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Food Safety: Setting and Enforcing Standards

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In December 2001, the United States Fifth Circuit Court of Appeals upheld a Texas district court decision blocking the U.S. Department of Agriculture (USDA) from closing a beef processing plant that had failed a series of *Salmonella* tests. This court ruling is the latest development in the evolution of food safety policy for meats and poultry. Over the last decade, the federal government has adopted new approaches and set new kinds of safety standards for meat. But these actions have been controversial with both industry and consumers. How the disputes over setting and enforcing food safety standards are resolved will have important consequences for the food industry, food costs, and public health. This article will examine the economic implications of setting performance standards for food safety. It is argued that performance standards would improve the efficiency of meat safety regulation by encouraging processing firms to find the most cost-effective means of reducing hazards in the food supply chain.

The Federal Role in Food Safety

Because of the high quality of U.S. food production and the current governmental standards, most food safety hazards today are fairly modest in scope and severity. Nevertheless, food safety is now receiving considerable public attention for several reasons. Science can trace many food-borne illnesses to specific pathogens in food. As consumers live longer and become more affluent, they demand higher levels of quality and safety. Changes in production practices and new sources of food, such as imports, introduce new risks. More foods are also purchased away from home or in prepared form, giving consumers less control.

More fundamentally, the economic rationale for governmental involvement in food safety is

clear. Consumers often cannot detect food hazards at the time of purchase, and thus cannot always indicate their demand for safer food through purchase decisions. Many food-borne hazards, such as microbial pathogens or residues from pesticides or drugs, are not easily detectable when consumers purchase food in grocery stores or restaurants. Even an acute illness may be difficult to trace to a specific source, if the illness occurs several days after con-

sumption. Because some hazards can enter the food supply anywhere from farm to table, and can grow or diminish once present, food producers may be unable to identify hazards or guarantee a safety level. This lack of information means that markets can fail to provide the level of safety that equates consumers' marginal utility with producers' marginal costs.

Public policies have addressed this market failure by setting standards and testing for safety. Twelve different government agencies have authority over different aspects of food safety in the U.S. The Food and Drug Administration (FDA) and the USDA carry out most food safety oversight activities. The USDA has primary responsibility for food safety in meat and poultry; the FDA has primary responsibility for all other foods.

The way in which public agencies approach food hazards has changed considerably during the past decade. The National Academy of Sciences has advocated a risk assessment approach to food safety regulation—determining how hazards enter food and where control is easiest. The approach also requires that expected regulatory benefits should exceed costs. The USDA and the FDA have used this approach in recent regulations.

A related trend in food safety regulation is the mandated use of the Hazard Analysis Critical Control Point (HACCP) systems of safety management. Under HACCP, processors are required to identify critical control points and develop procedures for monitoring and addressing failures in control. In 1996, the USDA mandated the use of HACCP in meat and poultry plants in order to reduce microbial pathogens in meat and poultry. The FDA mandated HACCP for seafood plants in 1995 and for fruit juice in 2001. Such mandates reflect the growing importance of preventing and controlling hazards before they reach the consumer.

Microbial Pathogens in Meat and Poultry

Since the beginning of the 20th century, the USDA has examined each meat carcass at slaughter (poultry was included in 1957). If the animal is disease-free, then the meat is considered suitable for human consumption. The USDA also monitors the operation of equipment, plant sanitation procedures, use of ingredients, and product labeling. Although it removed diseased animals and ensured sanitation, this system could not address microbial pathogens. Pathogens such as *E.coli* O157:H7 and *Salmonella* can live in the gastrointestinal tract of animals and may enter meat during slaughter and processing.

To address these hazards, the USDA 1996 Pathogen Reduction Regulation called for several major changes in meat inspection. First, all plants must follow HACCP plans to identify critical control points where hazards can enter, establish control procedures, and set critical limits. An example is ensuring that a refrigerated product is chilled at a specified temperature. HACCP includes steps for record-keeping and verification of control procedures, including some microbial pathogen tests to ensure that controls meet target safety levels.

Second, the USDA and the plants share this responsibility for microbial tests under the regulation. The USDA tests for *Salmonella* on raw meat and poultry; plants test for *E.coli* on carcasses. *Salmonella* is one of the most common food-borne illnesses, accounting for 1.3 million cases and 550 deaths per year, according to the Centers for Disease Control. Under the regulation, plants showing higher than industry-average *Salmonella* levels must reduce these levels over time.

Under the Pathogen Reduction/HACCP regulations, the USDA can initiate a withholding, suspension, or withdrawal action based on failure to:

- collect and analyze samples for the presence of *E.coli* and record results,
- develop or implement Sanitation Standard Operating Procedures,
- develop or implement a required HACCP plan, or
- meet applicable *Salmonella* performance standard requirements.

It is this last requirement—regarding *Salmonella* performance standards—that was the subject of the court case.

In 1999, the Supreme Beef Processors of Dallas, Texas filed suit against the USDA to prevent plant shutdowns resulting from *Salmonella* test results. The standards permitted no more than 7.5% of a plant's ground beef to contain *Salmonella*; more than 90% of federally inspected plants met that standard. Other plants failing the tests undertook corrective actions and stayed open. The USDA moved to withdraw inspectors after the Supreme Beef plant failed *Salmonella* tests three times over eight months. Removal of inspectors would have

shut down the plant, but a court injunction preventing this action was later upheld by the ruling. Supreme Beef argued that the government has no authority to regulate *Salmonella*: "[B]ecause *Salmonella* is not an adulterant and because *Salmonella* is destroyed during normal cooking, the presence of *Salmonella* is not a public safety issue."

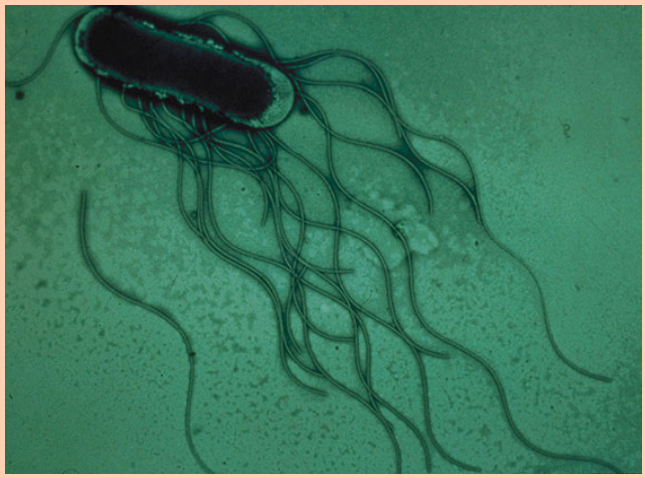
The first ruling in Texas, appealed and upheld in December 2001, found that the USDA did not have statutory authority to suspend inspection in the plant because *Salmonella* test results do not necessarily evaluate the sanitation conditions of the plant. The *Salmonella* found at Supreme Beef, which grinds beef for hamburger, enters on raw materials purchased from beef slaughter plants. This ruling applies only to Supreme Beef (which is now defunct) but sets a precedent for *Salmonella* tests at other meat and poultry plants.

According to the USDA, the *Salmonella* performance standard continues in the USDA's Pathogen Reduction/HACCP inspection system. *Salmonella* testing will be used along with other information to verify that Pathogen Reduction /HACCP systems and sanitation systems are under control. A plant that fails two *Salmonella* sample sets will be subject to an in-depth review of the plant's food safety systems. If deficiencies are found, the USDA may initiate enforcement action. Thus, *Salmonella* test results must be used in conjunction with other information to shut down a plant.

The use of microbial pathogen testing to set performance standards in meat and poultry is currently under study by the National Academy of Sciences and the National Advisory Committee on Microbiological Criteria for Foods. On March 14, 2002, members of Congress introduced legislation to restore the USDA's authority to set and enforce standards for *Salmonella* in meat and poultry, including the power to close processing plants.[1]

Economic and Policy Issues

Several food safety regulatory issues are not fully resolved, as the recent court decision demonstrates.



These issues include the USDA's authority under current meat inspection laws as well as the scientific validity of sampling and testing procedures. Beyond these legal and scientific issues, is a microbial pathogen standard for meat and poultry plants economically rational? The economic issues surrounding responsibility, balancing costs and benefits, and efficiency are explored below.

Who is responsible for food safety—the food producer or the consumer? Naturally occurring microbial pathogens can enter food at several points from farm to table. They can then multiply or cross-contaminate other foods. The current USDA position is that all those involved in food production and consumption share food safety responsibility. Yet even acceptance of shared responsibility does not preclude controversy over who will bear specific risks or the costs of risk avoidance.

Historically, responsibility for reducing such pathogens rested mainly with the final food preparer. The appeals court decision noted that "American housewives and cooks normally are not ignorant or stupid, and their methods of preparing and cooking food do not ordinarily result in salmonellosis." But the advent of more fresh foods and use of new technologies, such as microwave ovens, changes some food safety risks in the home. Furthermore, food preparation has increasingly moved outside the home—to restaurants, day care centers, nursing homes, or even deli counters in grocery stores. These changes reduce consumer control over food preparation and change traditional ways of ensuring food safety. Clearly, consumer protection in this changing food system means shifting more

1. *Bills were simultaneously introduced in both the House and the Senate. These bills were referred to the respective Agriculture committees in May 2002. No further actions have been taken.*

responsibility to the food industry. The questions are how and to what extent to regulate different parts of the food chain.

One approach is to determine the most cost-effective point to intervene in the food supply chain. However, federal agencies currently have responsibility for only certain portions of the food supply chain or types of food. Because the food retail sector is not federally regulated, federal actions have focused on meat and poultry plants. Requiring these plants to meet microbial pathogen standards reduces the probability of later contamination at the retail level and subsequent food-borne illness. Because animal slaughter and processing are critical control points for pathogens in the food supply chain, enforcing standards for these plants is part of an effective control strategy. By making such standards more difficult to set and enforce at the processing level, the court decision forces consumers and regulators to focus on other ways of preventing food-borne illness.

How should costs and benefits be balanced in setting food safety standards? Benefits from reducing food-borne illness are potentially very large. The range of estimated benefits from reducing food-borne illness due to improved meat and poultry food safety could range from $2 billion to $172 billion annually over the next 20 years. This wide range reflects varying estimates of the extent of food-borne illness and different methods for valuing life and health. On the cost side, the new investments needed to reduce pathogen levels over time are uncertain. The USDA estimates the costs of the Pathogen Reduction Regulation at $1.1 to 1.3 billion over the next 20 years. The wide gap between estimated benefits and costs led USDA to the conclusion that the regulation provided net positive benefits. Recent research has shown that specific costs at some plants may be 30 to 100 times higher than USDA estimates, although still only 1 to 2% higher than current total processing costs. Furthermore, the food safety improvement costs increase sharply as control becomes more effective (i.e., there are rising marginal costs of control). Thus, a standard's allowable levels will determine the increases in processing costs.

Increased costs are not evenly distributed across plants. The *Salmonella* standard of no more than 7.5% of samples was based on average industry levels in pre-regulation tests conducted by USDA. The USDA's nationwide test results show that only a few plants have higher levels of *Salmonella*. Those plants might have higher *Salmonella* because they have few controls and in that case can achieve initial reductions in pathogens with simple inexpensive controls. Or, their higher *Salmonella* levels could be due to unique circumstances that are costly to control. Whether improvements in these plants will result in widespread reductions in food-borne illness is also unknown. Greater public health benefit might be achieved by reducing the *Salmonella* levels in all plants by a small amount. Thus, the costs and benefits of this kind of standard are uncertain.

What kind of standard will improve food safety most efficiently? Standards can either require a certain product outcome (e.g., the 7.5% *Salmonella* limit) or certain production processes, such as specific sanitation procedures. Economists argue that product outcome standards are less costly over time, because firms can choose how to comply at least cost. Process standards force firms to use the same procedures, even when changes occur in technologies or knowledge about hazards. An outcome standard provides accountability to the public and transparency to industry. It ensures that regulation is uniformly enforced across plants. In practice, food safety standards often combine product outcome and process standards, because it is difficult and expensive to test food products.

The Pathogen Reduction Regulation combines both kinds of standards. It requires certain processes (e.g., a HACCP plan with monitoring and record keeping) as well as outcome measures such

as *E.coli* and *Salmonella* tests. The court ruling reduces the importance of the *Salmonella* tests as an outcome standard, although both *E.coli* and *Salmonella* tests will continue to inform the USDA about how effectively HACCP is reducing pathogens. Efficiency of the Pathogen Reduction Regulation would increase if scientists agree on performance standards for microbial pathogens in meat. Such standards would encourage firms to find ways to reduce the incidence of these pathogens in the food supply.

The desirability of setting clear standards for microbial pathogens is supported by analyses of risks and costs, how to balance costs and benefits, and how to efficiently achieve public health goals. Both consumers and industry would be better served by clear standards. This may require changes in the meat and poultry inspection laws and further research to determine the best monitoring and control methods. Better understanding of the incremental costs and benefits achieved with different standards would help to determine how to improve food safety most efficiently.

For More Information

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