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Public Disclosure of Tests for Salmonella: The Effects on Food Safety Performance in Chicken Slaughter Establishments

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What Is the Issue?

The assured safety of chicken and other food products is of vital concern for Americans, especially the elderly, children, people with suppressed immune systems, and others vulnerable to foodborne illness. To provide this assurance, the Food Safety and Inspection Service (FSIS) or its U.S. Department of Agriculture antecedents have been regulating food safety in meat since before 1900. Amid mounting food safety concerns, FSIS promulgated the Pathogen Reduction and Hazard Analysis and Critical Control Point (PR/HACCP) rule in 1996. For chicken-related salmonellosis illnesses, these provisions had a substantial short-term impact, reducing annual instances in the United States by 190,000 from 1996 to 2000, but with little further effect (Williams and Ebel, 2000).

Notwithstanding the large effect of the PR/HACCP rule, Painter et al. (2013) estimated that from 1998 to 2008, 650,000 people became ill each year from poultry contaminated with *Salmonella* and other bacteria. Food safety experts have long recognized that many consumers contract a foodborne illness because they cannot directly observe the food safety of the products they buy. Some sophisticated institutional buyers undertook their own *Salmonella* or other testing programs to measure food safety, but many other buyers that did not test their produce had no direct knowledge of the safety of the products they purchased. This began to change in 2003 when FSIS announced its intention to update regulations and raised the possibility of making results for *Salmonella* testing for individual establishments publicly available.

Information about *Salmonella* levels of the products sold by their suppliers would give institutional buyers information that would enable them to take food safety into account in their purchasing decisions. FSIS had promulgated a standard for the number of samples in a test that could be positive for non-typhoidal *Salmonella* (hereafter referred to as *Salmonella*) for livestock and poultry carcasses and ground meat and poultry under the PR/HACCP rule. FSIS began testing at establishments in 1996 and publishing industry-level data on the results of such tests, but without identifying the performance of individual establishments.

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Over the 8 years following 2003, FSIS (1) in 2006 adopted an easy-to-understand metric for rating an establishment's performance on *Salmonella* tests and informed the industry that regulatory changes were forthcoming; (2) from 2008 to 2010 disclosed the identities of establishments with mediocre or poor performance on *Salmonella* tests on the agency's website; and (3) in 2011 established a new *Salmonella* standard for chicken carcasses that was less than half the 2005 level.

This ERS report examines the impact of the regulatory changes in the levels of *Salmonella* on young chicken carcasses from FSIS tests. ERS researchers reasoned that if food safety is important to institutional buyers and performance on *Salmonella* testing is a measure of food safety, then chicken slaughter establishments would have an incentive to improve performance if test results were made public. The availability of more information to the public, starting in 2006, should lead to a reduction in *Salmonella* levels.

What Did the Study Find?

We define poor performance as failing to stay within the FSIS standard's percentage of samples allowed to test positive for *Salmonella*. Good performance equals a *Salmonella* share of less than half the FSIS standard; mediocre performance means the establishment meets the FSIS standard but does not outperform it. The ERS analysis showed that:

- Chicken slaughter establishments identified as having poor or mediocre performance on *Salmonella* tests in 1 year were almost certain to improve their performance the following year. The odds of an establishment with mediocre performance showing improvement were about 7 to 1. For those with poor performance, the odds were much higher at 49 to 1.
- The adoption of an easily interpreted numerical rating of performance on *Salmonella* tests, with subsequent disclosure of test results to the public, was followed by a sharp drop in *Salmonella* levels on young chicken carcasses. ERS results show that the percentage of samples testing positive for *Salmonella* declined by about 30 percent over 2006-08.
- The decline of young chicken samples testing positive for *Salmonella* of about 60 percent over 2006-10 enabled FSIS to reduce the standard for the number of samples testing positive for *Salmonella* by about half.
- The Internet appears to be an effective communication tool through which market forces, set in motion by better information about the food safety performance of slaughter establishments, can discipline establishments that perform poorly on *Salmonella* tests. The result is a level of food safety determined more by market demand and less by direct regulation.

How Was the Study Conducted?

The key data required to conduct this analysis were *Salmonella* test results from FSIS. The agency also provided administrative data and Dun & Bradstreet information on the characteristics of slaughter establishments for 2000-14.

Because many factors could be responsible for differences in performance on *Salmonella* tests, ERS researchers used an econometric model that captured three regulatory periods and accounted for establishment size and other variables related to plant operations. They chose a fixed-effects model to allow for establishment-specific characteristics, such as initial food safety technology, that do not change over time. However, the model did not account for the effects of standards imposed on chicken slaughter establishments by their customers and changes in meat and poultry food-safety recall policies.