

Managing Risk in Fruit & Vegetable Production

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Strategy

- ∞ Reduce consumer uncertainty regarding food products
 - ∞ Access to new markets
 - ∞ Improved pricing
 - ∞ Reduced risk of customer loss
 - ∞ Reduced risk of revenue loss

Why are Consumers Uncertain about Their Food?

- ∞ Rising disposable household incomes
 - ∞ Food away from home
 - ∞ Health concerns
- ∞ Increased food related outbreaks, unknown potential effects
 - ∞ E-coli, *Salmonella*
 - ∞ GMOs, antibiotic-resistance, pesticide/herbicide residues
- ∞ Growing separation between agricultural producers & consumers
 - ∞ <2% of population living on farms, 17% living in rural areas

Food Safety

- ∞ Food safety incidents/food borne illnesses
 - ∞ More than 200 known diseases are transmitted through food
 - ∞ CDC estimates 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths resulting from food consumption annually
 - ∞ Fresh produce accounts for five of top 10 riskiest foods regulated by FDA

Food Safety

- ∞ Industry costs of food safety incidents/recalls
 - ∞ Food safety scare associated with strawberries in 1996 -
“Before it was over, the industry suffered nearly \$40 million in lost sales, 5,000 lost jobs, and a 10 percent reduction in crop acreage the following year.”
 - ∞ “The U.S. peanut industry could lose \$1 billion and small business millions of dollars more because of an outbreak of salmonella that has forced the biggest food recall in U.S. history.”

Pricing

- ∞ Consumers willing to pay premiums for products perceived to be safer, healthier, or environmentally friendlier
 - ∞ Natural/organic/reduced chemical inputs
 - ∞ Food safety inspections
 - ∞ Local foods or certain areas of origin
 - ∞ Humane animal treatment
 - ∞ Nutritional related factors (e.g. high antioxidant, low fat)
 - ∞ Social responsibility

Tools

- ∞ Food safety management plan
- ∞ Product labeling
- ∞ Consumer education/events

Overview of Food Safety Risks

∞ Biological

∞ Bacteria, viruses, parasites, allergens, and prions

∞ Chemical

∞ Pollution of air, water, and soil, and application of agrochemicals

∞ Physical

∞ Risk of choking, lacerations, or food damage

Biological Risks

❧ Bacteria

- ❧ Salmonella, Listeria

❧ Viruses

- ❧ Hepatitis A

❧ Parasites

- ❧ Giardia lamblia, Cyclospora cayetanensis

❧ Prions

- ❧ Transmissible Spongiform Encephalopathies
- ❧ Variant Creutzfeldt-Jakob disease, Mad Cow Disease (BSE)

❧ Allergens

- ❧ Sulfites, peanuts, tree nuts, wheat, soybeans, milk, eggs, and fish

Chemical/Physical Risks

- ∞ Toxic metals and dioxins
- ∞ Agrochemicals such as pesticides, fertilizers, and herbicides
- ∞ Stones, small sticks, bits/pieces of wood, plastic, metal, or glass
- ∞ Equipment fragments
- ∞ Employee objects such as pens, pencils, jewelry

Food Safety Management Plans

- ❧ Good Agricultural Practices (GAPs)
 - ❧ FDA & USDA published farm level voluntary 'guidelines' in 1998
 - ❧ Created an audit program based on guidelines
 - ❧ Producer must pay auditor's time and mileage (federal rate \$92.00/hour)
 - ❧ Separate audit required for each crop

- ❧ Leafy Greens Marketing Agreement (LGMA)
 - ❧ Response to 2006 spinach outbreak
 - ❧ Mandatory for many California growers
 - ❧ Some use in Nevada and Arizona

Good Agricultural Practices (GAPs)

- ∞ USDA Good Agricultural Practices & Good Handling Practices Audit Verification Checklist
 - ∞ Overview of food safety risk controls & management
 - ∞ Crop production water
 - ∞ Manure and municipal bio solids
 - ∞ Worker health and hygiene
 - ∞ Field and harvest sanitation
 - ∞ Postharvest water during packing
 - ∞ Transportation
 - ∞ Storage and distribution

Hazard Analysis and Critical Control Points (HACCP)

- ∞ Adopted by FDA in oversight and regulation of food production industries
- ∞ Prevention-based safety program to identify and monitor risks in food production
- ∞ Simple and logical system

Seven Principles of HACCP

- ∞ Perform a hazard analysis
- ∞ Identify the Critical Control Points (CCPs)
- ∞ Establish preventative measures
- ∞ Establish monitoring procedures
- ∞ Establish corrective actions
- ∞ Establish verification procedures
- ∞ Establish effective record keeping

New Markets - Grocery Store Requirements

- ∞ Farm business plan (product description, cost, availability, delivery schedule, etc.)
- ∞ Farm land use history and surrounding land use history
- ∞ Water and irrigation system description with water testing certificate
- ∞ Pesticide, fertilizer, herbicide application records
- ∞ Employee food safety training schedule
- ∞ HACCP or similar plan
- ∞ Harvest, packing storage, and transportation methods
- ∞ Record-keeping, safety incident management plan
- ∞ Certificate of insurance

Product Labeling Methods

- œ Product label specifying food production system or specific breed/style used
 - œ Organic, natural, grass-fed, hormone free
- œ Product label specifying food origin (local foods)
 - œ Regional, state, valley, etc.
 - œ Utah's Own, Oregon Grown, Kona Coffee
- œ Country of origin labeling requires retailers to label the country of origin
- œ Food safety inspections/certifications

Benefits of Using Labels

- ☞ Loureiro and Umberger (2007): Consumers in U.S. willing to pay a premium of \$2.57/lb for steak with COOL
- ☞ Loureiro and Umberger (2007): U.S. consumers willing to pay premium of \$8/lb for “USDA food safety inspected” label on steak
- ☞ Nilsson et al. (2006): Consumers willing to pay a premium of \$2.66/lb for “certified free of antibiotics” pork chops
- ☞ Grannis and Thilmany (2002): 38% of surveyed respondents were willing to pay a 10% premium for natural steaks
 - ☞ 14% of respondents were willing to pay a 20% premium

Third-Party Labeling Programs

- ∞ Allows producers to enter a recognized market using an established umbrella program or label
- ∞ Certified products provide consumer assurance that products meet certain “extra-sensory” or production/process attributes
- ∞ Third-party certification implies that certifying party does not directly benefit from sale of the good



Examples include USDA Organic, Oregon Grown, Certified Angus Beef, Fair Trade, etc.

Functions of Third-Party Programs

- ∞ Standard Setting
 - ∞ Specific quality level, well defined consumer known terminology
- ∞ Testing/Inspection
 - ∞ Objective measure of quality, record-keeping requirements
 - ∞ Pesticides, GM ingredients, hormones, etc.
- ∞ Certification
 - ∞ Provide labels to certified producers
- ∞ Enforcement
 - ∞ Continued testing & inspection
 - ∞ Fines/penalties for fraud

First-Party Labels

- ∞ Direct claims made by a firm about its product
 - ∞ e.g., “Healthy,” “Homegrown,” “Nature’s Best,” “pasture-raised,” exempt organic producers (<\$5,000 in organic sales)
- ∞ Requires no generally accepted standards
- ∞ Firms are still held to “truth-in-labeling laws”
- ∞ Consumers may prefer first-party claims as personal relationships & trust develop over time

Branding

- ∞ Generally privately owned & managed
- ∞ Focus on product attributes that are desired by a company's target markets
- ∞ Successful at local or regional level if consumers associate brand/label with desirable quality attributes
 - ∞ Example include Kleenex, Coke, Zerox, etc.

Third-Party Program Cost-Benefit Analysis

- ☞ Need to compare overall benefits to overall costs - Comparison must be done for a reasonable multi-year time horizon

- ☞ Benefits
 - ☞ Higher prices for goods
 - ☞ Increased market access
 - ☞ Improved price stabilization

- ☞ Costs
 - ☞ Price of attaining certification
 - ☞ Production process changes
 - ☞ Record keeping costs
 - ☞ Brand design & marketing

Minimum Record-Keeping Requirements

- ∞ All field activity
 - ∞ Planting, spraying, & harvesting
- ∞ All cleaning & packaging activity
 - ∞ Handling, cleaning, washing, packaging (if any), & storage
- ∞ All transport activity
 - ∞ Inspection & cleaning of transport units

Consumer Education/Events

- ∞ Brochures, signs, and marketing materials to demonstrate
 - ∞ Product nutritional benefits
 - ∞ Special farm production methods
 - ∞ Farm food safety procedures
 - ∞ Local foods sustainability – energy

Consumer Education/Events

- ∞ Educational newsletters and programming
 - ∞ Safe handling, storage & washing of fresh fruits/vegetables
 - ∞ Safe handling & storage of meat/poultry/fish/dairy
 - ∞ Cooking classes with minimum cooking times & temperatures
 - ∞ Handling/storage of processed foods
 - ∞ Home gardening/production methods
 - ∞ Farm tours

Thank you!



Resources

- ∞ D. Jolly and C. Lewis (2005), “Food Safety at Farmers Markets and Agritourism Venues: A Primer for California Operators.” Publication of the UC Small Farm Center available at http://sfp.ucdavis.edu/farmers_market/safety/
- ∞ L. Kitinoja and A. Kader (2003), ”Small-Scale Postharvest Handling Practices: A Manual for Horticultural Crops (4th Edition).” UC Davis Postharvest Horticulture Series No. 8E available at <http://ucce.ucdavis.edu/files/datastore/234-1450.pdf>
- ∞ Good Agricultural Practices: A Self-Audit for Growers and Handlers. Publication of UC Davis at <http://ucce.ucdavis.edu/files/filelibrary/5453/4362.pdf>
- ∞ Hazard Analysis Critical Control Point Information Center, IOWA State University at <http://www.extension.iastate.edu/HRIM/HACCP>
- ∞ Good Agricultural Practices Network, Cornell University at <http://www.gaps.cornell.edu>
- ∞ Small food business safety programs, e.g. good manufacturing practices, sanitation, and HACCP, Utah State University at <http://foodsafety.usu.edu>

Resources

- ∞ FDA Labeling & Nutrition at <http://www.fda.gov/Food/LabelingNutrition/default.htm>
- ∞ National Organic Program & Farmers' Markets at <http://www.ams.usda.gov>
- ∞ Utah's Own at <https://utahsown.utah.gov/>
- ∞ Western Extension Marketing Committee at <http://www.valueaddedag.org>

Resources

- ∞ Should You Sell Products to Grocery Stores? A guide for farms considering selling in grocery stores. Publication of Local Fare at <http://www.uwplatt.edu/content/localfare/pdf/SellingToGroceryStores.pdf>
- ∞ Whole Foods at <http://www.wholefoodsmarket.com/>
- ∞ USDA, National Ag Library at <http://www.nal.usda.gov/afsic/pubs/csa/csafarmer.shtml>
- ∞ ATTRA publications at <http://attra.ncat.org/>