NAAMIC Workshop V: New Generation of NAFTA Standards

An Assessment of Food Safety Policies and Programs for Fruits and Vegetables: Food-borne Illness Prevention and Food Security

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California State University, Fresno

Austin, Texas, May 22, 2008
Overview

Proliferation of Standards & Quality Assurance Schemes Create:

Confusion for Market Participants

With Several Standards
What do they mean?
Which one(s) do you Implement?
How do they Relate?

Is this sustainable in an increasingly globally sourced food network?
• How Did We Get Where We Are?
  • What’s Going ON?
• How Do Standards Relate
  • Where Are We Going?
Focus: Process Standards

- Safety Cannot be Tested into a Product
- Negative Tests Don’t Prove Absence
- What will you test for?
- Focus on Process Not Product
- Focus on the Problems facing the Producer
Food Safety Programs Minimize Risk
They Do Not Eliminate It

- No Kill Steps
- Washing will NOT Eliminate Hazards
- Cross Contamination Potential
Hence
Concern for Human Health
Food-Borne Illness Outbreaks

- 1996 & 1997 Outbreaks traced to Guatemalan raspberries

- 2000 – 2002 Outbreak linked to Mexican cantaloupe
# Food-Borne Illness Outbreaks

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Year</th>
<th>Location</th>
<th>Produce Source</th>
<th>Venue</th>
<th>Type of Melon</th>
<th>No. of Cases</th>
<th>No. of Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Escherichia coli</em> O157:H7</td>
<td>1993</td>
<td>Oregon</td>
<td>NR&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Restaurant</td>
<td>Cantaloupe</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td><em>Salmonella Chester</em></td>
<td>1989-90</td>
<td>Multistate, US and Central America</td>
<td>Unknown</td>
<td>Cantaloupe</td>
<td>&gt;245 (25,000 estimated)</td>
<td>2</td>
<td></td>
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<tr>
<td>S. Javiana</td>
<td>1991</td>
<td>Michigan</td>
<td>NA</td>
<td>Indoor picnic and in-school party</td>
<td>Watermelon</td>
<td>26 primary 13 secondary</td>
<td></td>
</tr>
<tr>
<td>S. Miami</td>
<td>1954</td>
<td>Massachusetts</td>
<td>Florida</td>
<td>Supermarket</td>
<td>Watermelon</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td>S. Oranienburg</td>
<td>1979</td>
<td>Illinois</td>
<td>Illinois</td>
<td>Supermarket</td>
<td>Watermelon</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>S. Oranienburg</td>
<td>1998</td>
<td>Ontario, Canada</td>
<td>US, Mexico, or Central America</td>
<td>Various</td>
<td>Cantaloupe</td>
<td>22</td>
<td>0</td>
</tr>
<tr>
<td>S. Poona</td>
<td>1991</td>
<td>Multistate, US and Canada</td>
<td>Texas or Mexico</td>
<td>Unknown</td>
<td>Cantaloupe</td>
<td>&gt; 400 confirmed US, 72 Canada</td>
<td>0</td>
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<tr>
<td>S. Poona</td>
<td>2000</td>
<td>Multistate, US (8 states)</td>
<td>Mexico</td>
<td>Various</td>
<td>Cantaloupe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S. Saphra</td>
<td>1997</td>
<td>California</td>
<td>Mexico</td>
<td>Home, grocery stores, and restaurants</td>
<td>Cantaloupe</td>
<td>24</td>
<td>0</td>
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<tr>
<td><em>Salmonella</em></td>
<td>1950</td>
<td>Minnesota</td>
<td>NA</td>
<td>Roadside stand</td>
<td>Watermelon</td>
<td>6</td>
<td>0</td>
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<tr>
<td><em>Shigella sonnei</em></td>
<td>1987</td>
<td>Sweden</td>
<td>Morocco</td>
<td>Dinner party</td>
<td>Suspect watermelon</td>
<td>15</td>
<td>0</td>
</tr>
</tbody>
</table>
Spinach Crisis 2006

Thursday September 14, 2006
FDA Warning on Serious Foodborne E.coli O157:H7 Outbreak

- All retail and food service product pulled from shelves.
- Distribution chain stopped in motion.
- Harvesting / processing stopped.

- Planting decisions on hold.
- An entire industry shut down.
The time from the beginning of the patient’s illness to the confirmation that he or she was part of an outbreak is typically about 2-3 weeks. Case counts in the midst of an outbreak investigation must be interpreted within this context.
Anatomy of an Outbreak

Cases of E. coli O157:H7 by state and states where lot code _227 reported by patients, United States, August-September 2006 (N=192)

26 States

Number of cases of E. coli O157:H7 by date of illness onset, United States, August-September 2006 (N=181)

204 Illnesses
31 HUS
104 Hospitalizations
3 Deaths
The Economic Health of the Industry

Impact of the E.Coli Spinach Incident on Weekly Supermarket Sales of Spinach, in $1,000, 1/9/05 through 5/27/07

FDA Spinach Advisory 9/14

Source: Fresh Look Marketing

Roberta Cook, November 2007
Juxtaposed to the Other Health Message

Joe Klein, a Sparta, Mich., apple and cherry grower

“An apple a day keeps the doctor away—if it’s clean.”
“Yes, but take away the rodent droppings and the occasional shard of glass and you’ve still got a damn fine product.”
February 12, 1999

Dear Grower/Shipper

Scientists and nutritionists recommend that consumers include several servings of fresh fruit and vegetables in their daily diets. However, along with information about the health benefits of consuming fresh produce, the general public is being bombarded with news about produce implicated in E.coli, salmonella, cyclospora, clostidium, and shigella outbreaks. Consequently, while fresh produce is one of the most important and nutritious products we carry, it is also becoming one of the most customer-sensitive. Indeed, in response to the outbreaks of foodborne illness, the federal government has created a "food czar" to centralize, regulate, and enforce food safety programs. In response to these changing dynamics, Safeway is expanding its produce buying safety program. With the help of produce growing and handling professionals, we are initiating a scientifically based audit program.

As a condition of doing business with Safeway, growers and shippers of certain agricultural commodities will be required to participate in a verifiable, independent third-party food safety audit. The program will focus initially on produce which has been implicated in food-borne illness outbreaks by the Center for Disease Control or FDA, or which has otherwise been identified as a high risk for potential contamination. Once the produce safety program is in place, we will purchase produce only from growers/shippers meeting the objective standards necessary to be certified under the program.

In the same letter:

Although the audit/certification process may introduce a small additional cost of doing business, we hope and believe that this type of program will become a standard for improving the produce industry's food safety efforts.
Food Safety – Industry Status

- 2006 spinach crisis finally brought industry focus on food safety
- GAP Metrics developed and have added some quantification to field food safety practices for leafy greens.
- Leafy Greens Marketing Agreement – 2007 (CA & AZ)
- For those with existing documented GAP programs, minimal changes.
- Commodity specific guidance is current focus for industry
- Research has become a top priority but efforts widely divergent
- Media and consumer focus on food safety remains high
- Customers searching for answers, but little has changed via purchase decisions from buyers
- Some feel they can test their way out of problem
- Others seek to gain market advantage with specific audits or tests
- Product testing and its validity still remains as a key issue
- Current sampling and testing methodologies not specific and sampling programs remain statistically insignificant.
- Likely government regulation and/or MA extension near term
Food Safety Programs
Control, Reduce or Eliminate Hazards
Risk Factors – Environment/Crop Interactions

Adapted from Beuchat, 1996
Good Agricultural Practices
The Heart of Producer Based Food Safety Programs
Many Programs!

- Public GAPs USA = Food Safety Guidelines with emphasis on decreasing risk of microbial contamination
- Private GlobalGAP = International Standards, can be more robust
- Private Industry, NGO, etc, etc, etc = Standards Proliferation
U.S. F.D.A
Guidelines
Developed
Initially in 1998

Public Standards

Focus

• Cropland History
• Adjacent Land Use
• Fertilizer Usage
• Pesticide Usage
• Water Usage
• Employee Hygiene
• Packing House Operations
One of the leading private standards and certification programs in the horticultural sector is the Euro-Retailer Produce Working Group Good Agricultural Practice (EurepGAP) program. In 1997, a group of 13 of the largest European retailers including Royal Ahold, Marks & Spencer, Tesco, Safeway, and Sainsbury began to work together under the EUREP banner. Their objective was to establish a harmonized standard for Good Agricultural Practices (GAP), together with a TPC system for the production of fresh fruit and vegetables. These retailers agreed to work together to develop EurepGAP as a benchmark standard in order to avoid a situation where suppliers have to be separately certified for multiple retailers (USDA/FAS 2001). In order to sell fresh produce to the European stores of these chains, suppliers must be Third Party certified against the standards established by EUREP which include aspects of food safety, sustainable agriculture, labor and animal welfare.
The challenge of globalising markets is nowhere greater than in the primary food sector. GLOBALGAP (formerly known as EUREPGAP) has established itself as a key reference for Good Agricultural Practices (G.A.P.) in the global market-place, by translating consumer requirements into agricultural production in a rapidly growing list of countries – currently more than 80 on every continent.

- GLOBALGAP is a private sector body that sets voluntary standards for the certification of agricultural products around the globe. The aim is to establish ONE standard for Good Agricultural Practice (G.A.P.) with different product applications capable of fitting to the whole of global agriculture.

- GLOBALGAP is a pre-farm-gate standard, which means that the certificate covers the process of the certified product from farm inputs like feed or seedlings and all the farming activities until the product leaves the farm. GLOBALGAP is a business-to-business label and is therefore not directly visible to consumers.

- GLOBALGAP certification is carried out by more than 100 independent and accredited certification bodies in more than 80 countries. It is open to all producers worldwide.
Private standards built on state Standards.

As both larger suppliers and food retailers source and sell in more and more nations, the crazy quilt of public standards tends to restrict the rapid and strategic movement of goods. Thus, retailers have tried to engage in a form of standards harmonization by creating metastandards (standards for standards). If met, these metastandards permit retailers to shift shipments from one nation to another and still meet public standards. An example is the food safety metastandards promulgated by CIES, the Food Business Forum.

Food Marketing Institute (FMI)
The SQF (Safe Quality Food) Program is a leading, global food safety and quality certification program and management system designed to meet the needs of buyers and suppliers worldwide.

1998 the British Retail Consortium (BRC),

Federal Union of German Trade Associations (BDH e.V.) and accepted by the German Trade
The key criteria included:
• Food safety management systems
• Good agricultural practices / manufacture practices / trading practices
• HACCP systems
California Experience
Directly Linked to Leafy Greens (Spinach and Lettuce, etc)
About LGMA

In 2007 California farmers came together to raise the bar for food safety. As a result the California Leafy Green Products Handler Marketing Agreement (LGMA) was formed. Members of the LGMA are working collaboratively to protect public health by reducing potential sources of contamination in California-grown leafy greens.

To date nearly 120 handlers, representing over 99% of the volume of California leafy greens, have joined the LGMA. These companies have committed themselves to sell products grown in compliance with the food safety practices accepted by the LGMA board. LGMA membership requires verification of compliance with the accepted food safety practices through mandatory government audits. These food safety practices were developed by university and industry scientists, food safety experts and farmers, shippers and processors. California leafy greens are now grown under a unique system that has become a model for leafy green growers in other states.

Fourteen leafy green products are covered by the LGMA including:

- Arugula
- Baby Leaf Lettuce
- Butter Lettuce
- Cabbage
- Chard
- Endive
- Escarole
- Green Leaf Lettuce
- Iceberg Lettuce
- Kale
- Red Leaf Lettuce
- Romaine Lettuce
- Spinach
- Spring Mix
Service Mark

The California Leafy Greens Marketing Agreement (LGMA) Service Mark assures buyers of California leafy greens that product bearing the mark has been grown according to the food safety practices accepted by the LGMA. This mark signifies the member has been verified through government audit to be in compliance with mandatory food safety practices of the LGMA. Members of the LGMA are only allowed to use the Service Mark after they have been certified by California Department of Food and Agriculture (CDFA) inspectors. Buyers can verify that handlers are members of the LGMA by checking the members section of the LGMA website and by looking for the Service Mark on bills of lading.
Avendra LLC  (Comprehensive Procurement Company)

Darden Restaurants  (Darden Restaurants, Inc.,
(NYSE: DRI) headquarterd in Orlando, Fla., is the world’s largest
cfull-service restaurant company with almost $6.7 billion in annual
sales and approximately 170,000 employees. The Company owns
and operates nearly 1,700 restaurants including Red Lobster, Olive
Garden, LongHorn Steakhouse, The Capital Grille, Bahama Breeze
and Seasons 52)

McDonald’s Corporation

Publix Super Markets

Wal-Mart Stores, Inc.

Walt Disney World Company
Compare and Contrast The Various Standards To Illustrate the Current Situation/Frustration and Likelihood for Change
Figure 1. Convergence of Multiple Process Standards

- **International**
  - GlobalGAP

- **National**
  - United States Food and Drug Administration

- **Producer**
  - California Leafy Green Marketing Association

- **Industry/Retail**
  - Food Safety Leadership Council
Common Components in All Systems
Linked to Hazard Areas

- Soil and Soil Amendments
- Water
- Animals
- People
Production & Harvest

Practices: Site Selection & Adjacent Land Use
Production & Harvest
Possibilities: Site Selection & Adjacent Land Use

**Site Selection**
- Range Land
- Crop Production Land that has been Grazed
- Flooded Ground

**Adjacent Land**
- Forest
- Riparian Environment
- Farm Land
- Urban Interface
- Composting Operations
- Sewage Treatment Facilities
Production & Harvest

Controls: Adjacent Land Use

Proximate Safe Distance

Potential Contamination Source

Mitigation Measures / Risk Factors

- Composting Operations
- CAFO’s
- Compost On Adjacent Farms
- Grazing Lands
- Leach Fields
- Fallow Areas (Woods, etc.)
Production & Harvest

Practices: Production

WATER
Water Use: Production (Contact, Non Contact) Postharvest

- Microbial Action Levels Based on Safe and Sanitary Intended Use

- Testing Frequency Based on Source Variability

- Microbial Indicators Used To Measure System Performance (generic *E. coli* )

- Water of appropriate microbial quality for irrigation?
- What factors effect pathogen persistence and growth in irrigation water?
- How effectively are pathogens transferred by water uses?
- Does the irrigation method used alter pathogen transference risk?
- If pathogens are transferred to produce what environmental factors and production practice effect survival and growth of human pathogens?
- Root uptake? Contaminated seed?
The Animal Element
Now if the Animals Could Just Read the Sign

WARNING

ABSOLUTELY NO ANIMALS ALLOWED DUE TO FOOD SAFETY ISSUES
The Human Element
Health & Hygiene

Practices: Harvest
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<tr>
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<tr>
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<td>Global Gap 1</td>
</tr>
<tr>
<td>Documented Plan and Monitoring</td>
<td>Yes</td>
</tr>
<tr>
<td>Biosoild Use Allowed</td>
<td>No</td>
</tr>
<tr>
<td>Specific Acceptance Criteria</td>
<td>No</td>
</tr>
<tr>
<td>Fecal Coliforms</td>
<td>EPA CFR 503</td>
</tr>
<tr>
<td>Salmonella spp</td>
<td>EPA CFR 503</td>
</tr>
<tr>
<td>E. coli 0157: H7</td>
<td>EPA CFR 503</td>
</tr>
<tr>
<td>Generic E. coli</td>
<td>NA</td>
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</tbody>
</table>

3. Commodity Specific Food Safety Guidelines for the Production of Harvest of Lettuce and Leafy Greens, 10-16-07.
4. Food Safety Leadership Council On-Farm Standards, V1.0, 9-10-07
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<tr>
<td><strong>Selected Cultural Practice or Activity</strong></td>
<td>Global Gap 1</td>
</tr>
<tr>
<td><strong>Documented Plan and Monitoring</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Specific Acceptance Criteria</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Pathogen Presence</strong></td>
<td>≤ 1 per L</td>
</tr>
<tr>
<td><strong>Well Water Generic E. coli</strong></td>
<td>Faecal conforms ≤1000/100 ml</td>
</tr>
<tr>
<td><strong>Surface Water Generic E. coli</strong></td>
<td>Faecal conforms ≤1000/100 ml</td>
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</tbody>
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Well Water Used for Irrigation and Foliar Applications (Appendix 1)

To establish baseline (testing requires a minimum of daily samples for five consecutive days) and monthly routine testing subsequently.

**Generic E. coli test results < 1.1 MPN/100 mL**
- Acceptable Water Criteria
  - Continue use for irrigation and foliar applications. Test water at a minimum on a monthly basis and at the onset of crop production.
  - **Generic E. coli < 1.1 MPN/100 mL**
    - Acceptable Water Criteria
      - Revert back to monthly test schedule.
  - **Generic E. coli ≥ 1.1 MPN/100 mL**
    - Unacceptable Water Criteria
      - Do not use water source. Use alternate water source that meets acceptable water criteria.
      - Continue testing, treatment, and evaluation of water source until acceptable water criteria are met.

**Generic E. coli test results ≥ 1.1 MPN/100 mL**
- Unacceptable Water Criteria
  - Do not use water source for irrigation or foliar applications.
  - Complete evaluation of well water and its method of distribution and look for potential sources of contamination.
  - Take appropriate documented corrective and preventative actions, including treatment of well.
  - Re-test unacceptable well water sample for Generic E. coli.
Surface Water Sources Used for Irrigation and Foliar Applications (Appendix 2)

To establish rolling geometric mean baseline (testing requires a minimum of daily samples for five consecutive days) and monthly routine testing subsequently.

- Test results for Generic E. coli are <1.1 MPN/100 mL
  - Acceptable Water Criteria
  - Continue use for irrigation and foliar applications. Test water at a minimum on a monthly basis and at the onset of crop production.

- Test result for Generic E. coli are 1.1 MPN/100 mL but ≤126 MPN/100 mL
  - Conditional Water Criteria
  - Complete evaluation of open water source and its method of distribution and look for potential sources of contamination.
  - Take appropriate documented corrective and preventative actions.
  - If treatment system is installed, test to validate system effectiveness.
  - Testing required by selecting Option A and/or Option B below:
    - Option A: Test water daily for five (5) consecutive days for Salmonella spp. and E. coli O157:H7.
    - Option B: Before harvest test crop for Salmonella spp. and E. coli O157:H7.

- Generic E. coli ≥126 MPN/100 mL
  - Unacceptable Water Criteria
  - Do not use water source. Use alternate water source that meets Acceptable water criteria.
  - Complete evaluation of open water source and its method of distribution and look for potential sources of contamination.
  - Take appropriate documented corrective and preventative actions.
  - Before harvest test crop for Salmonella spp. and E. coli O157:H7.

Option A Requirements:
- Test water daily for five (5) consecutive days for Salmonella spp. and E. coli O157:H7.

Option B Requirements:
- Before harvest test crop for Salmonella spp. and E. coli O157:H7.

Negative for Pathogens
- Acceptable Water Criteria
  - Can use the water source for irrigation and foliar applications.
  - Continue with routine testing schedule.

Positive for Pathogens
- Unacceptable Water Criteria
  - Do not use water source. Use alternate water source that meets Acceptable water criteria.
  - Before harvest test crop for Salmonella spp. and E. coli O157:H7. If the crop is positive for pathogens, the crop must not be sold/distributed for human consumption.
  - Continue testing, treatment and evaluation of water source until Acceptable water criteria are met.
  - If treatment system is installed, test to validate system effectiveness.

Negative for Pathogens
- Acceptable Product Criteria
  - Can use the water source for irrigation and foliar applications.
  - Continue with routine testing schedule.

Positive for Pathogens
- Unacceptable Product Criteria
  - Crop must not be sold/distributed for human consumption.
  - Do not use water source. Use alternate water source that meets Acceptable water criteria.
  - Continue testing, treatment and evaluation of water source until Acceptable water criteria are met.
  - If treatment system is installed, test to validate system effectiveness.

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Version 1.0 September 7, 2007
Table 3. Alternative Animal Related Standards by Regulatory Body: Animal Intrusions

<table>
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<td>Yes</td>
</tr>
<tr>
<td>Specific Acceptance Criteria</td>
<td>No</td>
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<tr>
<td>Pathogen Presence</td>
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<tr>
<td>Specific Distance From Growing Fields</td>
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The Human Element
Health & Hygiene

- Don’t Make for an Easy Table
- Training and Common Sense Management
Traceability Another Time

Customer Frequent Shopper Card
4 01234 56789 2

ITEM
00 614141 04174 9

CASE of 54 Gala apples
= (01) 10 614141 04174 7

PALLET
8 CASES
= (01) 30 614141 04174 3
Cost of Compliance

Anecdotal evidence from California producers report Primus Labs general ranch audits to be around $450 per ranch, not including the costs associated with correcting any problems revealed in the review. California producers like Metz Fresh, in Kings City California have reported compliance costs associated with LGMA participation in the range of $210 to $260 per crop acre.[1]

[1] Reported in panel discussion at the 82nd annual meeting of the Western Growers Association in November, 2007 in Maui, Hawaii.
The annual cost of Third Party Certification can be divided into three components:

- audit costs
- transportation and field expenses of certifiers
- costs involved in preparing farms and firms for the audits

Each of these costs varies considerably.

For example, in the fresh produce industry, on the high end, a supplier may be expected to spend approximately US$ 8,500 initially. This covers the training of suppliers in the implementation of standards, and the costs of audits. The cost may be reduced if a group of suppliers jointly applies for a field audit. In the case of Société Générale de Surveillance (SGS), each group member is charged between US$ 5,000 and US$ 6,000 initially, followed by audit costs of US$1,200 to US$1,500 per visit (Grower Magazine, Boyd 2004).
Cost of Compliance

In another study and attempt was made to document compliance costs association with a host of regulations including but not limited to food safety issues imposed on producers in Texas, Arizona and California.[1] In that study Texas citrus operators reported a cost of $2.11 per acre ($11,394) for activities associated with Primus Labs and Eurepgap certification. California lettuce producers reported a cost of $1.50 per acre ($4,800) in additional food safety related cultural costs. Arizona lettuce growers reported $3,000 for the inspection of the ranch by Primus Labs, harvest process inspections o $125 per crew and time required in documentation and oversight of $1,190 for an added cost of $1.50 per acre.

Cost of Compliance

Private agri-food standards: Implications for food policy and the agri-food system; Volume 30, Issue 3, Pages 241-370 (June 2005)
Edited by Spencer Henson and Thomas Reardon

A Dutch tomato grower who is EUREPGAP-certified highlights some of the benefits he sees in TPC: Retailers are not paying more for certified produce … [P]articipation in EurepGAP will not lead to better prices, but… its importance is that it will ensure access to world markets and create a sound basis for expansion… EUREPGAP, 2003).

A study of the Michigan blueberry industry found that growers who ran their own processing facilities had to make considerable investments, in some cases reaching upwards of $100,000, to meet the requirements of TPC (Bain and Busch, 2004). These investments included upgrading the plant facilities (e.g., installing impermeable washable surfaces), purchasing new equipment and technology (e.g., metal detectors, optical sorters), and employing extra labor to conduct the ongoing day-to-day tasks of documentation (Bain and Busch, 2004).

Carl Tarabbio Jr., of Tarabbio Farms illustrates some of the frustration felt by growers: [Retailers] are asking us to pay as much as $600 a day for private labs to come and inspect our farms. They want the packing house to be enclosed so birds can’t fly in and possibly contaminate the containers or produce. They want our crates and boxes stored in concrete padded room. They want us to disinfect each basket after picking. They want us to disinfect the truck after each delivery. There is no way we can comply with an additional 100 plus demands and remain in business (Miller, 2001).
Conclusions

Private agri-food standards: Implications for food policy and the agri-food system; Volume 30, Issue 3, Pages 241-370 (June 2005)
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Conclusions

The key message from the papers brought together by this special issue is the growing dominance of private food safety and quality standards as a dominant form of governance in agri-food systems. The papers collected together in this special issue, that present different disciplinary, geographical and product context perspectives, demonstrate how private food safety and quality standards have evolved in response both to weaknesses in public system of food safety and/or quality oversight or changes in the level and nature of regulatory requirements and as a strategic mechanism for competitive positioning in markets for high-value agricultural and food products. The papers suggest that the most significant driver of this phenomenon is the global concentration of food retailing and, more specifically the increasing dominance of supermarket chains, not only in industrialised countries, but also the developing world.
Conclusions

Boggiatto Produce Inc., a Salinas, Calif., producer of lettuce, artichokes and broccoli, replaced its audited food-safety program with new, industry-developed standards for California leafy-greens growers after the 2006 *E. coli* outbreak in spinach, says Michael Boggiatto, president and general manager.

“It’s definitely added more levels of management and more cost,” he says. “It seems like every month we’re having to do something.”

The company is beginning to apply the practices to all its crops. It’s hard to justify doing something for greens but not other vegetables, Boggiatto says.

“I don’t object to reasonable demands on us for the sake of food safety,” he says. “But the demands need to be science-based.”

Although Boggiatto advocates nation-wide standards, Trevor Suslow, a University of California, Davis, Extension research specialist, says that may not be realistic.

“Having a uniform set of criteria and standards levels the playing field,” Suslow says. “But it’s really difficult to have one set that works everywhere. In some areas, it may be too permissive or too restrictive according to the risk in that area.”

Soil types, irrigation methods and other growing practices affect risk levels, says.
Conclusions

Absolutes Subject to Negotiation?

One big shipper and processor put it this way: “...we have been given a green light to continue supplying our products without meeting the FSLC’s metrics... on water and distances. At least for the 2008 year... they have been reasoning and negotiating with their suppliers...”
Conclusions

Absent an agreement on universal standards the uncertainty regarding food safety will likely increase as the source of food for consumption within North America becomes increasingly global. Food supplies coming from producers adhering to a mixed set of standards with an undetermined amount of consistency regarding how potentially hazardous elements in the process are addressed. The ability of agents charged with assuring public confidence in the food supply, domestically produced or imported, will be a more challenging. Such an environment may lead to a situation where the only option left for harmonization of standards will be government intervention at either the national, regional or global level.
Food Safety is a Worldwide Concern
In a Global Source Food Network

Uzbekistan Food Safety Study
The World Bank & World Health Organization

Value Chain for Selected Food Stuff and Possible Entry Points for Food Safety Risks

Tashkent, March 2008