Impact of U.S. Good Agricultural Practices on the Mexican Fruit and Vegetable Industry

Belem Avendaño
University of Baja California, Mexico
www.belem_avendano@yahoo.com

Linda Calvin
Economic Research Service, U.S. Department of Agriculture
lcalvin@ers.usda.gov

The views expressed here are those of the authors, and may not be attributed to the Economic Research Service or the U.S. Department of Agriculture.

Presentation at “New Food Safety Incentives and Regulatory, Technological, and Organizational Innovations”
AAEA Pre-conference Workshop
Long Beach, California, July 22, 2006
1998
The U.S. Food and Drug Administration (FDA) published its GAPs—guidelines to help farmers minimize microbial risk for fresh fruit and vegetables at the farm level—

Prevention
It is difficult to test for microbial contamination so FDA relies on the prevention principle

“GAPs are voluntary”
Growers evaluate costs and benefits

**Costs**
- Can be large and immediate. There is no compensating increase in price for products with GAPs

**Benefits**
- Reduce losses in the case of an outbreak
- Many buyers require GAPs
2002 Survey of Mexican Growers

- Exporters
- Variety of fresh fruit and vegetable products
- Three northwest Mexican states
Northwest of Mexico
GAP Status in 2002 of Surveyed Farmers

- No GAPs: 20%
- In the process of adopting GAPs: 51%
- GAPs: 29%

Source: Avendaño
Adoption of GAPs by Farm Size

Source: Avendaño
## Capital Improvements for Food Safety

<table>
<thead>
<tr>
<th>Type</th>
<th>%</th>
<th>Cost (U.S. $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewage/water</td>
<td>73</td>
<td>15,000-30,000</td>
</tr>
<tr>
<td>Process installations</td>
<td>58</td>
<td>150,000</td>
</tr>
<tr>
<td>Storage for chemicals</td>
<td>51</td>
<td>5,000</td>
</tr>
<tr>
<td>Water treatment plant</td>
<td>42</td>
<td>45,000-50,000</td>
</tr>
<tr>
<td>Break areas for workers</td>
<td>36</td>
<td>22,000</td>
</tr>
<tr>
<td>Ice plant</td>
<td>13</td>
<td>400,000-800,000</td>
</tr>
</tbody>
</table>

Source: Avendaño
Capital Investment by Size

Source: Avendaño
<table>
<thead>
<tr>
<th>Region</th>
<th>Increase in cost per box (U.S. $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexicali Valley and San Luis Rio Colorado</td>
<td>0.15-0.20</td>
</tr>
<tr>
<td>Coastal Zone, Baja California</td>
<td>0.03-0.04</td>
</tr>
<tr>
<td>Culiacan</td>
<td>0.09</td>
</tr>
<tr>
<td>Los Mochis</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Source: Avendaño
GAPs, Foodborne Illness
Outbreaks, and Trade

Best case scenario—green onions

Worst case scenario—cantaloupe
U.S. Green Onion Supply from United States and Mexico

Metric tons

Outbreak

Mexico

United States

1980 1990 2000
## Comparison of green onions and cantaloupe industries in Mexico

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Green onions</th>
<th>Cantaloupe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Concentrated</td>
<td>Dispersed</td>
</tr>
<tr>
<td>Organization</td>
<td>Strong</td>
<td>Weak</td>
</tr>
<tr>
<td>Firm size</td>
<td>Large</td>
<td>Small</td>
</tr>
<tr>
<td>Length of season</td>
<td>Year round</td>
<td>Short</td>
</tr>
<tr>
<td>Share of U.S. supply</td>
<td>86 %</td>
<td>13%</td>
</tr>
</tbody>
</table>
U.S. Imports of Cantaloupe from Mexico and Central America

Outbreaks

Metric tons


0 50,000 100,000 150,000 200,000 250,000 300,000 350,000 400,000 450,000 500,000

Central America

Mexico

Outbreaks
Adopting GAPs is expensive but now is just one of the requirements for operating in the U.S. and other international markets.

Larger farmers have been more successful in adopting GAPs than medium farmers, in part because of the large capital costs.

GAPs have structural impacts.
Conclusions

Organized industries have been able to use GAPs to their advantage as in the green onion case.

The way GAPs have been used has evolved over time and Mexico has been involved in that change.

Industry requirements for GAPs
Commodity-specific GAPs
BELEM DOLORES AVENDAÑO RUIZ: Economist from the University of Baja California, obtained her Doctor degree in Economic Agro-industrial problems in the CIESTAAM of the University Chapingo, in 2004.

- Experience in research, oriented to the Agricultural Economy, with special focus in Food Safety on Fruits and Vegetables. At the moment is responsible for the project Competitiveness and standards of the Baja Californian produce industry.

- Her experience in the industry dated since 1995, collaborating for more than eleven years with the Union Agricola Regional de Productores de Hortalizas del Valle de Mexicali, in Mexico, as Director of the association and now as adviser. Was in charge of the Program of Qualification in Food Safety: fruits and vegetables for the State of Baja California financed by the Foundation Produce.

- www.belem_avendano@yahoo.com

**Linda Calvin** is an agricultural economist for USDA’s Economic Research Service. She specializes in analysis of fruit and vegetable markets with an emphasis on food safety and technical barriers to trade.

- lcalvin@ers.usda.gov
Industry perspectives on incentives for food safety innovation
Continuous food safety innovation as a management strategy
  Dave Theno, Jack in the Box, US
Economic incentives for food safety in their supply chain
  Susan Ajeska, Fresh Express, US
Innovative food safety training systems
  Gary Fread, Guelph Food Technology Centre, Canada

Organizational and technological food safety innovations
Is co-regulation more efficient and effective in supplying safer food?
  Marian Garcia, Agricultural Sciences, Imperial College London
  Andrew Fearne, Centre for Supply Chain Research, Kent, UK
Chain level dairy innovation and changes in expected recall costs
  Annet Velthuis, Cyriel van Erve, Miranda Meuwissen, & Ruud Huirne Business Economics & Institute for Risk Management in Agriculture, Wageningen University, the Netherlands
Regulatory food safety innovations
Prioritization of foodborne pathogens
Marie-Josée Mangen, J. Kemmeren, Y. van Duynhoven, A.H. Havelaar, National Institute for Public Health & Environment (RIVM), the Netherlands

Risk-based inspection: US Hazard Coefficients for meat and poultry
Don Anderson, Food Safety and Inspection Service, USDA

UK HAS scores and impact on economic incentives
Wenjing Shang and Neal H. Hooker, Department of Agricultural, Environmental & Development Economics, Ohio State University

Private market mechanisms and food safety insurance
Sweden’s decade of success with private insurance for Salmonella control in broilers
Tanya Roberts, ERS, USDA and Hans Andersson, SLU, Sweden

Are product recalls insurable in the Netherlands dairy supply chain?
Miranda Meuwissen, Natasha Valeeva, Annet Velthuis & Ruud Huirne, Institute for Risk Management in Agriculture; Business Economics & Animal Sciences Group, Wageningen University, the Netherlands

Recapturing value from food safety certification: incentives and firm strategy
Suzanne Thornsbury, Mollie Woods and Kellie Raper
Department of Agricultural Economics, Michigan State University
Applications evaluating innovations & incentives for food safety
Impact of new US food safety standards on produce exporters in northern Mexico
Belem Avendaño, Department of Economics, Universidad Autónoma de Baja California, Mexico and Linda Calvin, ERS/USDA
EU food safety standards and impact on Kenyan exports of green beans and fish
Julius Okello, University of Nairobi, Kenya
Danish Salmonella control: benefits, costs, and distributional impacts
Lill Andersen, Food and Resource Economics Institute, and Tove Christensen, Royal Danish Veterinary and Agricultural University, Denmark

Wrap up panel discussion of conference
FSN section rep. – Tanya Roberts, ERS, USDA
AEM section rep. – Randy Westgren, University of Illinois
INT section rep. – Julie Caswell, University of Massachusetts
FAMPS section rep. – Jean Kinsey, University of Minnesota
Discussion of everyone attending conference
Note: speaker is either the 1st person named or the person underlined.

Thanks to RTI International for co-sponsoring the workshop.
Workshop objectives
- Analyze how new public policies and private strategies are changing economic incentives for food safety,
- Showcase frontier research and the array of new analytical tools and methods that economists are applying to food safety research questions,
- Evaluate the economic impact of new food safety public policies and private strategies on the national and international marketplace,
- Demonstrate how new public policies and private strategies in one country can force technological change and influence markets and regulations in other countries, &
- Encourage cross-fertilization of ideas between the four sponsoring sections.

Workshop organizing committee
Tanya Roberts, ERS/USDA, Washington, DC - Chair
Julie Caswell, University of Massachusetts, MA
Helen Jensen, Iowa State University, IA
Drew Starbird, Santa Clara University, CA
Ruud Huirne, Wageningen University, the Netherlands
Andrew Fearne, University of Kent, UK
Mogens Lund, FOI, Denmark
Mary Muth, Research Triangle Institute Foundation, NC
Jayson Lusk, Oklahoma State University, OK
Randy Westgren, University of Illinois, IL
Darren Hudson, Mississippi State University, MI