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Food-Product Recalls in the U.S., 2000–2003

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The discovery of problems that lead companies to recall products from distribution is an important event for business management and for regulators monitoring the safety of foods. As a starting point for analysis of policy effectiveness or managerial performance, the basic data on food-product recalls must be compiled and analyzed. This research summarizes the extent of product recalls affecting the U.S. food industry in the period following the implementation of HACCP, the major food-safety program in place in the United States.

Other researchers have examined food-product recalls, mainly those affecting meat and poultry products. Previous work has analyzed the impact of product recalls on financial markets, managerial performance, and consumer demand (Salin and Hooker 2001; Thomsen and McKenzie 2001; Teratanavat and Hooker 2004; Salin, Hooker, and Teratanavat 2002; Hooker, Teratanavat, and Salin 2005; Teratanavat, Salin, and Hooker 2005; Ollinger and Chin 2002; Piggott and Marsh 2004). Each of these prior studies covered recall events involving meat and poultry products.

Product recalls are voluntary actions by firms, with input from the two regulatory agencies: U.S. Department of Agriculture (USDA) and Food and Drug Administration (FDA).

There is no consistent policy across government agencies and firms to define exactly the circumstances that lead to recall. The USDA is the lead regulating agency on meat, poultry, and processed egg products and primarily inspects slaughter and processing operations. The FDA is the responsible agency for foods sold in interstate commerce other than meat, poultry, and processed egg products. In 2002, the FDA's budget for food-safety regulation was $393 million; the USDA's food-safety budget that year was $704 million (Merrill 2005). "While FDA relies on approximately 250 field inspectors to oversee some 60,000 food establishments, FSIS employs 7,600 full-time residential inspectors in approximately 6,000 meat and poultry plants" (Merrill 2005, p. 34). The institutional structure and differences in resources allocated to the food-regulatory agencies is likely a key factor underlying the differences in recalls across food-product types; however, there were no differences in total counts of food-product recalls that each agency reported during 2000–2003.

This research expands the available information on food-product recalls to include products recalled under FDA authority. The evidence includes the full range of food products—beef, pork, poultry, dairy, seafood, ice cream, confectionary, processed fruit and vegetables, and fresh produce. This research is the first to comprehensively cover the recall actions affecting seafood, cheese, fruits, vegetables, and processed convenience foods, which are recalled under FDA authority, as well as the meat, poultry, and egg product-recall events supervised by USDA. A total of 713 observations are analyzed, by product type and by reason for the recall (bacterial contamination, labeling problems, chemical contamination). Information about the severity of the event is included, when available (Table 1).

Data Sources

Data are collected from the press releases about product-recall events posted on U.S. agency web sites. While it is possible that some product-recall events occur and are not announced with a government agency press release, we believe that nearly all of the important product recalls are included in the data. The set of press releases is the most comprehensive available source of centralized information about food-product recalls. Nevertheless, it is still difficult to develop economic indicators based upon this information. Very little information is available to determine the costs of the product-recall event. For some events, the quantity recalled is known from product descriptions in the press release (numbers of packages or pounds of product, for example). It is left to the researcher to find prices of the products, as was done by Shiptsova, Thomsen, and Goodwin (2002) in their study of economic

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Table 1. Selected Characteristics of Food-Product Recalls in the U.S., 2000–2003.

	Number	Comments
Recalls, all causes	713	Includes the events that were described in press releases posted on USDA and FDA Internet sites.
Recalls due to pathogens	313	Listeria, salmonella, E. coli, Campylobacter
Recalls linked with illness	12	
Recalls linked with deaths	7	
Major recalls	79	100,000 pounds or more, or one day's production. Not all press releases provided information on size of recall.
Mega recalls	10	1 million pounds or more.

Source: Compiled from FDA and USDA - FSIS sources.

losses due to meat-product recalls.

The press releases contain elements that can be characterized as risk communication; they aim to reach consumers who are exposed to hazards and provide them with information to enable them to prevent illness or injury. Details about the company and contact information are included, and highly detailed descriptions of the products are typically provided, including brand identification, if any. Some press releases contain quoted statements from managers that can be construed as crisis management. Most of those crisis-management statements offer reassurance about the integrity of the company's processes and the willingness of the company to take steps to restore consumers' goodwill.

Meats (beef, poultry, pork, and other meats) were involved in half of the recalls during the sample period (Figure 1). These counts of recall events do not account for the differing quantities produced in the respective industries. Confectionery and baked goods were frequently involved in product recall, accounting for 16% of the events. Dairy (mainly cheese and ice cream) accounts for 8% of the product types recalled. Seafood recalls, accounting for 5% of the events, typically were smoked or pickled items and the concern was *listeria* contamination.

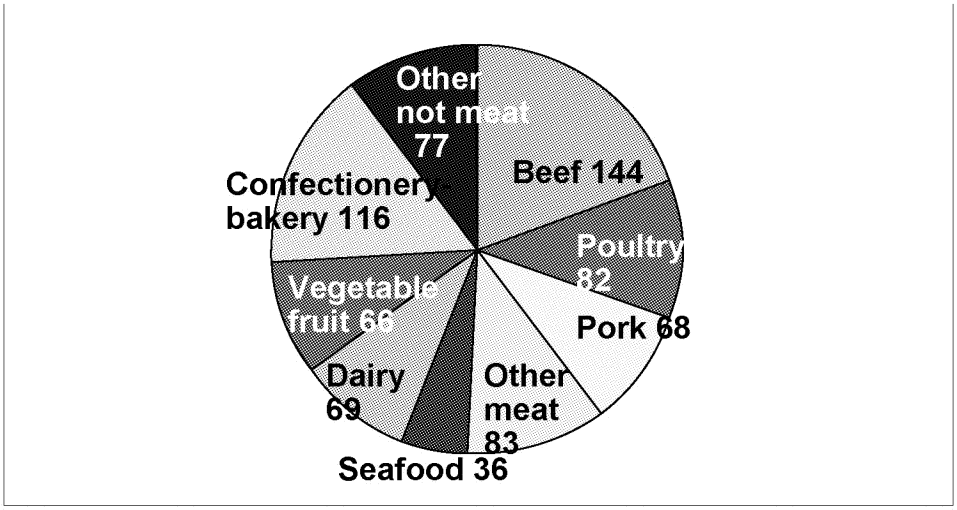

Figure 1. Number of Food Recall Events, by Product Type, 2000–2003.

Source: Compiled from FDA and USDA - FSIS sources.
Note: Some recalls involved more than one type of product and have been counted in each category.

Reasons for Recalls

Pathogens in foods are the major concern of food-regulatory agencies, and, according to Ollinger and Ballenger (2003), more-intense regulatory focus on detection of pathogens is responsible for the increasing numbers of product recalls. Microbial contaminants accounted for 43.9% of food recall events between 2000 and 2003 (313 events). Listeria (*Listeria monocytogenes*), E. coli (*Escherichia coli*), and Salmonella (*Salmonella enteritidis*) are the main types of pathogens suspected in foods that were recalled.

Listeria monocytogenes is the most prevalent among the bacterial sources of contamination leading to recall, accounting for 186 product recalls (26% of all events) during 2000–2003. E. coli contamination as a driver of product recall reached its peak in the year 2000 and continued to decrease its food recall share in subsequent years.

More than half of the product-recall events were initiated for problems other than pathogens (Figure 2). Mislabeling tops the list of reasons for product recall (about 43%). Most mislabeling incidents were a failure to declare potentially allergenic ingredients such as nuts, sulfites, eggs, or dairy products. Many of these recall events involved a local processor, such as a supermarket onsite bakery, or imported specialty products, and did not appear to be nationally or regionally distributed items. The majority of the recalls due to mislabeling occurred under FDA supervision.

Indicators of Severity of Product Recalls

Out of 713 recall incidents, a few have been linked with deaths. Most of the deaths are not associated with bacterial contamination, but rather are deaths induced by choking hazards to children (6 deaths reported). The major reason for choking was the

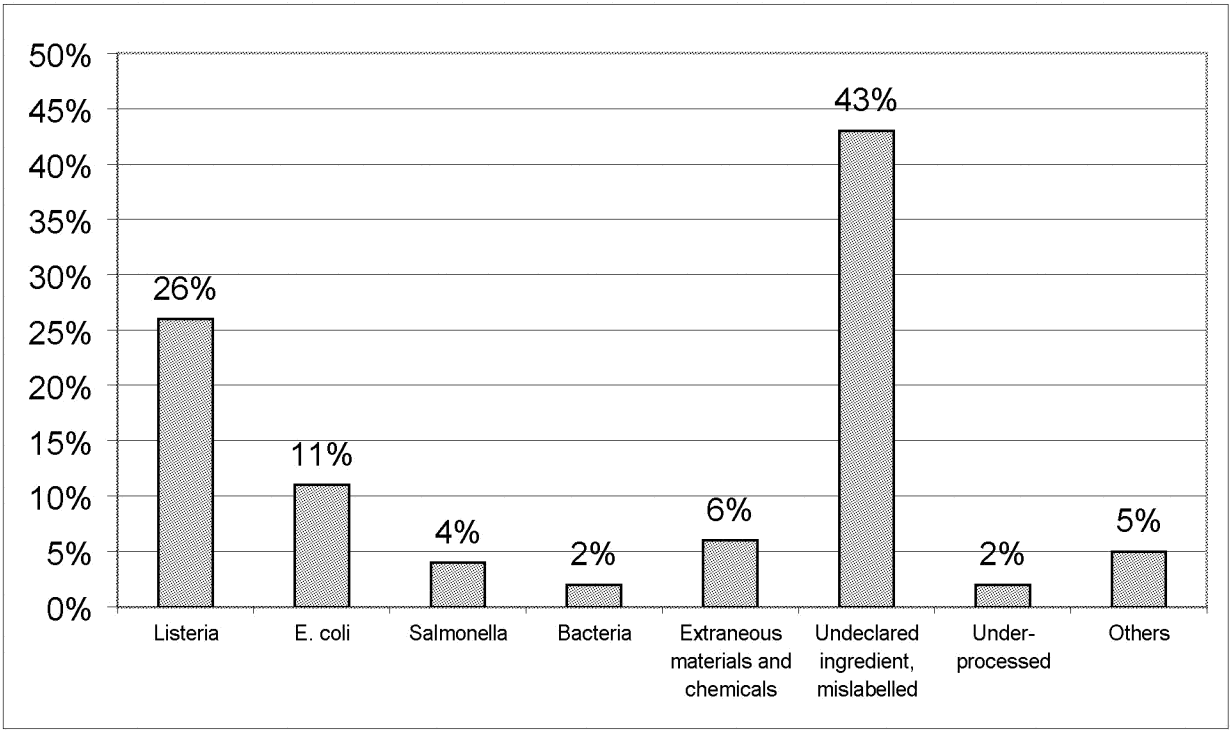

Figure 2. Reasons for Food Recalls, 2000–2003.

Source: Compiled from FDA and USDA - FSIS sources.

Note: Percentages do not add to 100 due to rounding.

consumption of mini fruit jellys, a type of imported candy. The FDA undertook a major effort to identify the importers of this candy, according to its press releases, and issued many individual recall notices as more importers and shippers were found.

Other health-related indicators of severity were available from a few press releases. There were 10 reported allergic reactions linked with product recalls. Twelve other recall events were reported to be associated with food-borne illness from pathogens, 3 were illnesses due to chemical contamination, and one was an injury from glass. At this time, we have not examined other news sources or disease-outbreak data to link press-release information with other complementary sources on severity in terms of public-health outcomes.

Severity of recall incidents, from a cost perspective, can be examined by looking at the quantities of products recalled. Even after HACCP had been fully implemented, there were still 10 recall events involving more than one million pounds of product during 2000–2003. As a proportion of total recalls, these million-pound events constitute 1% of the number of events. Yet each major recall was extensive, averaging 9.7 million pounds. Each of these major recalls involved meats. Excluding these 10 major recalls, the average quantity of product recalled was 57,000 pounds.[1] Clearly, the typical food-product recall is modest in terms of the quantity of product affected.

Summary

The compilation of information on product recalls overseen by the two major food-safety agencies in the U.S. indicates differences in product types and the extent of distribution of foods that present risks to consumers. Pathogens remain a key concern in this period of full implementation of HACCP, especially the pathogen that causes listeriosis. By far, the greatest number of food recall events were limited in scope, although a few major recalls of millions of pounds of product indicate that quality failures are potentially high-risk for certain consumers and for the businesses involved.

[1]It should be noted that many of the press releases on recall events do not provide information on quantity recalled. The detail on the product is generally in terms of identifying codes that can assist shippers or distributors to find the affected cases or lots, and is not linked with a quantity that is useful for assessing economic impact.

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