Production

General Production Patterns

India is a significant global producer of many agricultural products, mainly to feed its own population. It is the largest or second-largest global producer of milk, pulses, sugar cane, tea, wheat, rice, certain fruits (bananas and mangoes), certain vegetables (potatoes, onions, garlic, and ginger), and peanuts. India is also a major producer of cotton and castor (used for oil). Fresh fruits, vegetables, and livestock, including dairy, account for the largest agricultural contributions to Indian GDP.[12]

Indian commodity production patterns reflect the Green Revolution's focus on intensive farming and high-yield seeds, almost exclusively for food grains, specifically rice, wheat, corn (maize), and millet (a coarse grain).[13] During the 1970s and 1980s, Indian agricultural yields for food grains increased through a combination of the use of high-yielding varieties, increases in irrigated areas, and the introduction of intensive double-cropping.[14] Government irrigation projects included a system of dams to capture monsoon rains and provide water for a second yearly crop of certain commodities. Current irrigation patterns reflect those initiatives; nationally, percentage of area under irrigation for sugar cane, wheat, and rapeseed/mustard are relatively high (72–93 percent), in contrast to other commodities, such as soybeans, coarse grains, and pulses (2–15 percent).[15]

[11] Indian government policies related to incentives for the food processing sector and food safety are also described in this chapter. Both sets of policies set up frameworks under which companies are permitted to operate in India for investment and trade. In principle, they are policies that impact Indian and foreign companies uniformly.

[12] Horticulture and livestock each account for approximately one-quarter of agriculture's contribution to GDP. Mittal, "Can Horticulture Be a Success Story for India?" August 2007, 2; Indian National Dairy Development Board, National Statistics, 2008.

[13] Coarse grains include corn, barley, oats, sorghum, rye, millet, and mixed grains.

[14] Double-cropping is the growing of two consecutive crops on the same land in the same season or calendar year. Jha et al., "Indian Wheat and Rice Sector Policies and the Implications of Reform," May 2007, 2.

[15] Irrigation rates are for MY 2005/06. Government of India, Ministry of Agriculture, *Agricultural Statistics at a Glance*, 2008.

For most crops, however, Indian agricultural productivity is significantly below world averages, and production increases have slowed.[16] With the exception of cotton, current seed varieties used in India are not producing the rapid annual gains in crop yields that existed 20–30 years ago. The overuse of fertilizer and low-cost electricity for pumping groundwater has led to deteriorating soils and shrinking groundwater supplies.[17] In addition, large increases in government expenditures for input support programs and migrant farm labor payments over the last five years have crowded out public investment in agricultural research, extension services, irrigation, and other rural infrastructure projects. Research suggests that India's public expenditure patterns in agriculture have not maximized long-term sustainable economic growth.[18] In particular, long-term capital underinvestment in irrigation infrastructure undermined agricultural yields in 2009, as drought affected planted areas in Delhi, Haryana, Madhya Pradesh, Punjab, Rajasthan, and Uttar Pradesh.[19]

Recent Production Trends

During MYs 2003/04–2007/08, the volume of production of many major commodities grew rapidly in India (table 4.1), despite the slowdown in overall growth of Indian agriculture relative to previous periods. Most major commodities showed double-digit increases for the period. The production volume of cotton nearly doubled during this period, a result of favorable weather and the increased use of hybrid varieties and Bt cotton. Poultry, soybean, and milk production grew extremely rapidly as well, boosted by increased domestic demand.

Production of food grains is heavily influenced by government procurement prices. These increased over the period, resulting in faster rates of growth after MY 2006/07, following several poor harvests as a result of unfavorable weather. Although the planted area remained relatively steady, wheat, rice, and coarse grains benefited from favorable weather in MY 2007/08 and reportedly from greater distribution of improved seeds to farmers that resulted in higher yields.[20] The area planted with wheat increased slightly after MY 2005/06, mostly at the expense of mustard/rapeseed, because of the lower relative support price for rapeseed vis-à-vis wheat.[21] Pulses (e.g., peas, beans, and lentils) production has generally been stagnant since the 1970s. There have been few varietal improvements for domestic pulse production, and only a small share of production is under irrigation.[22] As a result, yields have not increased compared to other crops, and the planted area has not expanded, eroding its profitability relative to other crops, such as wheat and rice.[23]

Major oilseed production increased by 18 percent between MY 2003/04 and MY 2007/08, driven in large part by increases in soybeans. High domestic market prices for soybeans and groundnuts (peanuts) toward the end of the period encouraged

[16] Landes, "Indian Agriculture and Policy in Transition," 2008, 19.
[17] Jha et al., "Indian Wheat and Rice Sector Policies and the Implications of Reform," May 2007, 2.
[18] Persaud and Rosen, "India's Consumer and Price Policies," *Food Security Assessment*, February 2003, 34–35.
[19] Balchand, "Agricultural Situation to Be Reviewed," *The Hindu*, July 9, 2009.
[20] Govindan, *India: Grain and Feed*, May 6, 2008, 3.
[21] Govindan, *India: Grain and Feed*, January 10, 2007, 3.
[22] Industry representative, interview with Commission staff, New Delhi, India, May 26, 2009.
[23] Price, Landes, and Govindan, *India's Pulse Sector*, May 2003, 3.

TABLE 4.1 India: Agricultural production by commodity, MYs 2003/04–2007/08 (million mt)

Product	2003/04	2004/05	2005/06	2006/07	2007/08	% increase 2007/08 over 2003/04
Grains						
Rice	88.5	83.1	91.8	93.4	96.7	9.2
Wheat	72.2	68.6	69.4	75.8	78.6	8.9
Coarse grains	37.6	33.5	34.1	33.9	40.8	8.4
Pulses	14.9	13.1	13.4	14.2	14.8	-1.0
Major oilseeds	25.2	24.4	28.0	24.3	29.8	18.1
Groundnut	8.1	6.8	8.0	4.9	9.2	12.9
Rapeseed-mustard	6.3	7.6	8.1	7.4	5.8	-7.3
Soybean	7.8	6.9	8.3	8.9	11.0	40.3
Sugar cane	233.9	237.1	281.2	355.5	348.2	48.9
Sugar	15.2	14.2	21.1	30.8	28.6	89.0
Tea	0.9	0.9	0.9	1.0	0.9	7.5
Coffee	0.3	0.3	0.3	0.3	0.3	-3.3
Cotton (million bales)	13.7	16.4	18.5	22.6	25.9	88.5
Fruit[a]	([b])	([b])	55.4	58.9	62.9	13.6
Vegetables[a]	([b])	([b])	111.4	116.0	122.3	9.8
Milk, all	88.1	92.6	97.1	100.9	104.8	19.0
Buffalo milk	48.0	50.2	52.1	55.2	57.0	18.7
Cow milk	35.0	37.3	39.8	41.0	42.1	20.5
Meat, bovine	2.1	2.3	2.4	2.4	2.5	16.0
Goat meat	0.4	0.5	0.5	0.5	0.5	32.4
Pig meat	0.5	0.5	0.5	0.5	0.5	1.4
Sheep meat	0.2	0.2	0.2	0.2	0.2	12.5
Poultry	1.7	1.9	2.0	2.2	2.5	50.9

Source: Government of India, Ministry of Agriculture; FAOSTAT; USDA, FAS, PSD database.

[a]Percentage change from 2005/06 to 2007/08.
[b]Not available.

production and increased plantings.[24] Soybean planted area alone increased 35 percent during this time. Rising feed demand, mainly for poultry production, in domestic and international markets also kept soybean meal prices high.[25]

India experienced its fifth record cotton crop in MY 2007/08 (and its sixth in MY 2008/09) as a result of increased planting and higher yields from improved hybrid varieties and Bt cotton,[26] improved crop management practices, and favorable weather.[27] Cotton planted area increased by 24 percent over the period, reaching 9.43 million hectares in MY 2007/08, although the crop competes for area with other crops (rice and fodder crops in the north; coarse grains, pulses, and sugar cane in the central region; and rice, tobacco, and chilies in the south) that also enjoyed strong prices and relative profitability, particularly in MY 2008/09. [28] Cotton yields have nearly doubled–increasing 90 percent between 2002 and 2007 versus 10 percent or less for corn, rice, and

[24] Indian government MSPs set for oilseeds are typically too low to influence market prices. Aradhey, *India: Oilseeds*, April 16, 2009, 3.
[25] Aradhey, *India: Oilseeds*, May 19, 2008, 6.
[26] Bt cotton was introduced in India in 2002 and accounted for 85 percent of total cotton area in MY 2008/09.
[27] Singh, *India: Cotton and Products*, May 12, 2008, 1.
[28] Ibid., 4.

soybeans[29]—but are still below the world average, leaving room for production gains despite limited additional area for planting cotton.[30]

Milk production showed steady growth throughout the period. In response to increased demand for milk and value-added dairy products because of several factors—rising incomes, changing food habits and lifestyles, and urbanization—private sector milk processing capacities continued to expand.[31] The expansion was aided by foreign direct investment (FDI) in the sector and resulted in strong farmgate milk prices.[32] With regard to meat, poultry is the fastest growing segment, expanding by over 50 percent between MY 2003/04 and MY 2007/08. Consumer demand for processed poultry increased as prices decreased, which can be attributed to the increasing presence of integrated growing, processing, and distribution operations with higher production efficiencies.[33] FDI also aided the growth of this sector.[34]

The Farm Sector

Although large-scale agricultural production exists in India, the agricultural sector consists overwhelmingly of small (1–2 hectares) and marginal (less than 1 hectare) landholding farmers who do not benefit from economies of scale. Of approximately 500 million workers in the country, 234 million were farmers in 2001: 19 percent of these were considered small, and 62 percent were considered marginal in 2000–2001.[35] Small farms produce 41 percent of India's total grains, 49 percent of rice, 40 percent of wheat, 29 percent of coarse grains, 27 percent of pulses, and more than 50 percent of the fruits and vegetables.[36] The average size of farmer landholdings has decreased in recent decades, as plots are customarily divided when inherited. In addition, land ownership laws and government restraints on bank lending for land acquisition may reinforce the pressures that keep holdings in agriculture small.[37]

Many of the marginal holdings are merely for subsistence needs. But even for farmers who sell surplus production on the open market, returns are generally low.[38] Poor Indian farmers have little access to input or output markets, credit, or extension services, and limited investment options.[39] They therefore make very little investment in improved seeds, fertilizers, or pesticides, limiting advancements in productivity. In addition, in 2008, 57 percent of Indian crop production was nonirrigated, and because India receives on average 80 percent of its total rainfall between June and September from the southwest monsoon, farmers on nonirrigated land face considerable weather-related risk.[40]

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[29] Ibid., 5.

[30] Industry sources expect area for cotton production to peak at 10 million hectares. Aradhey, *India: Cotton*, May 21, 2008, 5.

[31] Shunmugam, *India: Dairy and Products*, October 20, 2003, 3.

[32] Dhankhar, *India: Dairy and Products*, November 5, 2008, 3.

[33] Singh, *India: Poultry and Products*, September 14, 2006, 3.

[34] See chapter 8 for a discussion of the Tyson-Godrej joint venture in poultry production.

[35] Government of India, Ministry of Agriculture, *Agricultural Statistics at a Glance*, 2008.

[36] Government of India, Agriculture Division Planning Commission, "Report of the Working Group on Agriculture Marketing Infrastructure and Policy Required for Internal and External Trade for the Eleventh Five Year Plan 2007–12," January 2007, 20.

[37] OECD, *Agricultural Policies in Emerging Economies*, 2009, 107-108; U.S. Dairy Export Council, *India: Dairy Industry*, March 2006, 13.

[38] See chapter 7 for further discussion of farm-level marketing and its impact on grower returns.

[39] Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 38.

[40] Ibid., 46.

India's labor productivity in agriculture is very low—just 1.2 percent of the U.S. rate.[41] In part this is because of the extremely large number of Indians employed in the sector, as well as small farm plots which do not lend themselves to mechanization. The number of Indians employed in the agricultural labor force has also not adjusted to the decline of agriculture's share of Indian GDP.[42] In India, agriculture value added per worker grew 15 percent in real terms from 1990 to 2004, compared to 60 percent in China and more than 100 percent in Brazil.[43]

Small and marginal Indian farmers are often stuck in a cycle of poverty. The large number of rural dwellers relative to available land and the fragmented nature of landholdings make it difficult for large families to subsist on crop production alone. Indian farmers face considerable weather- and market-related risks with few risk management tools available to them. Savings are often inadequate, yet high transaction costs, lack of collateral, and uncertain returns on many crops leave poor farmers without access to institutional credit. For those that do secure access to rural credit schemes or informal moneylenders, burdensome debt levels and interest rates often follow.[44] High debt levels are among a number of factors that have led to large numbers of farmer suicides in recent years.[45]

Food Processing Sector

The Indian processed food sector, valued at $70 billion, is small relative to India's large, wide-ranging raw material base. [46] The level of processing of perishable products in India is low compared to that of other countries. For example, 2 percent of total vegetable production in India is processed, compared to 65 percent for the United States and 70 percent for Brazil.[47] In part, India's low rates, as shown in the following tabulation, can be attributed to the prevalence of small-scale farming, the lack of grades and standards for raw materials, and poor transport and cold storage infrastructure, resulting in a small supply of processed foods to the Indian consumer.

India: Share of primary products processed, 2008 (%)

Product	Share processed[a]
Fruits and vegetables	2
Poultry	6
Milk	35–37
Other meats	21
Grains	91

Source: Dhankhar, *India: Food Processing Sector*, July 2, 2008, 3.

[a]Processed products include both those that have had primary processing (e.g., the milling of grains or the packaging of fruits and vegetables or liquid milk) and those that have undergone further processing (i.e., value-added processing). The processing of poultry and meat involves their preparation in slaughterhouses.

[41] McKinsey Global Institute, "The 'Bird of Gold,'" May 2007, 89.

[42] Unlike the experiences of East Asian countries, the movement of labor from agricultural to other sectors of the economy in India has been slow because of rigid labor laws in both the agricultural and industrial sectors. EIU, "Indian Agriculture: Production and Demand," June 18, 2007.

[43] European Commission, "India's Role in World Agriculture," December 2007.

[44] According to the Indian government, 26 percent of farm households are indebted, and approximately half of those are in debt to private informal moneylenders. Government of India, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 33, 88.

[45] OECD, *Agricultural Policies in Emerging Economies*, 2009, 104.

[46] Dhankhar, *India: Food Processing Sector*, July 2, 2008, 3.

[47] IBEF, *Food Processing: Market and Opportunities*, 4.

Food processing in India involves mainly primary processing, such as packaging fruits and vegetables and milling and crushing grains, oilseeds, and pulses, as well as the preparation of simply prepared or dried foods such as pickles, spice mixtures, tea, and some snack foods. Such primary processing accounts for approximately 60 percent of Indian processed foods.[48]

Until the 1990s, food processing was governed by laws that relegated it to small-scale industry with a prescribed maximum investment. Under these laws, large-scale or vertically integrated operations were effectively prohibited. Although changes in the law have opened up the sector to large and medium-sized domestic firms, as well as multinationals, currently about 75 percent of Indian food processing output is generated by small enterprises in the unorganized sector.[49] Most processing in the sector is done manually, with limited use of controlled-atmosphere storage and irradiation facilities, and low levels of processing technology.[50]

Indian Government Policies Affecting Farm-Level Production

As stated above, India's support for the farm sector can be largely subdivided into three types: input support programs, output price support programs, and farmer welfare funds, all designed to either boost farmers' incomes directly or lower the cost of production. Output price support programs and input support programs give domestic agricultural production a competitive advantage over foreign production, while farmer welfare funds boost overall demand for food through higher incomes. In principle, higher demand for food will stimulate demand for both domestic and foreign goods in the absence of trade barriers. Indian government policies regarding food processing and food safety set up frameworks under which all companies in India operate and are intended to affect Indian and foreign companies uniformly.[51] Table 4.2 summarizes the Indian policies described in this chapter.

India's legal approach to agricultural policies is important in discerning why government funding of the farm sector often varies significantly from state to state and why Indian agricultural policies tend to lack transparency. According to the Indian constitution, the implementation of most agricultural policies falls within the legal domain of India's states and not the union (central) government.[52] The Ministry of Agriculture (Ministry) in New Delhi formulates broad agricultural policies under five-year plans and allocates funds for those purposes (box 4.1). The Ministry and other central government agencies make key decisions about research and development, infrastructure, investment, credit, and trade. For the most part, however, policies are implemented by the states, an arrangement that gives the states some latitude to adjust policies to fit their economic and social needs.[53]

[48] Ibid., 3.

[49] The unorganized sector consists of small traditional outlets, primarily family owned and operated. Dhankhar, *India: Food Processing Sector*, July 2, 2008, 3.

[50] IBEF, *Food Processing: Market and Opportunities*, 8.

[51] Whether government policies actually affect foreign and domestic companies uniformly depends largely on how they are implemented.

[52] Singh, *Federalism, Nationalism and Development*, 2008, 104.

[53] OECD, *Agricultural Policies in Emerging Economies*, 2009, 99. For more information on India's constitutional structure related to agriculture, see appendix G.

TABLE 4.2 India: Summary of central government's key funding and regulations for agricultural production

Policy	Policy description	Policy effect	Impact on U.S. exports
Minimum support prices (MSPs)	Guarantees minimum price. Higher levels of support are given to rice and wheat.	Distort production decisions by farmers toward rice and wheat.	Limit opportunities for imports of rice and wheat from all sources.
Farmer input support programs (fertilizers, irrigation, electricity, diesel, seeds)	([a])	Encourage farmers to overproduce, and prices drop.	Imports are less competitive relative to domestic production.
Farmer debt forgiveness	([a])	Lowers production costs, increases production, and increases food demand by farmer households.	Undetermined. Lowers cost of Indian domestic production relative to U.S. production costs, but also boosts food consumption by farmers.
Low-interest farmer loans	([a])	Lower production costs, increase production, and increase food demand by farmer households.	Undetermined. Lower cost of Indian domestic production relative to U.S. production costs, but also boost food consumption by farmers.
Rural employment guarantee program	Payments are made to farm laborers, principally for work on water, forestry, and land development projects.	Increases labor costs, reduces production, and increases food demand by rural households.	Encourages exports to India from all countries, including the United States, through higher food demand and higher relative costs of Indian production.
Incentives for food processing	The government sets up agri-food export zones, gives duty-free treatment to capital goods and raw materials, and offers income tax rebates for certain producers.	Boost domestic food processing sector, and encourage a wider variety of food for consumers.	Increase demand for inputs that all exporters to India, including the United States, can supply.
Food safety regulations	Food Safety and Standards Act of 2006 combined and expanded several of the central government laws together into one comprehensive law.	Establish and enforce science-based food safety regulations.	State implementation may put additional requirements on U.S. exporters (e.g., labeling), but U.S. exports could benefit from uniform, predictable enforcement.

Source: Compiled by Commission staff.

[a]See policy column for description.

BOX 4.1 The Central Government's Five Year Plan for Agriculture

India's central and state government policies toward agriculture are based on long-standing objectives promoting food self-sufficiency in grains, enabling food security, and increasing farmers' incomes.[a] Every five years the central government issues broad policy guidelines through the Planning Commission for every major sector of the economy, including agriculture. The intent of these five-year plans is to set production and economic growth targets and formulate action plans for meeting the goals. Under the Tenth Five Year Plan (2002/03–2006/07), India set annual economic growth targets for agriculture (both field crops and livestock) of 4 percent. Actual annual growth was only 2.3 percent over the period,[b] although growth rose to nearly 5 percent in the final two years (2005/06 and 2006/07).[c] Growth rates during the five-year plan varied across agricultural subsectors, ranging from 1 percent annual growth for cereals to 3 percent or more for fruits and vegetables.[d] The most recent Indian government planning document, the Eleventh Five Year Plan, spans FY 2007/08 to FY 2011/12.

Economic growth in India's farm sector lagged significantly behind that of other sectors of the economy in the last reported fiscal year, reaching only 1.6 percent during 2008/09 (April 2008–March 2009).[e] This rate of annual growth is far below India's overall annual economic growth rate of about 6 percent for that year.[f] The reasons given by the Indian central government for the agricultural sector's lower-than-expected growth rates include (1) lower profits for farmers, caused by fluctuating world prices for agricultural commodities and efforts to keep domestic prices low for consumers;[g] (2) increased vulnerability to world food price volatility after trade liberalization;[h] (3) slower development of agricultural technology than expected; (4) rapid and widespread decline in the groundwater table, with particular adverse impact on small and marginal farmers; and (5) an inefficient use of available technology and inputs.[i] Economists also note a lack of public and private investment in agriculture, relative to the rest of India's economy. For example, the annual percentage of gross domestic product (GDP) invested in gross fixed capital formation for India as a whole was 27 percent during 2005/07; for agriculture it was only 7 percent.[j] Public investment in irrigation has been insufficient for more than 25 years.[k]

To meet India's production goals and all of the other policy objectives, the Indian government plans to increase public expenditures in agriculture from 3 percent of agricultural GDP to 4 percent, focusing on increasing per-unit productivity of land and water resources through improved technology and increased crop yields.[l] Government funds allocated to agriculture during the Eleventh Five Year Plan, as well as specific projects targeting irrigation, pest management, animal and seeds research, technological dissemination, and credit expansion, among others, are detailed in vol. 3 of the plan.

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[a] Landes, "Indian Agriculture and Policy in Transition," 2008, 20, 23.
[b] Department of Agriculture and Cooperation, *National Policy for Farmers 2007*, 1.
[c] Government of India, *Eleventh Five Year Plan: 2007–12,* vol. 3*,* 2008, 4.
[d] Ibid., 3.
[e] Bhardwaj. "India Aims for 4 Pct Growth; Analysts Cautious."
[f] EIU, *India: Country Report*, July 2009, 7.
[g] Government of India, Department of Agriculture and Cooperation, *National Policy for Farmers 2007*, 2.
[h] The Indian government appears to be referring to trade liberalization coinciding with India's implementation of WTO commitments after completion of the Uruguay Round in the 1990s.
[i] Government of India, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 4.
[j] Landes, "Indian Agriculture and Policy in Transition," 2008, 21–23.
[k] Balakrishnan et al. *Agricultural Growth in India Since 1991*, 23–27.
[l] Government of India, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 7–8.

Output Price Support Policies

The Agricultural Prices Commission (now known as the Commission for Agricultural Costs and Prices) was created in 1965 by the central government to set MSPs for major commodities.[54] Today, direct domestic support for agricultural production continues through MSPs for 25 products, including grains, pulses, oilseeds, and cotton. MSPs are implemented by various central and state government agencies, often linked to changes in production costs for farmers.[55] The Food Corporation of India (FCI) is the implementing agency for wheat and rice procurement. In conjunction with state and union territory (UT) procurement agencies, the FCI purchases all wheat and rice that is offered for sale by Indian farmers (and meets prescribed specifications). By purchasing at the notified MSP, the FCI ensures a stable market for these two crops.[56] The National Agricultural Marketing Federation (NAFED) operates price supports for rapeseed, mustard, and corn.[57] The Cotton Corporation of India (CCI) and NAFED undertake price support operations for cotton, and the Department of Agriculture and Cooperation within the Ministry of Agriculture implements price support operations for pulses and oilseeds.[58]

The Indian government steadily increased MSPs for most covered commodities over the last five years; MSPs for staple crops such as rice, wheat, corn, and millet all increased more than 60 percent over the period. Much of that increase occurred in the last two years and was directly related to increasing fertilizer and energy costs.[59] For crops other than rice and wheat, open-market prices are typically higher than the support price, and therefore the impact of the MSP program on India's agricultural production is somewhat limited (box 4.2).[60]

For agricultural commodities not covered under the MSP scheme, the Department of Agriculture and Cooperation implements the Marketing Intervention Scheme (MIS), which operates only on request from state and UT governments and typically procures products that are perishable, such as horticultural goods.[61] The MIS is designed to protect growers from making distress sales in the event of a bumper crop that drives prices below the cost of production. With a few exceptions, financial losses incurred under the MIS are shared equally between the central and state governments and limited to 25 percent of the total procurement cost. Profits are retained by the procuring agencies, typically NAFED and state-designed agencies. Procurements made under the MIS are very small relative to procurements under the MSP scheme, totaling $43.5 million during FY 2008/09.[62]

[54] Panagariya, *India: The Emerging Giant*, 2008, 73.
[55] Jha et al., *Indian Wheat and Rice Sector Policies*, May 2007, 5.
[56] Government of India, Department of Food and Public Distribution, *Annual Report 2008–09*, 32.
[57] When crop prices are at or below the MSP in the marketplace, NAFED procures crops directly from the farmers through its cooperative network, using mandis (see explanation of mandis in chapter 7).
[58] Government of India, *Economic Survey 2008–09*, 180.
[59] Ibid., 178.
[60] Government official, e-mail message to the Commission, July 22, 2009.
[61] Government of India, *Economic Survey 2008–09*, 180.
[62] Ibid., 180–81.

BOX 4.2 Does the Minimum Support Price Program Really Affect U.S. Exports?

To the extent that minimum support prices (MSPs) force India's internal market prices above the corresponding world price, they may encourage U.S. exports, particularly for goods that the United States produces in large volumes for export markets. For those MSP crops that the United States might ship to India under a free trade scenario—wheat, corn, and lentils—Indian market prices were as much as 60–120 percent above the MSPs for corn and lentils for 2008 and the first half of 2009.[a] (Rice was not considered as a possible U.S. export because India imports virtually no rice and remains a significant net exporter.) Therefore, MSPs for corn and lentils were not affecting Indian domestic prices. This leaves only wheat.

Although market prices for wheat tracked the MSP for wheat during 2008 and the first half of 2009 and therefore appear to have affected Indian domestic prices in an upward direction, prices of U.S. wheat exports to third-country markets during this 18-month period were significantly higher than Indian domestic prices (by 30–100 percent).[b] (Quality differences may account for most of the price difference; the United States typically produces and exports high-quality wheat.) Therefore, it appears that the United States already sells wheat in third-country markets at higher prices than those found in India. Consequently, Indian MSPs, by themselves, are unlikely to encourage U.S. exports in a free-trade environment. However, higher levels of government support for rice and wheat encourage their production at the expense of other commodities, such as pulses.[c] This may discourage imports of rice and wheat and encourage imports of other agricultural commodities from all sources.

[a] Commission staff chose representative Indian market prices for wheat, lentils, and corn (maize) from large producer states, in this case Uttar Pradesh, Madhya Pradesh, and Maharashtra, respectively. Government of India, Ministry of Agriculture, Agmarknet database.

[b] Indian agricultural prices sometimes vary significantly between states: in 2008, the price of wheat in Punjab and Madhya Pradesh differed by as much as 20 percent. At all price points, however, Indian prices were lower than U.S. export prices. Government of India, Agmarknet database; Philip, "High Food Prices in India," 2.

[c] Industry representatives, interviews by Commission staff, New Delhi, India, May 26, 2009, and Mumbai, India, May 28, 2009.

Input Support Programs

India's farmers benefit from input support on fertilizer, irrigation water, electricity, diesel, and seeds. In each case, these programs lower the price of inputs to the farmer, thereby encouraging their overuse. Farm support, particularly for fertilizers, was introduced to promote the government's goal of self-sufficiency in food grain production.[63] Farm support is also intended to boost farmers' income by lowering the cost of production. Government expenditures for these goods are costly, however, crowding out public investment in agricultural research, extension services, irrigation infrastructure projects, and other rural infrastructure. Research indicates that India's public expenditure patterns in agriculture have not maximized long-term, sustainable economic growth.[64]

Fertilizer Support Programs

Fertilizer support programs are traditionally the largest among the agricultural input supports funded in the central government's budget. The government controls the prices at which fertilizers are sold to farmers, paying the difference between controlled prices and market prices to fertilizer producers and importers; payments include an extra amount to cover transportation costs. Estimated expenditures for FY 2008/09 total Rs. 758.5 billion ($16.5 billion); this estimate excludes "off-budget" special bonds issued by the government to provide fertilizer companies with funds to meet their capital

[63] Mittal, Tripathi, and Tripathi, "Reshaping Agriculture Trade Policy," 2008, 83.

[64] Persaud and Rosen, "India's Consumer and Price Policies: Implications for Food Security," February 2003, 34–35.

requirements.[65] India's Planning Commission, the author of the five-year plans, notes that "the present system of fertilizer subsidy is irrational and has become counterproductive," encouraging soil degradation and damaging agricultural productivity.[66] It promotes the overuse of primary nutrients such as nitrogen, phosphorus, and potassium, rather than the use of secondary nutrients and micronutrients such as zinc, sulphur, and gypsum, all required in small quantities to maintain soil fertility.[67]

Irrigation Water Support

Government support for irrigation water primarily targets canal irrigation, although some of the money supports tank irrigation (man-made reservoirs) as well. Payments are made by state governments and totaled approximately $3.2 billion in FY 2005/06 (the last year for which data were available).[68] According to Indian analysts, the program as designed promotes the excessive use of groundwater, degrades soil quality, and depletes government coffers of tax revenues that could be better used for capital projects to upgrade irrigation infrastructure.[69] By contrast, in the Indian government budget for FY 2009/2010, capital projects for irrigation in drought areas under the Accelerated Irrigation Benefit Programme will receive funding of Rs. $10 billion ($200 million).[70]

Electricity and Diesel Support Programs

Electricity support payments—the difference between the market costs of electricity generation/distribution and the lower fixed rates paid by farmers—are given by state governments directly to electricity providers. Because these payments are intended to help support farmers' use of irrigation pumps, farmers' fixed rates are based on the declared horsepower of the pumps; and because the fixed rates do not cover the full cost of electricity, they lower the cost of production for farmers and encourage the overuse of electricity and groundwater. India's electricity support for farmers totaled $7.1 billion in FY 2007/08 and is estimated by the OECD to be $7.6 billion for FY 2008/09.[71]

Diesel is used mostly by Indian farmers for running irrigation pumps and tractors. Each year, certain states pay support on an ad hoc basis to cover some of the cost of diesel used for agricultural purposes, and the payments are typically reflected in the price of diesel charged to the purchaser. Nationwide cost estimates are unavailable, but anecdotal evidence indicates that diesel support totals hundreds of millions of dollars annually.[72] In the aftermath of the lower-than-normal rainfall experienced by many rice farmers during the 2009 monsoon season and the need for significantly higher levels of irrigation, states such as Bihar and Punjab appealed to the central government to bear most of the cost of diesel used to provide additional irrigation to drought-stricken crops.[73] In response, on

[65] Government official, interview by Commission staff, Mumbai, India, May 13, 2009.
[66] Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 16.
[67] Misra, "Centre Debates Remodeling Fertiliser Subsidy," October 30, 2007.
[68] OECD, *Agricultural Policies in Emerging Economies*, 2009, 104. The payment is calculated by totaling all operating costs incurred by government irrigation systems and subtracting payments by farmers.
[69] Mittal, Tripathi, and Tripathi, "Reshaping Agriculture Trade Policy," 2008, 83.
[70] Haq, "Seeds of Hope and Change," July 7, 2009.
[71] OECD, *Agricultural Policies in Emerging Economies*, 2009, 104.
[72] For example, the state of Bihar provided a diesel payment to farmers for the summer growing season totaling Rs. 10 per liter in 2007 and Rs. 15 per liter in 2008. The budget expenditure in 2008 was estimated to be Rs. 63.18 crore ($12.6 million). *The Times of India*, "Farmers to Get Diesel Subsidy of Rs. 15 a litre," September 20, 2008.
[73] The chief minister of Punjab also requested a Rs. 2,000 ($40) per acre payment from New Delhi for farmers facing additional planting costs in 2009 due to the reduced monsoon rains. *Webindia123*, "Bear Full Diesel Subsidy for Farm Sector: Badal to PM," July 25, 2009.

August 3, 2009, New Delhi announced a Rs. 1,000 crore ($200 million) support payment on diesel to offset 50 percent of the fuel costs required for additional crop irrigation during the summer growing season, called the "kharif crop."[74] Under the program, state and UT governments of areas affected by drought during July 15–September 30, 2009, were extended the full support payment and partially reimbursed by the central government.[75]

Government Support to Farmers for Seeds

Free seeds for farmers, paid out of the government budget, have a long history in India.[76] Today, seed purchases by farmers are still largely supported through state-run programs, and these payments lower farm production costs. For example, in the states of Karnataka and Uttar Pradesh, government tenders for bulk sunflower seed are announced, companies bid to provide the seed, and the government buys it on consignment. The farmer pays 50 percent of the market price, and the rest is paid to the companies by the government. If the sunflower seed is not sold to farmers, it is returned to the seed company.[77] An estimated 75 percent of sunflower seeds in India are sold in this way. In Karnataka and Uttar Pradesh, 20 percent of corn seed is sold to farmers using the same method, as is an estimated 10–15 percent of all corn seed nationwide. The states of Uttar Pradesh, Chhattisgarh, and Bihar participate in a similar program for rice.[78] For Bt cotton, various states (e.g., Andhra Pradesh in 2006, Gujarat in 2008, and Maharashtra in 2009) passed cotton acts to empower seed price controls. These laws forced seed companies to lower cotton seed prices to farmers by fiat.[79]

Data on total seed support from Indian state governments are unavailable, but anecdotal evidence shows that the payments are significant. In the state of Andhra Pradesh, a support of Rs. 25 ($0.50) per kilogram was granted for maize (corn) seed in May 2009.[80] The state of Karnataka covered 50 percent of farmer seed expenditures in 2008.[81] The state of Haryana announced a Rs. 120 million ($2.4 million) seed payment to farmers in March 2008 for summer moong (mung bean) cultivation covering 20,000 hectares. At a support rate of Rs. 30 ($0.60) per kilogram, the total payment was 70 percent of the seed cost.[82]

[74] *The Hindu*, "Govt. to Extend Rs. 1,000-Crore Diesel Subsidy to Paddy Growers," July 31, 2009.

[75] Reimbursement would be up to 50 percent of their costs, not to exceed a payment of Rs. 7.50 per liter of diesel, Rs. 500 per hectare and two hectares per farmer. Government of India, Press Information Bureau, "Centre to Give Financial Assistance to States Introducing Diesel Subsidy to Farmers in Deficit Rainfall Affected Areas," August 3, 2009.

[76] Government official, interview by Commission staff, New Delhi, India, May 4, 2009.

[77] Industry representative, interview by Commission staff, Mumbai, India, May 12, 2009.

[78] Ibid.

[79] As discussed in chapter 9, seed companies note that the majority of Indian states now have price caps in place, because when one state institutes a price cap, the resulting disparity in price puts pressure on other state governments to conform. The challenge for these companies in the future is how to retain a portion of the farm value of genetically modified seeds that justifies the investment costs. Industry representative, interview by Commission staff, Mumbai, India, May 11, 2009.

[80] *The Hindu*, "Subsidy Offered on Seed," May 30, 2009.

[81] Jayaramiah, "Karnataka Set to Ensure Free Flow of Fertilizers, Seeds," May 6, 2009.

[82] *Express India*, "Rs. 1.2 Crore Marked to Provide Seed Subsidy," March 28, 2008.

Farmer Welfare Programs

Low-Interest Loans for Farmers

Implemented through the National Bank for Agriculture and Rural Development and starting in the 2006/07 crop year, India's central government provides approximately $400 million per year in interest rate support on farm loans under a program called the "Short-Term Rural Co-operative Credit Structure." Under the program, which lowers farmers' operating costs, farmers are eligible for short-term crop loans of up to Rs. 300,000 ($7,150) at a preferential annual interest rate of 7 percent, roughly 2 percent below the market rate. These loans came to approximately Rs. 2.8 trillion ($70.1 billion) during MY 2008/09.[83] In the Indian government budget for FY 2009/2010, farm loans totaling Rs. 3.25 trillion ($65 billion) will be granted at a preferential annual interest rate of 6 percent.[84]

Debt Write-Offs for Farmers

India's 2008 central government budget wrote off loans for farmers totaling more than Rs. 653 billion ($14.2 billion).[85] The relinquished loans represented 1.6 percent of India's GDP.[86] Of the total, $2.4 billion were one-time waivers of overdue loans. These payments assisted an estimated 40 million farmers, more than 30 million of whom were classified as small and marginal farmers. Some Indian analysts have commented that such actions by the government create a moral hazard for farmers, who will assume that future loans are likely to be paid off by the government in a similar way.[87] Like low-interest loans, debt write-offs lower Indian farmers' operating costs.

National Rural Employment Guarantee Act

The National Rural Employment Guarantee Act (NREGA), passed in August 2005 and brought into force in February 2006, provides 100 days of employment every year to tens of millions of rural poor and migrant laborers. Since its creation, the act has generated more than 4.5 billion person-days of employment and paid more than Rs. 350 billion ($7 billion) in wages, primarily to poor and migrant farmers.[88] About 70 percent of NREGA projects involve watershed management, water conservation, forestation, and land development.[89] In the Indian central government budget for FY 2009/10, announced July 6, 2009, NREGA was funded at Rs. 390.1 billion ($7.8 billion), an increase of 144 percent from FY 2008/09 and more than the program's combined funding over the previous three years.[90]

This program boosts incomes for poor farm laborers, but it also increases operating costs for farmers that use migrant labor. NREGA is blamed by farmers for a shortage of laborers in agricultural regions such as the state of Punjab. Even though farmer-owners,

[83] OECD, *Agricultural Policies in Emerging Economies*, 2009, 104.
[84] Haq, "Seeds of Hope and Change," July 7, 2009.
[85] Government official, interview by Commission staff, Mumbai, India, May 13, 2009. The budget was presented in February 2008 by Finance Minister Palaniappan Chidambaram.
[86] *The Economist*, "Waiving, Not Drowning," July 3, 2008.
[87] India Knowledge@Wharton, "India's 2008 Budget," March 6, 2008; industry representative, interview by Commission staff, New Delhi, India, May 9, 2009.
[88] Swaminathan, "Synergy between Food Security Act and NREGA," June 1, 2009.
[89] Mukherjee, "India to Quantify Climate Benefits from Poverty Project," June 1, 2009.
[90] Haq, "Seeds of Hope and Change," July 7, 2009.

known as zamindars, have doubled or tripled wages for rice paddy sowing in 2009 compared to the previous year and offered other enticements such as free meals, liquor, and opium, migrant labor from the states of Uttar Pradesh and Bihar are not arriving in sufficient numbers to fill 750,000 planting jobs.[91] The migrants prefer available employment opportunities closer to home under NREGA. Punjab's agriculture department is scrambling to purchase 700 farm machines to partially offset the shortfall in human labor.[92]

NREGA is likely to increase India's food price inflation in two ways. First, the rural poor are likely to use their NREGA wages to buy food, thus increasing the overall demand for food. In addition, since it diverts ever-larger numbers of laborers from actual work on farms, rising farm labor costs are likely to be passed on to consumers in the form of higher prices.

Indian Government Policies Affecting Food Processing

Recent Indian Government Incentives for the Food Processing Sector

The Indian government considers the food processing sector to be an important driver of the Indian economy,[93] as well as an important conduit for capturing some of the current wastage of perishable agricultural products.[94] Changes in Indian society and economy are leading to a boom in the food processing sector, which grew 7 percent in 2002–03 and 13 percent in 2006–07.[95] The government, through the Ministry of Food Processing Industries (MOFPI), has set targets to increase the level of processing of perishables from the current 6 percent to 20 percent, the share in global trade from the current 1.5 percent to 3 percent, and increase value added by an additional 20–35 percent by 2015.[96] MOFPI plans include the establishment of 60 "agri export zones" and 53 "mega-food parks" to encourage food processing,[97] duty-free import of capital goods and raw materials into these zones for export-oriented production, and income tax rebates for producers of fruits and vegetables.[98]

The Indian government maintains a liberal policy regime regarding FDI in food processing.[99] Nonetheless, although there is currently some FDI in the processed food sector, it accounts for a relatively small portion of the industry. U.S. firms are the primary contributors of FDI in this sector and include Coca-Cola, Pepsi, Heinz, Kellogg's, and Cargill. Opportunities exist for investment in areas that support food processing, such as agricultural technology and postharvest treatment and equipment. Multinational firms bring international quality standards and business practices to the Indian food sector and are contributing to its growth. In addition, the emerging organized retail sector in India, including restaurant chains, is influencing the growth in processing because of its

[91] Jolly, "Punjab Farmers Desperate As Migrant Workers Vanish," May 31, 2009.
[92] Ibid.
[93] IBEF, "Agriculture," March 3, 2009.
[94] Industry representative, interview by Commission staff, New Delhi, India, June 1, 2009.
[95] Dhankhar, *India: Food Processing Sector*, July 2, 2008, 3.
[96] Ibid., 13.
[97] Ibid.
[98] IBEF, "Food Processing: Market and Opportunities," 7.
[99] Industry representative, interview by Commission staff, New Delhi, India, June 2, 2009.

increased backward linkages. It is likely that as the organized retail sector grows, backward integration will grow as well, triggering a push for more food processing.[100]

Food Safety Standards and Regulations

Food safety standards are set nationally under the authority of the central government rather than state governments. Before 2006, Indian food standards were governed by several food laws enacted at different times and under the authority of different ministries, including the Prevention of Food Adulteration (PFA) Act of 1954, enforced by the Ministry of Health and Family Welfare; the Agricultural Produce (Grading and Marketing) Act of 1937, enforced by the Ministry of Agriculture; and the Standards and Weights Measure Act of 1976, enforced by the Ministry of Food and Civil Supplies.[101]

In August 2006, the central government passed the Food Safety and Standards Act of 2006, in which eight separate laws were consolidated.[102] This act regulates food safety standards related to the manufacture, storage, distribution, sale, and import of food for human consumption. Standards—still in the process of being formulated—will cover the specifications for ingredients, contaminants, pesticide residue, biological hazards, and labeling.[103] The establishment and enforcement of science-based food safety standards for domestically produced and imported food is now carried out by the Ministry of Health and Family Welfare through a regulatory body called the Food Safety and Standards Authority (FSSA), which began operation in July 2008.[104] Its activities include restricting ingredients used in food preparations, sampling foods for poisons and other toxic substances, licensing and registering businesses selling food for human consumption, and regulating food manufacturing practices and labeling. State commissioners of food safety will provide some of the staff and resources for enforcement.[105]

Because implementation and enforcement of laws by the FSSA only began in late 2008 and certain authorities under the FSSA will not be operational until late 2009, it is too early to assess the impact of the FSSA on U.S. exports of agricultural goods.[106] Early actions, however, suggest that U.S. exports of wine and spirits may be negatively affected by new labeling requirements. Under the law, each state has the right to require separate labels with different information for consumers. According to industry representatives, if Indian states permit stickers to be added after shipment and the original labels remain, the cost and administrative burdens are expected to be minimal. On the other hand, if states insist on entirely new labels, the additional cost could be very high, forcing wine and spirits manufacturers to exit certain markets, particularly Indian states without high-volume sales.[107]

Another open question is whether enforcement practices by the FSSA will match or exceed those that prevailed under previous laws. For example, some Indian sources assert

[100] Dhankhar, *India: Food Processing Sector*, July 2, 2008, 3.
[101] For a full list of the Indian laws impacting food safety, see *Vision, Strategy and Action Plan for Food Processing Industries in India*, April 2005, 115–116.
[102] *The Times of India*, "Health Ministry to Oversee Food Safety," April 11, 2007.
[103] Panagariya, *India: The Emerging Giant*, 2008, 317.
[104] Briggs, "India Sets Up Food Safety and Standards Authority," July 8, 2008.
[105] Food Safety and Standards Act 2006, ch. 7, sec. 29–30.
[106] *The Financial Express*, "FSSA to Unveil New Food Safety Guidelines Soon," July 7, 2009.
[107] Industry representative, interview by Commission staff, New Delhi, India, May 8, 2009.

that the PFA Act was strictly enforced for the organized sector.[108] Eight years ago, directors of companies were made directly liable for adulteration problems with food. As a result, all large companies, including multinationals, and many medium-sized companies remedied violations and began abiding by the law.[109] However, other Indian sources paint a different enforcement picture, claiming that foreign companies and importers were subject to PFA Act enforcement but domestic companies were not.[110] Whether sufficient government resources will be devoted to monitoring food safety, and whether FSSA enforcement will be strictly and fairly applied to all food companies operating in India, is uncertain.

[108] The Prevention of Food Adulteration Act of 1954 focused on regulatory standards for primary food products (i.e., those products which constitute the bulk of the Indian diet). All imported products were regulated under this law, including labeling and marking requirements. Seth Associates, *Food and Drug Industry in India: An Overview*, 2006.

[109] Industry representative, interview by Commission staff, New Delhi, India, May 9, 2009; Government of the National Capital Territory of Delhi, Directorate of Prevention of Food Adulteration.

[110] Industry representative, interview by Commission staff, Mumbai, India, June 1, 2009.

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CHAPTER 5
TARIFFS

Overview

Indian tariff policy is focused on supporting India's domestic agricultural policy objectives discussed earlier: food security, food self-sufficiency, and supporting farmer incomes. As a result, Indian agricultural tariffs are among the highest in the world. The average Indian World Trade Organization (WTO) bound tariff rate for agricultural products is substantially higher than that of many other developing countries. Indian applied tariff rates vary substantially by product and average approximately 34 percent, creating an impediment to U.S. agricultural exports. India also levies additional duties that further increase the cost of imported goods. An additional problem noted by U.S. exporters is the large difference between India's bound and applied tariff rates on many agricultural products, which allows the Indian government to modify its tariffs substantially while complying with its WTO commitments. For example, the Indian government tends to frequently modify tariffs on food staples, such as wheat, pulses, rice, sugar, and vegetable oils. This variability, as well as the complex process for notifying India's trading partners of tariff-rate changes, creates uncertainty and acts as an additional impediment for certain U.S. exports.[1]

Commission modeling simulations estimated that, in the absence of Indian agricultural tariffs, U.S. agricultural exports to India would have been 42–61 percent higher in 2007, which is equivalent to $200–291 million. U.S. exports most affected by Indian agricultural tariffs in 2007 were almonds, fresh apples, cotton, soybean oil, and certain other vegetable fats and oils.

Bound Tariffs and Tariff-Rate Quotas

India bound its tariff rates on imports of all agricultural products as a part of its Uruguay Round commitments under the General Agreement on Tariffs and Trade. The average Indian bound tariff rate for agricultural products is 114 percent ad valorem, which is among the highest in the world and much higher than the average bound rates of other developing countries such as Brazil (36 percent) and China (16 percent).[2] In comparison, the average bound tariff rate for agricultural products in the top 10 markets for U.S. agricultural exports is 34 percent.[3] Moreover, the average Indian bound tariff rate for agricultural products is considerably higher than India's average bound rates for nonagricultural products (36 percent).[4]

The majority of Indian bound tariff rates for agricultural products are between 50 and 150 percent ad valorem. Only 4 percent of tariff rates for agricultural products are bound

[1] USIBC, written submission to the Commission, June 26, 2009, 7.

[2] Only 12 WTO member countries have higher average bound agricultural tariffs than India: Bangladesh, Lesotho, Malawi, Mauritius, Nigeria, Norway, Saint Lucia, Saint Vincent and the Grenadines, Tanzania, Tunisia, Zambia, and Zimbabwe. WTO, *World Tariff Profiles*, July 2008.

[3] The top 10 U.S. WTO agricultural export markets include Canada, Mexico, EU, Japan, China, Korea, Taiwan, Indonesia, Egypt, and Hong Kong. GTIS, World Trade Atlas Database (accessed May 6, 2009).

[4] WTO, *World Tariff Profiles*, July 2008, 94.

TABLE 5.1 India: Average bound and applied tariff rates by selected product groups and products, as of April 2009 (%)

Products	Bound tariff	Applied tariff
Vegetable fats and oils	227	24
Palm oil, crude	300	0
Soybean oil, refined	45	7.5
Alcoholic beverages and spirits	150	133
Wine	150	150
Oilseeds	130	30
Soybeans	100	30
Coffee, tea, spices	128	56
Certain food grain products[a]	127	33
Sugars and confectionery	125	40
Sugar	150	60
Grains	113	40
Wheat[b]	100	50
Rice, semi-/wholly milled	70	70
Corn (maize)[c]	60	50
Processed fruits and vegetables	111	30
Prepared or preserved potatoes (french fries)	55	35
Live animals, animal meat, and other animal products	105	33
Chicken cuts	100	100
Chicken, whole	100	30
Miscellaneous vegetable extracts	105	28
Fresh and dried fruits, vegetables, and nuts, excluding almonds	100	30
Potatoes	150	30
Lentils	100	0
Dried beans	100	0
Pistachios	100	30
Apples, fresh	50	50
Grapes, fresh	40	40
Pears, fresh	35	30
Dairy products[c]	94	33
Milk powder	60	60
Whey	40	30
Cheese	40	30
Nonalcoholic beverages	91	31
Grape juice	85	30
Hides and skins	35	17

Sources: Government of India, Ministry of Finance, Central Board of Excise and Customs, *Customs Tariff 2008/09*; Government of India, Ministry of Finance, Central Board of Excise and Customs, various *Notifications of Customs*.

Note: All average tariffs are rounded to whole numbers.

[a]Certain food grain products include products in chapter 11 (products of the milling industry, malt, starches, inulin, and wheat gluten) and chapter 19 (preparations of food grains, flour, starch or milk; bakers' wares) of the Harmonized System.

[b]The tariffs listed are for private-sector traders. State trading enterprises import wheat duty free.

[c]Subject to a tariff-rate quota. The applied tariff listed is the over-quota rate.

at 25 percent or less, and although most tariffs are bound below 150 percent, some rates are bound at 300 percent.[5] Average bound tariff rates for agricultural products vary by product group, and most are higher than 100 percent (table 5.1). Product groups with the highest average bound tariff rates are those considered by the Indian government to be

[5] WTO, *World Tariff Profiles*, July 2008, 94.

sensitive. They include vegetable fats and oils; oilseeds; coffee, tea, and spices; certain grain products; alcoholic beverages; and sugars and confectionery.[6]

Since 2000, India has maintained tariff-rate quotas (TRQs) on six agricultural product tariff lines at the six-digit level of the Harmonized System (HS) of the World Customs Organization (table 5.2).[7] Indian private and government organizations designated by the Indian Ministry of Commerce and Industry can apply for TRQ allocations.[8]

TABLE 5.2 India: Tariff-rate quotas on agricultural products, as of January 2008

Product	HTS	TRQ (mt)	Applied in-quota tariff	Applied over-quota tariff
		Metric tons	Percent	
Corn	1005.90	500,000	15	50
Crude sunflower and safflower seed oil	1512.11	150,000	50	75
Refined rapeseed, colza, or mustard oil	1514.19 1514.99	150,000	45	75
Milk powder	0402.10 0402.20	10,000	15	60

Source: WTO, *India Trade Policy Review 2007*.

According to the Indian government, except for sunflower and safflower seed oil importers, who regularly import under TRQs, there has been limited demand for TRQ access from the designated organizations. For example, India reports minimal interest in the milk powder TRQ, and allocations were only issued in 2003–04.[9] Both in-quota and over-quota tariffs on products to which TRQs apply are variable, and they are influenced by both market prices and supply conditions. For example, in February 2007, India announced that it would allow duty-free imports of corn through December 2007 to lower domestic market prices and encourage imports, effectively eliminating the quantitative limitation of the TRQ.[10]

[6] Within these product groups, examples of specific agricultural products that are considered to be sensitive and that have very high bound tariff rates are palm oil and sunflower oil (300 percent); wine (150 percent); cane and beet sugar (150 percent); coffee (150 percent); and pasta (150 percent).

[7] Previously under the General Agreement on Tariffs and Trade (GATT), these products had tariffs that were bound either at zero or at low levels. In 2000, as a result of negotiations with the United States, the European Community, and Australia, TRQs were established to replace the previous bound rates. Government of India, Ministry of Commerce and Industry, *Negotiations under Article XXVIII of the GATT 1994*.

[8] For example, organizations that can apply for milk powder quota allocations include the National Dairy Development Board (NDDB), State Trading Corporation (STC), National Cooperative Dairy Federation (NCDF), National Agricultural Marketing Federation (NAFED), Mineral & Metals Trading Corporation (MMTC), Projects & Equipment Corporation of India Limited (PEC), and Spices Trading Corporation Limited (STCL). Government of India, Ministry of Commerce and Industry, *Procedure for Import of Various Items under Tariff Rate Quota (TRQ)*, October 4, 2002.

[9] WTO, *India Trade Policy Review*, July 24, 2007, 44. Applications for access to in-quota TRQ rates for rapeseed, colza, or mustard oil have not been made since FY 2002–03. Demand for allocation of the milk powder and corn TRQs in India may be driven by other factors, including nontariff measures. See chapter 6.

[10] Govindan, *India: Grain and Feed*, February 28, 2008, 12. In addition, duties for sunflower and safflower seed oil and rapeseed, colza, or mustard oil were lowered during 2008 for an unspecified time period.

Applied Tariffs

High applied tariff rates are a major impediment to U.S. agricultural exports to India, according to U.S. agricultural exporters, because they increase the price of U.S. goods in relation to domestically produced products. Indian tariff rates are applied almost exclusively on an ad valorem basis and primarily range from 10 to 150 percent.[11] The simple average of Indian applied tariff rates on agricultural products declined significantly from 113 percent in 1991[12] to approximately 34 percent during 2007; however, they remain among the highest in the world.[13] Indian applied tariff rates on agricultural products are also substantially higher than its applied rates for nonagricultural products. As a result of the continuing sensitivity of the Indian agricultural sector and India's preparations to implement a free trade agreement (FTA) with the Association of Southeast Asian Nations (ASEAN), the government has been reducing tariff rates on nonagricultural products faster than those for agricultural products.[14]

India's applied tariff rates vary substantially by product and product group. Certain agricultural product groups, such as sugar and grains, are considered sensitive because of employment and food security concerns; these generally have high average applied tariff rates.[15] Market conditions, industry stability and employment, and the importance of the product to Indian consumers are other factors that contribute to significant differences in applied tariff rates for specific agricultural products within product groups. For example, among vegetable fats and oils, the tariff rate for margarine is 80 percent, while the tariff rates on crude soybean and palm oils were reduced to free in March 2009. Vegetable oils have traditionally been protected by high tariffs, although tariff rates on this product group have been reduced to an average of 24 percent in order to combat food price inflation. Similarly, the average tariff rate on animal products is 33 percent, with most products subject to a 30 percent tariff. However, imported fresh and frozen chicken cuts, which compete with the large domestic industry, are subject to a 100 percent applied tariff rate. Applied tariff rates on specific grains also differ widely. For example, the tariff rates on oats and rye are zero, while the tariff rates on other cereals, such as semi- and

[11] In the Indian tariff schedule, specific tariffs are assessed only on two tariff lines for agricultural products: shelled and inshell almonds. The tariff on almonds was applied on an ad valorem basis before extensive negotiations between the Indian government and the U.S. almond industry resulted in a specific tariff. The specific tariff is advantageous for the U.S. industry because it has eliminated underinvoicing and reduced the risk of tariff variability. In addition, the spread between the specific tariff on shelled and inshell almonds provides a comparative advantage for U.S. producers. USITC, hearing transcript, April 21, 2009, 77–78 (testimony of Mark Masten, Cal-Pure Pistachios, Inc., and Julian B. Heron, on behalf of Blue Diamond Growers).

[12] Mattoo and Stern, "India and the WTO," 2003, 16.

[13] During 2007–08, India's average applied rate on agricultural products was the ninth highest among WTO members. The eight WTO member countries with higher average applied agricultural tariffs were Egypt, Iceland, the Republic of Korea, Morocco, Norway, Switzerland, Tunisia, and Turkey. *World Tariff Profiles*, July 2008.

[14] The Indian government has lowered its tariffs on nonagricultural products in order to align them with rates established in the ASEAN FTA, which India is expected to sign in late 2009. The ASEAN FTA allows India to shield sensitive products (479 items) from tariff cuts. Most of the products India shields are agricultural products, and as a result, many tariffs on agricultural products have not declined. Consequently, the gap between average applied rates for nonagricultural products (11.5 percent in 2007) and agricultural products (34.4 percent in 2007) has widened. WTO, *India Trade Policy Review*, July 24, 2007, 37; Sen, "India Gets Kinder ASEAN Duty Cuts," *Economic Times*, June 6, 2009; and WTO, *World Tariff Profiles*, July 2008, 94.

[15] Priyadarshi, "Decision-Making Processes in India: The Case of the Agriculture Negotiations."

wholly milled rice and wheat, which are important for maintaining food self-sufficiency, are 70 percent and 50 percent, respectively.[16]

U.S. exporters indicate that high tariffs raise the price of imported U.S. products to levels that can substantially dampen Indian demand for them. For example, the U.S. apple and pear industries estimate that U.S. exports could more than double if the tariff rates were reduced or eliminated.[17] Both the U.S. apple and pear industries compete for market share with cost-competitive Indian producers. In some instances, the presence of high tariffs keeps U.S. exporters from trying to enter the Indian market.[18]

In addition to lower tariffs, some industry officials, including U.S. exporters and Indian importers, suggest that certain other changes to the current Indian tariff structure could increase U.S. access to the Indian market. For example, some Indian importers have requested that India follow the approach taken in the European Union on certain seasonal products by varying tariff levels on imports of those products based on the time of year, with higher rates applied when domestic production is available and a lower rate applied when domestic production is out of season.[19] Some importers claim that this change would increase market access while not harming the domestic industry. In addition, certain importers have requested that the Indian government apply tariffs on a specific or per-kilogram basis, a method used currently only for almond imports, instead of on an ad valorem basis.[20] This system would create more certainty for foreign exporters because industry officials report that tariffs assessed by volume are generally less likely to be manipulated than those assessed by value.[21]

Any changes to Indian tariff-rate levels or the structure of the Indian tariff schedule would likely be considered carefully by the Indian government, because tariffs are an important source of central government revenue. Despite a decline in the average applied tariff rate and in the importance of tariff revenue in overall government receipts, customs revenue accounted for approximately 23 percent of Indian federal net government revenue in fiscal year (FY) 2008/09.[22] In comparison, U.S. customs duties and fees accounted for 1.2 percent of total U.S. federal government receipts during FY 2008.[23] Some U.S. industry representatives suggest that India's revenues might actually increase if tariffs are lowered and market access is expanded for certain agricultural imports; the reason, they argue, is that the volume of imports would rise more than enough to offset

[16] European Commission, *India's Role in World Agriculture,* December 2007, 3.

[17] NHC, written submission to the USITC, June 24, 2009, 2. Industry estimates of the impact of Indian tariffs on these and other U.S. agricultural products can be found in appendix D, Positions of Interested Parties.

[18] Industry representative, interview by Commission staff, New Delhi, India, May 26, 2009; industry representative, telephone interview by Commission staff, March 4, 2009.

[19] The United States also uses seasonal tariffs for a few horticultural products, such as tomatoes. Industry representative, interview by Commission staff, Mumbai, India, June 1, 2009.

[20] Industry representative, interview by Commission staff, Mumbai, India, June 1, 2009.

[21] Practices such as underinvoicing reportedly occur frequently. Industry representative, telephone interview by Commission staff, March 26, 2009; industry representative, interview by Commission staff, Mumbai, India, June 1, 2009.

[22] Government of India, Ministry of Finance, *Union Budget 2009–2010, Abstract of Receipts,* 1.

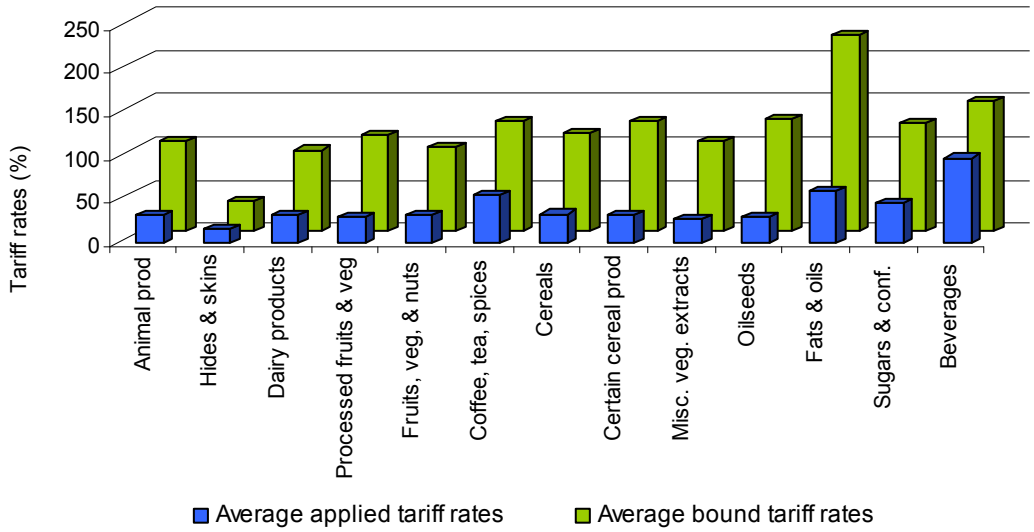
[23] U.S. Government Printing Office, *2009 Fiscal Year Budget of the United States Government,* 2008, 50. To compare Indian customs revenue to that of a country at a similar level of economic development, Brazilian customs receipts contributed 1.8 percent of total federal tax revenue in 2006, the most recent year for which data are available. Government of Brazil, Secretariat of the Federal Revenue of Brazil, *The Fiscal Load in Brazil 2006,* July 2007, 10.

the lower return on each transaction.[24] For example, according to an industry representative, India cut the tariff rate on almonds in half in 2001; by 2006, India's revenues from the tariff on almonds had increased by 71 percent over prior levels.[25]

Tariff Variability

The difference between high Indian average bound tariff rates and lower average applied tariff rates for agricultural products allows the government to raise applied tariffs on most agricultural products without violating its WTO commitments (fig. 5.1). The Indian government has used this authority to modify rates on certain agricultural products frequently, especially for staple food products. Industry sources claim that tariff-rate variability is an impediment for U.S. agricultural exports because frequently changing tariff rates create uncertainty, making negotiating future sales and determining financial plans difficult.[26]

FIGURE 5.1 India: Average applied and bound tariff rates by selected product groups, 2009



Source: Government of India, Ministry of Finance, Central Board of Excise and Customs, *Customs Tariff 2008/09*; Government of India, Ministry of Finance, Central Board of Excise and Customs, various *Notifications of Customs*.

[24] Industry representative, interview by Commission staff, Washington, DC, March 3, 2009; industry representative, interview by Commission staff, Mumbai, India, June 1, 2009.

[25] USITC, hearing transcript, April 21, 2009, 33 (testimony of Mark Masten, Cal-Pure Pistachios, Inc.).

[26] Industry representative, telephone interview by Commission staff, April 14, 2009; industry representative, telephone interview by Commission staff, June 25, 2009.

The Indian government views the ability to adjust tariff rates as a necessary trade instrument, as long as the system is WTO compatible.[27] The rationale for adjusting tariff rates is to protect farmers and maintain domestic price stability when domestic production and international prices fluctuate. The Indian government strives to balance competing interests of producers and consumers by adjusting tariff rates in reaction to market conditions, typically lowering them when domestic prices are rising and domestic production cannot meet domestic demand. Conversely, the Indian government often increases tariff rates when international market prices are falling and there is a surplus in domestic production or government buffer stocks, decreasing the country's need for imports.[28] In addition to government-directed changes, domestic industry associations can petition the Ministry of Finance to lower tariffs. In response, the Ministry of Finance will determine the reduction's impact on the budget before lowering tariff rates.[29] Concerns about the impact of tariff-rate adjustments on government revenue are generally secondary to their impact on producers and consumers.[30]

The history of Indian applied tariff rates for certain products, especially food staples, illustrates the frequent variability that occurs. Between 2005 and 2008, production shortfalls and rising international prices caused Indian domestic food prices to rise sharply. To minimize the burden on consumers, India decreased tariff rates on many staple food products. As prices declined, however, tariff rates generally were returned to their previous levels to support Indian farm prices (figs. 5.2 and 5.3). This is shown by recent changes in applied tariff rates for wheat, rice, pulses, and vegetable oils:

- *Wheat:* The tariff rate on wheat was lowered as poor harvests caused domestic prices to increase. The rate was lowered from 50 percent to 5 percent in June 2006 before being reduced to zero in September 2006. As a result, India imported wheat in 2006 for the first time since 2001.[31] As domestic production increased and prices declined, India returned the rate to 50 percent on January 1, 2009.

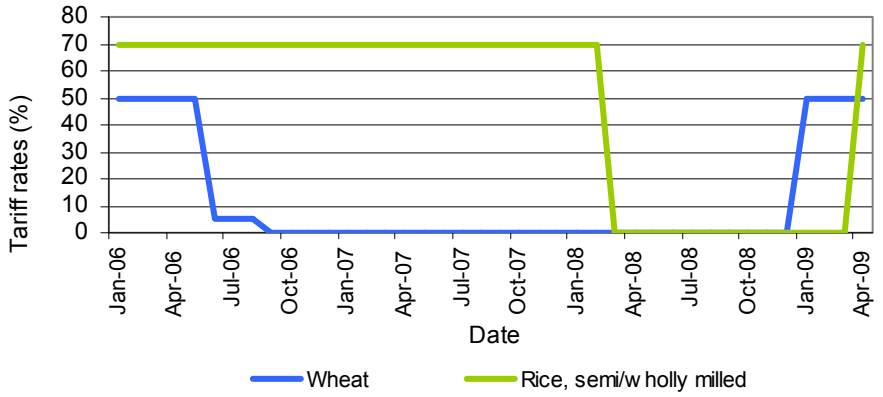
- *Rice:* Concerns about the rising price of rice caused India to lower the tariff rate on rice from 70 percent to zero in March 2008. When market prices stabilized in March 2009, the tariff rate was returned to 70 percent. [32]

- *Pulses:* The wholesale price index for pulses rose by 45.6 percent between 2003 and 2006.[33] As a result, on June 8, 2006, the Indian government exempted pulses from the applicable 10 percent import duty in order to control prices. The duty exemption has been extended until March 31, 2010.[34]

- *Vegetable oils:* In order to support farm prices, India raised tariff rates in early 2005 on crude palm oil from 65 percent to 80 percent and on refined palm oil from 70 percent to 90 percent. In early 2007, edible oil prices began rising quickly because of lower domestic production, which led the government to reduce rates three times during 2007 on both crude and refined palm oils, before reducing the tariff rates on

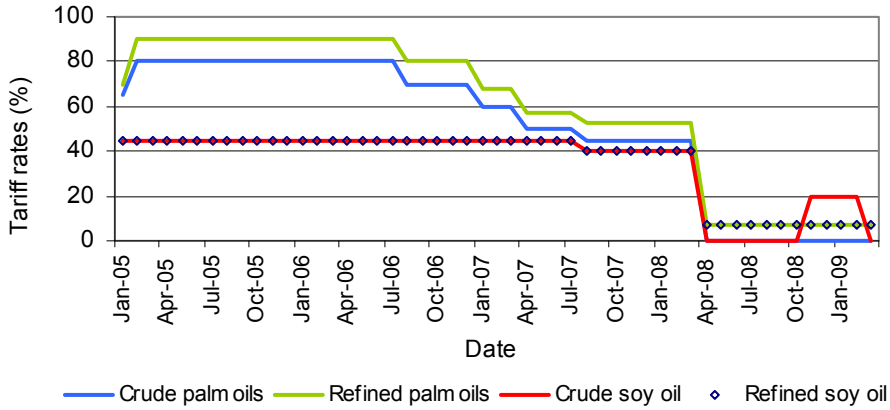
[27] Government of India, "High-level Committee Report."
[28] Government of India, Planning Commission, *Eleventh Five Year Plan 2007–12,* vol. 3, 2008, 15.
[29] Industry representative, interview by Commission staff, Mumbai, India, May 28, 2009.
[30] Industry representative, interview by Commission staff, New Delhi, India, June 4, 2009.
[31] Govindan, *India: Grain and Feed,* February 20, 2009, 8.
[32] *Indian Express.com,* "Government Allows Duty-Free Rice Imports," March 21, 2008.
[33] Aradhey, *India: Grain and Feed,* December 14, 2007, 5.
[34] Govindan, *India: Grain and Feed,* May 6, 2008, 5; Government of India, Ministry of Finance, Central Board of Excise and Customs, *Notification No. 28/2009-Customs,* March 26, 2009.

FIGURE 5.2 India: Applied tariffs for wheat and rice, by quarter, Jan. 2006–April 2009



Source: USDA, FAS, various *India Grain and Feed* GAIN Reports.

FIGURE 5.3 India: Applied tariffs for selected vegetable oils, by quarter, Jan. 2005–Jan. 2009



Source: USDA, FAS, various *India Oilseeds and Products* GAIN Reports.

crude soybean and crude palm oils to zero and on all refined edible oils to 7.5 percent on April 1, 2008.[35] During the remainder of 2008 and through early 2009, prices and import levels of soybean oil continued to fluctuate, and as a result, the tariff rate on crude soybean oil also continued to vary.[36]

[35] Dankhar, *India: Oilseeds and Products*, May 18, 2007.

[36] Because palm oil imports increased after palm oil duties were cut and a tariff was restored on crude soybean oil (a substitute product), the domestic palm oil industry pressed to impose a duty on imports of crude palm oil. Officials from the Ministries of Finance, Agriculture, and Commerce evaluated market conditions in December 2008 and decided not to reimpose the duty on crude palm oil because of inflationary concerns. Aradhey, *India: Oilseeds and Products*, February 2, 2009, 3.

India also reportedly raises its applied tariff rates on products in isolated instances to increase market prices. The Indian government raised tariff rates on at least 30 agricultural products between 2002 and 2008.[37] In some cases tariffs were raised to protect growing industries. For example, the tariff rate on cut flowers was increased from 30 percent to 60 percent in the FY 2005/06 budget, reportedly to protect an infant industry with expanding employment and export potential.[38] Other examples of tariff-rate increases during 2002–08 involve natural honey, margarine, garlic, coffee, cigars, and pepper.

Tariff Adjustment Process

Not only does the Indian government adjust tariff rates frequently, but the rates are adjusted under two different methods, which adds complexity and confusion to the tariff system.[39] The first method involves changes made annually through the budgetary process, under which tariff revenues still represent a significant source of revenue for the Indian government. During February of each year, the Minister of Finance presents the government's budget to the Indian Parliament for the new fiscal year, which begins April 1.[40] The budget is enacted after parliamentary review and approval. The proposed budget, which is released to the public, may propose changes to any number of applied tariff rates. The budget approved for FY 2008/09, for example, adjusted tariff rates on four agricultural products: tariffs on two were reduced (unworked corals and feed additives), and tariffs on two were increased (cigars and cigarillos).[41]

The second and more common method is for tariffs to be changed on an ad hoc basis by the Indian Ministry of Finance's Central Board of Excise and Customs in notifications published in the *Gazette of India*, the national government's official publication. During 2008, the Indian government issued 138 tariff-rate amendment notifications.[42]

Because tariff-rate adjustments can be made frequently and through more than one government process, and because they may be effective for either a set period of time or an indefinite period, exporters to the Indian market generally describe the process as lacking transparency and certainty.[43] Other complications compound the difficulties. For example, tariff-rate changes in many notifications are referenced by serial numbers established and designated to goods in previous notifications, rather than providing

[37] WTO, *India Trade Policy Review*, July 24, 2007, 32 (documenting 27 tariff increases); Government of India, Ministry of Finance, *Union Budget 2002–2008*, 2008.

[38] Acharya, Keya, "Thorns in India's Cut-Rose Industry," *Asia Times Online*, December 6, 2007. In addition to the duty increase, the government has supported commercial cultivation through tax holidays and subsidies for cold storage facilities, greenhouse construction, improved packaging material, and transportation. Saffron, "Indian Flowers! Backward Flip," Issue 1, October 8, 2008.

[39] Industry representative, telephone interview by Commission staff, May 20, 2009.

[40] The Indian parliament often does not pass the budget until May. As a result of the gap between the when the fiscal year begins and when budget passes, the government typically seeks an interim budget that authorizes expenditures until the budget has been approved.

[41] Government of India, Ministry of Finance, *Union Budget 2008–2009*, 2008, 1.

[42] The 138 notifications include changes to both agricultural and nonagricultural tariffs. A notification can amend the duties on one or many tariff lines. Notifications also amend previous changes and announce tariff changes due to rulings in antidumping cases. Government of India, Ministry of Finance, Indian Central Board of Excise and Customs, *Tariff Notifications of Customs in Year 2008.*

[43] Industry representative, interview by Commission staff, Mumbai, India, May 28, 2009; industry representative, telephone interview by Commission staff, May 20, 2009; and industry representative, telephone interview by Commission staff, June 18, 2009.

descriptive product language or specific tariff codes.[44] The research required to determine which serial numbers apply to which goods reportedly increases costs to exporters. To keep track of the current tariff rates, market participants state that they must monitor the Customs and Excise website daily because tariff-rate changes come into effect immediately unless otherwise specified.[45] Additionally, the large number of notifications reportedly also makes the system more susceptible to error, irregular or arbitrary administrative discretion, or corruption.[46] U.S. industry officials report that Indian customs agents may not be aware of which tariff rate applies to certain imports, and unless the importer knows for certain that a specific tariff rate has been reduced, customs agents may charge the higher rate previously in effect.[47] In addition, many notifications incorporate changes to a wide variety of products, both agricultural and nonagricultural, while amending notifications from previous years.[48] The Indian Minister of Finance recognized the complexity of the system in his February 2006 budget speech and called for the system of notifications to be simplified.[49]

Adjustments to Product Classifications

Certain adjustments to applied tariff rates are made based on the end use of the product or product descriptions that are not specified in the tariff schedule, reportedly creating uncertainty for foreign exporters to India. For example, in the FY 2006/07 budget, India reduced its tariff rate from 20 percent to 12.5 percent "on non-edible grade oils (other than crude palm oil), falling under {HS} headings 1507 to 1515, having 20 percent {free fatty acid} when imported for manufacture of soaps, industrial fatty acids and fatty alcohols by a manufacturer having a plant for splitting up of such oils into fatty acids and glycerols."[50] Because the Indian tariff schedule does not classify edible oils by their free fatty acid content for duty purposes, the customs determination regarding classification of those edible oil imports may require interpretation. Consequently, an exporter may be uncertain at the time of shipment whether the higher or lower tariff rate will ultimately be applied.[51] In addition, this tariff-rate reduction only applied to oils that are destined for use in a specific type of manufacturing, and it is unclear how customs agents determine the end use of the imported product in such cases.

[44] For example, Notification No. 27/2009-Customs amended Notification No. 21/2002-Customs and lowered the tariff on certain edible oils. The amendment states that "[i]n the said notification, in the Table, against S. No. 29A, for the entry in column (4), the entry 'Nil' shall be substituted." Neither the HTS number nor the product name is explicitly stated, only a reference to a serial number that was established in a prior notification. Government of India, Ministry of Finance, Central Board of Excise and Customs, *Notification No. 27/2009-Customs,* March 24, 2009.

[45] Industry representative, interview by Commission staff, New Delhi, India, May 26, 2009; government official, telephone interview by Commission staff, July 23, 2009.

[46] WTO, *India Trade Policy Review*, July 2007, 37.

[47] Industry representative, telephone interview by Commission staff, March 3, 2009.

[48] The Indian government attempted to simplify the notifications in 2002 by consolidating all the previous changes into a single notification (Notification No. 21/2002-Customs).

[49] Chidambaram, *Union Budget*, February 28, 2006.

[50] Government of India, Ministry of Finance, *Union Budget*, 2006, 1.

[51] Government official, telephone interview by Commission staff, July 23, 2009.

Reference Prices

Reference prices, which are set by the Indian government based on international market prices, are used to determine actual duties paid on vegetable oils and poppy seeds. The reference price, rather than the actual import value of the product, is used in conjunction with the ad valorem tariff rate to determine the total import duty. This system, reportedly established to prevent any loss of revenue resulting from underinvoicing by importers,[52] results in dramatic shifts in the effective ad valorem tariff rate based on fluctuations in the established reference price. Moreover, these fluctuations can lead to speculation in the Indian market as well as to increased uncertainty and costs.[53]

Until late 2006, the Indian government reportedly adjusted reference prices regularly to reflect world prices. When the reference price is higher than the invoiced price on the shipment, the effective applied tariff rate can be higher than India's bound tariff rate, a scenario that has occurred for soybean oil imports.[54] For example, in August 2005, the tariff reference price for crude soybean oil was $558 per metric ton,[55] but the average unit value of U.S. exports to India of crude soybean oil during August was $485 per metric ton.[56] As a result, even though the bound rate is 45 percent, the U.S. exporter paid an effective applied tariff rate of 51.8 percent.[57] Since late 2006, when the Indian government began lowering tariffs on vegetable oils (fig. 5.3), reference prices have remained unchanged. By March 2008, the use of reference prices had no impact on imports of certain vegetable oils because the tariff rate was reduced to zero.

Additional Border Fees and Taxes

In addition to applied tariffs, imports may be subject to a number of additional fees and duties that lower demand for agricultural imports and increase the cost and complexity of trading in the Indian market.[58] The commonly cited fees are (1) the additional duty, (2) the additional duty of customs, (3) the educational cess (surcharge), and (4) landing fees.[59]

Additional Duty

The additional duty, or "countervailing duty," levied on certain agricultural imports is equal to the central excise duty (generally 8 percent) that is assessed on similar products

[52] Industry representative, interview by Commission staff, Mumbai, India, May 28, 2009.

[53] Shunmugan, *India: Oilseeds and Products; Government Increases Reference Prices*, October 5, 2005. In reaction to the negative consequences of the reference price system on vegetable oil exporters, one industry representative has advocated that the reference price system be replaced with tariffs applied on a specific per-kilogram basis. Industry representative, interview by Commission staff, Mumbai, India, June 1, 2009.

[54] Govindan, *India: Oilseeds and Products*, May 15, 2006.

[55] Shunmugan, *India: Oilseeds and Products; India Revises Tariff Rates and Reference Prices*, April 5, 2005.

[56] USITC, Dataweb (accessed June 24, 2009).

[57] The tariff paid was calculated as 45 percent of the reference price of $558 per metric ton. The effective tariff rate was calculated by dividing the $251.10 in duties paid by the $485 per metric ton import unit value.

[58] *Indian Express.com*, "Excise Duty Drops from 16% to 8% in One Year," February 25, 2009.

[59] Government of India, *Taxation-Types of Customs Duties*.

produced domestically.[60] Assessed primarily on manufactured goods, the additional duty applies only to certain agricultural products, such as malt, some starches, biscuits, some bakery products, custard powder and spices, soft drink concentrates, confectionery products, cocoa products, and certain vegetable oils.[61] The additional duty is levied on the c.i.f. value of the imported good, plus the applied tariff and certain other landing fees.[62]

During 2008 and early 2009, the central excise duty rate was reduced from 16 percent to 8 percent in three different adjustments.[63] The reduction of the excise duty not only lowers the additional duty but also the impact of the 4 percent special additional duty on the price of imported goods (see below) because the special additional duty is applied to the aggregated total of all duties and the value of the imports.[64]

Additional Duty of Customs

In the FY 2006/07 budget, India introduced a 4 percent additional duty of customs (special additional duty, or special countervailing duty) that applies to most imports, including many agricultural goods.[65] Some agricultural products are exempted from the special additional duty including staple food products such as pulses, fresh fruits and vegetables, rice, wheat, and coarse grains. In some cases, the Indian government uses the special additional duty to maintain price stability, exempting certain products from this duty to lower domestic market prices.

The special additional duty is applied to the c.i.f. value of the imported product plus all applicable taxes, including the applied tariff and the additional duty described above. As a result, the effective rate of the special additional duty is greater than 4 percent. The special additional duty applies even to goods that have tariff rates equal to the bound rate, such as raisins and almonds.[66] A credit can be provided for the special additional duty for products that are also subject to the additional duty.[67] However, according to one source, the refund generally takes at least 12 months to receive and further adds to the short-term cost of importing goods.[68]

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[60] The Indian government often refers to the "additional duty" as a countervailing duty. This term is not related to the WTO definition of a countervailing duty. Government of India, *Customs Tariff Act, 1975*, 4. Domestic producers are liable for the central excise duty as soon as the good is produced. Government of India, *Taxation-Excise Duty*.

[61] USDA, FAS, *India-Agriculture Economy and Policy Report*, January 2009, 3; government official, e-mail message to Commission staff, July 20, 2009.

[62] The c.i.f. value is the delivered value of the product which includes cost, insurance, and freight. Government of India, *Taxation-Types of Customs Duties*. For certain products, the additional duty may be charged as a percentage of the Indian government established maximum retail price. Importers and retailers are then required to print the maximum retail price on the product label. Industry representative, e-mail message to Commission staff, July 10, 2009.

[63] The central excise rate is not the rate applied to all goods. Some goods were previously charged 4 percent or 8 percent, but those rates only apply to a limited number of commodities, and the rates have remained stable despite changes to the primary rate. In the FY 2008/09 budget, India initially lowered the rate from 16 percent to 14 percent. Later in December 2008, the central excise duty was again reduced from 14 percent to 10 percent. The acting Indian Minister of Finance, Shri Pranab Mukherjee, announced the final reduction to 8 percent in February 2009 as part of an economic stimulus plan.

[64] Government of India, *Customs Tariff Act of 1975*, 4.

[65] Government of India, Ministry of Finance, Central Board of Excise and Customs, *Customs Tariff Notification No. 19/2006*, March 1, 2006.

[66] Govindan, *India: The Indian Budget*, March 1, 2006, 2.

[67] Government of India, Ministry of Finance, *Union Budget*, 2005, 1.

[68] Industry representative, e-mail message to Commission staff, June 10, 2009.

Landing Fees and Educational Cess

A 1 percent landing fee is levied on the c.i.f. value of all imports, and a 3 percent educational cess (surcharge) is charged on agricultural imports and domestically produced products. Revenue from the educational cess contributes to the Indian educational budget. The 3 percent educational cess is assessed on the aggregate of the customs duties payable, not the value of the good. The educational cess was established in the FY 2003/04 budget and increased from 2 percent to 3 percent in the FY 2007/08 budget. Products with applied rates that equal the bound rate are exempt from the educational cess, but the cess reportedly is charged on some agricultural products even when it pushes the effective tariff rate above the bound rate (box 5.1).[69]

BOX 5.1 The Impact of Tariffs and Additional Fees on Wine Retail Prices

High tariffs and additional fees levied at the Indian border substantially increase the retail price of U.S. wine in the Indian market. The applied tariff (150 percent) is assessed on the c.i.f. value plus a 1 percent landing charge. Other fees are added as shown below (table A). The applied tariff and the additional fees together increase the total cost of a $10 bottle of U.S. wine (c.i.f. value) to $26.73. Consequently, the effective tariff rate on wine is 167.3 percent. The resulting disparity between retail prices of imported wine in the Indian market and retail prices for the same bottle in the United States illustrates the impact of high tariffs and the additional fees. For example, a 750 ml bottle of Blossom Hills Chardonnay, a California wine, can be purchased for approximately $27 (1,344 Rs.) in Mumbai, while the suggested retail price in U.S. stores for the 1.5 liter bottle (which holds twice the volume) is $9.99.[a]

TABLE A Cost structure of wine imported into India, 2009

C.i.f. value of imported shipment	$10.00
Landing charge (1% of c.i.f.)	$0.10
Assessible value (AV) (= c.i.f. + landing fee)	$10.10
Tariff (150% of AV)	$15.15
Education cess (3% of the assessed tariff)	$0.45
Total cost after tariff and education cess	$25.70
Special additional duty (4% of total cost)	$1.03
Total cost including all duties	$26.73

Source: Commission staff calculations.

The additional fees for imported wines in India have been adjusted in recent years. The additional customs duty, which was equivalent to the domestic excise tax and is charged on various other imported agricultural products, is no longer assessed on all alcoholic beverages. In July 2007, the Indian government repealed the additional customs duty after the European Union and United States filed for WTO dispute settlement proceedings and claimed that the additional fees violated India's WTO commitments by bringing its tariff rate above its maximum bound rate. However, following the removal of the additional customs duty, the Indian government raised the tariff rate on wine from 100 percent to the bound rate of 150 percent and gave states the power to institute "special fees" on alcohol products.[b]

[a] A 750 ml bottle of Blossom Hills Chardonnay is not marketed in the United States. Price calculated using the average exchange rate in May 2009 of $1 to 49 Rs.

[b] United States Trade Representative, "WTO Appellate Body Reverses Panel and Finds in Favor of the United States," October 30, 2008; JBC International Inc., *Comprehensive Study of the Indian Wine Market*, August 21, 2008, 18.

[69] JBC International Inc., *Comprehensive Study of the Indian Wine Market*, August 21, 2008, 18.

Free Trade Agreements

India provides tariff preferences to selected countries through regional and bilateral free trade and other agreements, but the impact of these agreements on agricultural trade appears to be limited. With the exception of the benefits that India extends to Sri Lanka under their FTA and to the least-developed-country participants in the South Asian Free Trade Agreement (SAFTA),[70] the number of agricultural products receiving preferences is low. In addition, the preferences themselves are not significant, only marginally reducing India's average applied tariff rates on agricultural products below the average most-favored-nation (MFN) applied rates on such products.[71] The agreements currently in force are SAFTA and the Asia-Pacific Trade Agreement (APTA), FTAs with Sri Lanka and Singapore, and preferential trade agreements (PTAs) with Chile, Bhutan, and the Common Market of the South (Mercosur). India has also signed an economic partnership agreement with the Republic of Korea, which is not yet in force.

India provides preferences that cover a limited number of agricultural products[72] and offer minimal tariff-rate reductions[73] in its agreements with Chile, Singapore,[74] and Mercosur,[75] as well as in APTA and SAFTA.[76] The preferences in these agreements are concentrated primarily in meats, preparations of meat, hides and skins, and miscellaneous edible preparations. Owing to the restricted nature of these concessions, the impact on Indian agricultural imports is limited. For example, since 2005 when the India-Singapore FTA entered into force, total Indian agricultural imports from Singapore grew by about $17 million, but agricultural products covered in the FTA accounted for only $3 million of that growth.[77]

India does provide more substantial tariff-rate reductions on agricultural products in its FTA with Sri Lanka, which covers 92.5 percent of agricultural tariff lines.[78] As a result, the average tariff rate on Indian agricultural imports from Sri Lanka is 7.6 percent, compared to the MFN average rate of 34.4 percent in 2007.[79] Since 2003, when the majority of Sri Lankan products were given duty-free access, Sri Lankan agricultural exports to India have increased significantly, especially cloves and certain vegetable fats and oils.[80]

[70] The least-developed-country members of SAFTA are Bangladesh, Bhutan, Maldives, and Nepal.

[71] WTO, *India Trade Policy Review*, July 24, 2007, 104.

[72] For example, the APTA covers only 8.4 percent of agricultural tariff lines. WTO, *India Trade Policy Revie*, July 24, 2007, 104

[73] For example, in the Chile FTA, the MFN rate was reduced only 15–20 percent. Government of India, Ministry of Finance, Central Board of Excise and Customs, *Customs Tariff Notification No. 101/2007-Customs*, September 11, 2007, 1.

[74] The FTA with Singapore provides phased concessions or tariff eliminations.

[75] *RTTNews*, "India-Mercosur Trade to Touch $10 Bln. in 5-years," June 4, 2009.

[76] India provides greater tariff preferences to the least developed countries of the SAFTA agreement; the average applied rates on agricultural products from those countries are lower than similar provisions in other FTAs.

[77] GTIS, World Trade Atlas Database (accessed September 17, 2009).

[78] Approximately one-third of the total tariff lines were granted duty-free access to the Indian market in 2000, and the remaining two-thirds, with a few exceptions, were granted duty-free access in 2003.

[79] WTO, *India Trade Policy Review*, July 24, 2007, 104.

[80] Sri Lankan exports of certain vegetable fats and oils and cloves increased from $0 and $3.7 million, respectively, in 2003 to $33.8 million and $31.1 million, respectively, in 2008. GTIS, World Trade Atlas Database (accessed June 16, 2009).

Simulated Effects of Indian Food and Agricultural Applied Tariffs

Model simulations prepared by Commission staff suggest that Indian agricultural tariffs reduced U.S. agricultural exports to India in 2007 by $200–291 million; in the absence of Indian tariffs, U.S. agricultural exports to India would have been 42–61 percent higher in 2007.[81] Among U.S. products most affected by Indian agricultural tariffs were almonds (U.S. exports to India were reduced by $26.9–32.7 million), fresh apples ($16.6–21.2 million), soybean oil ($17.1–21.7 million), cotton ($3.0–26.4 million), and certain vegetable fats and oils ($17.8–27.2 million).

The simulation results suggest that Indian agricultural imports from all countries would have expanded from $7.51 billion in 2007 to $10.7–11.3 billion in the absence of Indian tariffs in 2007. Because India applies the same tariff rates on imports from the United States as on imports from other countries, the U.S. share of those imports would have expanded from 6.36 percent in 2007 to 6.37–6.81 percent in the absence of Indian tariffs.

The simulated tariff effects were obtained from model simulations of the absence of Indian applied tariffs on agricultural imports from all countries. The simulations are based on 2007 statistics.[82] The simulations were performed with an interrelated framework that links a partial equilibrium trade model, specified at the six-digit level of the Harmonized System (HS6), to an economy-wide trade model, the Global Trade Analysis Project (GTAP) model. The simulation framework is described in appendix H.

The simulated tariff effects are the marginal effects of applied Indian tariffs and do not incorporate any other effects. In the absence of Indian tariffs and in the span of a few years, U.S. exports could expand by more than indicated here because of possible additional effects of economic growth in India and the results of market development by U.S. exporters.[83] The tariff simulations focus on applied tariffs and do not consider other policies that reduce demand for U.S. products in India.[84] The quantitative effects of certain Indian nontariff measures and domestic subsidies are discussed in chapter 6.

[81] A range of simulated effects was obtained by varying the magnitude of trade elasticities to account for the degree of statistical uncertainty in the econometric estimates of the elasticities. See appendix H.

[82] Indian applied tariff rates for staples fluctuate from year to year. Thus the simulated effects for 2007 could be different than effects for other years.

[83] These macroeconomic factors are considered in estimates provided by U.S. tree nut industry representatives. Blue Diamond Growers estimated that, using 2009 duty rates, the Indian market has the capacity to grow substantially, such that U.S. almond exports to India in the next few years could rise to $350–400 million. Also, U.S. industry representatives indicated that, absent the tariff, total Indian annual consumption of pistachios could expand from the 17 million pounds recorded in 2007 to an estimated 115–165 million pounds and that, at the current U.S. market share in India of 8 percent, U.S. exports to India could reach a value of $30–45 million. Blue Diamond Growers, written submission to the Commission, March 24, 2009; industry representatives, interview by Commission staff, Washington, DC, March 3, 2009.

[84] Additional Indian border fees and taxes discussed in this chapter are not considered in the tariff simulations. The additional duty is levied on imported and domestic products, and a simulation would not show significant effects for U.S. exports. The special additional duty and the educational cess surcharge are not considered in the tariff simulations because products are often exempted from them and because a definite list of those products cannot be assembled. The exceptions seem to have been provided when domestic prices were high. It is not clear, however, that the exemptions were given because of prices.

The simulated effects in table 5.3 have been aggregated to 26 broad product groups.[85] The table shows 2007 U.S. exports, corresponding Indian applied tariff rates, and simulated U.S. export effects for these product groups, which contain all U.S. agricultural products under consideration in this report. In 2007, U.S. agricultural exports to India were $477.6 million. The trade-weighted import tariff levied by India on agricultural imports from the United States was about 24 percent.

There is a wide variation in simulated effects by product group. For example, in the absence of Indian tariffs, U.S. exports to India of the product group "vegetables, fruits, and nuts" would have expanded by a large dollar value, $48.5–60.2 million.[86] In contrast, U.S. exports of "vegetable oils and fats" would experience a large percentage expansion, 232–324 percent.[87] In general, the simulated U.S. export effects are positive and are driven by the magnitude of the tariff and the degree of sensitivity of Indian consumers to prices. General equilibrium effects, however, may contribute to lower U.S. exports for certain product groups. In the absence of Indian tariffs, agricultural sectors in India would contract and release productive resources to the rest of the Indian economy. Other sectors would absorb these resources and thus expand their level of production. Because of the relatively small average Indian tariff for "cereal grains, not elsewhere specified" (i.e., corn and sorghum), this product group could be one of the expanding domestic sectors, and thus Indian imports in this sector would decline.

Table 5.4 reports U.S. export effects for the 50 HS6 product categories with the highest U.S. export effects in dollar terms. These 50 product categories accounted for $380.7 million, or 79.7 percent, of total U.S. agricultural exports to India in 2007. In the absence of Indian tariffs, U.S. exports of these 50 products to India would have been $189.7–279.2 million greater, a 50–73 percent expansion. Almonds, certain vegetable fats and oils, soybean oil, fresh apples, cotton, and fresh grapes accounted for $301.7 million, or 63.2 percent, of U.S. agricultural exports to India in 2007. In the absence of Indian tariffs, these exports would have expanded by $85.2–134.2 million, or 37–54 percent.

Several other studies have analyzed Indian tariffs. One study that used methodologies similar to those used in this report found that, in the absence of Indian tariffs, Indian imports of agricultural commodities from all countries would have expanded by $6.5 billion, or 93.9 percent, in 2001.[88] The study found that Indian imports of "vegetable oils and fats" would have expanded by $3.9 billion, or 127.7 percent; "vegetables, fruits

[85] The 26 product groups are those specified in the Global Trade Analysis Project (GTAP) global trade model, one of the models used in this analysis. The GTAP model is discussed in appendix H. For more information about the GTAP model, see Hertel, *Global Trade Analysis: Modeling and Applications*, 1997; and Narayanan and Walmsley, *Global Trade, Assistance, and Production: The GTAP 7 Data Base*, 2008.

[86] Table 5.4 shows that the expansion in this product group is driven by growth in three products: almonds (product rank 2 in table 5.4), fresh apples (rank 5), and fresh grapes (rank 10). These three products account for about 97 percent of the expansion in the aggregate group.

[87] Table 5.4 shows that the expansion in this product group is driven by growth in two products: (1) fixed vegetable fats and oils and their fractions (product rank 3 in table 5.4), and (2) soybean oil (rank 4). These two products account for about 98 percent of the expansion in the aggregate group.

[88] For an analysis of the effects of the 2001 Indian agricultural tariffs using the GTAP model, see Ganesh-Kumar, Panda, and Burfisher, "Reforms in Indian Agro-processing and Agriculture Sectors in the Context of Unilateral and Multilateral Trade Agreements," 2005.

and nuts" by $0.9 billion, or 65.8 percent; and "food products n.e.c." by $0.3 billion, or 85.7 percent.[89]

[89] Other studies have analyzed the combined effects of Indian food and manufacturing tariffs, and they do not provide simulated effects either for Indian agricultural imports or U.S. agricultural exports. See Panda and Quizon, "Growth and Distribution Under Trade Liberalization in India," 1999; Panda and Ganesh-Kumar, "Trade Liberalization, Poverty and Food Security in India," 2008; Hertel and Keeney, "What Is at Stake: The Relative Importance of Import Barriers, Export Subsidies and Domestic Support," 2006; Anderson, Martin, and van der Mensbrugghe, "Market and Welfare Implications of Doha Reform Scenarios," 2006; and Polaski et al., *India's Trade Policy Choices: Managing Diverse Challenges*, 2008.

TABLE 5.3 India: U.S. food and agricultural exports and simulated effects of the absence of Indian tariffs, by product group, 2007

Product groups containing food and agricultural products	2007 U.S. food and agricultural exports to India	Average, trade-weighted, Indian applied tariff rate	Simulated effects in ranges: U.S. food and agricultural exports to India in the absence of Indian tariffs	Simulated effects in ranges: Change in U.S. food and agricultural exports to India in the absence of Indian tariffs	
	Million $	Percent	Million $	Million $	Percent
Paddy rice	0.22	80	1.24–12.04	1.02–11.82	462–5,342
Wheat	0	0	0–0	0–0	0–0
Cereal grains n.e.c.	1.13	1	1.11–1.09	-0.02– -0.04	-2– -4
Vegetables, fruit, nuts	282.69	18	331.21–342.89	48.53–60.20	17–21
Oil seeds	0	32	0–0	0–0	0–0
Sugar cane, sugar beet	0	30	0–0	0–0	0–0
Plant-based fibers	78.55	10	81.55–104.97	3.00–26.43	4–34
Crops n.e.c.	8.26	20	13.45–14.31	5.19–6.06	63–73
Bovine cattle, sheep and goats, horses	0.12	30	0.17–0.20	0.06–0.09	47–73
Animal products n.e.c.	6.95	8	7.32–7.44	0.37–0.49	5–7
Wool, silkworm cocoons	5.84	15	8.87–11.75	3.03–5.91	52–101
Forestry	0.75	30	1.26–1.49	0.51–0.74	69–99
Fishing	0.08	10	0.09–0.10	0.01–0.01	9–15
Bovine meat products	0.05	30	0.10–0.16	0.05–0.11	102–214
Meat products n.e.c.	0.11	49	0.16–0.17	0.05–0.06	44–53
Vegetable oils and fats	15.35	52	50.92–65.11	35.57–49.76	232–324
Dairy products	8.20	34	19.07–23.67	10.87–15.46	133–189
Processed rice	0.06	76	0.13–0.54	0.07–0.48	107–781
Sugar	1.51	98	4.76–18.23	3.25–16.72	215–1,107
Food products n.e.c.	45.96	61	115.09–121.51	69.13–75.55	150–164
Beverages and tobacco products	4.19	103	6.74–7.96	2.55–3.77	61–90
Textiles	0.25	26	0.50–0.51	0.25–0.26	98–102
Wearing apparel	0.01	13	0.01–0.01	0.00–0.00	20–21
Leather products	2.58	25	4.81–5.03	2.23–2.45	86–95
Chemical, rubber, plastic products	14.72	30	28.70–29.31	13.99–14.59	95–99
Manufactures n.e.c.	0.03	30	0.06–0.06	0.03–0.03	112–121
Total	477.61	24	677.35–768.57	199.74–290.96	42–61

Source: Commission calculations with simulation framework discussed in appendix H.

Notes: (1) Simulated effects for 699 HS6 products have been grouped in 26 broad product groups as these groups are specified in the GTAP global trade model. Most of the product groups are composed of only agricultural products. The following product groups, however, contain other products—forestry; fishing; textiles; wearing apparel; leather products; chemical, rubber and plastic products; and manufactures n.e.c. (2) Indian tariff rates for staples fluctuate from year to year. Thus, the simulated effects for 2007 shown here could be different than effects for other years. (3) A range of simulated effects was obtained by varying the magnitude of trade elasticities to account for the degree of statistical uncertainty in the econometric estimates of the elasticities. (4) The acronym n.e.c. means not elsewhere classified.

TABLE 5.4 India: U.S. food and agricultural exports and simulated effects of the absence of Indian tariffs, top 50 HS 6-digit products, 2007

Rank	HS6 product description (abbreviated)	HS6 number	2007 U.S. exports to India	Average Indian applied tariff rate	Simulated effects in ranges		
					U.S. exports to India in the absence of Indian tariffs	Change in U.S. exports to India in the absence of Indian tariffs	
			Million $	Percent	Million $	Million $	Percent
1	Food preparations n.e.s.o.i.[a]	210690	11.48	150	64.26–69.84	52.77–58.35	460–508
2	Almonds, fresh or dried, in shell	080211	174.24	20	201.09–206.94	26.85–32.70	15–19
3	Fixed vegetable fats and oils and their fractions	151590	3.01	100	20.79–30.23	17.78–27.22	590–903
4	Soybean oil, and its fractions, refined	150790	11.63	40	28.75–33.33	17.12–21.71	147–187
5	Apples, fresh	080810	26.78	50	43.36–47.98	16.58–21.20	62–79
6	Cotton, not carded or combed	520100	78.55	10	81.55–104.97	3.00–26.42	4–34
7	Cane or beet sugar and chemically pure sucrose, refined	170191	1.04	100	3.33–12.79	2.28–11.74	219–1,125
8	Essential oils of peppermint *(mentha piperita)*	330124	3.96	30	9.07–9.30	5.11–5.34	129–135
9	Milk and cream, powered	040210	1.13	60	4.84–6.88	3.71–5.75	328–508
10	Grapes, fresh	080610	7.50	30	11.35–12.46	3.85–4.96	51–66
11	Rice, husked (brown)	100620	0.22	80	1.24–12.03	1.02–11.80	462–5,341
12	Bulgur wheat, in grain form or in form of flakes	190430	6.03	30	9.39–9.55	3.36–3.52	56–58
13	Wool, not carded or combed, other	510119	4.34	15	6.59–8.66	2.25–4.33	52–100
14	Lactose and lactose syrup containing by weight 99% lactos	170211	2.64	30	5.37–6.32	2.73–3.67	103–139
15	Peptones and derivatives; other proteins and derivatives, n.e.s.o.i.	350400	4.04	30	7.08–7.20	3.04–3.16	75–78
16	Whey and modified whey, whether or not concentrated	040410	1.68	30	3.67–4.42	1.98–2.74	118–163
17	Cane or beet sugar and chemically pure sucrose, refined	170199	0.42	100	1.35–5.22	0.92–4.80	220–1,140
18	Lactose in solid form and lactose syrup, n.e.s.o.i.	170219	2.32	30	4.16–4.74	1.84–2.42	80–105
19	Wine of fresh grapes (other than sparkling wine)	220421	1.56	150	3.02–3.68	1.46–2.11	93–135
20	Mucilages and thickeners, whether or not modified	130239	3.95	30	5.23–5.30	1.29–1.35	33–34
21	Seeds of flowering herbaceous plants	120930	1.28	30	2.46–2.65	1.17–1.36	91–106
22	Essential oils, n.e.s.o.i.	330129	1.30	30	2.52–2.57	1.22–1.27	94–98
23	Potatoes, including french fries, prepared or preserved	200410	2.15	35	3.29–3.35	1.14–1.20	53–56
24	Mucilages and thickeners, whether or not modified	130232	1.93	30	3.06–3.13	1.13–1.20	59–62
25	Potatoes, n.e.s.o.i., prepared or preserved	200520	2.03	30	3.16–3.22	1.13–1.19	56–59
26	Wool, not carded or combed, shorn	510111	1.51	15	2.28–3.08	0.78–1.58	52–105
27	Concentrates of essential oil; other than resinoids	330190	0.85	30	1.98–2.03	1.13–1.18	133–139
28	Whiskies	220830	0.83	150	1.70–2.13	0.87–1.30	105–157

See footnote at end of table.

TABLE 5.4 India: U.S. food and agricultural exports and simulated effects of the absence of Indian tariffs, top 50 HS 6-digit products, 2007—*Continued*

Rank	HS6 product description (abbreviated)	HS6 number	2007 U.S. exports to India	Average Indian applied tariff rate	Simulated effects in ranges: U.S. exports to India in the absence of Indian tariffs	Simulated effects in ranges: Change in U.S. exports to India in the absence of Indian tariffs	
			Million $	Percent	Million $	Million $	Percent
29	Pistachios, fresh or dried, whether or not shelled	080250	3.69	30	4.60–4.84	0.91–1.15	25–31
30	Vegetable seeds for sowing	120991	3.68	10	4.64–4.75	0.96–1.07	26–29
31	Essential oils of mints, n.e.s.o.i.	330125	0.67	30	1.55–1.59	0.89–0.93	133–139
32	Milk albumin, including concentrates of two or more whey proteins	350220	1.62	30	2.50–2.54	0.88–0.92	54–57
33	Seeds of coriander	090920	0.69	30	1.40–1.52	0.71–0.83	102–120
34	Animal feed preparations (mixed feeds, etc.)	230990	2.59	30	3.31–3.34	0.72–0.75	28–29
35	Starches, n.e.s.o.i.	110819	0.81	50	1.42–1.45	0.61–0.65	76–80
36	Protein concentrates and textured protein substances	210610	1.01	30	1.59–1.62	0.59–0.62	58–61
37	Natural gums, gum resins, resins and balsams, n.e.s.o.i.	130190	0.72	30	1.21–1.43	0.49–0.71	69–99
38	Essential citrus fruit oils of orange	330112	1.00	30	1.57–1.59	0.57–0.59	57–59
39	Full grain unsplit whole bovine and equine leather	410711	0.44	25	0.98–1.04	0.55–0.61	125–139
40	Seeds of forage plants for sowing, n.e.s.o.i.	120929	0.52	30	1.04–1.13	0.52–0.61	99–116
41	Tobacco, partly or wholly stemmed/stripped	240120	0.41	30	0.88–0.97	0.47–0.56	114–136
42	Essential oils of citrus fruit, n.e.s.o.i.	330119	0.44	30	0.93–0.95	0.49–0.51	110–114
43	Sauces and prep. Therefor, n.e.s.o.i.	210390	0.78	30	1.23–1.25	0.45–0.48	58–61
44	Products consisting of natural milk constituents	040490	0.30	30	0.66–0.80	0.36–0.50	118–163
45	Mixes and doughs for the preparation of bread, pastry, cakes	190120	0.65	30	1.02–1.04	0.37–0.39	58–61
46	Bovine and equine leather, not whole, n.e.s.o.i.	410799	0.29	25	0.63–0.67	0.34–0.37	115–127
47	Edible mixtures or preparations of animal or vegetable fats or oils	151790	0.49	30	0.82–0.86	0.33–0.37	67–76
48	Vegetable saps and extracts, n.e.s.o.i.	130219	0.65	30	0.98–1.00	0.34–0.36	52–55
49	Starch, corn (maize)	110812	0.30	50	0.63–0.65	0.33–0.35	108–115
50	Bread, pastry, cakes, biscuits and similar baked products, n.e.s.o.i.	190590	0.51	30	0.79–0.81	0.28–0.30	55–58
	Total for 50 HS6 product categories		380.65	28	570.31–659.84	189.65–279.18	50–73

Source: Commission calculations with simulation framework discussed in appendix H.

Notes: (1) This table focuses on the 50 HS6 product categories with the largest simulated expansions in U.S. exports in dollar terms. (2) Indian tariff rates for staples fluctuate from year to year. Thus, the simulated effects for 2007 shown here could be different than effects from other years. (3) A range of simulated effects was obtained by varying the magnitude of trade elasticities to account for the degree of statistical uncertainty in the econometric estimates of the elasticities. (4) The acronym n.e.s.o.i. means not elsewhere specified or indicated.

[a]The basket category "Food preparations n.e.s.o.i." is composed of several other basket categories, the largest of which in 2007 were $7.8 million of edible preparations, not canned or frozen, not containing cane and/or beet sugar, n.e.s.o.i. (HTS 2106907090) and $1.3 million of preparations for the manufacture of beverages, n.e.s.o.i. (HTS 2106906573).

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CHAPTER 6
Nontariff Measures

Overview

U.S. agricultural exports to India face a wide array of nontariff measures (NTMs), whose application either raises the cost of exporting U.S. agricultural products to Indian consumers or bars those exports completely.[1] As international agreements have resulted in the general lowering of agricultural tariff rates worldwide, the prominence of NTMs in certain countries as the next "line of defense" has increased.[2] Unlike tariffs, which are normally applied equally to all trading partners, NTMs can affect agricultural imports from some countries disproportionately.[3] Furthermore, certain NTMs have no practical effect when other NTMs are more trade restricting; U.S. exporters of agricultural products are well aware that resolving one NTM may only make others more prominent.[4]

Indian NTMs identified as hindering U.S. agricultural exports include quality standards on certain processed foods, fumigation requirements for pulses, and government monitoring of import volumes of fruits and nuts, cotton, and alcoholic beverages. Indian NTMs reported to effectively block U.S. agricultural exports include unattainable standards for purity in wheat exports; non–science-based health standards for poultry, swine, and dairy exports; and effective bans on most U.S. products containing genetically modified organisms (GMOs). More broadly, all U.S. exports are affected by certain types of systemic and nontransparent Indian NTMs, such as inefficient regulatory notice and comment procedures, corruption at the ports of entry, and burdensome or irregular customs procedures.

Identifying trade conditions that are covered by rules or guidelines in World Trade Organization (WTO) agreements as NTMs can be difficult, and negotiating to lower or remove the measures can be time consuming.[5] Certain NTMs facing U.S. agricultural

[1] Mattson, Koo, and Taylor, "Non-Tariff Trade Barriers in Agriculture," March 2004, 1. The World Trade Organization (WTO), the World Bank, and the United Nations Conference on Trade and Development (UNCTAD) hosted a recent trade conference during which NTMs were defined using a fairly common construction: "government measures other than ordinary tariffs that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices or both." WTO Secretariat, "Data Day at the WTO: Trade and Market Access Data for Policy Makers," May 18–19, 2009, 25. See also Nicita, "Non Tariff Measures," May 18, 2009. The conference definition distinguished nontariff barriers as NTMs having a "protectionist intent." As the Indian government and U.S. exporters of agricultural products to India differ on the intent or purpose of Indian NTMs, this chapter will focus on NTMs identified as already having had an economic effect on existing or potential U.S. agricultural exports to India.

[2] For example, in discussing U.S. exports of processed foods, one industry group states that although Indian tariffs have been reduced and Indian barriers to investment have decreased, regulatory barriers that effectively bar U.S. exports have simultaneously increased. Industry representative, telephone interview with Commission staff, May 8, 2009.

[3] A number of the Indian NTMs examined here affect all imports, although sometimes to varying degrees. This chapter will focus on the effect of Indian NTMs specifically on U.S. agricultural exports.

[4] For example, imports of U.S. processed agricultural goods containing genetically modified organisms (GMOs) would be hindered by Indian labeling regulations that differ from internationally accepted norms. Such goods are already effectively banned from the Indian market, however, by rules on the importation of products containing GMOs, thus rendering labeling regulations presently irrelevant as an NTM.

[5] Kulkarni, "Non-Tariff Barriers and NAMA Negotiations," September 2005, 1–4; Kumar, Mukherjee, and Simi, "Negotiations on Nontariff Barriers Under NAMA," 2007.

exports to India have existed for some time, but the elimination or easing of NTMs to promote smoother trade flows has occurred only for a few select products. A summary of the NTMs facing U.S. agricultural exports to India is presented in table 6.1.

TABLE 6.1 India: Nontariff measures facing certain U.S. agricultural exports, 2009

Measure	Application	Products
Sanitary/phytosanitary measures		
Health standards	Exceed internationally accepted standards	Poultry, swine, dairy
Contamination standards	Inconsistent with international practices	Wheat, barley
Rules for genetically modified organisms	Effectively ban imports because of burdensome approval process	Corn, certain processed foods
Fumigation requirements	Require destructive or unavailable treatment processes	Pulses, certain fruits
Quality standards	Exceed internationally accepted standards	Certain processed foods, hides and skins, bovine semen
Labeling and packaging rules	Preclude agricultural product distribution without mandated disclosures	Processed foods
Bans, monitoring, and licensing requirements	Place restrictions on free movement of imports	Beef, poultry, edible oils, grains, nuts, corn
State trading enterprises	Restrict imports to certain state-sanctioned entities	Food grains
Customs procedures	Create uncertainty regarding paperwork and valuation	All
Notice and comment procedures	Hinder information dissemination about rules affecting imports	All
Corruption	Raises costs through payment of bribes	All

Source: Compiled by Commission staff.

Following identification of the NTMs, Commission staff conducted economic modeling simulations to estimate possible increases in certain U.S. agricultural exports to India if the NTMs specifically affecting those products were removed. Using 2007 data, the estimated increase in U.S. agricultural exports would be $187–391 million, the majority of which would be from exports of wheat.

Sanitary and Phytosanitary Issues

Use of sanitary and phytosanitary (SPS) restrictions to manage the flow of agricultural imports, including those from the United States, has been a consistent tool of the Indian government since the general import licensing system was eliminated in 2001. Indian SPS measures have substantive and implementation shortcomings stemming from several factors: (1) the nontransparent process for issuing SPS standards; (2) a lack of expertise on the part of the Indian government bureaucracy issuing the standards, which can produce unintended consequences such as overly broad restrictions or unclear benchmarks; and (3) unequal enforcement of Indian SPS standards on domestic and

foreign sources.[6] For example, SPS measures become noticeably less restrictive when Indian policymakers determine that market shortages require imports.[7] Because of these shortcomings, Indian SPS measures create difficulties for U.S. exporters in building consistent and large-scale business relationships with Indian customers.[8]

The WTO agreements, including GATT 1994, recognize the right of WTO member countries to maintain animal health and food safety measures to protect their animal and human populations. The WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS agreement) establishes a framework to ensure that these measures are not used as a means to protect a domestic industry from import competition. Article 3 of that agreement allows a member to set standards other than the international standards, guidelines, or recommendations only when there is scientific justification for doing so, or if scientific evaluation of the international standards, guidelines, or recommendations reveals that they do not afford the level of safety the member determines to be appropriate.[9]

International Health Standards

Indian import standards regarding organic contaminants often either exceed widely accepted international norms without providing a recognized scientific justification or exceed Indian standards for the corresponding domestic product. India continues to ban imports of U.S. poultry and swine products because of the presence of low-pathogenic avian influenza (AI) in the United States. These imports are approved for entry into markets where low-pathogenic AI is not present, such as India, under internationally accepted health standards in the World Organization for Animal Health (OIE).[10] Despite numerous requests for a scientific justification for the AI bans, India has not provided an explanation that the United States, Canada, and the European Commission accept as compatible with OIE guidelines.[11] Also, India's standards for dairy imports with regard to hormones and certain bacteria are more stringent than its domestic dairy standards (box 6.1).

[6] Government official, interview by Commission staff, New Delhi, India, May 4, 2009; government official, interview by Commission staff, New Delhi, India, May 26, 2009; and industry representative, interview by Commission staff, Mumbai, India, June 1, 2009.

[7] Government official, interview by Commission staff, New Delhi, India, June 2, 2009; industry representative, interview by Commission staff, New Delhi, India, June 4, 2009; and industry representative, interview by Commission staff, Gurgaon, India, June 5, 2009.

[8] Government official, interview by Commission staff, New Delhi, India, June 2, 2009; industry representative, interview by Commission staff, New Delhi, India, June 4, 2009; and industry representative, interview by Commission staff, Gurgaon, India, June 5, 2009.

[9] Agreement on the Application of Sanitary and Phytosanitary Measures, art. 3, para. 3. The SPS agreement explicitly recognizes three relevant international organizations that develop and review accepted standards, guidelines, and recommendations: the OIE, which focuses on animal health (the organization changed its name to the World Organization for Animal Health in 2003, but is still widely known by its former French acronym, OIE); the Codex Alimentarius (Codex) Commission, which focuses on food safety; and the International Plant Protection Commission. Agreement on the Application of Sanitary and Phytosanitary Measures, art. 3, para. 4. The Codex Commission was created in 1963 by the Food and Agricultural Organization of the United Nations (FAO) and the World Health Organization (WHO) to develop international food standards, guidelines, and codes of practice.

[10] USTR, *2009 National Trade Estimate Report on Foreign Trade Barriers,* 2009, 239; WTO, "Trade Policy Review: Report of the Secretariat: India," July 24, 2007, 47.

[11] USTR, *2009 National Trade Estimate Report on Foreign Trade Barriers,* 2009, 239.

BOX 6.1 Milk and Milk Products

New requirements for India's sanitary certificate regarding certain bacteria and hormones: In November 2003, the Indian government revised its import permit requirements for milk and milk products. The government required new attestation statements[a] on India's sanitary certificate, which included a certification that the milk-producing animals had not been treated with bovine growth hormones and bovine somatotropin hormones (BST) or been subjected to estrogenic treatments. In addition, the sanitary certificate must include an attestation statement that the milk and milk products were free from organisms causing tuberculosis, brucellosis, listeriosis, paratuberculosis, Q fever, and any toxic substances.[b] The U.S government does not provide such attestation statements for its dairy exports.[c] Moreover, these standards are higher than the standards typically enforced for milk and milk products produced in India.[d]

During 2004–05, U.S.-Indian consultations were conducted without progress. In October 2005, the U.S. Food and Drug Administration (FDA) submitted a revised dairy sanitary certificate to the Indian Ministry of Agriculture with new language for their consideration and possible adoption. No answer was received. In May 2006, additional bilateral consultations yielded only a request from the Indian government for more information on U.S. regulations and inspection programs. In October 2006, the U.S. government provided the Indian government with a sanitary dairy certificate that certified various U.S. practices and government regulations pertaining to the new Indian requirements. At a meeting in December 2006, the Indian government rejected the proposed certificate.[e]

In early February 2009, the U.S. Department of Agriculture (USDA) Foreign Agriculture Service (FAS) proposed the use of a new dairy export certificate modeled after a template certificate approved by the Codex Commission in July 2008.[f] In late July 2009, the Indian government responded to the alternative certificate proposed by the U.S. government, stating that India's current certificate is already in line with the Codex Committee standard on Model Export Certificate for Milk and Milk Products. The Indian government also stated that although the United States has maintained that the use of BST by U.S. dairy producers does not pose a public health risk, the research on which it is based was generated by the manufacturer of BST. The Indian government is not certain whether the results of that research are unbiased and complete. Furthermore, it contends that using BST in animals for longer periods is harmful to animal health. Indian government officials also stated that countries such as Canada, the EU, Japan, and New Zealand have imposed a ban on BST, and therefore, a requirement in the Indian certificate banning the use of BST in dairy products is justified. U.S. government officials note that although these countries ban the use of BST by their own producers for various reasons, all of them allow imports of milk from animals treated with BST.

New requirements for India's sanitary certificate regarding chemical and heavy metal residue limits: In December 2006, during negotiations over the attestation statements discussed above, the Indian government put forward new trade requirements regarding residue levels for pesticides, veterinary drugs, heavy metals, and mycotoxins in imported U.S. dairy products. Indian officials asserted that because U.S. action levels were above the limits prescribed by Codex Committee levels for these products, they were in violation of the Indian import regulations and would be banned.[g] The U.S. government and representatives of the U.S. dairy indusry responded that (1) India's own domestic maximum residue levels for several of those pesticides were higher than the Codex Committee levels they were seeking to impose on imports of milk and milk products; (2) the Indian government is not regularly testing Indian dairy products for these residues but is seeking to impose blanket restrictions on imported products, which the U.S. government notes is a violation of national treatment provisions in the WTO; and (3) milk and milk products that U.S. exporters ship globally meet Indian and Codex Committee residue testing

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[a] Attestation requirements are government guarantees that claims made on a sanitary certificate are truthful.

[b] Industry representative, e-mail message to Commission staff, March 12, 2009.

[c] The USDA does not attest (certify) that U.S. agricultural products meet non-U.S. standards (even Codex Committee standards), only that they meet the appropriate health and safety standards for human consumption in the United States, as required under U.S. law. Government official, interview by Commission staff, Washington, DC, March 5, 2009.

[d] Industry representative, e-mail message to Commission staff, April 17, 2009.

[e] Industry representative, e-mail message to Commission staff, March 12, 2009.

[f] U.S. and Indian delegates to the Codex Commission actively participated in the Codex Committee on Milk and Milk Products to create the template certificate. Government official, interview by Commission staff, Washington, DC, March 5, 2009.

[g] The term "action level" refers to the levels recommended by the U.S. Environmental Protection Agency to trigger enforcement actions by the FDA and USDA when pesticide residues occur in food or feed commodities for reasons other than the direct application of the pesticide. Action levels are set for inadvertent residues resulting from previous legal use or accidental contamination.

BOX 6.1 Milk and Milk Products–*Continued*

levels. The U.S. government noted that the pesticides in question have been banned in the United States since the 1970s and that U.S. action levels are outdated and much higher than residue levels actually contained in U.S. dairy exports.[h]

In response to the national treatment issue, the Indian government responded that although it is holding imports to a higher standard than domestic product in some cases, it is attempting to move toward the higher standards for all products. It did not identify a timetable for imposing these higher standards on domestic products. U.S. government officials raised this issue with their Indian counterparts at bilateral consultations during the WTO SPS committee meeting in February 2007. Later that spring, USDA officials provided Indian officials with data covering several years for pesticide residue testing on milk produced in the United States. The data demonstrated the safety of U.S. products. During 2007 and 2008, U.S. officials repeatedly brought the issue to the attention of Indian officials, seeking permanent resolution.[i] In late July 2009, the Indian government responded to U.S. concerns, stating that India's certification requirement on chemical contaminant residues is in accordance with Codex Committee standards, which are based on scientific risk analysis. The U.S. government believes the Indian government interpretation of Codex Committee certification is overly restrictive, and U.S. officials indicate that they will discuss this topic with Indian officials in the future.[j]

[h] Industry representative, e-mail message to Commission staff, March 12, 2009.
[i] Ibid.
[j] Government official, telephone interview by Commission staff, August 17, 2009; government official, e-mail messages to Commission staff, August 13 and 17, 2009.

Contamination Standards

India enforces phytosanitary standards on some agricultural imports that exceed commonly accepted international standards for those products. When pressed, the Indian government frequently does not offer a scientifically based and widely accepted justification for the heightened standards. For example, the United States has exported wheat to India on very few occasions over the past six years because India has enacted a strict tolerance limit for the presence of weed seed in wheat shipments.[12] U.S. producers assert that they cannot economically meet this limit and have unsuccessfully engaged the Indian government in attempts to prove that wheat imports meeting the U.S. tolerance limits would pose no threat to Indian agriculture (box 6.2).

The Indian government also rejects U.S. barley, corn (maize), and wheat exports because they do not meet Indian requirements that the shipments be free from ergot (a fungus contaminant), even though exports of similar quality are accepted in other countries around the world. The current Codex Alimentarius Commission standard for ergot contamination in shipments of barley, corn, and wheat is 0.05 percent, a standard that is accepted by the United States. Prior to January 2008, the Indian standard was 0.01 percent. After that time, India's Ministry of Agriculture began to require that all U.S. grain shipments have "freedom" from ergot contamination. The U.S. Department of Agriculture (USDA) states that they are unable to certify U.S. grain shipments to such a standard because it is unreasonable. Furthermore, the USDA states that ergot contamination is a quality issue rather than a quarantine issue, as India contends, because

[12] WTO, "Trade Policy Review: Report of the Secretariat: India," July 24, 2007, 46; industry representative, interview by Commission staff, New Delhi, India, June 4, 2009.

BOX 6.2 Wheat

India has imported several million tons of wheat in recent years because of weather-related production shortfalls, despite the fact that normally it is able to achieve its overall food security goal of having the capability to produce enough wheat to satisfy its domestic requirements. Even with the market demand for U.S. wheat, however, no U.S. shipments have been able to overcome the nontariff measures that have effectively foreclosed one of the world's largest wheat markets to U.S. producers.

Although Indian wheat production fluctuates annually because of its variable water supply and government support programs that have created cyclical, distorting production incentives, India has largely satisfied its domestic demand in recent years. It has also been a major exporter since 2000, although its exports declined sharply in 2006–08 because of higher global prices that led to stronger government efforts to maintain domestic supplies. To retain stocks for distribution to the poor, as well as to adjust for storage waste, India imported wheat each year during 2006–08, primarily from Russia, Argentina, and Canada. Indian food processors that expressed an interest in importing high-quality U.S. wheat[a] indicated that they were prevented from doing so by Indian tariffs and certain long-standing phytosanitary issues.[b]

For Indian private sector importers of wheat, the applied tariff rate is 50 percent; but for Indian state trading enterprises, through which most wheat is imported, the applied rate is zero. The private sector applied rate is the primary tariff tool used by the Indian government to manage domestic stocks; that rate dropped from 50 percent to 5 percent to zero within three months in 2006 to encourage private sector imports.

Although tariffs on wheat vary with market conditions, the most vexing problem facing U.S. wheat producers is the Indian phytosanitary standard for the presence of weed seed in wheat shipments, which has effectively banned sales of U.S. wheat in India. The Indian government mandates that levels of weed seed, a contaminant reportedly present in practically all wheat shipments worldwide, not exceed a very low threshold (1 seed per 2 kilograms, or effectively zero) and that the seller's government provide certification to that effect. The U.S. government maintains that because the wheat is imported for consumption, not planting, the plant health risk posed by weed seed is low and the standard is unreasonable.[c]

As a matter of course, U.S. wheat producers "clean" their wheat to remove a number of contaminants and may unknowingly remove enough weed seed during this process to satisfy Indian requirements in any single shipment, but they cannot reliably and consistently meet the Indian standard as a practical matter. The Animal and Plant Health Inspection Service (APHIS) of the U.S. Department of Agriculture only provides certification that a contaminant is not present when the pest does not exist in the United States or a treatment precludes the possibility of a pest, because sampling and testing margins of error will always be greater than zero. Neither scenario applies to all of the weed seeds for which India has quarantine requirements.[d] Therefore, APHIS cannot certify that U.S. wheat shipments meet the very low Indian threshold, and consequently, U.S. wheat shipments to India are almost nonexistent.

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[a] The high protein content, relative to the majority of Indian wheat production, is one of the most attractive features of U.S. wheat. Industry representative, interview by Commission staff, New Delhi, India, May 8, 2009; industry representative, interview by Commission staff, Mumbai, India, May 11, 2009.

[b] Industry representative, interview by Commission staff, New Delhi, India, May 6, 2009; industry representative, interview by Commission staff, New Delhi, India, May 8, 2009; and industry representative, interview by Commission staff, New Delhi, India, June 2, 2009.

[c] All other purchasers of U.S. wheat reportedly also recognize the risk as low. Government official, e-mail message to Commission staff, September 22, 2009.

[d] Ibid.

BOX 6.2 Wheat—*Continued*

Yet, India imports wheat from other sources that likely also have weed seed in their shipments but that certify these shipments as meeting Indian contaminant thresholds. Because India reportedly cannot test for the presence of weed seed in shipments after arrival at the port and has only a limited ability to test offsite, acceptance of these wheat imports is dependent on the certifications by the origin country.[e] Questions are routinely raised by U.S. private sector and government officials regarding the ability of India's foreign wheat suppliers, especially Russia and Ukraine, to provide this certification. Furthermore, although the U.S. government has made concerted attempts to engage the Indian government on the continued effectiveness of the weed seed standard, most recently in 2007, no progress has been made.[f]

The Indian government eases weed seed tolerances and other phytosanitary standards when it decides more wheat supplies are necessary for the Indian market.[g] For example, another Indian standard for wheat imports involves a tolerance for ergot (a fungus) that is nominally zero, meaning completely free from ergot. India relaxed those standards for a short period in 2007 when policymakers determined that the Indian market was experiencing a wheat shortage.[h]

[e] Tracy, written testimony to the USITC, April 22, 2009.
[f] Ibid.
[g] Government official, interview by Commission staff, New Delhi, India, June 2, 2009.
[h] Industry representative, interview by Commission staff, New Delhi, India, June 4, 2009; industry representative, interview by Commission staff, Gurgaon, India, June 5, 2009.

the disease already exists in India.[13] Similarly, India recently issued proposals for maximum acceptable residue levels in carbonated beverages that U.S. producers state exceed international norms and are not justified by scientific standards.[14]

Rules for Genetically Modified Organisms

Other than a standing exception for soybean oil, Indian rules prohibit importation of any product containing GMOs (e.g., U.S. corn or certain processed foods) without prior Indian regulatory approval (box 6.3).[15] The approval must be obtained from the Genetic Engineering Approval Committee (GEAC), an Indian administrative authority that industry sources regard as underresourced and not fully capable of exercising its oversight functions, such as testing and trials of new products.[16] The GEAC is at the center of a GMO approval process that can involve four Indian ministries and result in serial delays, even for products containing GMOs undergoing testing for cultivation in India.[17] As a result, import bans on U.S. agricultural products containing GMOs are

[13] Government officials, interview by Commission staff, Washington, DC, March 5, 2009.
[14] Rochette, International Council of Grocery Manufacturer Associations (ICGMA), to Dr. Chattapadhya, Ministry of Health, Government of India, September 30, 2008. The final version of these regulations containing tolerance limits were issued on June 17, 2009; became effective that same day; and had not been notified to the WTO as of a week later. Dhankhar, "GOI Amends PFA Rules Relating to Carbonated Water," June 30, 2009.
[15] Industry representative, interview by Commission staff, New Delhi, India, June 4, 2009; Singh, *India: Agricultural Biotechnology*, July 24, 2009; *Hindu Business Line*, "Bt Brinjal: No Outstanding Bio-safety Issues," July 17, 2009; and Das, "ICAR Body to Study Socio Economic Impact of BT Brinjal," August 13, 2009.
[16] Industry representative, interview by Commission staff, Mumbai, India, May 11, 2009; industry representative, interview by Commission staff, Mumbai, India, May 12, 2009.
[17] Singh, *India: Agricultural Biotechnology*, 2009 July 24, 2009; *Hindu Business Line*, "Bt Brinjal: No Outstanding Bio-safety Issues," July 17, 2009; and Das, "ICAR Body to Study Socio Economic Impact of BT Brinjal," August 13, 2009.

BOX 6.3 Corn

The Indian government's focus on self-sufficiency in corn production has left few market opportunities open for U.S. corn exports, even when U.S. and Indian corn prices are competitive.[a] Those opportunities that do exist for foreign corn in the Indian market are constrained primarily by nontariff uncertainties that hinder U.S. corn producers in particular.

On a relative and an absolute basis, Indian import demand for corn has been modest since 1999, although import levels have been climbing since reaching their nadir in 2003. India essentially produces all the corn it consumes and had a small amount of exports (less than $1 million) in 2008. Approximately two-thirds of Indian corn production is consumed as animal (primarily poultry) feed. Increased domestic corn production has kept pace with increased domestic poultry production, and as a result, demand for corn imports has not increased.[b] India's corn imports were valued at only $2.4 million in 2007 and $3.7 million in 2008 despite increased corn prices worldwide in 2007 and 2008. Approximately 80–90 percent of this amount originated in Argentina, and the remainder came from the United States.[c]

U.S. and Argentine corn exports face the same tariff-rate quota (TRQ) rates of 15 percent in-quota and 50 percent over-quota, but when India lowers its tariff rates to encourage imports, U.S. corn producers cannot take advantage of the change principally because of restrictions on importation of agricultural products containing genetically modified organisms (GMOs). For example, in February 2007, the Indian government abolished its corn TRQ and lowered the duty to free for 11 months, but imports of U.S. corn did not rise significantly.[d]

The most important Indian trade measure affecting U.S. corn exports is the restriction on agricultural imports containing GMOs. India has not approved for import and will not knowingly import corn containing GMOs. Growers in Argentina and the United States have cultivated one variety of GMO corn, Bt corn, at least since the late 1990s.[e] India requires GMO-free certifications for its corn imports, which the Argentine government provides but the U.S. government does not.[f] U.S. growers can supply non-GMO corn, but growing and channeling the corn separately adds significantly to the cost, a process that should prevent any supplier of truly GMO-free corn from being price competitive in the Indian market.[g] Furthermore, the complexity of India's GMO approval process, the lack of specificity and transparency in Indian GMO regulations and procedures, and overlapping Indian agency jurisdictions for GMO import administration all serve to block possible increases in U.S. corn exports.[h]

Certain specific Indian consumption factors indicate an increased demand for corn in the future, but U.S. corn export opportunities may remain limited. For example, a U.S. quick-service restaurant chain that features corn products is intending to expand its presence in India and will require increased corn imports because the Indian supply will likely be insufficient. However, these imports are projected to come from the EU because U.S. corn exports contain varieties with unapproved GMOs.[i] Similarly, although consumption of processed food products containing corn is expected to rise over the next few years, Indians may hesitate to import U.S. corn to use in making these products, even if import approval is granted, because standard U.S. yellow corn is not as orange in color as Indian corn. According to one U.S. agricultural products company operating in India, use of U.S. corn would change the appearance of Indian processed food products to a great degree.[j]

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[a] Industry representative, interview by Commission staff, New Delhi, India, June 4, 2009.

[b] Industry representative, interview by Commission staff, Mumbai, India, May 28, 2009.

[c] Indian industry representatives stated that U.S. corn has a higher moisture content than domestic and Argentine corn, which may make it less suitable for Indian consumption. Industry representative, interview by Commission staff, Mumbai, India, May 28, 2009, and industry representative, interview by Commission staff, Mumbai, India, May 29, 2009. A U.S. industry source indicated that the moisture level issue can be addressed by the U.S. corn exporter. Industry representative, e-mail message to Commission staff, July 23, 2009.

[d] Indian imports of U.S. corn were approximately $376,000 in 2007 and $364,000 in 2008. GTIS, World Trade Atlas Database (accessed November 3, 2009). Because of the low value, industry sources declined to speculate on the composition of these corn shipments. Industry representatives, telephone interview by Commission staff, September 9, 2009.

[e] Robertson, "Biotechnology: Information on Prices of Genetically Modified Seeds in the United States and Argentina," June 29, 2000, 2.

[f] Industry representative, interview by Commission staff, New Delhi, India, May 8, 2009. See box 6.2.

[g] Industry representatives, telephone interview by Commission staff, September 9, 2009.

[h] NCGA, written submission to the USITC, June 19, 2009.

[i] Industry representative, interview by Commission staff, New Delhi, India, May 8, 2009.

[j] Industry representative, interview by Commission staff, Mumbai, India, May 11, 2009.

perpetuated continuously. The import ban stands in contrast to the range of responses by the Indian market regarding the sale of products containing GMOs, from some support at the retail level to some resistance within the Indian domestic supply chain and from nongovernmental organizations.[18]

Fumigation Requirements

For certain agricultural products, India requires designated fumigation treatments that can be administratively difficult or prohibited for U.S. producers to implement, and it has resisted allowing other scientifically justified treatments to be used. For example, the Indian government has allowed U.S. pulses to be imported under a short-term exception to Indian requirements for fumigation treatment of U.S. shipments with methyl bromide prior to export.[19] Methyl bromide treatment is not available in the United States to U.S. pulses producers, who have proposed that the treatment be completed following arrival in India, which is occurring now, or that the treatment requirement be ended because it is unnecessary.[20] The exception is renewed at six-month intervals, creating uncertainty for U.S. exporters. [21] Similarly, U.S. shipments of sweet cherries to India are not commercially viable because methyl bromide fumigation would reduce quality and shelf life. The U.S. horticultural industry states generally that a nonfumigation systems approach would obviate the need for fumigation.[22]

Quality Standards

Demands by the Indian government for the highest possible quality of certain agricultural imports effectively bar their importation into India, despite the acceptance of lesser-quality goods throughout the global trading system. For example, in the recent past, the Indian government issued import standards for hides and skins that producers could not meet because of the government's requirement for perfectly unblemished imports; the standards were subsequently relaxed in 2009, and there has been a report that trade has improved.[23] The Indian government has placed quality requirements on imports of bovine semen that would exclude most of the product that is traded worldwide.[24]

[18] Industry representative, interview by Commission staff, Mumbai, India, May 11, 2009; industry representative, interview by Commission staff, New Delhi, India, May 26, 2009; and industry representative, interview by Commission staff, New Delhi, India, June 4, 2009.

[19] Industry representative, interview by Commission staff, New Delhi, India, June 4, 2009; USTR, *2009 National Trade Estimate Report on Foreign Trade Barriers*, 2009, 239; and Aradhey, *India: Grain and Feed; Pulse Situation and Outlook*, December 14, 2007, 7.

[20] Government official, interview by Commission staff, New Delhi, India, May 26, 2009; industry representative, interview by Commission staff, Mumbai, India, May 28, 2009. Fumigation with methyl bromide continues to occur legally for very select agricultural purposes in the United States because of ozone depletion concerns. See U.S. Environmental Protection Agency, "The Phaseout of Methyl Bromide," August 3, 2009.

[21] Govindan, *India: Grain and Feed*, February 20, 2008, 20; Govindan, *India: Grain and Feed*, February 20, 2009, 21.

[22] NHC, written submission to the USITC, June 24, 2009.

[23] Government official, interview by Commission staff, New Delhi, India, May 26, 2009; industry representative, e-mail message to Commission staff, September 16, 2009.

[24] Dhankhar, *India: Livestock and Products*, September 14, 2009, 8; USTR, *2009 National Trade Estimate Report on Foreign Trade Barriers*, 2009, 239.

Labeling and Packaging Rules

The right of countries to implement their own labeling and packaging requirements for the health and safety of their people is well established in the WTO Agreement on Technical Barriers to Trade (TBT).[25] Governments use labeling requirements to protect consumers from deceptively labeled products as well as to protect producers against unfair competition.[26] Diverse and confusing labeling rules among markets served by the same globally traded agricultural products can hinder free trade.[27] Specific labeling requirements in a given market can restrict trade by differing from generally accepted international labeling norms, creating a burdensome label acquisition and approval process, or constructing a perception that one product is inferior to a competing product.[28]

India amended its Prevention of Food Adulteration Rules (PFA Rules) in March 2009 to institute updated labeling rules for imported food products, but it is unclear what effect the new rules, once implemented, will have on foreign exports to the Indian market. Similar to U.S. rules, Indian labeling rules require that the packaging list the ingredients used, in descending order of their composition by weight or volume; the month and year of manufacture or packaging; the expiration date; and the "best before" consumption date, among other things.[29] Requirements for certain other information, such as recipes and other trade or proprietary information, were not included in the updated rules, although U.S. producers and Indian processed food companies have had to confront these possibilities in the past as part of a frequently nontransparent Indian regulatory process that is still moving toward internationally accepted standards.[30]

The administration of Indian labeling laws can also present challenges for foreign food processing companies, who find themselves managing a variety of labeling mandates. Issuance and enforcement of labeling requirements under the PFA Rules are the responsibility of the central government, but the labels themselves on occasion may have to be written in the language of the locality where the product is ultimately sold. India has 16 official languages, and food processing companies often will not know which pallet of food products will be transported to any specific state. Similarly, the packaging must specify the maximum retail price of the product, including any taxes. Some applicable taxes are levied at the state level, raising the same state-by-state shipment problem.[31] Certain other requirements, such as individual container labels for bulk products and

[25] WTO Agreement on Technical Barriers to Trade, 1995, preamble ("Desiring however to ensure that technical regulations and standards, including packaging, marking and labeling requirements, … do not create unnecessary obstacles to international trade; Recognizing that no country should be prevented from taking measures necessary … for the protection of human, animal or plant life or health, of the environment, or for the prevention of deceptive practices, at the levels it considers appropriate, subject to the requirement that they are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail or a disguised restriction on international trade…").

[26] Organisation for Economic Co-operation and Development (OECD), "Analysis of Nontariff Measures," November 13, 2003, 6 and 10.

[27] Office of the Spokesman, U.S. Department of State, "U.S. Concerned That EU's Biotech Labeling Could Be Burdensome," July 4, 2003; "Labeling," American Apparel and Footwear Association, n.d. (accessed August 24, 2009); and Mattson, Won, and Taylor, "Nontariff Trade Barriers in Agriculture," March 2004, 9.

[28] OECD, "Analysis of Nontariff Measures," November 13, 2003, 13.

[29] WTO, "Trade Policy Review: Report of the Secretariat: India," July 24, 2007, 46. Infant milk substitutes and infant foods, bottled mineral water, and milk products have other labeling requirements.

[30] Industry representative, interview by Commission staff, Washington, DC, April 8, 2009.

[31] Government representative, interview by Commission staff, New Delhi, India, May 26, 2009.

notices that must be integrated with the packaging as opposed to affixed using a sticker label, add to processing costs for producers.[32] The scope of the labeling rules has unintended effects on certain agricultural products, such as alcoholic beverages, that differ from everyday packaged foods. For example, the U.S. distilled spirits industry has complained about nutritional, ingredient, and expiration labeling requirements that it views as inappropriate for spirits products.[33]

Processed foods that contain genetically modified (GM) ingredients may face unique issues as a result of Indian labeling laws. Proposals made in 2006 required food packages containing GM ingredients to state that fact on their labels, with a declaration that the product has been cleared for sale in the exporting country.[34] A U.S. food organization noted that the proposals contained no explanation for such individual treatment of foods containing GM ingredients and that they might penalize U.S. products because the U.S. government does not "clear" food products for sale and does not establish any standards or analytical methods that food processing companies could reference in an attempt to meet the requirements.[35] Implementation of these labeling proposals has been deferred indefinitely.[36] Because the GEAC has not approved imports of any agricultural products containing GMOs, except for soybean oil, almost all U.S. agricultural products containing GMOs are prohibited in India in any case.

Bans, Monitoring, and Licensing Requirements

India eliminated import licensing during the early 1990s for all but roughly 3,000 agricultural products and consumer goods, placing these items on a "negative list."[37] For the various categories of agricultural goods on the negative list, importation can be prohibited, monitored, or licensed in some form.[38]

Bans

The Indian Government, under the authority of the 1962 Customs Act and following requisite notice in the *Gazette of India*, may prohibit the importation of any agricultural good for reasons such as a potential market surplus, balance of payment issues, or health standards. India currently bans imports of beef (because of religious sensitivities) and related products; live pigs and pig meat products; tallow, fats, and oils of animal origin; and poultry from countries reporting outbreaks of AI, citing health reasons.[39]

Monitoring

Once India removed its final quantitative restrictions on agricultural imports in 2002, it established a monitoring mechanism (a committee chaired by the Secretary of the

[32] Industry representative, interview by Commission staff, New Delhi, India, May 26, 2009.
[33] DISCUS, written submission to the USITC, June 2, 2009.
[34] WTO, "Trade Policy Review: Report of the Secretariat: India," July 24, 2007, 58.
[35] AgBiotech Planning Committee to Assistant Director General (PFA), Directorate General of Health Services, Government of India, n.d.
[36] Government official, e-mail message to Commission staff, September 22, 2009.
[37] Hoque, "India Relaxes Restraints on Agricultural Imports," November 2000, 14 and 16.
[38] Importation only through state trading enterprises (STEs) is another type of negative list restriction and is addressed elsewhere in this chapter.
[39] WTO, "Trade Policy Review: Report of the Secretariat: India," July 24, 2007, 46–47; OECD, *Agricultural Policies in Emerging Economies*, 2009, 109.

Department of Commerce) for some imports it considered to be "sensitive." These products include edible oil, cotton, milk and milk products, grains, fruit and vegetables, nuts, spices, tea, coffee, and alcoholic beverages.[40] Should the Indian government determine that imports of these sensitive products are disrupting the domestic market, the government may adjust the applied tariff rates, sometimes as frequently as several times annually in the case of grains, to maintain a sufficient domestic supply of or a stable market price for these products.[41] The existence of the monitoring process itself creates uncertainty for U.S. exporters of agricultural products, who face the prospect of planned shipments becoming uncompetitive in terms of price because of Indian restrictions announced and implemented within a short time frame.[42]

Licensing Requirements

Specific import licensing requirements by the Indian government directly affect certain U.S. agricultural exports or would affect them in the absence of other applicable NTMs. Starting in 1998, the Indian government began gradually dismantling its general import licensing system, which the government had used as a primary method of restricting certain agricultural as well as nonagricultural imports through the refusal to issue licenses.[43] In April 2001, the government abolished the general import licensing system itself and replaced it with a collection of other measures for protecting Indian producers, including specific import licensing.[44]

For example, over the last four years India has allowed importation of live animals only under license because of sanitary concerns, which according to the USDA has restricted or effectively banned the import of live animals.[45] Furthermore, the licensing process must begin at least 30 days prior to import; spans two government ministries, depending on whether the livestock product is freely traded or restricted; and involves approximately three levels of administrative review before issuance. Some of these administrative bodies meet only twice per month.[46] This restriction affects U.S. equine (horses and mules) exports to India.[47] Similarly, an industry representative indicated that no corn is imported within the Indian tariff-rate quota (TRQ), thereby qualifying those imports for the lower in-quota duty rate, because the process for obtaining a license to

[40] WTO, "Trade Policy Review: Report of the Secretariat: India," July 24, 2007, 46–47; OECD, *Agricultural Policies in Emerging Economies*, 2009, 109.

[41] See Govindan, *India: Grain and Feed*, February 20, 2008; Govindan, *India: Grain and Feed; Quarterly Lock up Report*, May 6, 2008; and Pursell, Gulati, and Gupta, "Distortions to Agricultural Incentives in India," December 2007, 7. See also chapter 5.

[42] A source indicates that the Indian government has withdrawn the monitoring list of trade-sensitive items from use without a formal announcement. Pursell, Gulati, and Gupta, "Distortions to Agricultural Incentives in India," December 2007, 7. The Indian Department of Commerce, however, publishes details on a monthly basis about the sensitive agricultural imports it monitors, including the countries of origin for those imports. Food grains and edible oils are frequently highlighted items in the monthly Press Notes. Ministry of Commerce and Industry, "Import of Sensitive Items" (accessed September 22, 2009).

[43] A general import license allows the importation of goods covered by the license from any applicable country. FAO, "Import Policy Instruments," n.d. (accessed September 17, 2009).

[44] Some of the other measures are occasionally sharp increases in tariffs, the use of STEs to control agricultural imports, the use of tariff-rate quotas (TRQs), and the issuance of new technical and SPS standards. Pursell, Gulati, and Gupta, "Distortions to Agricultural Incentives in India," December 2007, 7.

[45] Shunmugam, *India: Livestock and Products*, August 30, 2005, 4–5; Singh, *India: Livestock and Products*, August 23, 2006, 4–5; Dhankhar, *India: Livestock and Products*, October 1, 2007, 10; and Dhankhar, *India: Livestock and Products*, September 2, 2008, 9–10.

[46] Dhankhar, *India: Livestock and Products*, October 1, 2007, 10.

[47] USITC, DataWeb (accessed September 18, 2009).

import corn under the TRQ is too bureaucratically cumbersome.[48] U.S. corn exports in any significant volumes are already effectively blocked by Indian restrictions on the approval and importation of agricultural products containing GMOs.

State Trading Enterprises

State trading enterprises (STEs)—commercial entities created and usually wholly owned by the national government or granted special or exclusive economic privileges—play a central role in India in managing the supply and price of certain commodity agricultural imports for the benefit of the Indian consumer, as they have since the 1950s.[49] India imports specific bulk grains, such as wheat and corn, in which U.S. producers are highly competitive globally, primarily through these limited and preferential STE channels.

The use of STEs by governments in developing countries is widespread and long-standing. The WTO recognizes their prevalence in economies where agriculture is an important trade factor and states that it does not seek to prohibit or discourage the use of STEs.[50] Yet trade distortions may occur when the Indian STEs, unlike private sector traders, do not act as independent commercial actors seeking profit maximization, but instead promote government policies favoring domestic production.[51] The Indian government facilitates the preeminent role of STEs in agricultural trade, as well as their ability to further government objectives, by granting STEs preferential treatment in the tariff rates applicable to their imports compared to private sector Indian importers. An example is the current 50 percent tariff on private sector wheat imports versus the zero percent duty on STE wheat imports.[52]

The four primary STEs in India for agricultural imports are the State Trading Corporation of India Ltd. (STC), established in 1956; the National Agricultural Cooperative

[48] Industry representative, interview by Commission staff, New Delhi, India, June 4, 2009.

[49] WTO, "Technical Information on State Trading Enterprises" (accessed June 11, 2009). For one listing of the numerous and varied Indian STEs, see India's Homepage (accessed June 9, 2009).

[50] Article XVII of the GATT 1994 is the principal provision dealing with STEs and their operations. Work on this subject in the WTO is undertaken mainly by the Working Party on State Trading Enterprises.

[51] See WTO, "Technical Information State Trading Enterprises" (accessed June 11, 2009). The Indian government stated in its "Foreign Trade Policy 2004–2009" document that STEs should import "solely in accordance with commercial considerations … in a non discriminatory manner and shall afford enterprises of other countries adequate opportunity, in accordance with customary business practices, to compete for participation in such purchases or sales." Government of India, Ministry of Commerce and Industry, Department of Commerce, "Foreign Trade Policy 2004–2009," April 11, 2008, 25. This wording is very similar to WTO text on the optimal operation of STEs.

[52] STEs also assist Indian government goals with "balancing" Indian imports and exports through the use of countertrade, which involves an agreement for one country to sell goods to another in exchange for goods (perhaps also involving some cash or services) of an equal value from the second country. The practice is most prevalent between countries that have foreign exchange constraints or balance of payments issues, as India had in the past. Ministry of Commerce and Industry, "Foreign Trade Policy 2004–2009," April 11, 2008, 82; *Hindu Business Line*, "Beware the Palm Oil Cartel," March 12, 2004; and Reuters, "India Steps Up Countertrade Deals to Cut Trade Gap," n.d. (accessed September 17, 2009).

India has stated there is no countertrade requirement, although private companies are reportedly "encouraged to use countertrade" and MMTC promotes its countertrade operations on its Web site. WTO, "Trade Policy Review: Report of the Secretariat: India," July 24, 2007, 62; USTR, *2009 National Trade Estimate Report on Foreign Trade Barriers*, 2009, 247–48; and "MMTC Inside" (accessed June 17, 2009). Some of the most recent uses by India of countertrade involve capital goods, but India has used countertrade in agricultural products as recently as 2002–03. Mohanty, "Offsets in Indian Defence Sector," May 22, 2009; *FDIMagazine*, "Countertrade Still Thrives," December 8, 2003; *Indonesian Commercial Newsletter*, "Indonesia—India Agrees on Counter Trade," March 26, 2002; and *AsiaPulse News*, "India to Use 'Counter Trade' to Boost Grain Export," March 25, 2002.

Marketing Federation of India Ltd. (NAFED), established in 1958; the Minerals and Metals Trading Corporation (MMTC), established in 1963; and PEC Ltd., established in 1971. They import edible oils, sugar, wheat, fatty acids, pulses, soybean meal, rice, and corn.[53]

Importation of these bulk commodities through STE channels exclusively is known as canalization. The United States and India concluded a quantitative restrictions agreement eliminating this import method in December 1999, following a WTO dispute settlement ruling.[54] The dispute settlement panel recommended that India bring its STE practices into accord with the GATT provisions addressing STEs, an adjustment that the Indian government continues to implement.

Indian STEs are forthright about the role they play in trying to stabilize agricultural commodity domestic supply and prices and seeking to provide for food security at the direction of the Indian government, an activity that can include indemnification with government funds.[55] In its most recent notification to the WTO on state trading, the Indian government confirmed its goals: "a fair return to the farmers as well [as] food security i.e. availability of adequate food for all sections of the society at prices affordable by them."[56]

The effects of STE actions that hinder trade, as outlined above, are compounded by a corresponding lack of transparency about STE activities in the market. The WTO attempts to gather information on STEs routinely through its requirement that WTO member states file notifications every three years on their STE activities.[57] India last filed its STE notification in 2001. Furthermore, despite a WTO requirement that member states furnish statistics on products imported by STEs, such as value, quantity, and the breakdown of imports between STEs and private traders, Indian authorities do not collect such data.[58]

[53] OECD, *Agricultural Policies in Emerging Economies*, 2009, 109. Certain STEs have focused on particular agricultural commodities of high interest to the Indian marketplace, and some were merged with more general STEs. See "Welcome to The Jute Corporation of India Ltd.—A Govt. of India Enterprise," http://www.jutecorp.com/index.htm (accessed June 9, 2009); "Business India Info: State Trading Corporation of India Ltd.," http://money.newkerala.com/company-profile-id-16610053.00.html (accessed June 9, 2009) (information on the Cashew Corporation of India); and "STCL Ltd.," http://www.stclindia.com/html/profile/about.html (accessed June 9, 2009) (information on STCL Ltd., a trading company for cardamom and other spices).

[54] WTO Appellate Body, "India—Quantitative Restrictions on Imports of Agricultural, Textile and Industrial Products," August 23, 1999. The ruling concluded that canalization, as implemented by India under its then-existing balance of payments regime, was no longer justified. USTR, *2002 National Trade Estimate Report on Foreign Trade Barriers*, 2002, 175; USTR, *2003 National Trade Estimate Report on Foreign Trade Barriers*, 2003, 168–70.

[55] For example, STC states that it "imports … to cover the domestic shortfalls and hold the price line. STC serves the national objective by arranging timely imports at most competitive prices." "Imports Into India" (accessed June 10, 2009). During 2007–08, "[i]n [o]rder to arrest the rising price trend of pulses" in the Indian market, NAFED imported pulses "on behalf of" the Indian government, which "agreed to reimburse the losses to NAFED to the extent of 15%." "International Trade of Nafed" (accessed June 10, 2009).

[56] WTO Working Party on State Trading Enterprises, "State Trading," October 8, 2001, 7.

[57] WTO, "Technical Information State Trading Enterprises" (accessed June 11, 2009).

[58] WTO, "Trade Policy Review: Report of the Secretariat: India," July 24, 2007, 61.

Customs Procedures

India has put into place many of the characteristics of a modern customs clearance process, which should enhance speedy and low-cost importation of all products.[59] Several of the advances that India has implemented, however, have less effect on agricultural imports, including those from the United States, entry for which requires additional approvals, an out-of-transaction reference valuation, or both.

For example, the handlers of import documents for agricultural imports must obtain any necessary health and sanitary certificates, or import permits for goods under restriction, prior to import and must submit them with the customs declaration, adding to the time required for import transactions even prior to entry and placing a premium on customs operational efficiency.[60] Furthermore, one Indian industry representative stated that if the agricultural imports require an SPS certificate, the transaction may be delayed while parties wait for an SPS officer to arrive and process the necessary paperwork personally.[61] Delays from inefficiently handled or excessive documentation requirements can lead to storage and loss costs for the exporter.[62]

Except for the launching of the National Import Database in 2002, India's customs valuation procedures have changed little since the September 2001 amendments to the 1998 Customs Valuation (Determination of Price of Imported Goods) Rules, which at first glance accord with international norms. However, as described in chapter 5, those rules do not cover valuation for all major Indian agricultural product imports. India uses reference prices for edible oils to determine the value of imports and applicable duties.[63] Indian customs officials have sometimes rejected the declared value of soybean oil imports from the United States, for example, because they believe the price to be lower than market prices. The higher reference prices used by Indian customs officials effectively increase the amount of duty owed on the transaction. According to Indian officials, the reference prices are adjusted to align with international market prices, but the edible oil reference prices remained unchanged from late 2006 to mid-2009. The uncertainty about what price will be applied to the transaction adds to the risk and cost of agricultural shipments to India.[64]

Notice and Comment Procedures

A number of countries, including the United States, have persistent concerns about India's irregular and occasionally abbreviated process for notifying its trading partners of

[59] India introduced electronic processing of import documents in 1995 and processes 85–90 percent of total imports electronically, according to its most recent declaration and private sector sources. India also implemented a risk management system in 2005 that has greatly reduced the need for inspections of most import shipments. Together, these improvements reportedly have reduced the time for customs clearance to eight hours. WTO, "Trade Policy Review: Report of the Secretariat: India," July 24, 2007, 35; WTO Trade Policy Review Body, "Trade Policy Review: Report by India," April 18, 2007, 17–18.

[60] WTO, "Trade Policy Review: Report of the Secretariat: India," July 24, 2007, 34–35.

[61] Industry representative, interview by Commission staff, Mumbai, India, May 29, 2009.

[62] See Beghin, "Nontariff Barriers," December 2006, 2.

[63] The 1962 Customs Act authorizes the relevant Indian government bodies to set the reference prices "if satisfied that it is necessary or expedient to do so." *Customs Act, 1962*, ch. 5, sec. 14.2 ("Levy of, and Exemption From, Customs Duties: Valuation of Goods").

[64] WTO, "Trade Policy Review: Report of the Secretariat: India," July 24, 2007, 103; USTR, *2009 National Trade Estimate Report on Foreign Trade Barriers*, 2009, 238.

legal or regulatory changes that affect the import of agricultural goods, for example, changes affecting U.S. exports of hides and skins and certain beverages to India. A routinized, clearly understandable, and fully participatory process for notice and comment[65] on regulations affecting international agricultural trade can encourage trade by, among other things, removing the risk of unexpected, unexplained, or unexamined government action. The process commonly consists of three parts—notice, comment, and implementation period—and India's trading partners have cited areas for improvement by India at each step.

Two methods of notice, each serving specific purposes, are publication in the *Gazette* and notification to the WTO of these measures. Publication in the *Gazette* generally provides for public comment and establishes a deadline for comment submission, if any. Notification to the WTO is one aspect of India's commitments to allow its trading partners an opportunity to review proposals or actions that affect trade and comment on their adherence to international trade agreements.[66] The U.S. government, U.S. and international business groups, and other countries have complained to the WTO about India's late notifications, most recently involving labeling amendments to the PFA Rules;[67] import requirements for hides and skins;[68] and certain fumigation requirements, among others.[69]

Once a rule or regulation is notified to the WTO or published in the *Gazette*, the period for submission of comments prior to implementation has frequently been an issue for India's trading partners. WTO members protested that the comment period for the fumigation requirements mentioned above was insufficient, a charge India disputed.[70] More recently, the U.S. Grocery Manufacturers Association (GMA) urged the Indian government in a 2008 letter to delay implementation of the PFA Rules amendments so that relevant comments could be fully considered.[71] The International Council of Grocery Manufacturer Associations (ICGMA) noted that once those amendments were notified to the WTO, the comment deadline was 36 days later and the amendments were to be implemented on day 37.[72] By comparison, the SPS and TBT Committees in the WTO recommend at least a 60-day period for comments, if possible.

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[65] Notice and comment is a term used to describe the official processes by which a government regulatory agency publishes a new or changed regulation and receives comments from entities outside the government, such as private citizens, companies, or other governments, expressing opinions about the regulation. For more information, see Galligan, *Due Process and Fair Procedures*, 1997, 494; Warren, *Administrative Law in the Political System*, 2004, 218.

[66] See WTO Agreement on Technical Barriers to Trade, 1995, arts. 2.9 and 5.6 and annex 3.

[67] Rochette, Food Processors Association (FPA), to Michael Riedel, Foreign Agricultural Service (FAS), USDA, January 17, 2006; Rochette, ICGMA, to Dr. Chattapadhya, Ministry of Health, Government of India, September 30, 2008. The final version of these regulations containing tolerance limits were issued on June 17, 2009; became effective that same day; and had not been notified to the WTO as of a week later. Dhankhar, "GOI Amends PFA Rules Relating to Carbonated Water," June 30, 2009.

[68] USTR, *2009 National Trade Estimate Report on Foreign Trade Barriers*, 2009, 239.

[69] WTO, "Trade Policy Review: Report of the Secretariat: India," July 24, 2007, 56–57; WTO Committee on Sanitary and Phytosanitary Measures (SPS Committee), "Specific Trade Concerns: Note by the Secretariat," February 15, 2002; WTO SPS Committee, "Specific Trade Concerns: Note by the Secretariat," March 26, 2003; WTO SPS Committee, "Specific Trade Concerns: Note by the Secretariat," March 2, 2004; WTO SPS Committee, "Specific Trade Concerns: Note by the Secretariat," February 25, 2005; and WTO SPS Committee, "Specific Trade Concerns: Note by the Secretariat," May 19, 2006.

[70] WTO, "Trade Policy Review: Report of the Secretariat: India," July 24, 2007, 56–57.

[71] Rochette, FPA, to Directorate General of Health Services, Government of India, July 30, 2008.

[72] Rochette, ICGMA, to Dr. Chattapadhya, Ministry of Health, Government of India, September 30, 2008.

Interests within India's trading partner countries have also expressed concern regarding the implementation period for new or revised Indian agricultural regulations. For example, the GMA in 2008 protested to the Indian government that the May 2008 PFA labeling amendments mentioned above were to take effect after only six months following public notification and, as a counterpoint, highlighted examples from Canada and the United States in which authorities allowed years to elapse (to allow for redesign, distribution, and marketing changes) before implementing analogous labeling rules.[73] In addition, the proposed rules were "significantly modified" five months into the six-month period, but no implementation extension was granted.[74]

Corruption

Corruption injects uncertainty into U.S.-Indian agricultural trade relations and increases the costs for exporting U.S. agricultural products to India.[75] In international trade transactions, corruption most commonly occurs as improper payments to customs or port officials.[76] Acknowledgement of corruption as an issue requiring transnational action has grown in recent years; the United States and India are among 140 signatories to the 2003 United Nations Convention Against Corruption.[77] More directly, some U.S. and Asian business advocacy organizations have explicitly recognized corruption as a barrier to trade.[78]

One widely used measurement of global business risk that examines corruption on a country-specific basis, the Opacity Index, placed India in the bottom one-third of the world's largest economies in 2008 for corruption.[79] Similarly, Transparency International's 2008 Corruption Perceptions Index ranked India tied for 85th of 180 countries, with a score that indicates "a serious corruption problem in the [Indian] public sector."[80] The scores underlying India's ranking on the index improved from 2004

[73] Rochette, FPA, to Directorate General of Health Services, Government of India, July 30, 2008.

[74] Rochette, Association of Food, Beverage and Consumer Products Companies, to Gloria Blue, U.S. Department of Commerce, November 6, 2008.

[75] See Asia-Pacific Council of American Chambers of Commerce (APCAC), "Corruption," n.d. (accessed June 11, 2009); Begovic, "Trade Liberalization: The Way Forward," October 25–27, 2006, 8–9. Corruption is popularly defined broadly as "the abuse of public office or public position for private gain." United Nations Development Programme (UNDP) and Global Integrity, "A Users' Guide to Measuring Corruption," September 2008, 6. The World Bank and Transparency International have used a slight variation of this definition as well. Ibid., 12.

[76] Corruption at this level of government can be characterized as petty corruption (low- to midlevel officials and small monetary amounts), as opposed to grand, or political, corruption (larger amounts of money and effects undermining the legitimacy of government). UNDP and Global Integrity, "A Users' Guide to Measuring Corruption," September 2008, 8.

[77] The United States has ratified the convention; India has not. United Nations Office on Drugs and Crime, "United Nations Convention against Corruption" (accessed June 11, 2009).

[78] See USAEngage, "NFTC and USAEngage Commend U.S. Senate for Approving Corruption Convention," September 15, 2006; National Foreign Trade Council, "Bill Reinsch's Speech on Impact of Corruption on Global Business," September 17, 2008; and APCAC, "Corruption" (accessed June 11, 2009).

[79] Kurtzman and Yago, "Opacity Index 2007–2008," April 2008, 3. On the Opacity Index, India was ranked 40th of 48 countries overall. The index examines factors such as corruption, regulatory effectiveness, and economic and enforcement policies to measure the costs and frequency of risks to business.

[80] Transparency International, "2008 Corruption Perceptions Index," September 23, 2008; Transparency International, "2008 Corruption Perceptions Index: Regional Highlights: Asia-Pacific," n.d. (accessed June 11, 2009).

to 2008, but the country has remained near the 50th percentile of all countries ranked each year, lower than comparable economies such as Brazil and China.[81]

U.S. and foreign government and industry officials with experience in Indian agricultural operations offer supporting evidence regarding corruption among low-level officials in India. Among the examples provided are rejection of U.S. agricultural products at certain Indian ports owing to different levels of bribery required by each port's officials, Indian government agricultural development programs in which participation is contingent on bribery, clearance delays of perishable shipments absent bribes to port officials, waivers of required certifications following bribe payments, and the use of Indian food safety regulations as a pretext to close port operations until shippers or importers pay bribes to officials.[82] One Indian industry representative termed the payment of bribes at this level "speed money" and estimated the required amount to be 2 percent of the transaction value.[83]

Modeling of Nontariff Measures

Commission staff conducted economic modeling simulations on a set of U.S. agricultural product sectors for which Indian import prices were higher than world prices—i.e., they have positive price gaps that can be interpreted as tariff equivalents—and for which Commission staff research indicated that NTMs were impeding U.S. agricultural exports. The estimated increase in U.S. exports of agricultural products to India following removal of Indian NTMs, relative to a 2007 baseline, is $187–391 million, most of which is an increase in U.S. exports of wheat of $146–334 million (U.S. wheat exports worldwide in 2007 were $8.3 billion). Increased exports of U.S. dairy products and wine composed most of the remaining increase in exports. These estimates include a sensitivity analysis for a range of elasticities, similar to that used in the estimates for effects of tariff reductions (table 6.2).[84]

The products in table 6.2 are subject to NTMs that have a distinct effect on that specific product. Examples include issues relating to phytosanitary certification and state trading for wheat and other food grains; sanitary issues for meat products, dairy products, and

[81] On a scale of 0 (highly corrupt) to 10 (highly clean) relating to perceptions of the degree of corruption as reported by business people and country analysts, India scored 2.8 in 2004 and 3.4 in 2008. Transparency International, "2008 Corruption Perceptions Index," September 23, 2008. See WTO, "Trade Policy Review: Report of the Secretariat: India," July 24, 2007, 20 n.13.

The Worldwide Governance Indicators project at the World Bank, which measures control of corruption, also ranked India lower than the 50th percentile in six of seven years from 2002 to 2008. Worldwide Governance Indicators Project, "Governance Matters 2009," n.d. (accessed September 20, 2009).

[82] Government officials, interviews by Commission staff, New Delhi, India, May 4, 2009; industry representatives, interview by Commission staff, New Delhi, India, May 4, 2009; industry representative, interview by Commission staff, Mumbai, India, May 30, 2009; industry representative, interview by Commission staff, Mumbai, India, June 1, 2009; government official, interview by Commission staff, New Delhi, India, June 2, 2009; industry representative, interview by Commission staff, Washington, DC, June 19, 2009; and Tracy, written testimony to the USITC, April 22, 2009.

[83] Industry representative, interview by Commission staff, Mumbai, India, May 29, 2009.

[84] Estimates of economic effects are affected by estimates of the elasticity of substitution affecting traded goods. The methods for estimating economic effects for tariffs and NTMs are broadly similar but differ in some details. See appendix H for further discussion.

TABLE 6.2 India: Estimated economic effects of removing NTMs on U.S. exports, 2007

Commodity groups containing food and agricultural products	2007 U.S. food and agricultural exports to India	Range of simulated U.S. exports to India in the absence of Indian NTMs		Range of simulated change in U.S. exports to India in the absence of Indian NTMs			
		Low	High	Low	High	Low	High
	Million $	Million $	Million $	Million $		Percent[a]	
Wheat	0.00	145.51	334.25	145.51	334.25	([b])	([b])
Cereal grains n.e.c.	1.13	2.67	8.64	1.54	7.50	135	661
Meat products n.e.c.	0.11	0.19	0.22	0.08	0.10	71	93
Dairy products	8.66	23.26	29.10	15.04	20.44	183	216
Beverages and tobacco products	4.19	10.39	13.53	6.20	9.34	146	223
Leather products	7.65	5.16	4.96	-2.50	-2.70	-33	-35
Total	21.75	187.18	390.68	165.67	396.67	96	165

Source: Commission staff calculations.

Note: "Low" and "High" refer to elasticities, not effects on U.S. exports; "not elsewhere classified" is denoted as "n.e.c."

[a]Total percentage changes for U.S. exports exclude wheat.
[b]Not applicable.

hides and skins; import bans for poultry; and labeling and import monitoring requirements for wine and alcoholic beverages.[85] NTM issues affecting importation of U.S. agricultural products generally, such as customs procedures, notice and comment procedures, and corruption, may also affect these products, as well as products not modeled.

Estimation of the NTM effects involves three steps: estimation of price gaps, identification of policies associated with those gaps, and simulation of economic effects. Because the presence of an NTM raises domestic prices and reduces quantities of imports much as a tariff does, Commission staff first identified products in the study for which Indian import prices are higher than export prices for the same goods from the same suppliers elsewhere in the world, after adjusting for transport costs. Commission staff estimated tariff equivalents for these products (table 6.3),[86] using data from the three-year period 2005–07 in order to take into account the annual variability both in agricultural prices and the policies involved. Commission staff also considered products for which the share of U.S. exports in Indian imports is unusually low relative to the share of U.S. exports in other markets or for which Indian imports are effectively zero. Second, among those products identified in the first step, Commission staff distinguished those products for which staff was able to document Indian NTMs that restrict imports. These products include corn and other cereal grains, pork and poultry, dairy products, wine, and leather products, which have positive NTM price gaps, and wheat, for which U.S. exports to the

[85] As noted below, the estimates of NTM price gaps make use of data from the three-year period from 2005 to 2007. The policies mentioned are applied in different ways in different years. All of the policies mentioned may not have been applied to all of the products in question in each of the three years, or subsequently. For example, as noted, certain policies pertaining to hides and skins (leather products) were relaxed in 2009.

[86] These price gaps are estimated at the Harmonized System (HS) six-digit subheading level. Separate price gaps are estimated for U.S. exports to India and rest-of-world exports to India. Estimates of economic effects are presented at the GTAP sector level and not the HS six-digit subheading level for computational reasons. See appendix H.

TABLE 6.3 India: Estimated tariff equivalents of Indian NTMs, 2005–07

Commodity groups containing food and agricultural products	Estimated ad valorem tariff equivalent of Indian NTMs on U.S. exports		Estimated ad valorem tariff equivalent of Indian NTMs on rest-of-world exports	
	For identified products	For GTAP sector	For identified products	For GTAP sector
	Percent			
Wheat	([a])	([a])	45.4	45.4
Cereal grains n.e.c.	260.6	150.5	85.8	77.4
Meat products n.e.c.	22.1	8.3	13.8	1.4
Dairy products	49.0	26.7	43.7	11.2
Beverages and tobacco products	199.2	75.1	199.7	20.0
Leather products	183.4	2.2	43.7	12.9
Average tariff equivalent	81.7	13.1	46.0	34.6

Source: Commission staff calculations.

Note: Averages for total calculated from Harmonized System six-digit subheading level data; "not elsewhere classified" is denoted as "n.e.c."

[a]Not applicable.

world are large although U.S. exports to India are zero. Using this narrowed list of products, Commission staff then estimated the economic effects of removal of the Indian NTMs using the Global Trade Analysis Project (GTAP) model, using 2007 trade data as the baseline.

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CHAPTER 7
Marketing and Distribution System

Overview

The agricultural marketing and distribution system consists of all commercial agricultural activities, from the point where raw agricultural products leave the farm to the point where they are consumed by the final purchaser. These activities include transportation, private and public storage, wholesaling, food processing, and retailing. Their cumulative cost creates a marketing margin, which is the difference between what farmers receive and what consumers pay. An efficient marketing and distribution system leads to lower marketing margins, which results in higher prices for farmers, lower prices for consumers, more production, and greater consumption.

Unfortunately, India's agricultural marketing and distribution system is considered to be largely inefficient. It is characterized by high levels of government intervention, poor quality and availability of storage and transportation infrastructure, a lack of alternative sales outlets for farmers, several layers of middlemen, limited access to marketing information, inadequate grades and standards, and few tools for risk management. As a result, large marketing margins exist for Indian agricultural products.[1]

Most agricultural products are affected by the same inefficiencies as they move through the Indian marketing and distribution system, whether they are domestically produced or imported. These inefficiencies generally do not disadvantage U.S. exports relative to Indian-produced agricultural products. Goods sold as differentiated products are the exception. Because most agricultural products in India are sold as commodities, undifferentiated by grade or quality, there is a lower supply of high-quality differentiated products—a market niche imports could occupy. Characteristics of India's agricultural marketing and distribution system, and its effects on imports, are presented in table 7.1.

Market Structure

The majority of India's agricultural output is produced on a subsistence basis by small family farms.[2] Most food products are consumed after only primary processing, such as milling and crushing of grains.[3] Consequently, much of India's agricultural production never enters formal marketing channels but is instead consumed "on-farm," meaning that it is eaten by farming households, used as in-kind payment to farm laborers, or bartered for other goods. The share of agricultural production that is marketed is the "marketed

[1] Mattoo, Mishra, and Narain, *From Competition at Home to Competing Abroad*, 2007, xvii–xviii.

[2] Nearly three-fourths of India's population lives in rural areas, and more than 60 percent of total national employment is in the agricultural sector. Government of India, Ministry of Statistics, *Statistical Pocket Book*, 2007, 5–6; Government of India, Ministry of Agriculture, *National Policy for Farmers 2007*, 1.

[3] Dhankhar, *India: Food Processing Sector*, July 2, 2008, 3.

TABLE 7.1 India: Characteristics of the agricultural marketing and distribution system and its effects on imports

Characteristic	Effect on imports
Most small farmers restricted to on-farm consumption or to sales within a state-regulated mandi (market) with few buyers.	Lower prices for domestic products with which imports compete.
Government regulations and market structures vary by state.	Added uncertainty and complexity.
Limited crop- and market-specific price information.	Lower prices for domestic products with which imports compete. Increased risks for processors buying domestic products.
Limited grades and standards.	Lack of an attribute on which imports can compete.
Limited risk management tools.	Lower prices for domestic products with which imports compete. Increased risks for processors.
High storage costs and product losses.	Increased costs, reduced quality.
Poor transportation infrastructure.	Increased costs; limits on market opportunities, particularly in rural areas. May present opportunities for imports in areas near major ports.
Unreliable and expensive electrical power. Limited availability of electrical power to rural population.	Increased cost and risk, particularly for processing. Limited market for chilled or frozen products.
Uneven application of some regulations in the organized retail sector.[a]	Increased costs for imports relative to domestic products.

Source: Compiled by Commission staff.

[a] The organized retail sector can be generally characterized as modern retail businesses, owned by companies who hire employees to work in the store. The unorganized retail sector consists of small traditional outlets, which are primarily if not exclusively family owned and operated.

surplus." Approximately half of the cereals and pulses that account for the bulk of the Indian diet are marketed, as shown in the following tabulation.[4]

India: Share of marketed surplus for certain cereals and pulses (%)

Commodity	Marketed surplus
Paddy (rice)	52
Wheat	54
Corn (maize)	46
Barley	57
Red gram (pigeon peas)	54
Green gram (mung beans)	60
Bengal gram (chick peas)	52
Lentils	49

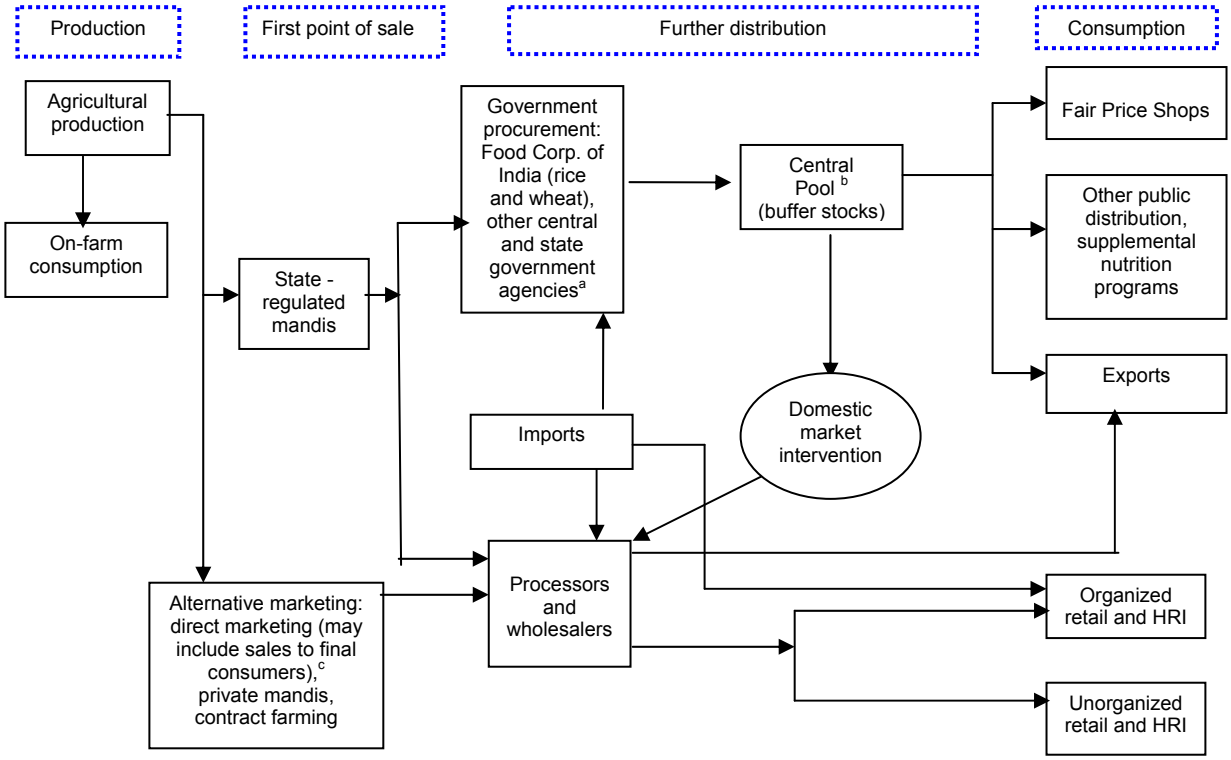
Source: Ministry of Agriculture, "Abstract of Reports on Marketable Surplus and Post-Harvest Losses of Foodgrains in India," March 2005.

Note: Data are for the three-year period ending marketing year 1998/99, the latest data published.

[4] The concept of marketed surplus is important in understanding the reactions of subsistence farmers to commodity prices. If prices for major food crops decline, subsistence farmers in India may market a larger share of their production, because the lower prices reduce farm income. Reddy, "Factor Productivity and Marketed Surplus of Major Crops in India," May 2009, 44. Therefore, a policy that results in lower prices for major food crops at the farm level could lead subsistence farmers to market a larger share of the crop, reinforcing the price decline. Similarly, an improvement in marketing, distribution, or infrastructure might be expected to result in higher returns to farmers, letting subsistence farmers offer a smaller share to the market and keep more for home consumption.

Figure 7.1 depicts the flow of agricultural products through India's marketing and distribution system. The first point of sale for marketed commodities is typically a state-regulated market, or mandi.[5] Prior to 2003, all agricultural products were required to be sold in mandis. Since that time, alternative marketing structures have been allowed in some states and territories. Government agencies procure commodities through the mandis, and private wholesalers and processors buy agricultural commodities from the mandis or alternative markets. Products reach Indian consumers through government distribution, the unorganized retail sector, and the organized retail and hotel, restaurant, and institutional (HRI) sectors.[6]

FIGURE 7.1 India: Agricultural marketing and distribution structure



Source: Compiled by Commission staff.

[a]Under the decentralized procurement scheme, state governments purchase products on behalf of the Government of India.

[b]Commodities are distributed monthly to state/union territory (UT) governments for public distribution. Stocks are held in order to ensure (1) minimum buffer stocks for food security, (2) monthly releases to state/UT governments, (3) ability to address emergency situations, and (4) ability to intervene in the market.

[c]Farmer cooperatives may also be considered a type of direct marketing. Farmer cooperatives may act as processors, wholesalers, and retailers.

[5] Farmers may also sell their products in rural village markets to brokers or consolidators who will then sell in a mandi. Farmers may also sell rice and sugar to a mill for processing, or may have their rice milled either for sale or for on-farm consumption.

[6] The unorganized retail sector consists of small traditional outlets, which are primarily family owned and operated. The organized retail sector can be generally characterized as modern retail businesses, owned by companies who hire employees to work in the store.

First Point of Sale

State-Regulated Mandis

Over time, mandis, originally designed to protect the farmers from large purchasers with market power to set prices, have become controlled by traders and middlemen; they now act to limit farmer incomes.[7] The large number of small farmers selling their products in mandis and the limited number of buyers, traders, and brokers, increases the buyers' market power. The mandis reduce the marketing opportunities available to India's farmers and keep farm-level prices low.

The system of regulated markets, or mandis, was created over a period of several years following India's independence.[8] There are more than 7,500 mandis in India.[9] Mandis guarantee agricultural producers a minimum support price (MSP) for agricultural commodities deemed essential by the Indian government.[10] Most products are sold without distinction as to grade or quality standards, and therefore farmers have little incentive to provide higher-quality products. Farmers pay a fee to access the mandi to maintain the storage infrastructure and rural roads, normally equal to 1.5–3.5 percent of the value of their crops, depending on the state.[11]

Alternative Markets

Alternative market structures were authorized by India's central government in the State Agricultural Produce Marketing (Development and Regulation) Act of 2003 (Model Act) to counter the market power of traders and brokers in the mandi. The Model Act allows, but does not require, states to create alternative marketing arrangements for farmers.[12] Most states and union territories used the opportunity presented by the Model Act to implement reforms to their state agricultural produce marketing acts, but implementation varies considerably from state to state.[13] Under most of the revised state marketing laws, mandis, regulated by local government committees (agricultural produce marketing committees, or APMCs), continue to operate as they did under the old system, but three principal alternative market arrangements have emerged: (1) direct marketing, which allows farmers to sell produce directly to consumers; (2) private mandis, owned by individuals or firms that may be granted a license by the state government to purchase directly from farmers; and (3) contract farming, which allows farmers to sell their harvest directly to purchasing companies under mutually agreed upon contract terms without

[7] Government official, interview by Commission staff, Jaipur, India, June 3, 2009.

[8] Acharya, "Agricultural Marketing and Rural Credit," 2004, 9.

[9] Tiwari, "Post-Harvest Management and Marketing," 2009.

[10] See chapter 4 for a discussion of MSPs.

[11] As a technical matter, traders and middlemen pay the infrastructure fee, but these fees are passed back to the farmers in the form of lower prices for their goods. As a consequence, farmers bear the economic burden of the fee because they have few other options to sell their crops. Traders sometimes pay the infrastructure fee twice if they sell purchased crops to another mandi market area. Fees are intended for local infrastructure projects to benefit the mandi, although the funds are often not used by local governments for their intended purpose. Industry representative, interview by Commission staff, New Delhi, India, May 5, 2009; industry representative, interview by Commission staff, New Delhi, India, May 6, 2009.

[12] As noted in chapter 4, agricultural policy implementation is largely controlled by the states rather than the central government. The central government formulates broad agricultural policies, which the states tailor to fit their specific economic and political needs. The Model Act encourages state agricultural marketing boards to promote standards, grading, quality certification, and farmer training. Chadha et al., "Competition and Regulation Issues in Indian Agricultural Markets," June 5, 2008, 5.

[13] See appendix G for a description of India's central and state government jurisdiction on agriculture.

going through local markets.[14] The farmer cooperative is another marketing form that existed prior to the Model Act and has proved successful in increasing the pricing power of small farmers (box 7.1).

BOX 7.1 Farmer Cooperatives: The Anand Pattern and Mother Dairy

Farmer cooperatives in India were established largely in response to a system in which individual small farmers have little market power. One cooperative that epitomizes this idea is Mother Dairy.

Between 1951 and 1970, milk production in India grew approximately 1 percent per year. The majority of milk producers were, as they are today, small or marginal farmers or landless laborers. Dairying was largely unorganized, and most dairies obtained their milk through middlemen who consolidated milk production into larger batches.[a]

Dairy cooperatives enable small dairy producers to reach the economies of scale of a large producer. Because farmers own the processing plants, more profits flow back to dairy producers rather than to middlemen. The Kaira District Cooperative Milk Producers' Union (AMUL) was established in 1946, originally to ship milk to Mumbai (Bombay). Under what has become known as the Anand Pattern, the milk producers formed a cooperative society at the village level. The village cooperatives formed a district-level union, and as the system expanded, the district-level unions formed a state-level federation.[b] The governing bodies of the cooperatives, unions, and federations were made up entirely of milk producers.

The largest dairy cooperative in India, Mother Dairy in Delhi, was established in 1974 by the National Dairy Development Board under the Operation Flood Programme that was formed to replicate the success of the Anand Pattern throughout India. Today, Mother Dairy is the most popular brand of milk in India and markets more than 2 million liters of milk per day. In addition to a wide range of dairy products, Mother Dairy sells edible oils, fresh fruits and vegetables, frozen vegetables, and fruit juices through the same network of vendors. All milk, and most fruits and vegetables, are sourced from village-level associations.[c]

[a] Banerjee, *Dairying Systems in India*, n.d. (accessed July 30, 2009).
[b] Joseph et al., *Impact of Organized Retailing on the Unorganized Sector*, May 2008, 170.
[c] Ibid., 171.

Direct marketing

Most agricultural products, even those that undergo little or no processing, change hands many times between the farmer and the consumer. Direct sales markets, also known as farmers' markets, facilitate the selling of perishable agricultural products, such as fruits and vegetables, directly from farmers to rural and urban consumers (including retailers in some areas).[15] By eliminating many of the intervening transactions, both buyers and sellers attain better prices.

The reach of direct marketing has been limited. Markets in rural areas are not easily accessible to many urban consumers. In addition, certain states and territories do not permit direct marketing, and some allow sales only to consumers and not to retailers. Other states have approved the practice under an administrative order that must be renewed annually and can be changed at any time.[16]

[14] Panagariya, *India: The Emerging Giant*, 2008, 315.
[15] Examples include uzhavar sandhai markets in Tamil Nadu and rythu bazaars in Andhra Pradesh. Shibu, "Rural Marketing in India," October 2008, 7; *Hindu Business Line*, "AP Rythu Bazaars," August 8, 2004.
[16] Industry representative, interview by Commission staff, New Delhi, India, May 9, 2009.

Private mandis

Some private companies are attempting to set up their own mandis, where permitted under state law.[17] Advantages of owning a mandi include (1) the ability to grade purchased crops (quality discovery), since middlemen from state mandis typically dilute the quality of the crops they sell; (2) the ability to determine the current price for a commodity (price discovery); (3) increased profits from the bundling of services with physical inputs such as the provision of seeds and fertilizers to farmers; (4) savings on fees to brokers and traders; (5) savings on labor, storage, and transportation costs; and (6) guaranteed access to warehouse space. According to industry sources, this advantage is important, because when bumper crops occur in India, the government may break contracts with private firms for the limited space available in public warehouses. A company that owns a private mandi, and thus the warehouses, avoids this problem.[18]

Contract farming

Contract farming creates a direct link between farmers and food processors or restaurants for the supply of a particular commodity of a certain quality at a specified price. Contract farming ensures purchasers a stable supply at a specified quality and lowers the transactions costs of dealing with large numbers of small-scale farmers.[19] Some contracts give the purchaser control over the seeds, other inputs, and farming techniques used by farmers. Contracts can benefit farmers by increasing their access to inputs, lowering business risk, and providing a better-paying market for a differentiated product. Some U.S.-based firms, as well as other multinational producers and domestic firms, have been involved in contract farming. Examples include PepsiCo's contracts with farmers in Maharashtra and Karnataka for potatoes and Agrocel's contracts for organic basmati paddy rice in Haryana.[20]

Successful contract farming arrangements have been those in which the contracting firm has (1) established a long-term relationship with the farmers, with additional financial incentives for loyalty to the contract; (2) set up a third-party arbiter with the ability to enforce the contract; and (3) contracted for a product that offers few marketing opportunities beyond the contracting purchaser (e.g., mint grown in Punjab).[21] In other cases, the contracting system has not been as successful. Problems with contract farming have arisen because the contracts are not legally enforceable, and breaches by both farmers and firms have occurred.[22]

Further Distribution

Government Procurement

Government purchases account for a large share of all agricultural sales each year. For example, either the Food Corporation of India (FCI), a government-owned entity, or a state agency acting on its behalf is obligated to buy rice and wheat at the MSP. The

[17] Industry representative, interview by Commission staff, New Delhi, India, May 8, 2009.
[18] Ibid.
[19] Industry representative, interview by Commission staff, New Delhi, India, May 6, 2009.
[20] Singh, "Leveraging Contract Farming," 2007, 4–10.
[21] Ibid., 7–10.
[22] Industry representative, interview by Commission staff, Mumbai, India, May 29, 2009; industry representative, interview by Commission staff, New Delhi, India, June 2, 2009.

government bought more than one-half the estimated marketed surplus of rice and wheat (the two largest Indian food crops by volume) produced in marketing year 2008/09.

The Indian government purchases farm products for two purposes: maintaining stocks for food distribution to the poor and ensuring a minimum price to those farmers by buying from farmers at MSPs. The FCI procures food grains (wheat and rice), and under the Department of Agriculture and Cooperation's Price Support Scheme, the National Agricultural Marketing Federation (NAFED) purchases oilseeds, pulses, and cotton.[23] Under the Market Intervention Scheme, NAFED and designated state agencies purchase perishable commodities at the request of the states, if prices fall below the respective MSPs.[24]

Government purchases of rice and wheat at the MSPs set market prices for these two commodities. This price support encourages higher production levels of wheat and rice. By contrast, most of the other crops subject to MSPs sell at higher market prices, rendering MSPs ineffective in stimulating more Indian production. In addition, industry representatives state that crops other than rice and wheat receive less government support than the two main staple crops.[25] Many of the 25 crops with announced MSPs do not have any designated government agency that purchases product at the MSP. If prices fall below the MSP, the only available recourse is to petition state governments for relief.[26]

Wholesale and Processors

As noted in chapter 4, most agricultural processing in India is primary processing such as milling of rice, oilseeds, and pulses, and processing accounts for only a small share of the total value of agricultural production. In contrast, wholesaling accounts for a large share of expenditure on agricultural products.[27] Even products such as pulses that undergo only minimal processing change hands multiple times in the marketing and distribution chain. Decisions on pricing, transportation across state lines, storage fees, and stocking volume are all subject to state regulation, which increases the complexity and cost of operating within India's marketing and distribution system.

Consumption

Government Distribution

The Indian Public Distribution System (PDS) supplies rationed quantities of basic food items (e.g., rice, wheat, sugar, and edible oils) at below-market prices primarily to the

[23] In 11 states, state agencies procure wheat and rice on behalf of the central government. Government of India, Department of Food and Public Distribution, *Annual Report*, 2008, 12.

[24] Additionally, NAFED and the Cotton Corporation of India are responsible for procurement of cotton, and the Jute Corporation of India procures jute. Commodities other than rice and wheat are purchased through a decentralized program in the various states. Government of India, Ministry of Finance, *Economic Survey*, 2009, 180–181. Another central government agency, the Central Warehouse Corporation, and 17 state warehousing corporations are involved in the storage of food grains and other essential commodities. Government of India, Department of Food and Public Distribution, *Annual Report*, 2008, 90, 52.

[25] Industry representatives, interviews by Commission staff, May 26 and 28, June 4 and 5, 2009.

[26] Government of India, Ministry of Finance, *Economic Survey*, 2009, 180–181.

[27] Industry representative, interview by Commission staff, Mumbai, India, June 1, 2009; Khan, *The Domestic Food Market*, n.d., 9.

approximately 65 million households "below the poverty line" or BPL.[28] These basic food items are distributed through a network of outlets, called Fair Price Shops, as well as through other nutrition programs targeted to specific populations. Public distribution policy is set by the central government but implemented by the states and territories. Commodities are transferred to the states and territories at the central issue price (CIP). Government distribution of agricultural products through the PDS and other subsidy programs has an impact on the wholesale price in the private market. Increases in the CIP have been shown to have a positive impact on wholesale prices.[29] The CIPs for rice and wheat have been unchanged since July 2002.[30]

By design, the large volume of essential commodities distributed at subsidized prices holds down consumer prices. Buffer stocks held in a central pool not only ensure the viability of the distribution programs but are also used to directly restrain wholesale price increases. At the direction of the central government, wheat is sold at predetermined prices during the off-season in order to moderate price increases. Additionally, rice that is old or otherwise unacceptable for distribution to state governments is sold through public tenders.[31]

Retail and Hotel, Restaurant, and Institutional (HRI) Sales

Food is available to consumers through both organized and unorganized retail channels. Indian consumers purchase food primarily in the unorganized retail sector. Unorganized retail outlets are generally small traditional shops, which are primarily, if not exclusively, family owned and operated. More than 99 percent of food and beverage retail sales in India were made by unorganized retailers in fiscal year (FY) 2005/06.[32] Types of unorganized retail outlets include bazaars, roadside stands, and small mom and pop stores (*kiranas*). In 2006, the number of kiranas was estimated at 6.5 million.[33] Although rural kiranas may often have limited offerings, in large urban centers such as New Delhi and Mumbai they may offer a wide range of products, including imported and multinational branded goods.[34]

Despite their generally crowded ambiance, kiranas reportedly have a distinct advantage in customer service when compared to organized grocery stores, largely because kiranas are family-owned and -operated stores with low labor costs.[35] Services offered by kiranas include phone orders, home delivery, credit sales, and small-quantity sales (e.g., individual cigarettes or a few pieces of bread). Further, by knowing their regular

[28] Tritah, "The Public Distribution System in India," July 7, 2003, 2; Government of India, Department of Food and Public Distribution, *Annual Report 2007–2008*, 27. The number of BPL households is reported by state, based on poverty estimates of the Registrar General of the Government of India as of March 1, 2000. The Indian PDS was renamed the "Targeted Public Distribution System" in 1997, although PDS is still more commonly used to describe this antipoverty program.

[29] Ramaswami and Balakrishnan, "Food Prices and the Efficiency of Public Intervention," 2002, 420.

[30] Ibid., Government of India, Department of Food and Public Distribution, *Annual Report 2007–2008*, 19.

[31] Government of India, Department of Food and Public Distribution, *Annual Report 2007–2008*, 19–20 and 45–46.

[32] Singh, *India: Retail Food Sector*, December 21, 2006, 2.

[33] Ibid.

[34] Govindan, *India: Exporter Guide*, October 1, 2007, 100; Govindan and Dhankhar, *India: Exporter Guide*, October 1, 2008, 10; observation of Commission staff when visiting markets and stores in New Delhi and Mumbai, India, May 27, 29, and 30, 2009.

[35] Observation of Commission staff when visiting markets and stores in New Delhi and Mumbai, India, May 27, 29, and 30, 2009; industry representative, interview by Commission staff, New Delhi, India, May 9, 2009.

customers, the operators of kiranas offer the ability to anticipate habits and needs for special occasions.[36]

Organized retail outlets, or supermarkets, can be generally characterized as modern retail businesses, owned by companies who hire employees to work in the store. They include small chain stores, grocery stores, and hypermarkets.[37] The sales share of such stores in the Indian marketplace is very small. The sector caters mainly to a small slice of the more affluent urban population for a small fraction of their overall grocery purchases. In FY 2006/07, only 0.8 percent of India's estimated $168 billion in food and beverage sales were made by organized retailers.[38] In theory, supermarkets offer a wide range of Indian and imported products and cater to a population wanting a wider selection of foods.[39] In reality, Indian supermarkets often have a rather small product range, although they offer multiple types of each product, whereas some kiranas have a large variety of products.[40]

Reducing the costs of the "back end" of retail and controlling purchase costs has been a key feature in organized retail in many developing countries. The same is true in India. Organized retailers in India have tried to increase efficiency by eliminating some of the middlemen.[41] The expansion of organized retail in developing economies has generally led to lower consumer prices and higher quality, with the effects noted first for sales of fruit and of processed and semiprocessed foods.[42] Research suggests that information on quality particularly benefits organized retailers more than those in the unorganized sector, as larger firms have more ability not only to supply high-quality goods but advertise them.[43] To date, organized retailers in India have not been able to significantly lower prices on the majority of grocery products below those charged by the unorganized sector because organized retailers have not been successful in reducing the complexity of the supply chain.[44] As the organized retail and the HRI sectors grow, the demand for processed agricultural products and branded products is expected to expand. For a discussion of foreign direct investment (FDI) regulations on organized retail, see chapter 8. Information on grocery products offered by type of establishment is presented in table 7.2.

[36] Industry representative, interview by Commission staff, New Delhi, India, May 9, 2009; government official and industry representative, interview by Commission staff, New Delhi, India, May 26, 2009; industry representative, interview by Commission staff, Mumbai, India, June 3, 2009; and Singh, *India: Retail Food Sector*, December 21, 2006, 12.

[37] Hypermarkets are large supermarkets that offer a variety of nonfood items.

[38] Singh, *India: Retail Food Sector*, December 21, 2006, 2; Joseph et al., *Impact of Organized Retailing on the Unorganized Sector*, May 2008, 10. Organized retail in the grocery segment has lagged development in other sectors. In FY 2006/07, the share of organized retail in India's total retail sales of all products was approximately 4.1 percent.

[39] Govindan, *India Exporter Guide*, October 1, 2007, 10; Govindan and Dhankhar, *India: Exporter Guide*, October 1, 2008, 10.

[40] Industry representative, interview by Commission staff, Mumbai, India, June 2, 2009.

[41] Industry representatives, interviews by Commission staff, New Delhi, India, May 26, and May 27, 2009.

[42] Reardon and Berdegue, "The Retail-led Transformation of Agrifood Systems," November 2006, 2.

[43] Reardon and Hopkins, "The Supermarket Revolution in Developing Countries," December 2006, 543.

[44] Retailers have generally been unable to significantly reduce the number of middlemen, even for products that undergo little processing. Industry representatives, interviews by Commission staff, New Delhi, India, May 29, 2009, and Mumbai, India, June 1, 2009.

TABLE 7.2 India: Food retail establishments and characteristics by outlet type

Type of outlet	The central plazas/bazaars	Street markets and roadside stands	Small stores/kiranas	Midsize grocery stores	Hypermarkets
Estimated number	1,000	10–12 million	Over 6.5 million	Unknown, but certainly a small number, as organized retail is estimated at 1 percent of the market.	
Estimated store size	Groups of approximately 100 stalls. Average stall size is 5–10 ft by 10–15 ft.	Varies greatly. Can range from a table to a large shop with multiple vendors.	Less than 2,000 square ft	3,000-6,500 square ft	25,000-150,000 sq ft
Type	Unorganized	Unorganized	Mostly unorganized, but some organized chains	Organized	Organized
Characteristics	Groups of stalls that together sell a large range of items, usually within a building complex.	Generally, little to no ambiance.	Variety of range of products from limited amount to a wide range of products, although not necessarily a large number of each product. Generally, little to no ambiance, but good customer service.	Often clean and well lit. Self-service.	Quality varies, both for the store itself and for the presentation of all products. Some stores are dimly lit and poorly managed; some are well lt, clean, and well run. Self-service.
Typical refrigeration	None	None	Some, mostly small beverage units.	Some refrigerated cases	Full range of refrigerated display cases
Types of goods sold	A wide selection of goods, including local fruits and vegetables, pulses, snack foods (including chips and nuts), and spices. Some processed and consumer goods. Small amount of imported fruit.	Selection of goods can range from a handful of items at small stores to a wider range (20–30 different fresh items) at large stores. Imported fruit available. Limited information on other products available.	Produce selection averages 15–30 items. Also dry goods. Some have bakeries and/or meat counters. Mainly at organized outlets: domestic food brands, including regional and specialty brands and some imported foods. Imported fruit available. Some outlets carry dairy and/or frozen foods.	Produce selection averages 20–50 products, although some chains offer significantly more selection. Domestic food brands available, including regional and specialty brands and some imported foods. Imported fruit available. Many have bakeries and dairy sections. Some have frozen food section.	Range of products, including produce, dry goods, beverages, and snack foods of both domestic and foreign origin. Some also have bakeries and meat sections. Also sell nonfood items.

Sources: Florida Department of Agriculture and Consumer Services, *India: Road to Success, 2007*; Singh, *India: Retail Food Sector;* 2006; Commission staff interviews with industry officials, Mumbai and New Delhi, India, May 4 to June 5, 2009; Commission staff observation of various food retail outlets, Mumbai and New Delhi, India, May 30, 2009, and May 27, 2009.

Note: There are no clear dividing lines between categories of unorganized retail, and even the number of outlets varies according to the different definitions.

As with the retail food sector, the restaurant sector has organized and unorganized segments. The unorganized restaurant sector includes snack shops, tea shops, roadside eateries, and other informal restaurants, on which there are insufficient data.[45] Organized restaurants and hotels in India are likely to buy imported food to satisfy their clientele; in fact, imported food and beverages are primarily consumed in the HRI sector. Imported foods are often served because the items in question are not available domestically or the domestic quality is not high.[46] One study found that hotels constitute an especially important potential market for imported foodstuffs because they are normally among the first users of imported products and often cater to an international clientele.[47]

Attributes of an Efficient Marketing and Distribution System

Characteristics of competitive markets that contribute to efficient marketing and distribution systems include (1) many sellers and many buyers, so that both are "price takers;" (2) the availability of timely and reliable information to all potential sellers and buyers; and (3) low transaction costs resulting from modern transportation networks, few middlemen, and no administrative restrictions on movement of products within the country. Inefficiencies in the Indian agricultural marketing and distribution system, stemming from shortcomings in these characteristics, drive a price wedge between producers and consumers.

Concentration

One of the characteristics of a competitive, efficient market is a large number of buyers and sellers, none with enough market power to influence prices by themselves. India's marketing system does not fit this profile. There are a relatively small number of buyers and a large number of farmers in the mandi system. Although the mandi system was set up to counter the market power of corporations or other large purchasers and give farmers a better profit margin, traders now maintain significant market power.[48] For commodities other than rice and wheat, MSPs have little impact on market prices in major producing states, and the market power of buyers is unhindered.[49]

Market Information

Access to price and quality data is one of the cornerstones of an efficient competitive market, but the typical Indian farmer has little up-to-date information on the price, quality, and volume of agricultural products in specific markets. The small size of most Indian farms and the small volume marketed by these marginal farmers mean that the benefits of price discovery are slight for the individual farmer. A low literacy rate and

[45] Bryant Christie Inc., "India Research Study for California Agricultural Exporters," January 31, 2008, 13; Singh, *India: HRI Food Service Sector*, December 14, 2007, 2.

[46] Singh, *India: HRI Food Service Sector*, December 14, 2007, 4.

[47] Imported seafood, cheeses, and high-end cuts of lamb are reportedly highly demanded by hotels. USMEF, "India's Pork Market," March 2007, 18.

[48] USIBC, written submission to the USITC, June 26, 2009.

[49] Agmarknet Web site, http://www.agmarknet.nic.in. Numerous interviews with industry representatives in India confirm that, except for wheat and rice, government support programs for most major agricultural products have little impact on prevailing prices.

poor communications infrastructure contribute to the lack of information.[50] National policy on futures markets is another problem: in some countries, futures markets serve as one avenue of price discovery; but in India, many futures markets are banned or restricted.

There have been some advances in market information, such as the arrival of e-Choupal, Agriwatch, and similar programs that provide time- and location-specific prices on commodities. These programs, however, do not reach all farmers in India.[51]

Grades and Standards

The lack of a widespread, well-functioning system of grades and standards is another factor impairing the efficiency of Indian agricultural markets. Not only does such a system enable the participant to characterize a product precisely enough that price information is meaningful, but use of the system also minimizes inspection costs. The lack of well-defined quality standards in India limits opportunities for buyers to purchase specific high-quality products that they seek. With the majority of Indian agricultural products sold as undifferentiated commodities, producers have no incentive to provide goods with unobserved higher-quality attributes. Some information is provided from producers to wholesalers, but not from wholesalers to retailers.[52] Even when it is known that certain buyers are paying a price premium for quality, high costs for storage and transportation often make it impossible for the typical Indian farmer to transport a product to a more lucrative market.

Indian agricultural products for domestic consumption, as well as for export, can be certified under standards of quality or safety established by the Agricultural Produce (Grading and Marking) Act, commonly known as the Agmark grading system; but in practice, most domestic products for internal consumption are not graded.[53] The Agricultural Marketing Information Network (Agmarknet) database maintained by the Ministry of Agriculture provides market-specific information on approximately 300 commodities in 1,900 markets, but information on quality is lacking. Most grain, for instance, sold in mandis is not sold through a strict grading system, but simply as fair to average quality (FAQ).[54] One reported advantage to a processor or wholesaler of buying in a local mandi is the opportunity to inspect the product for quality attributes.[55]

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[50] Approximately 75 percent of farmers are illiterate or semiliterate, and languages and dialects vary from region to region. Shibu, "Rural Marketing in India," October 2, 2008, 5. Official statistics report that 60 percent of adults in India were literate as of FY 2004/05. Government of India, Ministry of Statistics and Programme Implementation, *Statistical Pocket Book*, 2007, 47.

[51] ITC, Ltd.'s e-Choupal service, for example, currently serves 4 million farmers in 40,000 villages across 10 states with a series of 6,500 internet kiosks, but expects to double its reach over the next 5 years. ITC Ltd. e-choupal Web site, http://www.itcportal.com/rural-development/echoupal.htm (accessed September 10, 2009). Other services disseminate information through internet services and the postal system. Industry representatives, interviews by Commission staff, New Delhi, India, May 26 and Mumbai, India, June 1, 2009.

[52] Government official, interview by Commission staff, New Delhi, India, May 26, 2009. Reportedly, Indian consumers are very price sensitive. There is some brand loyalty, but only if a quality difference is visible to consumers.

[53] Government official, interview by Commission staff, New Delhi, India, May 27, 2009.

[54] Landes, *The Environment for Agricultural and Agribusiness Investment in India*, July 2008, 34; Agmarknet Web site, http://www.agmarknet.nic.in/.

[55] Industry representative, interview by Commission staff, Mumbai, India, May 29, 2009.

Risk Management

Economic risk in agriculture comprises many components, including (1) production risk, also known as yield risk, related to weather, pests, or disease that limit the volumes produced; (2) price risk, related to the uncertainty of the prices for inputs compared to the final price of the agricultural outputs; (3) institutional risk, related to changes in the government policy environment under which farmers operate; (4) financial risk, relating to the source and methods of financing the farming operations; and (5) personal risk, related to death or illness of the farmer or other workers.[56] Of these components, institutional risk, financial risk, and personal risk are outside the scope of this study.[57]

Risk management tools allow agricultural producers to lower price and production risks in their operations. These tools include futures markets that mitigate price risk for farmers, crop insurance that limits production risk, and contract farming that lessens both price risk for farmers and production risk for purchasers.[58]

India's risk management system is inefficient, in part, because government regulations restrict the tools that can be used. For example, in May 2008, the Indian government banned futures trading in soybean oil, chickpeas, and potatoes, citing speculation on the exchange as a factor contributing to rising prices for those commodities.[59] India banned futures trading in wheat for approximately 30 months, before revoking the ban in May 2009. Also in May 2009, futures trading in sugar was banned.[60] Bans on trading agricultural commodities futures restrict the ability of farmers, traders, and purchasers to engage in price discovery.

Even where risk management tools are permitted, the Indian system is inefficient in managing risk. A statistical analysis of four agricultural commodities (castor, cotton, pepper, and soybeans) traded on India's commodities futures exchange indicates the exchange is not yet providing enough price discovery to allow farmers to properly hedge their prices. This is because of thin market volumes, infrequent trading, ignorance among farmers of the futures trading process, underdeveloped spot markets, poor transportion infrastructure, and the absence of a well-developed system of grades and standards.[61] Another example of India's inefficient risk tools is government-run crop insurance. Since 1985, the Indian government has required all farmers that take out farm loans to purchase crop insurance, first through the All-Risk Comprehensive Crop Insurance Scheme and later by a successor program, the National Agricultural Insurance Scheme (NAIS), which began in 1999. The intent of NAIS is to provide stable incomes to farmers in the event of poor weather, pests, and diseases. The Indian government admits that the scheme has

[56] Hardaker, Huirne, and Anderson, *Coping with Risk in Agriculture*, 1997; Coble and Barnett, *An Assessment of Risk Exposure in Agriculture: A Literature Review*, December 16, 2008.

[57] In particular, this study was not asked to provide any analysis on institutional risk as defined—i.e., on the likelihood of future changes in current Indian policies.

[58] In Indian contract farming, the lower production risk for purchasers consists of access to higher-quality agricultural products or products that more closely conform to the specifications required. This occurs because the purchasers provide seeds and other inputs to farmers. Contract farming provides price risk management for farmers because the contract price is guaranteed, and also because, in practice, farmers routinely break the contract with the purchaser when spot prices are higher than the contract price but are rarely if ever sued for breach of contract. Industry representative, interview by Commission staff, New Delhi, India, May 6, 2009.

[59] *Egypt News*, "India Bans Rubber, Soybean Oil Futures to Cool prices," May 8, 2008.

[60] *Commodityonline.com*, "India Bans Futures Trading in Sugar," May 26, 2009.

[61] Easwaran and Ramasundaram, "Whether Commodity Futures Market in Agriculture Is Efficient in Price Discovery?—An Econometric Analysis," 2008, 337–344.

limited popularity with farmers because payments are based on yield estimates performed after the calamity, which delays the processing of claims, and because loss assessments are based on wide agricultural areas and not on individual farmer losses. Under the scheme, farmers with heavier-than-average losses are insufficiently reimbursed.[62]

Government Intervention

A competitive market is efficient because goods are valued according to the costs of production and the value to purchasers. Indian government interventions aimed at the goals of increased food security and self-sufficiency distort production decisions for farmers and act to limit the options available to producers and consumers. In particular, government support programs for irrigation, electricity, fuel, and fertilizer distort production decisions for crops that require more of these inputs.

MSPs and other government support for rice and wheat set the market price for these commodities that account for one-half the food calories consumed in India.[63] The lower level of government support for other commodities biases production decisions toward rice and wheat. For commodities sold at MSPs, quality differences are uncompensated. As noted, this discourages farmers from providing high-quality commodities if this would require greater expenses.

Other than MSPs, most government intervention is at the state level, which adds further complexity to decision-making for firms with operations in more than one Indian state. Prices can vary considerably from state to state for even basic commodities.[64] In addition, the Essential Commodities Act (ECA) of 1955 enables the national and state governments to impose restrictions on the storage, transport, price, distribution, and processing of certain "essential" agricultural products.[65] The ECA was repealed administratively in 2005 because of surplus market conditions, but remained on the official record.[66] In 2008, when food prices rose, the national government reauthorized the ECA, allowing states to implement these restrictions again. States implemented the law on an ad hoc basis, often through orders requiring firms to maintain strict stock limits and follow other regulations that stymied profits and investment.[67] The effect of the ECA and the corresponding state acts is to inhibit the internal integration of the Indian market for the regulated commodities.[68]

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[62] Government of India, Planning Commission, *India's Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 21–22.

[63] See chapter 3.

[64] Government of India, Agriculture Division Planning Commission, *Report of the Working Group on Agricultural Marketing Infrastructure*, January 2007, 19.

[65] Panagariya, *India: The Emerging Giant*, 2008, 313. Agricultural commodities deemed "essential commodities" by the Indian government as of December 15, 2004 (the latest data available), include (1) cattle fodder, including oilcakes and other concentrates; (2) foodstuffs, including edible oilseeds and oils; (3) raw cotton, either ginned or unginned, and cottonseed; (4) raw jute; and (5) seeds, including seeds of food crops and seeds of fruits and vegetables, seeds of cattle fodder, and jute seeds. Government of India, Ministry of Consumer Affairs, Food, and Public Distribution, "Essential Commodities Act, 1955." Edible oils are not covered under the ECA; rather, they are regulated under other laws, such as the Food Safety and Standards Act of 2006. Industry representative, interview by Commission staff, Jaipur, India, June 3, 2009.

[66] Industry representative, interview by Commission staff, New Delhi, India, May 9, 2009.

[67] Ibid.

[68] Another consequence of regulation under the ECA is that some potential investments in storage infrastructure have been delayed or abandoned because of the restraints imposed by the act, and the uncertainties this level of state intervention has generated. Industry representative, interview by Commission staff, New Delhi, India, May 6, 2009.

Until the 1990s, food processing was legally reserved for small-scale enterprises. Although these regulations have been repealed, the sector still largely consists of small, nonintegrated firms.[69] Larger processors often are unable to obtain a consistent source of inputs. Current regulations, plus the legacy of the reservations for small enterprises, can keep firms from attaining efficient economies of scale.

Transaction Costs

The difference between producer and consumer prices depends on a large number of variables, including the amount of processing the raw agricultural product undergoes before it is consumed. As noted, most food in India is consumed with only minimal processing. Yet, prices for consumers are often many times higher than prices paid to farmers. Some of the major components of this price difference between farmers and consumers are (1) the sheer number of transactions, (2) the costs and losses of storage, (3) high prices for power, and (4) high transportation costs.

Market Integration

Agricultural goods in India change hands multiple times, with each transaction adding to the cost. The effect of the Indian system is that the delivered price of a typical horticultural good in India, for example, may be seven to eight times the farmgate price.[70] One reason is the fragmented supply chain. A recent study of typical Indian transactions for pulses found that returns to agents, wholesalers, and retailers outweighed the costs of processing, transportation, and taxes in all markets studied.[71]

Storage

Storage and cold chain facilities are extremely limited in India. Poor storage infrastructure contributes to large seasonal variation in the price of domestic agricultural products.[72] Storage losses in public warehouses have been estimated at 12 percent. Post harvest losses of food grains has been estimated at 10.5 percent.[73]

Only 9 percent of the markets to which farmers take their produce have any cold storage capacity.[74] The lack of cold storage capacity contributes to severe swings in product availability for common vegetable crops such as onions, tomatoes, and cauliflowers. Prices for onions, for example, are as much as 10 times higher during the off-season than during the harvest.[75]

[69] Dhankhar, *India: Food Processing Sector*, July 2, 2008, 3; Landes, *The Environment for Agricultural and Agribusiness Investment in India*, 17; industry representative, interview by Commission staff, Mumbai, India, May 29, 2009; and industry representative, interview by Commission staff, Mumbai, India, June 1, 2009.

[70] Mattoo, Mishra, and Narain, *From Competition at Home to Competing Abroad*, 2007, xvi.

[71] Industry representative, interview by Commission staff, Mumbai, India, June 1, 2009.

[72] Industry representative, interview by Commission staff, New Delhi, India, May 28, 2009.

[73] Government of India, Agriculture Division Planning Commission, *Report of the Working Group on Agricultural Marketing Infrastructure*, January 2007, 81.

[74] Ibid., 77.

[75] Maheshwar and Chanakya, *Postharvest Losses Due to Gaps in Cold Chain in India*, 2006, 778.

The lack of infrastructure for electricity, as well as its high cost and poor quality, contribute to storage problems for products that are chilled or frozen.[76] Operating expenses for cold storage units in India are more than twice the costs in the West, partly because of high energy costs.[77] The lack of adequate cold storage infrastructure restricts sales and raises costs for products that require cold storage.

Electricity

According to data from the Ministry of Power, India's energy shortage for FY 2007/08 was 9 percent, the second-highest level in the last 10 years, behind only FY 2006/07; the peak unmet shortage was more than 15 percent, the highest in the past 10 years.[78] As a result, the electrical power supply is subject to frequent planned outages and unplanned interruptions.[79] Unreliable electricity provision increases risks and costs for cold storage and processing facilities, which must purchase generators and fuel to avoid shutdowns that would cost them even more.[80]

About one-half of India's rural population lacks access to electricity.[81] The government is attempting to address this problem, but much remains to be done. India launched the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) program in 2005 as part of the Bharat Nirman national rural development program. This program had the goal of bringing electricity to 125,000 villages and 23 million households out of the estimated 78 million total households without access to electricity. Through March 2009, the RGGVY program had reached approximately 60,000 villages and provided electricity to just over 5 million BPL households.[82]

Pumping groundwater for irrigation is a significant drain on the overtaxed power grid and has contributed to water shortages in some areas.[83] Low electricity rates for agriculture have encouraged drilling and pumping groundwater for irrigation. Subsidized electricity for agricultural use and flat-rate metering in many rural areas have led to overuse on the part of farmers and have deprived power companies of resources needed to maintain and expand the power grid.[84]

Transportation

Transportation in India is slow and expensive. The World Economic Forum ranks Indian transport and communications infrastructure 52nd out of 118 countries in its *Enabling*

[76] For example, pizza is gaining in popularity in India. One exporter approached an Indian importer with intentions to sell frozen pizza that could be heated in a microwave at a fraction of the cost of quick-serve pizza. The importer explained that most Indians do not have freezer space or microwaves, and most retail outlets either do not have freezers to store the product or turn the freezers off at night. Industry representative, interview by Commission staff, New Delhi, India, June 2, 2009.

[77] Maheshwar and Chanakya, *Postharvest Losses Due to Gaps in Cold Chain in India*, 2006, 779.

[78] Government of India, Ministry of Power, *Annual Report: 2007–08*, 11.

[79] Industry representative, interview by Commission staff, Mumbai, India, May 30, 2009; industry representative, interview by Commission staff, New Delhi, India, June 5, 2009.

[80] In the affluent city of Gurgaon, electricity service reportedly stops three or four times per day, and the cost of electricity produced by the company-owned generator was twice that charged by the utility company. Industry representative, interview by Commission staff, Gurgaon, India, June 5, 2009.

[81] World Bank, *World Development Report 2008*, 322.

[82] Government of India, Ministry of Finance, *Economic Survey*, July 2009, 232.

[83] International Water Management Institute, "The Energy-Irrigation Nexus," November 2003, 2.

[84] Ibid.,1; International Water Management Institute, "Improving Performance and Financial Viability of Irrigation Systems in India and China," April 2006, 1.

Trade Index 2008. Poor transportation networks in India effectively increase costs for both domestic food products and imports and reduce demand by limiting the number of consumers that can be reached.

According to the Ministry of Road Transportation and Highways, 65 percent of freight and 85 percent of passenger traffic is carried by road, a share that has been increasing.[85] Long-haul road transportation in India is characterized by long and unreliable transit times; long-haul delivery times average approximately twice those in the United States.[86] A number of characteristics make transportation in India slow and expensive:

- The mixed traffic on most roads, consisting of bicycles and animal-drawn carts as well as freight trucks and private automobiles, slows movement of freight by truck.
- The speed limit for trucks is typically 40 kilometers per hour.
- Congestion and the generally poor condition of many highways further increase transport times, even on the national highway system.[87]
- Only a small share of highways are limited access.[88]
- Differing state regulations force truck traffic to stop at state borders and incur further delays, accounting for 15–25 percent of transit time.[89]
- Entry taxes imposed at state borders plus informal payments at checkpoints add 5–10 percent to the cost of goods transported between states.[90]
- There is a lack of standardization in Indian transportation regulations in areas ranging from emissions to weight standards and driver and vehicle safety. Academic studies of transportation regulatory standardization in other economies indicate that the long-term cost of the lack of standardization is significant.[91]

The absence of highway access for many rural Indians effectively eliminates them from being potential customers. Many of India's poor, particularly in rural areas, are not served by year-round roads. This situation reduces the demand for agricultural products from outside the immediate area, particularly those that require refrigerated storage. Rural roads are maintained by the various states, so the quality of rural roads varies widely. In 2000, approximately 40 percent of India's villages, containing 74 percent of its rural population, lacked access to an all-weather road; the 2008 *World Development Report*

[85] Government of India, Ministry of Road Transportation and Highways, *Roads & Highways: An Overview* (accessed April 6, 2009); Landes, *The Environment for Agricultural and Agribusiness Investment in India*, July 2008, 30.

[86] Landes, *The Environment for Agricultural and Agribusiness Investment in India*, July 2008, 30.

[87] The national highway system accounts for only 2 percent of the road network but reportedly carries 40 percent of the all road traffic. Government of India, Ministry of Road Transportation and Highways, *Roads & Highways: An Overview* (accessed April 6, 2009). One industry representative reported that the poor state of the highways also means that packaging for products must be more robust, and therefore more expensive. Industry representative, interview by Commission staff, New Delhi, India, May 26, 2009.

[88] Limited access highways are those roadways with vehicle entrance restricted to a relatively small number of points. Even most of the national highway system is not limited access.

[89] World Bank, *India: Road Transport Service Efficiency Study*, November 1, 2005, 17.

[90] Industry representative, interview by Commission staff, New Delhi, India, June 4, 2009.

[91] World Bank, *India: Road Transport Service Efficiency Study*, November 1, 2005, 18–19.

found that 39 percent of the rural population lacks access to an all-season road.[92] Planning documents for India's Eleventh Five-Year Plan report that as of March 2007, 35 percent of villages were not yet connected by all-weather roads. The current plan calls for all towns and villages of more than 1,000 to be connected by the end of 2009.[93]

The efficiency of Indian ports lags that of other major trading nations in Asia but is not reported as a significant barrier to U.S. agricultural exports. When asked about major barriers to imports, only two industry representatives mentioned that unloading at Indian ports was unusually slow, and neither reported that delays were caused by deficiencies in port infrastructure.[94] Capacity and volume of traffic have increased significantly in recent years, and planned expansions under the Eleventh Five-Year Plan will more than double port capacity.[95] Between FY 2001/02 and FY 2006/07 average ship berth output (ASBO) increased 76 percent, and average ship turnaround time (ASTA) declined 39 percent.[96] However, a report for the Confederation of Indian Industry noted that in 2006, ASTA at Indian ports was approximately 20 times longer than in Singapore and that ASBO in Indian ports lags that of other major shipping nations.[97] Since FY 2006/07, ASBO has improved but ASTA has worsened, both slightly.[98]

Effects on U.S. Exports

Many of the inefficiencies that exist in the Indian system do not disproportionately disadvantage imports over domestic products. Transportation infrastructure, for example, increases costs for all firms in India. The regulations imposed under the ECA restrict domestic production as well as imports. The poor state of the electric power grid and the high cost of electricity create problems for all firms with a presence in India. The absence of an integrated market for intermediate goods and the lack of consistent water supplies may increase costs on all agribusiness firms with production in India.[99]

However, some characteristics of the Indian marketing and distribution system do adversely impact imports more than domestic products. Price volatility of some products due to deficiencies in storage capacity, combined with the long and uncertain delays in approving import licenses, can serve as a barrier to imports of agricultural commodities.[100] Some imports may require storage and handling that is not readily available in India.

Organized retailers and suppliers, both foreign and domestic, have some costs that are not borne by their unorganized competitors. Current food safety regulations are unevenly applied within the Indian food distribution system. Organized retailers and suppliers are forced to comply with regulations and bear the resultant costs but gain little in return. For example, regulations specify that packaging for edible oils should not be reused.

[92] World Bank, *Rural Roads*, 2007, 1; World Bank, *World Development Report* 2008, 322.
[93] Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 294.
[94] Industry representatives, interviews by Commission staff, New Delhi, India, May 26, 2009, and Mumbai, India, May 28, 2009.
[95] Government of India, Ministry of Shipping, Road Transport and Highways, *Report of the Working Group for the Port Sector*, March 2007, 19; Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 314, 318.
[96] Government of India, Planning Commission, *Eleventh Five Year Plan: 2007–12*, vol. 3, 2008, 315.
[97] Cygnus, "Background Note—Logistics," September 2006, 5.
[98] Government of India, Ministry of Finance, *Economic Survey 2008–09*, 244.
[99] Landes, *The Environment for Agricultural and Agribusiness Investment in India*, July 2008, 17.
[100] Industry representative, interview by Commission staff, New Delhi, India, June 4, 2009.

Organized suppliers must comply with this requirement, but as most edible oil is sold in the unorganized market, the majority of their competitors do not have this expense.[101] Uniform application of food safety laws would be expected to favor organized retailers over unorganized competitors.[102]

An inefficient marketing and distribution system can also confer unintended benefits on exports from all countries, including the United States. For example, India's poor storage and transportation infrastructure leads to product losses, deterioration in quality, and increased costs for domestically produced agricultural goods. These problems may actually provide opportunities for U.S. exports in the Indian market. The situation with apples, which are a popular fruit in India, offers a good illustration of this dynamic. India produces large quantities of fresh apples in the northern part of the country, but few can be efficiently transported over land in a timely manner to India's southern regions.[103] Instead, U.S. fresh apples are often shipped through southern Indian ports to satisfy Indian demand.

[101] Industry representatives, interviewed by Commission staff, New Delhi, India, May 6 and June 1, 2009. Organized suppliers do receive a small premium for a branded product.

[102] The U.S. Food Law of 1908, for instance, helped foster the growth of organized retail in the United States. Joseph et al., *Impact of Organized Retailing on the Unorganized Sector*, May 2008, 33.

[103] Deodhar, Landes, and Krissoff, "Prospects for India's Emerging Apple Market," January 2006, 17, 21, 25.

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CHAPTER 8
Foreign Direct Investment in Indian Agricultural and Food-Related Industries

Overview

U.S. firms have become active participants in India's food and agriculture sector. Normally, they do not engage directly in agricultural production: under Indian government regulations, foreign firms and individuals are not permitted to own agricultural land in India directly, with a few exceptions as detailed below. However, they have found many other opportunities through investing in the broader food sector. The majority of U.S. foreign direct investment (FDI) is in food and beverage processing, alcoholic beverages, and quick-service restaurants. U.S. companies focus on those segments of the market because those industries offer the most lucrative opportunities, not because they face particular regulatory or non-regulatory obstacles to FDI in other parts of India's food and agriculture sector. Other than the alcoholic beverages distribution and retail sectors, industry representatives did not report significant regulatory barriers to U.S. investment.

Because foreign firms do not engage for the most part in direct agricultural production, they obtain their agricultural inputs through imports, local commodity markets, or contract farming operations. U.S. firms report that, in areas open to foreign investment, the Indian government encourages them to establish operations, and they generally have not experienced market access or national treatment barriers. Many U.S. firms prefer to operate in India through joint ventures rather than wholly owned affiliates, since local partners can be particularly important in helping U.S. firms navigate their way through central and state government bureaucracies and the intricacies of local business customs.

U.S. food industry firms must weigh a number of business environment factors when deciding whether or not to invest in the sector. Investment incentives include (1) U.S. companies' keen interest in accessing India's large and growing consumer market; (2) the need for a local presence to understand how best to adapt products to local needs and requirements; (3) high tariffs and nontariff measures (NTMs) in India that encourage entry into the market through investment rather than U.S. exports; and (4) policy incentives, such as tax rebates linked to Special Economic Zones (SEZs). Disincentives include regulations that ban FDI in most farming activities; occasionally difficult relations with joint venture partners; complex licensing and regulatory systems; a disjointed national market in which it is difficult to achieve economies of scale because of logistical constraints and differing state regulations; and changing agricultural marketing regulations for many commodities, primarily related to the Agricultural Produce Market Committee (APMC) Act and the Essential Commodities Act (ECA).

FDI Regulations and Trends

Beginning in 1991, as part of India's policy of opening to the global economy, the Indian government authorized FDI with foreign equity stakes of up to 51 percent in most industries, including food processing. The equity limit for FDI in food processing was later raised to 100 percent. Foreign investors generally are not permitted to own agricultural land in India and are prohibited from investing in most direct agricultural (farming) activities. Exceptions exist for tea plantations and for investment in agriculture under "controlled conditions," such as farming in climate-controlled facilities such as greenhouses (table 8.1).[1]

TABLE 8.1 India: Specific FDI regulations in certain food-related industries

Industry	Equity cap (%)	Entry route	Other conditions
Primary agricultural production			
Floriculture, horticulture, development of seeds, animal husbandry, pisciculture, aquaculture, cultivation of vegetables and mushrooms under controlled conditions, and services related to agro and allied sectors.[a]	100	Automatic	None reported.
Tea sector, including tea plantations.[b]	100	Approval from the Foreign Investment Promotion Board required	Subject to divestment of 26 percent of equity in favor of an Indian partner or the Indian public within 5 years, and prior approval of the state government concerned in case of any change in future land use.
Food processing			
Alcohol distillation and brewing	100	Automatic	Subject to license by appropriate authority.
Manufacture of cigars and cigarettes	100	Approval from the Foreign Investment Promotion Board required	Subject to industrial license under the Industries (Development and Regulation) Act of 1951.

Source: Government of India, Ministry of Commerce and Industry, Department of Industrial Policy and Promotion, "Consolidated Policy on Foreign Direct Investment," March 31, 2008.

[a]FDI is not allowed in any other agricultural sector/activity.
[b]FDI is not allowed in any other plantation sector or activity.

India also prohibits FDI in multibrand retail establishments, which may inhibit investment in the agriculture sector. The ban on FDI in multibrand retail is meant to protect the interests of India's many small "kirana" retail shop owners.[2] For instance, foreign food companies with established brands may find it difficult to break into the Indian market through the kiranas because the shops are small and shelf space is at a

[1] Beyond the agricultural industries noted in the table, FDI is not allowed in any other agricultural sector or activity. Government of India, Ministry of Commerce, Department of Industrial Policy and Promotion, "Consolidated Policy on Foreign Direct Investment," 2008; government official, interview by Commission staff, New Delhi, India, May 5, 2009.

[2] India permits FDI in single-brand retail establishments, defined as shops that only sell products by a single producer, such as a footwear manufacturer. FDI is prohibited in multibrand retail establishments, which are shops that sell products from more than one manufacturer, as do most U.S. supermarkets and department stores.

premium. However, in the larger stores owned by organized retail chains, there is more space for branded foods. Additionally, the more sophisticated supply and distribution systems used by organized retail chains create greater access for high-volume brand-name food items.[3] For more detail on the growth of India's organized retail sector, see chapter 7.

India began to liberalize its FDI regulations for the distribution industry in 2006. Although foreign investors are still prohibited from investing in multibrand retail establishments, a wholesaler can now be 100 percent foreign owned, and foreign companies can hold up to 51 percent equity of a single-brand joint venture.[4] Wal-Mart, for example, has initiated a wholesale distribution joint venture with Indian conglomerate Bharti that commenced operations in 2009. The firm has announced plans to source more than 80 percent of its goods locally, partly to cater to small businesses.[5] In addition, the Indian parliament has debated lifting the ban on FDI in multibrand retail organizations. Many observers expect the law to be changed, but as of November 2009, there has been no action.[6]

From 2004 through 2008, FDI inflows into agriculture-related industries grew rapidly but continued to account for less than 3 percent of total FDI inflows into India (table 8.2).[7] Fermentation industries (alcoholic beverages) accounted for the largest share (51 percent) of agriculture-related FDI in 2008, followed by food processing industries (20 percent).[8] The sharp upsurge in FDI in fermentation industries in 2008 reflects new investment in breweries, distilleries, and wineries by several multinational companies. The largest contributor was a change in ownership of a 37.5 percent equity stake in United Breweries, India's largest beer company, a result of the acquisition of Scottish & Newcastle plc (United Kingdom), which owned a stake in United Breweries, by a consortium consisting of Carlsberg (Denmark) and Heineken (Netherlands). Several other multinational breweries invested in India during 2007 and 2008. Carlsberg built its fourth Indian brewery in West Bengal in 2008 at a cost of $16.1 million, and InBev (Belgium) invested $25.3 million in a brewery in Andhra Pradesh. In late 2006, SABMiller (United Kingdom) announced plans to invest $125 million in India over the following two to three years, both to expand existing facilities and to construct two new breweries (begun in 2007 at an expected cost of $49.0 million).[9]

[3] Industry representative, interview by Commission staff, Gurgaon, India, May 6, 2009.

[4] Government of India, Ministry of Commerce and Industry, Department of Industrial Policy and Promotion, Press Note 3 (2006); Government of India, Ministry of Commerce and Industry, Department of Industrial Policy and Promotion, *Investing in India*, n.d., 68.

[5] fDi Markets database (accessed March 13, 2009).

[6] Industry representatives, interview by Commission staff, New Delhi, India, June 4, 2009.

[7] Detailed Government of India FDI data by industry is not available for 2003.

[8] Government of India, Reserve Bank of India, CEIC database, September 25, 2009.

[9] A significant share of the construction costs were likely recorded as FDI in 2008, as construction continued. Data regarding new FDI by breweries from fDi Markets database, June 22, 2009, Financial Times Ltd.

TABLE 8.2 India: Agriculture-related FDI inflows, by industry (million $)

Industry	2004	2005	2006	2007	2008	Share of total, 2008 (%)
Sugar	2.9	3.0	15.7	10.9	5.0	0.7
Vegetable oils and vanaspati	5.9	13.7	4.4	14.3	44.1	5.8
Tea and coffee	([a])	([a])	([a])	3.7	52.4	6.9
Agriculture services	([a])	([a])	([a])	120.0	10.7	1.4
Hybrid seeds and plantation	([a])	([a])	([a])	65.7	1.2	0.2
Horticulture	([a])	([a])	([a])	0.5	4.1	0.5
Food processing industries	80.2	40.8	54.0	65.6	150.0	19.7
Fermentation industries	7.4	8.3	4.3	49.1	388.7	51.1
Total agriculture-related FDI	96.4	65.8	78.5	329.7	656.2	100.0
Total FDI (all industries)	3,753.6	4,354.0	11,119.5	15,921.3	33,028.8	
Agriculture-related as share of total FDI	2.6%	1.5%	0.7%	2.1%	2.0%	

Source: Government of India, Reserve Bank of India, CEIC database, September 25, 2009.

Note: FDI by industry data not available for 2003.

[a]Government of India statistics did not provide separate data for this industry before 2007.

The large inflows of FDI that have been reported in the hybrid seed and plantation area in 2007 were likely the result of Devgen SA's (Belgium) acquisition of a significant share of Monsanto's India business, although the financial details of the transaction were not disclosed. Monsanto is focusing on its core Indian businesses of cotton, oilseeds, corn, and herbicides and sold its other seed businesses, including rice, sorghum, millet, and sunflower.[10]

The Indian government does not provide a further breakdown of the FDI data by country, but U.S. and other foreign firms are active participants in several segments of the food industry. A database of greenfield (new) FDI projects in India lists 151 projects covering the food, beverage, and warehousing/distribution industries between 2003 and 2008 (table 8.3).[11]

TABLE 8.3 India: Identified greenfield FDI projects in food-related industries, 2003–08

Sector	2003	2004	2005	2006	2007	2008	Total
Food and tobacco	11	10	9	13	11	24	78
Beverages	3	6	2	7	6	7	31
Warehousing and storage	5	2	3	16	3	13	42
Overall total	19	18	14	36	20	44	151

Source: Financial Times Ltd., fDi Markets database, 2009.

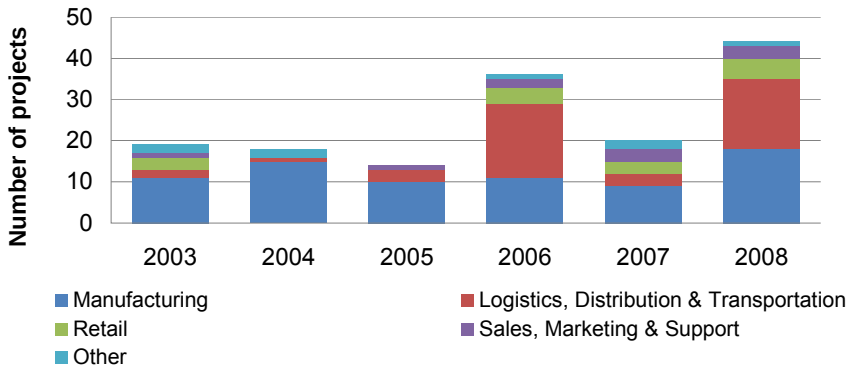
Note: Data for warehousing and storage projects are not specific to the agriculture and food sectors.

Of the total number of food-related greenfield FDI projects, 74 projects (49 percent) involved manufacturing (fig. 8.1), with U.S.-based investors responsible for 18 of those. The United States has been the leading source of greenfield FDI in India's food-related sector during the past six years (fig. 8.2).

[10] Bureau van Dijk, Zephyr M&A database (accessed June 25, 2009).

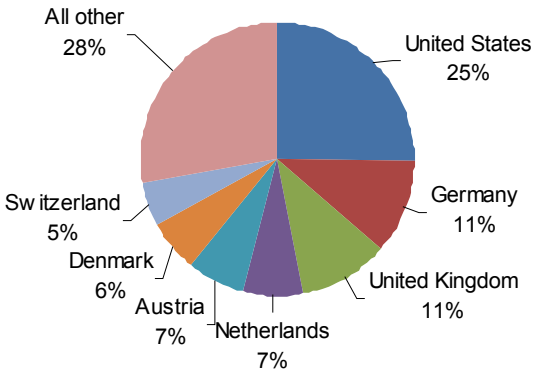
[11] Greenfield projects are those newly established by the investing company, as opposed to acquisitions of existing companies. The Indian government's official FDI data presented in table 8.1 includes FDI through both greenfield projects and acquisitions.

FIGURE 8.1 India: Food-related FDI projects in India by business activity, 2003–08



Source: Financial Times Ltd., fDi Markets database (accessed June 22, 2009).

FIGURE 8.2 India: Food-related greenfield FDI projects by source country, 2003–08



Source: Financial Times Ltd., fDi Markets database (accessed June 22, 2009).

In addition to greenfield FDI, there were 47 foreign majority acquisitions of Indian agriculture-related companies between 2003 and 2008, in diverse industry segments, including breweries and distilleries, confectionery, seeds, and vegetable oil processing. U.S.-based firms were identified as the acquirer in eight of these transactions (table 8.4).[12]

[12] For the purposes of this study, a majority acquisition is defined as an acquisition of a final equity stake of at least 51 percent in an Indian company. Additional mergers and acquisitions (M&A) activity occurred during the time period, but those transactions involved foreign firms acquiring only a minority stake or an unreported equity stake in an Indian company.

Food Processing and Nonalcoholic Beverages

India's government has a strong interest in reducing wasted food through increased development of the food processing industry. Toward this goal, Indian government regulations permit FDI in food processing with no industrial license required, except for alcoholic beverages and products reserved for small-scale industries (SSI).[13] Observers expect processed food to grow rapidly as a share of all perishable food, moving from

TABLE 8.4 India: U.S. majority acquisitions of Indian food companies, 2003–08

Acquirer	Target	Final equity stake (percent)	Deal value (million $)	Date announced	Industry
Bunge Ltd.	Hindustan Lever Ltd.'s edible oils and fats business	100	0.2	June 20, 2003	Refining and blending of fats and oils
Gabriel Management Group	Bonsai Garden (India) Pvt. Ltd.	100	NA	December 17, 2003	Soil preparation, planting, and cultivating
Wm. Wrigley Jr. Company	Joyco India Pvt. Ltd.	100	264.5	January 8, 2004	Confectionery
Schreiber Foods Inc.	Dynamix Dairy Industries Ltd.	51	37.5	February 24, 2004	Dairy products
Mr. and Mrs. Epparala	KICM (Madras) Ltd.	100	NA	June 19, 2004	Mushroom processing
Delta and Pine Land Company	Vikki's Agrotech Pvt. Ltd.	100	NA	January 22, 2006	Cotton seeds
The Hershey Company	Godrej Beverages and Foods Ltd.	51	55.0	April 3, 2007	Confectionery
Anheuser-Busch International	Crown Beers India Ltd.	100	NA	June 20, 2008	Breweries

Source: Bureau van Dijk, Zephyr M&A database, June 25, 2009.

approximately 3 percent in 2006 to 6 percent in 2009 and continuing to grow at a compound annual growth rate of 12 percent in coming years.[14] Further FDI in food processing will be essential to increasing India's food processing capacity. Factors contributing to the increased demand for processed and packaged foods include the gradual expansion of organized retail outlets, more double-income families, and the decreasing cost of processed foods.[15] U.S. companies have noted this trend and have begun to take an active role in India's processed food industry (box 8.1).

[13] As of 2008, the remaining foods reserved for SSI were pickles and chutneys; bread; pastry; hard-boiled sugar candy; rapeseed, mustard, sesame, and groundnut oil; and ground and processed spices. Landes, *The Environment for Agricultural and Agribusiness Investment in India*, July 2008, 16–17.

[14] Industry representative, interview by Commission staff, Mumbai, India, May 29, 2009; Investment Commission of India Web site, "Food & Agro Products."

[15] Investment Commission of India Web site, "Food & Agro Products."

BOX 8.1 FDI in India's Poultry Market

Godrej Tyson Foods is a joint venture between Tyson Foods, Inc., a major U.S. poultry processor, and Godrej Agrovet. The venture, established in 2008, was aimed at convincing Indian consumers to purchase chicken as most Americans do—in chilled bags of whole chickens or tray packs of chicken parts readily available in a retail shop. This is a significant change for Indian consumers, who typically purchase live chickens that are slaughtered to order. The company emphasizes the convenience and food safety advantages of refrigerated chicken for India's growing population of consumers with disposable income. Nonetheless, Godrej Tyson's market is limited because many rural areas do not have sufficient access to the electric power required for refrigeration and because retailers are required to store vegetarian and nonvegetarian food separately, creating competition for retailers' limited refrigerated storage space.

For retail customers, Godrej Tyson sells processed chicken under the Real Good brand and ready-to-eat frozen foods, such as chicken sausages and vegetarian patties, under the Yummiez brand. The joint venture also sells frozen food to the restaurant and hotel trade. These large customers generally require a health certification from their meat suppliers, which gives large companies such as Godrej Tyson an advantage.

Godrej Tyson maintains complete control of its cold chain distribution system from slaughterhouse to retail, including generating much of its own electricity, an essential investment for refrigeration capacity. Chickens are raised through a contract farming arrangement with local farmers, and Godrej Tyson supplies the feed and all other inputs.

The company sells chicken through a controlled distribution system to 600–700 retail outlets. Godrej Real Good Chicken is sold with a three-day shelf life from the date of processing. One roadblock has been that most Indian food retailers are not accustomed to the hygiene requirements necessary for selling fresh meats, and there have been problems with retailers turning off the electric power to the refrigerators at night to save electricity costs, not understanding the bacterial risks. To combat this problem, Godrej Tyson has engaged in marketing efforts aimed at both consumers and retailers, and the company now refuses to credit retailers for any chicken that shows signs of nonrefrigerated storage.

Godrej Agrovet introduced chilled tray-pack chicken under the Real Good Chicken brand before partnering with Tyson, but Tyson brings several highly useful attributes to the joint venture, including new technology and operating procedures that can expand the retail shelf life of chilled chicken to 12 days by keeping bacteria counts low. Together, Godrej Agrovet and Tyson will invest millions of dollars to upgrade equipment in the venture's chicken processing plants in Mumbai and Bangalore, establish additional cold chain distribution facilities, and increase marketing efforts aimed at consumers and retailers. Godrej Tyson has also invested in self-controlled electric power and water and wastewater treatment facilities.

Godrej Tyson's inputs come from local Indian production rather than from imports. The company has imported equipment for its chicken processing line and some chicken vaccines, but chickens and chicken feed (primarily corn) are all sourced locally. Godrej Tyson exports small amounts of chicken from India to neighboring countries. Exports to larger markets in the Persian Gulf region, however, are currently prohibited because of the presence of avian influenza in India.

Sources: Industry representatives, interviews by Commission staff, Mumbai, India, May 13 and 28, 2009; industry representative, telephone interview with Commission staff, April 7, 2009; fDi Markets database; and press reports.

There is not necessarily a strong link between increased FDI in food processing and increased trade in food products. While some inputs must be imported, food producers in India, as elsewhere, generally prefer to use local inputs because of lower cost, greater availability, and local tastes. U.S. firms that have invested in India's food sector have imported ingredients from the United States or elsewhere, but only until they were able to find or develop locally available inputs that met company standards. As far as exports are concerned, a number of global food companies see India both as an important local market and a hub from which to export processed food products to the entire region. Although U.S. companies export a share of their Indian production to neighboring countries, there is no evidence to suggest that they have exported significant amounts of processed food from India to the United States.[16]

Examples of U.S.-based multinational companies invested in India's food processing sector include PepsiCo, Coca-Cola, ConAgra, Cargill, Heinz, ADM, and Kellogg's. Through their investments, many of these companies, and others based outside the United States, hold significant market shares in many segments of India's food market. In the confectionery market, for example, Cadbury-Schweppes held a 27 percent share by value in 2007, Nestlé held a 16 percent share, and Perfetti van Melle a 15 percent share.[17] Coca-Cola and PepsiCo held the two largest shares (33 percent and 27 percent, respectively) of a rapidly growing soft drink market valued at $3.2 billion in 2007.[18]

Incentives for FDI in Food Processing

U.S. companies are investing in India's food industry for several reasons. First, they want to gain access to the Indian local market. U.S. producers of food and other agricultural goods are well aware of India's growing consumer market, given its total population of 1.2 billion and its rapidly growing middle class with significantly greater discretionary spending power than earlier generations of Indian consumers.[19] Second, investing directly in the Indian market, rather than serving the market through U.S. exports, allows U.S. companies to take advantage of local commodity inputs and cheaper labor for processing facilities. Third, investing directly enhances U.S. companies' ability to understand and adapt to local consumer preferences, which is likely a more important concern for producers of packaged and processed foods than for exporters of commodities such as grains, nuts, and oilseeds (box 8.2).

Aside from offering easier access to local consumers, direct investment in India serves as a way to avoid tariffs or other border measures affecting U.S. exports. U.S. firms report that, in most cases, once established in India, they receive the same treatment as local firms.[20] Local establishment through FDI may actually help U.S. firms smooth the path for regulatory acceptance of increased U.S. exports. For example, support for lower tariffs on U.S. pistachio exports is one motivation for U.S. pistachio producers to invest

[16] Industry representatives, interviews by Commission staff, New Delhi and Mumbai, India, May 6, 11, and 12, 2009.

[17] DATAMONITOR, "Confectionery in India: India Profile," November 2008. The remainder is fragmented between Indian and other foreign countries.

[18] DATAMONITOR, "Soft Drinks in India: India Profile," November 2008.

[19] According to one estimate, India will be the fifth largest consumer market in the world in 2025, consisting of approximately 583 million middle class consumers, up from an estimated 50 million middle class consumers in 2005. McKinsey Global Institute, "The 'Bird of Gold': The Rise of India's Consumer Market," May 2007, 13.

[20] Industry representatives, interviews by Commission staff, New Delhi, India, May 6 and June 4, 2009.

BOX 8.2 PepsiCo Operations in India

PepsiCo has a particularly large presence in India's food processing sector, directly employing 4,600 and indirectly employing 60,000 in 2006. PepsiCo entered the Indian market in 1989 and has invested a total of $700 million since then. The company has one syrup concentrate plant, from which it supplies all of India, and 43 bottling plants. PepsiCo also operates three Frito-Lay snack processing plants and a citrus nursery in India. In support of its orange juice business, the company has set up an agro-technology program in association with the Punjab government. The program includes a large greenhouse facility focused on orange juice-related R&D, orange juice groves, and a processing plant to commercialize the cultivation of citrus for its juice business. PepsiCo also recently introduced the Quaker Oats brand into India.

PepsiCo originally entered the Indian market on the condition that it invest in the food processing sector. This led to the company's pioneering efforts in contract farming of tomatoes, to ensure sufficient product for its tomato processing plant, which produced tomato paste primarily destined for Pizza Hut. The tomato business was later sold to Unilever. PepsiCo's Frito-Lay operations in India obtain much of their inputs through contract farming. The primary crop now is potatoes, designated for potato chips and other snack foods. Frito-Lay reportedly uses about 150,000 mt of potatoes annually, of which 50 percent is sourced through contract farming agreements with 15,000 farmers across seven states. The Tropicana division also uses contract farming.

In India, PepsiCo focuses on production of food for the local market and does not export food or other agricultural products from the United States to India. Over time, PepsiCo has shifted its snack food strategy to develop more indigenous Indian products, including new chatpate crackers with wheat and daal, offered in such typically Indian flavors as "special pindi masala" and "tomato and roasted spices." Some snack foods are even more localized, with regional flavors rather than flavors designed to appeal to consumers across India.

In June 2009, PepsiCo announced plans to double its overall India investment, with approximately $350 million to be invested over the next three years, in addition to the capacity additions that the company made in 2008. These new investments will support increased facilities across the manufacturing, market infrastructure, supply chain, fruit processing, agriculture, and R&D business areas. The company has begun searching for suitable locations for new greenfield manufacturing plants and plans to focus on states that offer the best investment environment.

Sources: PepsiCo, "PepsiCo Doubles Investment in India in 2009," June 1, 2009; interviews with industry representatives; International Brand Equity Foundation (IBEF), "PepsiCo Holdings India Pvt. Ltd.," *Fortune 500 Companies in India: Success Stories*; Food Biz Daily, "PepsiCo's Frito-Lay India Launched Aliva—New Baked Savory Cracker," June 4, 2009; Animesh Banerjee, "Role of Private Sector in Contract Farming & Direct Procurement," January 29, 2008; and press reports.

in Indian processing facilities.[21] India's central and state governments also offer targeted incentives for FDI, some of them specific to the food and agriculture sectors. Foreign investors welcome such incentives, but there is little evidence to suggest that investors see these incentives as crucial aspects of the FDI decision-making process.

At the central government level, the Ministry of Food Processing has included FDI as part of its vision for promoting the food processing industry, with a focus on plans to implement a "single-window" clearance system for new FDI in food processing and to undertake sector-specific marketing campaigns to attract foreign investors to India's food processing industry.[22] Specific tax and other incentives offered at the national level for investment in food processing include the following:

[21] Industry representative, telephone interview by Commission staff, March 3, 2009.

[22] Rabo India Finance Pvt. Ltd, *Vision, Strategy and Action Plan for Food Processing Industries in India*, vol. 1, April 2005, 25.

- For processing of fruits and vegetables, an income tax rebate for 100 percent of profits for the first five years, and 25 percent of profits for the next five years.
- Zero excise duty on most processed food products, compared to an 8 percent excise duty on most other products.
- Permission for futures commodity trading for agricultural produce.
- Financial assistance to investors from various ministries and government agencies for building infrastructure, establishing or modernizing food processing facilities, conducting research and development (R&D), and other efforts.[23]

India has established a network of SEZs—specified geographical areas in which domestic and foreign investors receive tax incentives and other benefits. In many cases, the central or state government has given investors preferential access to ports or has developed special infrastructure within SEZs, such as dedicated electric power, minor ports and jetties, or inland container depots and container freight stations. However, since SEZs have been created to promote Indian exports, only 50 percent of production from the zones may be sold in the local market, and the remainder must be exported. Thus, SEZs are unlikely to meet the needs of investors primarily interested in accessing Indian consumers.[24]

Separate from the existing SEZ program, the Ministry of Food Processing has developed a new Mega Food Parks scheme. Under the program, the ministry will provide financial assistance for private-sector firms to develop up to 30 large food industry parks, aimed at developing strong forward and backward linkages among farmers, food processors, and retailers. The parks are envisioned as "agri/horticultural-processing zone[s] containing state of the art processing facilities with support infrastructure and well established supply chain."[25] Unlike the SEZ program, the Mega Food Parks program is focused primarily on domestic investment and establishing linkages between the different segments of India's food industry, rather than on exports or foreign investment. However, the program may well offer opportunities for foreign as well as domestic food industry investors. The Mega Food Parks scheme has only recently been implemented, with construction beginning on one of the first parks, the Western Agri Food Park in Pune, Maharashtra, in March 2009.[26]

A number of state governments also offer incentives to investors that establish manufacturing facilities in the state, although these regulations are subject to change. For example, as of 2008, Jammu and Kashmir offered land at concessional rates and investment subsidies on fixed capital investment. The Himachal Pradesh government offered concessions on sales tax and electricity rates and other incentives for setting up a plant in its tax-free zones.[27]

[23] Ibid., 7, 108; Goyal, *Big's Easy Reference Customs Tariff 2009–2010*, July 7, 2009, 76–78.

[24] Industry representative, interview by Commission staff, Washington, DC, April 30, 2009; Rabo India Finance Pvt. Ltd, *Vision, Strategy and Action Plan for Food Processing Industries in India*, vol. 1, April 2005, 6–7; and industry representative, interview by Commission staff, Mumbai, India, May 30, 2009.

[25] Government of India, India.gov.in Web site, March 23, 2009.

[26] *India PR Wire*, "Western Agri Food Park (P) Ltd Under Govt. of India's Mega Food Scheme to be Launched at Shirwal," March 3, 2009.

[27] India Brand Equity Foundation (IBEF), "Fast Moving Consumer Goods," n.d., 11; IBEF, "Himachal Pradesh," December 2008.

Disincentives for FDI in Food Processing

India can be a difficult food market for foreign investors faced with unfamiliar market conditions, difficult supply and distribution systems, and confusing or burdensome central and state government policies and regulations. Indian government regulations that may inhibit FDI in the food processing sector include the ban on FDI in multibrand retail (discussed below), prohibitions on contract farming in some states, barriers to interstate commerce based on tax revenue and food security concerns, and some of the world's highest taxes on processed foods. Other characteristics of the Indian market that inhibit FDI, but do not result from government regulations, include India's system of small agricultural holdings, its inefficient infrastructure and marketing networks, poor distribution networks, the lack of cold chain and cold storage facilities, and Indian consumer preferences that remain focused on traditional foods.[28]

Even though 100 percent foreign equity ownership is permitted in food processing, foreign investors often face challenges in dealing with local licensing requirements and other regulations necessary for establishing a new business. The lack of transparency and the difficulty of overcoming bureaucratic hurdles in establishing a locally traded company have led many foreign investors to choose to establish affiliates in India through a joint venture, despite a preference for sole ownership.[29] However, Indian regulations on joint venture agreements have also led to difficulties between some U.S. investors and their joint venture partners. These regulations have changed for new investors, but difficult situations from past joint venture relationships remain (box 8.3).

[28] Govindan, *India: Exporter Guide*, October 1, 2008, 12. See chapter 7 for more information on these topics.

[29] USTR, *2007 National Trade Estimate Report on Foreign Trade Barriers*, 2007, 246.

BOX 8.3 Restrictions on Foreign Joint Venture Partners

In 1974, India required that all wholly owned foreign companies operating in India sell off a share of their equity to a local Indian partner (become a joint venture). Under Press Note 18 of 1998,[a] foreign investors were also forbidden to establish a competing business in the same industry as an existing joint venture or to increase their equity share in the existing business without the permission of the Indian government. The Indian government gave such permission only with a notice of approval from the Indian joint venture partner. This regulation applied regardless of the terms of the original joint venture contract and was meant to protect the Indian joint venture partner. The regulation gives Indian joint venture participants tremendous leverage over their foreign business partners, and some U.S. companies have stated that they are essentially held hostage in the Indian market by their joint venture partners.

The regulation was updated through Press Note 1 of 2005, issued by the Department of Industrial Policy and Promotion. The new regulation liberalized the rules for new joint venture investments in India. Under the new rules, all joint venture partners are bound by the terms of the contract between them, which may specify provisions for dissolving the partnership. However, approval by the Indian government, conditioned on joint venture partner approval, is still required for most new investments involving companies that entered into joint ventures and agreements concluded before January 12, 2005.

Even though the regulation does not apply to new investments in India, a number of U.S. companies remain directly affected, and others may consider the regulation as a disincentive to investment when evaluating their investment options.

[a] India's Ministry of Commerce and Industry, Department of Industrial Policy and Promotion, introduces policy changes related to FDI through announcements called Press Notes, which are numbered in a series that begins with No. 1 each calendar year.

Sources: Government of India, Ministry of Commerce and Industry, Department of Industrial Policy and Promotion, Press Note 18 (1998) and Press Note 1 (2005); industry representatives, telephone interviews and e-mail communication with Commission staff, March 17, April 7, and May 8, 2009; USTR, *2009 National Trade Estimate Report on Foreign Trade Barriers*, 2009, 247; and press reports.

The entire food processing industry was once reserved for small-scale industry. Although this is true for only a few foods now, the legacy of the system is an industry that is not vertically integrated and is composed almost entirely of small firms, making FDI difficult for agribusiness investors looking for efficient, competitive suppliers of intermediate goods and services. Particular attributes of the small-scale sector that inhibit efficiency include lack of access to credit, lack of management expertise, poor equipment, and little knowledge of marketing techniques.[30] Foreign investors might be able to remedy these deficiencies, but the existing situation increases the required scale of any initial investment, acting as a disincentive to new investors. The SSI legacy also shapes the relationships between foreign investors and contract farmers. Because most Indian farms are so small, farmers often do not have the ability to do business directly with large food processing companies, and the companies find it difficult to conclude contracts with enough small farmers to guarantee sufficient product to operate their factories. For these reasons, foreign firms often work through middlemen who serve as bundlers by negotiating directly with many small farmers, allowing the firms to ensure sufficient supplies to profitably operate food processing facilities.[31]

India's agricultural markets are closely regulated, primarily to protect local farmers. Regulations are not directed at foreign investors, and domestic firms are subject to the same rules, but market distortions such as price controls and local government

[30] Rabo India Finance Pvt. Ltd, *Vision, Strategy and Action Plan for Food Processing Industries in India*, vol. 1, April 2005, 6.

[31] Industry representatives, interviews by Commission staff, New Delhi and Mumbai, India, May 4–12, 2009.

implementation of particular regulations may deter foreign investment in India's agricultural sector. The two primary agricultural market regulations at the central government level are the APMC and the ECA.[32] Under the 2005 APMC revisions, a few foreign and domestic firms have begun to invest in local agricultural markets (mandis) to purchase agricultural goods directly from farmers.[33] The ECA gives state governments the right to intervene in food markets to ensure food supplies and protect consumers. Even though the ECA is not often used, the ongoing possibility of government intervention in agricultural markets inhibits investment, particularly in warehousing, which might be seen as a hoarding mechanism if the ECA were implemented.[34]

Alcoholic Beverages

Under India's central government regulations, FDI with up to 100 percent foreign equity is permitted for the distillation and brewing of alcohol, subject to licensing by the appropriate authority.[35] However, FDI in the rapidly growing Indian market for alcoholic beverages is complicated by the fact that each Indian state government has its own laws regulating the production, distribution, and sale of alcohol, including several states that prohibit all sales of alcoholic beverages.[36] The Indian market for alcoholic beverages comprises beer, wine, and spirits. Foreign investors face many of the same issues in all three segments of the market, and a number of companies are engaged in two or all three market segments, although some issues are specific to only one segment. For instance, wine producers often prefer to have direct control over their vineyards, whereas producers of beer and spirits are more likely to purchase their ingredients in local markets or import them.

Foreign companies have a strong presence in the Indian beer market, as FDI is relatively easy, and they have a keen interest in the rapidly growing market. SABMiller (United Kingdom) was the leading foreign brewery in 2008, with a 36 percent share of India's beer sales, second to India-based United Breweries (maker of Kingfisher beer) with 48 percent.[37] SABMiller's share of the overall alcoholic drinks market, including beer, was 19 percent. SABMiller has been actively acquiring regional Indian breweries, increasing its market share.[38] Other foreign companies with brewery investments in India in 2007 and 2008 include Heineken (Netherlands), Carlsberg (Denmark), and AB InBev (Belgium).[39] U.S. firms have not been among the leading investors, primarily because most large players in the global beer market are European companies.

[32] For more information on these regulations, see chapter 7.

[33] Industry representatives, interviews by Commission staff, New Delhi and Gurgaon, India, May 5–6, 2009; Landes, *The Environment for Agricultural and Agribusiness Investment in India*, July 2008, 2.

[34] Industry representative, interviews by Commission staff, Gurgaon, India, May 6 and 8, 2009; Landes, *The Environment for Agricultural and Agribusiness Investment in India*, July 2008, 2.

[35] Government of India, Ministry of Commerce and Industry, Department of Industrial Policy and Promotion, "Subject: Rationalisation of the FDI Policy," 2006; Ministry of Food Processing Web site, "Policies and Regulations," n.d.

[36] Industry representatives, interview by Commission staff, Washington, DC, June 19, 2009; DATAMONITOR, "Beer in India: India Profile," December 2008.

[37] United Breweries owns the very popular Kingfisher brand of beer. Heineken (Netherlands) owns 37.5 percent of United Breweries. Vijay Mallya, "Chairman's Statement, 2008," Kingfisher World Web site, 2008.

[38] DATAMONITOR, "Beer in India: India Profile," December 2008; "Alcoholic Drinks in India: Industry Profile," December 2008.

[39] Financial Times Ltd, fDi Markets database (accessed June 22, 2009).

Under certain circumstances, FDI can be a driver of trade, but as noted above, that has not necessarily been the case with regard to investment in India's food and agriculture sector. One exception may be the case of the barley used for brewing beer. Barley is a significant input for breweries, and high-quality barley is difficult to find in India, where barley is produced and used mostly for animal feed. Several beer industry representatives and importers have noted that they would be interested in importing barley from the United States, but U.S. exports cannot be certified to meet India's requirement for ergot-free barley, so brewers in India import from other, more expensive sources, primarily Canada.[40]

Foreign and domestic investment in India's wine industry is in the very early stages, but it is growing rapidly, and is encouraged in part by projected future increases in consumption and a supportive FDI environment. According to one estimate, India's production and consumption of wine are expected to increase by 25–30 percent between 2008 and 2013, driven by increasing incomes, rapid urbanization, and the growth of organized retail outlets in India.[41]

Foreign firms can wholly own a production facility such as a winery but are not permitted to purchase and farm most types of agricultural land, including vineyards. Pernod Ricard, a global company in the alcoholic beverage market, has built a winery named "Nine Hills" in Nasik and is producing wines for the domestic market. Because of the ban on agricultural land ownership, Pernod Ricard has established contract farming arrangements to purchase wine grapes from local farmers. The contracts require farmers to follow specific production methods, dictated by a Nine Hills viticulturalist who educates local farmers on wine grape production. Many of these farmers have long experience growing table grapes but have switched because wine grapes sell at significantly higher prices.[42]

The central government offers some support for foreign investors in the wine industry, including:

- direct subsidies for winery development, approximately 25–33 percent of start-up costs for capital investments in wineries, up to $160,000;
- capacity-building initiatives, including technical training of workers;
- research assistance and assistance in establishing a laboratory; and
- approval of the formation of a National Wine Board, intended to be a public-private partnership that will advocate for growth initiatives for the Indian wine industry.[43]

Although the distilled spirits industry in India is open to FDI, global spirits companies tend to export to India even though existing tariffs are high, rather than establish operations within India and produce locally because certain spirits are distinctive products of particular countries or regions. For instance, genuine Scotch whiskey must be produced in Scotland, and genuine bourbon must be produced in the United States.

[40] Industry representatives, interview by Commission staff, Gurgaon, India, June 5, 2009; industry representatives, interview by Commission staff, Washington, DC, June 19, 2009. See chapter 6 for additional discussion of NTM restrictions that apply to barley.

[41] Rabobank, "Executive Summary," February 2008.

[42] According to an industry representative, table grapes sell for Rs. 10–12 per kilogram and wine grapes for Rs. 28–38 per kilogram, although production costs for wine grapes may also be higher than for table grapes. Industry representatives, correspondence with Commission staff, March 12, 2009.

[43] Industry representative, correspondence with Commission staff, March 12, 2009.

Alcoholic beverage production and sales are closely regulated by state governments, and industry representatives have identified (1) specific state regulations, (2) the general system of state regulation, and (3) the practice of export taxes payable for shipments from one Indian state to another as deterrents to FDI or domestic investment in particular states.[44] Specific state regulations cited as impediments to FDI include those related to labeling requirements, licensing for breweries and distilleries, prohibitions on sales of alcoholic beverages produced in other states, product standards, and price caps, all of which tend to vary widely among states.[45]

Under India's 2008 Food Safety Law, states are able to require separate labeling standards for alcoholic beverages. The law entered into force in May 2009, so state regulations have not yet been issued, but industry representatives cite this development as a potentially significant barrier to sales. Specific labeling issues noted include requirements to list ingredients, dates of packaging and manufacture, and nutritional information on labels (see chapter 6). This practice is not standard for alcoholic beverages worldwide. [46] If states with smaller markets imposed distinct labeling requirements, major distributors would likely exit those markets and concentrate on major market areas such as Maharashtra, New Delhi, and Goa.[47]

The case of SABMiller in Tamil Nadu exemplifies problems with licensing procedures in India. The company applied for a brewery license in 2007 and was still waiting for approval as of September 2009. Because Tamil Nadu does not permit alcoholic beverages to be transshipped from other Indian states, SABMiller has been supplying its products to Tamil Nadu through a contract brewing arrangement with Mohan Breweries & Distilleries (MBDL), an Indian company with brewing facilities in the state. MBDL suspended its agreement with SABMiller in April 2009, leaving SABMiller with no production or distribution facilities in Tamil Nadu. SABMiller reportedly had been selling 3 million cases of beer annually in Tamil Nadu, India's second-largest beer market, and the company hopes to resume operations in the state before the end of 2009.[48]

By carving up the large Indian market into separate jurisdictions, state regulations may dissuade large investors from investing in India at all, because the barriers to interstate movement of goods make it very difficult for investors to benefit from the economies of scale that such a large market would generally offer. In the wine industry, for example, the Bureau of Indian Standards has developed the standards for Indian winemaking, but these standards are only suggestions to the State Excise Departments. Each state establishes and enforces its own standards, which are usually, but not necessarily, the same from state to state.[49]

State regulations have also been used to impose price caps on specific products, often with little or no warning of the change in regulations and after production has

[44] The central government imposes high tariffs on alcoholic beverages, but other taxes and restrictions on the industry are the purview of the individual states.

[45] Industry representatives, interviews by Commission staff, New Delhi, India, May 8, 2009, and Washington, DC, June 19, 2009.

[46] DISCUS, submission to the Commission, June 25, 2009.

[47] Industry representatives, interviews by Commission staff, New Delhi, India, May 8, 2009, and Washington, DC, June 19, 2009.

[48] Industry representative, e-mail message to Commission staff, September 25, 2009; Boby Kurian, "Mohan Breweries to Exit SABMiller Pact," *The Economic Times*, May 12, 2009.

[49] Industry representative, correspondence with Commission staff, March 12, 2009.

commenced. States tend to be quick to match price caps imposed in other states, so investors can find that their national marketing strategy becomes invalid from one day to the next. For example, in five of India's top 10 state markets for alcoholic beverages, local government regulations mandating certain price limits resulted in reduced brewery profit margins in 2008. In a number of states, wholesale and/or retail prices for alcoholic beverages are set directly by the state.[50]

The counterfeiting of spirits companies' valuable brands is of concern to the industry as well.[51] According to industry estimates, India's informal sector is thought to produce approximately 300 million cases of liquor a year, double the official production.[52] Scotch whiskey, particularly Johnnie Walker, is reportedly the counterfeit product of choice in India, as it is one of the country's most popular brands.[53] Counterfeiting occurs through a variety of means, including the collection of used genuine liquor bottles that are filled with counterfeit product that tastes similar to the genuine product, but with distribution and sale of the counterfeit through bootleg liquor channels.[54] The large size of India's domestic market, high price sensitivity, weak and uncoordinated enforcement efforts, and a lack of knowledge among customers all contribute to a substantial market for counterfeit spirits in India.[55]

Quick-Service Restaurants

The quick-service restaurant industry is another sector that has attracted significant amounts of FDI from U.S. investors. Two U.S.-based companies, Yum! Brands and McDonald's, are leading companies in India's quick-service restaurant sector.[56] Yum! Brands operates restaurant chains including KFC, Taco Bell, Pizza Hut, and Long John Silver's. Other chain restaurants such as Domino's Pizza, Subway, Quiznos, and Papa John's, have also invested in India and are recognized brands in the country.

Restaurants are significant consumers of agricultural products, and quick-service chain restaurants with integrated supply chains represent an important part of the food product market in this sector. Because of their U.S. ties, quick-service restaurant chains such as Yum! Brands and McDonald's would appear to be likely exporters of food products from the United States to their affiliate companies in India, but that is seldom the case. It is true that at the outset, companies will pay the extra costs, such as high tariffs, associated with imported ingredients when they are not available locally, to protect their reputations for high quality.[57] In many cases, however, Indian quick-service restaurants shift to using local ingredients as soon as they are able to obtain or develop what they need from local sources.

[50] Industry representative, e-mail message to Commission staff, May 8, 2009.

[51] Industry representative, interview by Commission staff, New Delhi, India, May 8, 2009; industry representative, interview by Commission staff, Washington, DC, June 19, 2009.

[52] International Center for Alcohol Policies (ICAP), *Noncommercial Alcohol in Three Regions*, 2009, 24–25.

[53] Industry representative, e-mail message to Commission staff, May 8, 2009.

[54] Industry representative, e-mail message with Commission staff, June 26, 2009; Keith Nuthall, "Focus: Spirits Industry Calls for Tougher Action on Counterfeiting," April 28, 2009.

[55] KPMG, *Combating Counterfeiting and Grey Market: A Challenge for Indian Corporates*, December 22, 2008, 7; industry representative, interview by Commission staff, New Delhi, India, May 8, 2009; and industry representative, interview by Commission staff, Washington, DC, June 19, 2009.

[56] DATAMONITOR, "Profit Foodservice in India: Industry Profile," August 2008.

[57] Industry representatives, interviews by Commission staff, Mumbai and New Delhi, India, May 8–12, 2009.

There are a number of reasons why quick-service restaurant companies prefer local over imported food ingredients. One is that they try to offer fresh food wherever possible, leading to a preference for local supplies. Fresh produce such as lettuce and tomatoes is also easier to purchase locally, reducing transport and other logistics costs. Moreover, these restaurants tailor many of their products to local tastes, so it is logical for them to use local products. For instance, KFC offers a chicken product in India that is much spicier than their U.S. chicken choices. Other food products must conform to Indian government regulations, such as a ban on the use of artificial colors.[58] Also important is the fact that global food companies want to be seen as good local citizens and part of the local community, supporting local farmers and food producers.

Today, Yum! Brands and McDonald's establishments in India import few ingredients from the United States. For example, potatoes for McDonald's french fries are grown to exacting standards; globally, they are provided by McCain Foods. For the first eight years that McDonald's was established in India, the company imported its MacFry supplies from the United States, while McCain Foods attempted to grow potatoes to McDonald's specifications in India. McDonald's began using some locally sourced potatoes in 2007 and expects to be able to source all of its potato needs, estimated to be 12,000 mt, from Gujarat by 2010. In fact, McDonald's hopes to export surplus potatoes from India to China in the near future. These Indian exports would replace MacFry exports from the United States to China.[59]

Some restaurant companies prefer to import certain ingredients, though it is not always possible for them to do so. Certain widely available bulk commodities that are easy to ship, including wheat and vegetable oil, would seem to be likely candidates for imports. For example, low-protein Indian wheat is not well suited to high-rising dough products, such as Western-style bread rolls and pizza dough, and restaurants that use Indian wheat to make such products must include a costly extra step of adding wheat gluten to their bread dough. However, existing Indian barriers to foreign wheat imports make imports of high-protein foreign wheat more expensive; as reported elsewhere in this report, U.S. wheat, though desirable, is almost impossible to import into India. Thus most companies continue to rely on less-suitable Indian wheat.[60]

Global brand reputation is tremendously important to quick-service restaurants, and they have been successful in building brand loyalty with Indian consumers. For example, the *Economic Times* annual brand survey has named Pizza Hut the "Most Trusted Service Brand" in India for the last five years.[61] Yet it does not appear that brand loyalty is built, for the most part, on providing specifically U.S. ingredients in these restaurants' offerings. Rather, U.S. brand owners report that success in the quick-service industry in India is in direct proportion to their ability to adapt product offerings to local palates while continuing to emphasize those parts of the global brand that Indian customers value most, such as high quality, convenience, cleanliness, and good service.[62]

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[58] Industry representatives, interviews by Commission staff, Mumbai and New Delhi, India, May 8–12, 2009.

[59] Industry representative, interview by Commission staff, Mumbai, India, May 12, 2009; *Hindu Business Line*, "MacFry Now Made in India," March 7, 2008.

[60] Industry representative, interview by Commission staff, New Delhi, India, May 8, 2009.

[61] StreetInsider.com, "Pizza Hut Named Most Trusted Food Service Brand in India by the Economic Times for Fifth Year," June 25, 2009.

[62] Bahn and Nemer, "Brand Magic in India," May 8, 2006; industry representative, interview by Commission staff, Mumbai, India, May 12, 2009; and industry representative, interview by Commission staff, New Delhi, India, May 8, 2009.

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CHAPTER 9
Intellectual Property Rights and Related Policies in the Indian Seed Sector

Overview

U.S. and global seed firms identified intellectual property rights (IPR) as particularly important to their operations in India.[1] Firms in other agricultural sectors, by contrast, did not identify IPR policies as critical to their trade or investment decisions.[2] U.S. and other global firms participate in the market mainly through the local research and development (R&D) and commercialization of hybrid and genetically engineered, or biotech, seeds.[3] This local presence enables global firms to establish and maintain close connections with customers and facilitates the development and regulatory approval of seeds tailored to India's specific agronomic conditions.[4]

U.S. and other global firms have identified three factors as critical to increasing their participation in the Indian market: comprehensive and effective IPR laws, market-based pricing, and science-based regulatory review of new seed technologies. In the area of IPR, India has recently put in place a plant variety protection law, as well as patent provisions for seed biotechnology inventions; however, industry sources indicated that broad exceptions in the laws, delayed implementation, and uncertainty regarding enforcement undermine the effectiveness of these protections. They also noted that state-level restrictions on prices and time-consuming and unpredictable regulatory review impede the commercialization of new seed technologies. In the absence of effective regulatory review and IPR enforcement, industry sources claim that illegal and counterfeit seed markets have flourished, to the detriment of legitimate products.[5]

[1] One IPR issue of substantial concern to producers of agricultural chemicals is India's lack of protection against the unfair commercial use of tests or other data that firms submit to obtain government marketing approval for their products. Biotechnology Industry Organization (BIO), written submission to the Commission, June 26, 2009, 3. Because chemicals are outside the scope of this investigation, the issue is mentioned only briefly here.

[2] Although not reported to be of primary importance, the value of trademarks to successful FDI in the processed food and quick service restaurant sectors, and problems with the counterfeiting of spirits, were issues raised by industry representatives during Commission interviews and are noted in chapter 8.

[3] Although India's domestic seed market is one of the largest in the world, imports account for only a small portion of the market. The International Seed Federation (ISF) estimates the value of India's domestic seed market at $1.5 billion. See ISF Web site, http://www.worldseed.org/en-us/international_seed/home.html (accessed June 20, 2009). The United States accounted for $6 million of India's total planting seed imports of $49 million in FY 2007–08. Singh and Kaul, *India: Planting Seeds*, December 17, 2008, 6.

[4] Industry representative, interview by Commission staff, Mumbai, India, May 12, 2009; Monsanto India Ltd., *Annual Report 2007–2008*, 2009, 16.

[5] Industry representatives, interviews by Commission staff, New Delhi, India, May 4, 5, 6 and 9, 2009; industry representatives, interviews by Commission staff, Mumbai, India, May 11 and 12, 2009; and industry representatives, telephone interviews by Commission staff, January 21, March 30, and June 10, 2009. See also BIO, written submission to the Commission, June 26, 2009, 2–3; USIBC, written submission to the Commission, June 26, 2009.

Structure of the Indian Seed Market

The Indian seed market comprises a large public sector and a growing private sector. The involvement of the public and private sectors in the market varies according to the three major types of seeds: (1) open-pollinated varieties (OPVs), which can be saved and reproduced from one year to the next without deteriorating quality; (2) hybrids, which must be replaced each year but generally provide substantial yield and quality gains over OPVs; and (3) biotech seeds, or seeds that have been engineered to include genes with desirable traits, such as insect resistance, that are transferred from other organisms.[6] Genetic engineering techniques can be used with hybrids or OPVs; in India, biotech seeds are typically hybrids. Generally, Indian public-sector seed companies supply high volumes of low-value OPVs—such as grains and pulses. The private sector supplies low volumes of high-value hybrids and biotech seeds, such as vegetables and cotton.[7] Demand for hybrid and biotech seeds is growing as Indian farmers become convinced of the substantial quality, stability, and yield improvements such seeds can bring to the harvest.[8]

With this transition away from OPVs, the private sector's share of the seed market has increased to 60–70 percent, up significantly from 20 years ago.[9] Economic reforms in the seed industry in the late 1980s and in the Indian economy in 1991—including the removal of industrial licensing requirements, of small-scale industry reservations, and of restrictions on foreign direct investment (FDI)—also have opened the industry to broader participation by Indian and global firms. Today, there are reportedly no FDI or profit repatriation restrictions limiting investment in India's seed sector.[10]

U.S. and other global seed firms with a substantial presence in the Indian hybrid and biotech seed markets include Monsanto (United States), Bayer CropScience (Germany), DuPont/Pioneer (United States), Syngenta (Switzerland), and Dow AgroScience (United States). Leading Indian firms include Rasi Seeds, the Maharashtra Hybrid Seed Company (Mahyco), Nuziveedu Seeds, Advanta/United Phosphorus Limited, and JK Seeds. Together these foreign and domestic firms reportedly supplied more than 90 percent of the Indian hybrid and biotech seed market in 2006.[11]

Intellectual Property Rights Protection for Seeds

IPR protection for seeds is important because the invention, development, and commercialization of new products often entails large research expenditures, uncertain

[6] Choudhary and Guar, *Trust in the Seed*, 2008, 15.

[7] Govindan, *India: Planting Seeds*, December 29, 2003, 3.

[8] Industry representative, telephone interview by Commission staff, June 10, 2009; Choudhary and Guar, *Trust in the Seed*, 2008, 10–14.

[9] Ramaswami, "Understanding the Seed Industry," August 2002, 4.

[10] Industry representative, interview by Commission staff, New Delhi, May 9, 2009; Murugkar, Ramaswami, and Shelar, "Competition and Monopoly in the Indian Cotton Seed Market," May 2007, 2.

[11] Girdhar, "Public Private Partnership in Seed Development," October 19, 2006. Dow AgroScience is a more recent entrant to the hybrid and biotech seed market in India and thus was not included in the Bayer CropScience market estimates.

outcomes, and lengthy and costly regulatory procedures.[12] U.S. and other global seed firms report that stronger IPR protections are necessary to help recover these substantial costs and to provide incentives for continued innovation.[13]

IPR protection is considered crucial for all types of seeds, but particularly for new OPVs and biotech seeds. The value of these types of seeds can be relatively easily appropriated; OPVs can be saved and reused or shared among farmers, and the latest biotechnology tools facilitate the reverse engineering of biotech seeds by commercial competitors.[14] Hybrids, which are created through the crossing of two or more parental lines, have some built-in protection from appropriation by farmers as the seeds lose their superior yield potential and other valuable characteristics after the first planting. [15] Moreover, competitors cannot copy a hybrid without obtaining access to the parental lines used to create it.[16] However, these built-in protection mechanisms have their limitations. Seed production in India tends to be concentrated in geographic zones with favorable agronomic conditions; the presence of many competing firms working in a relatively small area creates numerous opportunities for misappropriation.[17] U.S. and other global firms report that they are cautious about developing and marketing hybrids in India, particularly seeds that are produced by only a single cross of parents, preferring multiple crosses to make unauthorized access to the parental lines more difficult.[18]

Plant Variety Protection

The WTO Agreement on the Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) requires that members protect plant varieties with patents, an effective alternative system, or both.[19] A limited number of countries, including the United States, use both patents and an alternative system to protect plants. Most developing countries have chosen not to offer patent protection and instead provide an alternative system, relying on the model supplied by the International Union for the Protection of New Varieties of Plants (UPOV) (box 9.1).

[12] According to BIO, "it can take ten to fifteen years and tens of millions of dollars to commercialize an agricultural biotechnology product." BIO, written submission to the Commission, June 26, 2009, 2. See also Monsanto India Ltd., *Annual Report 2007–2008*, 2009, 10; Maskus, "Intellectual Property Rights in Agriculture," December 2004, 721; and Gracen, "How Intellectual Property and Plant Breeding Come Together," 2007, 1820–23.

[13] Industry representatives, interviews by Commission staff, New Delhi, India, May 4, 5, 6, and 9, 2009; industry representatives, interviews by Commission staff, Mumbai, India, May 11 and 12, 2009; industry representatives, telephone interviews by Commission staff, January 21, March 30, and June 10, 2009; and BIO, written submission to the Commission, June 26, 2009, 2.

[14] Maskus, "Intellectual Property Rights in Agriculture," December 2004, 721.

[15] Industry representative, telephone interview by Commission staff, June 10, 2009.

[16] World Bank, *Intellectual Property Rights*, 2006, 7.

[17] Tripp, Louwaars, and Eaton, "Plant Variety Protection," 2007, 360.

[18] Industry representative, telephone interview by Commission staff, June 10, 2009.

[19] TRIPS, art. 27.3(b).

BOX 9.1 The UPOV System for Plant Variety Protection

UPOV was established by the International Convention for the Protection of new varieties of plants (the UPOV Convention). The UPOV Convention was originally adopted in 1961, with the objective of encouraging the development of new varieties of plants by granting IPR to plant breeders. UPOV grants plant breeders rights over a variety that is "distinct, uniform, and stable" (the DUS criteria) for a defined number of years. Breeders can bring suit to enforce their rights and obtain damages for infringement.

The UPOV Convention was revised in 1972, 1978, and again in 1991, with the 1991 revision providing stronger protection to plant breeders than earlier conventions. For example, the 1991 UPOV Convention makes it optional rather than mandatory for a member state to recognize a farmer's privilege to use and exchange saved seeds of a protected variety. Moreover, the farmer's privilege is more narrowly tailored in the 1991 UPOV Convention.

Although members joining UPOV generally are required to join under the latest version of the UPOV Convention, India received a dispensation that would permit it to join under the 1978 UPOV Convention. Although India has applied to join UPOV, to date UPOV has not granted India's application, at least in part because of the broad farmer's privilege in India's law (discussed below).

Sources: Dhar, "Sui Generis Systems," April 2002, 8–16; World Bank, *Intellectual Property Rights*, 2006, 16; and industry representative, telephone interview by Commission staff, June 10, 2009.

India enacted its own unique legislation in 2001, the Protection of Plant Varieties and Farmers' Rights Act, 2001 (PPV&FR law). Major differences between the Indian law and U.S. law, which follows the 1991 UPOV Convention, are highlighted below (table 9.1). The most significant difference stems from India's attempt to safeguard the interests of farmers by broadly permitting them to save, use, sow, exchange, share, and even sell protected seed. U.S. and other global seed firms state that this broad farmer's privilege is a significant disincentive to their introduction of new technologies in India.[20] The only limitation on the farmers' privilege is a prohibition on the sale of "branded seed." Even branded seed is often protected only in theory: the practice of "brown bagging," where farmers and others sell repackaged branded seed or seed of unknown origin in brown bags in village markets, is widespread in India.[21]

[20] Industry representative, telephone interview by Commission staff, March 30, 2009; industry representatives, interviews by Commission staff, New Delhi, India, May 4, 8, 2009; and industry representative, e-mail message to Commission staff, June 19, 2009.

[21] As several industry representatives noted, it is virtually impossible to sue farmers in India. Industry representative, interview by Commission staff, New Delhi, India, May 5, 2009; industry representative, interview by Commission staff, Mumbai, India, May 12, 2009; and industry representative, telephone interview by Commission staff, June 10, 2009. For additional information on brown bagging and illegal seed, see box 9.3.

TABLE 9.1 Major differences between Indian and U.S. plant variety protection laws

	India	United States
Length of protection	18 years for trees and vines; 15 years for other crops and "extant" (existing) varieties.	25 years for trees and vines, 20 years for other crops.
Scope of protection	Allows protection of extant varieties and farmers' varieties, as well as new varieties. Only new varieties must meet the UPOV requirement that variety be distinct, uniform and stable.	Allows protection of plant varieties that are novel and that meet the UPOV requirement that variety be distinct, uniform and stable.
Farmer seed saving and exchange	Seed saving, exchange, and sale by farmers are broadly permitted, without reference to breeders' interests. Farmers are prohibited only from selling "branded seed."	Seed saving and sole use by the farmer to produce a crop are permitted, subject to the legitimate interests of the breeder. Farmers cannot sell or share seed without the permission of the breeder and payment of royalties.
Breeder's exemption	Activities for purpose of breeding other varieties are generally permitted.	Activities for purpose of breeding other varieties are permitted provided that they do not result in the production of "essentially derived varieties."

Sources: Indian Protection of Plant Varieties and Farmers' Rights Act (2001); U.S. Plant Variety Protection Act, 7 U.S.C. §§ 2321–2582 (2007).

Moreover, India's delayed implementation of the PPV&FR law makes it difficult to assess its effectiveness. Despite enactment of the law in 2001, the regulatory agency charged with implementation, the PPV&FR Authority, was not established until October 2005 and did not begin accepting applications for registration until May 2007.[22] Furthermore, the PPV&FR Authority has been phasing in protection by initially accepting applications for only 12 species of crops, and more recently adding 6 more species.[23] U.S. and other global seed firms are concerned that this phased-in approach leaves many important fruit and vegetable crops excluded from any potential coverage for the foreseeable future.[24]

The PPV&FR Authority has received more than 1,200 applications for registration of new and existing varieties of the 18 permitted species.[25] Most applications cover varieties already existing at the time of the law's enactment. To date, only registration certificates for existing varieties, which do not require extensive testing procedures for registration, have been issued; no new varieties have been extended protection under the law.[26]

Most applications have been filed by the public sector. Applications filed by the Indian Council for Agricultural Research (ICAR), India's preeminent agricultural research body, and by state agricultural universities (SAUs) make up 54 percent of all filings, while applications by domestic and global firms comprise 45 percent of filings. Farmer filings are minimal (fig. 9.1). The substantial number of filings by ICAR and the SAUs suggest

[22] PPV&FR Authority Web site, http://www.plantauthority.gov.in (accessed June 20, 2009); government official, interview by Commission staff, New Delhi, India, May 4, 2009.

[23] The 18 species that may be protected are: black gram, bread wheat, cotton (tetraploid), cotton (diploid), chickpea, field pea, green gram, jute, kidney bean, lentil, maize, pearl millet, pigeon pea, rice, sorghum, sugarcane, tumeric and ginger. PPV&FR Authority Web site, http://www.plantauthority.gov.in (accessed June 20, 2009).

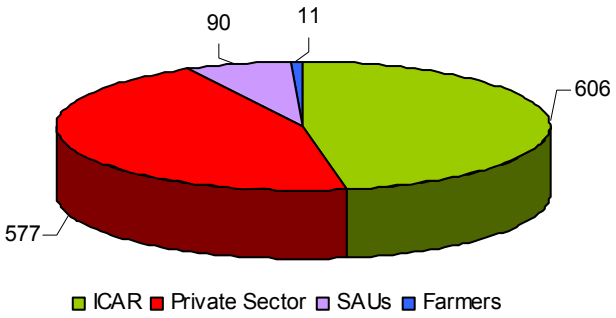
[24] Industry representative, e-mail message to Commission staff, June 19, 2009.

[25] Government official, e-mail message to Commission staff, July 24, 2009.

[26] PPV&FR Authority Web site, http://www.plantauthority.gov.in (accessed June 20, 2009).

that the public sector in India has an ongoing role in the seed sector and, like the private sector, is focused on protecting its IPR in plant varieties.[27]

FIGURE 9.1 Plant variety protection applications filed in India, 2007–present



Source: Indian PPV&FR Authority.

The process for approval of new plant varieties reportedly requires the deposit of the parental lines used for making hybrid seeds, as well as a gene bank deposit of the genetic material for biotech seeds. These deposits can be used for resolving legal disputes and for "compulsory licensing" in cases of famine or other emergency.[28] U.S. and other global seed firms have expressed substantial concern with the deposit requirements, particularly with whether the confidentiality of the deposits will be maintained during testing by public-sector scientists or whether instead seed technologies will be shared with public- and private-sector competitors.[29]

Patent Protection

India's patent law with respect to seed technologies is complex. It excludes plants, seeds, varieties, and species from patenting, but for the production of plants, it permits the patenting of microorganisms and processes that are not "essentially biological."[30] There has been substantial discussion within India of the appropriate scope of coverage for microorganisms and biotechnology. Recently, a government-appointed expert group concluded that although some protection for microorganisms was required by the TRIPS Agreement, strict guidelines should be implemented to limit patents to cases of "substantial human intervention and utility."[31] The Indian Patent Office reportedly is considering how to address the suggestions of the expert group.[32]

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[27] Ibid.; Government official, interview by Commission staff, New Delhi, India, May 4, 2009.

[28] Government official, interview by Commission staff, New Delhi, May 4, 2009. The PPV&FR permits compulsory licensing three years after the registration of the protected seed where the reasonable requirements of the public are not met or the seed is not available at a reasonable price. Protection of Plant Varieties and Farmers' Rights Act (2001), Chapter VII, Section 47.

[29] Industry representative, e-mail message to Commission staff, June 19, 2009; industry representative, telephone interview by Commission staff, March 30, 2009; and World Bank, *Intellectual Property Rights*, 2006, 24.

[30] India Patents Act, 1970 (2005), Section 3(j).

[31] While initially issued in December 2006, this expert report was withdrawn in 2007, and then reissued in March of 2009. Technical Expert Group on Patent Law Issues, "Report of the Technical Expert Group on Patent Law Issues" (revised March 2009), 15.

[32] Government official, interview by Commission staff, May 8, 2009.

U.S. and other global seed firms state that it remains difficult to obtain patent rights of any significant commercial value for biotechnology inventions because the law excludes plants from protection.[33] They also have expressed concern over the patent law's broad compulsory license provisions and stringent requirements for the identification of the source and geographical origin of any biological material contained in an invention.[34] Major differences in plant-related patent provisions in India and the United States are set forth below (table 9.2).

TABLE 9.2 Major differences between Indian and U.S. plant-related patent provisions

	India	United States
Patents available for plants, seeds, and varieties	No	Yes
Patents available for microorganisms and certain biotechnology processes	Yes	Yes
Compulsory license may be imposed three years after patent grant where invention has not been worked on domestically, where reasonable requirements of the public have not been satisfied, or where invention is not available at a reasonably affordable price	Yes	No
Mandatory identification of source and geographical origin of biological material in the invention	Yes	No

Sources: India Patents Act, 1970 (2005), §§ 3, 10, 84; U.S. Plant Patent Act, 35 U.S.C. § 161; Utility Patent Statute, 35 U.S.C. § 101 (2007).

Notwithstanding these concerns, global firms have patented seed technologies in India.[35] According to online records of the Indian Patent Office, Monsanto has the largest number of recently granted patents for seed technologies (table 9.3). For example, Monsanto has obtained a patent for "Cotton Event MON15985," the genetic sequence underlying the second generation of its biotech cotton product (Bollgard II). Patents for biotechnology methods and products, as well as seed coatings and treatments, also have been issued to Bayer and Syngenta. However, neither DuPont/Pioneer nor Dow Agroscience appear to have patented any seed technologies in India recently, and the same is true of such large Indian seed companies as Rasi Seeds, Mahyco, and Nuziveedu.

TABLE 9.3 India: Patents granted to U.S. and other global seed firms for biotechnology, 2007–09

Company	Recent seed patents	Subject matter
Monsanto	17	Biotechnology methods and processes; genetic sequences that confer valuable traits including insect resistance, herbicide tolerance, improved germination rates, and increased oil levels; and seed treatments.
Bayer	13	Biotechnology methods and processes; genetic sequences that confer valuable traits such as insect resistance, reduced seed shattering, stress tolerance, and increased starch content; and methods for producing transgenic cotton and rice.
Syngenta	7	Biotechnology methods and processes; seed coatings and treatments.

Source: Indian Patent Office.

[33] BIO, written submission to the Commission, June 26, 2009, 3; industry representative, telephone interview by Commission staff, March 30, 2009; and industry representative, e-mail message to Commission staff, June 19, 2009.

[34] According to BIO, the "special disclosure requirements impose unreasonable burdens on patent applicants, subjecting valuable patent rights to great uncertainty." BIO, written submission to the Commission, June 26, 2009, 3; industry representative, telephone interview by Commission staff, March 30, 2009; and industry representative, e-mail message to Commission staff, June 19, 2009.

[35] The Controller General of Patents, Designs, and Trademarks (Indian Patent Office) has online search facilities that permit the searching by applicant name of "new records" of granted patents. See Indian Patent Office, Public Search for Patents, http://ipindia.nic.in/patsea.htm (accessed July 12, 2009). Although date parameters for new records are not provided, they appear to include patents granted since 2007. Patents related to fertilizers, pesticides, and other agricultural chemicals are not included in the totals reported here.

Whether this situation will soon change is unclear. While global seed firms, and some Indian companies, have patent applications pending for seed technologies, there are significant resource constraints and a large backlog in the processing of applications by the Indian Patent Office.[36] Although the Patent Office has taken steps to reduce the backlog in recent years, applications relating to biotech seeds reportedly have not been included in the group of applications given priority for resolution.[37]

U.S. and other global firms also are concerned about how effectively any IPR granted to seed technologies will be protected.[38] Civil suits often take many years to conclude, and the enforcement of judgments ultimately obtained is reported to be difficult.[39] Moreover, India's court system is reported to be extremely slow because of a large volume of cases and numerous opportunities to challenge adverse rulings.[40]

State Pricing Restrictions

Biotech seeds give rise to a market for both the seeds and the underlying technology. The genetic technology is typically licensed by the technology producer to seed companies for a "trait fee." Seed companies insert the genetics into local varieties and then sell the seeds to distributors or directly to consumers. Since India has no national laws or regulations that restrict the price of either seeds or trait fees, the technology producers and the seed companies should have an unrestricted ability to set prices.[41] However, this has not been the case for Bt cotton, the first biotech seed approved for planting in India. A description of the development and adoption of Bt cotton in India is provided below (box 9.2).

Controversies over the pricing of Bt cottonseed began in 2005. In January 2006, the state government of Andhra Pradesh filed a complaint with the Monopolies and Restrictive Trade Practices Commission alleging that the trait fees charged by Mahyco-Monsanto Biotech (MMB) to seed companies and passed on to farmers in seed prices were too high. After an early ruling in its favor, Andhra Pradesh issued a 2006 directive to all biotech seed companies that limited the customer price for a packet of MMB's first-generation product, Bollgard I, to Rs. 750 ($17) per package, a substantial reduction from prevailing prices that ranged from Rs. 1,600–1,800 ($36–$41).[42]

Other states, including Maharashtra, Gujarat, Tamil Nadu, Karnataka, Madhya Pradesh, and West Bengal, have been quick to adopt directives restricting prices in a "race to the

[36] WTO, "Trade Policy Review of India," 2007, 89. The U.S. Patent and Trademark Office also has a significant backlog of patent applications for processing.

[37] Industry representative, telephone interview by Commission staff, January 21, 2009.

[38] India has been on the Priority Watch List of the U.S. Trade Representative because of weak IPR protection and enforcement since 1989. Generally, however, U.S. concerns have focused on copyright infringement and internet piracy, the counterfeiting of pharmaceuticals, the need for criminal IPR enforcement, and the failure to enact a law protecting against the unfair use of test data, rather than seed-related IPR issues. USTR, "India," *Special 301 Report*, 2009.

[39] Industry representative, interview by Commission staff, Washington, DC, June 19, 2009.

[40] USTR, *2009 National Trade Estimate Report on Foreign Trade Barriers*, 2009, 242; industry representative, interview by Commission staff, Washington, DC, June 19, 2009. The backlog is so substantial that the chief judge of the High Court in New Delhi, which hears criminal and civil cases, recently stated that it would take 466 years just to adjudicate all of the pending criminal cases at the present rate of resolution. *International Business Times*, "Indian Court Is 466 Years Behind Schedule," February 7, 2009.

[41] Singh, *India: Agricultural Biotechnology*, July 24, 2009, 8.

[42] Sourav, "Monsanto at the Receiving End of Bt Cotton Pricing Policy," July 14, 2006; industry official, e-mail message to Commission staff, August 25, 2009.

bottom" for the pricing of Bt cottonseeds.[43] Today, Bt cottonseed price are limited to Rs. 650–750 ($13–$15) per package for Bollgard I, and Rs. 750–925 ($15–$19) for Bollgard II.[44] These restrictions on customer prices necessarily limit the amount that MMB can charge its licensees for the technology. Various legal challenges mounted by MMB to the state government price restrictions have been unsuccessful.

BOX 9.2 Bt Cotton in India

Bt cotton is an insect-resistant transgenic crop that contains genetics from the bacterium *Bacillus thuringiensis* (Bt). These genetics confer resistance to certain pests, particularly the bollworm.

In 1996, Monsanto, the original developer of the Bt cotton technology, obtained approval in the United States for the commercial release of its product, marketed under the brand name Bollgard. At about this same time, the Indian firm Mahyco obtained permission to import Monsanto Bt cotton genetics under a license agreement.

Mahyco began to backcross its hybrid cotton lines with the Monsanto genetics. In 1998, Monsanto acquired a 26 percent share in Mahyco and created MMB to develop and commercialize biotech products in India. Field tests of three Mahyco backcrossed lines began in 1998. In 2002, India's Genetic Engineering Approval Committee (GEAC) approved the three hybrids for cultivation in central and southern India.

Patent protection was not available for biotech products in India at the time of Bollgard's initial release, so the technology underlying the first generation product, Bollgard I, is not patented in India. In 2009, however, Monsanto was granted a patent for the technology underlying its second-generation product, Bollgard II.

Since the initial approval in 2002, the Monsanto genetics have been broadly licensed to other private- and public-sector firms and incorporated into their cotton hybrids. As of 2008, 274 cotton hybrids had been approved for marketing by 30 different seed companies. These hybrids incorporate genetics developed by Monsanto (Bollgard I and II); the Indian firm JK seeds, in collaboration with the Indian Institute of Technology; and genetics developed by the Chinese Academy of Agricultural Science and licensed to the Indian firm Nath Seeds. In May 2008, the GEAC approved the release of genetics developed by an Indian public-sector institute and incorporated in an OPV such that farmers will be able to effectively save and reuse the biotech seed.

In 2008, approximately 5 million (82 percent) of India's small farmers were reported to be planting Bt cotton. The adoption of Bt cotton has been credited with substantial yield increases, decreases in pesticide use, and increases in farmers' profitability per hectare. Farmers have been willing to purchase Bt cottonseeds despite higher prices than conventional cottonseeds (before price restrictions were implemented) because of these substantial benefits.

Sources: Scoones, *Regulatory Manoeuvres*, August 2003, 6–7; James, G*lobal Status*, 2008, 57; industry representatives, telephone interviews by Commission staff, January 21 and June 10, 2009; and industry representatives, interview by Commission staff, Mumbai, May 11, 2009.

[43] Singh, *India: Agricultural Biotechnology,* August 25, 2008, 8; industry representative, telephone interview by Commission staff, January 21, 2009.

[44] Industry official, interview by Commission staff, Mumbai, India, May 11, 2009; industry official, e-mail message to Commission staff, August 25, 2009.

The U.S.-India Business Council states that non-market-based pricing of seeds and intellectual property infringement threaten the continued availability of new and improved seed technologies and thus the ability of Indian farmers to compete with U.S. and other global agricultural interests.[45] U.S. and other global firms report that they are reconsidering investment decisions, product offerings, and business models in light of the state government pricing restrictions.[46] Price restrictions undermine the willingness of global firms to introduce their most valuable technologies to the Indian market. Domestic firms' innovative efforts also have been impaired by state government interference in pricing.[47]

Biosafety Regulation

A transparent and science-based biosafety regulatory system is essential for global and domestic firms seeking to introduce new seed technologies on the Indian market, as well as for farmers and the consuming public. The stated goals of the Indian biosafety system are to ensure that biotech crops pose no major risk to food safety, environmental safety, or agricultural production, and that farmers are not economically harmed by biotech crops.[48] The latter goal of protecting farmers is unique to India's regulatory system. Based on this wide-ranging mandate, regulatory review in India has been reported to take into account not just health and safety factors but also the manner in which a product will be commercialized, including whether a single company would have market exclusivity and/or the ability to charge relatively high prices in the event of an approval. Regulatory approval may be delayed or denied to avoid such a result.[49]

U.S. and other global firms report that biosafety regulatory proceedings in India can be lengthy and unpredictable.[50] Lengthy regulatory proceedings can have the unintended effect of encouraging the growth of illegal seed markets to fill unmet demand during protracted review periods (box 9.3).

[45] USIBC, written submission to the Commission, June 26, 2009, 6.

[46] Industry representatives, interviews by Commission staff, Mumbai, India, May 11–12, 2009; industry representatives, telephone interviews by Commission staff, January 21 and June 10, 2009.

[47] Suresh and Rao, "Profiles of Four Top Biotech Companies," 2009, 299.

[48] Pray et al., "Costs and Enforcement," 2006, 142.

[49] Industry representative, telephone interview by Commission staff, June 10, 2009.

[50] According to the NCGA, "[W]hile there is a policy for biotechnology registrations, overall Indian policy regarding genetically modified organisms is not well-defined." NCGA, written submission to the USITC, June 19, 2009, 1. Industry representative, telephone interview by Commission staff, June 10, 2009; industry representatives, interview by Commission staff, Mumbai, India, May 12, 2009; and USTR, *2009 National Trade Estimate Report on Foreign Trade Barriers*, 2009, 240.

BOX 9.3 Illegal and Counterfeit Cottonseeds in India

Enforcement of biosafety and IPR laws remains an ongoing challenge in India. Biotech seeds must be approved by the Indian biosafety system; seeds that do not obtain regulatory approval are illegal. In 2001, unapproved biotech cottonseed was found in farmers' fields in Gujarat, while the MMB product was still being reviewed by regulators for release. The illegal seed was identified as NB 151, a variety registered as a conventional hybrid by NavBharat Seeds but containing the Bt genetics developed by MMB.

NavBharat Seeds was banned from the cottonseed business and prosecuted for violating biosafety laws, but the production, distribution, and widespread use of NB 151 reportedly continues today. The seed is produced through a network of seed companies, producers, and agents, many of whom are former contract growers for NavBharat Seeds. Illegal Bt cottonseed production and sales reportedly are concentrated in Gujarat and, to a lesser extent, in Punjab, Maharashtra, and Andhra Pradesh. According to press reports, 5 million packets of illegal seeds were produced in Gujarat in 2007. Government raids have had limited effect in stopping the activity.

Counterfeit cottonseeds also are a substantial problem. Dealers label counterfeits with names similar to well-known Bt cotton sources—for example, "Mahaco" rather than "Mahyco." The counterfeits do not carry the insect-resistant trait of legitimate products. As mentioned elsewhere, "brown bagging," where farmers and other parties sell repackaged branded seed and seed of unknown origin in brown bags in village markets, is also a common practice.

Drawn-out regulatory proceedings, by keeping potentially high-demand legitimate products out of the market, create a void that may be filled by illicit goods. In recognition of the importance of more timely regulatory review, India recently announced that it would adopt a new approval mechanism for cotton hybrids—one that will be based on *genetic events* (i.e., particular genetically engineered organisms) rather than on the particular hybrid. Under this new mechanism, any cotton hybrid incorporating one of the four already approved genetic events will go through a streamlined review process. This change is intended to ease market access for legitimate and safe products.

Sources: Lalitha, Pray, and Ramaswami, "The Limits of Intellectual Property Rights," March, 2008, 10–11; *Business Standard*, "Guj Worst-Hit by Illegal Bt Cotton Production," April 22, 2008; Government of India, Ministry of Environment and Forests, "New Procedure for Commercial Release of Bt Cotton Hybrids," February 20, 2009; and Herring, "Persistent Narratives," 2009, 16–17.

High regulatory costs and lengthy procedures also can result in products being withdrawn from consideration if the costs of compliance outweigh the benefits the firm can obtain in a particular market.[51] Bayer CropScience, for example, reportedly pulled its biotech mustard seed from regulatory consideration in India in 2003 after approximately nine years of review and testing and millions of dollars in costs. Bayer reported that the continued costs, uncertainty about whether the product would ever be approved, and potentially small market size all contributed to its decision not to continue with commercialization of the product in India.[52]

Regulatory review that is not timely and science-based does not serve either farmers or the consuming public. Biotech seeds are being developed to incorporate traits such as pest resistance, drought tolerance, and yield and nutritional enhancement that could substantially assist India in meeting its goals of self-sufficiency, food security, and supporting farmer incomes.[53] A large number of such products are currently undergoing regulatory review in India.[54] The product closest to completing review appears to be Bt

[51] Researchers have compared the costs of biosafety review in India and China and found that the cost of initial approval of Bt cotton in India exceeded the cost in China by a ratio of 20:1, and that approval took substantially more time in India. Pray, et al., "Costs and Enforcement," 2006, 146–50.

[52] Pray, Bengali, and Ramaswami, "The Cost of Biosafety Regulations," 2005, 273.

[53] These goals are discussed in chapter 1.

[54] Singh, *India: Agricultural Biotechnology*, July 24, 2009, 3.

eggplant, which began field trials in 2002 and was expected to reach final approval in 2009.[55] That time frame now appears less likely in light of the recent announcement by India's environment Minister that approval by GEAC was not sufficient and that a series of additional consultations with interested groups would be necessary.[56] Wide-ranging inquiries into matters other than biosafety can make regulatory review processes unduly time-consuming and unpredictable.

[55] Choudhary and Guar, *Development and Regulation*, 2009, 54.
[56] *The Times of India*, "Bt Brinjal Debate Goes to People," October 16, 2009.

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APPENDIX A
REQUEST LETTER

United States Senate

COMMITTEE ON FINANCE

WASHINGTON, DC 20510–6200

January 12, 2009

The Honorable Shara L. Aranoff
Chairman
U.S. International Trade Commission
500 E Street, S.W.
Washington, DC 20436

Dear Chairman Aranoff,

U.S. agriculture depends on reliable access to global markets. Strong economic growth in developing countries like India presents opportunities for U.S. agricultural exports. Although the United States is globally competitive in a wide variety of agricultural products – ranging from wheat, corn, soybeans, peas, lentils, and edible oils – U.S. farmers only provide about 5 percent of India's current food imports. While U.S. exporters can provide individual examples of trade measures that prevent their sales to India, the extent to which trade and investment measures account for the disproportionately low U.S. share of India's agricultural imports remains largely undocumented.

We are writing to request that the U.S. International Trade Commission (ITC) conduct an investigation under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)) regarding the effects of tariff and non-tariff measures on U.S. agricultural exports to India. The report should cover the period 2003-2008, or the period 2003 to the latest year for which data are available.

To the extent possible, the report should include the following:

- an overview of the Indian agricultural market, including recent trends in consumption, imports, and domestic supply;
- a description of the principal measures affecting Indian agricultural imports, including tariffs, sanitary and phytosanitary measures, food regulations, packaging and labeling requirements, pricing policies, intellectual property policies, and customs procedures;
- information on Indian government regulations, including state regulations, covering agricultural markets and foreign direct investment affecting U.S. agricultural products in India;

- an evaluation of the impact of India's food marketing and distribution system, including market structure, transportation infrastructure, and cold-storage capacity, on U.S. agricultural products in the Indian market; and,

- a quantitative analysis of the economic effects of Indian tariffs, and to the extent possible, non-tariff measures on U.S. agricultural exports to India.

The Commission should provide its completed report no later than ten months from the receipt of this request. As we intend to make the report available to the public, we request that it not contain confidential business information.

Sincerely,

Max Baucus
Chairman

Charles E. Grassley
Ranking Member

APPENDIX B
FEDERAL REGISTER NOTICE

your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Dated: January 15, 2009.

Ann Gold,

Acting Regional Director—UC Region.

[FR Doc. E9–2727 Filed 2–12–09; 8:45 am]

BILLING CODE 4310–MN–P

INTERNATIONAL TRADE COMMISSION

[Investigation No. 332–504]

India: Effects of Tariffs and Nontariff Measures on U.S. Agricultural Exports

AGENCY: United States International Trade Commission.

ACTION: Institution of investigation and scheduling of hearing.

SUMMARY: Following receipt on January 13, 2009, of a request from the United States Senate Committee on Finance (Committee) under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)), the U.S. International Trade Commission (Commission) instituted investigation No. 332–504, India: Effects of Tariffs and Nontariff Measures on U.S. Agricultural Exports.

DATES: *March 24, 2009:* Deadline for filing requests to appear at the public hearing.

April 2, 2009: Deadline for filing prehearing briefs and statements.

April 21, 2009: Public hearing.

April 28, 2009: Deadline for filing posthearing briefs and statements.

June 26, 2009: Deadline for filing all other written submissions.

November 12, 2009: Transmittal of Commission report to the Committee.

ADDRESSES: All Commission offices, including the Commission's hearing rooms, are located in the United States International Trade Commission Building, 500 E Street, SW., Washington, DC. All written submissions should be addressed to the Secretary, United States International Trade Commission, 500 E Street, SW., Washington, DC 20436. The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at *http://www.usitc.gov/secretary/edis.htm.*

FOR FURTHER INFORMATION CONTACT: Project leader George Serletis (202–205–3315 or *george.serletis@usitc.gov*) or deputy project leader Brian Allen (202–205–3034 or *brian.allen@usitc.gov*) for information specific to this investigation. For information on the legal aspects of this investigation, contact William Gearhart of the Commission's Office of the General Counsel (202–205–3091 or *william.gearhart@usitc.gov*). The media should contact Margaret O'Laughlin, Office of External Relations (202–205–1819 or *margaret.olaughlin@usitc.gov*). Hearing-impaired individuals may obtain information on this matter by contacting the Commission's TDD terminal at 202–205–1810. General information concerning the Commission may also be obtained by accessing its Internet server (*http://www.usitc.gov*). Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202–205–2000.

Background: As requested by the Committee, the Commission will conduct an investigation and prepare a report on the effects of tariffs and nontariff measures on U.S. agricultural exports to India. As requested, to the extent possible, the report will include—

(1) An overview of the Indian agricultural market, including recent trends in consumption, imports, and domestic supply;

(2) a description of the principal measures affecting Indian agricultural imports, including tariffs, sanitary and phytosanitary measures, food regulations, packaging and labeling requirements, pricing policies, intellectual property policies, and customs procedures;

(3) information on Indian government regulations, including state regulations, covering agricultural markets and foreign direct investment affecting U.S. agricultural products in India;

(4) an evaluation of the impact of India's food marketing and distribution system, including market structure, transportation infrastructure, and cold-storage capacity, on U.S. agricultural products in the Indian market; and

(5) a quantitative analysis of the economic effects of Indian tariffs, and to the extent possible, nontariff measures on U.S. agricultural exports to India.

The Committee requested that the Commission deliver its report 10 months after receipt of the request letter, or by November 12, 2009.

Public Hearing: A public hearing in connection with this investigation will be held at the U.S. International Trade Commission Building, 500 E Street, SW., Washington, DC, beginning at 9:30 a.m. on Tuesday, April 21, 2009. Requests to appear at the public hearing should be filed with the Secretary no later than 5:15 p.m., March 24, 2009, in accordance with the requirements in the ''Submissions'' section below. All prehearing briefs and statements should be filed not later than 5:15 p.m., April 2, 2009; and all posthearing briefs and statements responding to matters raised at the hearing should be filed not later than 5:15 p.m., April 28, 2009. In the event that, as of the close of business on March 24, 2009, no witnesses are scheduled to appear at the hearing, the hearing will be canceled. Any person interested in attending the hearing as an observer or nonparticipant may call the Office of the Secretary (202–205–2000) after March 24, 2009, for information concerning whether the hearing will be held.

Written Submissions: In lieu of or in addition to participating in the hearing, interested parties are invited to file written submissions concerning this investigation. All written submissions should be addressed to the Secretary, and all such submissions (other than pre- and post-hearing briefs and statements) should be received not later than 5:15 p.m., June 26, 2009. All written submissions must conform with the provisions of section 201.8 of the Commission's Rules of Practice and Procedure (19 CFR 201.8). Section 201.8 requires that a signed original (or a copy so designated) and fourteen (14) copies of each document be filed. In the event that confidential treatment of a document is requested, at least four (4) additional copies must be filed, in which the confidential information must be deleted (see the following paragraph for further information regarding confidential business information). The Commission's rules authorize filing submissions with the Secretary by facsimile or electronic means only to the extent permitted by section 201.8 of the rules (see Handbook for Electronic Filing Procedures, *http://www.usitc.gov/secretary/fed_reg_notices/rules/documents/handbook_on_electronic_filing.pdf*). Persons with questions regarding electronic filing should contact the Office of the Secretary (202–205–2000).

Any submissions that contain confidential business information must also conform with the requirements of section 201.6 of the Commission's Rules of Practice and Procedure (19 CFR 201.6). Section 201.6 of the rules requires that the cover of the document and the individual pages be clearly marked as to whether they are the ''confidential'' or ''nonconfidential'' version, and that the confidential business information be clearly identified by means of brackets. All

written submissions, except for confidential business information, will be made available for inspection by interested parties.

In its request letter, the Committee stated that it intends to make the Commission's report available to the public in its entirety, and asked that the Commission not include any confidential business information in the report it sends to the Committee. Any confidential business information received by the Commission in this investigation and used in preparing this report will not be published in a manner that would reveal the operations of the firm supplying the information.

Issued: February 9, 2009.

By order of the Commission.

Marilyn R. Abbott,

Secretary to the Commission.

[FR Doc. E9–3079 Filed 2–12–09; 8:45 am]

BILLING CODE 7020–02–P

INTERNATIONAL TRADE COMMISSION

[Investigation No. 337–TA–625]

In the Matter of Certain Self-Cleaning Litter Boxes and Components Thereof; Notice of Commission Determination To Review a Final Initial Determination In Part; Grant a Motion To Strike; and Set a Schedule for Filing Written Submissions on the Issues Under Review and on Remedy, the Public Interest, and Bonding

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has determined to review in part the final initial determination (''ID'') issued by the presiding administrative law judge (''ALJ'') on December 1, 2008, in the above-captioned investigation, and has granted Complainants' motion to strike.

FOR FURTHER INFORMATION CONTACT: Mark B. Rees, Office of the General Counsel, U.S. International Trade Commission, 500 E Street, SW., Washington, DC 20436, telephone (202) 205–3116. Copies of non-confidential documents filed in connection with this investigation are or will be available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street, SW., Washington, DC 20436, telephone (202) 205–2000. General information concerning the Commission may also be obtained by accessing its Internet server at *http://www.usitc.gov.* The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at *http://edis.usitc.gov.* Hearing-impaired persons are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on (202) 205–1810.

SUPPLEMENTARY INFORMATION: The Commission instituted this investigation on December 28, 2007, based on the complaint of Applica Consumer Products, Inc. of Miramar, Florida (''Applica'') and Waters Research Company of West Dundee, Illinois (''Waters''). 72 FR 73884 (Dec. 28, 2007); 73 FR 13566 (Mar. 13, 2008). The complaint alleges violations of section 337 of the Tariff Act of 1930 (19 U.S.C. 1337) in the importation into the United States, the sale for importation, and the sale within the United States after importation of certain self-cleaning litter boxes and components thereof by reason of infringement of U.S. Patent No. RE36,847 (''the '847 patent''). The respondents are Lucky Litter, LLC of Chicago, Illinois (''Lucky Litter'') and OurPet's Company of Fairport Harbor, Ohio (''OurPet's'').

On December 1, 2008, the ALJ issued his final ID, finding that a violation of section 337 has occurred in the importation, sale for importation, or sale after importation of certain self-cleaning litter boxes and components thereof by reason of infringement of claim 33 of the '847 patent. His final ID also included his recommendation on remedy and bonding. Respondents Lucky Litter and OurPet's, complainants Applica and Waters, and the Commission investigative attorney (''IA'') filed petitions (or contingent petitions) for review on December 16, 2008. All parties filed responses to the petitions on December 24, 2008. Complainants also filed a motion to strike on December 23, 2008, to which Lucky Litter and the IA filed oppositions on January 5, 2009.

Having examined the record in this investigation, including the ALJ's final ID, the petitions for review, and the responses thereto, the Commission has determined to review the following issues: the construction of ''comb drive'' (asserted claims 8, 13, 31–33), ''comb drive means'' (asserted claims 27, 41–42), ''drive means'' (asserted claims 24–25), ''discharge position adjacent the discharge end wall'' (asserted claims 8, 13), ''comb * * * coupled to the comb drive'' (asserted claims 31–33), and ''mode selector switch * * * moveable between a manual operation position * * * and an automatic operation position'' (asserted claim 33); invalidity due to anticipation; invalidity due to obviousness; and direct and contributory infringement.

On review, the Commission requests briefing on the above-listed issues based on the evidentiary record. The Commission is particularly interested in responses to the following questions:

(1) Did the ALJ err in finding that the specification of the '847 patent contains no disavowal that limits the claimed comb drive? If the patentee disavowed certain drives, what is the correct scope of the disavowal? Does it include, for example, worm drives of any configuration, or only the drive disclosed in the Carlisi prior art reference, which has a ''worm'' along the side of the litter box that turns and thereby drives the rake or comb on its path in the litter box?

(2) What are the differences or similarities in the patent's use of ''comb drive'' in asserted claim 8, ''comb drive means'' in asserted claim 27, and ''comb drive'' in asserted claim 33?

(3) Is there a difference in function between the ''guide'' wheels and ''guide'' pins referenced in the specification in connection with figures 1–3 of the '847 patent and the ''drive'' wheels and ''drive'' pins referenced in claim 10?

(4) What result should the Commission reach on infringement if it were to find that the '847 patent disavows all worm drives or that it disavows only the Carlisi drive?

(5) What result should the Commission reach on infringement if it were to find that the synonyms for ''adjacent'' cited in the ID at 143–44 incorrectly narrow the limitation ''discharge position adjacent the discharge end wall'' in asserted claim 8?

(6) Is the limitation ''comb * * * coupled to the comb drive'' in asserted claims 31–33 met in OurPet's SmartScoop under a broader construction that includes, as Complainants argue, an ''indirect'' connection? Should the infringement analysis that follows from the correct construction of this limitation be different in claim 31 than it is in claim 33? Did the ID err in finding claim 33 infringed on the one hand and, on the other, that the same limitation is not met for purposes of claim 31?

(7) How does a finding of disavowal of all worm drives, or the Carlisi drive, impact the consideration of obviousness under section 103 and anticipation under section 102? Do the broader constructions of ''discharge position adjacent the discharge end wall'' and ''comb * * * coupled to the comb

APPENDIX C
HEARING WITNESSES

CALENDAR OF PUBLIC HEARING

Those listed below appear as witnesses at the United States International Trade Commission's hearing:

Subject:	India: Effects of Tariffs and Nontariff Measures on U.S. Agricultural Exports
Inv. No.:	332-504
Date and Time:	April 21, 2009 - 9:30 a.m.

Sessions were held in connection with this investigation in the Main Hearing Room (room 101), 500 E Street, S.W., Washington, D.C.

ORGANIZATION AND WITNESS:

National Cotton Council
Cordova, TN

Gary Adams, Vice President, Economic and Policy Analysis

JBClawson International
Washington, D.C.
on behalf of

The Wine Institute
WineAmerica
The California Association of Winegrape Growers
The Winegrape Growers of America

James Gore, Director, JBClawson International

ORGANIZATION AND WITNESS:

Tuttle Taylor & Heron
Washington, D.C.
on behalf of

Blue Diamond Growers

Julian B. Heron) – OF COUNSEL

Almond Board of California
Modesto, CA

Brian Tormey, Director of Sales and Marketing, Premier Almonds

Cal-Pure Pistachios, Inc.
Los Angeles, CA

Mark Masten, Senior Vice President, Sales

The California Pistachio Export Council ("CPEC")

Jim Zion, President, CPEC

Will E. Leonard, Counsel, Adduci, Mastriani & Schaumberg, LLP

The Western Pistachio Association ("WPA")

Brian Blackwell, Chairman, Government Relations Committee, WPA

Will E. Leonard, Counsel, Adduci, Mastriani & Schaumberg, LLP

-END-

APPENDIX D
SUMMARY OF VIEWS OF INTERESTED PARTIES

Summary of Views of Interested Parties[1]

Almond Board of California[2]

The Almond Board of California (ABC) runs programs on behalf of U.S. almond growers in the areas of industry information and statistics, nutrition research, global marketing, food safety, environmental stewardship, and production research. ABC programs are funded through a mandatory assessment on almond growers pursuant to a U.S. Department of Agriculture (USDA) federal marketing order.

In its written submission and its direct hearing testimony, the ABC highlighted the history of its trade relationship with India, the factors in India that contribute to the growing market there, and the positive effect that India's current specific tariff on almonds has on transparent and predictable trade for U.S. almonds. The ABC noted several statistics to illustrate the importance of U.S. almond trade with India: (1) Export markets currently constitute 70 percent of the U.S. almond industry's total shipments. (2) In 2008, almonds were the largest U.S. agricultural export to India, valued at $177 million. (3) Given the last three years (marketing years 2006/07–2008/09) of record almond shipments to India, the U.S. industry estimates that India could triple its import volume in the next 10 years.

The ABC indicated that several factors have contributed to the expansion of U.S. almond exports to India over the last several decades. The ABC attributed the U.S. almond industry's success thus far to its ability to take advantage of the growing Indian middle class and its rising disposable income as well as the general greater interest in health and wellness in India. The ABC noted that almonds, unlike other food imports, hold a unique place in Indian food culture and heritage, a situation on which the U.S. industry has been able to capitalize. In addition, the ABC noted that the stable duty on almond imports has allowed U.S. exporters and Indian importers to better implement longer-term planning. Although duties would frequently change in the past, resulting in extreme market volatility, the current specific duty rate has eliminated a degree of financial risk for U.S. almond exporters, according to the ABC. The organization noted in its statement that "[t]he California almond industry's experiences with tariff and nontariff issues have largely been addressed in consultation with U.S. government and Indian authorities over the years, and are no longer viewed as a significant impediment to future growth." In his direct hearing testimony, Mr. Tormey similarly noted that the Indian duty on almond imports is one economic factor that U.S. exporters weigh in establishing market prices for almonds in India, but that U.S. exporters consider the duty to be transparent and predictable and no longer a market distorting barrier.

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[1] This chapter of the report summarizes the testimony presented at the Commission's hearing and written submissions filed with the Commission during this investigation. In many instances, the chapter reflects only the principal points made by the particular party. The views expressed in the summarized materials should be considered to be those of the submitting parties and not necessarily the Commission. In preparing this summary, Commission staff did not attempt to confirm the accuracy of or otherwise correct information summarized. For the full text of hearing testimony and written submissions, see entries associated with Investigation No. 332-504 at the Commission's Electronic Docket Information System (http://searchapp.usitc/edis3/app).

[2] USITC, Hearing transcript, April 21, 2009, 24–29 (testimony of Brian Tormey, Premier Almonds on behalf of the Almond Board of California); Almond Board of California, written submission to the Commission, June 26, 2009.

The ABC further noted that the success of current and future marketing efforts in India will be influenced by factors that are not uncommon in any developing market, such as mature infrastructure, distribution systems, and importers' access to capital (for financing). Finally, in its written statement, the ABC cited several concerns that it views will impact future sales to India: (1) India's bureaucratic system and nontransparent nature of regulatory development; (2) India's development of standards (for pesticide residues, commodity standards, and food safety regulations) independent of globally recognized standards; and (3) a potential free trade agreement between India and Australia, India's second-largest import supplier of almonds.

Biotechnology Industry Organization[3]

In its written submission, the Biotechnology Industry Organization (BIO) stated that it represents more than 1,200 biotechnology companies, academic institutions, state biotechnology centers, and related organizations in the United States and 31 other nations. BIO asserted that India's lack of tolerance for the low-level presence of genetically engineered commodities that might be inadvertently present in shipments of grain from the United States acted as a significant trade barrier. BIO requested that the United States prioritize the issue in bilateral discussions with India. BIO stated that it is opposed to a policy under consideration in India that would require the labeling of all products derived from agricultural biotechnology. Instead, BIO expressed its support for science-based regulations that would require labeling only when the product has been significantly changed nutritionally or in health-related characteristics.

Finally, BIO identified several intellectual property issues of concern in India, including the alleged use of compulsory licenses that go beyond the letter and spirit of the Doha Declaration, exceptions for transgenic plants and animals in the patent laws, the requirement that the source and geographical origins of biological material used in an invention be disclosed in patent applications, and the lack of meaningful protection for test data submitted to support the regulatory approval of pharmaceuticals and agricultural chemicals.

Blue Diamond Growers[4]

In its written statement and its direct hearing testimony, Blue Diamond Growers described itself as a nonprofit, farmer-owned grower cooperative and the largest processor and marketer of almonds in the world. In its written statement, the cooperative detailed the history of cooperation among Blue Diamond Growers, the U.S. government, and the Indian government in successfully opening and maintaining market access for U.S. almonds in India, dating back to the early 1980s. According to Blue Diamond Growers, through its efforts the Indian government first allowed U.S. almond imports into the country in 1981 at tariff rates of 120–190 percent. Over time, that rate fluctuated, and today U.S. almonds are subject to 18–20 percent ad valorem equivalent tariffs. As the pioneer in bringing U.S. almonds to India, Blue Diamond Growers stated that it has been active in product promotion in India and created a mass market for almonds through

[3] Biotechnology Industry Association, written submission to the USITC, June 26, 2009.

[4] USITC, Hearing transcript, April 21, 2009, 20–24 (testimony of Julian Heron, Blue Diamond Growers); Blue Diamond Growers, written submission to the USITC, March 24, 2009.

advertising and promotional programs held throughout India. Accordingly, demand in India for U.S. almonds has grown, as demonstrated by the growth in U.S. exports there, rising from approximately 3,000 mt in 1989 to just more than 38,000 mt in 2008.

California Cling Peach Board[5]

In its written submission, the California Cling Peach Board, a nonprofit, quasi-governmental association representing approximately 600 cling peach growers in California, stated that the U.S. cling peach industry is interested in exporting canned peaches and canned fruit mixtures, the industry's principle products, to India but the high tariffs, additional import fees, and the lack of a developed market for canned fruit have prevented U.S. exports. In addition, another industry concern noted in the submission is the large disparity between lower Indian applied and high bound rates, which allows India to adjust their tariff rates legally but by large amounts. As a result, high Indian bound rates may limit the impact of future World Trade Organization (WTO) Doha negotiations on Indian applied rates.

California Pistachio Export Council[6]

In his direct testimony, Mr. Zion stated that the California Pistachio Export Council (CPEC) handles 40 percent of U.S. pistachio exports and represents six of the seven major processors in California. He noted the strong and growing demand for pistachios in India because of their historical presence in India due to pistachios imported from Afghanistan and Iran. Demand for pistachios has also grown along with the increase in India's middle class population, education levels, and increased desire to enjoy healthier snack foods. Mr. Zion noted that the CPEC does not consider that Indian laws and regulations for imports and domestic procedures constitute nontariff measures but that the 30 percent tariff on pistachio imports in India is a large burden for U.S. exporters. Until the tariff is lowered, Mr. Zion asserted, U.S. pistachio exports to India will never reach their full potential. He further added that the reduction of the tariff would benefit Indians by increasing government revenues, employment in pistachio processing facilities through increases in foreign direct investment, and availability of the nuts at lower prices.

In response to questions from Commissioner Williamson, in his posthearing brief Mr. Zion provided estimates of the domestic economic benefits for expanded pistachio trade to India. He cited a research finding that, for every $1 billion in agricultural exports from California, 27,000 jobs are created. He cited additional estimates that, for every dollar of exports, about $1.70 in economic activity is generated. Using these statistics, Mr. Zion indicated that, with a 50 percent increase in U.S. pistachio exports to the Indian market over the next three years, 90 new jobs would be created and an additional $5.6 million in economic activity would be generated. Mr. Zion stated that his organization believes that India has the potential to be a $100 million market for U.S. pistachios, which would equate to 2,500 new jobs and an additional $160 million in economic activity.

[5] California Cling Peach Board, written submission to the USITC, May 26, 2009.

[6] USITC, Hearing transcript, April 21, 2009, 34–38 (testimony of Jim Zion, California Pistachio Export Council); Zion, Posthearing brief to the USITC, April 28, 2009.

Cargill Incorporated[7]

In a written submission, Cargill Incorporated, a privately held company, stated that it is an international producer and marketer of food, agricultural, financial, and industrial products and services. Cargill's operations in India include several businesses, employing several hundred people.[8] Cargill stated that the importation of U.S. agricultural products into India by its Indian operations is limited relative to its agricultural imports from other origins (e.g., crude edible oils from South America and Southeast Asia and sugar from Asia).

Cargill listed several recommendations that could reduce policy distortions in the food system to advance economic relationships in agriculture between India and the United States. Cargill recommended the elimination of production subsidies in both countries and the reassessment of agricultural input subsidies, such as fertilizer, in India. Cargill explained that Indian input subsidies, which are currently based on specific fertilizer products, should be non–product specific and nutrient based. A second recommendation was the reduction and capping of tariffs at applied rates rather than bound rates. Cargill noted that high tariffs on processed foods limited Indian consumers' access to U.S. processed foods. In addition, Cargill noted that India should maintain the zero duty on vegetable oils and harmonize the tariff rates for all vegetable oils to allow Indian consumers access to their preferred choice of oils.

Cargill also recommended that India consistently apply sound science to its decisions. In particular, Cargill stated that India should implement a system that expeditiously reviews and approves genetically modified organisms and that Indian food laws, regulations, and specifications should conform to global standards (e.g, Codex Alimentarius (Codex), OIE, and IPPC). Among other recommendations listed by Cargill in its written submission is the adoption of the nationwide goods and service tax to reduce regional trade barriers and the consistent operation of the futures market so that it may operate effectively as a risk management and price discovery tool for farmers.

Cargill also stated that there needs to be "increased opportunities for increased investment in agricultural and food production infrastructure" and "promotion of innovations and technological advancements in agriculture and food production, distribution, marketing, and retail to link the farmer to the consumer."[9]

Distilled Spirits Council of the United States[10]

The Distilled Spirits Council of the United States (DISCUS) is a national trade association representing U.S. producers, marketers, and exporters of distilled spirits products. DISCUS noted that India represents the fifth-largest global market for distilled spirits, which presents "enormous opportunities" for U.S. spirits exporters, particularly exporters of U.S. whiskey. DISCUS noted that Indian demand for spirits is among the

[7] Cargill Inc., written submission to the USITC, June 30, 2009.

[8] Cargill is invested in the handling and processing of various products, including refined oils, grain and oilseeds, sugar, cotton, and animal feeds. Cargill also develops flavor systems and operates a value investing business in India.

[9] Cargill Inc., written submission to the USITC, June 30, 2009, 7–9.

[10] Distilled Spirits Council of the United States, written submission to the USITC, June 25, 2009.

highest in the Asia-Pacific region. Growth rates of consumption have exceeded 80 percent during 2003–08.

DISCUS argued that exceptionally high Indian tariffs on spirits (150 percent) have "severely impeded" the sale of U.S. spirits in the Indian market. DISCUS asserted that the Indian spirits tariff is dramatically higher than those of the "vast majority" of developing countries (e.g., China's spirits tariff is 10 percent). The association noted that the Indian government has modified its spirits duties a number of times since 2001 to bring them in line with its WTO commitments. DISCUS stated that it is seeking assurances that the central government will not reimpose additional duties that would exceed India's WTO bound-level commitment. DISCUS noted that certain states apply discriminatory measures to imported spirits, including taxes and fees that are not imposed on domestically produced spirits. DISCUS reported that certain Indian labeling requirements are inconsistent with the Codex standards regarding such issues as ingredients, packaging dates, and nutritional information.

Florida Citrus Mutual[11]

In its written submission, Florida Citrus Mutual (FCM) stated that it represents more than 90 percent of Florida's citrus growers and is a voluntary cooperative association with an active membership of more than 9,000 Florida citrus growers who produce for the fresh and processed markets.

The FCM stated that India represents a large and potentially important market for U.S. fresh citrus and citrus juices but that tariffs and nontariff measures (NTMs) are impeding U.S. exports. The association stated that India has a large population, including a growing and health-conscious middle class, and has experienced steady transformation of its retail food sector, including the entrance of large Indian conglomerates in food retailing. In addition, India has a growing number of quick-service chains and luxury hotels, increasing exposure to Western products and lifestyles, increasing urbanization, and a growing food processing industry looking for imported food ingredients. The FCM stated that the United States has not been able to export more than a trace amount of orange or grapefruit juice to India during the past five years and none in 2008. The FCM argued that high tariffs, "dated food laws," unwarranted sanitary and phytosanitary restrictions, poor infrastructure, and restrictions on foreign direct investment in food retailing have seriously impeded trade. Indian tariffs and duties on citrus juice are equivalent to an effective rate of about 53 percent ad valorem. Additional duties include a countervailing duty of 16 percent on most consumer food products, an educational cess of 3 percent, and a special countervailing duty of 4 percent, which is assessed on most imports. The FCM stated that NTMs include complicated Indian food laws, including those pertaining to the use of additives and colors, labeling and packaging requirements, weights and measures, shelf-life issues, and phytosanitary requirements.

The FCM supports efforts to reduce measures affecting trade, including the prohibitory tariffs and NTMs that India imposes against U.S. citrus juice and other citrus products. It also supports efforts to reduce the multiple additional duties that have made it very difficult for U.S.-produced citrus juice to have access to and compete in the large Indian market.

[11] Florida Citrus Mutual, written submission to the USITC, June 26, 2009.

National Confectioners Association[12]

The National Confectioners Association (NCA) stated that it represents approximately 400 U.S. manufacturers of chocolate and confectionery products. The NCA stated that U.S. exports of chocolate and confectionery to India are constrained by high tariffs and border taxes. The NCA stated that the Indian agricultural and food products sector, as well as the growing middle class of consumers, would benefit from the reduction of tariffs on chocolate and confectionery inputs and finished products. The NCA also stated that the increased competition in the Indian chocolate and confectionery sector that would result from tariff reductions would encourage domestic and foreign investment in this sector as well as in the sugar, dairy, cereals, and fruit sectors.

National Corn Growers Association[13]

In its written submission, the National Corn Growers Association (NCGA) noted that it represents the interests of more than 300,000 corn farmers. The NGCA stated that India's large population, rapid growth rate, and developing economy make it an important potential market for U.S. corn exports. The NCGA reported that India is projected to export 1 million mt of corn this year and import 5,000 mt from sources other than the United States. It noted that India's corn exports are volatile and that India historically imports grain as needed. Further, the NCGA reported that although India temporarily removed a 15 percent duty on corn imports in 2008, a 5 percent rebate on exports remains in place.

The NCGA asserted that India's policy regarding registration of genetically modified organisms is not well defined. The NCGA noted that, under the 1989 Notification of "Rules for the Manufacture, Use, Import, Export and Storage of Hazardous Micro Organisms, Genetically Engineered Organisms or Cells," the Genetic Engineering Approval Committee must approve imports. However, the NCGA stated that a constituted group of concerned ministers can also serve as a decision-making body. The NCGA noted that "(t)he lack of formal procedure for the approval of biotech product imports could result in delays in approving any corn import applications."

National Cotton Council[14]

In a written submission, the National Cotton Council of America (NCC) stated that it represents all U.S. cotton industry segments (producers, ginners, warehousers, merchants, cottonseed processors/dealers, cooperatives, and textile manufacturers) regarding raw cotton, oilseed, and U.S.-manufactured product markets at home and abroad. The NCC stated that India is not a major export market for U.S. cotton because of the large domestic cotton production in India.

The NCC reported that there are no major or systemic problems with exporting U.S. cotton to India. However, letters of credit were noted as being more complicated and lengthy than in other markets. The NCC also stated that Indian applied tariff rates of 10 percent (effectively 15 percent when including other duties and fees) are not a barrier

[12] National Confectioners Association, written submission to the USITC, May 14, 2009.
[13] National Corn Growers Association, written submission to the USITC, June 19, 2009.
[14] National Cotton Council, written submission to the USITC, April 21, 2009.

to U.S. exports to India but that Indian WTO bound rates of 100 percent remain an area of possible future concern.

The NCC also expressed concern with ongoing and expanded subsidies received by Indian cotton farmers, primarily through a minimum support price (MSP) and export subsidies, and their effect on world cotton prices. The Indian government raised the MSP for most cotton by 26–48 percent, resulting in a large buildup in government stocks. The NCC stated that the Indian government reportedly is beginning to sell cotton from these stocks at a discounted rate both domestically and abroad. Discounts to domestic textile mills are provided under a bulk discount scheme with discounts of $23–29 per mt, while exporters are provided with a "scrip" equal to 5 percent of the value of exports that can be used to pay duties on imported products or be sold on a secondary market to other entities purchasing imports.

National Milk Producers Federation and U.S. Dairy Export Council[15]

The National Milk Producers Federation (NMPF) is a national farm commodity organization that represents dairy farmers and the dairy cooperative marketing associations they own and operate throughout the United States. The U.S. Dairy Export Council (USDEC) is a nonprofit, independent membership organization that represents the export trade interests of U.S. milk producers, dairy cooperatives, proprietary processors, and export traders. The NMPF and USDEC submitted a joint written submission.

The submission noted the extent to which the U.S. dairy industry depends on export markets for continued growth and survival. The NMPF and USDEC highlighted steady export gains since 2002 but noted that U.S. exports are largely blocked to India, the world's second-largest country by population and largest consumer of milk. They attribute the low volume of U.S. dairy exports to India to nontariff measures imposed by the Indian government, including revised import permit requirements that went into effect at the end of 2003. The new import permit requirements direct the U.S. government to provide what the U.S. industry considers to be arbitrary and unfeasible new attestation statements.[16] The statements require the U.S. government to provide endorsement on India's export certificates that the milk from which the products were derived was not subjected to certain hormones, such as recombinant Bovine Somatotropin Hormone (rBST), and did not contain drugs, pesticides, and heavy metal residues above limits prescribed by the Codex Commission. The NMPF and USDEC state that the U.S. Food and Drug Administration has determined that proper use of rBST is safe for human consumption. With respect to residue levels, U.S. standards differ in certain respects from Codex Commission levels, as do standards in most countries, including India, but the tested residue levels in U.S. dairy exports are well within Codex Commission limits.

After more than five years of negotiating with the Indian government through U.S. diplomatic channels, the NMPF and USDEC stated that U.S. dairy exporters have been unable to resolve this issue. The U.S. dairy industry stated that it is frustrated by the

[15] Milk Producers Federation and U.S. Dairy Export Council, written submission to the USITC, April 17, 2009.

[16] All dairy exporting countries, including Australia and New Zealand, appear to be equally affected by the revised attestation statements.

negotiating process, claiming that the Indian government is engaging in deliberate stall tactics. According to the written submission, the NMPF and USDEC, working with the U.S. government, develop proposals and submit them to the Indian government for resolution, but the Indian government provides no response, an ineffective response, or a response not based on sound science and WTO principles.

National Oilseed Processors Association[17]

The National Oilseed Processors Association (NOPA) represents the U.S. soybean, sunflower, canola, flaxseed, and safflower seed crushing industries. NOPA represents 15 member companies that account for approximately 95 percent of all soybean processing in the United States and essentially all U.S. soybean oil exports to India. NOPA's submission noted that the country imports about one-half of the vegetable oil it consumes and Indian demand for vegetable oil has increased because of rising per capita income and an increase in population. India's applied tariffs for oilseeds and oilseed products, high by global standards, are intended to protect small-scale domestic farmers. India is not a significant importer of oilseeds for processing because of its 30 percent applied tariff and nontariff measures, such as a restriction on imports of genetically modified oilseeds. In April 2008, India reduced its applied tariffs on vegetable oils to zero or very low levels because of concerns regarding domestic food price inflation. India is the world's fifth-largest exporter of both soybean meal and total oil meals, although growth in exports of these products has been dampened by expanding domestic feed use and slow growth in domestic soybean production.

NOPA stated that even when India's high tariff protection is in place, domestic oilseed producers have been unable to meet the rapid increase in consumer demand. This is because of industry fragmentation, barriers created by the Indian government to foster small-scale activity, past policies favoring wheat and rice over oilseeds, inefficiencies in marketing and processing, and erratic rainfall. The United States is a very minor participant in the Indian market because South American (primarily Argentine) soybean oil and Asian palm oil are less costly than U.S. soybean oil. According to NOPA, the primary competitive advantage that Argentina has over the United States is Argentina's use of differential export taxes (DETs) on oilseeds and oilseed products, including soybean oil and sunflower oil. NOPA believes that as long as Argentina's DETs exist, U.S. oilseed processors will find it difficult to compete for India's very large and expanding edible vegetable oil market. NOPA believes that all DETs, including those used by Argentina (soybean), Malaysia (palm oil), Indonesia (palm oil), Russia (sunflower seed), and Ukraine (sunflower seed), as well as other export subsidies, must be eliminated in the Doha Round of global trade negotiations.

National Pork Producers Council[18]

The National Pork Producers Council (NPPC) is an association of 43 state-level pork producer organizations. In its submission, the NPPC asserted that India maintains both significant unscientific sanitary and technical barriers and high tariffs on pork that effectively ban imports of pork from the United States. The NPPC urged that India adopt

[17] National Oilseed Processors Association, written submission to the USITC, April 1, 2009.
[18] National Pork Producers Council, written submission to the USITC, June 25, 2009.

transparent sanitary regulations that are based on a sound scientific basis and lower its bound and applied tariff rates on pork.

The NPPC indicated that numerous requirements of India's import permit system for pork are not supported by science. These requirements include that the originating country be free of diseases and parasites such as porcine reproductive and respiratory syndrome (PRRS), anthrax, and trichinae. Another requirement is that the originating country be free of high pathogenic avian influenza, although influenza is not spread through the handling or consumption of pork. The NPPC noted that the permit system requires plant-by-plant inspection of U.S. pork processors, rather than adhering to the principle of equivalence required by the WTO SPS Agreement and, further, that the import permit specifies feeding requirements, slaughter plant requirements, and packaging material requirements that are not based on food safety.

Other requirements of India's import permit system were reported to be vague and nontransparent. Among these are the requirement that imported pork "not have any residues of pesticides, drugs, mycotoxins, or chemicals above the maximum residue limits (MRLs) prescribed internationally"[19] without specifying either the substances subject to these requirements or the respective MRLs. The NPPC urged that these requirements be replaced with MRLs based on a scientific assessment of risk.

The NPPC further noted that India's bound tariff on pork is 100 percent, and its applied tariff is 30 percent. A tariff rate of 30 percent is a significant barrier to imports. The NPPC argues that one goal of the current WTO Doha Round negotiations should be the lowering of India's tariff on pork to below its current applied rate.

Northwest Fruit Exporters[20]

In its written submission, the Northwest Fruit Exporters (NFE), a nonprofit organization that coordinates activities of growers, packers, and exporters of fresh apples and sweet cherries in the Pacific Northwest, stated that the highly restrictive tariff on apples has prevented the full development of the Indian market for U.S. exporters. In addition to the high tariff, the NFE noted that a number of additional national, state, and local taxes are assessed on imports that may or may not be imposed on domestic products, further restricting Pacific Northwest apple exports. The NFE explained that if the high tariff and additional taxes were reduced, annual U.S. exports of apples to the Indian market would grow to approximately $50 million.

Northwest Horticulture Council[21]

In its written submission, the Northwest Horticulture Council, which represents growers, packers, and shippers in the Pacific Northwest on national and international policy issues, stated that U.S. apple and pear exports to India are restricted by high tariffs that do little to protect domestic producers. The council indicated that U.S. exports do not compete directly with Indian domestic production because U.S. apples and pears are differentiated by their higher quality and a disparity in the season of fruit availability. The council

[19] National Pork Producers Council, written submission to the USITC, June 25, 2009, 2.
[20] Northwest Fruit Exporters, written submission to the USITC, June 22, 2009.
[21] Northwest Horticulture Council, written submission to the USITC, June 24, 2009.

stated that U.S. exports of apples and pears would likely double if the tariffs are reduced. In addition to high tariffs, the council stated that U.S. cherry exports are restricted by the lack of a reliable cold chain and a restrictive phytosanitary protocol. Indian phytosanitary protocols require cherries to be fumigated with methyl bromide, which reduces quality and limits shelf life.

Paramount Farms[22]

In his direct testimony, Mark Masten, senior vice president of sales for Paramount Farms, a California company involved in pistachio growing, processing, and export, described his organization as the single-largest producer of pistachios in the world. Mr. Masten noted that India is a burgeoning market for pistachios because India does not grow them, yet it has a growing middle class and lifestyle changes that are driving a rise in the incidences of Type 2 diabetes and the need for healthy snacks. Paramount Farms is committed to exporting to the Indian market and has invested in a pistachio processing plant in Gujarat, India, which was to be inaugurated in June 2009. Paramount Farms is working to reduce the current 30 percent tariff on pistachios, which it has found makes it difficult for California pistachios to achieve the price point that could reach the majority of the Indian middle class. Mr. Masten used U.S. almond exports to India as an example to describe what might happen if the pistachio tariff were lowered. After the almond import tariff was cut in half, almond consumption doubled and Indian government tax revenue increased by 71 percent during 2001–06. Mr. Masten noted that Paramount Farms also produces and exports almonds and benefited from that change.

Sunkist Growers[23]

In a written submission, Sunkist Growers stated that it is a nonprofit membership cooperative and marketing association owned by and operated on behalf of its member farmers, who produce about 65 percent of California and Arizona citrus. Sunkist Growers stated that it markets its members' produce, develops and maintains reliable domestic and export markets in order to get the highest returns for its member growers, and provides consumers with premium quality fresh and processed citrus products. Sunkist's principal products are fresh oranges, lemons, grapefruit, tangerines, citrus juices, and other processed citrus products. They are marketed under the SUNKIST trademark. Sunkist currently exports some 33 percent of its fresh citrus production, accounting for 45 percent of its farmers' fresh fruit revenue.

Sunkist stated that it would like to export its products to India, which it views as a potentially important market for citrus products, but high tariff and NTMs prevent exports in consequential amounts. Although India is not currently a meaningful export market for fresh oranges, lemons, and grapefruit, or frozen concentrated orange juice (FCOJ) from the United States, Sunkist views India as a potentially large market for these products, provided that its high tariffs are removed or reduced.

Although India produces citrus, its production is limited to loose-skin tangerines, mandarins, lemons, and limes. Fresh citrus is an important part of the Indian diet. India currently imports limited quantities of fresh citrus, mainly oranges, which are used in the

[22] USITC, Hearing transcript, April 21, 2009, 29–34 (testimony of Mark Masten, Paramount Farms).
[23] Sunkist Growers, written submission to the USITC, May 1, 2009.

hotel and catering sectors. U.S. exports to India of fresh citrus have been inconsequential, except in 2008 when India imported $1.3 million of fresh U.S. citrus, up from $220,000 in 2007. India mainly imports citrus from Australia during India's off-season of June through October. India imports almost no fresh grapefruit or lemons. India also imports $2–3 million annually of FCOJ mainly from Brazil and none from the United States. High applied and bound tariffs are the principal barrier to U.S. exports of citrus products to India. India's bound rates range from 25 percent for fresh grapefruit to 100 percent for fresh mandarins, and the rate is 85 percent for FCOJ. Applied rates are 25 percent for fresh grapefruit, and 30 percent for most other fresh citrus products. However, the applied rates could be legally raised to the higher bound rates. In addition, taxes of 2–4 percent are routinely assessed on top of the tariff. Sunkist has limited information about Indian NTMs because the high tariffs already prevent most U.S. exports of fresh citrus to India.

Sunkist reported that it is concerned that in the WTO Doha Round, India will be permitted to designate itself as a developing country, allowing India to reduce its tariffs from the higher bound rates, rather than the lower applied rates. This would result in minimal market access gains below India's current applied tariff rates because under the draft agricultural modalities, developing countries make smaller-tiered formula tariff reductions than developed countries and these can be phased-in over a longer period of 10 years. As a developing country, India could also claim exemptions from tariff reductions for designated "special" products and could temporarily impose special safeguard mechanisms to reinstate higher tariffs on products it deemed sensitive.

U.S.-India Business Council[24]

The U.S.-India Business Council (USIBC) is a business advocacy organization representing U.S. and Indian companies. The mission of the USIBC is to serve as a direct link between business and government leaders focusing on increased trade and investment between the two countries. The USIBC noted that Indian domestic and international agricultural policies, in response to severe food shortages, are focused on food self-sufficiency, price stability for consumers, and adequate returns for farmers.

The USIBC stated that since the Green Revolution in the early 1960s, the India agricultural sector has experienced dramatic output growth, making India one of the world's leading producers of agricultural products. However, the USIBC indicated that recent performance in the sector has lagged, despite substantial economic growth in the Indian economy since the economic reforms of 1991. According to the USIBC, the agricultural sector, which employs 70 percent of the country's 1.1 billion people, has suffered from structural deficiencies, including underinvestment, which has led to poverty in the rural sector. The USIBC noted that the Indian government has taken a number of steps to improve the performance of the agricultural sector, including market and regulatory reforms.

The USIBC indicated that Indian agricultural tariffs and other border taxes remain at levels that are not commercially viable for many foreign products. The association argued that reducing tariffs would benefit Indian consumers, producers, and the Indian government. The organization stated that reduced tariffs would allow foreign companies to test the interest of their products to the Indian market, which could lead to investment in domestic production of those products. The USIBC also stated that India's efforts to

[24] U.S.-India Business Council, written submission to the USITC, June 26, 2009.

streamline regulation are commendable and represent important steps toward harmonizing domestic standards with international standards, but that certain sanitary and phytosanitary standards are not consistent with internationally recognized best practices. The organization argued that private sector partnerships would spur innovation and increase agricultural yields. These policies should be done in conjunction with reducing tariff barriers, incentivizing investment, and applying best practices to safety standards that will lead to benefits for Indian farmers.

Welch Foods Inc.[25]

In a written submission, Welch Foods Inc., a cooperative, stated that it is the processing and marketing affiliated cooperative of the National Grape Co-operative Association**,** Inc. It represents some 1,300 grower-owners of Concord and Niagara grapes, which are grown on 50,000 acres of vineyards in New York, Pennsylvania, Ohio, Michigan, and Washington. Welch Foods' principal products are Concord and Niagara grape juice. Welch Foods also produces a variety of other fruit juices, juice cocktails, jellies, jams, preserves, juice bars, and fruit-flavored carbonated drinks. Welch Foods' total production value was $685 million for the 12 months ended August 31, 2008. Welch Foods markets its products in the United States and 30 other countries and exports more than $80 million of Concord and Niagara grape juice products, mainly to Japan, the United Kingdom, Hong Kong, Korea, and China.

Welch Foods would like to expand into India because the creation of new export outlets has become increasingly essential to the financial health of its farmer-owners and the rural economies that they help to support, but global trade distortions in the grape juice and grape juice products markets in the form of tariffs and subsidies are preventing them from expanding into countries such as India. Welch Foods stated that it has begun to explore opportunities in the Indian market. The principal barriers to Welch Foods in India include high bound tariffs on grape juice of 85 percent and applied tariffs of 30 percent. Welch Foods believes that it could establish annual sales of $30 million in India for its grape juice and grape juice concentrate products if the tariffs were removed or significantly reduced.

Welch Foods has requested that the U.S. government aggressively pursue meaningful tariff reductions with India in the WTO Doha Round negotiations. Specifically, Welch Foods would like to see meaningful reductions in India's high bound rates for U.S. grape juice and grape juice products to levels below current applied rates. In addition, because there is limited information about India's grape juice market and NTMs and government regulations affecting U.S. grape juice exports to India, Welch Foods also asked that the USITC include as much information as possible in its report about India's grape juice market.

[25] Welch's Foods Inc., written submission to the USITC, June 23, 2009.

Western Pistachio Association[26]

In his direct testimony, Brian Blackwell, vice chairman of Western Pistachio Association (WPA), described it as a trade association representing pistachio growers in the western United States and the sole pistachio grower-member organization whose directors are elected by pistachio growers. The WPA runs programs in the areas of trade barrier removal, nutritional research and promotion, governmental affairs, and defense of existing U.S. unfair trade orders. Mr. Blackwell stated that the WPA has worked closely with U.S. government trade officials to remove tariff and nontariff measures in various countries. Mr. Blackwell noted that Indians have consumed pistachios for generations, mainly from the large Iranian production and trade with Afghanistan. The WPA views the high Indian tariff as the major impediment to U.S. exports there. Mr. Blackwell stated that besides the tariff, WPA members have not experienced any trade impediments in India.

U.S. Wheat Associates[27]

U.S. Wheat Associates is a trade association that focuses on promoting export market development on behalf of U.S. wheat producers. The association stated that U.S. wheat growers export approximately 50 percent of the U.S. wheat crop every year, which makes the industry trade dependent. U.S. Wheat Associates argued that the Indian agricultural market is one of the most protected in the world. The association claimed that Indian import policies, including tariffs and NTMs, are not transparent and create significant obstacles to U.S. exports of wheat.

U.S. Wheat Associates reported that Indian phytosanitary requirements are "impossible to meet," specifically, prohibitive weed seed requirements. The association stated that the USDA Animal and Plant Health Inspection Service cannot certify that U.S. wheat shipments are free of these quarantined seeds because they cannot be reliably removed by cleaning. U.S. Wheat Associates argued that these same weeds are likely common to most wheat exporting countries, including countries that supply India.

The association also commented on the restrictiveness of high and variable Indian wheat tariffs and export subsidies, which affect U.S. wheat exports. Specifically the organization stated that Indian tariffs on wheat are high except when there is a shortfall in Indian domestic production. The association argued that when Indian buffer stocks increase, India raises its wheat tariff, which imposes "exorbitant" risk for private importers. U.S. Wheat Associates also stated that India provides export subsidies when domestic buffer stocks rise above necessary levels, by selling wheat to government-owned and private sector exporters at discounted prices, as much as 50 percent below the acquisition cost. The association also stated that India has been "obstructionist" in WTO Doha Round talks because of domestic political pressures. The organization also claimed that U.S. exporters are disadvantaged because of widespread corruption in India, specifically mentioning that "it has been suggested that certification problems can be resolved with cash payments."

[26] USITC, Hearing transcript, April 21, 2009, 38–43 (testimony of Brian Blackwell, Western Pistachio Association).

[27] U.S. Wheat Associates, written submission to the USITC, April 16, 2009.

Wine Institute et al.[28]

In his direct testimony, Jim Gore, of JBC International (JBC) representing the U.S. wine industry, stated that the Indian wine market, currently valued at $60 million, represents an opportunity for U.S. wine exporters. He argued that duties, taxes, special fees, and restrictive regulations and other restrictions make selling U.S. wine in India a "complex, costly, and oftentimes frustrating endeavor." Mr. Gore stated that tariffs and NTMs are designed to prohibit imported wine in the Indian market. He stated that comprehensive information on these challenges is detailed in a report by JBC, "A Comprehensive Study of the Indian Wine Market."

According to Mr. Gore, India charges customs duties at the federal level, in excess of its bound levels through additional duties, extra additional duties, and other taxes. Mr. Gore argued that certain state-level practices violate WTO national treatment provisions. He cited the example of Maharashtra state, which charges a 200 percent special fee on imported wine but exempts local producers from this tax. Mr. Gore stated that the Indian base tariff rate of 150 percent plus additional fees and taxes, plus state taxes, can reach a total of 400 percent, making a bottle of California wine which would sell for $10 in a U.S. wine shop, retail for $80 in India.

Mr. Gore also cited a number of NTMs affecting U.S. wine exports, including a lack of an integrated cold chain and other supply chain, infrastructure, and distribution limitations. In addition, he cited issues related to labeling, requirements for bank holdings with regard to bonded warehousing, minimum retail pricing, and monopoly wholesaling and retailing, which all serve to limit U.S. exports of wine.

[28] USITC, Hearing transcript, April 21, 2009, 13–20.

APPENDIX E
POTENTIAL FOR U.S. AGRICULTURAL PRODUCTS IN THE INDIAN MARKET

Many factors make India an appealing market for U.S. agricultural products, chief among them being a rising per capita income and an increasing Indian middle class, which is already approximately the size of the total U.S. population.[1] Greater expenditures on food, more exposure to Western cuisine, aspirations to higher food quality and wider food diversity, and growing health consciousness are leading to increased consumption of Western-style foods in general and U.S. agricultural exports to India in particular.[2]

Certain regions of India are more likely to provide future demand for U.S. agricultural exports than others. As discussed in chapter 3, these areas include large cities with higher-income density, such as Mumbai and New Delhi. The growth of urban areas, where middle- and upper-class consumers are more likely to live, provides a concentration of potential customers for U.S. agricultural exports.[3] This concentration makes reaching customers easier, especially with the expansion of organized retail stores and restaurants in cities.

U.S. food products are generally well regarded by Indian consumers because of global brand recognition and consistently high quality. For example, U.S. apples and almonds are perceived as healthy and high quality, compared to alternative domestic and imported sources.[4] Providing and marketing healthy, high-quality, and safe foods is likely to help U.S. exporters make future sales to India.[5]

Table E.1 lists U.S. agricultural products that have export potential to the Indian market, according to academic research, U.S. Department of Agriculture reports, or industry and foreign government documents. The table excludes products identified as having export potential without corroborating information. The table also excludes products such as almonds and apples, which already have gained significant market share in the Indian market.

[1] See chapter 3 for further information.
[2] USDA, FAS, *India: Exporter Guide; Annual, 2008*, October 1, 2008, 4.
[3] See chapter 3 for further information on Indian incomes and urbanization.
[4] Government officials, interview by Commission staff, New Delhi, India, May 26, 2009.
[5] Industry official, interview by Commission staff, Washington, DC, October 1, 2008.

TABLE E.1 India: U.S. agricultural products with sales potential

Product(s)	Projected annual import growth in value (%)	Growth period	Market attractiveness for United States	Constraints	Tariff rate(s) (%) Bound	Tariff rate(s) (%) Applied	Specific NTM/issue[a]	Source(s)
Alcoholic beverages								
General	15–20	2008–12	Growing consumption but poor quality of some domestic products. Consumer willingness to try U.S. wines and spirits. Kerala and Punjab are large potential markets.	Competition from the EU and other foreign suppliers.	150	150	TX, TBT, SR	USDA, FAS, *India: Exporter Guide, Annual 2007*, October 1, 2007; USDA, FAS, *India: HRI Food Service Sector, Annual 2007,* December 14, 2007.
Distilled sprits	([b])	([b])	Fifth-largest market for distilled spirits in the world. Large potential market for U.S. whiskey exports.	Large volume of domestic production. Special constraints on alcohol sales.	150	150	TX, TBT, SR	Distilled Spirits Council of the United States, written submission to the USITC, June 25, 2009; government officials, interview by Commission staff, New Delhi, India, May 11, 2009
Wine	([b])	([b])	Developing wine culture especially in the top income brackets. Wine market has high growth rates.	Special constraints on alcohol sales. Competition from Australia, EU, and other exporting countries. Increased domestic production.	150	150	TX, TBT, SR	JBC International Inc. "Comprehensive Study of the Indian Wine Market," August 21, 2008; USITC, Hearing transcript, April 21, 2009, (testimony of James Gore for the Wine Institute, Wine America, the California Association of Winegrape Growers and the Winegrape Growers of America).
Confectionery								
Chocolate, chocolate syrups, and other cocoa products	5–10	2008–12	Increasing demand for imported products/brands and a shortage of quality domestic products. Low per capita consumption compared to the United States and Western Europe as well as other developing countries, holds potential for increased consumption.	Competition from domestic suppliers, South Asian countries, and the EU.	150	30	NR	USDA, FAS, *India: Exporter Guide, Annual 2008*, October 1, 2008; USDA, FAS; *India: HRI Food Service Sector, Annual 2007*, December 14, 2007; and National Confectioners Association, written submission to the USITC, May 14, 2009, 3–4.

See footnotes at end of table.

TABLE E.1 India: U.S. agricultural products with sales potential—***Continued***

Product(s)	Projected annual import growth in value (%)	Growth period	Market attractiveness for United States	Constraints	Tariff rate(s) (%) Bound	Tariff rate(s) (%) Applied	Specific NTM/issue[a]	Source(s)
Dairy								
General	([b])	([b])	India is one of the largest milk consumers in world, and dairy is substantial in the Indian diet. Increasing consumption of processed milk products.	Currently, the market is effectively closed. Industry identifies the biggest barrier as the nonresponsiveness of the Indian government in discussions of NTMs.	40–100	30–40	SPS	U.S. Dairy Export Council, written submission to the USITC, April 17, 2009; *India: Dairy Industry*, March 2006; and Government officials, interview by Commission staff, Washington, DC, March 5, 2009.
Dried fruit/nuts								
Figs (fresh and dried)	([b])	([b])	Consumption of figs is approximately double domestic Indian production.	Pakistan is a major supplier; Iran is a distant second. The United States is not a major fig supplier, but has the opportunity to increase market share.	100	30	NR	Bryant Christie Inc., "India Research Study for California Agricultural Exporters," January 31, 2008.
Pistachios	8	Annually	No domestic production. Indians like pistachios, especially for special occasions and holidays. Trend towards healthier foods helps as pistachios are presented as a healthy snack. Some exporters believe it will be easy to place pistachios into the almond distribution chain. California suppliers are competitive. "California" branding may enable U.S pistachios to compete with Iranian pistachios.	Competition from Iran, Afghanistan, and Pakistan.	100	30	NR	USDA, FAS, *India: Exporter Guide, Annual 2008*, October 1, 2008; Bryant Christie Inc., "India Research Study for California Agricultural Exporters," January 31, 2008; Government officials, interview by Commission staff, New Delhi, India, May 11, 2009; USITC, Hearing transcript, April 21, 2009, (testimony of Mr. Masten, Paramount Farms; Mr. Zion, The California Pistachio Export Council; and Mr. Blackwell, The Western Pistachio Association); and industry official, interview by Commission staff, Washington, DC, March 3, 2009.

See footnotes at end of table.

TABLE E.1 India: U.S. agricultural products with sales potential—***Continued***

Product(s)	Projected annual import growth in value (%)	Growth period	Market attractiveness for United States	Constraints	Tariff rate(s) (%) Bound	Tariff rate(s) (%) Applied	Specific NTM/issue[a]	Source(s)
Dried fruit/nuts—***Continued***								
Raisins	([b])	([b])	Small U.S. market share has been growing.	Competition from Pakistan and Afghanistan.	100	100	NR	Bryant Christie Inc., "India Research Study for California Agricultural Exporters," January 31, 2008.
Edible oils								
Soybean oil	([b])	([b])	India imports about 50 percent of its edible oil.	Competition from Argentina and Brazil.	45 (refined)	7.5 (refined)	NR	National Oilseed Producers Association, written submission to the USITC, April 1, 2009.
Olive oil	10–15	2008–12	Growing Western-style, quick-service restaurant sector and a shortage of quality domestic products.	Competition from the EU.	46 (refined)	7.5 (refined)	NR	USDA, FAS, *India: HRI Food Service Sector, Annual 2007*, December 14, 2007.
Fruit and vegetables								
General	5–8	2008–12	Growing demand for fruits in off-season. Increased interest in high-quality fruit and exotic vegetables among middle class. Wide acceptance of a variety of imported fruits. Demonstrated willingness to pay for premium products by those with higher disposable income.	Growing competition from Australia, China, New Zealand, etc.	Various	Various	SPS	USDA, FAS, *India: HRI Food Service Sector, Annual 2007*, December 14, 2007; industry officials, interview by Commission staff, New Delhi, India, May 26, 2009; Florida Department of Agriculture and Consumer Services, *India: Road to Success*, August 2007.
Canned peaches and canned fruit mixes	12–15	2008–12	India does not have a developed canned fruit industry.	Low imports. Competition from EU and Chile.	150	30	NR	California Cling Peach Board, written submission to the USITC, May 26, 2009.
Frozen french fries and vegetables	([b])	([b])	Growing Western-style, quick-service restaurant sector and lack of domestic availability.	Competition from the EU, Australia, New Zealand, and domestic suppliers.	55	30–35	NR	USDA, FAS, *India: HRI Food Service Sector, Annual 2007*, December 14, 2007.
Preserved dried vegetables	10–15	2008–12	Growing Western-style, quick-service restaurant sector and shortage of quality domestic products	Competition from domestic suppliers, South Asian countries, and the EU.	35, 100, or 150	30	NR	USDA, FAS. *India: HRI Food Service Sector, Annual 2007*, December 14, 2007.

See footnotes at end of table.

TABLE E.1 India: U.S. agricultural products with sales potential—***Continued***

Product(s)	Projected annual import growth in value (%)	Growth period	Market attractiveness for United States	Constraints	Tariff rate(s) (%) Bound	Tariff rate(s) (%) Applied	Specific NTM/issue[a]	Source(s)
Fresh fruit and vegetables—*Continued*								
Citrus fruit	5–10	2008–12	Indians prefer fresh citrus. Market share for some items, such as oranges, increasing.	Competition from a strong domestic industry and other suppliers such as Australia, which has an off-season advantage. Some U.S. products (e.g., California oranges) do not have an off-season advantage.	25–100	25–40	TBT	Bryant Christie Inc., "India Research Study for California Agricultural Exporters," January 31, 2008; and Sunkist Growers, written submission to the USITC, May 1, 2009.
Temperate fruit	([b])	([b])	Off-season advantage for some items. The United States is currently a supplier of certain fruits (e.g., largest supplier of peaches and plums).	Competition from other suppliers (e.g., pears from China, peaches and plums from Australia) and domestic production. Need to build demand for cherries.	25–100	25–50	SPS	Bryant Christie Inc., "India Research Study for California Agricultural Exporters," January 31, 2008; Northwest Horticulture Council, written submission to the USITC, June 25, 2009.
Fruit juices								
General	([b])	([b])	Increasing health awareness among middle class and shortage of quality products locally.	Competition from domestic suppliers and nearby suppliers.	85	30	TBT	USDA, FAS, *India: Exporter Guide, Annual 2008*, October 1, 2008; Florida Citrus Mutual, written submission to the USITC, June 26, 2009.
Grains								
Wheat	([b])	([b])	U.S. wheat could capture 10–15 percent of the import market.	Large volume of domestic production and competition from other suppliers.	100	50	SPS	U.S. Wheat Association, written submission to the USITC, April 16, 2009; industry officials, interview by Commission staff, New Delhi, India, May 26 and 29, 2009.
Malt barley	10	Annually	Needed by brewers because Indian malt barley does not meet brewers' standards.		100	0	SPS	Industry official, interview by Commission staff, Washington, DC, June 19, 2009.

See footnotes at end of table.

TABLE E.1 India: U.S. agricultural products with sales potential—***Continued***

Product(s)	Projected annual import growth in value (%)	Growth period	Market attractiveness for United States	Constraints	Tariff rate(s) (%) Bound	Tariff rate(s) (%) Applied	Specific NTM/issue[a]	Source(s)
Skins and hides								
General	([b])	([b])	India is beginning to expand its leather industries, which will increase demand for hides and skins. For example, the Council of Leather Exporters has requested that India establish "leather parks," which would increase tanning capacity. Certain Indian firms have invested in machinery that is better able to handle U.S. product.	Competition from EU suppliers. Indians are used to working with hides smaller than U.S. ones. Water shortages and stricter environmental standards on tanners. View of Indians that long transit times causes damage to U.S. product. Certain Indian processors prefer unbranded hides. Most U.S. hides are from branded cattle.	25	0–25	TBT	United States Hides, Skin and Leather Association Study of the Indian Leather industry and Its Potential for US Hides (funded by USDA/FAS); and industry official, telephone interview by Commission staff, February 20, 2009.
Pork								
Premium pork products	([b])	([b])	Increased Westernization and the expanding hospitality industry may increase demand for premium processed pork products in food service and retail. Poor availability of pork products in India.	Muslims do not consume pork. Some Hindus view pork as an inferior product. Pork is the least developed major livestock sector in India.	55–100	30	SPS	USMEF, "India's Pork Market Opportunities" For the US Pork Industry, March 2007; National Pork Producers Council, written submission to the USITC, June 25, 2009; and industry officials, interview by Commission staff, New Delhi, India, May 2009.
Processed food								
Jams and jellies	([b])	([b])	Increasing popularity of imported brands and a shortage of quality domestic products.	Competition from domestic suppliers, South Asian countries, and the EU.	150	30	TBT	USDA, FAS, *India: HRI Food Service Sector, Annual 2007*, December 14, 2007.
Pasta	5–10	2008–12	Growing Western-style, quick-service restaurant sector and shortage of quality domestic products.	Competition from domestic suppliers, South Asian countries and the EU.	150	30	NR	USDA, FAS, *India: Exporter Guide, Annual 2008*, October 1, 2008; and USDA, FAS, *India: HRI Food Service Sector, Annual 2007*, December 14, 2007.

See footnotes at end of table.

TABLE E.1 India: U.S. agricultural products with sales potential—***Continued***

Product(s)	Projected annual import growth in value (%)	Growth period	Market attractiveness for United States	Constraints	Tariff rate(s) (%) Bound	Tariff rate(s) (%) Applied	Specific NTM/issue[a]	Source(s)
Processed food—***Continued***								
Potato products and other snack products	10–15	2008–12	Growing Western-style, quick-service restaurant sector.	Competition from domestic suppliers.	Varies by product	Varies by product	TBT	USDA, FAS, *India: Exporter Guide, Annual 2007*, October 1, 2007.
Sauces, spreads, salad dressing, condiments, soups/broths, etc.	20	Annually	Growing Western-style, quick-service restaurant and food processing sectors and increasing popularity of imported brands.	Competition from domestic, South Asian, and EU suppliers.	55–150	30	TBT	USDA, FAS, *India: Exporter Guide, Annual 2008*, October 1, 2008; USDA, FAS, *India: HRI Food Service Sector, Annual 2007*, December 14, 2007.

Source: Compiled by Commission staff.

[a]*Nontariff measures (NTM) Codes:* NR = Nothing reported; SPS = Sanitary and phytosanitary barriers; SR = State regulations; TBT = Technical barriers to trade other than SPS barriers and taxes (including, among others, labeling and packaging requirements, customs administration, and weights and measurements); and TX = Taxes.

[b]Not applicable.

APPENDIX F
INDIAN AGRICULTURAL PRODUCTION AND CONSUMPTION BY SECTOR

Indian Agricultural Production and Consumption by Sector[1]

Grains

Production

India is generally self-sufficient in grains, only importing in bad crop years.[2] Grain production is dominated by rice and wheat, of which India is a leading global producer.[3] Rice production totaled 96.7 million metric tons (mmt) and wheat production totaled 78.6 mmt in marketing year (MY) 2007/08 (table F.1). Rice covered 43.8 million hectares (ha), and wheat covered 28.2 million ha in MY 2007/08, representing an expansion of 2–5 percent over their MY 2003/04 levels.

Both grains are distributed to the poor through the government food distribution system.[4] Public procurement is usually equivalent to about one-fourth of the production of these two food grains, except in 2008–09, when procurement increased to nearly one-third of production (table F.2).

Production of food grains is heavily influenced by government procurement prices, which increased over the period, with faster rates of growth after MY 2006/07 following poor harvests because of unfavorable weather. Wheat, rice, and coarse grains benefited from favorable weather in MY 2007/08 and reportedly from greater distribution of improved seeds to farmers resulting in higher yields.[5] Area planted to wheat increased slightly after MY 2005/06, mostly at the expense of rapeseed/mustard, because of the lower relative support price for rapeseed vis-à-vis wheat.[6]

Most of the increase in coarse grains production is accounted for by corn (maize), which rose 22 percent in MY 2007/08 to 19 mmt.[7] Increased demand for corn comes from the growing Indian poultry industry for use as feed and from the cornstarch industry for use in paper, pharmacy, food, and textiles.[8] Of total annual corn production, almost two-thirds is used for animal feed, about one-quarter is consumed as food, and the remainder is used to produce starch.[9] Other coarse grains produced in India include pearl millet (bajra), sorghum (jowar), and barley.

[1] The following discussion is limited by the gaps in Indian production and consumption data for certain sectors.

[2] Multinational pizza chains operating in India import high-protein wheat for making pizza crusts because Indian wheat is reportedly low in protein and unsuitable for making pizza crusts. Industry representative, interview by Commission staff, New Delhi, India, May 8, 2009.

[3] Regional patterns of crop production are shown in figure F.1.

[4] The Targeted Public Distribution System is the largest of India's food distribution programs.

[5] Govindan, *India: Grain and Feed; Quarterly Lock-Up Report*, May 6, 2008, 3.

[6] Govindan, *India: Grain and Feed; Monthly Lock-Up Report*, January 10, 2007, 3.

[7] Govindan, *India: Grain and Feed; Quarterly Lock-Up Report*, May 6, 2008, 6.

[8] Govindan, *India: Grain and Feed; Quarterly Lock-Up Report*, August 31, 2007, 9.

[9] Indian industry representative, interview by Commission staff, Mumbai, India, May 28, 2009.

TABLE F.1 India: Agricultural production by commodity, MYs 2003/04–2007/08 (million mt)

Product	2003/04	2004/05	2005/06	2006/07	2007/08	% increase 2007/08 over 2003/04
Grains						
Rice	88.5	83.1	91.8	93.4	96.7	9.2
Wheat	72.2	68.6	69.4	75.8	78.6	8.9
Coarse grains	37.6	33.5	34.1	33.9	40.8	8.4
Pulses	14.9	13.1	13.4	14.2	14.8	–1.0
Major oilseeds	25.2	24.4	28.0	24.3	29.8	18.1
Groundnut	8.1	6.8	8.0	4.9	9.2	12.9
Rapeseed/mustard	6.3	7.6	8.1	7.4	5.8	–7.3
Soybean	7.8	6.9	8.3	8.9	11.0	40.3
Sugarcane	233.9	237.1	281.2	355.5	348.2	48.9
Sugar	15.2	14.2	21.1	30.8	28.6	89.0
Tea	0.878	0.893	0.946	0.956	0.944	13.3
Coffee	0.271	0.276	0.274	0.280	0.262	–3.3
Cotton (million bales)	13.7	16.4	18.5	22.6	25.9	88.5
Fruit	([a])	([a])	55.4	58.9	62.9	[b]13.6
Vegetables	([a])	([a])	111.4	116.0	122.3	[b]9.8
Milk, all	88.1	92.6	97.1	100.9	104.8	19.0
Buffalo milk	48.0	50.2	52.1	55.2	57.0	18.7
Cow milk	35.0	37.3	39.8	41.0	42.1	20.5
Meat, bovine	2.13	2.25	2.38	2.4	2.5	16.0
Goat meat	0.4	0.5	0.5	0.5	0.5	32.4
Pig meat	0.490	0.497	0.497	0.497	0.497	1.4
Sheep meat	0.216	0.225	0.241	0.240	0.243	12.5
Poultry	1.7	1.9	2.0	2.2	2.5	50.9

Source: Government of India, Ministry of Agriculture; FAOSTAT; USDA, FAS, PSD database.

[a]Not available.
[b]Percentage change represents MY 2005/06 to MY 2007/08.

TABLE F.2 India: Government procurement and distribution of rice and wheat, MYs 2004/05–2008/09 (million mt)

Item	2004/05	2005/06	2006/07	2007/08	2008/09
Rice production	83.13	91.79	93.35	96.69	99.37
Wheat production	68.64	69.35	75.81	78.57	77.63
Sum of rice and wheat production	151.77	161.14	169.16	175.26	177.0
Procurement under Central Pool					
Rice	24.0	26.7	26.3	26.3	32.8
Wheat	16.8	14.8	9.2	11.1	22.7
Sum of rice and wheat	40.8	41.5	35.5	37.4	55.5
Procurement under Central Pool as share of production (%)					
Rice	28.9	29.1	28.2	27.2	33.0
Wheat	24.5	21.3	12.1	14.1	29.2
Sum of rice and wheat	26.9	25.8	21.0	21.3	31.4
Distribution (offtake)					
Rice for targeted public distribution system	16.6	19.2	21.2	22.6	22.3
Wheat for targeted public distribution system	13.1	12.2	10.4	10.9	12.5
Sum for targeted public distribution system	29.7	31.4	31.6	33.5	34.8
Total other (welfare)	10.6	9.7	5.1	3.9	3.3
Sales and exports	1.2	1.1	0.0	([a])	0.1
Total rice and wheat distributed	41.5	42.1	36.7	37.4	38.1
Distribution as share of production (%)					
Rice for targeted public distribution system	20.0	20.9	22.7	23.4	22.4
Wheat for targeted public distribution system	19.1	17.6	13.7	13.9	16.1
Sum for targeted public distribution system	19.6	19.5	18.7	19.1	19.7
Total other (welfare)	7.0	6.0	3.0	1.9	1.8
Sales and exports	0.8	0.7	0.0	([b])	([b])
Total distribution	27.3	26.1	21.7	21.3	21.6

Source: Government of India, Ministry of Finance, *Economic Survey, 2008–09*, Tables 7.4 and 7.21; Government of India, Ministry of Agriculture.

Note: Distribution data for MY 2008/09 were extrapolated from data for April–February.

[a]Less than 500 mt.
[b]Less than 0.05 percent.

The Indian milling sector is dominated by wheat, mainly milled for wheat flour and to a lesser degree rice and pulses. Wheat milling is mainly done by the unorganized sector, but a few large firms produce and market branded wheat flour. Bakery products are the largest segment of grain-based processed foods, and this production is also performed by mainly small and medium-sized unorganized local players and a limited number of organized firms. Bread production was 2.7 mmt in 2004; 50–55 percent of it took place in the organized sector.[10] Higher value-added processed grain products include Western-style breakfast cereals, which is a small but growing segment.

Consumption

Grains, predominantly wheat and rice, are the largest component of the Indian diet and are consumed in many forms. Although wheat is most popular in the north, its consumption is growing nationally partly because of migration but also because of its wider availability, its versatility, and the public's increasing awareness of its health benefits.[11] Other, less commonly consumed grains include sorghum (jowar), pearl millet (bajra), and maize (corn). Sorghum and millet are consumed in substantial quantities in only approximately one-half of all states and have very low per capita consumption (about 0.6 kilograms or less per month) in most of the remaining states.[12] Food consumption of corn is also low in most states.

Pulses

Production

India is a leading global producer of pulses of many types, including desi (small) chickpeas, pigeon peas, black matpe, and mung beans. Total pulse production was 14.8 mmt in MY 2007/08 with a planted area of 23.9 million ha; this represents a steady decline in area and relatively stagnant production since the 1970s. There have been few varietal improvements for domestic pulse production over the years, and only a small share of production is under irrigation.[13] As a result, yields have not risen compared to other crops, eroding profitability relative to crops such as wheat and rice.[14] Production takes place mainly in Madhya Pradesh, Maharastra, and Uttar Pradesh (fig. F.1). Some pulse-producing states provide indirect support for pulse production. For example, in Tamil Nadu a 4 percent tax is levied on yellow/green peas and chickpeas that are shipped across state lines. This tax is intended to limit the amount of pulses that are imported or transported through the state.[15]

[10] IBEF, *Food Processing: Market and Opportunities*, 5.

[11] Wheat has higher levels of calcium and protein relative to rice. Government of India, Ministry of Agriculture Directorate of Marketing and Inspection, "Post Harvest Profile of Wheat," n.d.

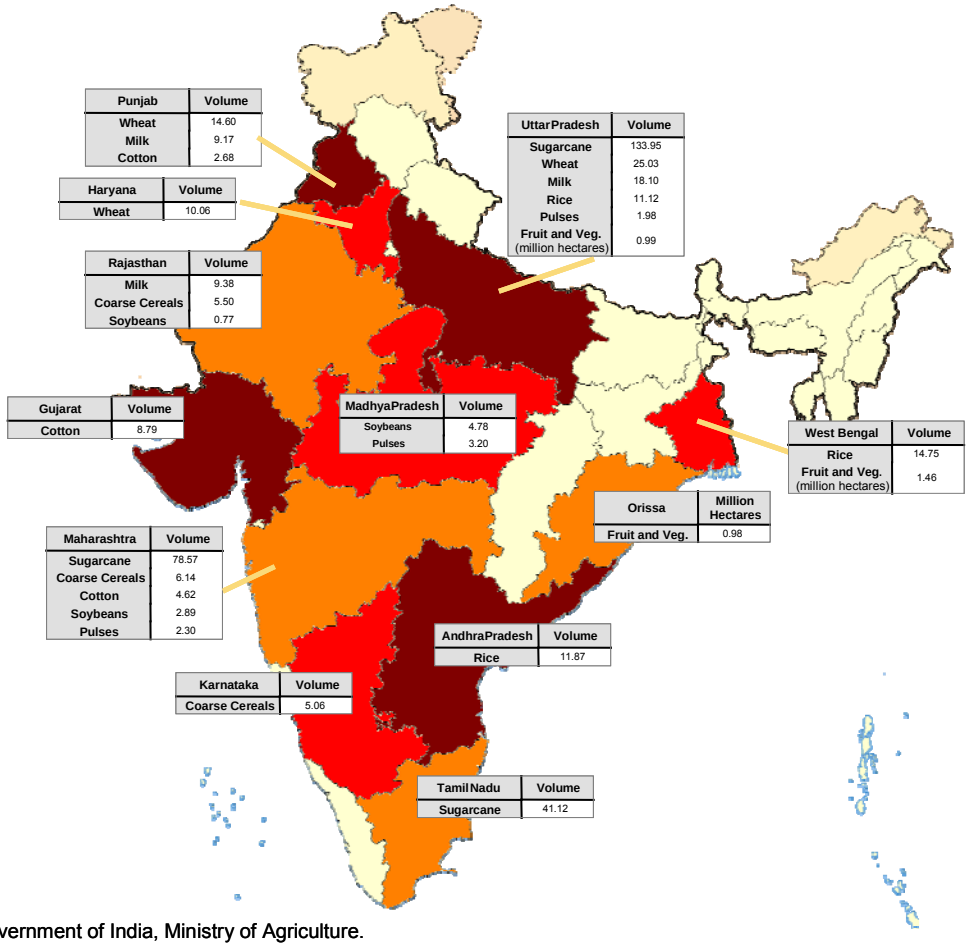
[12] Government of India, NSSO, *Household Consumer Expenditure in India, 2006–07*, October 2008, app. A, table 7R.

[13] Indian industry representatives, interviews by Commission staff, New Delhi and Mumbai, India, May 26 and 28, 2009.

[14] USDA, ERS, *India's Pulse Sector*, May 2003, 3.

[15] Ibid., 5.

FIGURE F.1 India: Leading state agricultural production for select commodities (mmt)



Source: Government of India, Ministry of Agriculture.

Consumption

Pulses are an important protein source for low-income households in India, and consumption was 35–37 percent of total world pulse consumption from 2000 to 2003.[16] Essentially, all Indians consume pulses, mostly in shelled and split form, called daal,[17] or as flour.[18] The four most popular pulses in India are desi chickpeas, pigeon peas, mung beans, and lentils.[19] Desi chickpeas are eaten throughout India, while the other popular pulses are preferred in certain regions.[20] Pulses with lower consumption include green, yellow, and den peas. To help meet demand, India imports pulses, including yellow peas, green peas, chick peas, and lentils from the United States, Australia, and Canada.[21]

[16] FAOSTAT, downloaded May 27, 2009.

[17] "Daal" also refers to dishes Indians make out of pulses which can be in the form of soup or a thick paste.

[18] USDA, ERS, *India's Pulse Sector*, May 2003, 6; Govindan, *India: Exporter Guide*, October 1, 2007, 5.

[19] USDA, ERS, *India's Pulse Sector*, May 2003, 7 (table 1).

[20] To see regional preferences for different pulses, see USDA, ERS, *India's Pulse Sector*, May 2003, 7 (table 1).

[21] Industry official, interview by Commission staff, Mumbai, India, May 28, 2009; industry official, interview by Commission staff, Mumbai, India, May 29, 2009.

Yellow peas can serve as a low-cost substitute for desi chickpeas and other pulses.[22] Green peas, which normally cost more than yellow peas, are used in daal and for snack foods.[23]

Although income and pulse demand are generally positively correlated, per capita pulse consumption fell over the period 1970–2001 despite rising incomes.[24] This decline occurred because of reduced production and import levels and price increases that may have outpaced income growth.[25] This dynamic reflects the high level of Indian food price sensitivity.[26] In response to rising pulse prices, it appears that middle- and low-income Indians have replaced pulses with lower-priced grains and vegetables, not with other proteins.[27] The shift from pulses by higher-income Indians, however, is possibly because of preference changes in favor of previously less-consumed items, such as meat, vegetables, fruit, or dairy.[28]

Oilseeds

Production

India is a major global producer of oilseeds. The most important oilseed crops in India in terms of production are soybeans, peanuts, and rapeseed/mustard. Approximately 80 percent of total oilseed production is processed into oil. With only 24 percent of oilseed production in India irrigated, the majority of oilseed farmers are dependent on monsoon rainfall. As a result, oilseed yields are well below world averages. Major oilseed production—28.1 mmt on 26.5 million ha in MY 2007/08—increased by nearly 20 percent between MY 2003/04 and MY 2007/08. The increase in oilseed area was driven by increases for soybeans, which alone during the same period increased by 35 percent. High domestic market prices for soybean, peanut, and rapeseed toward the end of the period encouraged production and increased plantings.[29] Rising feed demand, mainly for poultry production, in the Indian domestic and international markets kept soybean meal prices high.[30] Other oil meals, including peanut and rapeseed meals, are also used in feed formulations, although to a lesser extent, and experienced similar increased demand and firm prices in MY 2007/08.

For soybeans, meal is the most important processed product, and it is used for poultry feed. Of total soybean production, approximately 85 percent is converted into meal. The Indian poultry industry consumes about one-third of domestic soy meal production while most of the rest is exported.[31] Approximately 70 percent of domestic soybean production

[22] USDA, ERS, *India's Pulse Sector*, May 2003, 7 (table 1); industry official, interview by Commission staff, New Delhi, India, May 26, 2009.

[23] USDA, ERS, *India's Pulse Sector*, May 2003, 7 (table 1); industry official, interview by Commission staff, Mumbai, India, May 28, 2009; and industry official, interview by Commission staff, New Delhi, India, May 26, 2009.

[24] USDA, ERS, *India's Pulse Sector*, May 2003, 6, 22.

[25] Ibid., 22.

[26] Industry official, interview by Commission staff, New Delhi, India, May 26, 2009; industry official, interview by Commission staff, Mumbai, India, May 28, 2009.

[27] USDA, ERS, *India's Pulse Sector*, May 2003, 6, 8.

[28] Ibid., 8.

[29] Indian government minimum support prices for oilseeds are typically set too low to influence market prices. Aradhey, *India: Oilseeds; Annual*, April 16, 2009, 3.

[30] Aradhey, *India: Oilseeds; Annual*, May 19, 2008, 6.

[31] Industry representative, interview by Commission staff, Mumbai, India, May 28, 2009.

is in nonirrigated areas with yields of 1,000 kg/ha, compared to 2,000–3,000 kg/ha in the United States.[32]

The oilseed processing sector consists of firms involved in crushing for oil and meal, as well as oil refining and marketing. In 2008, a significant portion (1 mmt) of Indian edible oils, including imported palm oil, was hydrogenated to make margarine.[33] Because India imports a considerable amount of unrefined oil, refineries are generally situated on the coasts near ports of import. The Indian preference for importing unrefined oil reportedly reflects a desire to generate the added value of refining, generate domestic tax revenue on the processing, and create employment opportunities at refineries.[34] Because transportation logistics are poor and local taxes vary, large refiners generally set up multiple locations in different states to serve local markets.[35]

Oilseed processing is performed by a large number of small-scale, low-technology, high-cost plants. Indian government regulations regarding small-scale industry have traditionally limited plant sizes in this sector, keeping operations from benefiting from economies of scale or vertically integrating.[36] In addition, government policies have provided tax incentives to build new capacity in depressed areas, often areas where processing is not economically viable. Oil refining capacity utilization in India is low, as plants generally run only during the domestic oilseed harvest and government policies discourage imports of oilseeds for processing.[37]

Edible Oil Consumption

Traditionally, edible oil preferences have been notably regional. For example, the southern states have a preference for coconut and sunflower oils and the northern states for rapeseed (canola) oil.[38] Oils are highly substitutable, however, and price is an important determinant of purchases.[39] As a result, Indians have recently been switching from traditional oils to lower-priced imported edible oils, mainly palm and soybean oils; these lower-priced imported oils are estimated to account for 53 percent of edible oil consumption in MY 2008/09.[40]

Palm oil, which is relatively low priced, accounts for the largest share of edible oil consumption, and its consumption has risen in recent years.[41] It can easily be blended with other edible oils and is also used in processed foods.[42] Soybean and rapeseed oils account for the second and third largest shares of edible oils consumed. In line with the

[32] Ibid.
[33] Dhankhar, *India: Food Processing Sector; Annual, 2008*, July 2, 2008, 14.
[34] Indian industry representative, interview by Commission staff, New Delhi, India, May 26, 2009.
[35] Indian industry representative, interview by Commission staff, Mumbai, India, June 1, 2009.
[36] USDA, ERS, *The Role of Policy and Industry Structure in India's Oilseed Markets,* April 2006, 14. Such policies do not apply to soybean and sunflower seed processing, resulting in relatively larger plants in those sectors.
[37] Because of high costs of transporting oilseeds and the 5:1 soybean-to-oil ratio, importing oilseeds for processing in India may not be practical. Indian industry representative, interview by Commission staff, Mumbai, India, May 28, 2009.
[38] Aradhey, *India: Oilseeds; Annual,* April 16, 2009; industry officials, interview by Commission staff, Mumbai, India, June 1, 2009.
[39] Industry officials, interview by Commission staff, Mumbai, India, June 1, 2009.
[40] Aradhey, *India: Oilseeds; Annual,* April 16, 2009.
[41] Ibid.
[42] Industry officials, interview by Commission staff, New Delhi, India, May 26, 2009 and May 28, 2009; Aradhey, *India: Oilseeds; Annual,* April 16, 2009.

trend toward healthier eating, Indian demand for healthful oils, such as sunflower, safflower, and palmolein, is rising.

Sugar

Production

Sugarcane is an extremely important cash crop in India. The production, pricing, and international trade of sugarcane and sugar is highly regulated by the Indian government. Production, which stood at 348.2 mmt of sugarcane and 28.6 mmt of sugar in MY 2007/08, has grown dramatically over the years because of the central government's planned growth in the sector, which included the development of central/state government extension services, increased support prices, and increased use of irrigation.[43] Favorable government policies, as well as favorable weather, have led to a steady increase in planted area, which in MY 2007/08 reached 5.0 million ha.

Indian sugarcane and sugar production generally follows a six- to eight-year cycle, whereby three to four years of high production, with corresponding high stocks and low prices, is usually followed by two to three years of lower production. High sugarcane production during MY 1999/2000–2002/03 was followed by marked drops in production during MY 2003/04–2004/05.[44] The next upswing, aided by increased planted area, resulted in record sugar production in MY 2005/06 and converted India into a net sugar exporter for the first time. Another year of record production followed in MY 2006/07, which led again to cyclical oversupply, low prices, and a distressed situation for farmers. Delayed cane price payments by the mills to growers in key growing regions and relatively higher prices for food grains shifted growing area out of cane in MY 2007/08. Delayed payments also caused farmers to use less fertilizer, pesticides, and irrigation water, resulting in lower yields.[45]

The Indian sugar milling sector consists of several hundred sugar mills, about one-half of which, accounting for 56 percent of processing capacity in 2007, were organized as farmer cooperatives. The remainder is processed by private and public sector mills.[46] The sugar milling industry is concentrated in Maharastra and Uttar Pradesh.

[43] FAO, "Factors Determining Indian Sugar Production," October, 1997, 29–31.
[44] Singh, *India: Sugar, Semi-Annual 2008*, October 6, 2008, 4.
[45] Ibid.
[46] Government of India, Agriculture Division Planning Commission, *Report of the Working Group on Agriculture Marketing Infrastructure and Policy Required for Internal and External Trade for the XI Five Year Plan 2007–12*, January 2007, 27.

Consumption

India is the largest sugar-consuming country in the world in terms of absolute numbers, though not in per capita terms.[47] Per capita sugar consumption in India was 24 kilograms in 2003 versus 8 kilograms in China, 56 kilograms in Brazil, and 70 kilograms in the United States. In higher-income urban centers, however, Indian per capita consumption of refined sugar is as high as that of many developed countries.[48] Sugar is an important part of Indian culinary and cultural practices and is mixed into everything from syrupy tea to dense sweets. A basic staple of most households, it is consumed in various forms: the traditional, unrefined sugar called khandsari, typically used by sweets makers; gur, an unrefined lumpy brown sugar, mainly consumed in rural areas; and white, refined sugar. As levels of income and urbanization have risen, consumption of refined sugar has increased, with a corresponding decrease in consumption of khandsari and gur.[49] Industrial consumption of refined sugar by the food processing sector is rising as well.

Dairy

India is the largest milk producer in the world, at approximately 114 mmt in 2008.[50] In 1970 the Indian government and the World Food Program began a campaign to encourage the growth of the dairy sector as a rural poverty alleviation program as well as a dairy production program.[51] Almost 40 years later, the landless, unable to grow crops, are still attracted to dairying, as alternative paid employment is not generally available in rural areas.[52] Even for marginal landholders, dairying provides regular, more immediate cash flow than crops, and livestock has become a side business to cropping.[53]

The industry consists of mainly smallholder farmers with one or two cows or buffaloes and some dairy farms—large, by Indian standards—with about 30 cows. Smallholder farmers, who mainly milk cows by hand, have advantages over "commercial" or full-time farmers because of unpaid labor and low dry fodder costs.[54] Part-time dairy farmers in rural areas account for the vast majority of production, which is largest in Uttar Pradesh, Rajasthan, and Punjab. Productivity rates in India are very low at the farm level: milk production per cow is only one-eighth the U.S. average, though it is growing at 5 percent annually.[55] The increases in milk production have occurred mainly because of new entrants into dairying, rather than yield increases.

Approximately 85 percent of total milk production is marketed through the informal sector, i.e., consumed on the farm by the farmer's household or sold and possibly

[47] FAO, *Food Outlook*, November 2008.
[48] India Infoline, *Sector Database*, "Sugar," n.d.
[49] Ibid.
[50] The second-leading global milk producer, the United States, produced about 86 million metric tons of milk in 2008. Pandit, "Amul Ranks Among Top 21 Global Dairy Biz Cos," June 25, 2009; USDA, NASS, 2009.
[51] U.S. Dairy Export Council, *India: Dairy Industry*, March 2006.
[52] Ibid.
[53] Ibid.
[54] Ibid., 15.
[55] Overgrazing on public lands and the use of crop residues for animal feed, rather than high-quality grains, severely restricts milk productivity. U.S. Dairy Export Council, *India: Dairy Industry*, March 2006, 25.

processed (into other dairy products like cheese) directly by the farmer.[56] Milk in the informal sector remains unpasteurized and is typically not held to national food safety standards. Surplus milk is generally marketed through state-level milk marketing federations, district-level milk unions, and village-level cooperatives.[57] Processed dairy production consists largely of packaged liquid milk, but other products produced in the organized sector include ethnic sweets, milk powder, curd, whey, butter, ghee (clarified butter), cheese, ice cream, and casein.[58] Sweetened milk powders, condensed milk, and creamers are also important products for this sector.

Indian milk cooperatives have few national brand names, with perhaps two exceptions. The Amul and Sagar brands were developed by the 2.8 million dairy farmers of the Gujarat Cooperative Milk Marketing Federation, India's largest food products marketing organization, with 19 processing plants and $650 million in annual sales.[59] The national brand Mother Dairy, developed by the National Dairy Development Board and based in New Delhi, has successfully organized and marketed the milk production of more than 117,000 small-scale milk producers.[60]

Of the multinational dairy firms that operate in India, Nestlé may have the most recognized brand name among consumers and the most aggressive plan for growth. In 2006 and 2007, Nestlé India created business ties with several regional dairies for sourcing, processing, packaging, and supplying milk products, including Andhra Pradesh-based Heritage Foods India Ltd. for sales in the south, Bengal Nester in the east, and Dynamix Dairy Industries Ltd. in the west. The company already had strong ties dating back to 1961 to the Moga Dairy in Punjab, where the company sources approximately 1 million liters of milk per day[61] and currently has contracts with 100,000 farmers.[62] Nestlé's consumer focus is liquid milk, infant formula, and yogurt.[63]

Consumption

Liquid milk and ghee are the most widely consumed dairy products in India, accounting for an estimated 80 percent of total milk production.[64] For liquid consumption, Indian consumers prefer high-fat milk, particularly buffalo milk.[65] Milk consumption has increased with the growth of Indian urban areas,[66] as wealthier urban Indians consume substantially more milk than poorer, rural Indians.[67] Ghee, typically produced without the benefit of pasteurization, is a popular dairy food because it can be stored without

[56] Dairy processing plants are regulated if they employ more than 20 people and process more than 10,000 liters. U.S. Dairy Export Council, *India: Dairy Industry*, March 2006.

[57] Government-owed dairy processors or cooperatives in the organized sector are generally more concerned with employment than profits. Low productivity rates among processors are often the result of poor management and a lack of competition, as new entrants in the dairy processing sector are often denied government permits if their plants are close to existing facilities. Many cooperatives also receive government aid for providing reasonable prices to consumers, a practice that deters them from maximizing profits. Ibid., 28.

[58] Ibid., 44–46.

[59] Amul India, "Gujarat Cooperative Milk Marketing Federation."

[60] Indian industry representatives, interview by Commission staff, Mumbai, India, March 28, 2009; Raghu, "Mother Dairy to Take On Amul Milk in Gujarat," December 31, 2007.

[61] *The Hindu Business Line*, "Nestlé India Increasing Focus on Dairy Biz," July 23, 2007.

[62] Indian industry representative, interview by Commission staff, New Delhi, India, June 4, 2009.

[63] *The Hindu Business Line*, "Nestlé India Increasing Focus on Dairy Biz," July 23, 2007.

[64] U.S. Dairy Export Council, *India: Dairy Industry*, March 2006, 47.

[65] Dhankhar, *India: Livestock and Product, 2008*, September 2, 2008.

[66] EIU, *India Food: Sub-Sector Update*, November 11, 2008.

[67] U.S. Dairy Export Council, *India: Dairy Industry*, March 2006, 49.

refrigeration. This characteristic is advantageous in India, where refrigeration capacity is limited and electricity supply is erratic in many areas of the country. Other traditional dairy products include dahi (curds) and paneer (cottage cheese); only 4 percent of dairy consumption is in the form of Western-style dairy products such as milk powder and ice cream.[68]

Meat and Poultry

Production

India has the largest livestock population in the world, with 50 percent of the global total of buffaloes and 20 percent of the cattle.[69] This livestock is not used mainly for meat production; Indian per capita meat consumption is well below the world average.[70] Only 11 percent of buffalo, 6 percent of cattle, 33 percent of sheep, and 38 percent of goats are slaughtered for meat.[71] Cattle are used mainly for dairy production and as farm service animals. The main bovine meat processed is male buffalo meat, which is also exported. The Indian meat and poultry processing sector had a capacity of 1 mmt in 2008, mostly in small slaughterhouses, with about a 40–50 percent capacity utilization rate.[72]

Poultry production is the fastest growing meat production, expanding by 50 percent by volume between MY 2003/04 and MY 2007/08. However, only about 6 percent is processed in slaughterhouses, because Indians generally prefer freshly butchered meats.[73] The poultry-processing industry is growing and has become increasingly organized and technologically advanced. Large-scale producers that use commercial feed operate in India, and domestic corn production has risen accordingly.[74] Some vertical integration has occurred in the southern part of India, where growers raise but do not take ownership of the poultry, while the processors provide them the chicks and feed. Tyson Foods, Inc., through a joint venture with the Indian firm Godrej Agrovet, has invested in the Indian poultry industry, establishing an integrated growing, processing, and distribution operation with production facilities in Mumbai and Bangalore.[75]

Consumption

Even though most Indians are not vegetarians, in general they consume low levels of meat relative to other counties. Indians consumed on average just 21 calories per day from meat from 2001 to 2003, which is dramatically less than the 367–446 calories from meat consumed daily in China, Brazil, and the United States. This low level of meat consumption may be attributable to religious practices as well as the high cost of meat.[76]

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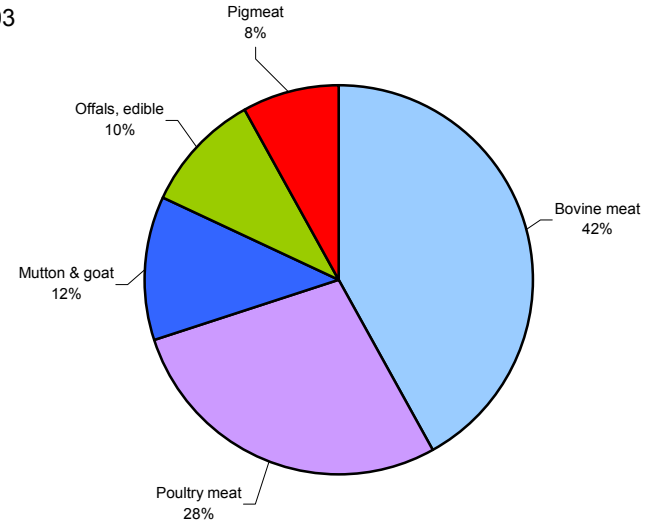
[68] Ibid., 47.
[69] IBEF, *Food Processing: Market and Opportunities*, 6.
[70] Per capita annual meat consumption in India is 1.5 kg versus the world average of 35.5 kg.
[71] IBEF, *Food Processing: Market and Opportunities*, 5.
[72] Dhankhar, *India: Food Processing Sector*, July 2, 2008, 14.
[73] Indian industry representative, interview by Commission staff, Mumbai, India, May 28, 2009.
[74] Ibid.
[75] Indian industry representative, interview by Commission staff, Mumbai, India, May 28, 2009. See chapter 8 for details on the Tyson-Godrej joint venture.
[76] USDA, ERS, *India's Pulse Sector*, May 2003, 6; USMEF, "India's Pork Market: Opportunities," March 2007, 4.

Per capita meat consumption has been rising steadily, however, and is expected to continue to increase.[77]

Indians traditionally prefer fresh meat, and thus there is low demand for chilled meats and even less for frozen meat.[78] Bovine meat, mainly buffalo meat, and poultry accounted for approximately 70 percent of all meat consumption in 2003 (fig. F.2). Buffalo meat and poultry are popular, in part, because they are competitively priced and neither is taboo to any major Indian religion.[79] In recent years, some pulses have become more expensive than buffalo meat, making it more popular as a protein alternative to pulses.[80] Goat and sheep meat are actually preferred by Indians to buffalo meat and poultry, but consumption is low because low production levels keep their prices relatively high.[81]

FIGURE F.2 India: Selected total meat consumption, percent share, 2003



Source: FAO, FAOSTAT (accessed May 27, 2009).

Fruits and Vegetables

Production

India is the second-largest producer of fruits and vegetables in the world. Fruit production was 62.9 mmt and covered 5.8 million ha in MY 2007/08.[82] Although India's different climatic zones allow for the production of many different kinds of fruit, tropical fruit dominates, in particular bananas, mangoes, and citrus fruits, which together account for

[77] EIU, *India Food: Sub-Sector Update,* November 11, 2008.
[78] Ibid.
[79] Dhankhar, *India: Livestock and Products,* September 2, 2008, 8; industry official, interview by Commission staff, Washington, DC, April 7, 2009.
[80] Dhankhar, *India: Livestock and Products,* September 2, 2008, 8.
[81] Ibid., 3.
[82] Government of India, Ministry of Agriculture, Directorate of Economics and Statistics, *Agricultural Statistics at a Glance*, 2008.

70 percent of total fruit production.[83] The lack of a fully developed cold chain particularly affects fruit and vegetable production and results in significant postharvest quality degradation and losses. Top horticulture-producing states by area are West Bengal, Uttar Pradesh, and Orissa.[84]

India is the world's largest producer of bananas and mangoes, with MY 2006/07 production of 20.9 mmt and 13.5 mmt, respectively.[85] Citrus ranks as the third-largest fruit by production volume, with 7.1 mmt in MY 2006/07.[86] Although they are produced in much smaller volumes, the production of grapes and apples, at 1.7 mmt and 1.6 mmt, respectively, in MY 2006/07 is significant in India. Grape production is mostly of table grapes, although wine grapes have been introduced to support a nascent wine industry. India is the sixth-largest producer of apples in the world, with the second-largest area, after China, but the lowest yields (5.5 mt/ha) of the major world producers.[87]

A wide variety of vegetables is produced in India. Potatoes dominate national production, while onions, tomatoes, eggplant, tapioca, cabbage, and cauliflower are also important vegetable crops. India is the second-largest global producer and consumer of potatoes, which are a staple of the Indian diet. India produced 30.2 mmt of potatoes in MY 2006/07.[88] India is the world's largest producer of cauliflower, second largest in onions, and third largest in cabbage. Rising incomes and growing health awareness among Indian consumers are contributing to rising production.

Processing capacity for fruits and vegetables was 2.5 mmt in 2007.[89] The main processed products in the organized sector (with a 48 percent share of the sector as a whole[90]) are juices, pulp concentrates, vegetable pastes, ready-to-serve beverages, ready-to-eat vegetables, jams, and frozen french fries. Tomato ketchup and jam production are currently very small but growing rapidly. About 20 percent of processed fruit and vegetable products are exported and consist of fruit pulps, pickles, chutneys, canned foods, and concentrated pulps and juices. Mangoes and mango-based products account for about 50 percent of those exports.[91]

Consumption

Traditionally, Indians do not consume large quantities of fruit or vegetables. Per capita fruit consumption is comparatively lower than other countries (e.g., 37.3 kilograms of fruit per capita in India versus 64.6 kilograms in China),[92] and only 4 percent of food expenditure goes to fruit.[93] Indians spend more of their food budget (10–12 percent) on

[83] Dhankhar, *India: Product Brief; Indian Fresh Fruit Sector*, December 16, 2008, 3.

[84] The Indian state of Gujarat is striving to become a horticulture hub and has recently experienced a twofold increase in the land already allotted to horticulture. The state government has plans to bring in another 20 million hectares.

[85] Government of India, Ministry of Agriculture, Directorate of Economics and Statistics, *Agricultural Statistics at a Glance*, 2008.

[86] Dhankhar, *India: Product Brief; Indian Fresh Fruit Sector*, December 16, 2008, 11.

[87] USDA, ERS, *Prospects for India's Emerging Apple Market*, January 2006, 8.

[88] Government of India, Ministry of Agriculture, Directorate of Economics and Statistics, *Agricultural Statistics at a Glance*, 2008.

[89] Dhankhar, *India: Food Processing Sector*, July 2, 2008, 14.

[90] IBEF, *Food Processing: Market and Opportunities*.

[91] Ibid.

[92] EIU, *India: Food: Sub-Sector Update*, November 11, 2008; EIU, *China Food: Sub-Sector Update*, January 20, 2009.

[93] Dhankhar, *India: Product Brief; Indian Fresh Fruit Sector*, December 16, 2008, 4.

vegetables than fruit, and vegetable consumption is higher than fruit consumption. It is estimated that Indians each consumed 69.6 kilograms of vegetables in 2008.[94] Nonetheless, India's vegetable consumption is still low compared to other countries. For example, China consumed an estimated 326.1 kilograms per capita of vegetables in 2008.[95]

In India, the number of health-conscious consumers is rising, and fresh fruits are increasingly popular with this population.[96] Major fruits in India are those served by domestic production: bananas, mangoes, citrus fruits, papayas, guavas, grapes, and apples.[97] Citrus fruit consumption includes mousambi (sweet limes), limes, lemons, and oranges.

Fruit consumption in India emphasizes locally grown types that are available in abundance at relatively low prices; bananas, mangoes, and citrus all have higher consumption levels than apples and grapes, which command higher prices in both domestic and imported versions.[98] Despite low per capita consumption, because of its sheer numbers, India is the sixth-largest consumer of apples in the world.[99] In northern India, where apples are produced, consumers demand premium apples, but in southern India, where the climate is too warm for apple production and infrastructure deficiencies leave apples in short supply, consumers reportedly will purchase apples of any quality.[100]

Nuts

Production

Indians are large consumers of several types of tree nuts, but domestic commercial production is limited to cashews and walnuts. India is the second-largest producer of cashews in the world after Vietnam and maintains a large, export-oriented cashew-processing industry that includes significant imports of raw cashews from sub-Saharan Africa. The Indian domestic cashew crop was 176,000 mt in MY 2008/09.[101] India produces relatively fewer walnuts; the MY 2008/09 walnut crop was 37,000 mt.[102] Walnuts are mainly grown in the northernmost state of Jammu and Kashmir on rocky terrain under rain-fed conditions. Yields for walnuts are relatively low because of poor genetics, lack of irrigation, and poor soil quality and management practices.[103]

Consumption

Indians consume multiple kinds of nuts, including cashews, almonds, pistachios, and walnuts. These are generally eaten as snack foods, although some types of nuts are also used in confectionery, cosmetics, and soap.[104] Cashews are the most prevalent and are

[94] EIU, *India Food: Sub-Sector Update*, November 11, 2008.
[95] Ibid.; EIU, *China food: Sub-sector Update*, January 20, 2009.
[96] Dhankhar, *India: Product Brief; Indian Fresh Fruit Sector*, December 16, 2008, 4.
[97] USDA, ERS, *Prospects for India's Emerging Apple Market*, January 2006, 5; Dhankhar, *India: Product Brief; Indian Fresh Fruit Sector*, December 16, 2008, 3.
[98] USDA, ERS, *Prospects for India's Emerging Apple Market*, January 2006, 5.
[99] Ibid., 1, 3, and 5.
[100] Industry official, interview by Commission staff, Mumbai, India, June 1, 2009.
[101] *The Cracker*, International Nut and Dried Fruit Council Foundation, April 2009, 52.
[102] Dhankhar, *India: Tree Nuts*, August 26, 2008, 4.
[103] Dhankhar, *India: Tree Nuts*, September 14, 2007, 6.
[104] Aradhey, *India: Tree Nuts*, September 11, 2008, 7.

reportedly preferred in southern India.[105] Pistachios are not grown in India, so demand is met entirely though imports.[106] Reportedly, they are viewed as a luxury good and are a popular gift and festival item during major Indian holidays.[107] Almonds are most popular in northern India. Walnuts have primarily been consumed during festival season (September to January), but they are beginning to be consumed year-round as awareness of their health benefits grows and as they become available in vacuum packs.[108]

Beverages

Production

India is the largest producer of tea in the world, reaching 944,000 mt in MY 2007/08. Indian coffee production, at 262,000 mt in MY 2007/08, is also large and mainly exported (75 percent in MY 2005/06). Other nonalcoholic beverages produced in India include carbonated and noncarbonated drinks. The carbonated segment has sizable organized production. Noncarbonated drinks are mainly fruit based. For alcoholic beverages, production includes beer and grain-based alcoholic beverages. Wine production is a relatively new endeavor, building on India's sizable production of table grapes. Wine grape production and most of India's wineries are located in Maharashtra. Wine production reached approximately 920,000 nine-liter cases in 2008.[109]

Consumption

Among nonalcoholic beverages, the Indian beverage of preference is overwhelmingly tea, which Indians call *chai*. India is the world's largest consumer of tea, typically brewed with a variety of spices, such as cardamom, cinnamon, and cloves.[110] A study of the Indian hot drinks market found that that tea commanded 69 percent of the beverage market by value in 2007, while coffee held only 10 percent.[111] A survey found that 77 percent of Indians drank tea or coffee every day in 2006.[112] Historically, there has been little interest in coffee, except perhaps in the south, but this pattern is beginning to change, and there is a rise in the number of high-end coffee shops.[113]

Besides tea and coffee, Indians drink a wide variety of nonalcoholic beverages, including carbonated drinks, juices, bottled water, and milk, as well as traditional Indian drinks such as lassis (a yogurt drink) and badam doodh (a milk and almond drink). A survey on the soft drinks market found that in 2007, carbonated drinks had the biggest market share by value, followed by bottled water and juices.[114] With regard to international brands,

[105] Industry official, interview by Commission staff, Mumbai, India, May 11, 2009; Vinayak, "Retailing the King of Nuts," July 31, 2008.

[106] USITC, Hearing transcript, April 21, 2009, 30 (testimony of Mr. Masten, Paramount Farms).

[107] Government official, interview by Commission staff, New Delhi, India, May 4, 2009; industry official, interview by Commission staff, Mumbai, India, May 11, 2009; and USITC, Hearing transcript, April 21, 2009, 30 (testimony of Mr. Masten, Paramount Farms).

[108] Aradhey, *India: Tree Nuts*, September 11, 2008, 7.

[109] JBC International, Inc., "Comprehensive Study of the Indian Wine Market," 2008, 10.

[110] EIU, *India Food: Sub-Sector Update*, November 11, 2008.

[111] DATAMONITOR, "Hot Drinks in India," October 2008.

[112] Yadav and Kumar, "The Food Habits of a Nation," August 14, 2006. Given tea's market share, most of these hot drinks are likely tea rather than coffee.

[113] EIU, *India Food: Sub-Sector Update*, November 11, 2008.

[114] In this instance, "soft drink" does not refer exclusively to carbonated beverages.

some are altered to fit Indian taste preferences, such as adding carbonation.[115] A survey of the Indian juice market found that fruit drinks (consisting of a maximum 30 percent juice) had the largest market share (83 percent) by value in 2003.[116]

Although Indians drink a wide variety of nonalcoholic beverages besides tea and coffee, most of these drinks are not necessarily cold. A survey found that Indian cold drink consumption is low. Specifically, approximately 22 percent of the rural population and 23 percent of the urban population consume cold drinks, and only 4 percent of the population consumes cold drinks every day.[117] This low consumption of cold drinks is likely because of limited refrigeration in Indian households.

Indians consume spirits, beer, and wine, but in general, India has a low level of alcohol consumption compared with other countries. Alcohol consumption in India was 1.8 billion liters in 2008, compared to 26.3 billion liters in China.[118] A 2008 study of the Indian drinks market estimated that spirits held a 75 percent share of the market by value.[119] Beer and similar drinks had a 24 percent market share, and wine held the remaining sliver of the market. Out of the dominant spirits category, whiskey is most popular. In 2007 the top three spirits by value held the following market shares; whiskey, 71 percent; brandy, 10 percent; and vodka, 2 percent.[120] Despite overall low alcoholic consumption rates, whiskey is very popular, and India has the highest total whiskey consumption in the world.[121] Indian youth reportedly prefer white spirits, such as vodka, sales of which are increasing.[122] With regard to beer, Indians on average drink only about 0.75 liters per annum, which is much lower than the 99 liters and 116 liters per capita consumption in the United Kingdom and Germany, respectively.[123] The beer market is growing, however, at an estimated 12 percent a year.[124]

Wine consumption is concentrated in certain cities and states. Mumbai and New Delhi are the largest wine markets, followed by Bangalore and the state of Goa.[125] Generally, Indians prefer red and white table wines, which commanded an estimated 80 percent of the Indian wine market in 2008.[126] There is a limited market for sparkling wines and champagne, which accounted for about 16 percent of the wine market in 2008. The upper class, which drives Indian wine consumption, prefers traditional wine presentation that includes "real corks, full size bottles, and dry red and white wines."[127] The middle class, on the other hand, prefers sweet wines with a more nontraditional presentation that includes screw caps and smaller bottles.

[115] Industry official, interview by Commission staff, Mumbai, India, May 11, 2009.
[116] DATAMONITOR, "Juices in India," May 2004, 9, 6. The 2003 data are the most recently available information.
[117] Yadav and Kumar, "The Food Habits of a Nation," August 14, 2006.
[118] Ibid.; EIU, *India Food: Sub-Sector Update*, November 11, 2008.
[119] DATAMONITOR, "Alcoholic Drinks in India," December 2008, 11.
[120] DATAMONITOR, "Spirits Drinks in India," November 2008, 11.
[121] Industry official, interview by Commission staff, New Delhi, India, May 4, 2009.
[122] Ibid.
[123] EIU, *India Food: Sub-Sector Update*, November 11, 2008.
[124] Ibid.
[125] JBC International Inc., "Comprehensive Study of the Indian Wine Market," August 21, 2008, 6.
[126] Ibid.; DATAMONITOR, "Wine in India," December 2008, 11.
[127] JBC International, Inc., "Comprehensive Study of the Indian Wine Market," August 21, 2008, 6. This study defined the upper class for its study as the top 2 percent of this population and finds that this class is characterized by its monetary means, international experiences, and lifestyle, all of which expose them to wine.

Cotton

During MY 2003/04–2007/08, India became the second-largest global producer of cotton after China. Indian production feeds India's extensive textile mills, which enjoyed higher textile export demand during this period. India had its sixth consecutive record cotton crop in MY 2008/09 as a result of increased planting and higher yields from improved hybrid varieties and Bt cotton,[128] improved crop management practices, and favorable weather.[129] Cotton planted area increased by 24 percent over the period, reaching 9.4 million hectares in MY 2007/08. This was true even though cotton must compete for area with other crops (rice and fodder crops in the north; coarse grains, pulses, and sugarcane in the central region; and rice, tobacco, and chilies in the south) that also enjoyed strong prices and relative profitability, particularly in MY 2008/09.[130] Cotton yields have nearly doubled—they increased 90 percent between 2002 and 2007, versus 10 percent or less for corn, rice, and soybeans during the same period[131]—but are still below the world average, leaving room for production gains despite limited additional area for planting cotton.[132]

[128] Bt cotton was introduced in 2002 and accounted for 85 percent of cotton area in MY 2008/09.
[129] Singh, *India Cotton and Products Annual 2008*, May 12, 2008, 1.
[130] Ibid., 4.
[131] Ibid., 5.
[132] Industry sources expect area for cotton production to peak at 10 million ha. Singh, *India Cotton and Products Annual 2008*, May 12, 2008, 5.

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APPENDIX G
UNION AND STATE/UNION TERRITORY JURISDICTION OVER INDIAN AGRICULTURAL MATTERS

Indian Legal Structure for Agricultural Matters

India is a democratic republic governed at the national level by a bicameral parliament. Members of the lower house, known as the House of the People (Lok Sahba), are directly elected, while members of the upper chamber, the Council of the States (Rajya Sahba), are elected by the state and territorial legislatures, with a few exceptions. India's president, elected by an electoral college for a five-year term, acts as the head of state, and the prime minister of the Lok Sahba is the head of government.

Governmental responsibilities are divided between the central ("union") government and state governments. The seventh of the 12 schedules[1] in the Indian constitution comprises three lists. List I, the union List, sets out the departments, activities, and subjects under the control of the union government. List II, the State List, does the same for the states. List III, the Concurrent List, specifies the areas where states and the union government share powers and responsibilities.[2] Included on the State List is agriculture, meaning that unlike such sectors as defense, banking and finance, transportation, and communications, agriculture falls within the legal domain of India's states and not the union government.[3]

Thus, the agricultural sector is largely, though not completely, controlled at the state level. This authority covers agricultural education and research, protection against pests, prevention of plant and animal diseases, water supplies and irrigation, and land use rights for agricultural land. It also encompasses agricultural tax policy, such as income and excise taxes on agricultural products and estate and succession duties (taxes) on agricultural land. For alcoholic beverages, state-level authority extends even further to embrace nearly all aspects of the "production, manufacture, possession, transport, purchase, and sale" of those items.[4]

The allocation of power to the states on agricultural matters is less absolute than it might appear. In reality, other provisions of the Indian constitution give the union government the legal means to influence or intervene in agricultural policies throughout India.[5] Very broadly, Article 248 of the constitution grants the union government residual powers of legislation for policy areas not specified under the three lists. In addition, under Article 249, the union government has authority to legislate on any subject, even those on the State List, if the union government believes it to be "in the national interest." Subsequent cases brought before India's Supreme Court (e.g., *State of Bengal versus Union of India*, 1962) have confirmed the union government's authority to legislate on issues from the State and Concurrent Lists if the national interest is at stake.[6]

Similarly, under paragraph 33 of the Concurrent List, both the union and state governments have legislative authority over trade in foodstuffs, including edible oilseeds and oils, cattle fodder, raw cotton, and cottonseed, as well as over their production, supply, and distribution. The union List gives the central government certain direct powers over agriculture: under paragraph 51, the union government can legislate standards of quality for agricultural exports or goods transported from one state to another. Under paragraph 52, the parliament is authorized to control the production of

[1] A schedule is a statement of supplementary details in a legislative document.
[2] Government of India, Ministry of Law and Justice, *The Constitution of India*, July 2008, 315–329.
[3] Singh, *Federalism, Nationalism and Development*, 104.
[4] Government of India, Ministry of Law and Justice, *The Constitution of India*, July 2008, 323–325.
[5] Singh, *Federalism, Nationalism and Development*, 105.
[6] Ibid., 106.

certain agricultural goods in the public interest. Consequently, laws could be passed controlling, for example, the production of milk if national control of milk marketing were deemed to be in the public interest.[7]

The boundaries between the union government's and state governments' powers to implement agricultural policies are complicated—and are evolving. For the most part, the Ministry of Agriculture in New Delhi formulates agricultural policies under the five-year plans. The ministry and other central government agencies make key decisions relating to research and development, infrastructure, investment, credit, and trade. These policies are implemented by the states, which have enough individual latitude to make policy adjustments to fit their economic and social needs.[8]

States use this legal leeway in different ways. One example is the State Agricultural Produce Marketing (Development and Regulation) Act of 2003, commonly known as the Model Act. Among other things, the Model Act allows but does not require states to establish private markets and to permit farmers to sell directly to purchasers and engage in contract farming.[9] In the past, farmers were required to sell their produce only to government-run markets (mandis). Of the 28 states and 7 union territories (UTs) in India, all but 8 either have amended their local Agricultural Produce Marketing Committee (APMC) Acts to align with at least some of the national guidelines or had no need to amend their state laws.[10] However, many states and UTs that revised their APMC Acts did not accept Model Act recommendations in full, creating a complex regulatory web for agricultural producers and distributors to follow.[11] A list of APMC Act revisions by Indian state or UT is listed below.

States/UTs and Implementation of the Model Act[12]

States/UTs That Have Implemented the Model Act

The following states and UTs have reformed their APMC Acts to closely follow the Model Act. Reforms for farmers included direct marketing, contract marketing, and private or cooperative mandis.

Andhra Pradesh (date amended: 10/26/2005)
Arunachal Pradesh (date amended: 09/05/2006)
Assam (date amended: 01/19/2007)
Chhattisgarh (date amended: 02/10/2006)
Goa (date amended: 08/06/2007)
Gujarat (date amended: 05/01/2007)

[7] Ibid.

[8] OECD, *Agricultural Policies in Emerging Economies 2009*, 99.

[9] For the draft template created by the Union government for states to follow when creating their own APMC Act rules, see http://agmarknet.nic.in/amrscheme/FinalDraftRules2007.pdf (accessed June 8, 2009).

[10] Industry representative, interview by Commission staff, New Delhi, India, May 9, 2009.

[11] Over the last three years, states such as Uttar Pradesh and West Bengal have denied requests by Indian companies to open private mandis. In states where private mandis have been approved, the approval is typically for a limited time (e.g., one year) and made under administrative order rather than by statute. Thus, the administrative order can be changed at any time. Industry representative, interview by Commission staff, New Delhi, India, May 9, 2009.

[12] Government of India, Planning Commission, *India's Eleventh Five Year Plan: 2007-12*, 23, and Chaulan, "Agricultural Marketing Reforms," April 23, 2008.

Himachal Pradesh (date amended: 05/26/2005)
Karnataka (date amended: 08/16/2007)
Madhya Pradesh (date amended: 06/15/2003)
Maharashtra (date amended: 07/11/2006)
Nagaland (date amended: 09/08/2005)
Orissa (date amended: 05/17/2006)
Rajasthan (date amended: 11/18/2005)
Sikkim (date amended: 04/20/2005)
Tripura (date amended: 05/11/2007)
Tamil Nadu (no amendments to the state APMC Act needed to implement reforms)

States/UTs Implementing Amended APMC Acts

The following states and UTs reformed their APMC Acts only partially. The areas affected by the partial reforms are listed in parentheses.

Chandigarh (UT) (contract farming, private and cooperative mandis)
Haryana (contract farming)
National Capital Territory of Delhi (direct marketing)
Punjab (contract farming, private and cooperative mandis)

States/UTs with No APMC Act

The following states and UTs have no APMC Acts. No reforms were implemented to allow direct marketing, contract marketing, and private or cooperative mandis:

Bihar (AMPC Act repealed effective 09/01/2006)
Kerala
Manipur
Andaman and Nicobar Islands (UT)
Dadra and Nagar Haveli (UT)
Daman and Diu (UT)
Lakshadweep (UT)

The following states and UTs have initiated administrative action for reform of their APMC Acts:

Mizoram
Meghalaya
Jammu and Kashmir
Uttarakhand
West Bengal
Puducherry (UT)
Jharkhand
Uttar Pradesh

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APPENDIX H
ANALYTICAL FRAMEWORK AND ASSUMPTIONS FOR ECONOMIC SIMULATIONS

Simulation Framework

The effects of the removal of Indian tariffs on U.S. agricultural exports have been simulated with a framework that has a general equilibrium (GE) model component and a partial equilibrium (PE) model component. The GE model comprises 57 sectors covering all aspects of the economy, including trade among India, the United States, and the rest of the world (RoW). The PE model is linked to the GE model and focuses on food and agricultural trade among India, the United States, and the RoW for 699 products specified at the international Harmonized System six-digit (HS6) level.[1]

The General Equilibrium Model

The GE model is the Global Trade Analysis Project (GTAP) model of world trade.[2] The GTAP framework consists of a database containing global data on international trade, together with interindustry relationships, national income accounts, and a simulation model. In the GTAP model, domestic products and imports are consumed by firms, governments, and households. Product markets are assumed to be perfectly competitive, implying zero economic profits for firms, with imports viewed as imperfect substitutes for domestic products and with sectoral production equal to global demand.

In addition to the data on bilateral trade in each of the 57 GTAP sectors, the database includes data on domestic production and use for each sector, including intermediate use in the production of other commodities and services, as well as data on use of land, capital, and labor employment by sector. An additional component of the data is a set of parameters that, in the context of the model's equations, determine economic behavior. These parameters are principally a set of elasticities that determine, among other things, the extent to which imports and domestically produced goods are substitutes for one another. The GTAP data used in this report have been updated from their 2004 base-year to 2007 (the most recent year for which data are available), using trade and statistics on gross domestic product.[3]

The Partial Equilibrium Model

The PE model is organized in 26 groups of HS6 products. Each product group corresponds to one of 26 sectors in the GTAP model that contain these HS6 products. Table H.1 lists the 26 GTAP sectors and the number of food and agricultural HS6 products they contain. For example, the product group "Food products n.e.c." contains 188 HS6 products, and the group "Fruits, vegetables, and nuts" contains 91 HS6 products.

Simulations Performed

A PE-GE simulation of import tariff effects consists of three steps. First, a PE simulation of the elimination of Indian tariffs at the HS6 level provides tariff shocks for the 26

[1] The 699 HS6 products identified in this work are the products covered by the WTO Agreement on Agriculture.

[2] For more information about the GTAP model, see Hertel, *Global Trade Analysis: Modeling and Applications*, 1997; Narayanan and Walmsley, *Global Trade, Assistance, and Production: The GTAP 7 Data Base*, 2008.

[3] Version 7 GTAP data were used in this report.

GTAP sectors in table H.1. Second, tariff effects are simulated using the GE model to obtain GE effects. Third, certain GE effects are incorporated in a second-round PE simulation of tariff effects at the HS6 level.

TABLE H.1 GTAP model sectors and number of food and agricultural HS6 products contained in each sector

GTAP sector description	Number of food and agricultural HS6 products
Paddy rice	2
Wheat	2
Cereal grains n.e.c.	10
Vegetables, fruit, and nuts	91
Oil seeds	16
Sugar cane, and sugar beets	1
Plant-based fibers	3
Crops n.e.c.	62
Cattle, sheep, goats, horses	7
Animal products n.e.c.	47
Wool, silk-worm cocoons	7
Forestry	9
Fishing	3
Meat: cattle, sheep, goats, horses	29
Meat products n.e.c.	49
Vegetable oils and fats	47
Dairy products	24
Processed rice	2
Sugar	7
Food products n.e.c.	188
Beverages and tobacco products	31
Textiles	12
Wearing apparel	5
Leather products	28
Chemical, rubber, and plastic products	16
Manufactures n.e.c.	1
Total number of HS6 products	699

Sources: Hertel, *Global Trade Analysis*, January 1997; Narayanan and Walmsley, *Global Trade, Assistance, and Production* , 2008.

Note: The acronym n.e.c. means not elsewhere classified.

To illustrate how a PE-GE simulation is generated, figure H.1 specifies supply, demand, and trade linkages for a theoretical product group that contains only two HS6 products. In the figure, the world is divided into three regions: India, the United States, and the RoW. The quantities of total demand for the i^{th} product group in India, $QD_{i,India}$, and domestic supply, $QO_{i,India}$, are exogenous in the PE model. In a first-round PE simulation of tariff effects, the model simulates trade changes for HS6 products under the restriction that demand and supply for the GE product groups are not affected by the simulation. In a second-round PE simulation of tariff effects, demand and supply for GE product groups are changed to reflect GE effects.[4] Market-clearing conditions in the PE model ensure that supplies are equal to total demand for each of the HS6 products identified in the model. Because products are distinguished by their region of origin, there are 2,097 (3 multiplied by 699, the total number of HS6 products) market-clearing conditions.

[4] Other works applying a PE-GE approach are Grant, Hertel, and Rutherford, "Extending General Equilibrium to the Tariff Line," June 2007; Narayanan, Hertel, and Horridge, "A Nested PE/GE Model for GTAP," June 2008; Jansson et al., "Getting the Best of Both Worlds?" June 2008; U.S. International Trade Commission, *Global Beef Trade*, September 2008; and Tsigas et al., "An Analysis of BSE Restrictions on Beef Imports from the United States and Canada," June 2009.

Producers determine the optimal supply for HS6 products ($QO_{i,1,India}$ and $QO_{i,2,India}$ in figure H.1) by maximizing revenues subject to a constant elasticity of transformation (CET) production possibilities frontier with an elasticity of transformation, ET_G.[5] Optimal demand for HS6 products ($QD_{i,1,India}$ and $QD_{i,2,India}$) is determined by minimizing expenditures subject to CES (constant elasticity of substitution) trade-offs with an elasticity of substitution, ES_G.[6] Optimal demand for the domestic varieties of HS6 products ($QDS_{i,1,India}$) and total imports of HS6 products ($QIM_{i,1,India}$) is determined by a CES function with an elasticity of substitution, ES_D. Finally, the quantities of HS6 products imported from the United States and the RoW ($QXS_{i,1,USA,India}$ and $QXS_{i,1,RoW,India}$) are determined by a CES function with an elasticity of substitution, ES_M.

The PE model specifies that the domestic product is differentiated from imports and that consumers, whether final or intermediate, view imports of a particular product from a specific region as different from imports from all other regions. These two specifications constitute the Armington specification of product differentiation by country of origin.[7]

Data for Partial Equilibrium Model

The PE model requires certain statistics and economic parameters. The statistics are the dollar value of bilateral trade and demand for the domestic variety of a product and the corresponding bilateral import tariffs. Bilateral trade statistics were obtained from the United Nations Commodity Trade Statistics (UN Comtrade) database for 2007, the latest year available at the time of this work, with complete and consistent statistics for India, the United States, and the rest-of-the-world.[8]

Statistics for demand for the domestic variety of a product are not currently available for HS6 products. Thus, statistics from two sources were used to construct domestic demand statistics. The Food and Agriculture Organization of the United Nations' (FAO) FAOSTAT databases provide export/production and import/demand shares for specific products and certain product groups. The GTAP database also provides these statistics for 26 GE product groups. Trade shares from the FAO and GTAP data were applied to the HS6 trade statistics to construct domestic supply and demand statistics.[9]

[5] A CET production possibilities frontier is characterized by a constant percentage change in a product-mix ratio to changes in the marginal rate of transformation. Powell and Gruen, "The Constant Elasticity of Transformation Production Frontier and Linear Supply System," 1968, 315–28.

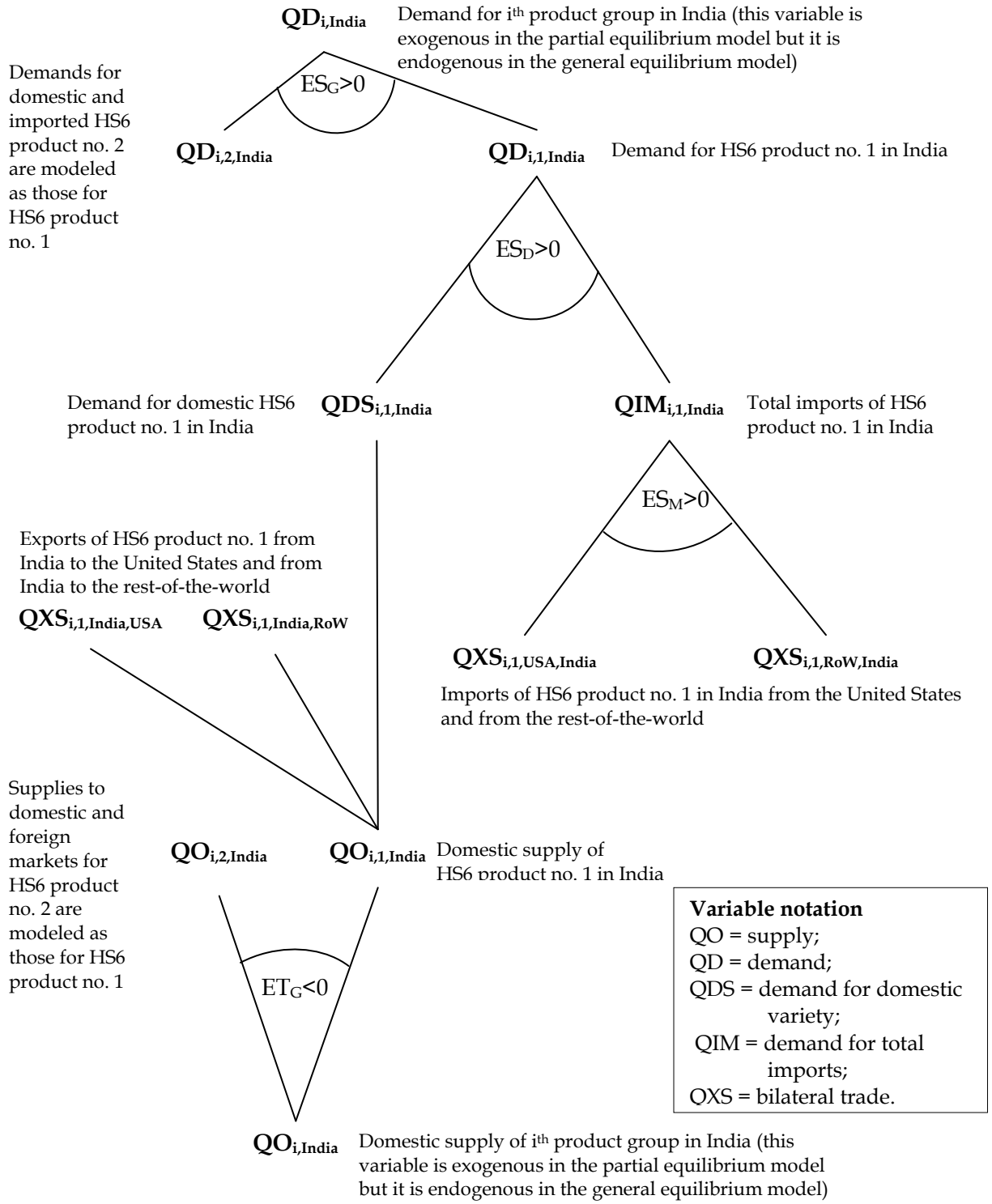
[6] A CES function is characterized by a constant percentage change in product proportions because of a percentage change in the marginal rate of technical substitution. Arrow et al., "Capital-Labor Substitution and Economic Efficiency," 1961, 225–50.

[7] Armington, "A Theory of Demand for Products Distinguished by Place of Production," 1969, 159–76.

[8] United Nations Commodity Trade Statistics Database, statistics downloaded from WITS (World Integrated Trade Solution) on March 24, 2009.

[9] FAO statistics for production, consumption, and trade for various products and product groups were downloaded from the FAOSTAT online database.

FIGURE H.1 Partial equilibrium model and linkages to general equilibrium model: Indian supply, demand, and trade for a general equilibrium product group that contains two hypothetical HS6 products



Source: Developed by Commission staff.

Applied ad valorem tariff equivalents were obtained from the United Nations Conference on Trade and Development (UNCTAD) Trade Analysis and Information System (TRAINS) data and the MAcMapHS6 data.[10] Indian food and agricultural tariffs are current as of 2007.

The elasticities ES_G, ES_D, ES_M (fig. H.1) are based on the GTAP database. Estimated values for ES_M and their standard deviations are shown in table H.2. Employing the "rule of two," values for ES_D, and ES_G are computed from ES_M as follows: $ES_D = ES_M/2$ and $ES_G = ES_D/2$.[11] A range of simulated effects is obtained by employing low and high values for ES_M.[12] Table H.2 also shows the values of ET_G, the parameter determining the supply response at the HS6 product level (fig. H.1). For most product groups, ET_G is assigned the value –1. For product groups that may require relatively more resources and time to adjust to price changes, ET_G is assigned the value –0.8.

TABLE H.2 Values of partial equilibrium model parameters ES_M and ET_G

	ES_M		
Product group	Estimated value	Standard deviation	ET_G
Paddy rice	10.1	4.0	-1.0
Wheat	8.9	4.2	-1.0
Cereal grains n.e.c.	2.6	1.1	-1.0
Vegetables, fruit, nuts	3.7	0.4	-0.8
Oil seeds	4.9	0.8	-1.0
Sugar cane, sugar beet	5.4	2.4	-1.0
Plant-based fibers	5.0	0.4	-1.0
Crops n.e.c.	6.5	0.7	-0.8
Cattle, sheep, goats, horses	4.0	0.7	-0.8
Animal products n.e.c.	2.6	0.3	-0.8
Wool, silk-worm cocoons	12.9	2.7	-1.0
Forestry	5.0	0.7	1.0
Fishing	2.5	0.6	-1.0
Meat: cattle, sheep, goats, horses	7.7	1.9	-1.0
Meat product n.e.c.	8.8	0.9	-1.0
Vegetable oils and fats	6.6	0.7	-1.0
Dairy products	7.3	0.8	-1.0
Processed rice	5.2	2.6	-1.0
Sugar	5.4	2.0	-1.0
Food products n.e.c.	4.0	0.1	-1.0
Beverages and tobacco products	2.3	0.3	-1.0
Textiles	7.5	0.1	-1.0
Wearing apparel	7.4	0.2	-1.0
Leather products	8.1	0.3	-1.0
Chemical, rubber, plastic products	6.6	0.1	-1.0
Manufactures n.e.c.	7.5	0.2	-1.0

Source: Estimated values for ES_M and their standard deviation are from Hertel et al., "How Confident Can We Be of CGE-Based Assessments of Free Trade Agreements?" 2007.

Note: The acronym n.e.c. means not elsewhere classified.

[10] TRAINS statistics were downloaded from WITS on February 13, 2009. For documentation of the MAcMapHS6 database, see Boumellassa, Laborde, and Mitaritonna, "A Consistent Picture of the Protection Across the World in 2004," 2009.

[11] This rule was proposed by Jomini et al., *The SALTER Model of the World Economy,* 1994. Another study failed to reject this rule statistically. Lui, Arndt, and Hertel, "Parameter Estimation and Measures of Goodness of Fit in a Global General Equilibrium Model," 2004, 626–49.

[12] Low and high values for ES_M are computed as $ES_M \pm$ standard deviation (table H.2).

Model Limitations

Simulated effects from this PE-GE model are based on established U.S. export patterns that may exist for such reasons as the distance between countries and the presence or absence of transport infrastructure. These factors are imperfectly captured by the model. Furthermore, the model does not directly account for historical or cultural factors as determinants of trade patterns. The model assumes that these factors are unaffected by the economic policy changes.

Economic models capture the most important factors for the question under consideration: existing trade flows and trade policies and the degree of consumer demand sensitivity to price changes. However, economic models are limited in their ability to reflect the degree of complexity evident in the real world.[13] Despite these limitations, the simulations performed here can be quite useful in providing insights on the effects of economic policies. The model presents a unified framework in which the likely effects of the policy can be assessed.

Estimation of Price Gaps for Nontariff Measures

Estimation of Nontariff Measure Price Gaps

The quantification of nontariff measures (NTMs) using the method of price gaps, or "tariff equivalents," has been frequently used in Commission studies on NTMs.[14] In this study, we estimated price gaps at the HS6 subheading level. We estimated separate price gaps for Indian imports from the United States and Indian imports from the rest of the world in order to account for possible quality differences between U.S. and non-U.S. varieties of agricultural exports. The fact that imports from the United States and other countries sell at different prices is indicative of quality differences. Estimating separate price gaps recognizes both these differences and the possibility that the NTMs may have a greater or lesser impact on Indian prices for imports from different sources. [15] We used unit values from available trade data to construct the price gaps. In particular, we considered price data for 2005–07 to account for variable effects of NTMs under different market conditions. The median price gap for the three years was used as the estimate. We eliminated some products that presented data difficulties.[16]

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[13] Examples of real-world complexities that are difficult to reflect in the model include the changing relative growth of different economies; politically motivated, export-oriented investment; relationships between multinational subsidiaries that influence trade patterns; and such events as catastrophic weather or violence that are inherently unpredictable (at least in their details).

[14] For the foundations of the method for estimating price gaps for NTMs at the Commission, see Linkins and Arce, "Estimating Tariff Equivalents of Non-Tariff Barriers," August 2002. For further descriptions of the price-gap method, as well as literature reviews, see Deardorff and Stern, *Measurement of Non-Tariff Barriers*, 1998, and Ferrantino, "Quantifying the Trade and Economic Effects of Nontariff Measure," January 2006. The methods used in this study with respect to quality adjustments for different trading partners build on a previous Commission study. See USITC, *U.S.-Korea Free Trade Agreement*, September 2007.

[15] In general, it is not feasible to correct for all possible quality differences while estimating NTM price gaps because some of these differences are unobservable. Certain countries consistently export products at higher unit values than other countries, however, suggesting a quality difference, particularly for relatively homogeneous goods. The methods used in this study exploit the observed quality differences arising from differences in exporter-specific unit values.

[16] These difficulties included, inter alia, nonstandard units of measurement and thinly traded products exported from small countries, for which a reference price could not be established. The standard unit of measurement for almost all agricultural products is the kilogram or the metric ton. Beverages are typically measured in liters.

We considered the possibility that some NTMs might prohibit U.S. agricultural exports to India completely or almost completely over the period considered. For those products, wheat being the most notable, we estimated a quantity gap as described below.

For Indian imports of U.S. goods, unit values on a cost-insurance-freight (c.i.f.) basis were taken from the UN Comtrade database, which was accessed using the WITS system. Unit values for U.S. exports to the world were taken from U.S. official data as reported on the Commission's Dataweb system.[17] The transport cost adjustment was based on the U.S. ratio of import charges to c.i.f. value for imports from India, adjusted by a factor to account for the fact that charges for U.S. exports are generally smaller than charges for U.S. imports. A calculation based on GTAP model data indicates that U.S. export margins to India are 41.3 percent of U.S. import margins from India, but the GTAP margins are derived indirectly from balance-of-payments data on transport services. Our estimates assume that U.S. export margins to India are 60 percent of U.S. import margins from India. This assumption is conservative and tends to understate the price gap. In general, the estimated price gaps are substantially larger than the transport margins, so they are not greatly affected by the method used to estimate the margins.

For Indian imports of non-U.S. goods, we constructed unit values using a method that adjusts for systematic quality differences among different suppliers to the Indian market. In particular, we estimate a price gap for each supplier, again comparing Indian c.i.f. values with the various suppliers' free on board (f.o.b.) values, and then weight these gaps by the quantities imported into India, using Indian data for the weights. We adjust the weighted average for transport costs. For these calculations, we compared data from UN Comtrade with alternate data obtained from Global Trade Atlas, a product of Global Trade Information Services, Inc. (GTIS). Occasionally, UN Comtrade data contain estimated quantities and thus estimated unit values. In these cases, we believe GTIS data to be more reliable. The format of UN Comtrade, however, is more computationally convenient than that of the GTIS. The method used here relies on GTIS data for India's largest two suppliers of those HS6 subheadings with larger trade flows (annual Indian imports exceeding approximately $100,000). To the extent feasible, when one of India's largest two import sources was a country not reporting data to the GTIS, we replaced the missing f.o.b. unit value with a c.i.f. unit value from a country other than India with imports from the same supplier. The transport cost adjustment was based on sector-specific margins for India's imports from the world, as reported in the GTAP model.

Market Share Anomalies and Quantity Gaps

In order to take account of situations in which NTMs might be prohibitive or near prohibitive, we considered products for which the U.S. export market share is large in the RoW and small in India and products for which Indian imports are zero in the base data. To identify such products, we used the same 2007 base data as were used in the PE modeling. The single, striking anomaly in this case is wheat. U.S. exports to countries other than India accounted for 29.7 percent of world exports of nondurum wheat and 21.8 percent of exports of durum wheat in 2007. Official U.S. data record zero U.S. exports to India of either category of wheat during 2005–07, on which the analysis of NTMs was based. Indian data report imports of durum wheat from the United States of $217,295 for 2006, but zero otherwise during 2005–07.

[17] USITC DataWeb.

Yet, 2007 was not a representative year for India's wheat market. Indian imports of wheat fluctuate greatly from year to year and were unusually high in 2006 and 2007 by historical standards. India's annual wheat imports in 2006 and 2007 amounted to approximately $1.3 billion (5–6 million mt) in each year. By contrast, in the 12-year period from 1997 to 2008, India reported imports of less than $1 million (less than 5,000 mt) during six years, including two years of zero imports, and imports of $180–$280 million (700,000 mt to 2 million mt) in four years. An assumption that U.S. wheat sales would equal an amount equivalent to more than 20 percent of India's 2007 wheat imports leads to unrealistically large displacement of India's domestic production of wheat and similarly unrealistic effects on India's other crops.

Accordingly, we assumed that, in the absence of Indian NTMs, U.S. wheat exports to India would represent the U.S. global share of world wheat exports over a longer term, applied as a share of India's typical imports of wheat. For the last 10 years in which India reported positive imports, the median imports amounted to approximately 1.04 million mt, or about 20.6 percent of India's 2007 imports. The U.S. median share of world wheat exports over the 10 years from 1999 to 2008 is 26.0 percent. Thus, a typical U.S. global market share in the long term of India's typical wheat imports amounts to approximately 5.36 percent of India's 2007 imports.[18] This share was the basis for the estimation presented here.

Simulation of Economic Effects

The NTM price gaps were aggregated to GTAP sectors, and the effects of their removal were simulated in the GTAP model. The estimated price gaps, before and after aggregation, are presented in table 6.1. Because of the large values for many of the price gaps (100–1,000 percent), it is not computationally tractable to estimate their removal using a PE model simulation. The aggregation to GTAP sectors reflects the fact that, in some cases, estimated price gaps at the HS6 level apply to some products in the sector but not all, as reflected in table 6.1, which shows the difference between the average NTM price gaps for relevant products and for the GTAP sector. The price gaps were aggregated to the sector level using a method that holds the implied NTM rents for the aggregate equal to the sum of implied NTM rents at the HS6 level.[19] For wheat, the simulation was performed in such a manner as to set the final share of U.S. exports in India's imports at 27 percent.

A GTAP model simulation baseline for the NTM estimates was prepared excluding the tariffs, and the sector-specific price gaps were simulated as gaps between the c.i.f. value and the landed duty–paid value. Such price gaps were then removed. The results of this procedure are reported in table 6.2. These results include a sensitivity analysis with respect to the elasticities, similar to that performed for tariffs.

[18] 206 * 0.260 = 0.0536, approximately.

[19] This method uses the relation

(reference export unit value)*(1 + transport margin + NTM price gap) = (reference import unit value).

Thus, implied NTM rents = (NTM price gap/(1 + transport margin + NTM price gap))*(value of c.i.f. imports).

The usual method of trade weighting yields unrealistic results in this case because, for price gaps exceeding 100 percent, the implied tariff revenues are larger than the value of c.i.f. imports and not a realistic estimate of the value of NTM rents, which must be a share of the value of imports.

Estimation of Effects of Removal of Domestic Support

The estimated effects of Indian domestic support rely on the work of the World Bank's Agricultural Distortions Project, which calculated the value of this support on an annual basis for the period 1984–2004. Commission staff converted the results into a form compatible with the GTAP model.[20]

The support in question lowers the prices of fuel, electricity, and fertilizer paid by Indian producers. In 2004 the total value of support payments for 11 crops was $5.9 billion for fertilizer and $1.9 billion for electricity. Most of this support was for rice and wheat. Rice received 37.1 percent of the value of input support in 2004, amounting to 15.4 percent of the international reference price and 18.3 percent of the domestic price. Wheat received 35.2 percent of the value of input support, amounting to 18.9 percent of the international reference price and 27.2 percent of the domestic price.[21] The magnitude of these payments has been relatively stable in recent years.[22] Indian farmers also receive discounted water from canal irrigation schemes, as well as discounted credit and exemption from income taxes.[23]

Commission staff estimated the effects on U.S. exports of removing Indian domestic support for certain crops. The estimated effect on U.S. exports of removal of Indian support payments for electricity and fertilizer ranges from $11.7 million to $19.0 million, an increase of 3–5 percent from the 2007 baseline (table H.3). These effects are largely related to increased U.S. exports of plant-based fibers, primarily cotton.

GTAP simulation of the economic effects of removal of support for electricity, fuels, and fertilizer was performed by replacing the standard GTAP base data for Indian support with estimates based on the Agricultural Distortions project, which are better documented and more reliable. The estimates include a sensitivity analysis with respect to elasticities similar to that used in the estimates of tariff effects in Chapter 5 and NTM effects in Chapter 6.

[20] For the main results of the project for India, see Pursell, Gulati, and Gupta, "Distortions to Agricultural Incentives in India," December 2007. For the overall method for the project, which was applied to multiple countries, see Anderson et al., "Measuring Distortions to Agricultural Incentives, Revisited," April 2008. For the documentation for the GTAP-compatible results, see Valenzuela and Anderson, "Alternative Agricultural Price Distortions for CGE Analysis of Developing Countries, 2004 and 1980–84," December 2008.

[21] Pursell, Gulati, and Gupta, "Distortions to Agricultural Incentives in India," December 2007.

[22] Anderson and Valenzuela, "Estimates of Global Distortions to Agricultural Incentives, 1955 to 2007." The effects are expressed as output subsidy equivalents.

[23] Pursell, Gulati, and Gupta, "Distortions to Agricultural Incentives in India," December 2007.

TABLE H.3 India: Estimated effects on U.S. exports of removing certain Indian support payments, 2007

Commodity groups containing food and agricultural products	2007 U.S. food and agricultural exports to India	Estimated ad valorem equivalent of domestic support	Simulated effects in ranges: U.S. exports to India in the absence of Indian support		Change in U.S. exports to India in the absence of Indian support			
			Low	High	Low	High	Low	High
	Million $	Percent	Million $		Million $		Percent	
Paddy rice	0.22	18.300	0.33	0.49	0.11	0.27	48	123
Wheat	0.00	27.200	0.00	0.00	0.00	0.00	0	0
Cereal grains nec	1.13	10.500	1.19	1.26	0.05	0.12	5	11
Vegetables, fruit & nuts	282.61	3.374	285.62	280.38	3.02	-2.22	1	-1
Oil seeds	0.01	9.000	0.01	0.01	0.00	0.00	12	13
Sugar cane, sugar beet	0.00	20.500	0.00	0.00	0.00	0.00	0	0
Plant-based fibers	78.59	13.200	86.94	99.61	8.35	21.02	11	27
Crops nec	8.25	3.374	8.42	8.09	0.17	-0.16	2	-2
Processed rice	0.06	6.385	0.07	0.08	0.01	0.02	9	30
Total	370.88	5.488	382.58	389.93	11.70	19.05	3	5

Source: Valenzuela and Anderson, "Alternative Agricultural Price Distortions for CGE Analysis of Developing Countries, 2004 and 1980–84" for estimated ad valorem equivalent of domestic support; commission staff calculations.

Note: "Low" and "High" refer to elasticities, not effects on U.S. exports.

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