



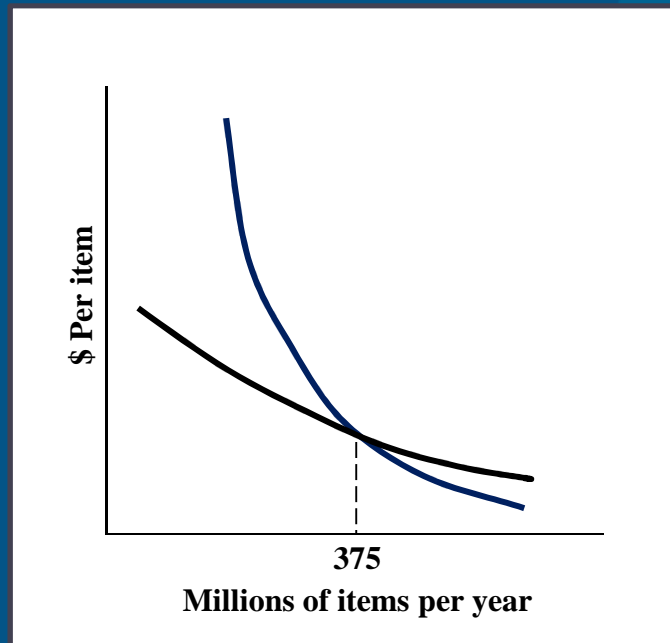
An Examination of Bounded Rationality in Food Businesses: Food Product Recall Event Analysis

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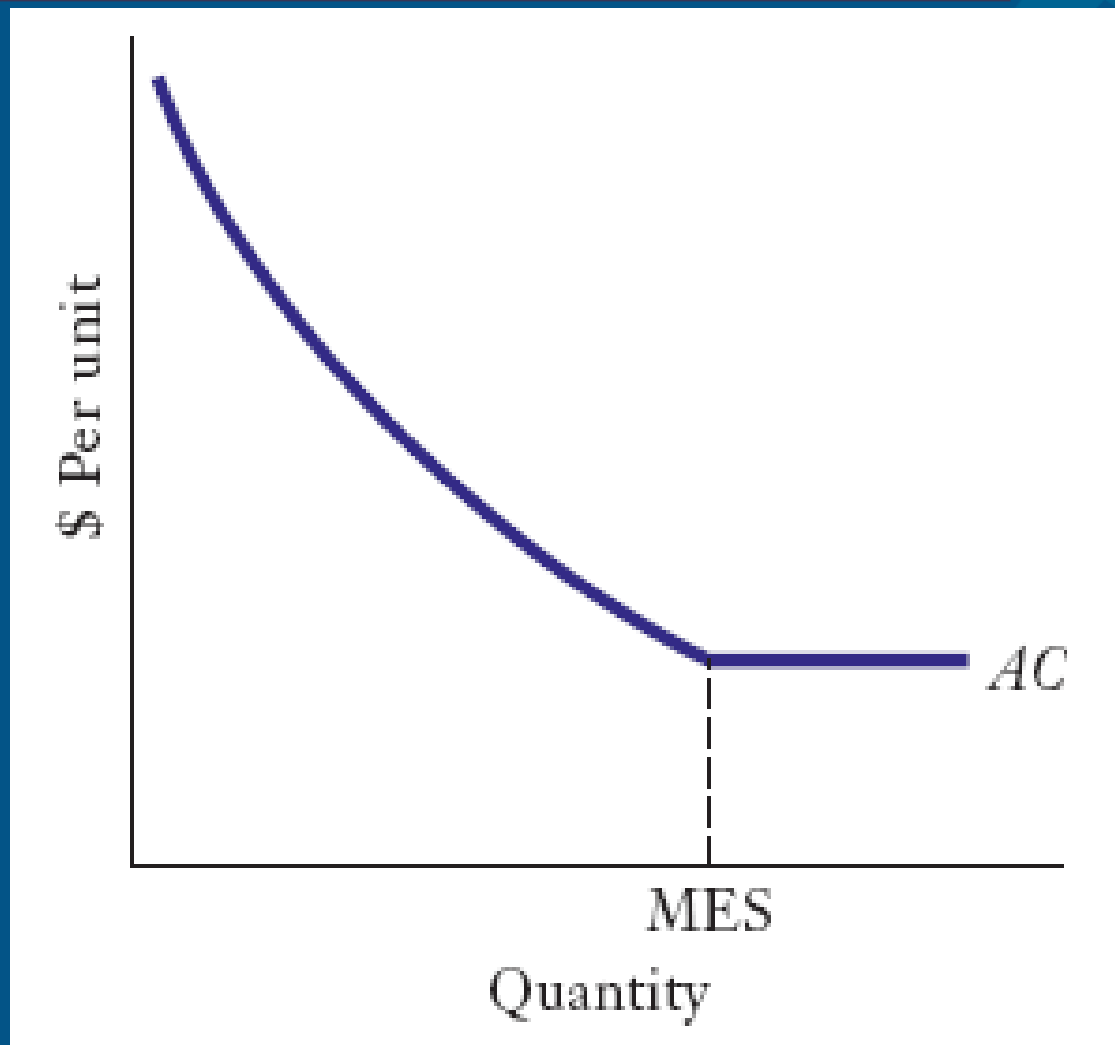
Support for this research under Cooperative Agreement number 58-4000-9-0058 with the Economic Research Service, U.S. Department of Agriculture, is gratefully acknowledged.

Economies of scale in the long run

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Costs can be held down by expansion via replication of processing lines or plants, maintaining each unit at the minimum efficient scale (MES).



Source: Besanko, Dranove, Shanley and Schaefer, p. 43

Economies of Scope

- Food products are cooked, processed, and have different ingredients relative to each other
- Different HACCP plans need to be developed for different products
- Diseconomies of scope occurs
- Hypothesis--Large firms can outweigh diseconomies of scope with economies of scale

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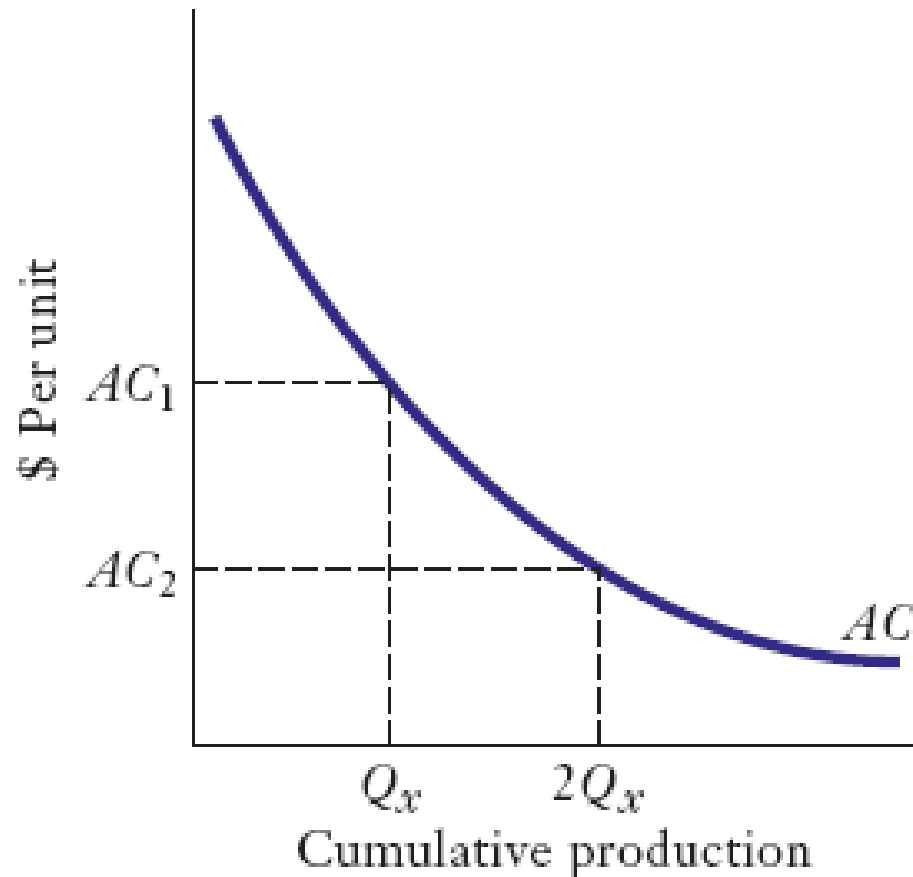
Economies of Scope (cont'd)

- Fresh fruits and vegetables have the same key risk factors,
- Thus a common protocol can be applied and leveraged over product types—e.g. water sanitation
- Hypotheses-Few diseconomies of scope for produce food safety

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Learning Curve-Larger firms move faster to the efficient point

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Sources of scale economies

- Spreading of fixed costs
- Productivity of specialized inputs
- Inventories

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Economies of Scale

- Large meat-processing plants invest in equipment and technology for food safety while small plants invest in sanitation and testing procedures

Source: Ollinger, Moore, and Chandran 2004.

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Empirical Difficulty to Distinguish Scale, Scope, and Learning

- Scale – pounds, dollar sales value
- Scope- SKUs, number of brands
- Learning-cumulative output, \$ on training, time since project implemented

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How to Move from Costs to Effectiveness in Safety

- Product recall as a performance indicator

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Hypothesis 1

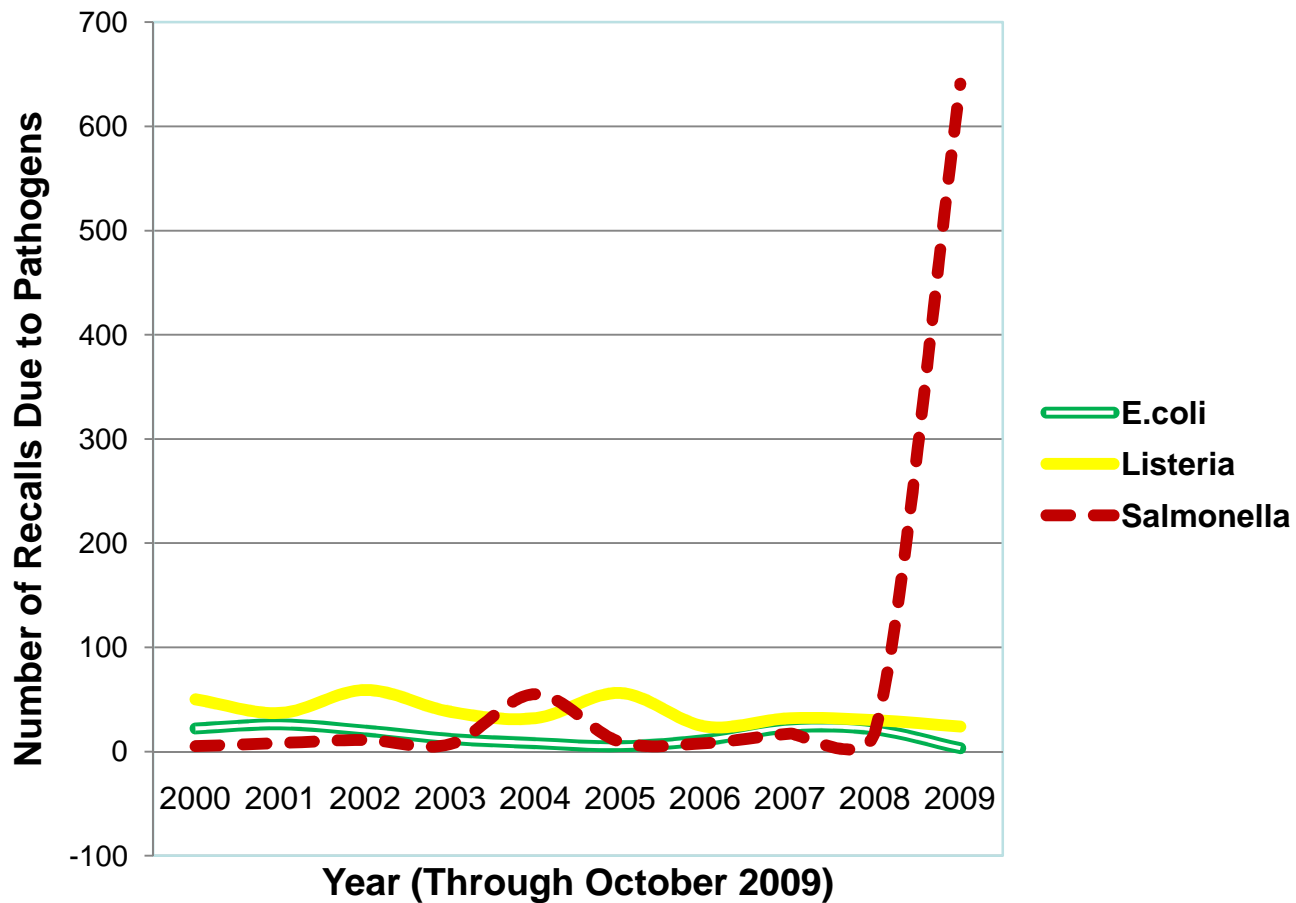
- *1a. Market concentration positively impacts “private” incentives to invest in a firm’s food safety reputation*
- *1b. The setting and enforcement of food safety standards is positively influenced by those sectors that exhibit the “greatest relative concentration”*

Recall Strategies and Stakeholders

- **Proactive firms** versus **Passive firms**
(Chen, xx and Gandreson)
- Consumers prefer proactive strategy on product recall
- Investors will view proactive strategies as a signal of hazard and cause financial damage to the firm
- Negative returns are associated with proactive recall strategies (CPSC notices)
- In food—voluntary recall; impact in mkts is short-lived and small

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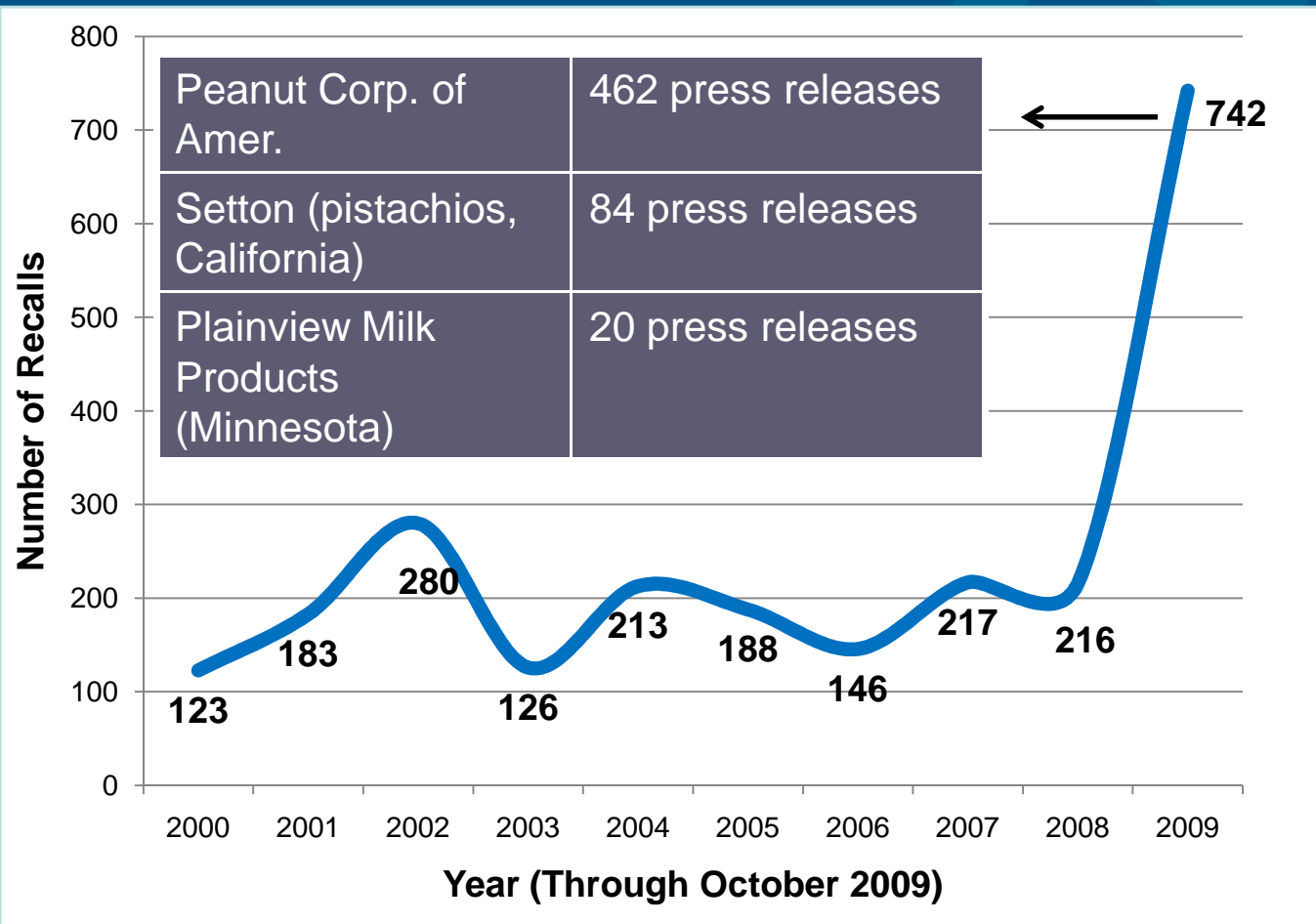
Recall Occurrence Due to Specific Pathogens, USA (January 2000-October 2009)



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Food Product Recall Events by Year

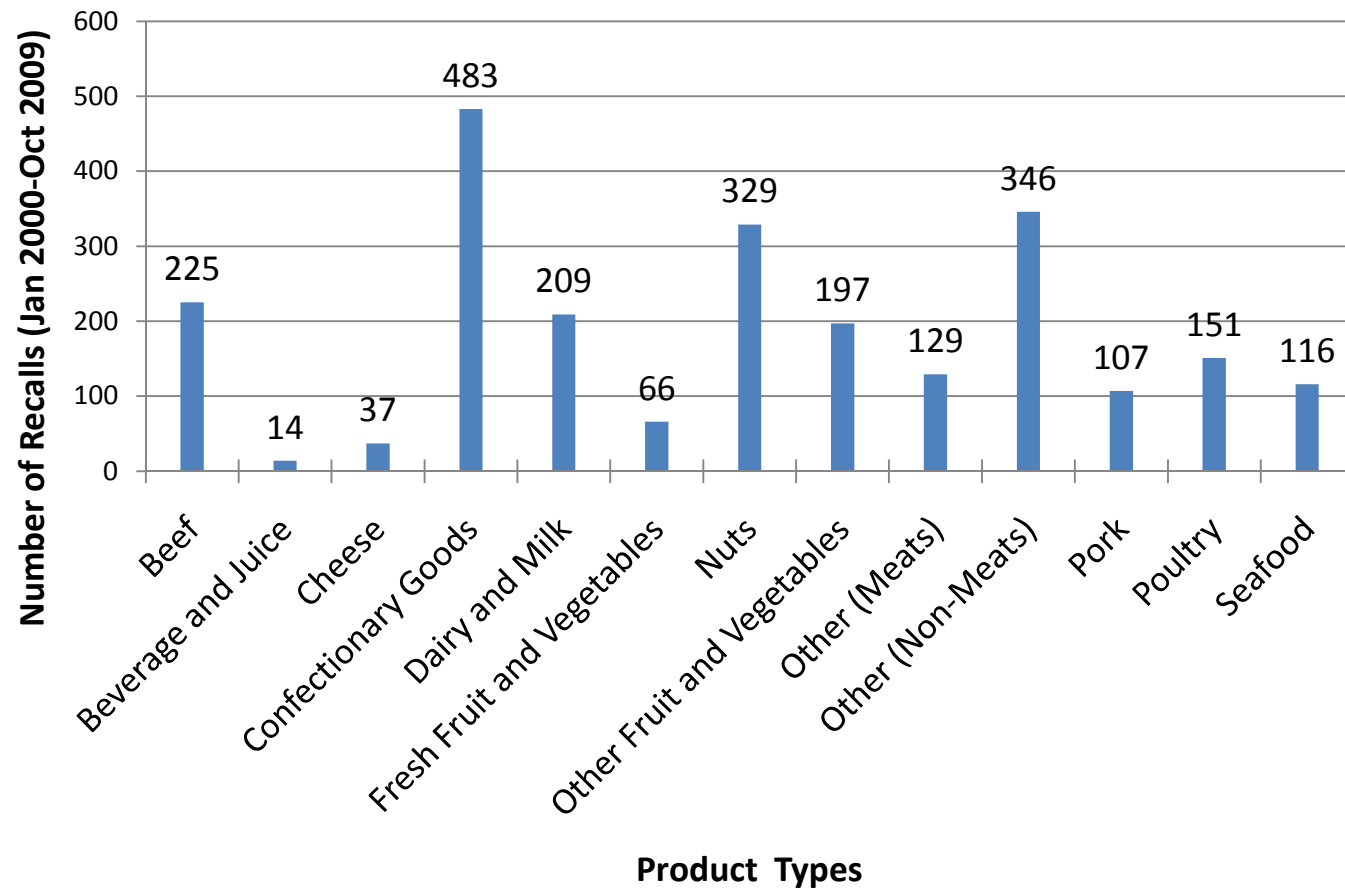
(January 2000-October 2009)



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Frequency by Products Recalled, USA

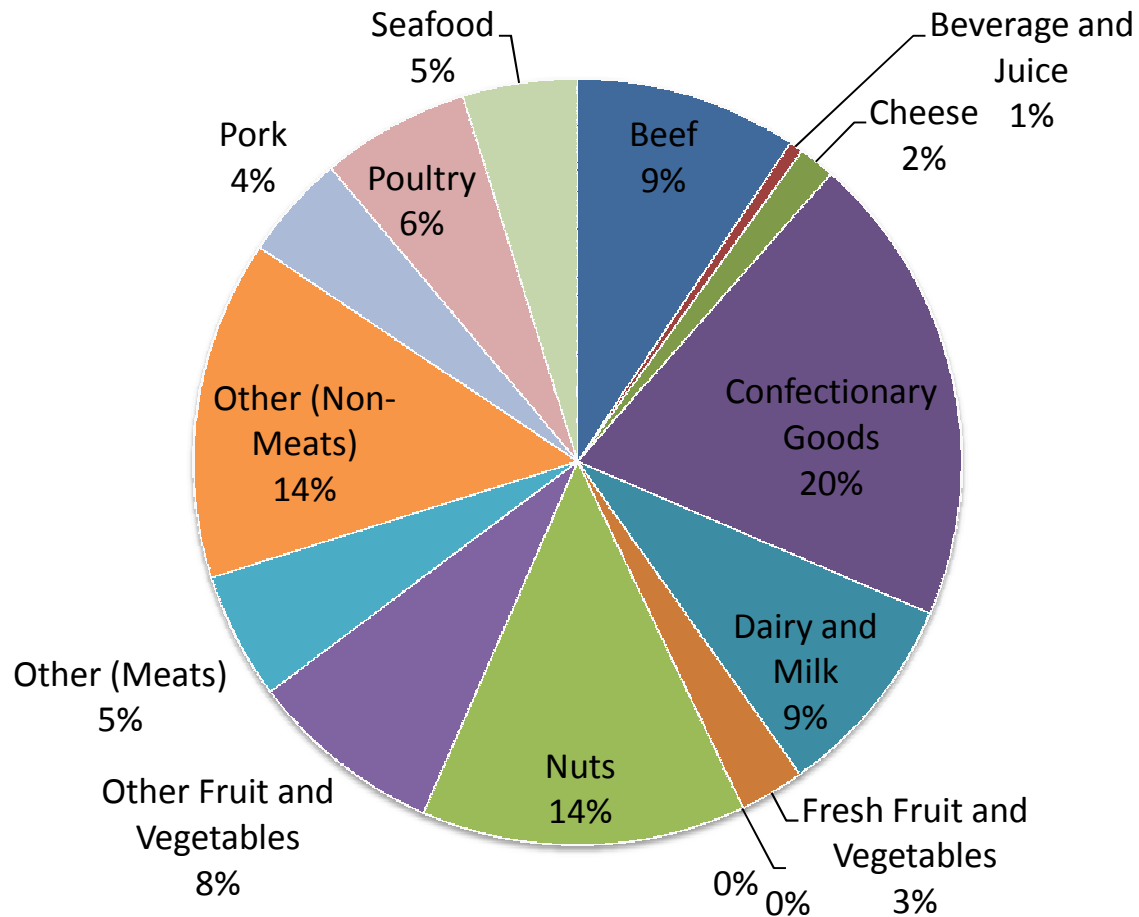
(January 2000-October 2009)



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Food Recalls by Product Type, USA

(January 2000-October 2009)



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Food Recalls *due to Pathogens* by Product Type

Table 1. Food Recalls due to Pathogens by Product Type, 2000-Oct. 2009

	<i>Frequency</i>	<i>Percent</i>
Meat, of which	363	26.41
Beef	167	12.15
Pork	61	4.44
Poultry	67	4.87
Other (Meats)	68	4.95
Nuts	323	23.49
Dairy, of which	166	12.07
Milk	60	4.36
Cheese	32	2.33
Other	74	5.38
Seafood	79	5.75
Fresh Vegetables	23	1.67
Fresh Fruit	28	2.04
Other Fruit-Vegetables	67	4.87
Confectionary Bakery	236	17.16
Juice	1	0.07
Beverage	4	0.29
Other (Non Meats)	85	6.18
Total	1,375	100

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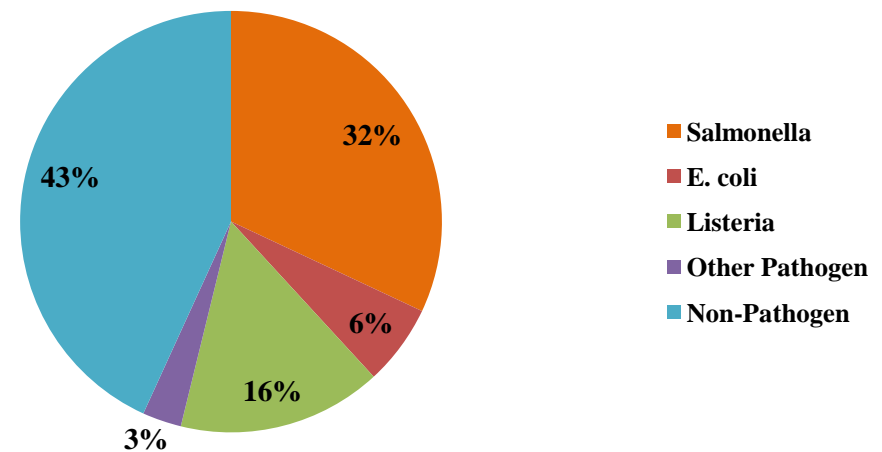
Food Recalls by Type of Pathogen

Table 2. Food Recalls due to Pathogens, by Type of Contamination, 2000-Oct. 2009

	<i>Frequency</i>
Salmonella	781
E. coli	151
Listeria	383
Other	73
Total	1,388

Note: The total number of product recalls, all causes, is 2,443.

All Recall Events: Pathogen and Non-Pathogen 2000, to October 2009



Size, Product Mix, or Complexity?

Economies of scale (meat). Ollinger et al 2004. “Small plants, which tend to produce more specialized products, had much higher average costs than the giant plants, which produce mainly commodity products such as boxed beef.” The larger plants producing undifferentiated products are able to handle the increased costs better than the few small plants that compete in the commodity market as price takers.

- At a certain point of complexity, management abilities are constrained
- RBV – capacity

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Food Safety Incentives

- Producers can charge price premiums if they commit to food safety
- If a firm fails in food safety, repeat sales will not occur
- Food safety reputation = specialized asset
- Reputation cannot be redeployed for other uses if the firm cannot produce safe food products

Source: Allen 1984, Sporleder and Goldsmith 2001, Shapiro 1983, Klein and Leffler 1981

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Separating Equilibrium

- Price premium signals high quality/safe product
- Separates high quality from low quality
- High price premiums support firm's brand reputation
- Food safety is an experience good; foodborne illnesses are observed after consumption

Source: Kirmani and Rao 2000, Klein and Leffler 1981.

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Stakeholders in Food Industry

- Privately held companies (around half of recall events are for companies that we cannot find sales data)
 - Hard to track investors' reactions
 - Does that mean there is less conflict about proactive / passive recall strategy?
- Buyers are an important stakeholder — increasing number of recall press releases where official recall notices issued by processors or retailers implicating the raw material supplier.

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Recall Strategies (cont'd)

- Investors will view proactive strategies as a signal of hazard and cause financial damage to the firm
- Negative returns are associated with proactive recall strategies
- A firm may be inclined to position with investors over consumer safety

Highly skewed size distribution

Sales by Firms involved in Product Recall, Descriptive Statistics

<i>Year</i>	<i>Number of Observations</i>	<i>Mean Sales (million US\$)</i>	<i>Standard Deviation</i>	<i>Median (million US\$)</i>
2007	11	1,423.90	1,465.51	859
2008	965	10,670.88	26,077.11	35.9
2009	41	23,223.49	24,471.87	7,586.00

Hazard analysis of probability of repeated event by a firm

- Found that increased firm size and branding are associated with increased risk of recall occurrence

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Findings

- No significant risk reduction due to brands
- Perhaps number of brands indicates increasing complexity
- Brand portfolio may be seen as insurance.
- Acquiring a brand-then planning to eliminate it.

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