
E. Coli & Fresh Produce: Some Lessons Learned

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Program Outline

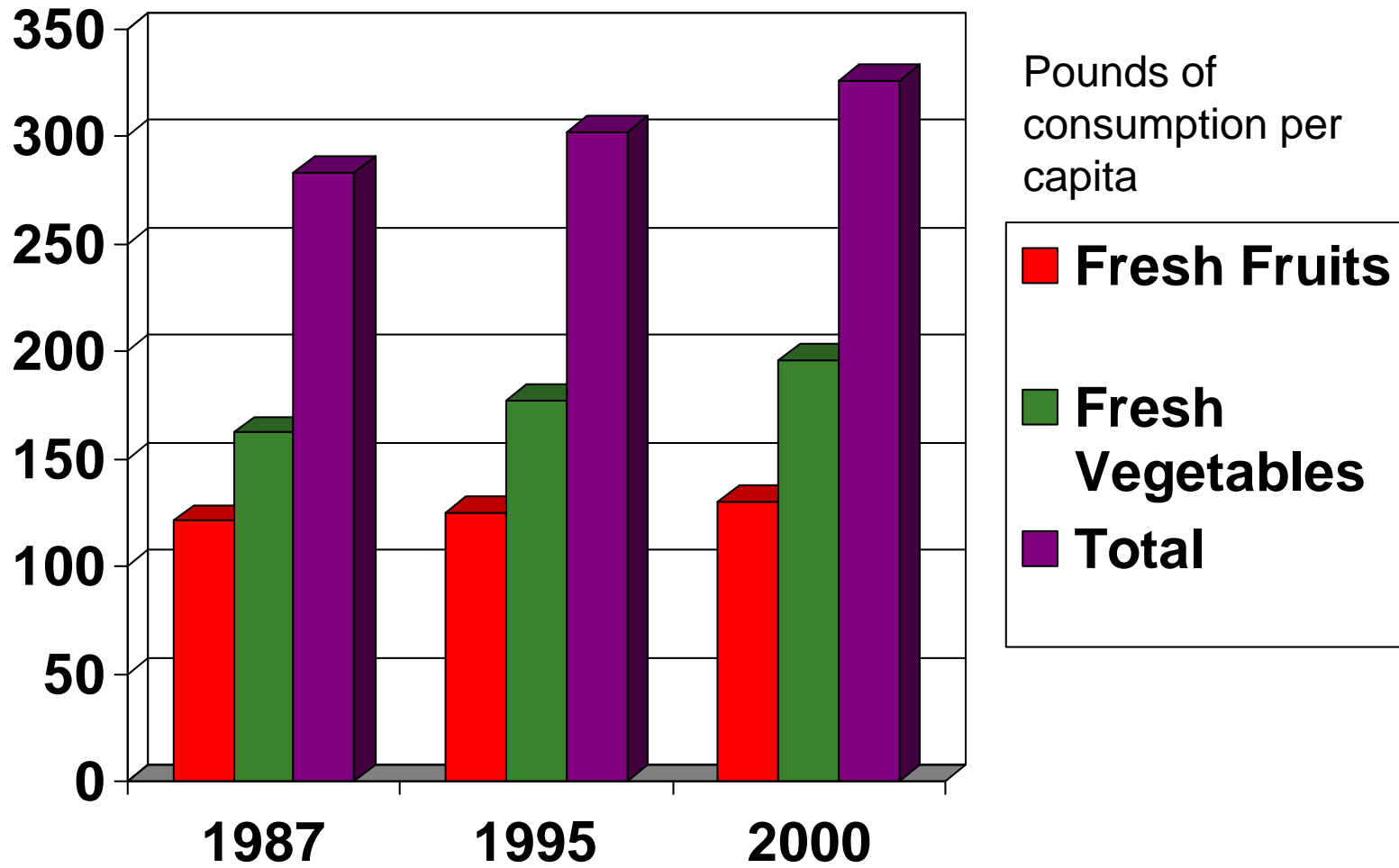
- Economic impact of E. coli in spinach and onions
 - Potential economic impact on NC crops
 - Management tools to implement GAPs
 - Critical GAP practices
 - Lessons learned
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The Economics of Implementing GAPs

- Reduced risk
 - Protected reputation
 - Reduce the possibility of catastrophic sales loss
 - Maintain/protect market access
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Overall consumption of fresh fruits and vegetables is increasing

U.S. Consumption of Fresh Fruits & Vegetables



Source: USDA, Fruit and Tree Nuts Situation and Outlook Yearbook, 2000, and Vegetables and Specialties Situation and Outlook Yearbook, 2000.

The industry is consolidating

- A smaller number of processors are handling a larger volume of product
- Outbreaks are more likely to be traced to the source if large numbers of consumers become ill



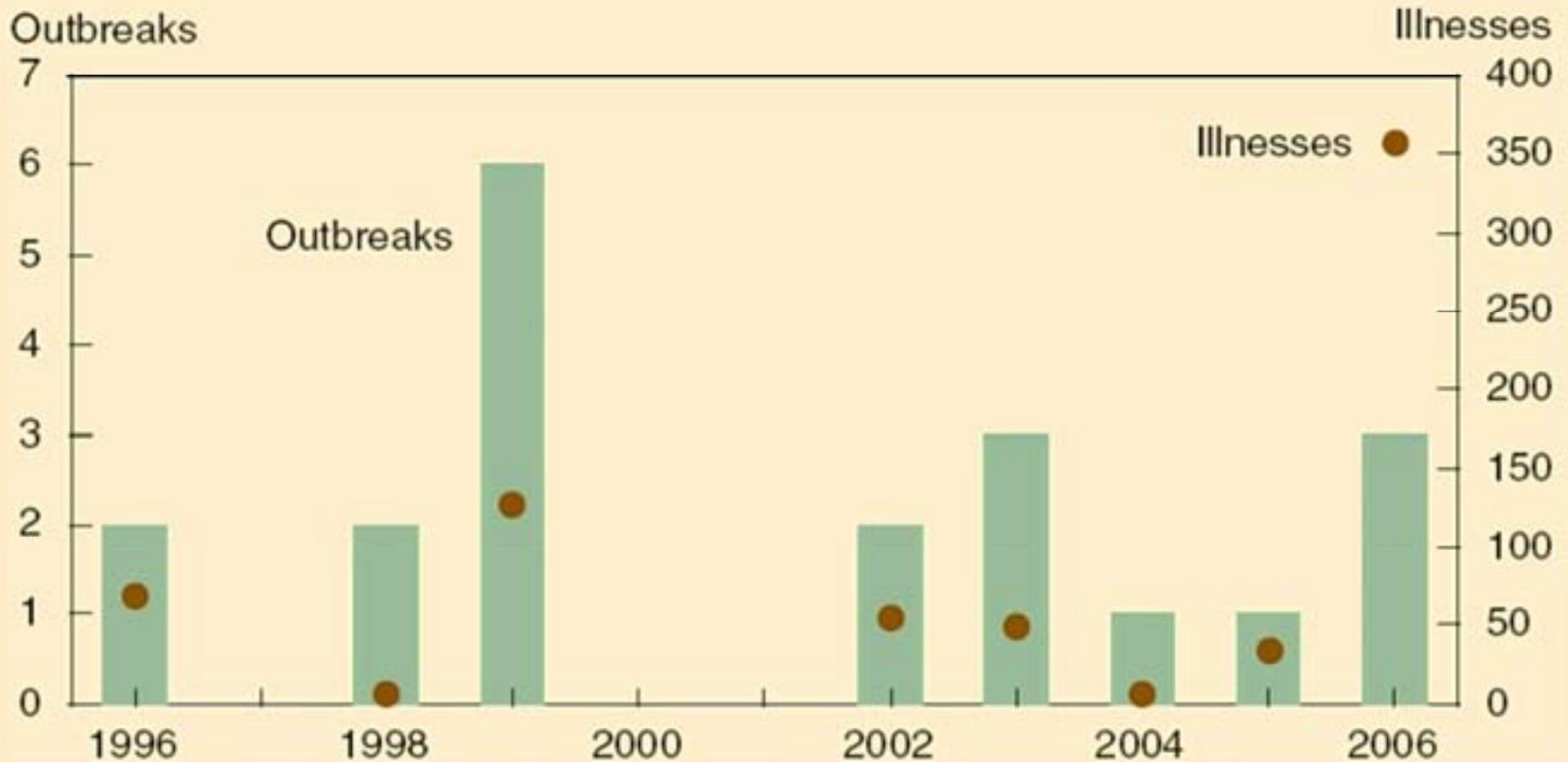
E. Coli is most likely to occur in:

- Leafy greens
 - Tomatoes
 - Melons (particularly cantaloupes)
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E. Coli and Leafy Greens

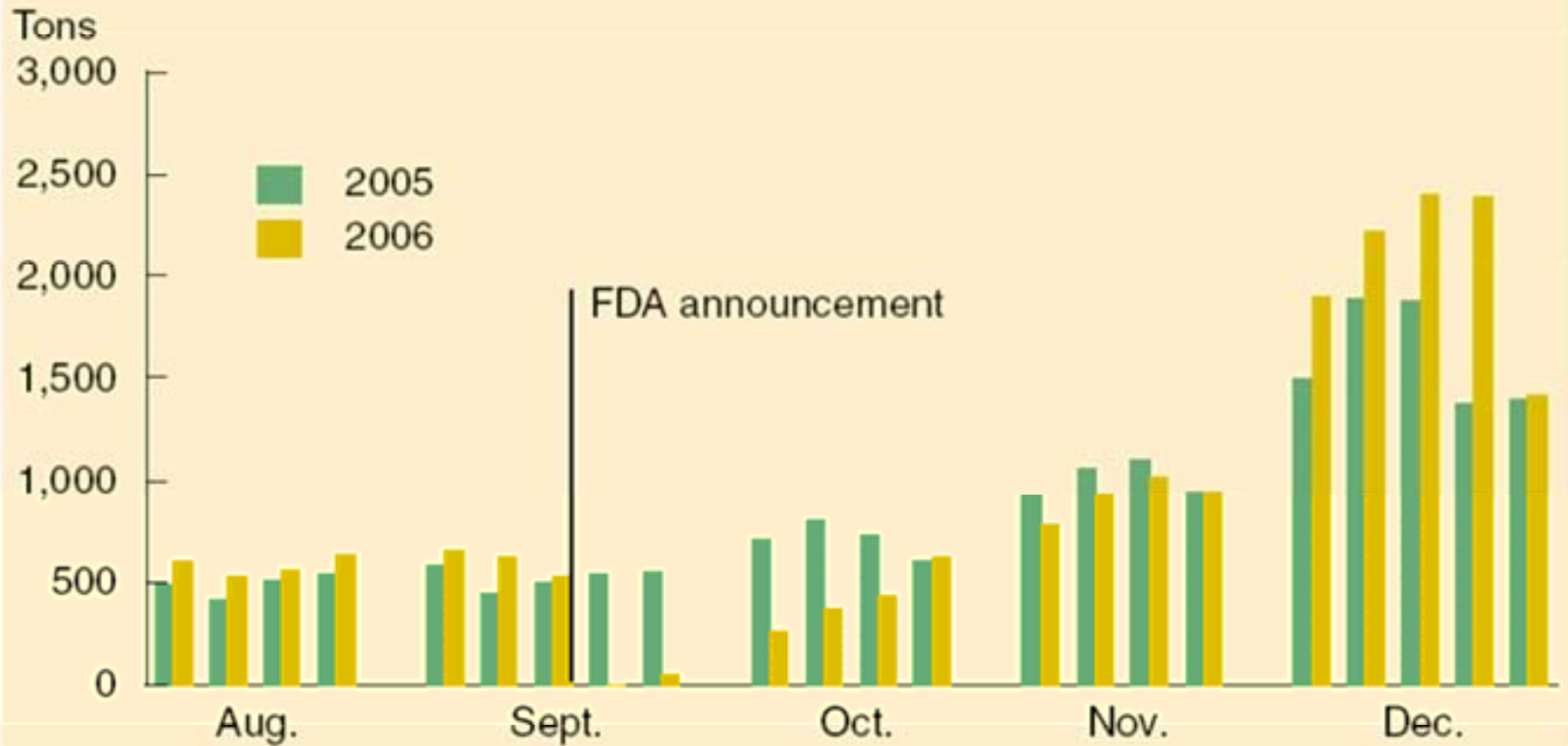
- Since 1996:
 - 34% of all outbreaks due to microbial contamination traced back to a specific fruit or vegetable
 - 10% of illnesses
 - 34% of deaths
- 20 of the 24 outbreaks have involved E.col O157:H7.

E. coli O157:H7 illnesses linked to leafy greens reached new record in 2006



Source: U.S. Food and Drug Administration.

Weekly bunched spinach shipments rebounded after outbreak



Source: USDA, Agricultural Marketing Service, Market News Service.

But the price did not

In 2007, bagged spinach and salad retail sales values still lag

Percent change in sales value from a year ago for:

January 24-
February 24, 2007

August 24, 2006-
February 24, 2007

Percent

Bagged spinach	-27	-43
Bagged salad with spinach	-24	-42
Bagged salad without spinach	-5	-8

Source: Perishables Group, *Facts, Figures & the Future*.

E.coli Sep '06 Spinach Outbreak Impact on Producer Prices

	1982=100	% change from month-month	
Sep 2006	419.5	*	
Oct 2006	312.1	-26%	
Nov 2006	367.1	17.6%	
Dec 2006	479.5	30.6%	
Annual	304.2	-54.8%*	*Represents change from previous year

Nov/Dec '06 Green Onion E.coli Outbreak Impact on Producer Prices

	1982=100	% change from month-month	
Nov 2006	258.1	*	
Dec 2006	177.3	-31%	
Jan 2007	327.4	85%	
Feb 2007	286.2	-12.6%	
Mar 2007	182.3	-36.3%	
Annual		-58.8%*	*Represents change from previous year

Fresh Vegetable Shipments

- Down 17% from the previous year for spinach
- Down 10% from the previous year for green onions

Putting it into an NC Perspective

- 2005 NC Fresh Tomato Crop valued at \$22.4MM

A 55% drop in prices to the grower would reduce the value to \$10.1MM

- 2005 NC Strawberry Crop valued at \$18.5MM

A 55% drop in prices to the grower would reduce the value to \$8.3MM

Other Factors in the Spinach Outbreak

- No third party audit was performed for the 2006 growing season
 - The fields were adjacent to those used for cattle operations
 - The grower was in the 2nd year of transition from traditional to organic production
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Figure 4

Daily green onion free-on-board prices in the United States, 2002 and 2003¹

Dollars per 13-lb box

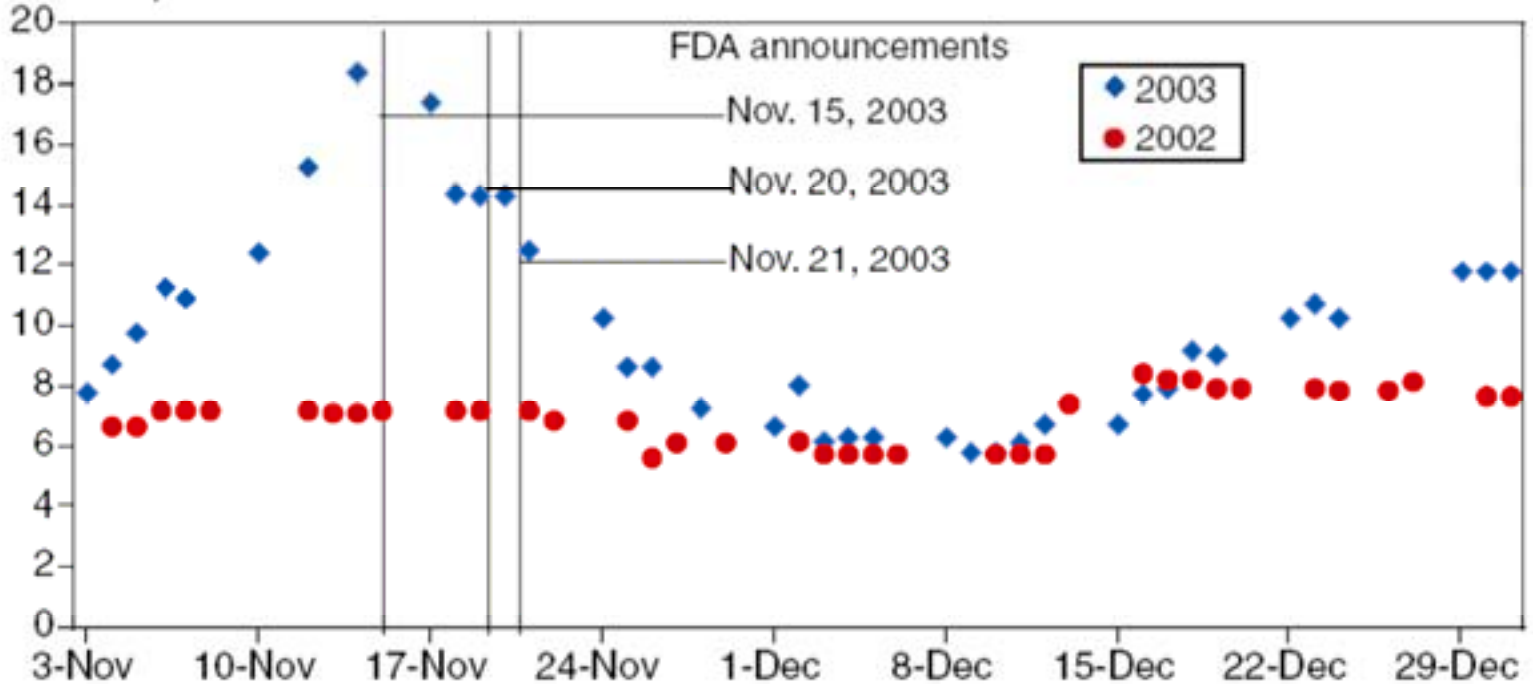
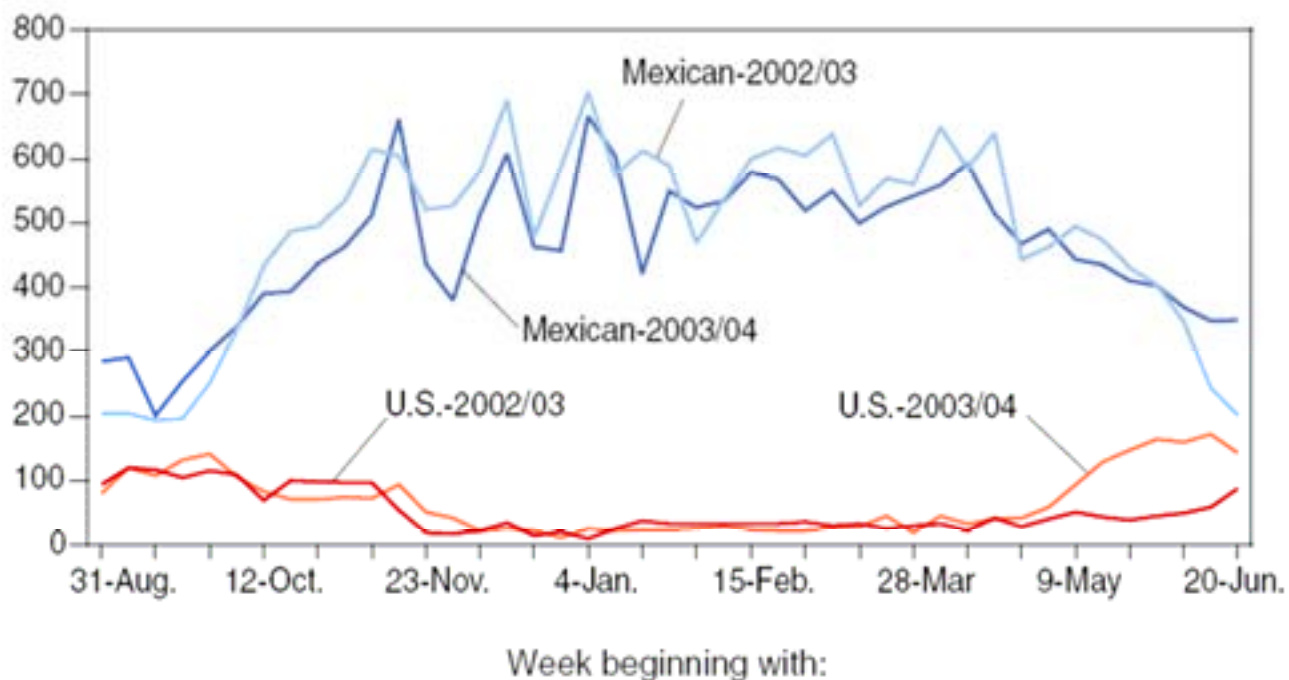


Figure 5

Weekly U.S. and Mexican green onion shipments, 2002/03 and 2003/04

Thousand 13-lb boxes



Source: *Fresh Fruits, Vegetables, and Ornamental Crops: Weekly Summary Shipments*. Agricultural Marketing Service, USDA.

Impact on Growers Following Hepatitis A Outbreak in Green Onions from Mexico, June 2004

**Table 2—Impact of food safety outbreak on Mexican growers,
by GAP status**

GAP status	Impact on:	
	Volume of green onion sales	Demand for other products
GAPs	Fairly constant	No impact
Partial GAPs	Down a bit	Some impact
No GAPs	Down by 50 percent	Down by about 30 percent
No GAPs and named by FDA	No sales and most fields plowed under	Shippers stopped selling all or almost all products from these growers

Source: Avendaño and Calvin (2004).

Making Food Safety Plans worth the effort

Employees: Infected employees who work with fresh produce increase the risk of transmitting foodborne illness.

- Train employees to follow good hygienic practices
- Establish a training program directed towards health and hygiene – include basics such as proper handwashing techniques and the importance of using toilet facilities
- Become familiar with typical signs and symptoms of infectious diseases in employees

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- Offer protection to workers with cuts or lesions on parts of the body that may make contact with fresh produce
 - If employees wear gloves, be sure the gloves are used properly and do not become a vehicle for spreading pathogens
 - Customer-pick and road-side produce operations should promote good hygienic practices with customers – encourage handwashing, provide toilets that are well equipped, clean, and sanitary and encourage washing fresh produce before consumption

Production practices: Poor management of human and other wastes in the field or packing facility increases the risk of contaminating fresh produce

- Be familiar with laws and regulations that apply to field and facility sanitation practices
- Toilet facilities should be accessible to workers, properly located, and well supplied
- Keep toilets, handwashing stations, and water containers clean and sanitary
- Use caution when servicing portable toilets to prevent leakage into a field
- Have a plan for containment in the event of waste spillage

Crop Production Water

- Know routes & handling of surface water sources, seasonal influences on quality and any microbial monitoring programs of the supplier
 - Identify potential sources of contamination
 - Ensure wells aren't contaminated by surface run-off and soil infiltration
 - Foliar applications from pathogen free source
 - Currently, foliar applications from potable source within two weeks of harvest
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GAPs are a *way of life*,
NOT a “one day event” when
the auditor is on site.

Lessons Learned

- Economic loss from a disease outbreak can be widespread and far-reaching
- All production methods – traditional and organic – require careful monitoring
- Food safety plans need to be worth more than the paper they are written on

A ***practice*** is something that is done daily.
