Fortieth Annual Citrus Packinghouse Day
Citrus Research and Education Center
Lake Alfred, Florida

- Food Safety -
Problems and Solutions
Jim Rushing

Jrshng@clemson.edu
Clemson University
Coastal Research and Education Center
2865 Savannah Highway
Charleston, SC 29414

Late 1980's…………………
Issue: Pesticides and Residues
Source: Packinghouse Wastewater
Concerns: Consumer Safety
Environmental Safety

Research:
Accumulation of pesticides in packinghouse wastewater and the influence of integrated pest management on reducing residues.
Rushing, Cook and Spell. 1995. HortTechnology 5:243-246

S.C. Industry Response to Research Report………
- Tomato growers pledged to utilize scouts and implement IPM practices more aggressively.
- Tomato packers constructed holding ponds to collect packinghouse wastewater.
- Analyses of pesticide residues from fruit did not indicate that consumer safety was an issue.
- Note. Peach packers already had constructed holding ponds to collect rinse water from de-fuzzing brushes and hydrocoolers.
Issue: Microbial Contamination

Crises: Two Outbreaks of Salmonellosis

1990
Salmonella javiana
174 cases identified

1993
Salmonella montevideo
79 cases identified

- Epidemiological Linkage -
  No Direct Evidence

1990 - Salmonellosis outbreak in Minnesota.

1993 - Salmonellosis outbreak in Illinois.

Can tomatoes support the growth of Salmonella?

S.C. Tomato Association provided funding.
Clemson University conducted sample collection.
University of Georgia conducted research.
Centers for Disease Controlled provided oversight.

South Carolina Tomato Growers Association
University of Georgia – Research Results

1. Salmonella infiltrated into a tomato can grow.
2. Salmonella can grow on surface of tomato.
3. Salmonella grows well on chopped tomatoes.
4. Salmonella growth is temperature dependent.
5. Chlorine can control Salmonella in the water, but does not disinfest fruit effectively.

Effects of temperature on growth of S. montevideo on tomato surface.
Critical Control Points in a Tomato Packinghouse
Where Can Contamination Occur?
1. Water quality maintenance.
2. Field and facility sanitation.
3. Hand sorting on the packingline.
Industry Response to Extension Reports
Implement Recognized Good Agricultural Practices (GAPs) for Each Step in the Handling Operation.

Mandatory Microbiological Testing?
1994 Results
Private Lab - 158 fruit samples.
CDC - 40 fruit and water samples.
All tests negative.
1995 Results
Private Lab - 77 fruit samples
All tests negative

Cost to Business

A Case Study of Salmonellosis Associated With Consumption of Fresh-market Tomatoes and the Development of a Hazard Analysis Critical Control Points (HACCP) Program.

Be Proactive, Not Just Reactive
Interagency Food Safety Council
Clemson University
Medical University of South Carolina (Agromedicine)
S.C. Department of Agriculture
S.C. Department of Health and Environmental Control
U.S. Food and Drug Administration
U.S. Centers for Disease Control
Industry Organizations
Fresh Produce, Beef, Poultry, Seafood, Restaurants, etc.
Clemson University
Food Safety Institute

Crisis Management Workshops
The Media – Information or Misinformation

Interagency Food Safety Council Plan

- Designate a media spokesperson (Rushing).
- Develop a statement for the media and stick to it. Avoid giving misinformation.
- Update the statement as new information becomes available.
- Inform the growers through County Extension.
- MUSC – Dept. of Agromedicine sent a fact sheet to family physicians by fax and e-mail on symptoms and diagnosis of *Cyclospora* related illness.

First Test of the Interagency Food Safety Council’s Crisis Management Strategy

**Issue:** *Cyclospora* related illness in Charleston, SC during the spring of 1996. First report from CDC, berries probably were responsible.

Misinformation: Second report from Texas stated that strawberries from CA were responsible.

Damage to California industry: ~$50 million

Challenge for SC: Prevent damage to our small pick-your-own strawberry industry.
Groups try to regain market

Clemson University’s Response to FDA’s Findings

- On-farm training with growers on GAPs in the presence of FDA inspector.
- Training workers (Spanish) in personal hygiene.

2001
- All FDA tests negative.

More Problems for S.C. Produce

2000
During routine screening by US–FDA, 3 samples of fresh produce tested positive for human pathogens.
Cantaloupes - *Salmonella*
Cantaloupes - *E. coli*
Green onions - *Shigella*

But no outbreaks of illness.

Conclusions and Questions

Food safety problems can occur in any industry, in fact occurrence seems inevitable.

Be proactive, develop a plan, anticipate a crisis.

Appoint and train a spokesperson for your company.

Could you recall your product if you had to?

Participate in programs, like this one.

Respond to the information you receive.

More Conclusions

Utilize the resources that are available to you. There are many.

Demand help from the people who are supposed to help you.

Observe what your competitors are doing, especially the off-shore companies. Their livelihood depends on exports. (Brazil, Argentina, South Africa, Australia).

Know which regulatory agencies impact your business.
Time is Money !!!

Set a Date and Get Started !!!

\[ \text{Clock} = \text{Dollar Signs} \]