



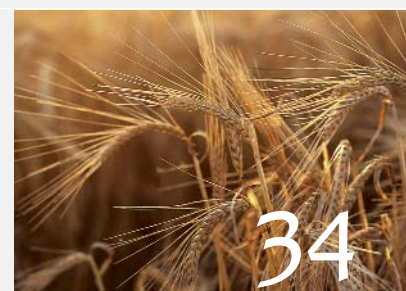
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A Pilot Program for U.S. Food Aid

The sharp rise in food and fuel prices since 2006 has added to existing concerns about food security in developing countries. According to ERS research, the number of food insecure people (those consuming below the United Nations (UN) Food and Agriculture Organization's recommended level of 2,100 calories per person per day) increased from an estimated 849 million in 2006 to near 1 billion in 2007 across 70 low-income developing countries. This change was largely attributed to higher prices, which reduced the capacity of these countries to import food.

At the same time that more people seem to be vulnerable to food insecurity, the level of global food aid donations has declined. Food aid has long been the major international food safety net provided to low-income countries to augment or stabilize consumption. Most donor countries allocate a specific budget to food aid. Therefore, when commodity prices rise, the quantity of food aid provided falls. Based on statistics from the UN's World Food Program, food aid deliveries have fallen from more than 11 million tons in 2000 to under 6 million tons in 2007. In fact, that 2007 level was the lowest since 1961.

The U.S. is the world's largest supplier of food aid, with a 55-percent share of global donations since 2000. The operating budget for the U.S. food aid program for fiscal year 2008 was approximately \$2.5 billion. The U.S. is the only major donor that provides most of its food aid in the form of commodities rather than cash. Arguments against commodity donations cite the costs and time required to transport food over long distances. Given the tremendous rise in fuel prices, the costs associated with shipping food aid from the U.S. to recipient countries have risen dramatically. Freight costs now consume about half of the U.S. food aid budget. As a result, the amount of food that can be provided, given a set budget, is much smaller than it was a few years ago when fuel prices were lower. In addition, it is estimated that once a country makes a request for food aid, it takes anywhere from 3 to 5 months for a U.S. shipment to reach the recipient.



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Under a pilot program for food aid in the 2008 Farm Act, the U.S. has made a commitment to provide cash of \$60 million over 4 years to be used for local food purchases in recipient countries. This approach reduces transportation costs, allows for more timely delivery of the food to the vulnerable populations, and supports local farmers by raising demand, and thereby prices, for their output. It also has the potential to encourage future investment in local agriculture and infrastructure. **W**

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This finding is drawn from . . .


Food Security Assessment, 2007, by Stacey Rosen, Shahla Shapouri, Kathryn Quanbeck, and Birgit Meade, GFA-19, USDA, Economic Research Service, July 2008, available at: www.ers.usda.gov/publications/gfa19/

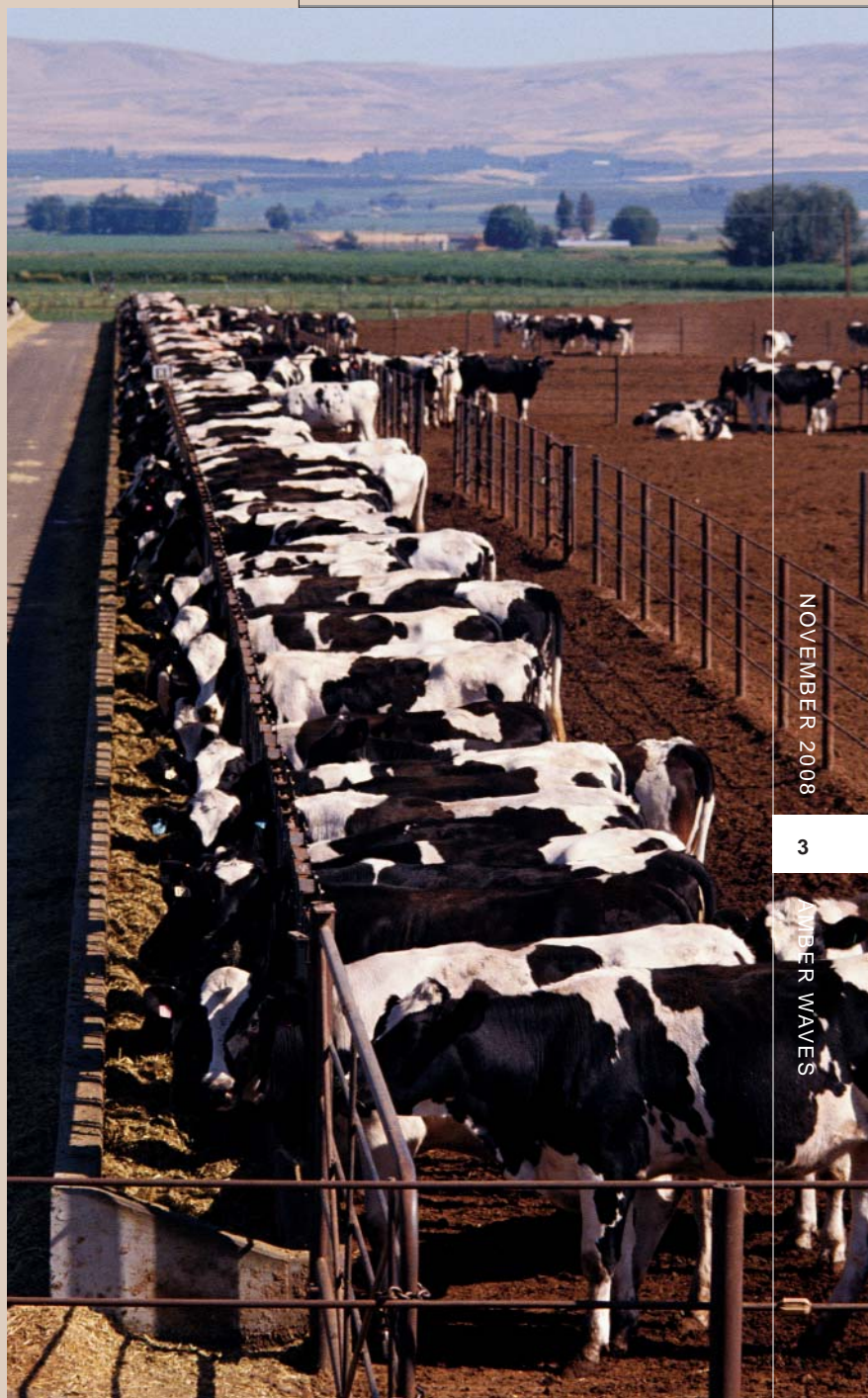
Lasting Influence of BSE on U.S. Protein Feed Markets

Few would argue against the need to reduce the risks from the spread of bovine spongiform encephalopathy (BSE) among cattle or to people in its human form, variant Creutzfeldt-Jakob disease (vCJD). The profound effects of these diseases, coupled with concerns about a loss of trust in the Nation's food supply by consumers and trading partners, have led policymakers to impose regulatory responses to the potential threats. But industries affected by these policies have begun to ask about the tradeoffs between the costs they must shoulder and the benefits of the risk-reduction measures, which are marginal and difficult to quantify.

A recent ERS study of a series of BSE/vCJD risk-reduction initiatives examines the cost of these policies, which have progressively limited the use of animal byproducts and rendered products by the cosmetic, pharmaceutical, and feed-manufacturing industries. Findings reveal that the August 1997 U.S. ban on feeding meat and bone meal (MBM) to ruminants (animals whose stomachs have multiple compartments), which followed the 1996 UK announcement of a link between BSE and vCJD, triggered a 53-percent decline in MBM prices between 1997 and 1999. Similarly, the U.S. Food and Drug Administration 2008 Final Rule, which will ban the use of some proteins previously manufactured from ruminants and other animals in hog and poultry rations, may require producers to discover new uses of restricted materials in order to recoup lost value. The ruling may also saddle producers with costs to dispose of hazardous materials.

Further regulatory restrictions on MBM may affect other protein meal markets as well. Based on earlier analyses of the broadest interpretation of the MBM ban (complete ban on mammalian protein fed to any animals), estimates of price increases for soybean meal, a protein substitute, range as high as 100 percent. Preliminary research at ERS suggests more modest price changes and limited substitution of feed grains for animal proteins in the aggregate, though it is clear the effect of these policies will extend beyond cattle markets.

The goals of establishing effective measures for disease prevention in animals and humans and confidence in the U.S. food supply remain paramount. But the direct and cumulative economic effects of prevention and mitigation policies on the competitiveness of the industry remain a concern for producers and other stakeholders. 



PhotoDisc

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This finding is drawn from ...

Economic Impacts of Feed-Related Regulatory Responses to Bovine Spongiform Encephalopathy, by Kenneth H. Mathews, Jr., LDP-M-170-01, USDA, Economic Research Service, September 2008, available at: www.ers.usda.gov/publications/ldp/2008/08aug/ldpm17001/

Stabilizing Federal Support for Emergency Food Providers

Food pantries, soup kitchens, and other emergency food providers are grappling with rising food prices and uncertain commodity donations. Many providers, reporting an increase in requests for assistance as well as higher operating costs, are concerned about having to turn away those in need. A 2002 ERS-funded study, the first to provide a broad, national overview of these private, nonprofit organizations, highlights the support provided by the Federal Government.

The study found that roughly 85 percent of food banks in the United States received USDA commodities, which accounted for nearly 14 percent of all food distributed by emergency food providers. Food banks and similar organizations function as "wholesalers," receiving food donations in bulk from a variety of sources, including USDA, and distributing them to food pantries and soup kitchens in their area. USDA also provides funds to help defray the cost of storage and distribution, contributing \$58.1 million for this purpose in fiscal year (FY) 2007.

Through The Emergency Food Assistance Program (TEFAP), the Federal Government supplies commodities and funds to States, who in turn provide them to emergency food providers, primarily food banks. TEFAP began in the early 1980s, and its original purpose was to provide needy households with commodities



Ken Hammond, USDA

purchased under Federal farm price-support programs. When these supplies of surplus commodities began to diminish, legislation in the late 1980s authorized USDA to purchase a variety of commodities specifically for TEFAP (known as entitlement commodities). USDA also continues to provide "bonus" commodities, purchased to support farm prices. However, there is no guarantee that bonus commodities will be available for TEFAP. As the ERS-funded study noted, quantities of TEFAP commodities can vary substantially from year to year.

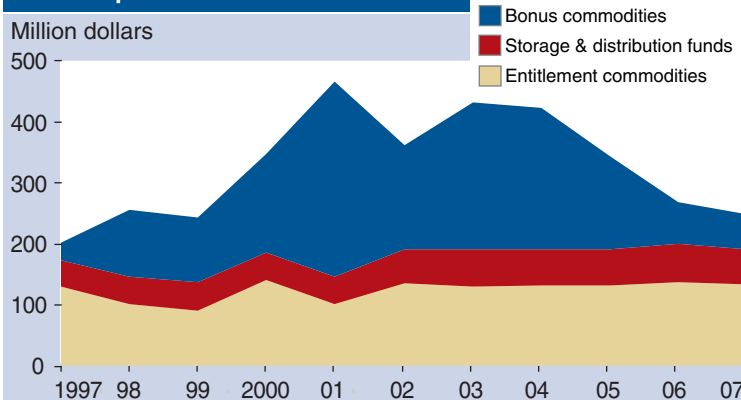
Federal expenditures for TEFAP commodities have also varied throughout the history of the program, largely due to fluctuations in bonus commodities. The Food, Conservation, and Energy Act of 2008 provides an immediate funding boost of \$50 million in FY 2008, as well as a longer term increase. The legislation increases the annual funding for entitlement commodities from \$140 million in FY 2007 to \$190 million in FY 2008 to \$250 million in FY 2009. The \$250 million funding will be adjusted for inflation from FY 2010 to FY 2012, helping to stabilize support from TEFAP for emergency food providers. In addition, the authorized maximum funds for storage and distribution of TEFAP commodities are increased from \$60 million to \$100 million per year. \mathcal{W}

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This finding is drawn from ...

The Emergency Food Assistance System—Findings From the Provider Survey, Volume I: Executive Summary, by James Ohls and Fazana Saleem-Ismail. FANRR-16-1, USDA, Economic Research Service, August 2002, available at: www.ers.usda.gov/publications/fanrr16-1/

Bonus commodities provided to TEFAP have fluctuated over the past decade



Source: USDA, Economic Research Service using data from USDA, Food and Nutrition Service.

2008 Farm Act Makes It Easier for Food Assistance Households To Save

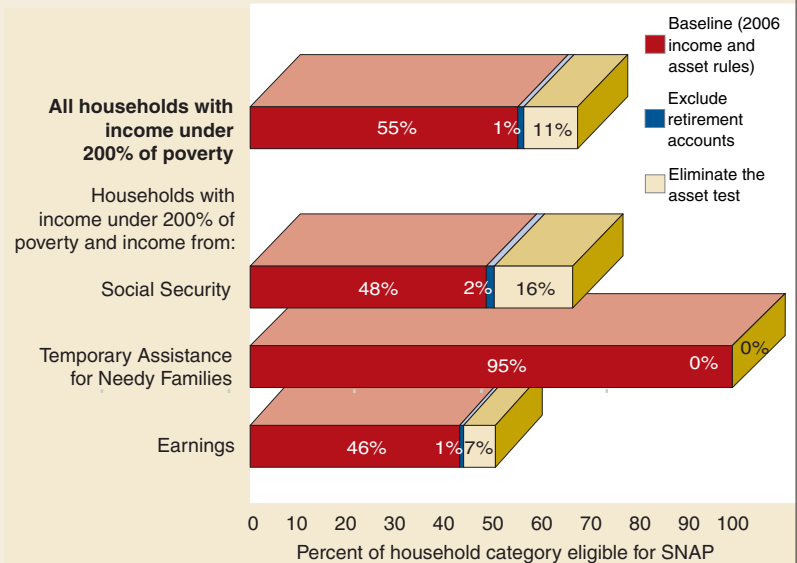
USDA's Supplemental Nutrition Assistance Program (SNAP), formerly known as the Food Stamp Program, helps low-income households maintain a nutritious diet and meet other expenses when their budgets are strained. To qualify for benefits, however, households cannot exceed program-specified resource limits. Some households must first draw down their savings until their financial assets fall below program-defined limits.

The recently enacted Food, Conservation, and Energy Act of 2008 (Farm Act) includes new provisions that make it easier for participating households to save, especially for education or retirement. For the first time since they were set in 1985, the asset limits that determine program eligibility will be adjusted annually for inflation in increments of \$250. The first change is expected to occur in 2012. Also, assets held in all tax-qualified retirement and education accounts (such as Individual Retirement Accounts (IRAs) and 529 Education Accounts) will not count against eligibility.

Currently, households with more than \$2,000 in countable assets are excluded from participating in SNAP. (The limit is \$3,000 if any household members are elderly or disabled.) Assets counted toward the limit include cash on hand, savings and checking accounts, stocks, bonds, and real estate not used as a home residence or for producing income. Automobiles worth more than \$4,650 were countable, but by November 2007, all States had acted to exclude one or all personal vehicles or raise the exempted value.

ERS-funded research estimates that, in 2006, about 55 percent of households with incomes under 200 percent of the poverty level were eligible for food stamp benefits given then-existing income

Boost in SNAP participation from excluding retirement accounts is largest for Social Security recipients



Source: USDA, Economic Research Service.

and asset requirements. The asset requirements had less of an effect on food stamp eligibility for households receiving Temporary Assistance for Needy Families (TANF) benefits than for households receiving Social Security benefits or with an elderly household member.

Eliminating asset limits altogether would have expanded food stamp eligibility by about 22 percent for the general population in 2006, but would not have appreciably increased eligibility for those receiving TANF. Based on 2006 data, an additional 354,000 households (slightly more than a 2-percent increase) will become eligible for SNAP benefits as a result of the 2008 Farm Act's exclusion of retirement accounts. Data were not available to estimate the effect of eliminating tax-qualified educational accounts.

In addition to increases in eligibility, the 2008 asset rules reduce disincentives to save that will affect not just the newly eligible, but future participants and the more than 28 million current participants. Although the effects of these changes on savings are difficult to estimate, the new asset rules are consistent with the goal of improving the self-sufficiency of low-income Americans. *W*

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This finding is drawn from . . .

The Nutrition Title of the 2008 Farm Bill Side-by-Side Comparison, available at: www.ers.usda.gov/farmbill/2008/titles/titleivnutrition.htm

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Conservation Reserve Program Acreage To Decline; Will Benefits Also Fall?

The 2008 Farm Act continues a trend started in 2002 to emphasize land conservation as well as land retirement by encouraging good practices on land in production. For 2008-12, the Congressional Budget Office projects funding for land retirement programs (the Conservation Reserve Program (CRP) and the Wetlands Reserve Program) to be \$13 billion, about 50 percent of mandatory spending in USDA conservation programs. Most of the balance (45 percent) will support conservation on working agricultural land through programs like the Environmental Quality Incentives Program (EQIP) and the Conservation Stewardship Program (CSP). The funding allocations represent a significant change from the 1990s, when the CRP dominated U.S. conservation policy and land retirement accounted for more than 90 percent of conservation payments to farmers. In recent years, CRP funding has also shifted toward partial field practices (such as field-edge filter strips and grassed waterways) that mitigate the environmental effects of land in crop production.

Over the next several years, CRP acreage could shrink rapidly. The Farm Act lowers the CRP acreage cap to 32 million acres (effective October 1, 2009) from the current enrollment of 34.7 million acres. By the end of 2011, CRP contracts on 13.9 million acres are scheduled to expire, creating ample room for new signups under the lower acreage cap. How many acres are actually enrolled is likely to depend largely on commodity supplies and prices.



Tim McCabe, USDA/NRCS

As the CRP shrinks, can environmental losses be minimized? To some extent, previous USDA actions will limit environmental losses over the next few years. In 2006, USDA offered to renew or extend contracts on 28 million CRP acres scheduled to expire before 2010, and 83 percent of such offers were accepted. Extensions varied from 2 to 5 years, with longer extensions offered on land producing larger environmental benefits. Re-enrollments of 10 to 15 years were offered for the land with the highest benefits.

Because contract expiration will make room for new enrollments, the small, but growing segment of CRP known as continuous signup can continue to expand, even as the overall size of the program shrinks. Currently at about 4 million acres, CRP continuous signup can focus effort on environmentally sensitive areas and fund high-priority practices, including wetland restoration, that encompass small acreage but can produce relatively large environmental gains. Focusing on sensitive areas and high-priority practices could offset some of the environmental effects of fewer CRP acres. For example, filter strips that encompass only 1-3 percent of a drainage can remove as much as 50-90 percent of the nitrogen and phosphorous from runoff water. On the other hand, many environmental benefits, such as nesting habitat, are highly correlated with total acreage, and are not as easily replaced as CRP acreage declines. \sphericalangle

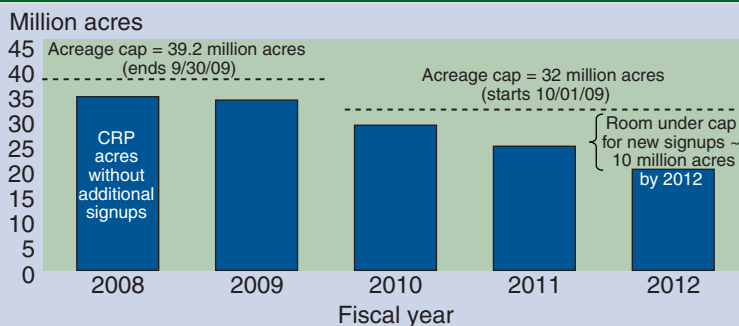
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This finding is drawn from ...

ERS Briefing Room on Farm and Commodity Policy, www.ers.usda.gov/briefing/farmpolicy/

Conservation Reserve Program acreage cap to decline



Source: USDA, Economic Research Service.

Conservation Program Provision May Have Limited Impact on Underserved Farmer Participation

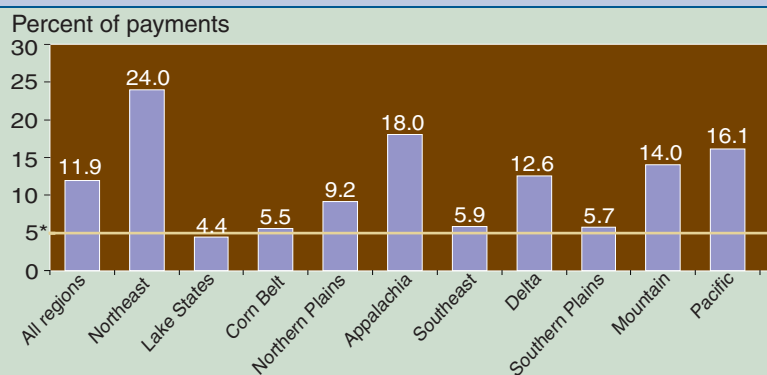
Several provisions of the 2008 Farm Act target traditionally underserved groups—beginning, limited-resource, and socially disadvantaged farmers—in an attempt to increase their access to conservation funds, farm loans, crop insurance, and other farm programs. The effect of such provisions often depends on the degree to which they address unmet demand for program participation by the underserved groups. For example, at least one of the Act’s new provisions for underserved farmers may have limited effect nationwide since participation by beginning farmers in the Environmental Quality Incentives Program (EQIP) already exceeds the goals set in the Farm Act.

Limited-resource farmers are farmers who in each of the past 2 years had gross farm sales below \$116,000 (in inflation-adjusted 2005 dollars) and low household income.

Many beginning and socially disadvantaged farmers are competitive enough to receive program funding without a specific funding set-aside. But if these farmers claim less than the legislated 5-percent set-aside funds, additional less-competitive underserved farmers may be able to participate without having to vie with nontargeted farmers for EQIP funds and CSP acreage. At some point during the year, unused set-asides are released for use by nontargeted farmers.

Payments to beginning farmers accounted for 12 percent of all EQIP payments in 2006, suggesting the national 5-percent funding set-aside will not increase beginning farmer enrollments in future years. However, if the 5-percent funding set-aside is administered by regions, then the Lake States region (including Michigan, Minnesota, and Wisconsin) may see a slight increase in EQIP participation by beginning farmers. Payments to beginning farmers in this region were below the 5-percent threshold in 2006.

Environmental Quality Incentives Program payments to beginning farmers varied regionally in 2006



*EQIP funding maximum set-aside (5%) for beginning farmers in the 2008 Farm Act. Source: USDA, Economic Research Service using USDA, Natural Resources Conservation Service, EQIP contract data, 2006.

In the past, beginning and limited-resource farmers have been eligible for higher payment rates and other targeted participation incentives in EQIP. The 2008 Farm Act builds on these provisions by setting aside 5 percent of funding in EQIP and available acres in the Conservation Stewardship Program (CSP) for beginning farmers, and 5 percent for socially disadvantaged farmers. Beginning farmers are defined as those who have operated a farm or ranch for less than 10 years. Socially disadvantaged farmers are defined as members of a group that has experienced racial or ethnic prejudice. These groups typically include Hispanics and non-Whites. Limited-resource farmers are not eligible for the set-asides in EQIP and CSP if they do not meet the beginning or socially disadvantaged farmer criteria.

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This finding is drawn from . . .

Provisions for Traditionally Underserved Groups, in the 2008 Farm Bill Side-by-Side Comparison, www.ers.usda.gov/farmbill/2008/titles/underserved.htm

ERS Briefing Room on Farm and Commodity Policy, Conservation Access for Beginning and Socially Disadvantaged Farmers page, www.ers.usda.gov/briefing/farmpolicy/conservationunderserved.htm

Jeff Vanuga, USDA/NRCS



New Payment Limits, Lower Income Cap Unlikely To Have Significant Impact

Limits on farm commodity program payments have been in effect since 1970, although they have evolved over time. Under the 2002 Farm Act, total payments from the direct, counter-cyclical, and marketing loan programs could not exceed \$360,000 annually for married couples or farmers with multiple operations. The 2002 legislation also limited eligibility for commodity payments to farmers with adjusted gross income (AGI) of \$2.5 million or less, unless 75 percent or more of their income was from farming. ERS research found that, despite these limits, a substantial portion of program payments continue to go to large farms. In 2006, about 1 percent of all farmers participating in commodity programs received over \$100,000 in payments. These farmers received over 18 percent of all payments and had average gross farm income of over \$1.35 million. In that same year, less than 0.1 percent of all farmers reported AGI over \$2.5 million, suggesting that very few farmers faced the potential loss of commodity payments as a result of the income cap.

The 2008 Farm Act retains the limits on direct and counter-cyclical payments but removes limits on marketing loan benefits. It also creates a system that matches payments to individuals and eliminates a farmer's ability to collect additional payments by oper-



Tim McCabe, USDA/NRCS

ating multiple farms (known as the three-entity rule). These changes primarily affect direct and counter-cyclical payments to unmarried producers who previously used the three-entity rule to double their payments. Because most payment recipients are married, however, few should be affected. Nonetheless, by tying payments to individuals rather than entities, the legislation makes it more difficult for

recipients to circumvent payment limits.

The Act also replaces the overall income cap for payment eligibility with separate caps for the farm and nonfarm components of AGI. Under the revised cap, an individual with average adjusted gross nonfarm income over \$500,000 is ineligible for commodity program payments. Those with average adjusted gross nonfarm income over \$1 million are also ineligible for conservation payments unless more than two-thirds of their total average AGI is farm income. An individual with average adjusted gross farm income over \$750,000 is ineligible for direct payments.

While somewhat tighter, the new caps are unlikely to have a significant impact on eligibility for, or the distribution of, farm program payments. The ability to allocate income on a joint return among spouses effectively doubles—to \$1 million—the nonfarm income cap for married couples. In 2005, only 0.48 percent of farm sole proprietors and share-rent landlords had AGI above \$1 million, and they received only 0.87 percent of farm payments. Likewise, less than a third of farm operators report a farm profit, and few of these report farm income over the \$750,000 cap for farm income that applies to direct payments.

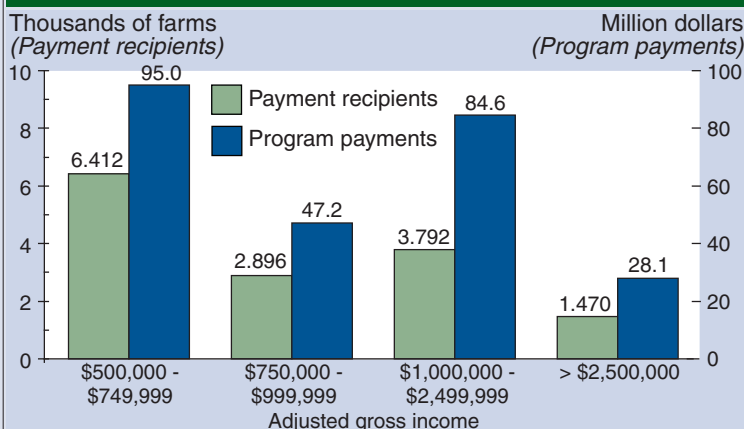
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This finding is drawn from ...

Farms Receiving Government Payments chapter of the ERS Briefing Room on Farm Income and Costs, www.ers.usda.gov/briefing/farmincome/govtpaybyfarmtype.htm

Title I (Commodities) of the 2008 Farm Bill Side-by-Side Comparison, www.ers.usda.gov/farmbill/2008/titles/titleicommodities.htm#administrationplaie

Few farmers* report income above payment eligibility cap in 2005



*Only 14,570, or 1.32 percent, of all farm sole proprietors and share rent landlords received payments and reported AGI over the \$500,000 income cap. Source: USDA, Economic Research Service, using data from Internal Revenue Service, Statistics of Income Division, 2005.

Child Health and Well-Being Differ for Metro and Nonmetro Low-Income Households

According to U.S. Census Bureau data, the Nation's poverty rate increased from 12.3 percent in 2006 to 12.5 percent in 2007. As has historically been the case, children made up a disproportionate share of that increase as well as of the total number of poor people across the U.S. The poverty rate is greater for children in families living in nonmetro households (15.1 percent) than for those in metro households (11.4 percent).

ERS research, drawing from the 2003 National Survey of Children's Health, shows that on average, low-income households—those with incomes at or below 133 percent of the poverty threshold—scored consistently worse than other households on indicators of their children's health and well-being. In most instances, members of poor households (incomes below the official poverty level) were more likely to give negative survey responses than members of near-poor households (incomes between 100 and 133 percent of the poverty level). For example, survey results reveal that children



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in poor metro households are 1.7 times more likely to miss school due to injury or illness than children in near-poor metro households.

The risks to the health and well-being of nonmetro children associated with low levels of household income, however, appear to differ from those facing low-income children in metro areas. For example, poor nonmetro parents were more likely than poor metro parents to report their children's general health as being excellent or very good (72 percent versus 65 percent). They were also more likely to score their children worse on individual indicators of health. This included, but was not limited to, the share of children in need of prescription drugs or medical care due to chronic illness, having vision and speech problems, prone to asthma and allergies, diagnosed with attention deficit disorder and socio-emotional difficulty, and in need of therapy or counseling. Alternatively, poor metro parents were more likely to score their children low on environmental indicators of well-being, such as perceived safety in their school, neighborhood, or home. **W**

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This finding is drawn from . . .

Rural America at a Glance, 2008 Edition, by Lorin Kusmin, EIB-40, USDA, Economic Research Service, October 2008, available at: www.ers.usda.gov/publications/eib40

The risk of poor physical and emotional health is often greater for nonmetro children

	Metro	Non-metro
	Percent	
Physical & emotional health		
Child's general health is fair or poor	8.8	6.8
Child has asthma	13.7	15.3
Child has allergies	20.2	23.9
Child has socio-emotional difficulties	24.1	27.7
Child sustained an injury in last 12 months	6.4	10.4
Home, community, & social environment		
Child is unsafe in neighborhood	8.6	3.0
Child is unsafe in school	4.0	1.9
Neighbors would not help child if hurt	10.5	6.6
Regularly spends time caring for self	13.7	17.3
Someone in household regularly uses tobacco	35.2	47.7

Source: USDA Economic Research Service estimates based on 2003 National Survey of Children's Health, U.S. Centers for Disease Control and Prevention.



Fluctuating Food Commodity Prices

A Complex Issue With No Easy Answers

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- Prices for food commodities increased sharply over the past 2 years.
- Rising food demand in developing countries outpaced production growth of major food commodities, and demand for global stockholding has fallen.
- Other factors behind higher food prices are increased energy costs, demand for biofuels, a weakening U.S. dollar, adverse weather, and policy responses by some major exporting and importing countries.

Fluctuating oil prices seem to be the issue of the day, but the cost of food commodities—particularly staples such as grains and vegetable oils—is a close second in grabbing global headlines. According to the International Monetary Fund (IMF), world market prices for food commodities rose more than 75 percent from the beginning of 2006 to July 2008.

Putting Prices Into Perspective

Rising food commodity prices over the last several years have been part of a general increase in global commodity prices, including minerals, metals, and energy. Although the food commodity index rose to a historic high over the past 2 years, the indices for all commodities, and for crude oil in particular, have significantly outpaced it. In fact, between January 2002 and July 2008, the IMF index for food commodities rose 130 percent, compared with 330 percent for all commodities and 590 percent for crude oil.

No single factor is responsible for the rapid escalation of food commodity prices. ERS has identified a set of interrelated factors that include long-term supply and demand trends, as well as more recent phenomena such as higher energy prices, increased biofuel production, depreciation of the U.S. dollar, adverse weather, and policy responses to domestic food price inflation by a number of countries.

Market Trends Have Contributed to Higher Commodity Prices

Long-term growth in worldwide demand, coupled with a slowdown in agricultural production growth, reduced global stockpiles of basic commodities like corn, soybeans, wheat, and rice. Lower stocks, in turn, made it more likely that new sources of demand, or disruptions to supply, precipitated sharply changing prices.

The rapid increase in food commodity prices did not happen overnight. On the supply side, growth in world food production was sluggish between 1995 and 2003. Stable food prices over the past 20 years and abundant global supplies reduced incentives for maintaining food stockpiles and for funding research and development to increase yields.

At the same time, strong global growth in average incomes and rising population (roughly 75 million people worldwide per year), particularly in developing countries, have increased food and feed



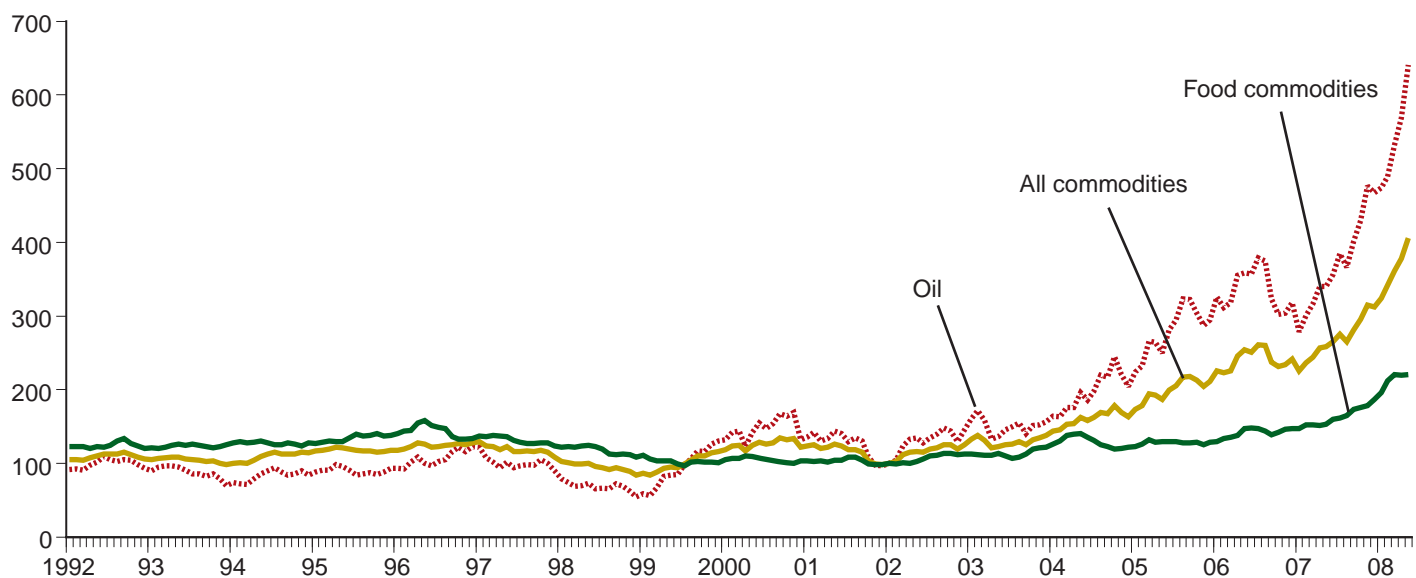
Population and income growth in developing countries is important for global food demand.

demand. As per capita incomes rose, consumers in developing countries not only increased per capita consumption of staple foods, but also diversified their diets

to include more meats, dairy products, and vegetable oils. This, in turn, amplified rising demand for grains and oilseeds used as feed.

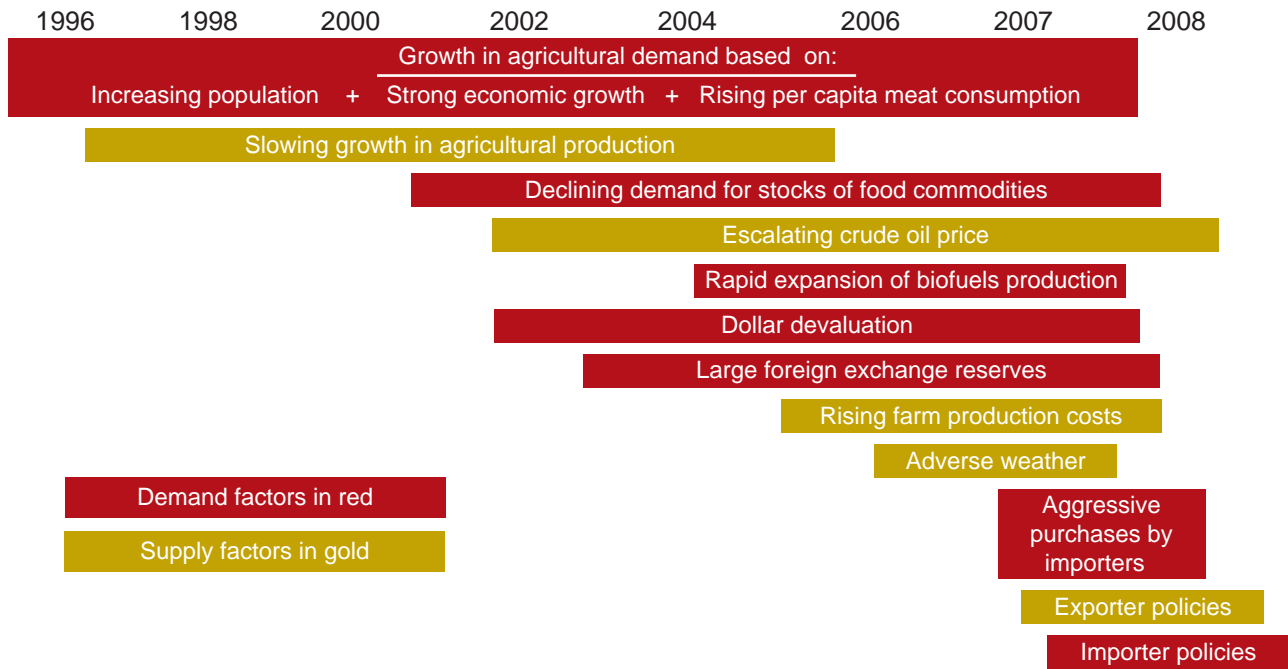
Prices for food commodities still lagging others

Index: January 1992=100



Source: USDA, Economic Research Service using International Monetary Fund; International Financial Statistics.

A number of factors have contributed to higher food commodity prices



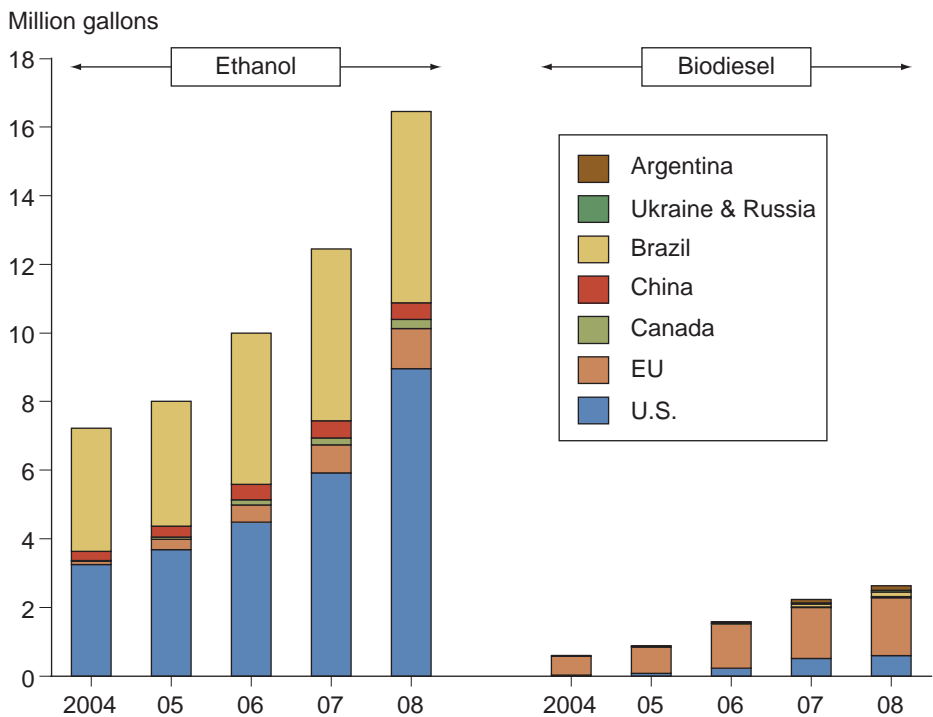
Source: USDA, Economic Research Service.

From the Farm to the Gas Tank

Use of biofuels—fuels, like ethanol and biodiesel, made from plant material—had been modest for several decades, but production rose rapidly in the U.S. beginning in 2003 and in the European Union (EU) starting in 2005. Output increased in response to concerns about rising petroleum prices, the availability of oil supplies, and the environmental impacts of fossil fuels. The U.S. Energy Policy Act of 2005 mandated that renewable fuels used in gasoline reach 7.5 billion gallons by 2012.

This growth in worldwide biofuels demand has contributed to higher prices for biofuel feedstocks. The U.S., Brazil, and the European Union are the largest manufacturers of biofuels. Biofuel feedstocks like grains, sugarcane, soybeans, and rapeseed now have new uses beyond food and feed.

World's largest producers of biofuels expand output



Source: USDA, Economic Research Service using *USDA Agricultural Projections to 2017*.

Factors Around the World Play a Role

Also underlying the historic peak in food commodity prices in 2008 was the general depreciation of the U.S. dollar after 2001. Although the dollar began to recover in the summer of 2008, its lower value meant that U.S. exports were more competitive vis-à-vis other exporters. It also meant that importers with stronger currencies had more buying power. The increased demand for U.S. food commodities from importers resulted in larger U.S. exports and contributed to higher prices in dollar terms. The dollar's depreciation also contributed to higher dollar prices for crude oil. At the same time, farmer demand for fertilizer, fuels, and pesticides rose sharply, raising agricultural production costs and adding to the high price of food commodities.

Recent high food prices were also due in part to unusually widespread adverse weather during 2006 and 2007. Droughts,



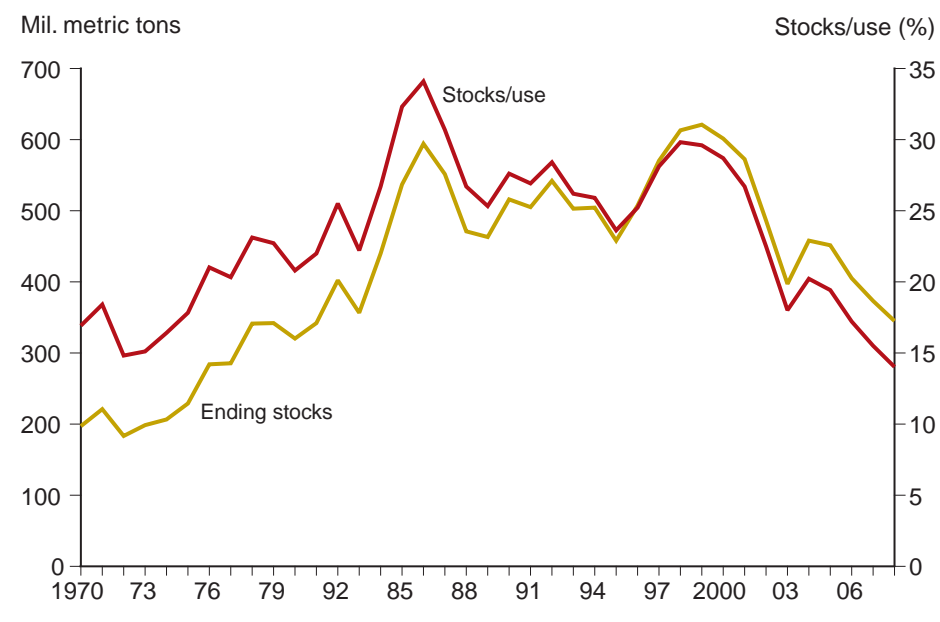
Lower value of the U.S. dollar relative to currencies of other countries strengthens U.S. export demand.

floods, high temperatures, and freezes affected agricultural yields in many coun-

tries. In 2007 alone, Northern Europe suffered harvest-time floods, while droughts enveloped Southeastern Europe, Ukraine, Russia, Turkey, and Australia. Ultimately, adverse weather caused a second consecutive drop in global average yields for grains and oilseeds, and a further decline in commodity stockpiles.

In 2006, rapidly rising agricultural commodity prices began to attract hedge, index, and sovereign wealth funds as investors sought to diversify their financial portfolios. Although the presence of funds in the commodity markets has expanded significantly in the last several years, it is unclear how this new infusion of funds has affected commodity prices or the underlying supply and demand relationships. However, the trend-following trading practices of some fund managers may have increased the volatility of agricultural prices.

World grain and oilseed stocks decline, setting the stage for price spikes



Source: USDA, Economic Research Service using USDA, Foreign Agricultural Service, Production Supply, and Distribution Database.

Policy Response Exacerbates Situation

By summer 2007, as soybean and corn prices reached record highs, fears concerning limited global supplies prompted aggressive importing of grains and oilseeds by a number of importers, particularly those countries whose citizens are sensitive to food inflation, or countries with large foreign exchange reserves. Twenty years of abundant world food supplies and low food prices, reduced trade barriers, and high costs of storage had reduced both government and private sector food commodity reserves in many countries. The low stocks-to-use ratio for aggregate global grains and oilseeds—under 15 percent in 2008, the lowest level since 1970—prompted some large international traders, including China, India, Russia, Ukraine, and Argentina, to raise export taxes, and to restrict or ban exports of agricultural commodities, particularly

grains and oilseeds. The goal was to moderate increases in retail food prices and provide domestic consumers access to such commodities.

On the demand side, major importing countries, such as the EU, India, Thailand, and Indonesia, enacted measures to restrain rising food commodity prices within their borders, but those actions also raised global import demand, causing worldwide prices to rise even more. Furthermore, a number of importers—China, Japan, other Asian countries, Russia, and some of the OPEC countries—had accumulated significant foreign currency reserves and were able to import large volumes of food commodities with little regard to record-high world prices. The result: surging import demand, at the same time that the policy responses of some major exporting countries reduced supplies on the world market.

Higher Food Prices Threaten Food Security

While recent food price inflation has affected nearly everyone, it has caused disproportional hardship and suffering among the world's low-income population. Developing nations are particularly vulnerable to social and political unrest in response to rising food prices. Demonstrations were reported in many countries, including Pakistan, South Africa, Haiti, Morocco, Indonesia, Ethiopia, and Mexico.

For low-income, food-deficit countries, foreign donations of food aid often provide supplemental assistance to lower income consumers. Food-aid donors operate on yearly fixed budgets, which cannot readily absorb spikes in prices. Moreover, higher petroleum prices have contributed to a sharp increase in ocean freight rates, making it more costly to deliver needed food aid (see "Rising Food Prices Intensify Food Insecurity in Developing Countries," *Amber Waves*, February 2008).

Higher Food Prices: Who Hurts the Most?

Rising food commodity prices tend to affect lower income consumers relatively more than higher income consumers:

- Lower income consumers spend a larger share of their income on food.
- Staple food commodities such as corn, wheat, rice, and vegetable oils—commodities experiencing sharp price hikes—account for a larger share of food expenditures for low-income families.
- Consumers in some low-income, food-deficit countries are vulnerable because they must rely on imported supplies subject to record-high world prices.
- Countries receiving food-aid donations based on fixed donor budgets stand to receive smaller volumes of aid.

To illustrate, the table below shows the effects on consumer budgets under a hypothetical 50-percent rise in the prices of food staples with an assumed 60-percent price pass-through to retail. This translates to less than a 1-percentage-point increase in share of income spent on food for high-income consumers but requires low-income consumers to spend over 10 percent more of their income on food.

Impact of higher food commodity prices on consumers' food budgets*

	High-income countries	Low-income food-deficit countries
I. Base scenario		
Income	\$40,000	\$800
Food expenditure	\$4,000	\$400
Food costs as percent of income	10	50
Staples as percent of total food spending	20	70
Expenditures on staples	\$800	\$280
Expenditures on nonstaples	\$3,200	\$120
II. Scenario: 50-percent price increase in staples, with 60 percent of the price increase passed through to consumers		
Increase in cost of staples	\$240	\$84
New total food costs	\$4,240	\$484
Food costs as percent of income	10.6	60.5

*These are illustrative food budgets that characterize the situations for consumers in high- and low-income countries.

Source: USDA, Economic Research Service.

What's Ahead: Keeping a Watchful Eye on Prices and Prospects

The future path of food commodity prices will depend on a host of complex factors. Already, crop prices have fallen from their peaks as favorable weather has fostered expectations of large 2008 harvests. Other factors that will influence prices include economic growth, energy prices (which have fallen from summer peaks), the value of the U.S. dollar, and weather in major producing countries. Thus, the movement of food prices cannot be definitively forecast. However, continued economic growth in developing nations would bolster demand and limit replenishment of low world food stocks. Further increases in petroleum prices would raise agricultural production expenses, as well as costs of transporting and processing food commodities.

According to USDA's 10-year projections, growth in global biofuels production is expected to slow, particularly produc-

tion of biofuels from grains and oilseeds. Given current U.S. ethanol policy, demand growth for ethanol-enhanced gasoline in the U.S. will slacken as the market for gasoline blended with 10-percent ethanol (commonly sold as "E10") is satisfied. However, continuing demand for grains and oilseeds for biofuel production, combined with strong world food demand, means that global agricultural commodity prices are not expected to retreat to past levels.

Also important will be the degree to which the world's agricultural community increases production in response to higher food commodity prices. High agricultural commodity prices raise economic incentives for expanded production through both increases in land use and gains in yields. Higher production costs can offset some of these production incentives by reducing farmers' profits. Also, farmers without credit and other financial resources may choose to plant less or grow less input-intensive crops.

Will agricultural growers and producers worldwide adequately adjust to new farming opportunities and challenges posed by wide fluctuations in energy costs? The quality and quantity of expanded cropland, as well as water shortages and irrigation challenges, will influence future yields and output. Higher food prices could encourage producers to embrace genetically modified seeds and other types of yield-enhancing technology. And, the effects of weather on agricultural markets will continue to be important, particularly when global stocks are low, making prices more vulnerable to production shortfalls. **W**

This article is drawn from ...

Global Agricultural Supply and Demand: Factors Contributing to the Recent Increase in Food Commodity Prices, by Ronald Trostle, WRS-0801, USDA, Economic Research Service, July 2008, available at: www.ers.usda.gov/publications/wrs0801

USDA Agricultural Projections to 2017, ERS contact: Paul Westcott, OCE-2008-1, USDA, Office of the Chief Economist and World Agricultural Outlook Board, February 2008, available at: www.ers.usda.gov/publications/oce081/oce20081fm.pdf

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Changing Structure of Global Food Consumption and Trade, by Anita Regmi (ed.), WRS-01-1, USDA, Economic Research Service, May 2001, available at: www.ers.usda.gov/publications/wrs011/

"The Future of Biofuels: A Global Perspective," by William Coyle, in *Amber Waves*, Vol. 5, No. 5, USDA, Economic Research Service, November 2007, available at: www.ers.usda.gov/amberwaves/november07/features/biofuels.htm



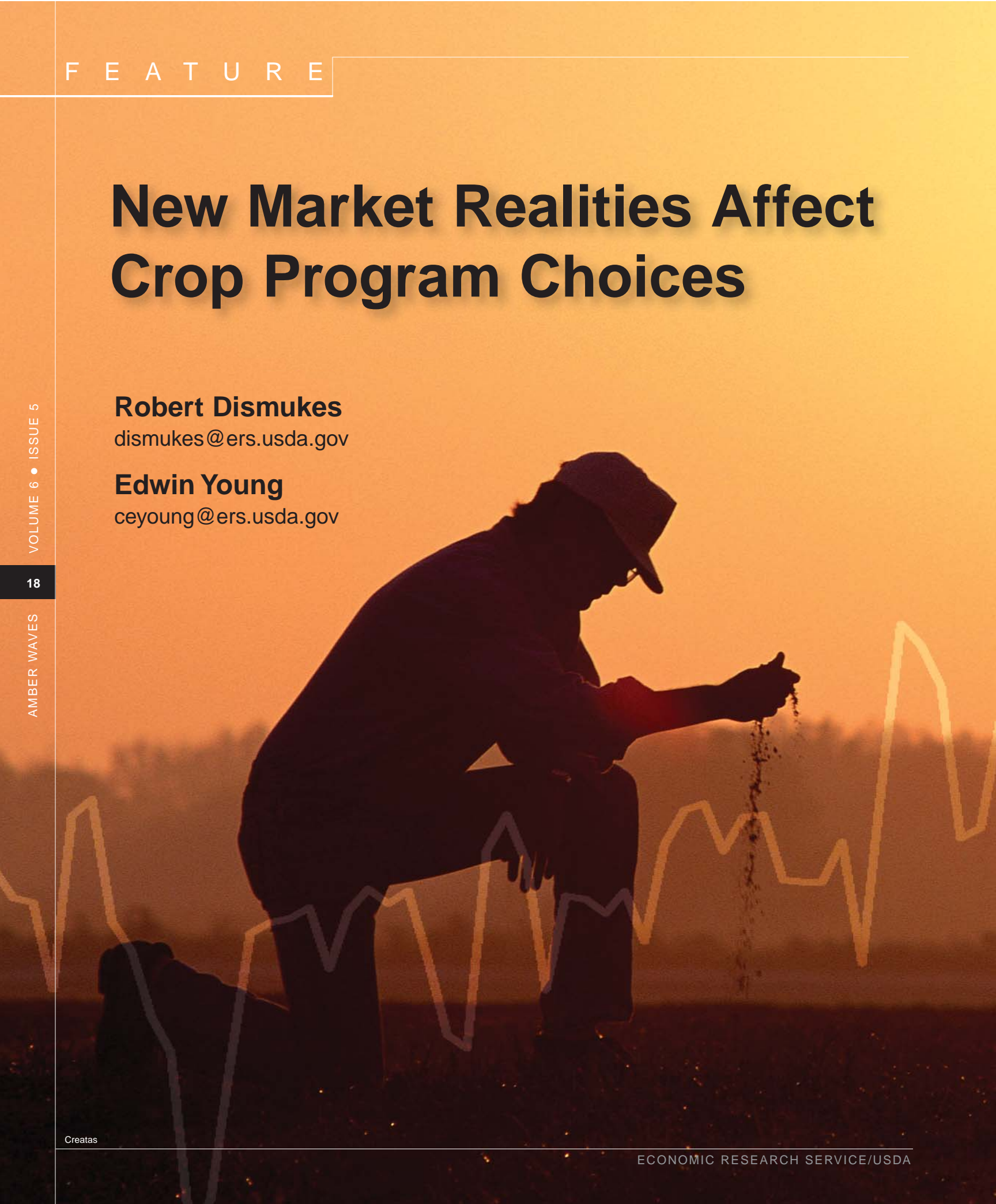
New Market Realities Affect Crop Program Choices


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Higher world market prices for major food commodities such as grains and vegetable oils have increased prices received by producers of several major field crops to historic highs—more than 75 percent above levels just 2 years ago (see, “Fluctuating Food Commodity Prices – A Complex Issue With No Easy Answers,” page 11). While price increases have boosted crop revenues and farm incomes, producers still face financial risks. For one, higher production costs—for fuel, seed, fertilizer, and land, in particular—have offset some of the gains in product prices and increased producers’ exposure to revenue losses. Higher prices have generally been accompanied by greater price volatility, increasing the costs of managing crop price risks. Prices might, as they generally have in the past after dramatic upswings, drop back to pre-spike levels. Finally, weather variability, as always, makes yields uncertain.

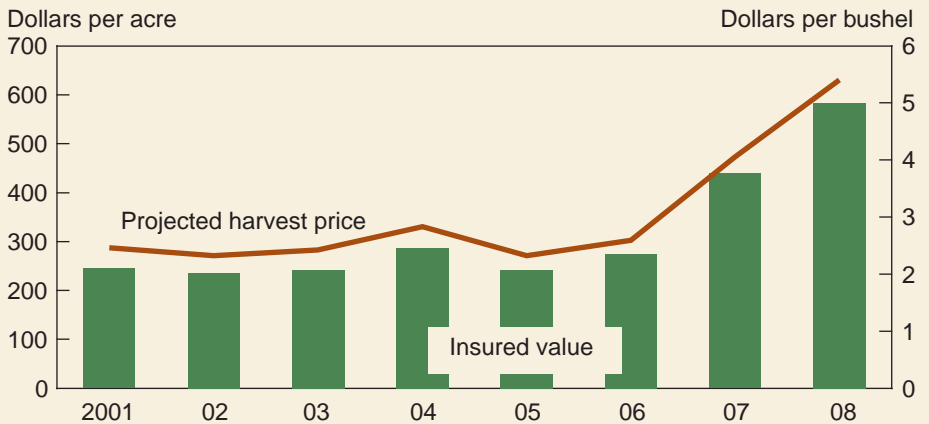
- Even as farmers enjoy record-high commodity prices and income, they face an array of risks, including high production costs and greater price volatility.
- Rising crop prices lead to increased Federal crop insurance coverage but reduce the likelihood of commodity program payments based on fixed target prices.
- The new ACRE program offers revenue protection based on recent market prices, but participating farmers must forgo some benefits of traditional commodity programs.

Farmers and ranchers employ a variety of tools and strategies—including forward contracting, diversification, savings/borrowing, and off-farm income—to mitigate and manage their risks. Field crop producers are also aided under government programs such as Federal crop insurance, disaster assistance, and commodity programs. The Food, Conservation, and Energy Act of 2008 (known as the Farm Act), which covers 2008-12, modifies these programs and adds new ones.

Crop Insurance: Coverage and Costs Adjust With Higher Crop Prices

Federally subsidized crop insurance, which includes a variety of crop yield and revenue insurance options, protects participating producers against risks over the growing season. Crop yield insurance protects against yield shortfalls; crop revenue insurance protects against revenue (yield multiplied by price) shortfalls. Both yield and revenue insurance adjust from year to year, depending on crop market price expectations. Since potential insurance payouts, as well as premium costs, increase with rising commodity prices, these insurance plans have assumed greater significance in the current price environment.

Insured value adjusts with expected market price of corn



Insured value = Federal crop insurance liability for 75-percent coverage level of Crop Revenue Coverage and Revenue Assurance. Insured value for 2008 is an estimate.
 Projected harvest price = Average daily settlement price in February of December corn contract of Chicago Board of Trade (price used to establish insurance coverage).

Source: Compiled by USDA, Economic Research Service, from USDA, Risk Management Agency data.

For example, assume that a corn producer's expected yield, based on recent history, is 150 bushels per acre. If, prior to planting, the expected price of corn is \$4 per bushel and the producer chooses the 75-percent coverage level, then the amount insured would be \$450 per acre. If the expected price of corn rises 50 percent to \$6 per bushel, and expected yield does not change, the producer's insurance coverage would increase by the same percentage to \$675 per acre. This increased revenue guarantee may be used to offset risks from higher input prices.

The most widely used insurance plans—which covered more than half of U.S. corn, soybean, wheat, and cotton acres in 2008—are revenue insurance plans that also provide increased amounts of insurance, within limits, if crop prices rise over the growing season. One example is Revenue Assurance with the Harvest Price Option, offered in the major corn and soybean States. Under this plan, the projected harvest price used in the revenue guarantee for corn is the average of the daily settlement prices during February of the December Chicago Board

of Trade corn futures contract (the price of a contract purchased in February for delivery in December). The actual harvest price is determined from the November average of that contract. The revenue guarantee for the crop uses the higher of these two prices, although regulations stipulate that the harvest price that is used cannot be greater than 200 percent of the projected price.

Crop yield insurance policies, the second most widely used type of insurance, also use expected market prices to establish the insured values of crops. These expected prices, however, are determined differently than those used with revenue insurance, and they do not change over the growing season. Each year, prior to the crop insurance enrollment period, USDA's Risk Management Agency (RMA) uses forecast season-average crop prices to set the prices at which yield losses would be paid. These prices, called "price elections," together with expected yields and coverage levels, determine the insured value of the crops covered by yield insurance.

Increases in insurance amounts, the insured value of crops, lead, of course, to



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higher premium costs. This means that for the same coverage level, expressed as a share of the expected yield or revenue, expenditures for insurance go up. For example, at the 75-percent coverage level, if the premium rate is 5 percent and the amount of the insurance guarantee is \$450 when the price of corn is \$4 per bushel, then the premium cost is \$22.50 per acre. The premium rises to \$33.75 if the price of corn is \$6 per bushel and the amount of the guarantee is \$675 per bushel. The \$225 increase in the amount of insurance costs an additional \$11.25 in premium, if premium rates do not change. But, premium rates for revenue insurance can increase when crop prices go up because price risk or volatility, which is part of revenue risk, usually increases when price levels increase. The amount of the premium increase depends on the size of the increase in price volatility and the size of the price risk relative to the yield risk.

Both producers and the government pay more when crop insurance costs increase. Premiums on crop insurance policies are subsidized by the Federal Government. The subsidy rate depends on the coverage level and insurance plan selected by the producer. For the most popular insurance plans and coverage level—individual farm revenue at 75-percent coverage—the premium subsidy is 55 percent, meaning that producers pay 45 percent of the premium cost. For the entire crop insurance program, the government pays about 60 percent of total premiums. Thus, rising crop prices mean higher insurance program costs for the government. Premium subsidies increased from \$2.3 billion in 2005 to \$3.8 billion in 2007 and are expected to be even higher in 2008, due largely to crop price increases.

Higher premiums also lead to increases in costs of other crop insurance program subsidies. For instance, administrative and operating subsidies, which are paid by the government to insurance com-

panies for selling and servicing crop insurance policies, are determined from premium values. When premium amounts go up, so do administrative and operating subsidies. In order to trim insurance program costs, the 2008 Farm Act made small reductions in premium subsidy rates for area yield and revenue plans and in administrative and operating subsidy rates.

Disaster Assistance Payments Add to the “Safety Net” for Producers

While subsidized crop insurance is the primary form of assistance provided by the Federal Government against bad weather, plant diseases, and other natural hazards, ad hoc disaster assistance payments have also been frequently provided. Between 2000 and 2007, four disaster programs were authorized, at a total cost of

about \$10 billion. The 2008 Farm Act established a permanent Supplemental Agricultural Disaster Assistance program, which includes programs for livestock as well as crop producers.

The program for crop producers, called Supplemental Revenue Assistance (SURE), is linked to crop insurance. To be eligible for SURE payments, a producer, with some exceptions, is required to obtain crop insurance or, if crop insurance is not available, to participate in the Non-Insured Acreage Program (NAP). The SURE guarantee level is based on the producer's insurance coverage: the higher the insurance level, the greater the SURE guarantee, up to 90 percent of the expected revenue.

Eligible producers in counties declared disaster counties by the Secretary of Agriculture, or in contiguous counties, or those who show proof of an individual

The 2008 Farm Act established a permanent Supplemental Agricultural Disaster Assistance program, which includes programs for livestock as well as crop producers.



Traditional Commodity Programs and the 2008 Farm Act

Direct payments are made based on historical acreages and yields, called *base acres* and *program yields*. Direct payment rates, which vary from crop to crop, play a role in the calculation of other commodity program payments. Direct payments are similar to the production flexibility contract (PFC) payments that were made available in 1996-2001 for wheat, feed grains, rice, and upland cotton. The 2002 Farm Act replaced PFC payments with direct payments and added oilseeds to the list of eligible crops. The 2008 Farm Act leaves payment rates unchanged, but reduces eligible payment acres from 85 percent of base acres to 83.3 percent for crop years 2009-11.

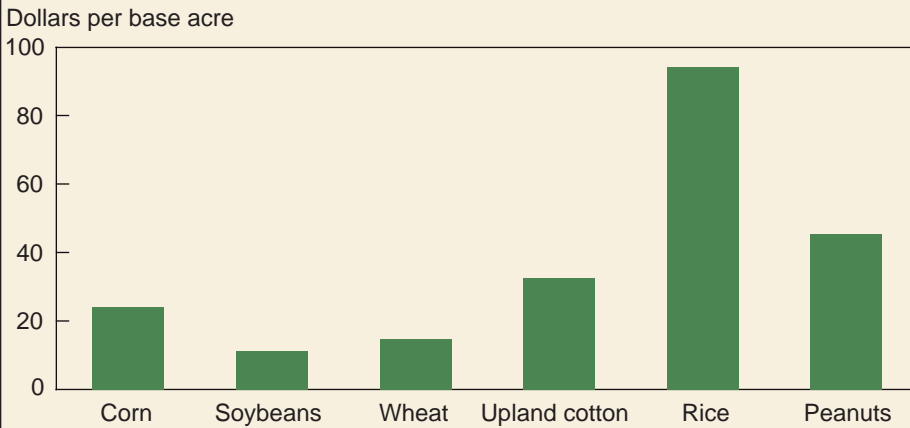
The nonrecourse loan program provides commodity-secured loans to producers for a specified period of time (typically 9 months), after which producers must either repay the loan and accrued interest (if market prices are above the loan rate) or transfer ownership of the commodity pledged as collateral to the Commodity Credit Corporation as full settlement of the loan, without penalty.

Instead of taking out a commodity loan, eligible farmers may choose to receive marketing loan benefits through loan deficiency payments (LDP) when market prices are lower than commodity loan rates. The LDP option allows the producer to receive the benefits of the marketing loan program without having to take out and subsequently repay a commodity loan. The LDP rate is the amount by which the loan rate exceeds the loan repayment rate or prevailing world market price, and, thus, is equivalent to the marketing loan gain that could be obtained for crops under loan.

The 2008 Farm Act continues commodity loan programs for wheat, corn, grain sorghum, barley, oats, long- and medium-grain rice, soybeans, other oilseeds, upland cotton, extra-long staple cotton, peanuts, wool, mohair, honey, small and large chickpeas, lentils, and dry peas. The loan rates, specified in the legislation, are unchanged for crop year 2008, but will increase for wheat, barley, oats, other oilseeds, and wool for crop years 2010-12. Loan rates for dry peas and lentils will be lowered for crop years 2009-12.

Counter-cyclical payments (CCPs) were established as a commodity program under the 2002 Farm Act and were initially available for wheat, corn, grain sorghum, barley, oats, rice, upland cotton, soybeans, other oilseeds, and peanuts. The 2008 Act continued CCPs for these crops and adds dry peas, lentils, and chickpeas. The 2008 Act does not change the target prices through crop year 2009, for all commodities, except for upland cotton. For upland cotton, the target price will be lowered to 71.25 cents per pound for crop years 2008-12. Target prices will increase for wheat, grain sorghum, barley, oats, soybeans, and other oilseeds for crop years 2010-12. The amount of historical production to which the CCP rate is applied will remain at 85 percent for crop years 2008-12.

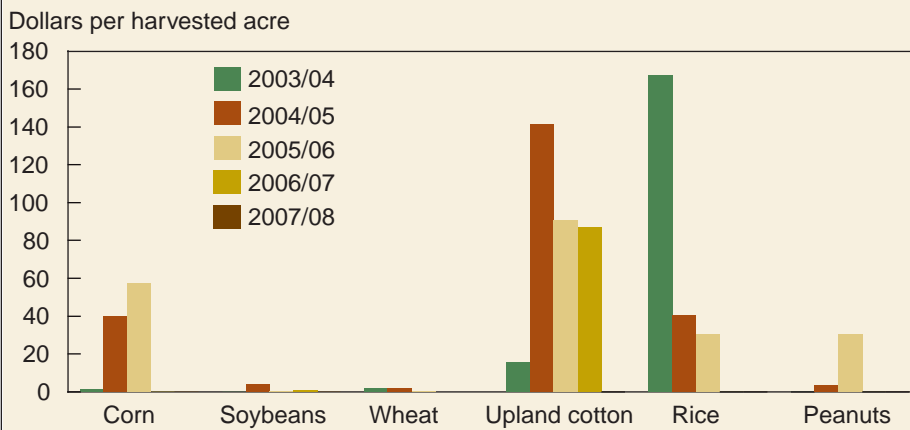
Direct payments are greatest for rice, peanuts, and cotton



Direct payments for crop year 2007-08.

Sources: Compiled by USDA, Economic Research Service from USDA, Farm Service Agency data.

Marketing loan benefits have been large for rice and cotton



Marketing loan benefits by crop year. 2007/08 is a forecast. Includes marketing loan gains, certificate gains, and loan deficiency payments as of February 4, 2008.

Sources: Compiled by USDA, Economic Research Service from USDA, Farm Service Agency and USDA, National Agricultural Statistics Service data.

loss of at least 50 percent are eligible to receive SURE payments for crop production or crop quality losses. Losses are measured considering whole-farm revenue, which includes crop insurance indemnities and commodity program payments, so that producers are not paid more than once for the same loss.

Traditional Commodity Programs Grow Less Important With Rising Prices

The commodity programs—direct payment, nonrecourse loan, and counter-cyclical payment (see box, “Traditional Commodity Programs and the 2008 Farm Act”)—provide benefits to field crop producers through income and product price supports. While each of these programs

provides different benefits, all use payment triggers or rates that are set by legislation and do not adjust when market prices rise. Thus, these programs become less relevant as risk management tools when high prices prevail, and none provide protection against yield risks.

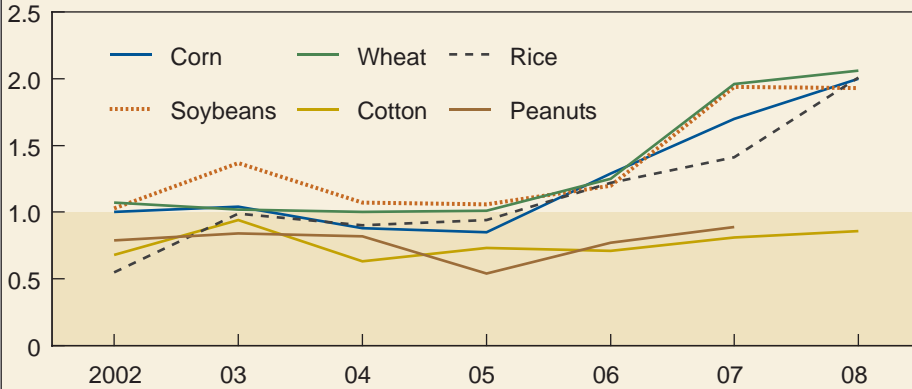
The 2008 Farm Act reauthorized, with some modifications, all three programs. Direct payments are fixed payments that do not vary with changes in crop prices or yields, and thus provide producers with steady, certain income. They are based on historical production and are made at payment rates, which are specified in legislation and vary by crop, with the largest per acre payments for rice, peanuts, and cotton. The nonrecourse loan and counter-cyclical payment programs provide benefits to producers when market prices drop below statutory trigger levels, called loan rates and effective target prices, which vary from crop to crop. Loan rates and effective target prices are specified in legislation and do not adjust with changes in market prices.

Commodity loans allow producers of designated crops to receive a loan from the government at a commodity-specific loan rate per unit of production by pledging the crop as loan collateral. The loans provide an effective price floor for participating producers. Because loan program benefits depend on actual production, they protect against price risk but not yield risk. Marketing loan benefits have been large for cotton since the 2003-04 crop year when market prices dropped below the loan rate.

Counter-cyclical payments (CCPs) provide an additional level of price-based income support. CCPs are designed to support and stabilize incomes when commodity prices are less than effective target prices. The effective target price for a crop is the target price established by legislation minus its direct payment rate. The payment rate is the difference between

Market prices of corn, soybeans, wheat, and rice have climbed above program target levels

Market price divided by effective target price



Market price = Marketing-year average prices, 2002-07; midpoint of forecasted price range for 2008. Effective target price = target price - direct payment rate.

Sources: Compiled by USDA, Economic Research Service from marketing-year average prices, USDA, National Agricultural Statistics Service, and from forecasted prices, USDA, World Agricultural Supply and Demand Estimates, October 10, 2008.

the effective target price and the market price or the loan rate, whichever is higher.

CCPs, because they are triggered by declines in prices, provide some price risk protection to producers growing the same crops they have produced historically or

other crops whose prices closely track the CCP program crops. However, because CCPs are paid on historical, not current, production, they provide little protection from yield risk. In fact, if a producer has a yield loss in the same year that many oth-

ers do and the market price of the crop goes higher than the CCP trigger level, there would be no CCP.

New ACRE Program Pegs Protection to Recent Market Prices

The 2008 Farm Act introduced an alternative to traditional commodity programs. The Average Crop Revenue Election Program (ACRE) is novel in that it protects against revenue (national price multiplied by State yield), rather than price, shortfalls and that it uses moving averages of market prices, instead of legislated target prices, to set levels of protection. By incorporating yield risk and by using recent market prices, ACRE could be an attractive alternative for producers in areas of high yield risk and for crops with market prices well above the trigger levels of traditional commodity programs. The choice, however, will not be simple.

The ACRE alternative will first be available in crop year 2009. To be eligible for ACRE payments, producers must elect the ACRE program for the farm, and then

Expected benefits or payments under traditional commodity programs, which are based on prices specified in legislation, are less likely to materialize for crops whose market prices have increased.



annually enroll in ACRE during the signup period announced by USDA's Farm Service Agency. Although an ACRE signup period will occur each year, once a producer chooses ACRE, the decision holds for the remaining years covered by the 2008 Farm Act, that is, through crop year 2012. Enrollment in ACRE applies to all covered commodities and peanuts on the farm. Covered commodities are wheat, corn, barley, grain sorghum, oats, extra-long staple and upland cotton, medium- and long-grain rice, oilseeds, pulse crops (small and large chickpeas, dry beans, and lentils), and sugar. Producers choosing ACRE will not be eligible for price-based CCPs, will give up 20 percent of their direct payments, and will have their nonrecourse loan rate lowered by 30 percent.

ACRE also differs from traditional programs in that it has a double trigger: State- and farm-level revenue shortfalls are required for a producer to receive a payment. The payment rate for an ACRE crop is based on the difference between the State-level revenue guarantee and the actual State-level revenue.

The payment rate is applied to a portion (83.3 percent in 2009-11; 85 percent in 2012) of the farm's acres of the crop multiplied by the ratio of the farm's average yield to the State's average yield. ACRE payments are based on planted rather than historical base acres, though the number of acres that receive an ACRE payment cannot exceed a farm's total base acres. In short, ACRE payments are available to producers of a crop if the State-level actual revenue for that crop is below the State ACRE guarantee revenue (90 percent of the national price guarantee times the 5-year Olympic average State yield) and if a producer's farm-level actual revenue falls below the farm level guarantee. The farm-level guarantee for a commodity equals the farm's 5-year Olympic average yield times the national guarantee price

plus any crop insurance premiums per acre paid by the producer on the farm.

Shifting Program Benefits and Crop Prices Require Complex Management Decisions

Recent upswings in market prices for farm commodities have affected the relative importance of different government programs for field crop producers. Programs such as Federal crop insurance and ACRE, which adjust coverage and payments to reflect recent market trends, are increasingly important to producers of crops whose prices have increased dramatically.

As a producer considers whether to enroll in ACRE, two factors will be especially important: how much government support from traditional programs will be relinquished and whether the producer's expectations are for robust or weakening prices. Direct payments, 20 percent of which will be surrendered to enroll in ACRE, are large for peanuts, cotton, and rice relative to payments for other crops. Expected benefits or payments under traditional commodity programs, which are based on prices specified in legislation, are less likely to materialize for crops whose market prices have increased.

Not all crop prices have increased equally. The marketing-year average price of corn rose to \$4.25 per bushel in 2007, about 80 percent higher than its 10-year average and well above its nonrecourse loan rate (\$1.95) and 2007 target price (\$2.63). Soybean and wheat prices have followed similar patterns, and prices for all three crops are expected to increase again in 2008. In contrast, the average price for upland cotton was 53.5 cents per pound in 2007, just 9 percent above its 10-year average, about equal to its loan rate of 52 cents, and below its 2007-crop target price of 72.4 cents.

But what if current high prices drop? How will benefits provided by the various programs change? A sharp drop in crop price over a single crop year could trigger revenue payments from crop revenue insurance and ACRE, depending on production levels. A more gradual downward trend in price would reduce the potential dollar amount of payments, though not necessarily the degree of risk protection, from these programs as they adjust to the market conditions. Moreover, if prices drop to pre-spike levels, then the traditional commodity programs that provide benefits when prices are below legislated targets would be more likely to provide price and income support to producers. In short, while prices for several field crops are at high levels, U.S. producers will face management decisions that are complex because of the variability of crop prices and the variety of farm program options. **W**

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Title I (Commodities) of the 2008 Farm Bill Side-by-Side Comparison:
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Title XII (Crop Insurance) of the 2008 Farm Bill Side-by-Side Comparison:
www.ers.usda.gov/farmbill/2008/titles/titlexiicropinsurance.htm

Can Low-Income Americans Afford a Healthy Diet?

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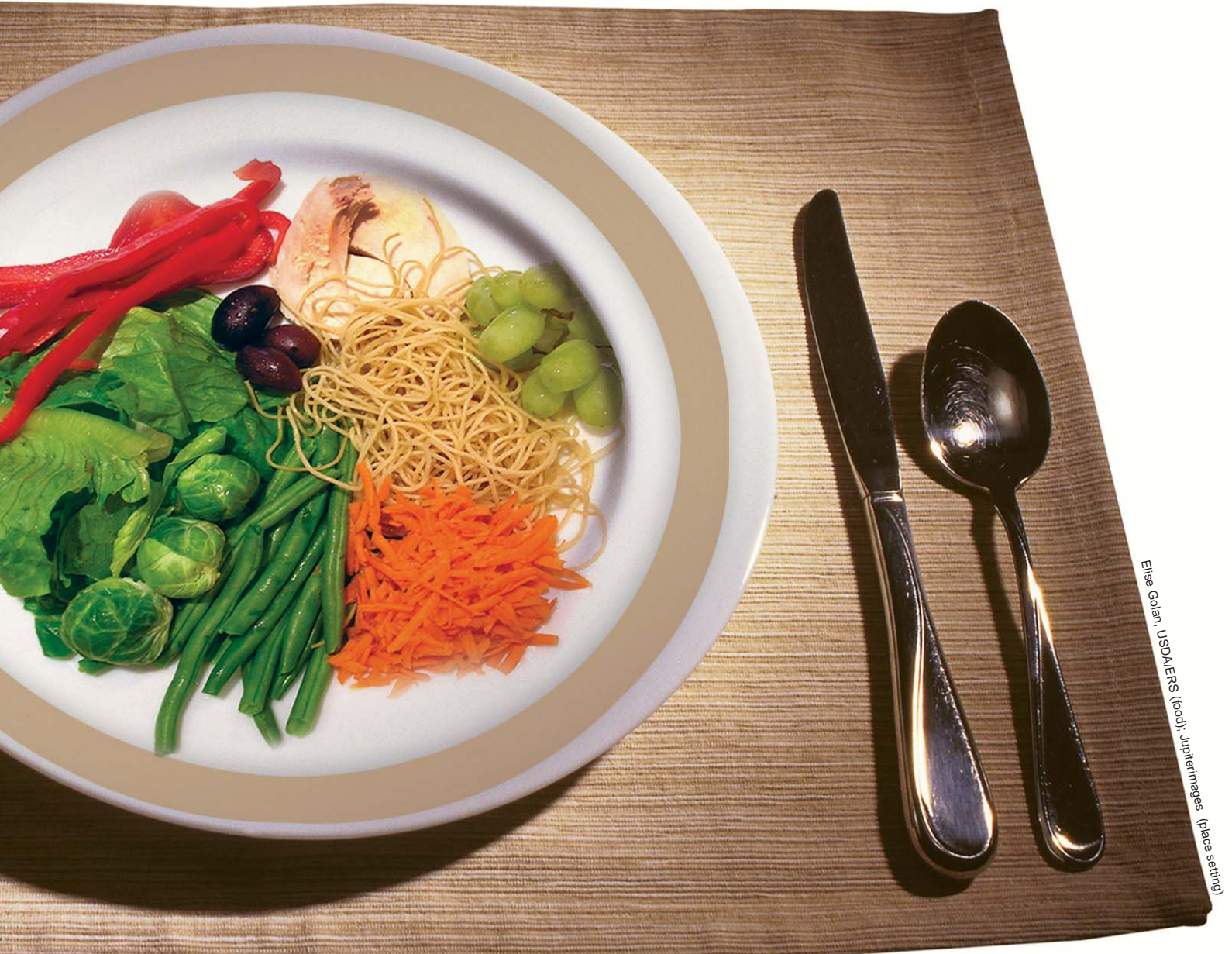
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- Low-income households that receive maximum benefits from the Supplemental Nutrition Assistance Program usually have the purchasing power necessary to afford healthy diets; others may not.
- Relative to other households, low-income households must allocate a higher share of both their income and time budgets to food if they wish to consume palatable, nutritious meals.
- For many American households, achieving an affordable healthy diet will require reducing their expenditures on less nutritious foods and moving nutrient-dense foods, such as fruit and vegetables, to the center of their plates and budgets.



Elise Gohari, USDA/ERS (food); Jupiterimages (place setting)

Low-income households tend to eat less nutritious diets than other households. On average, they do not meet Federal recommendations for consumption of fruit, vegetables, whole grains, and low-fat dairy products, and they consume fewer servings of these nutritious foods than other households. The difference between low-income households' food choices and those of other households raises concerns about the affordability of healthy foods. Do low-income households have unhealthy

diets because they cannot afford more healthy ones?

Affordability, defined as the ability to bear a cost, is a surprisingly complex concept to measure. If someone does not have the money or other resources to acquire an item, it is clearly unaffordable. If they have the money, but other things take priority in their budget, the item may also be unaffordable. If they decide the item is too expensive, it may also be unaffordable to them. Economists have long struggled with

the different aspects of affordability—absolute, relative, and subjective—in developing measures of affordability and consumer well-being.

Absolute, relative, and subjective aspects likewise complicate the question of whether a healthy diet is affordable. Individually, each aspect highlights important but limited information on food choice and budget decisions. Together, they illuminate actual consumer behavior and well-being.

**The First Complication:
Determining Composition and
Cost of a Healthy Diet**

To determine whether healthy diets are affordable one first needs some notion of what a healthy diet costs. This seemingly straightforward question is quickly complicated by both the enormous variety of foods that could make up a healthy diet and the range of prices consumers pay for those foods.

USDA has wrestled with defining the composition and cost of a healthy diet since 1894, when it published its first food plan. The plan identified quantities of reasonably priced foods needed to meet the nutritional requirements of the average American male undertaking moderate physical work.

The current USDA food plans, calculated by USDA's Center for Nutrition Policy and Promotion (CNPP), include the Thrifty, Low-Cost, Moderate-Cost, and Liberal Food Plan. These plans specify the types and quantities of commonly consumed foods that people could purchase and prepare at home to obtain a nutritious, palatable diet at four cost levels. Even the lowest cost plan—the Thrifty

Food Plan—is not a minimum cost diet of pease porridge.

To construct each plan, CNPP starts with data on how American households at different income levels actually eat and then uses a mathematical optimization model to identify a diet that takes account of existing consumption patterns while maintaining a specified cost level and meeting current Federal nutrition guidelines. The cost of each plan is calculated using national-average price estimates. In June 2008, the cost of the USDA food plans for a family of two adults and two elementary school-age children ranged from \$588.30 per month for the Thrifty Food Plan to \$1,151.40 per month for the Liberal Food Plan.

**A Healthy Diet Is Affordable for
Most Households...**

For most U.S. households, these meal plans, particularly the Thrifty Food Plan, are affordable. In 2006, the cost of the Thrifty Food Plan corresponded to about 8 percent of median income for a four-person household, while the more expensive Low-Cost Food Plan totaled about 11 percent. Eleven percent of income is close to the 10-percent share that the average American household devotes to food each year. The fact that the average American household spends about 10 percent of its income on food implies that these healthy diets are affordable, or at least as affordable as the diets Americans are currently consuming.

For low-income households that receive the maximum benefit amount from the Supplemental Nutrition Assistance Program, or SNAP (see box, "SNAP—Food Stamp Program Gets a New Name"), the cost of a nutritious diet modeled on the Thrifty Food Plan is also affordable since the maximum benefit

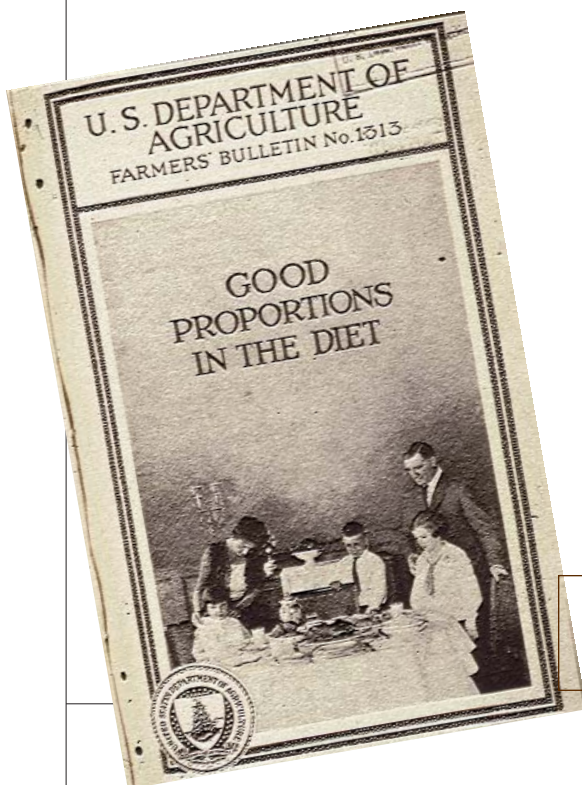
**SNAP—Food Stamp
Program Gets a New Name**

On October 1, 2008, low-income families began using SNAP benefits instead of "food stamps" to supplement their food spending. Under the 2008 Farm Act, the Federal name of USDA's largest food and nutrition assistance program—the Food Stamp Program—was changed to the Supplemental Nutrition Assistance Program (SNAP). States retain the option to independently name their programs. Some will use SNAP; others may choose alternative names. The Farm Act also formalized the program's existing nutrition education efforts.

In recent years, State agencies and USDA appealed to Congress to change the program's name to reflect the shift in how benefits are issued, emphasize the nutrition element of the program, and eliminate any possible stigmas associated with the term "food stamps." Since 2004, all food stamp participants have received electronic benefits transfer (EBT) cards instead of coupons. Recipients use their EBT cards like debit cards to access their program benefits at authorized food outlets. Studies have documented recipients' satisfaction with EBT and their preferences for EBT over coupons, even among the elderly and disabled.

The new name also reflects the program's intent to supplement household resources. The Food Stamp Program was never intended to fully meet the nutrition needs of households with income. Rather, these households were (and still are) expected to spend about 30 percent of their own resources on food. A household's monthly benefit allotment is determined by subtracting 30 percent of its monthly income (net of some expenses and allowable deductions) from the maximum allotment allowable for a household of that size. Maximum allotments are provided for households with no net income, which comprised about 31 percent of all households receiving benefits in fiscal year 2006.

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USDA efforts to define the composition and cost of a healthy diet, such as this 1923 food plan, date to the 1890s.

amount is equal to the cost of that Food Plan. For the nearly one out of three participating households that receive the maximum benefit, SNAP benefits alone are sufficient to purchase a healthy diet.

However, if these households pay higher food prices than those used in the cost estimates for the Thrifty Food Plan, their SNAP benefits may fall short. To help reduce this possibility, in 2007, CNPP began basing its Thrifty Food Plan cost estimates exclusively on what *low-income* households pay for food. Nielsen, a market research firm, provided data. Households participating in Nielsen's

"Homescan" panel report their food purchases, and Nielsen matches them with prices charged. Because households also report their income and other characteristics, CNPP is able to use average prices paid by low-income households to estimate the cost of the Thrifty Food Plan. The cost of the plan therefore, better represents average prices in the locations and types of stores typically patronized by households receiving SNAP benefits.

If they live in especially high-cost areas, some low-income households may still face higher prices than other low-income households. Average food prices

are rarely what any particular household is likely to pay for food. Prices vary regionally and locally across the United States. For example, households may need more money for food if they live in New York City, as opposed to South Bend, IN.

The maximum SNAP benefit amount may also not cover the full costs of the Thrifty Food Plan in periods of high food price inflation. Like most other government assistance programs, SNAP adjusts benefits for inflation to protect participants from losses in real benefits. However, benefit amounts currently are adjusted at the beginning of the fiscal year

Food costs vary across the United States¹

	Half-gallon, whole milk	Head, iceberg lettuce	29 oz can of peaches
Ames, IA	\$1.71	\$0.92	\$1.55
Asheville, NC	\$1.99	\$1.52	\$1.61
Atlanta, GA	\$1.75	\$1.24	\$1.63
Baltimore, MD	\$1.85	\$1.49	\$1.65
Boise, ID	\$1.74	\$1.09	\$1.48
Boston, MA	\$2.51	\$1.59	\$2.05
Bowling Green, KY	\$2.07	\$0.99	\$1.55
Charleston, WV	\$2.09	\$0.95	\$1.74
Chicago, IL	\$2.49	\$1.20	\$2.02
Cincinnati, OH	\$1.90	\$1.02	\$1.69
Grand Rapids, MI	\$1.93	\$0.99	\$1.74
Hartford, CT	\$2.23	\$1.41	\$2.27
Jackson, MS	\$1.98	\$0.90	\$1.57
Las Vegas, NV	\$1.91	\$1.14	\$1.52
Los Angeles-Long Beach, CA	\$2.34	\$1.28	\$2.24
Memphis, TN	\$1.71	\$0.95	\$1.36
Miami-Dade County, FL	\$2.09	\$1.36	\$1.84
New York (Manhattan), NY	\$2.12	\$1.83	\$2.17
Phoenix, AZ	\$1.71	\$1.24	\$1.86
Pittsburgh, PA	\$1.45	\$1.19	\$1.85
San Antonio, TX	\$1.88	\$0.99	\$1.39
San Francisco, CA	\$2.33	\$1.47	\$2.47
Seattle, WA	\$2.21	\$1.44	\$1.85
South Bend, IN	\$1.64	\$1.01	\$1.41
Springfield, MO	\$1.86	\$0.97	\$1.93
Washington-Arlington-Alexandria, DC-VA	\$2.13	\$1.79	\$1.83

¹All prices were collected in the first quarter of 2005.
Source: USDA, Economic Research Service using data from Council for Community and Economic Research.

according to the costs of the previous June, which may introduce a gap between SNAP benefits and food prices that grows throughout the year. During FY 2008, the loss in purchasing power for a family of four grew from \$12 at the beginning of the year to \$56 by July.

...Though Low-Income Households That Earn Income May Face Challenges

Relative affordability of food becomes an issue for low-income households that do not receive SNAP benefits or that receive less than the maximum benefit amount. SNAP benefits are typically reduced as a household's income increases. Households receive the maximum benefit for their household size less 30 percent of their income adjusted for a number of deductions. How quickly SNAP benefits actually decrease with income varies because of these deductions. Nonetheless, the basic 30-percent deduction for income reflects the assumption embedded in the calculation of U.S. poverty thresholds that 30 percent of income is a reasonable share

to spend on food. But is it? If not, SNAP households that receive less than the maximum benefit amount and households that earn just enough to be ineligible for benefits may have difficulty affording healthy diets. For these households, the affordability of the Thrifty Food Plan depends on whether they can allocate up to 30 percent of their income to food.

The 30-percent food share used in setting the poverty thresholds incorporates many relative notions of affordability that may no longer be valid. Use of the one-third standard originated with the 1963 poverty thresholds calculated by Mollie Orshansky for the Social Security Administration. Orshansky used data from the 1955 Household Food Consumption Survey to estimate the share of income spent on food. She found that for all households of two or more persons (not just low-income households), average food expenditures accounted for one-third of after-tax income. Public opinion surveys at the time concurred. Orshansky reasoned that this budgeting

norm should apply to low-income household budgets as well.

Since the 1960s, changes in living standards and relative prices have reduced the average share of income spent on food from 30 percent to around 10 percent. Expenditures on many goods such as housing, utilities, medical care, transportation, and child care have been growing. Basic needs other than food are taking up larger shares of household budgets. Low-income households faced with allocating 30 percent of their income to the purchase of healthy diets would have to forgo many of the items on which other households currently spend almost 90 percent of their income.

In reality, most low-income households do not allocate their budget shares in the same proportions as households in the 1950s. Research conducted by ERS and USDA's Food and Nutrition Service (FNS) found that in 2006, the typical household with income below 130 percent of the poverty line spent about 5 percent less on food than the cost of the Thrifty Food Plan.

In low-income households, as in other households, budgets are clearly pulled in many directions. The extent of this pull is further illustrated by numerous empirical studies on the impact of additional resources on household food purchases. Results show that an additional dollar of income increases low-income household food expenditures by 5 to 10 cents. This suggests that when budget constraints are relaxed, households give priority to spending on other basic needs, not food. Even when households are given a dollar's worth of SNAP benefits, they increase spending on food by only 17 to 47 cents. Even though they spend all SNAP benefits on food, these households simultaneously shift some of their previous cash expenditures on food to alternative uses.

Since the average household spends 10 percent of its budget on food, the one-

Mollie Orshansky's research on household budget shares underpins poverty threshold measures.





The average American household today spends almost 90 percent of its income on nonfood goods and services.

third share for food established in the 1960s may no longer reflect the current distribution of basic budgetary needs. But does this divergence render healthy diets unaffordable for low-income households?

This is not a question of whether low-income households should be able to afford exactly the same diets or luxury items as upper income households. Following Adam Smith's lead, it is a question of whether this divergence in presumed food budget share signifies a reduction in low-income households' ability to participate fully in society.

In his critique of notions of absolute poverty, Smith argued that the affordability of linen shirts became an issue only when a linen shirt became a prerequisite to entering the workforce. Likewise, the affordability of a diet requiring 30 percent of income becomes questionable if it means a household must cut back on child care, transportation, medical care, or other prerequisites for work. For low-income families today, a one-third budget share for food may be unaffordable.

Time May Be a Challenge, Too

Another area in which the requirements of the Thrifty Food Plan may diverge from social norms and create an affordabil-

ity problem is with respect to time allocation. The most recent Thrifty Food Plan includes a variety of convenience foods (see box, "Convenience and the Thrifty Food Plan"). However, meals in the plan may still involve more preparation time than typical American meals because they do not include hot ready-to-eat meals from grocery stores or "food away from home" (food sold for immediate consumption at dine-in or carryout restaurants). This could

put a strain on low-income households' ability to budget the time to prepare these meals, particularly when adults in the households are employed.

ERS researchers, using data from the 2003-04 American Time Use Survey, found that many low-income households—those with two adults or those headed by a single parent who worked less than 35 hours a week—did allocate enough time for the food preparation required by the Thrifty Food Plan. However, these same researchers also found that low-income women who worked full-time spent just over 40 minutes per day on meal preparation, which may not be enough time to prepare the meals specified by the Thrifty Food Plan.

When the Thrifty Food Plan was first created in 1975, most families had a non-working adult in the home who was likely to prepare meals from scratch. However, social norms have changed and an increasing number of households, including low-income households, have either a single working parent or two working parents. These low-income households may not have the time to prepare all their meals at

Convenience and the Thrifty Food Plan

The Thrifty Food Plan shows how a nutritious diet may be achieved with limited resources. To further help households put the plan into practice, USDA provides recipes online through the Food Stamp Nutrition Recipe Finder. The recipe finder currently contains baked lemon chicken, chicken soup, oatmeal raisin muffins, tuna quesadillas, and several hundred other recipes.

Previous versions of the Thrifty Food Plan assumed that meals were largely made from scratch, raising concerns about how much time households needed for food preparation. Research conducted at Tulane University estimated that households needed to devote over 2 hours to food preparation per day to follow the 1999 Thrifty Food Plan. Researchers based at Virginia Polytechnic Institute and State University put the time cost of these same meals at 40 minutes each, or 80 minutes per day if two meals are served.

To more realistically reflect the time available for food preparation, especially with increased expectations that people receiving assistance be in the workforce, USDA's Center for Nutrition Policy and Promotion has allowed for more convenience in its newly revised Thrifty Food Plan. Foods such as boxed macaroni and cheese, frozen vegetables, ready-to-serve breads and cereals, and other commercially prepared foods are included. And the recipe finder includes meals that can be prepared in 30 minutes or less.

home. Like their upper income colleagues, who spend almost half their food budget on food away from home, these households may turn to prepared foods and restaurant meals to help manage their time budgets.

Over time, the types of healthy diets affordable to low-income households may have deviated from those chosen by other households. Relative to other households, low-income households must allocate a higher share of both their income and time budgets to food if they wish to consume nutritious meals as described by the Thrifty Food Plan. This suggests that the relative affordability of a healthy diet is less than it was in the 1950s and 1960s.

Subjective Notions of Affordability May Also Create Barriers to Healthy Eating

Even if households are able to allocate enough time and money to afford the healthy diet described in the Thrifty Food Plan, subjective notions about affordability undermine some healthy food choices. Currently, many U.S. consumers seem to think that healthy foods such as fruit and vegetables are too expensive. In 2004, researchers from the University of Minnesota surveyed 796 people about the factors shaping their food choices. Thirty-nine percent indicated that the cost of a healthy diet limited what they ate.

Empirical research on overall diet costs has shown, however, that eating healthfully does not necessarily mean paying more. Researchers with the State

University of New York at Buffalo studied families participating in a program for overweight children. Each family was instructed to base their diets on low-calorie, high-nutrient foods. At the end of the program, not only had the health of family members improved, but they also had spent less on food. The researchers found that, as the families replaced snack foods with healthier foods like fruit and vegetables, costs went down.

The actual cost of nutrient-dense foods like fruit and vegetables support the conclusion that these foods need not break a household's budget. ERS researchers estimated that, in 2008, apples and field-grown tomatoes, for example, cost 37 and 70 cents per cup, respectfully, meaning that nearly half the recommended daily intake for fruit and vegetables could be purchased for about a dollar (see box, "How Much Do Fruit and Vegetables Cost?"). And prices of many fruit and vegetables, have remained constant relative to those of processed snack foods. ERS researchers examined inflation-adjusted prices for 11 basic fresh fruit and vegetables and 4 common snack foods (chocolate chip cookies, cola, ice cream, and potato chips) and found that prices for basic, minimally processed fruit and vegetables have been falling at about the same rate as those for snack foods.

Empirical evidence on consumer sensitivity to food price changes also suggests that price may not be a large barrier to healthy eating. A review of the literature

finds that a 10-percent reduction in the price of vegetables is predicted to increase a low-income household's purchases of vegetables for at-home consumption from 1 cup to between 1.03 and 1.07 cups per day. For fruit, a 10-percent price reduction is predicted to increase purchases from 0.72 cups to between 0.74 and 0.77 cups per day.

Even in situations where the costs of healthy and less nutritious food options are equal, many consumers evidently feel that they get more value from the less nutritious food. Taste and convenience may lead consumers to prefer less nutritious foods and value them more highly than foods with better nutritional profiles. For some, 75 cents is too much to pay for an apple but not for a soda.

Traditional attitudes about what constitutes a "good" meal may contribute to attitudes that fruit and vegetables are unaffordable. For example, research sponsored by FNS has found that for many low-income families, meat signifies status and success and is considered an essential, central part of any dinner. And ERS research suggests that households with incomes less than 130 percent of the poverty line are likely to spend additional income on beef and frozen prepared foods, not fruit and vegetables.

Like other U.S. households, low-income households tend to consume more than the recommended amounts of added fats, refined grains, and added sugars and sweeteners and below the recommended amounts of fruit, vegetables, whole grains,



How Much Do Fruit and Vegetables Cost?

Cost, like affordability, is an idea that admits many possibilities. Examining food prices highlights the range of possible ways to think about costs. Researchers at the University of Washington in Seattle and at research institutes in France have compared prices for fruit and vegetables with prices for other foods on both a per calorie and per nutrient basis. They found that fruit and vegetables are relatively expensive per calorie, but relatively inexpensive per nutrient.

In principle, food costs could be measured in terms of any of the needs consumers are trying to fill by purchasing particular foods. Sometimes their choices are made to fill caloric needs, sometimes to fill nutritional needs. But taste and convenience have to be satisfied, too. The many attributes that food manufacturers advertise indicate the numerous dimensions along which consumers make choices. If consumers were concerned only with calories or, for instance, calcium intake, their behavior would look very different than typical consumer behavior. With only one concern, consumers would specialize, choosing only the one food that is least expensive in terms of their single need.

Here, ERS examines prices for two fruit and three vegetables in terms of the cost to households to satisfy Federal dietary guidelines. Dietary guidelines recommend that a person who needs 2,000 calories per day consumes 2 cups of fruit and 2.5 cups of vegetables daily (2 cups of green leafy vegetables equals 1 cup of vegetables). According to the Bureau of Labor Statistics, in June 2008, a pound of apples cost \$1.36 while a pound of carrots cost \$0.87. ERS used conversion factors published by USDA's Food and Nutrition Service to estimate prices per cup. These conversions also account for the portion of the foods that is likely wasted, such as the core of a head of lettuce or the peel of a banana. The per cup cost of apples and carrots was found to be about 37 cents and 34 cents, respectively. A person needing 2,000 calories per day could meet the dietary recommendations for fruit and vegetables for under \$2.50 per day selecting among these five produce items.

	Price, per pound ¹	Price, per cup
Apples, red delicious	\$1.36	\$0.37
Bananas	\$0.63	\$0.36
Lettuce, iceberg	\$0.86	\$0.16
Tomatoes, field grown	\$1.81	\$0.70
Carrots, short trimmed and topped	\$0.87	\$0.34

¹Source: USDA, Economic Research Service using Bureau of Labor Statistics U.S. city average price data, June 2008. Prices are national averages and may not reflect prices charged in particular communities.



Ken Hammond, USDA

and low-fat milk and milk products. These food choices are at odds with dietary advice about the centrality of fruit, vegetables, whole grains, and low-fat dairy in healthy diets: almost half of the expenditure outlined in the Thrifty Food Plan is for fruit and vegetables.

For consumers looking for the best nutritional value for their dollar, foods with a high nutrient-to-price ratio like fruit and vegetables rank high. To realign subjective attitudes about the value of such foods, however, many Americans may have to move foods traditionally considered "side dishes" to the center of the plate. Not only would this move make healthy diets more affordable, it would also improve health. \mathbb{W}

This article is drawn from ...

Are Lower Income Households Willing and Able To Budget for Fruits and Vegetables? by Hayden Stewart and Noel Blisard, ERR-54, USDA, Economic Research Service, January 2008, available at: www.ers.usda.gov/publications/err54/

Price Trends Are Similar for Fruits, Vegetables, and Snack Foods, by Fred Kuchler and Hayden Stewart, ERR-55, USDA, Economic Research Service, March 2008, available at: www.ers.usda.gov/publications/err55/

Who Has Time To Cook? How Family Resources Influence Food Preparation, by Lisa Mancino and Constance Newman, ERR-40, USDA, Economic Research Service, May 2007, available at: www.ers.usda.gov/publications/err40/

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Can Food Stamps Do More To Improve Food Choices? An Economic Perspective, by Joanne F. Guthrie, Margaret Andrews, Elizabeth Frazão, Ephraim Leibtag, Biing-Hwan Lin, Lisa Mancino, Mark Nord, Mark Prell, David Smallwood, Jayachandran Variyam, and Michele Ver Ploeg, EIB-29, USDA, Economic Research Service, September 2007, available at: www.ers.usda.gov/publications/eib29/

Market Failures: When the Invisible Hand Gets Shaky



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- The enormously complicated problem of deciding where and how all of society's resources might best be used is usually solved by individuals following their own self-interest in markets largely free of government oversight.
- Markets fail when exchanges between willing buyers and sellers are impeded and efficiency is compromised.
- Overcoming such market failures is a role for government, but devising a solution that improves upon the status quo may not always be possible.

Every individual... neither intends to promote the public interest, nor knows how much he is promoting it...he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention.

Adam Smith, *The Wealth of Nations*, 1776

By "the invisible hand," Adam Smith refers to the notion that desirable social goals are usually reached by individuals following only their own self-interest. The self-interested interactions among individuals generate prices that coordinate complex economic undertakings, directing each individual's labor and capital to where it is most valued. Thus, public sector controls on economic activity are usually not needed, and such controls often degrade society's ability to produce and distribute goods and services. Smith argued against unnecessary government intervention into or regulation of markets. But Smith also recognized that there are circumstances where markets fail to coordinate economic activity.

When markets fail, there may, indeed, be justification for some market regulation by government. Smith saw an obvious role for the public sector in national defense, provision of a system of justice and investment in public infrastructure, among others. More recently, the folly of unnecessary market regulation and the need to regulate markets that fail has been codified in a series of Presidential Executive Orders that require Federal agencies that propose regulatory actions to back up those actions by stating explicitly what market failure(s) they address. Thus, more than 230 years after Adam Smith wrote about government intervention, his ideas have found direct and practical application.

Agriculture is the textbook example of a sector that, being highly competitive, comprised of many buyers and sellers dealing in transparent markets, should result in an efficient allocation of resources without direct intervention by government. Yet, governments intervene in the agricultural and food sectors in a variety of ways. Commodity programs and food assistance are well-known interventions. Regulations aim to reduce runoff of animal waste into waterways, prevent further draining of wetlands, protect farmworkers from exposure to pesticides, and guard against unfair competition. USDA pays farmers and ranchers to improve water, air, and wildlife habitat quality, to restore wetlands, and to preserve farm and grasslands. Government entities also provide information to improve market efficiency. Science-based nutritional information supports food labels, inspections increase food safety, standards and certification increase consumer confidence in specialty products such as organic foods, and publicly funded research and development sustains growth in agricultural productivity.

Why Are Governments Important in “Free Market” Economies?

There are four generally recognized classes or causes of market failures that may call for government intervention:

1. **Externalities**, such as water pollution, arise when buyers or sellers are neither charged nor compensated for the economic impacts of their choices on others.
2. **Public goods**, such as national defense, do not lend themselves to market allocation because it is difficult to exclude individuals from enjoying the good or service once it is produced and because it costs nothing for an additional individual to use.
3. **Insufficient information** about the characteristics of a good or service may prevent markets from forming even though, with more complete information, consumers would be willing to buy and manufacturers would be willing to sell. For example, whether food is organically grown is not immediately apparent to con-

sumers. Third-party assurances that the information provided on package labels is truthful may be necessary to make markets work.

4. **Market power**, where a few buyers or sellers are able to exert significant power over prices, can dampen production and exclude some otherwise willing market participants.

The following examples illustrate how markets relevant to agriculture might fail, and the corrective steps that governments may take. The examples also reveal that the evidence for failure is often mixed, and the most appropriate policy response for correcting the problem may not be clear cut.

Environmental Pollution—High Transaction Costs and Free Riders

Agriculture is the source of a variety of pollutants—like nutrients, pesticides, sediment, and greenhouse gases—and is routinely identified as the major source of impaired waters in much of the country. If markets allocate resources to their highest



and best use, is pollution from agriculture simply an undesirable but unavoidable outcome of doing business? Or is pollution a sign that markets are not operating as expected and resources are not being allocated efficiently?

As long as farmers can discharge agricultural chemicals into waterways without being charged for the costs their actions impose on other water users, the prices of the food they produce (and the chemicals they use) will not reflect full societal costs. And if prices are not accurate indicators of costs, markets cannot allocate resources efficiently. Market prices encourage farmers to produce more crops and more water pollution than if pollution's costs were reflected in those prices. This source of market failure is known as a negative externality.

One solution is for water users who are harmed by pollution to negotiate water quality with farmers. But doing so would be costly and complicated. Take the case of hypoxia in the Gulf of Mexico, a "dead zone" caused by excessive nitrogen coming down the Mississippi River. Simply identifying the numerous farmers in the Mississippi Basin who contribute nitrogen to the Mississippi River would be an enormous task. The large numbers of fishermen, water recreationists, and households affected by excess nitrogen in rivers and streams would make the costs of negotiating an efficient outcome even more onerous.

It is not just the numbers of people involved that make negotiation impractical. Water quality is a public good; individuals may enjoy the benefits without paying the cost (see box, "Why Public Goods Defy Markets"). If one person pays farmers to reduce pollution, it is nearly impossible to exclude other downstream water users from benefiting as well. As long as water users believe that someone else is going to pay to reduce pollution, they have no incentive to pay for it themselves, or even to reveal that they benefit from the

improvement. If every water user follows the same logic, water pollution persists.

Governments have approached the pollution problem in two ways. One is to offer conservation program payments to farmers as a substitute for consumer demand. Conservation programs encourage farmers to adopt practices that reduce the loss of sediment or chemicals to the environment. A more coercive approach is to use regulations such as the Clean Water Act, Clean Air Act, and Federal Insecticide, Fungicide, and Rodenticide Act to require farmers to adopt certain practices, or to ban the use of chemicals that are particularly harmful.

Foodborne Illness—Information Gaps Erode the Supply of Safety

In 1999, the U.S. Centers for Disease Control and Prevention estimated that annually, one in three Americans becomes ill from a foodborne disease, one in 700 is hospitalized, and one in 60,000 dies. Many foodborne illnesses are preventable. Some

reduction in food contamination can be accomplished with low-tech basic sanitation—hand washing. Cooking deactivates many pathogens. High-tech methods like irradiation can reduce contamination in raw and unprepared foods. And pathogen monitoring and testing can confirm whether procedures have been successful. So why do food recalls and safety concerns continue to make headlines?

There are two possible explanations for the persistence of food-related illnesses. One explanation is that consumers are unwilling to pay higher food prices in return for increased safety. Suppliers have to be compensated for the added cost of labor and capital equipment that would increase safety. If the increase in cost would be passed on to consumers and consumers are unwilling to pay the additional cost, suppliers will stop investing in food safety.

Another possibility is that there is an information gap that is causing the market for food safety to fail. Information

Why Public Goods Defy Markets

Markets work best when goods possess certain characteristics. One is "excludability," where a producer can prevent someone who has not paid for the good from obtaining it. Another is that the good is "rival," where a buyer's purchase will not benefit any other individual. For instance, a farmer can obtain a tractor only by purchasing it from a dealer. And, once he obtains it, he alone enjoys the benefits. Goods with these characteristics are known as private goods. Markets evolve naturally to provide private goods.

Public goods lack one or both of these characteristics. With a public good, a provider cannot exclude someone from obtaining a good even if he or she has not paid a price. For example, a farmer contemplating the sale of improved water quality by establishing vegetative buffers on his or her farm cannot exclude downstream users from benefiting; the downstream users are "free riders." In this situation, the farmer does not have an economic incentive to provide the good.

Furthermore, when a good is nonrival—that is, exclusive ownership is not possible—a buyer's purchase does not reduce the benefits derived by others; the same benefits are available to all. For example, once a TV signal is broadcast over the air, one person viewing it does not diminish his neighbor's ability to also view the signal. The marginal cost of providing the good is essentially zero. Efficient resource use requires that price equals marginal cost, but if marginal cost is zero, price should be zero. No market will arise for a good with a zero price. When a market does exist for a good that is nonrival, such as satellite TV, the market is inefficient.

problems might choke off any financial incentive to offer consumers safer food. Microbial contamination that causes foodborne illness is difficult for consumers to detect. Contaminated food might look, smell, and taste no different from uncontaminated food.

The information gap means buyers are likely to be wary of sellers' claims. If food suppliers cannot convince consumers that they have gone to the trouble of producing very safe food, their compensation will not cover expenses and there will not be much safety offered to consumers.

Food suppliers have come up with ways to overcome information gaps. Having a well-known brand such as McDonald's, Burger King, and Wendy's creates an incentive to ensure that the food supplied to consumers is safe. A brand with a good reputation is a marketing advantage and represents an asset its owner has built through financial commitment. A single foodborne illness linked to the firm could damage the brand and reduce the value of the investment in brand building.

While food suppliers do not make explicit safety claims on retail food labels, safety claims do influence prices further back in the food supply chain. As agricultural commodities are transformed into foods, third-party certifiers are providing validation of quality attributes (including safety practices used in manufacturing plants), reassuring input buyers that a product's attributes are as advertised. In the private sector, firms like SGS and AIB International, as well as many more, offer services to validate safety procedures and bolster market differentiation with respect to food safety.

When food providers produce foods that are treated as undifferentiated commodities, those producers may not have a name brand or the incentive to guard it. Policymakers may thus decide to inter-

vene in the market to enforce an acceptable level of food safety for all consumers. USDA's Food Safety and Inspection Service is responsible for the safety of meat, poultry, and egg products. As well as routine inspections of processing plants, it has promulgated rules requiring all meat and poultry establishments to develop and implement written sanitation standard operating procedures and to test for the harmful pathogens *E. coli* and *Listeria*. The U.S. Food and Drug Administration oversees food safety for all other foods.

The large question for policy is the extent to which the private sector has overcome information gaps. If branding and third-party certification lead to food safety levels that are above minimum government standards, government intervention cannot be cost effective. But branding and third-party certification are not universal, so consumers' demands for safety may go unmet without government oversight.

Concentration in Agricultural Markets—A Level Playing Field Requires Some Officiating

Economies of scale lower per unit production costs and thus increase a firm's profit potential. These economies are one of the main factors behind increased consolidation in U.S. agricultural markets. For example, concentration in meat processing has increased dramatically since 1980, and the top four beef packers now account for 81 percent of fed cattle slaughter.

Vertical coordination along the supply chain between producers and processors is another important feature of modern agriculture. Production and marketing contracts have become important tools for vertical coordination that reduce income risks from price and production variability, ensure market access, and provide higher returns for differentiated farm products. The sales of many livestock commodities, sugarbeets, fruit, and processing



Keith Weller, USDA/ARS

tomatoes are now handled primarily through contracts. And agricultural contracts are often used in highly concentrated markets having relatively few buyers.

Increased consolidation and coordination, however, call into question whether a market with few buyers and numerous competitive sellers can still operate efficiently. The market system works best when there are many buyers and sellers acting independently and where no single actor or set of actors can influence prices. With only a few buyers, processors may have sufficient market power, individually or cooperatively, to exert downward pressure on the price they pay producers. If that were to happen, the quantity supplied and prices paid to farmers would ultimately be lower than under more competitive conditions. Setting a price lower than would be observed in a competitive market excludes some sellers from the market: they have no outlet for what they could have produced and sold. This "lost" production is a net loss to society.

In theory, buyers can structure contracts to take advantage of market power. A buyer can use long-term contracts to tie up a large share of local supply, discourag-

ing new entrants. Pricing formulas in contracts can be designed to stifle competition among rival buyers. Confidentiality clauses that require farmers to keep contract details secret from other farmers can also be used to suppress competition among rival buyers. Because contractors usually purchase from more than one farmer, this gives them a strong information advantage in negotiations.

Federal laws and regulations can limit firms' exercise of market power. Antitrust laws provide the Federal Trade Commission and the Antitrust Division of the Department of Justice with a wide set of policy options—including civil fines, criminal penalties, and preventive injunctions—to prevent collusion among firms and mergers that are likely to lead to monopoly, and to restrict the use of business practices that are likely to limit competition.

Other laws and regulations also aim to facilitate competition. For example, USDA has long had a program to collect, summarize, and disseminate timely market information to facilitate price discovery. The 2002 Farm Act placed limits on the use of confidentiality clauses in livestock and poultry contracts, and the 2008 Farm Act added further requirements for

the disclosure of information to producers in such contracts.

What Does Market Failure Mean for Policy?

Market failure occurs when individual decisions guided by self-interest are at odds with an efficient allocation of resources from society's perspective. The examples provided here show how there may be more than one class of market failure affecting a market, such as the case of water pollution that demonstrates failures related to negative externalities and public goods.

Once a market failure has been recognized and described, policy officials still may have a range of approaches to resolving it through government intervention. Common options include prescriptive or prohibitive regulation; tax incentives to change behaviors leading to or exacerbating market failure; subsidies to encourage behavior that eases the effect of market failure; government provision of information that some market participants would not otherwise receive; and government establishment of standards. Ideally, the government's response should be based on the benefits and costs of intervention, and these may indicate that no form of intervention is called for, even when markets fail. For example, to resolve the fail-

ure of animal operations to control their runoff of manure nutrients, EPA put in place regulations requiring that the largest farming operations implement nutrient management plans. That these regulations were not extended to all animal operations was based on research indicating that the costs of doing so would not justify the benefits. **W**



Keith Weller, USDA/ARS

This article is drawn from ...

The Use of Markets To Increase Private Investment in Environmental Stewardship, by Marc Ribaudo, LeRoy Hansen, Daniel Hellerstein, and Catherine Greene, ERR-64, USDA, Economic Research Service, September 2008, available at:

www.ers.usda.gov/publications/err64/

Contracts, Markets, and Prices: Organizing the Production and Use of Agricultural Commodities, by James MacDonald, Janet Perry, Mary Ahearn, David Banker, William Chambers, Carolyn Dimitri, Nigel Key, Kenneth Nelson, and Leland Southard, AER-837, USDA, Economic Research Service, November 2004, available at:

www.ers.usda.gov/publications/aer837/

Food Safety Innovations in the United States: Evidence from the Meat Industry, by Elise Golan, Tanya Roberts, Elisabete Salay, Julie Caswell, Michael Ollinger, and Danna Moore, AER-831, USDA, Economic Research Service, April 2004, available at:

www.ers.usda.gov/publications/aer831/

You may also be interested in ...

"Creating Markets for Environmental Stewardship: Potential Benefits and Problems," by Marc Ribaudo, in *Amber Waves*, Vol. 6, Issue 4, September 2008, available at: www.ers.usda.gov/amberwaves/september08/features/creatingmarkets.htm

"Do Food Labels Make a Difference? Sometimes," by Elise Golan, Fred Kuchler, and Barry Krissoff, in *Amber Waves*, Vol. 5, Issue 5, November 2007, available at: www.ers.usda.gov/amberwaves/november07/features/foodlabels.htm

"Agricultural Contracting: Trading Autonomy for Risk Reduction," by Nigel Key and James MacDonald, in *Amber Waves*, Vol. 4, Issue 1, February 2006, available at: www.ers.usda.gov/amberwaves/february06/features/feature3.htm

2008 Farm Act: Where Will the Money Go?

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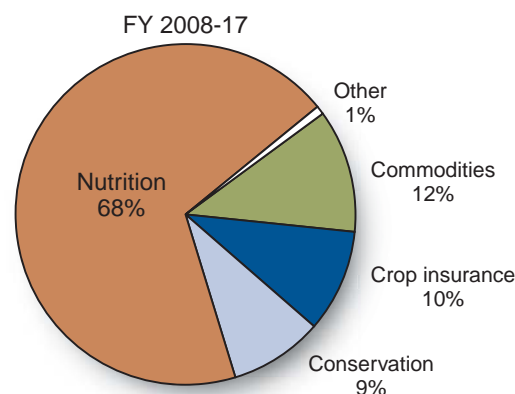
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AMBER WAVES

The Food, Conservation, and Energy Act of 2008 (Farm Act), enacted into law in June 2008, will govern the bulk of Federal agriculture and related programs for the next 5 years. The Act's 15 titles include administrative and funding authorities for programs that cover income and commodity price support, farm credit, risk management, conservation, export promotion, international food assistance and agricultural development, domestic nutritional assistance (including food stamps), rural development, agriculture and food sector research, accessibility and sustainability of forests, agricultural and rural renewable energy sources, and beginning and socially disadvantaged farmers and ranchers.

Who benefits from this vast array of programs? According to Congressional Budget Office projections, over two-thirds of Farm Act-related spending will not go to farmers in fiscal years (FY) 2008-17, but to food and nutrition programs to help low-income Americans purchase food, and provide food to programs that serve children and the elderly. Less than a third of the funding (spending) in the legislation will benefit farmers through commodity programs, crop insurance, and conservation programs. The remainder (1 percent) goes to all of the other programs, such as trade promotion, farm credit, research, and energy programs. These and other USDA programs are also funded in part by annual appropriations and other legislation.

Farm programs account for about 22 percent of Farm Act budget allocations

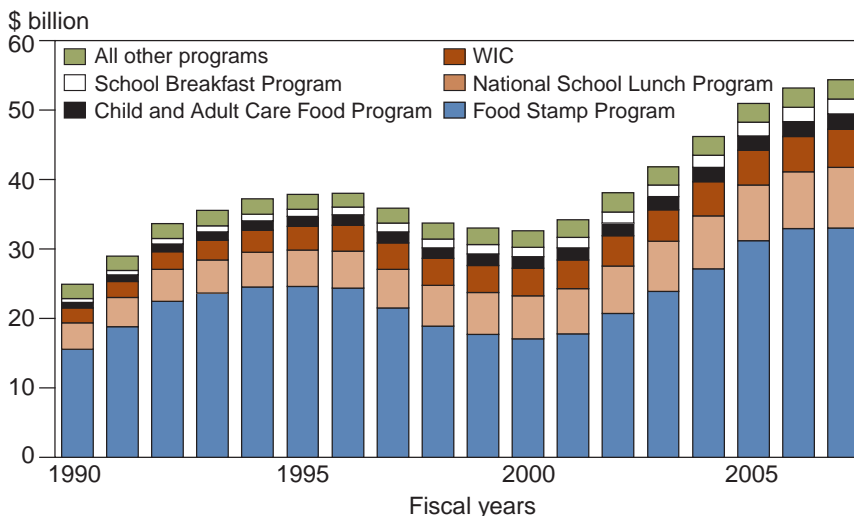


Source: USDA, Economic Research Service using Congressional Budget Office estimates.

Nutrition program spending on the rise

Expenditures for USDA's 15 domestic food and nutrition assistance programs that are funded in part through the nutrition title in the 2008 Farm Act have been increasing since FY 2000. The Food Stamp Program (renamed the Supplemental Nutrition Assistance Program (SNAP) in the 2008 Farm Act) accounted for 61 percent of total spending on nutrition programs in FY 2007. Projected increases in food stamp expenditures account for 85 percent of increased spending in the nutrition title. Food stamp use among States varied widely in FY 2007. Three States—Texas (\$2.7 billion), California (\$2.6 billion), and New York (\$2.3 billion)—accounted for one-quarter of total U.S. benefits (\$30.3 billion). However, on a per resident basis, payments were highest in the Delta and Appalachia regions.

Food stamps account for the bulk of nutrition program spending, FY 1990-2007

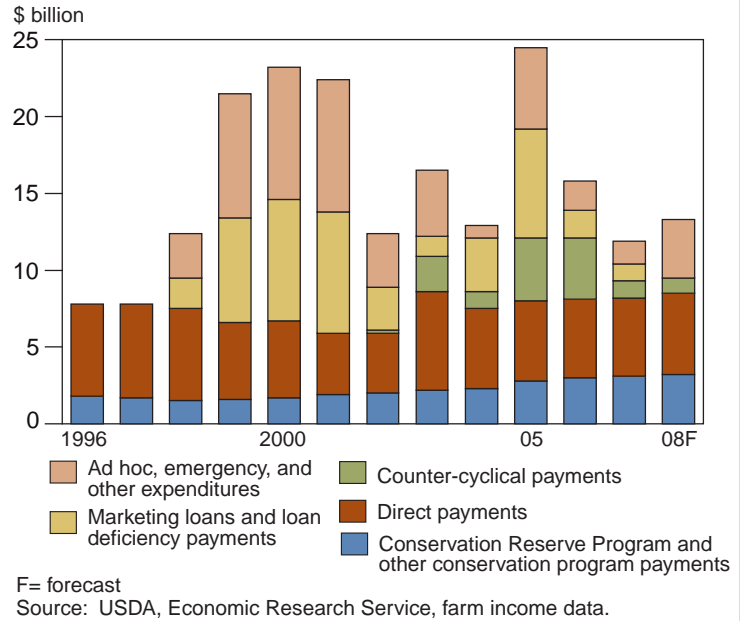


Source: Source: USDA, Economic Research Service using USDA, Food and Nutrition Service data.

Commodity programs benefit farmers

Eligible U.S. farmers receive support through a variety of Federal programs. The core programs provide price and income support for grains, oilseeds, fiber, dairy, and sugar. These commodity programs are intended to help farmers stabilize their incomes in the face of risks inherent in farming, and program expenditures can vary significantly from one year to the next. Other USDA programs help producers market products more effectively and farm in ways that preserve or enhance the environment. Commodity payments are concentrated in major producing areas. They are highest in the Southeastern Coastal Plain, where cotton and peanuts are produced, and along the lower Mississippi River, where cotton and rice are grown. Payments per acre are also high in the Corn Belt, where corn and soybeans are the predominant crops, in California, where rice and cotton are important, and in Arizona, where cotton is produced. Commodity program expenditures for direct and counter-cyclical payments are projected to decline under the 2008 Farm Act. Expenditures for the new Average Crop Revenue Election Program represent most of increased spending for commodity programs.

Government payments to the agricultural sector vary based on sector conditions



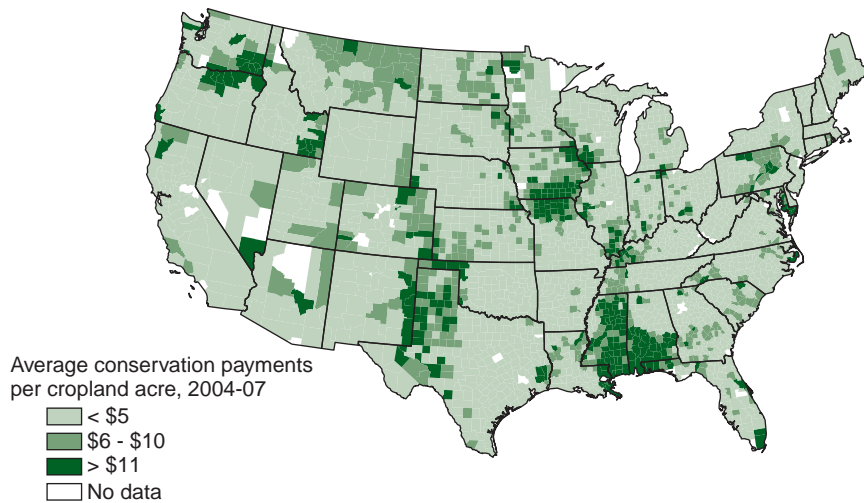
Conservation programs help farmers address environmental concerns

Conservation programs have led to a widespread reduction of soil erosion over the past seven decades. More recently established environmental programs address new challenges arising from demands for improved water and air quality, enhanced wildlife populations, water conservation, open space, carbon sequestration, and energy production and conservation. The two largest agri-environmental programs in terms of funding are the Conservation Reserve Program (CRP) and the Environmental Quality Incentives Program (EQIP). The 2008 Farm Act established the Conservation Stewardship Program (CSP), which replaces the Conservation Security Program established under the 2002 Farm Act. To participate in CSP, producers must demonstrate stewardship by showing that they have addressed at least one resource concern (e.g., soil quality or water quality) on their farm and agree to address at least one additional resource concern over the life of the 5-year contract. Payments are to be based on new practices adopted or installed under the CSP contract. The 2008 Act

increases funding for programs such as EQIP and CSP that address environmental needs for land that remains in production, while reducing expenditures on the CRP, a land

retirement program, by lowering the cap on total program acreage. This will likely shift spending to primary production regions such as the Corn Belt and Delta States.

Conservation payments are concentrated in regions with highly erodible soils or with water runoff concerns



Source: USDA, Economic Research Service using data from USDA, Farm Service Agency and USDA, National Agricultural Statistics Service.

For more information, see:

- ERS Briefing Room on Food and Nutrition Assistance Program Linkages with the General Economy, www.ers.usda.gov/briefing/generaleconomy/
- ERS Briefing Room on Farm and Commodity Policy, www.ers.usda.gov/briefing/farmpolicy/
- ERS Briefing Room on Conservation Policy, www.ers.usda.gov/briefing/conservationpolicy/

Data may have been updated since publication. For the most current information, see www.ers.usda.gov/publications/agoutlook/aotables/.

Farm, Rural, and Natural Resource Indicators

	2004	2005	2006	2007	2008	Annual percent change			
						2004-05	2005-06	2006-07	2007-08
Cash receipts (\$ bil.)	237.2	240.9	240.8	284.8	335.8 f	1.6	0.0	18.3	17.9
Crops	113.6	116.0	122.6	147.0	189.7 f	2.1	5.7	19.9	29.0
Livestock	123.6	124.9	118.2	137.9	146.1 f	1.1	-5.4	16.7	5.9
Direct government payments (\$ bil.)	13.0	24.4	15.8	11.9	13.2 f	87.7	-35.2	-24.7	10.9
Gross cash income (\$ bil.)	267.3	281.5	274.1	313.4	366.4 f	5.3	-2.6	14.3	16.9
Net cash income (\$ bil.)	82.3	86.6	68.0	87.4	101.3 f	5.2	-21.5	28.5	15.9
Net value added (\$ bil.)	127.6	123.6	103.1	132.5	144.2 f	-3.1	-16.6	28.5	8.8
Farm equity (\$ bil.)	1,434.6	1,642.2	1,851.0	1,998.4	2,147.3 f	14.5	12.7	8.0	7.5
Farm debt-asset ratio	11.3	10.5	9.6	9.6	9.0 f	-7.1	-8.6	-0.0	-6.3
Farm household income (\$/farm household)	81,596	81,599	77,654	87,031 p	90,009 f	0.0	-4.8	12.1	3.4
Farm household income relative to average U.S. household income (%)	134.8	128.8	116.7	128.7	na	-4.5	-9.4	10.3	na
Nonmetro-metro difference in poverty rate (% points) ¹	na	2.3	3.4	5.5	na	na	na	na	na
Cropland harvested (million acres)	312	314	304 p	na	na	0.6	-3.2	na	na
USDA Conservation Program Expenditures (\$ bil.) ^{1,2}	4.1	4.3	4.3	4.4 p	5.0 f	4.9	0.0	2.3	13.6

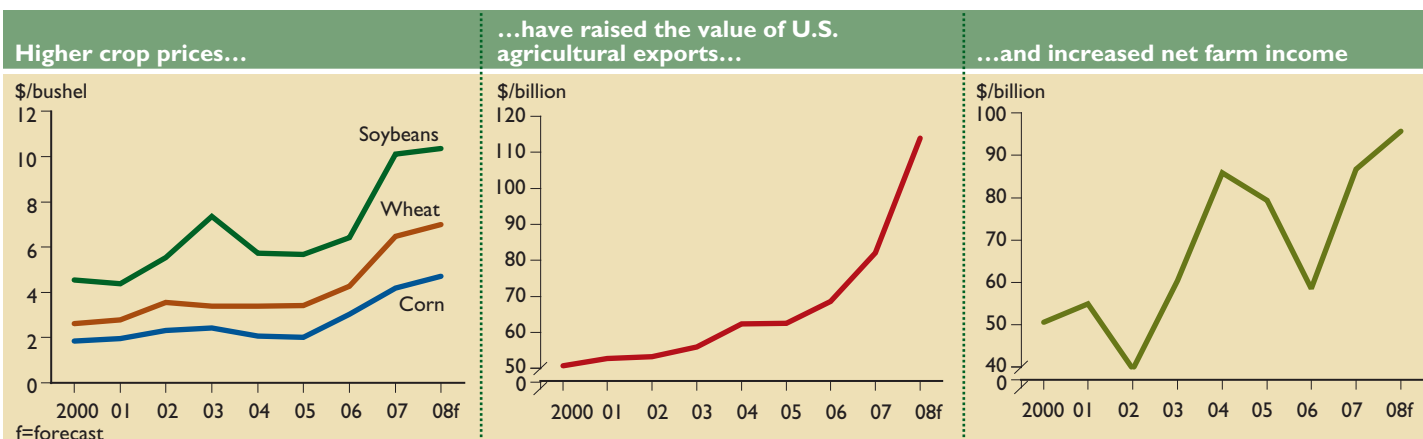
Food and Fiber Sector Indicators

U.S. gross domestic product (\$ bil.)	11,713	12,456	13,247	na	na	6.3	6.4	na	na
Share of agriculture & related industries in GDP (%) ¹	4.8	4.5	4.3	na	na	-6.3	-4.4	na	na
Share of agriculture in GDP (%) ¹	1.0	0.8	0.7	na	na	-16.3	-12.5	na	na
Total agricultural imports (\$ bil.) ²	52.7	57.7	64.0	70.1	79.0	9.5	10.9	9.5	12.7
Total agricultural exports (\$ bil.) ²	62.4	62.5	68.7	82.2	114.0	0.2	9.9	19.7	38.7
Export share of the volume of U.S. agricultural production (%) ¹	22.8	21.5	23.0	23.8 p	na	-5.7	7.0	3.5	na
CPI for food (1982-84=100)	186.2	190.7	195.3	202.9	214.1 f	2.4	2.4	3.9	5.5
Share of U.S. disposable income spent on food (%)	9.7	9.8	9.8	9.8	na	1.0	0.0	0.0	na
Share of total food expenditures for at-home consumption (%)	51.4	51.4	51.1	51.2	na	0.0	-0.6	0.2	na
Farm-to-retail price spread (1982-84=100)	232.1	239.2	246.2	248.3	na	3.1	2.9	0.9	na
Total USDA food and nutrition assistance spending (\$ bil.) ²	46.2	50.9	53.1	54.3	na	10.2	4.3	2.3	na

f = Forecast. p = Preliminary. na = Not available. All dollar amounts are in current dollars.

¹ The methodology for computing these measures has changed. These statistics are not comparable to previously published statistics. Sources and computation methodology are available at: www.ers.usda.gov/amberwaves/about/indicatorsnotes.htm

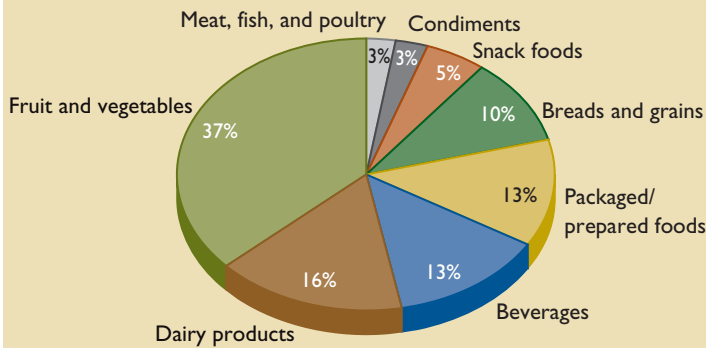
² Based on October-September fiscal years ending with year indicated.



For more information, see www.ers.usda.gov/amberwaves

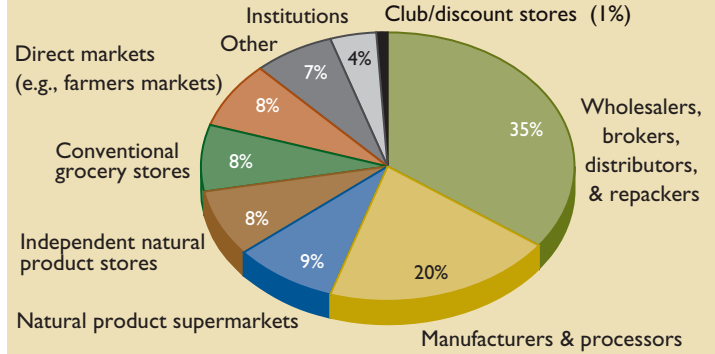
Markets and Trade

Fruit and vegetables accounted for over a third of organic retail sales in 2007



Note: Total organic retail sales were \$18.9 billion in 2007.
Source: *Nutrition Business Journal*, 2008.

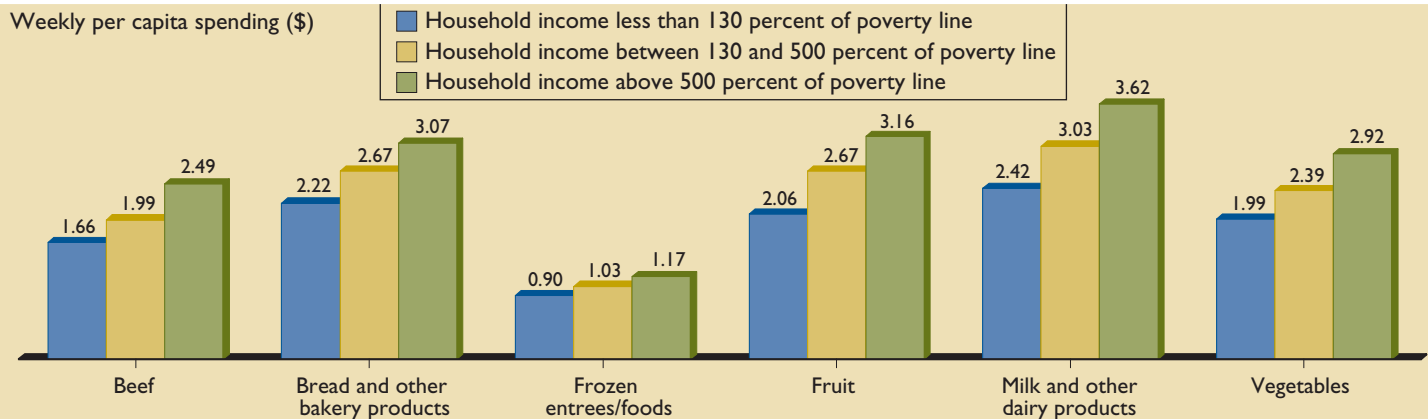
About 35 percent of organic handlers' sales went to wholesalers in 2004



Note: Outlets for handlers, 2004.
Source: USDA, Economic Research Service.

Diet and Health

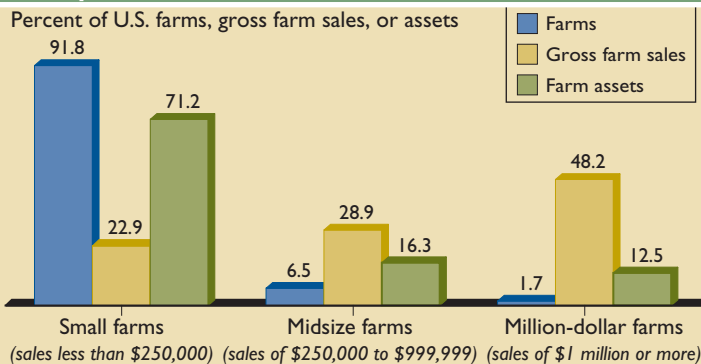
High and middle-income households outspend low-income households on many at-home foods



Source: Calculated by USDA, Economic Research Service using data from the Bureau of Labor Statistics' 2003 Consumer Expenditure Survey.

Farms, Firms, and Households

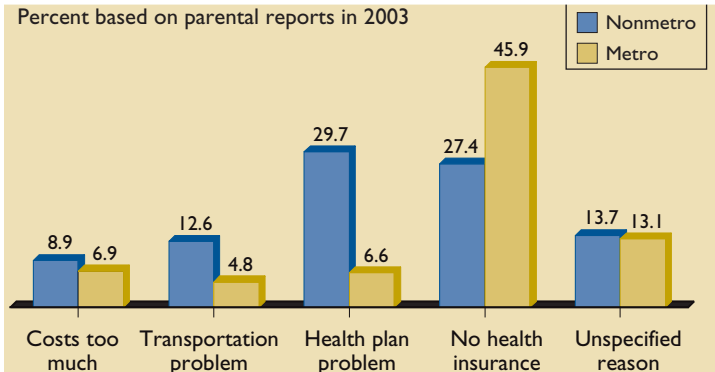
Million-dollar farms accounted for 2 percent of farms, 13 percent of farm assets, and 48 percent of sales of farm products in 2006



Source: USDA, Economic Research Service, 2006 Agricultural Resource Management Survey.

Rural America

Top five reasons why some nonmetro poor children did not receive needed medical care in 2003



Source: USDA Economic Research Service estimates based on 2003 National Survey of Children's Health, National Center for Disease Control.

On the Map

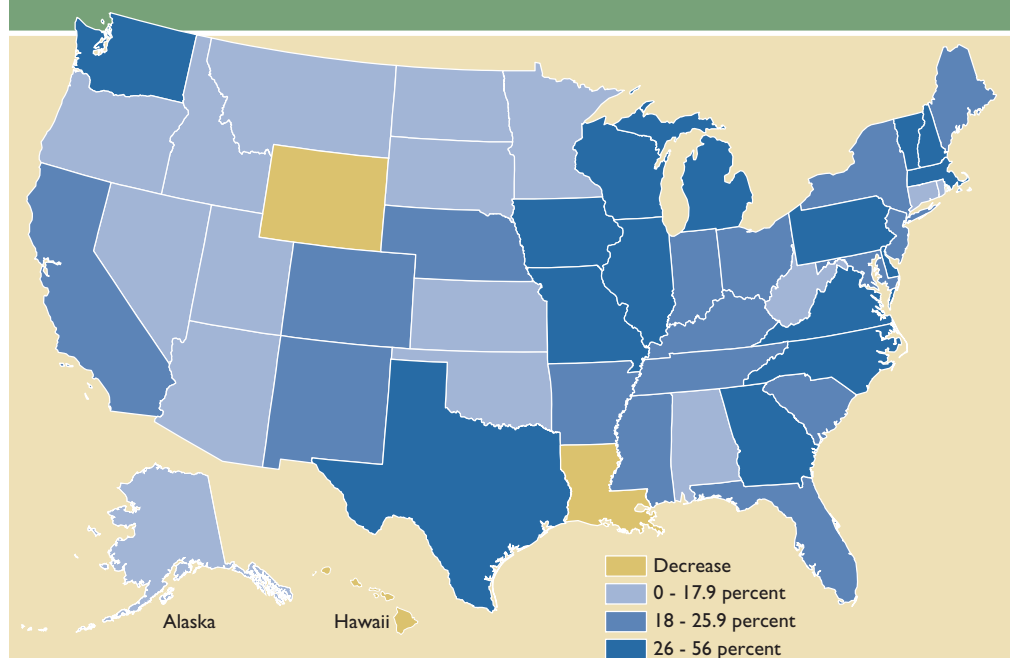
Food Stamp Participation up in All but Three States

Participation in the Food Stamp Program (renamed the Supplemental Nutrition Assistance Program (SNAP) in the 2008 Farm Act) grew nationally by 24.5 percent between fiscal years 2003 and 2007. Participation declined in three States during this period: Wyoming and Hawaii, down nearly 11 percent each; and Louisiana, down 1 percent. Massachusetts and Iowa saw the largest increases in participation, 56 percent and 55 percent, respectively. Factors that affect State-level participation include economic conditions, such as unemployment and housing costs, demographic composition of State residents, and State policies that aid or hinder participation.

John Young

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Percentage change in Food Stamp Program participation, FY 2003-07



Source: Prepared by USDA, Economic Research Service using data from USDA's Food and Nutrition Service.

In the Long Run

How Much Does Participation in the Food Stamp Program Reflect Economic Trends?

Participation in the Food Stamp Program (renamed the Supplemental Nutrition Assistance Program (SNAP) in the 2008 Farm Act) follows trends in poverty and unemployment, but cycles for the three are not completely in sync. In the 1980s, the number of food stamp participants peaked before the number of people in poverty and the number of people unemployed. But since 1989, the pattern has reversed, with food stamp participation peaking 2-3 years after the unemployment peak and 1 year after the poverty peak. Between 2003 and 2007, participation in the Food Stamp Program grew by 24.5 percent, and the number of people in poverty rose by 3.9 percent, while the number of people unemployed declined by 19 percent.

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Food stamp participants, people in poverty, and unemployed people, 1980-2007



Source: USDA, Economic Research Service using data from USDA, Food and Nutrition Service (food stamp participants); U.S. Census Bureau (poverty); and Bureau of Labor Statistics (unemployment).