



Costs of Foodborne Illness Outbreaks for Vegetable Producers

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When people become sick or die because they ate contaminated vegetables, the produce industry incurs immediate as well as long-term financial costs—sales and income drop, and the costs of complying with new food safety standards rise.

Although the costs of complying with higher food-safety standards are difficult to determine, surveys of growers in the California leafy green industry indicate that the losses caused by foodborne illness outbreaks are much higher than most expected.

Three major incidents illustrate the costs borne by U.S. produce growers and handlers after a food-related disease outbreak:

- **Spinach:** In 2006, farmers lost \$12 million in U.S. spinach sales after a deadly outbreak of the bacterium *Escherichia coli* O157:H7 (*E. coli*). People in several states became ill after eating spinach contami-

nated with *E. coli*. Before the outbreak was contained, 227 people had become ill; 104 had been hospitalized; 31 had developed serious complications; and three had died.

- **Cantaloupe:** Fifty people became ill with salmonella food poisoning in 2008 after eating contaminated cantaloupes from Honduras. No deaths were reported, but 14 people were hospitalized. The outbreak cost cantaloupe farmers \$5.8 million in sales revenues.
- **Tomatoes:** After another salmonella outbreak later in 2008, farm-level losses in U.S. tomato sales reached \$25 million. The illnesses appeared to be linked to the consumption of certain types of raw tomatoes and tomato products. However, the cause was later traced back to jalapeño and serrano peppers from Mexico. Ultimately, 1,200 cases of salmonellosis

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Spinach

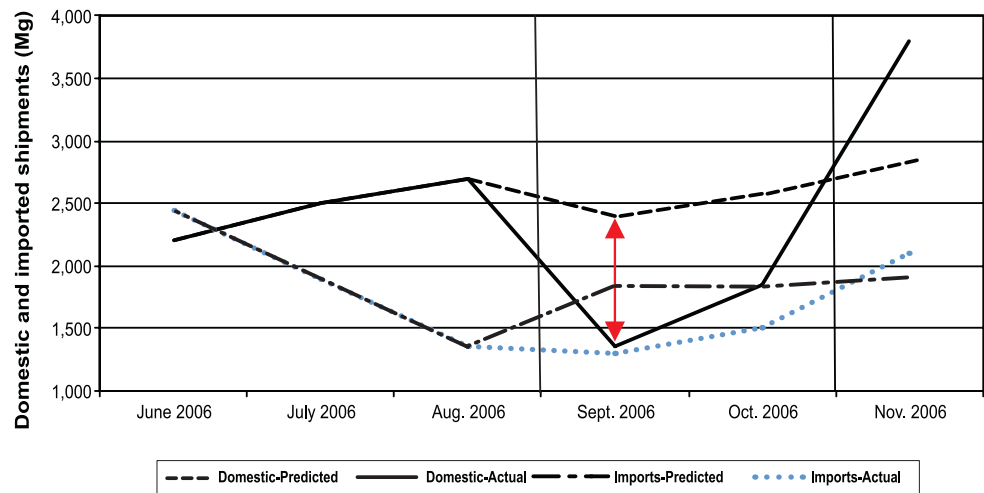
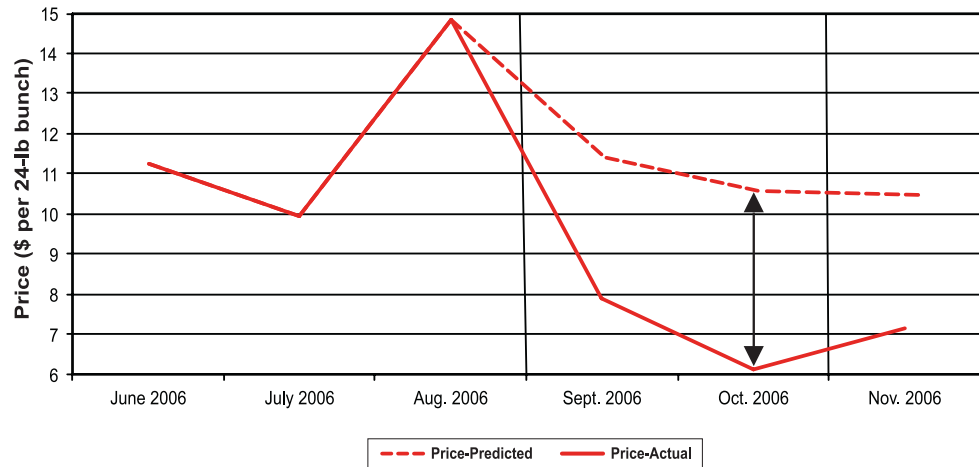


Figure 1.

Monthly spinach shipments, imports, and prices from June through November 2006. Note: Vertical lines are placed at dates of interest in September (beginning date of food scare) and October 2006 (ending date of food scare).



were reported across Arizona, Colorado, Idaho, Illinois, Indiana, Kansas, New Mexico, Texas, and Utah.

In response to these incidents, governmental agencies and industry groups have redoubled their efforts to improve food safety. They have improved domestic standards as well as increased the scrutiny of imported produce.

More actions are being considered, including the creation of a new agency to handle the food-safety regulatory activities of federal agencies such as the FDA and the U.S. Department of Agriculture (USDA).

Economic losses

Once consumers learn that produce has been contaminated, they not surprisingly reduce

their consumption of the affected produce. After the official notification of an incident, the produce is banned from sale until the contamination source is identified. The produce is also withdrawn from the market until the spread of illness is brought under control.

However, even after the produce is allowed back into the market, consumption levels may not rebound immediately because consumers continue to perceive a risk of illness. The reduction in sales depends on the severity of the outbreak—the number of people affected, the number of deaths, and the geographic scope.

Spinach

Immediately after the *E. coli* outbreak in August 2006 was linked to spinach, domestic

Cantaloupe

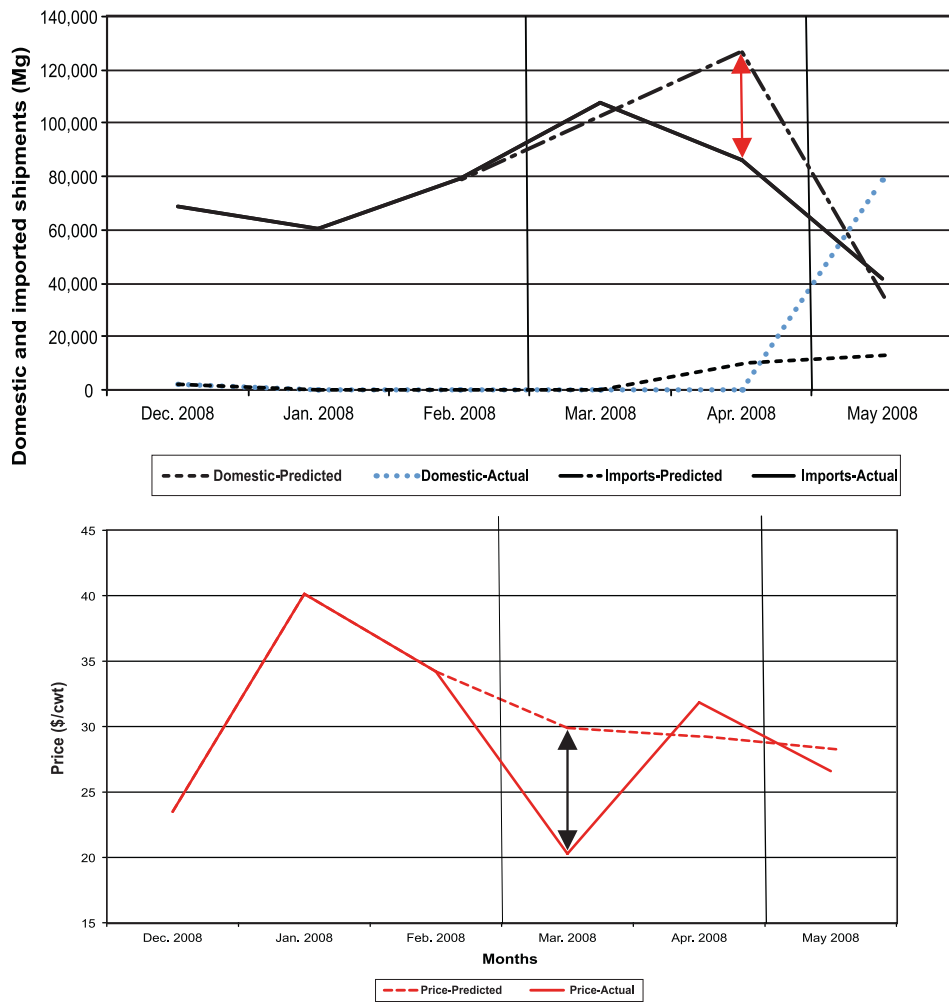


Figure 2. Monthly shipments, imports, and prices of cantaloupes from December 2007 through July 2008. Note: Vertical lines are placed at dates of interest, March 2008 (beginning date of food scare), and April 2008 (ending date of food scare).

and imported shipments of spinach began to fall below expected levels. Domestic sales declined in September by 1,000 metric tons (MT) (red arrow, Fig. 1).

In October, farm-level prices dropped from a high of \$15 in August to \$6 and a drop of about \$4 per 24-pound bunch compared to the price had there been no outbreak (black arrow, Fig. 1).

Despite an indication early in October that the problem was under control, consumers were still concerned about the safety of both domestic and imported spinach. Spinach sales did not rebound from both U.S. and imported sources until November. Prices returned to normal levels by December.

The farm-level loss in U.S. spinach sales was about \$12 million, of which \$4 million was to

foreign producers of imported spinach. Retail losses topped \$63 million.

Cantaloupe

Although the cantaloupe-related salmonella outbreak was reported in early January 2008, sales did not decline until April, after the source was determined to be imported cantaloupes. At that point, imports dropped by 40,537 MT (red arrow, Fig. 2). Farm-level cantaloupe prices decreased in March by \$10 per hundredweight (cwt), or 30 percent (black arrow, Fig. 2).

By May, sales had rebounded for U.S. cantaloupe. Prices rebounded earlier than did shipments: Prices were back to expected levels by April. The total import losses at farm-level prices reached \$23.7 million, almost all of which were sustained by Honduran imports.

Tomatoes

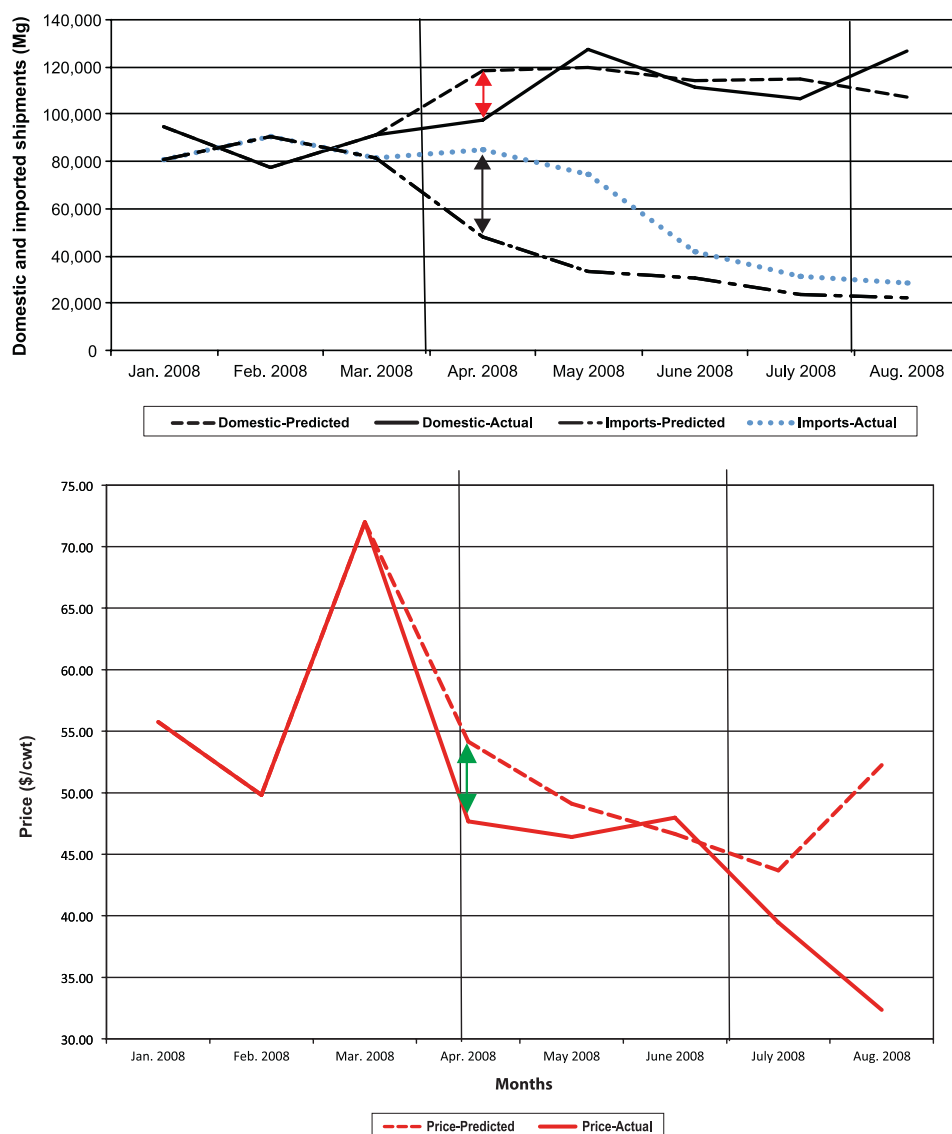


Figure 3.

Monthly tomato shipments, imports, and prices from January through August 2008.

Note: Vertical lines are placed at dates of interest in April (beginning date of food scare) and July 2008 (end date of food scare).

Ultimately, the outbreak cost farmers \$5.8 million in revenues from U.S. cantaloupe sales; retailers lost \$20.7 million.

Tomatoes

In 2008, sales declined immediately as news began to spread that contaminated tomatoes produced in Mexico and the United States may have caused salmonella food poisoning.

In April, shipments of U.S. tomatoes dropped by 20,700 million tons (red arrow, Fig. 3); imports, mainly from Canada, increased by 37,000 million tons (black arrow, Fig. 3).

Imports increased even further, to 40,900 MT, the following month as speculation shifted to Mexico as the potential source of the problem, and U.S. tomato sales rebounded. Sales of both Mexican and U.S. tomatoes continued to be lower than expected through July because the source of contamination, jalapeño peppers, was not identified until July 21, 2008.

During the outbreak, tomato prices dropped an average of \$5 per cwt at farm level (green arrow, Fig. 3). Prices returned to normal levels by June. Farm-level losses in U.S. tomato sales totaled \$25 million; retailers lost \$89 million.

Although U.S. and Mexican producers lost revenue, those from Canada and other tomato-exporting countries profited: U.S. tomato imports increased by 96,900 MT, or \$97 million at farm-level prices.

Compliance costs

Outbreaks of foodborne disease directly affect the development of public health policy. They also increase consumer fears about food safety.

Complying with higher process standards adds to the cost of doing business. To determine how to deal with the complex issue of food safety, growers should start by weighing the benefits and costs.

Benefits

Growers who adjust their operations to comply with new process standards can benefit in several ways:

- Incidents that reduce revenue are prevented.
- Product prices rise.
- Sales remain stable or increase in existing markets.
- New markets are created.
- Legal liability and insurance costs decrease.
- The farm operations become more efficient.

These benefits are uncertain and accrue over time. In contrast, compliance costs are upfront and in many cases are required to participate in a preferred market.

Costs

Information on costs is difficult to document. Many figures are producer estimates, not the result of careful economic analysis. To estimate those increased costs, surveys were sent to members of the Leafy Green Products Handler Marketing Agreement (LGMA), a voluntary initiative established in 2007 by growers, packers, and shippers in California, largely in response to the *E. coli* outbreak in spinach.

The survey respondents estimated that their annual compliance costs rose from \$210,000 before the 2006 outbreak to \$604,000 afterward. Compliance costs rose in three main areas:

- **Third-party audits:** Costs of third-party audits are typically reported on a perfarm or per-ranch basis. In 2008, they appeared to be \$400 to \$500.
- **Staffing:** Respondents reported that before the outbreak they had one trained employee overseeing food safety issues; now they have two.
- **Water testing:** The number of tests increased from 10 to 52 per month, costing a projected total of \$3,657 per operation.

The survey found that losses from the foodborne illness were several times higher than the costs of complying with escalating standards to help prevent such an outbreak. After the 2006 spinach outbreak, U.S. producers lost \$12 million at the farm level and \$63 million at the retail level.

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