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# FOOD SAFETY

# Risk-Based Inspections and Microbial Monitoring Needed For Meat and Poultry

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Mr. Chairmen and Members of the Subcommittees:

We are pleased to be here today to discuss the effectiveness of the federal meat and poultry inspection system and the need to move to a scientific, risk-based system. Our testimony is based on our past reports and testimonies as well as current work we are doing at your request.

Over the past 15 years, GAO and others have repeatedly reported that the existing federal meat and poultry inspection system is obsolete and must be replaced with a scientific, risk-based system to better protect the public from foodborne illnesses.[1] In addition to providing information on why the federal system is not responding to the principal risk associated with meat and poultry--microbial contamination--our testimony today will focus on industry efforts to use microbial testing programs. We will also critique the Food Safety and Inspection Service's (FSIS) proposal that meat and poultry plants implement a quality control system known as hazard analysis and critical control point (HACCP).

In summary, we found that

-- FSIS' move towards a scientific, risk-based inspection system is hampered by outdated statutory inspection requirements and labor-intensive inspection procedures. Consequently, most of FSIS' resources are devoted to carrying out the hands-on, visual inspection techniques that are not capable of detecting microbial contaminants.

-- FSIS does not routinely test for microbial contamination, does not require industry to perform microbial tests, and does not provide assistance to plants wanting to implement testing programs. Nevertheless, recognizing the importance of microbial testing, some plants have set up microbial testing programs on their own to ensure the safety and quality of their products. While self-initiated plant programs have resulted in worthwhile changes, they also vary in their effectiveness because sampling methodologies, types of tests performed, and test evaluation criteria differ from plant to plant.

-- A HACCP system is generally considered as the most effective approach currently available for ensuring safe foods. While FSIS plans to require that each meat and poultry plant develop and implement a HACCP system, it has not yet determined whether microbial testing will be required as an essential component of those systems.

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[1]Food Safety: Building a Scientific, Risk-Based Meat and Poultry Inspection System (GAO/T-RCED-93-22, Mar. 16, 1993).

Without specifying microbial testing requirements and establishing guidelines as to when test results require remedial actions, FSIS has no assurance that industry HACCP programs will effectively combat microbial contamination or that effective remedial actions will be taken when problems occur.

Before providing more details on our findings, we will briefly discuss the current inspection system.

## CURRENT FEDERAL MEAT AND POULTRY INSPECTION

To improve the safety of meat and poultry products, the Congress passed the Federal Meat Inspection Act in 1907 and the Poultry Products Inspection Act in 1957. These acts require federal inspection of meat and poultry to ensure that they are safe, wholesome, and correctly labeled and packaged.

To achieve these objectives, the acts require that during slaughter operations each individual animal carcass be examined by an on-line FSIS inspector. During this "post mortem" inspection, largely unchanged for 87 years, inspectors make judgments about disease conditions, abnormalities, and contamination in carcasses based on what they see, feel, and smell--a process known as organoleptic inspection.

Meat and poultry from government-inspected carcasses can be inspected again during further processing. (Processing can include simple cutting and grinding operations, complex canning procedures, or preparation of ready-to-eat products.) FSIS has long implemented these statutory responsibilities through daily inspections, under which all meat and poultry processing plants are inspected at least once each operating shift and again during overtime operations. These processing inspections also rely primarily on organoleptic methods.

FSIS and others have recognized that organoleptic inspection techniques are not capable of detecting microbial pathogens--the principal risk associated with meat and poultry. Although the actual extent of foodborne illnesses is unknown, the Centers for Disease Control estimates that there are from 6.5 million to more than 80 million cases annually and has recognized that meat and poultry products are a primary cause of foodborne disease. USDA estimates that the annual cost of foodborne illness in the United States ranges from $5.2 billion to $6.1 billion, with more than one-half of this amount--$3.9 billion to $4.3 billion--attributable to meat and poultry.

## FSIS UNABLE TO EFFECTIVELY USE ITS RESOURCES

Because of inflexible statutory inspection requirements and labor-intensive inspection procedures that are not capable of

detecting microbial pathogens, FSIS is not able to target its resources on microbial contamination. Moreover, the usefulness of FSIS' current approach is likely to diminish further because current FSIS resources cannot keep pace with industry growth. We estimate that in fiscal year 1993 FSIS allocated about two-thirds of its 10,750 staff year budget to perform outdated, labor-intensive inspections and to comply with statutory inspection requirements.

FSIS annually allocates over 5,000 staff years, or 47 percent of its total staff year budget, to meet the legal requirement that it examine every carcass. In addition to inspecting every carcass, FSIS, in accordance with current law, inspects about 5,900 meat and poultry processing plants at least once each operating shift, which accounts for about 2,200 staff years, or 20 percent of its total staff years.

Experts have increasingly questioned the public health benefits of FSIS' reliance on organoleptic inspection. According to a 1985 National Academy of Sciences report, while organoleptic inspection serves its original purpose of protecting consumers from grossly visible lesions or diseases, it cannot identify microbial pathogens. Similarly, an October 1993 conference of the World Congress on Meat and Poultry Inspection--an international association of government regulators from meat trading countries--concluded that post-mortem organoleptic inspection must be changed because (1) it wastes resources and cannot detect microbial contamination, (2) the animal diseases for which it was originally designed to detect have been eradicated in many countries, and (3) it results in unnecessary cross-contamination because the hands-on inspection techniques used virtually ensure that contamination is spread from one carcass to another.

Daily inspections of processing plants also hinder FSIS' effectiveness and increase its costs because FSIS inspectors must visit thousands of plants daily regardless of the potential health risk involved.

Risk-based inspections would result in safer products and help to reduce costs because scarce federal inspection resources would be redirected from low-risk operations to areas that may need greater coverage because they present a higher risk. FSIS officials agree that allocation of inspection resources should be based on risk.

## SOME PLANTS INDEPENDENTLY TEST FOR MICROBIAL CONTAMINANTS

FSIS does not routinely test for microbial contamination, require industry to perform microbial tests, or provide assistance to plants wanting to implement testing programs. Nevertheless, on the basis of our past work, we found that some plants were performing microbial tests on a regular basis. To obtain more

detailed information on industry microbial testing, we contacted 157 meat and poultry plants judgmentally selected from various regions of the country. Of the 157 plants contacted, 76 have implemented testing programs to monitor the level of microorganisms on equipment, products, and in the environment. Of the 76 plants with microbial testing programs, 74 have used the test results to make changes aimed at improving product safety and quality.

These changes cover four general areas--equipment/facility design, sanitation practices, employee awareness, and supplier/product management. The number of plants that have made changes in each general area and examples of those changes follow.

-- Thirty plants made changes to their equipment or facility design, such as cutting holes in machines to provide for better cleaning access and cutting grooves in floor drains to facilitate flow and reduce drain water backup.

-- Sixty-four plants made changes in their sanitation practices, such as using different cleaning solutions and replacing, rather than trying to clean, conveyor belts.

-- Forty plants made changes to increase employee awareness of good hygiene practices, such as focusing employee training on problems identified through microbial testing and posting additional sanitation signs near identified problem areas.

-- Forty-four plants made changes to improve their management of suppliers or products, such as dropping product lines that consistently exceeded plant microbial standards and notifying and requesting suppliers of products with high bacterial counts to lower them.

One plant that found its product contaminated with listeria--a pathogenic bacteria--demonstrates the benefits of microbial testing. Through further testing, the source of the problem was traced to a slicer. The plant replaced the slicer and changed cleaning procedures, thereby eliminating the listeria problem.

While many plants have their own microbial testing programs, larger plants--those producing more than 1 million pounds per year--were more likely to have testing programs than smaller plants. Of the 97 larger plants that we contacted, 61 had testing programs compared with 15 of the 60 smaller plants we contacted. Plants without testing programs generally cited cost as the main obstacle to adopting such programs. Costs for plants with microbial testing programs ranged from a low of $600 per year to a high of $750,000 per year, depending on the number and types of tests being performed.

Plants encounter these costs, in part, because they cannot turn to FSIS for assistance in program design. To fill this void, plants seek assistance from commercial laboratories or design their programs in-house. Therefore, sampling methodologies, type of tests performed, and test evaluation criteria vary from plant to plant.

Plants' testing programs differed as to what they tested for and how often they tested. For general bacterial levels, for example, some plants tested equipment surfaces before starting operations while others tested equipment surfaces during operations, and some plants tested incoming products while other plants tested finished products. Similarly, plants' programs varied as to how often they tested. Some plants tested equipment surfaces 10 or fewer times per week while other plants tested equipment surfaces more than 500 times per week, and some plants ran 10 or fewer product tests per week while other plants ran more than 500 product tests per week.

Plants' programs also differed in the types of tests that they conducted and the standards that they used to evaluate their test results. On raw products, for example, 57 plants tested for the overall bacteria level, 40 plants tested for coliforms, 42 plants tested for specific pathogens, and 15 plants tested for other contaminants such as yeast and mold. Similarly, the standards used to evaluate the test results also varied from plant to plant. The general bacterial level allowed on raw products before taking corrective action, for example, ranged from a strict standard of 500 or fewer colonies per gram to a minimal/no standard of over 100,000 colonies per gram.

While plant officials were reluctant to endorse specific standards, they believed that FSIS guidance would be beneficial. Officials in 48 of the 76 plants with microbial testing programs said that FSIS should provide guidelines for evaluating test results. While FSIS has a general guide of no more than 100 colonies per square inch for evaluating pre-operational equipment test results, such information is not disseminated to all meat and poultry plants. FSIS generally just provides this information to plants seeking to substitute microbial testing programs for mid-shift clean up because FSIS is reluctant to promulgate an industrywide guide until further research is conducted.

Our findings on the wide variation in plant microbial testing programs and the lack of FSIS assistance are consistent with the findings reported in June 1992 by a Science Review Panel, established by the Secretary of Agriculture to evaluate beef

slaughter inspection methods.[2] Among its major findings, the panel, which included veterinarians, microbiologists, and other scientists, reported that for the plants it visited, it found a great diversity in microbiological sampling and testing methodologies being used. The panel concluded that FSIS should undertake the leadership role in the development of more uniform methodologies and programs that will permit proper comparisons of data and provide feedback for corrective actions.

FSIS regional officials told us that they have received many calls from plants inquiring about microbial testing programs. These officials said that they refer these plants to industry associations because FSIS is not set up to provide such assistance. Further, without FSIS support and guidance, plants are less likely to learn from each other's experiences. As a result, plants spend time and resources identifying and correcting problems already resolved by others. For example, four plants we contacted found independently through microbial testing that one type of conveyor belt could not be sanitized and therefore was likely to harbor microorganisms. Each plant went through a laborious process of determining the source of its high microbial counts--experimenting with different sanitizers and evaluating employee hygiene and work habits--before determining that they needed to switch to a different type of conveyor belt.

## HACCP IS A GENERALLY ACCEPTED APPROACH FOR ENSURING FOOD SAFETY, BUT ROLE OF MICROBIAL TESTING IS UNCERTAIN

A HACCP system is generally considered the best approach currently available to ensure safe foods because it focuses on preventing contamination rather than detecting contamination once it has occurred. To prevent food safety problems before they occur, HACCP focuses on (1) identifying hazards and assessing risks associated with each phase of food production, (2) determining the critical points where the identified hazards can be controlled, and (3) establishing procedures to monitor these critical control points. (Hazards include any biological, chemical, or physical property that may cause an unacceptable consumer health risk.)

To strengthen its regulation of the industry and help ensure safer meat and poultry, the Secretary of Agriculture announced in May 1993 that each meat and poultry plant would be required to develop and implement a HACCP system. While FSIS plans to publish its proposed HACCP requirements in 1994, its plans to date do not specifically require microbial testing to verify that plants' HACCP systems are working effectively. Furthermore, FSIS has no plans to

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[2]Report of Comparative Review of USDA Streamlined Inspection System for Cattle and Traditional Inspection Methods, Andrulis Research Corporation (June 1992).

develop guidelines for evaluating the results of microbial tests and identifying when remedial actions are needed.

The HACCP concept uses a two-step process to ensure its effectiveness--evaluation of the individual critical control points and an overall evaluation (called verification) of the entire system. Individual critical control points must be evaluated on a real-time bases, that is, evaluation results must be immediately available so that corrective action can be taken as soon as possible. Real-time evaluation tools include physical observation and testing for chemical residues. Microbial testing does not provide real-time results because under today's technology results are not available for at least 24 hours, although FSIS has been encouraging the development of quicker testing methods.

The HACCP concept also requires verification that a plant's overall processing system is working, not just the individual control points. This verification need not be done on a real-time basis but can rely on, among other methods, testing samples of products taken at various times throughout production. Microbial testing can provide this overall verification, allowing judgments to be made on product safety and providing an alert to deficiencies in processing, distribution, storage, or marketing.

FSIS recognizes the benefits of microbial testing but has not yet determined if such testing will be required as an integral part of plants' HACCP systems. FSIS officials said that they are continuing to evaluate the need for microbial testing, including who should do it--the plant or FSIS inspectors. If microbial testing is required, regardless of who does it, guidelines will have to be developed to help plants or FSIS inspectors determine when microbial test results should require remedial action. Without guidelines, plants or FSIS inspectors will have to rely on their own judgments on when to take action, which would vary widely, as previously discussed.

## CONCLUSIONS

The current system's reliance on sensory inspection methods has not changed since it was first put in place 87 years ago. To better protect the public from foodborne illnesses, we believe FSIS must now move to a scientific, risk-based inspection system. Such a system would allow FSIS to target its resources towards the higher-risk meat and poultry products and plants by increasing inspection of such products and plants, developing methods or tools that would help inspectors detect microbial contamination, increasing product testing, and helping plants develop and operate microbial testing programs.

As we stated in testimony before your subcommittees last year, we must not underestimate the magnitude of the effort needed to implement the organizational and scientific changes necessary to

overhaul the inspection system. Modernizing a system that has survived largely unchanged for almost a century and forming a partnership among consumers, industry, inspectors, and regulators will require strong leadership. We believe the Congress can play an important role by providing the stimulus for change, strong support for agency management, and the vehicle for change through new legislation.

To facilitate the move to a modern, scientific risk-based inspection system, our report, which will be issued within the next few weeks, will offer recommendations aimed at strengthening microbial testing, assisting meat and poultry plants in the development of microbial testing programs, and providing FSIS with the flexibility and discretion to target its inspection resources towards the most serious food safety risks.

Mr. Chairmen, this completes our prepared statement. We would be happy to respond to any questions.

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