



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

USDA Modernizes Meat and Poultry Inspection

Jean C. Buzby and Stephen R. Crutchfield
(202) 219-0905 (202) 501-7415

The U.S. Department of Agriculture (USDA) oversees the safety of raw meat, poultry, eggs, and egg products. USDA's traditional inspection system for meat and poultry has relied largely on sight, touch, and smell—which were appropriate when the first major meat inspection law was passed in 1906. This carcass-by-carcass approach was developed in an era when the goal was to protect consumers from obvious abnormalities, such as visible lesions and other signs of animal diseases.

Since then, microscopic hazards—such as pathogens (bacteria, parasites, fungi, and viruses that cause human illness)—have attracted the attention of regulators and public-health authorities. Carcass-by-carcass visual inspections cannot detect these hazards. As a result, USDA is aggressively modernizing many aspects of the current inspection system to detect and reduce these microbial hazards.

In July 1996, new rules for meat and poultry processors and new testing procedures for plants and Federal inspectors were promulgated. The new system relies more on preventing contamination on

meat and poultry, whereas the old system relied more on after-the-fact detection of defective products.

The economic issue of concern is how best to achieve the goal of a safer food supply. Although regulations governing the production, processing, distribution, and marketing of food products may reduce foodborne illnesses, these regulations may also increase costs to producers and potentially raise the costs of food to all consumers. The task is to ensure that the regulations maximize the net benefits of increasing food safety. Economically efficient regulations are those where the incremental benefits of safer food equal the incremental costs of achieving food safety goals.

The U.S. Centers for Disease Control and Prevention (CDC) and USDA together have determined that up to 5 million human illnesses and 4,500 deaths occur each year in the United States from consuming meat and poultry products contaminated with *Campylobacter*, *E. coli* O157:H7, *Salmonella*, *Listeria monocytogenes*, *Clostridium perfringens*, *Staphylococcus aureus*, and *Toxoplasma gondii*. Slaughtering, defeathering, and processing all provide opportunities for contamination of meat and poultry from the bacteria found in the gastrointestinal tracts and on the hides and hooves of some animals.

Fecal contamination is the main source of pathogen contamination of carcasses.

USDA has already taken many other actions to reduce bacterial contamination of meat and poultry, which will in turn reduce the extent and severity of foodborne illness in the United States. A sample of these actions include mandatory safe-handling labels for raw meat and poultry products, increased funding for food-safety research, establishment of a USDA liaison at CDC, and the creation a new position, Under Secretary for Food Safety, which reports to the Secretary of Agriculture.

Modernization Plan Focuses on Prevention

The Food Safety and Inspection Service (FSIS) is USDA's agency in charge of meat and poultry inspection. As part of their ongoing efforts to enhance the safety of meat and poultry, FSIS is implementing a comprehensive strategy to modernize the 90-year old inspection program. There are four essential elements of this new food-safety system:

- All State and federally inspected meat and poultry slaughter and processing plants must have a

The authors are agricultural economists with the Food and Consumer Economics Division, Economic Research Service, USDA.

Hazard Analysis and Critical Control Points (HACCP) plan.

- All State and federally inspected meat and poultry plants must develop written sanitation standard operating procedures to show how they will meet daily sanitation requirements.
- FSIS will test for *Salmonella* on raw meat and poultry products to verify that pathogen reduction standards for *Salmonella* are being met.
- Slaughter plants will test for generic *E. coli* on carcasses to verify the process is under control with respect to preventing and removing fecal contamination.

Hazard Analysis and Critical Control Points Plan

USDA now requires that all meat and poultry plants develop HACCP plans to monitor and control production operations. These plants must first identify food-safety hazards and critical control points in their particular production and processing. In addition to biological hazards, such as pathogens, food-safety hazards include chemical and physical hazards, such as chemical residues and metal fragments, that may cause a food to be unsafe for human consumption. A critical control point is a point, step, or procedure where controls can be used to prevent, reduce to an acceptable level, or eliminate food-safety hazards.

As part of the HACCP plan, these plants must then establish critical limits for each hazard at a critical control point. Monitoring activities are necessary to ensure that the critical limits are met. In their HACCP plan, each plant is required to list its monitoring procedures and frequen-

cies. HACCP also includes steps for recordkeeping and verification, including some microbial testing of products to ensure the HACCP system is meeting the target level of safety for specific pathogens. Slaughter and processing plants and FSIS share responsibility for verifying the effectiveness of the HACCP system.

HACCP will be implemented first in plants with more than 500 employees. Seventy-five percent of meat slaughtered occurs in large slaughter plants. The effective date will be January 26, 1998—18 months after the July 1996 rule was published. In plants with 500 or fewer (but more than 10) employees, the effective date will be January 25, 1999. In very small establishments (those having fewer than 10 employees or annual sales of less than \$2.5 million), the effective date will be January 25, 2000.

Sanitation Standard Operating Procedures

USDA's new regulation for pathogen reduction as published in the Hazard Analysis and Critical Control Point Systems final rule requires that all State and federally inspected meat and poultry plants develop written sanitation standard operating procedures to show how they will meet daily sanitation requirements. This element is important in reducing pathogens on meat and poultry, because unsanitary practices in meat and poultry plants increase the likelihood of product contamination. Plants must document and maintain daily records of completed sanitation standard operating procedures, and any corrective and preventive actions taken. Plant managers must make these records available for FSIS inspectors to review and verify. Inspectors will perform hands-on sanitation inspection to verify plant's records. The

sanitation standard operating procedures' requirement for all sizes of slaughter and processing plants became effective on January 27, 1997—180 days from the date of publication of the final rule.

FSIS Will Test for *Salmonella*...

FSIS testing for *Salmonella* on raw meat and poultry products functions as an independent regulatory requirement and as a measure of the effectiveness of the plant's HACCP plan. All plants that slaughter and grind meat and poultry must achieve at least the current baseline level of *Salmonella* control for the product classes they produce. *Salmonella* was selected for testing because it is the most common cause of foodborne illnesses associated with meat and poultry in the United States. Plants must meet the *Salmonella* standard on the same time tables as they meet the HACCP requirement.

...And Slaughter Plants Will Test for *E. coli*

Slaughter plants will be required to test for generic *E. coli* on carcasses to verify that they are preventing and removing fecal contamination. Generic *E. coli* was selected because of the scientific consensus that it is an excellent indicator of fecal contamination, because the analysis is relatively easy and inexpensive to perform, and because levels of *E. coli* contamination can be quantified. One type of *E. coli*—*E. coli* O157:H7—causes foodborne illness and, in some cases, can lead to chronic kidney failure and death. *E. coli* contamination is not directly correlated with *Salmonella* contamination, which is affected by other factors as well, including the health

and condition of incoming animals. Therefore, the pathogen reduction standards for *Salmonella* and the *E. coli* testing complement one another.

The *E. coli* performance criteria are intended to provide an objective point of reference that will help slaughter plants and FSIS ensure that plants' process controls are preventing and reducing fecal contamination of meat and poultry products. These performance criteria are based on FSIS survey data on the prevalence of *E. coli* in raw products. These criteria could also be a factor in triggering regulatory action when considered with other information and inspectional observation.

Plants, regardless of size, were required to begin testing for *E. coli* on January 27, 1997. Plants were given an additional 6 months to gain experience in conducting these tests before FSIS personnel begin reviewing the test results as part of their inspection routine.

Enforcement Strategies Outlined

Implementation of the four essential elements of USDA's new food-safety system follows a schedule. In general, larger establishments are expected to comply sooner than smaller establishments. If FSIS inspectors find violations of these new requirements, enforcement action will vary, depending on the seriousness of the identified problem.

USDA's first concern will continue to be preventing potentially unsafe or adulterated products from reaching consumers, which could mean detaining products at the plant or requesting the company to recall the products. Violations of an establishment's HACCP and sanitation standard operating procedures will be noted by inspection personnel. A pattern of minor violations may

result in suspension of inspection if it is an indication of a systemic problem of noncompliance or underlying food-safety concern.

For more serious violations involving adulterated or contaminated products, inspectors may stop production lines until failures in HACCP and sanitation standard operating procedures are corrected and the plant provides measures to prevent recurrence. Inspectors may also identify specific equipment, production lines, or facilities that are causing the violations and remove them from use until sanitation or other problems are corrected.

Repeated or flagrant violations will result in other administrative, civil, or criminal penalties, after due process of the law. For example, improper maintenance or falsification of records would have potentially serious implications that may lead to withdrawal of inspection, because accurate recordkeeping is essential to the functioning of sanitation and HACCP systems and to the production of foods safe for human consumption. USDA will continually monitor and adjust its enforcement approach during this program transition to ensure its enforcement activities are effective, fair, and consistent.

Benefits and Costs of HACCP Compared

USDA's Economic Research Service (ERS) worked with FSIS to estimate the potential savings in medical costs and lost productivity associated with the new meat and poultry inspection systems when they are fully implemented. ERS estimated the costs from illnesses caused by seven major microbial pathogens in all food sources in 1993 to be between \$5.6 billion and \$9.4 billion annually. FSIS used ERS

estimates for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, and *Listeria monocytogenes* and calculated that the portion of these annual costs attributed to meat and poultry is \$0.99 billion to \$3.69 billion.

The overall benefits of pathogen reduction will depend on how successful HACCP is in reducing pathogens and preventing new cases of foodborne disease. FSIS estimated the costs of HACCP incurred by meat and poultry processors and FSIS over 20 years to be \$1 billion to \$1.2 billion (discounted to 1993 dollars to put future HACCP costs at the same point of reference). Using the low estimate of medical and productivity costs, FSIS determined that if HACCP reduces these illnesses by 15 to 17 percent, then the benefits of HACCP outweigh the costs. If the high estimate of medical and productivity costs applies, then the benefits of HACCP outweigh the implementation costs as long as at least 4 or 5 percent of illnesses are averted.

Outlook for Safer Foods

As USDA continues to strengthen the meat and poultry inspection system, other initiatives are underway to promote food safety. The U.S. Food and Drug Administration (FDA), which also has responsibility for monitoring food safety, is implementing a HACCP system for inspection of seafood products.

A governmentwide effort is underway to promote the safety of eggs and egg products. USDA, FDA, and CDC, along with State officials and private organizations, are examining the possibility of HACCP systems for eggs and egg products, targeted specifically at reducing the incidence of *Salmonella enteritidis*. *Salmonella enteritidis* is considered one of the leading causes of foodborne illness in the United States. Over the next few years, these changes and improvements in our

systems of food-safety regulation and inspection can be expected to improve the safety of the Nation's food supply.

References

Buzby, Jean C. and Tanya Roberts. "ERS Estimates U.S. Foodborne

Disease Costs" *FoodReview*, USDA, Economic Research Service, Vol. 18, Issue 2, May-Aug., 1995.

Buzby, Jean C., Tanya Roberts, C.-T. Jordan Lin, and James MacDonald. *Bacterial Foodborne Disease: Medical Costs and Productivity Losses, 1993*, AER-741. USDA, Economic Research Service. Aug. 1996.

CAST Report. "Foodborne Pathogens: Risks and Consequences,"

Task Force Report No. 122, ISSN 01944088; Washington, DC: Council for Agricultural Science and Technology. Sept. 1994.

Federal Register. "Pathogen Reduction; Hazard Analysis and Critical Control Point (HACCP) Systems; Final Rule," Vol. 61, No. 144, July 25, 1996, pp. 38805-989. ■