



U.S. EGG SAFETY ACTION PLAN

BY REBECCA BUCKNER

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In August 1998, President Clinton established a Council on Food Safety to protect the health of the American people by preventing foodborne illness using science-based regulation and well-coordinated surveillance and investigation, inspection, enforcement, research and educational programs. The Council has identified egg safety as one component of the overall public health issue of food safety that warrants immediate federal, interagency action. Under the auspices of the President's Council, the Strategic Planning Task Force commissioned an Egg Safety Task Force composed of designees of the federal food safety agencies to develop an action plan to eliminate egg-associated *Salmonella* enteritidis (SE) illnesses. These agencies are the Department of Health and Human Services' (DHHS) U.S. Food and Drug Administration (FDA) and Centers for Disease Control and Prevention (CDC), and the U.S. Department of Agriculture's (USDA) Food Safety and Inspection Service (FSIS), Animal and Plant Health Inspection Service (APHIS), Agriculture Marketing Service (AMS) and Agriculture Research Service (ARS). The Egg Safety Action Plan developed by the task force identifies the systems and practices that must be implemented to reduce, and ultimately, eliminate eggs as a source of SE illnesses.

BACKGROUND

Salmonella of various serotypes are commonly found in the digestive tracts of animals and frequently contaminate our environment. Originally, *Salmonella* contamination of shell eggs was believed to occur primarily when organisms present on the egg passed through the shell into the egg's contents. However, more recently, transovarian SE contamination of egg contents has been determined to occur from SE-infected laying hens. The rate of transovarian egg contamination has been estimated at about one SE-positive egg in every 20,000 eggs produced in the U.S.

From 1985 to 1998, there have been a total of 796 SE outbreaks reported to CDC involving 28,689 illnesses, 2,839 hospitalizations and 79 deaths. In 1997 alone, an estimated 300,000 infections may have occurred. Eggs are responsible for approximately 82% of SE outbreaks with a confirmed source. A typical case of salmonellosis is characterized by diarrhea, abdominal cramps, nausea, vomiting, fever and headache. Symptoms usually begin within six to 72 hours after consuming food, last four to seven days, and resolve without antibiotic treatment for most people who do not have underlying health problems. However, the infection can enter the bloodstream leading to severe and fatal illness. The invasive, life-threatening form of the disease is more likely in highly susceptible populations, including children, the elderly and persons with weakened immune systems. CDC reported that 54 of the 79 deaths associated with outbreaks of SE between 1985 and 1998 were of individuals in nursing homes. In addition, about 2% of those who recover from salmonellosis may later develop recurring joint pain and arthritis.

On a per capita basis, Americans consume about 234 eggs per year. Traditionally, practices such as the use of raw eggs in foods and the undercooking and non-refrigeration of eggs were not food safety concerns for the general population. More recently, however, the potential for internal SE contamination of eggs and their associated human illnesses with these practices has been established. Many of the common egg-handling practices are now considered to be unsafe, including temperature abuse (for example, holding eggs and egg-containing foods at room temperature instead of under-refrigeration), inadequate cooking, and pooling two or more eggs to prepare more than one customer's order of egg-containing food that is subsequently temperature-abused or inadequately cooked. The presence of SE bacteria in a raw egg alone does not guarantee illness upon consumption. However, the likelihood of developing an SE infection increases when the egg is not handled safely, thereby permitting the bacteria to multiply. Investigations of egg-related SE outbreaks show that eggs are either not cooked or undercooked or that the

eggs are held at room temperature. In fact, many of the SE outbreaks that occurred between 1985 and 1998 were attributed to commercial establishments, such as restaurants, hospitals, nursing homes, schools and prisons, and greater than 75% of those SE outbreaks with an identified source were associated with foods containing eggs.

AGENCY ROLES AND RESPONSIBILITIES

Federal authority to regulate egg safety is shared by FDA and USDA-FSIS. In addition, USDA-APHIS conducts a control program that certifies poultry breeding stock and hatcheries as SE-free and USDA-AMS conducts a surveillance program to ensure proper disposition of restricted shell eggs (eggs that cannot be marketed as table eggs).

FDA has jurisdiction over the safety of foods generally, including shell eggs, under the Federal Food, Drug and Cosmetic Act. Under the Public Health Service Act, FDA also has the authority to prevent the spread of communicable diseases, including the authority to regulate foods when the foods may act as a vector of disease, as in the case of SE-contaminated eggs. USDA has primary responsibility for implementing the Egg Products Inspection Act (EPIA). Under EPIA, FSIS has primary responsibility for the inspection of processed egg products to prevent the distribution of adulterated or misbranded egg products.

SE RISK ASSESSMENT

In December 1996, FSIS and FDA jointly began a comprehensive risk assessment in response to an increasing number of human illnesses associated with the consumption of eggs. A team of scientists developed a quantitative model to characterize the risks associated with the consumption of eggs contaminated internally with SE, using information obtained from academic, government and industry sources and scientific literature. The risk assessment model consists of discrete modules that may be used independently to evaluate the effect of variable changes during a particular stage of the farm-to-table continuum. However, the overall model encompasses the entire continuum, from the chicken through egg production, to egg consumption and human illness. Overall, the model predicted that

while using any one intervention could achieve a modest reduction in human SE illnesses, using multiple interventions could achieve a more substantial reduction for those interventions tested. This finding suggests that a broadly based policy is likely to be more effective in eliminating egg-associated SE illnesses than a policy directed solely at one stage of the egg production-to-consumption continuum.

THE EGG SAFETY ACTION PLAN

On August 26, 1999, the President's Council held a public meeting to obtain input during the development of the action plan to address egg safety. A single theme resounded from representatives of the consumer groups and the egg industry: The federal government needs a set of national, mandatory standards. These standards should provide consumers an assurance that all eggs are subject to the same safety standards across the U.S. and provide egg producers and processors a "level playing field" industry-wide.

With this in mind, the Council concluded that the development and implementation of an Egg Safety Action Plan is the most effective way to achieve its public health goals. This comprehensive action plan identifies activities necessary to reach the overarching goal of the elimination of SE illnesses associated with the consumption of eggs by 2010, and the activities necessary to reach the interim goal of a 50% reduction in egg-associated SE illness by 2005. While the plan focuses on SE and eggs, major components of the plan offer food safety benefits well beyond the specific goal of eliminating egg-associated human SE illnesses. For example, upgrading the information systems at public health departments will contribute to reductions in all foodborne illnesses.

The action plan consists of eight objectives, each with at least one performance measure, covering all stages of the farm-to-table continuum as well as support functions. The farm-to-table continuum encompasses egg production, shell egg processing (or packing), egg products processing, egg distribution, and egg handling and preparation. The support functions are surveillance of human and poultry SE infections (including outbreak and traceback investigations) and research and education.

The action plan clearly lays out the components for an effective program to prevent human SE infections resulting from consumption of contaminated eggs. At each stage of the egg production-to-consumption continuum, the plan identifies the systems and activities necessary to achieve our food

safety public health goals. The specific objectives of the plan include measures to reduce the number of SE-containing eggs marketed to the consumer; to reduce exposure of consumers to SE-containing foods; to expand and upgrade surveillance systems for human SE infections and poultry SE infections; to accelerate SE outbreak detection and investigation; to improve communication among federal, state and local agencies involved in SE outbreak and traceback investigations; to ensure that adequate current information is available to make decisions about SE preventive controls, surveillance and education; and to educate individuals throughout the production-to-consumption continuum using science-based materials.

In order to meet the public health goals of the plan, both FDA and USDA-FSIS plan to publish proposed rules this year that would put measures in place to reduce the number of SE-containing eggs marketed to the consumer. Industry will have a choice between two strategies for SE risk reduction that are equivalent for meeting the interim goal of the plan of a 50% reduction in egg-associated SE illnesses by 2005. Strategy I will focus on risk reduction at the farm along with associated packer/processor controls. FDA will propose requirements that producers implement a consistent, nationwide SE reduction program for egg production that may include components such as purchasing chicks from SE-monitored breeders, a biosecurity program, rodent and pest control, cleaning and disinfection of poultry houses on a routine basis, and SE environmental testing to verify the reduction measure's effectiveness. Strategy II will focus on risk reduction at the packer/processor. FSIS will propose required Hazard Analysis & Critical Control Points (HACCP) procedures, including a kill step, for shell eggs and egg products at the packer/processor along with associated on-farm controls.

FDA also plans to take steps to reduce exposure of consumers, particularly at-risk populations, to SE-contaminated egg-containing foods. To this end, the agency will establish standards for safe egg handling and preparation practices using egg-relevant sections of FDA's 1999 Food Code. The Food Code is FDA's guidance for use and adoption by the states and includes best practices for the retail sector for handling and preparing potentially hazardous foods, including shell eggs.


Although a significant amount of risk reduction can be achieved through efforts during production, at the packer/processor and at retail, these efforts must be accom-

panied by proper handling of eggs during preparation. Therefore, the Egg Safety Action Plan emphasizes education for all participants in the farm-to-table continuum. Current efforts include outreach through the FightBac campaign and an education campaign targeted for immunocompromised individuals, seniors, health professionals, health educators, public affairs specialists, parents and childcare providers.

IMPLEMENTATION AND ASSESSMENT

To consolidate egg safety oversight responsibilities and provide clarity, the Council identified one responsible agency for each stage of the farm-to-table continuum based on the strengths of each agency. Under the plan, FDA will develop standards for the producer and the states will provide oversight and enforcement on the farm. FSIS will develop standards for both shell egg packers and egg product processors and provide inspection and enforcement for both. FDA, CDC and USDA will conduct surveillance and monitor activities. CDC will focus on human health, while FDA and USDA will focus on the food supply.

The performance measures that will be used to assess the progress of the plan toward its goal are the numbers of SE cases, isolates and outbreaks annually. The data will be collected using the following existing systems: Foodborne Diseases Active Surveillance Network (FoodNet), National *Salmonella* Surveillance System (via PHLIS), and National SE Outbreak Surveillance System and Foodborne Diseases Outbreak Surveillance System. The new data will be compared to the 1998 baseline values of 1.9 cases per 100,000 persons, 5,900 SE isolates and 45 SE outbreaks, respectively.

The President's Council on Food Safety has identified egg safety as one component of the public health issue of food safety that warrants immediate federal, interagency action. The Egg Safety Action Plan identifies the systems and practices that must be implemented to reduce and, ultimately, eliminate eggs as a source of human SE illnesses. The risk reduction measures outlined in the plan at all levels of the farm-to-table continuum, along with consumer education and new knowledge gained from research efforts, will combine to make the public health goal of the Council, elimination of egg-associated SE illness by 2010, a reality. 

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