

Introduction

Food safety regulation of meat and poultry plants has been controversial. Plant operators have long argued that food safety regulation raises their production costs and imposes proportionately higher costs on small plants than on large ones. Some consumers and public health advocates, on the other hand, assert that an absence of food safety regulation encourages plants to sell products that may be harmful to humans. Despite this controversy, there have been few studies of the economic effects of food safety regulation on meat and poultry slaughter and processing plants. This report aims to address that deficiency.

The Federal Meat Inspection Act (FMIA) of 1906 mandated that the U.S. Department of Agriculture (USDA) inspect cattle, hogs, and sheep for animal diseases, verify that carcasses are fit for human consumption, and ensure the cleanliness of slaughter and processing plants. More recent regulations stemming from the enactment of the Wholesome Meat Act (WMA) of 1967 and the Wholesome Poultry Products Act (WPPA) of 1968 charged the Food Safety and Inspection Service (FSIS) of USDA with the responsibility of monitoring plant performance of a detailed set of sanitation and process controls practices (SPCPs).¹ Between 1967 and 1996, FSIS took a series of steps toward devoting more of its resources to the control of pathogens in meat and poultry. Then, in 1996, it promulgated the Pathogen Reduction/Hazard Analysis and Critical Control Point (PR/HACCP) rule. This regulation mandated the use of a HACCP food safety, process control program by all meat and poultry slaughter and processing plants and established a set of pathogen performance standards to which raw meat and poultry products were required to adhere.

The brief regulatory history illustrates a progressive but discontinuous march toward regulatory oversight

designed to reduce cases of foodborne illnesses. In this report, we focused on the costs of food safety regulation. Policymakers, meat and poultry plants, consumers, and others want to know how much food safety regulation costs. Moreover, they want to know how costs change and who pays those costs as food safety regulatory requirements change. For example, does food safety regulation favor large or small plants? Additionally, if food safety process control tasks are costly, are plants with larger food safety process control costs penalized? Further, does food safety process control performance change under alternative food safety regulatory regimes?

The main purpose of this report is to examine the cost implications of food safety regulation under the regulatory authority vested in FSIS stemming from the FMIA, WMA, WPPA, and PR/HACCP rule. We started by establishing the historical context within which food safety regulation exists. Then, we examined the production costs of SPCPs and the effect of SPCP performance on plant survival. Finally, after establishing that food safety process control performance under the regulations associated with the WMA and WPPA is correlated with food safety process control performance under PR/HACCP, we projected the costs of PR/HACCP from estimated costs of SPCPs.

The report differs from other analyses in several ways. To our knowledge, there have been no economic studies of food safety regulation that have been cast in a historical context nor any studies of the effect of food safety regulation or control measures on plant survival. Additionally, we are aware of no reports showing the relationship between performance of SPCPs under WMA and WPPA and performance of HACCP tasks under PR/HACCP. There have also not been any cost studies of SPCPs, but there have been such studies of PR/HACCP. The first of these studies (Knutsen et al., 1995, and FSIS, 1996) used accounting methods and projected labor requirements to provide preliminary cost estimates of PR/HACCP. Recently, Antle (2000) estimated costs based on a cost function analysis and

¹ The acronym SPCP refers to the type of cleanliness standards in place prior to 1996 and includes both sanitation and process control tasks. A process control task may be to keep raw and finished products in separate areas.

Boland et al. (2001) published the costs of PR/HACCP for 50 meat plants in the Great Plains.

Like Antle (2000), we took a cost function analysis approach. Our work differs from Antle (2000) in that we used a direct measure of food safety, process control effort that likely understates food safety, quality control costs because food safety quality depends on factors other than process controls. Antle's (2000) measure of food quality, on the other hand, likely overstates food safety, quality control costs because food quality includes nonhealth-related factors. Combined, the two studies provide a window within which the costs of PR/HACCP likely fall.

We cast our analysis in a historical context in order to illustrate the progression of events that led up to enactment of the PR/HACCP rule of 1996. We argued that PR/HACCP marked an acceleration of a long-term trend toward devoting more effort to protecting the public from unobservable foodborne pathogens. Viewed in this way, implications about the effects of food safety regulation prior to promulgation of PR/HACCP differ from those under PR/HACCP only in scale.

The analysis is based on the Census Bureau's 1992 Longitudinal Research Database (LRD) and Food Safety and Inspection Service's 1992, 1997, and 2001 Enhanced Facilities Database (EFD). It also uses a database containing SPCP and HACCP performance data obtained in private correspondences with FSIS personnel.² We relied on 1992 data for much of the analysis because this was the only year for which both SPCP and Census data were available.

This report is the first in a series of planned reports on the costs and technologies associated with food safety process control. This report provides some long-term economic implications of food safety regulation based on the performance of SPCPs under WMA of 1967

² SPCP performance data are based on inspection tasks as specified in the Inspection System Guide of FSIS. The inspection tasks are pre-operational and operational sanitation and process control tasks as detailed in the Performance Based Inspection System.

and WPPA of 1968. These implications are still valid under the PR/HACCP rule of 1996 because the two regulatory regimes are linked. A planned report on the costs of PR/HACCP based on plant survey results will discuss the short-term plant costs of adhering to the requirements of PR/HACCP. Other reports will investigate the adoption and performance of various types of food safety technologies.

The LRD has detailed establishment records for all manufacturing establishments for 1963 and 1967-97. We used the 1992 data for the cost analysis of SPCPs because 1997 LRD data were not available at the time of the analysis and percent-deficient SPCPs were available only for 1992. Data records include physical quantities of meat production, number of employees, electricity use and dollar values of worker's wages, plant shipments, material costs, fuel use, plant assets, and many other items. The LRD also notes ownership and location of establishments.

Researchers can access LRD records for research purposes only at a Census facility. Additionally, stringent disclosure requirements dictate that researchers can publish only aggregated information. We follow those same disclosure rules for FSIS data. Any references to specific company or plant names are based on publicly available records, and not on any Census or FSIS source.

The EFD details animal counts by animal species, types of production processes, plant names, and, until 1997, meat and poultry production volume. Since FSIS identifies plants by the same plant number for each of its databases, we matched these EFD data with the SPCP data and HACCP performance data.

The report proceeds as follows. In the second and third chapters, we reviewed some key food safety regulatory policies and key events. In the fourth and fifth chapters, we used the performance of SPCPs as a measure of process control effort to investigate the costs of food safety process controls and whether it is profitable to reduce performance of them. Finally, in chapters 6 and 7, we compared plant regulatory performance of SPCPs with performance of tasks under the PR/HACCP rule and estimated the costs of PR/HACCP, based on our estimated costs of SPCPs.