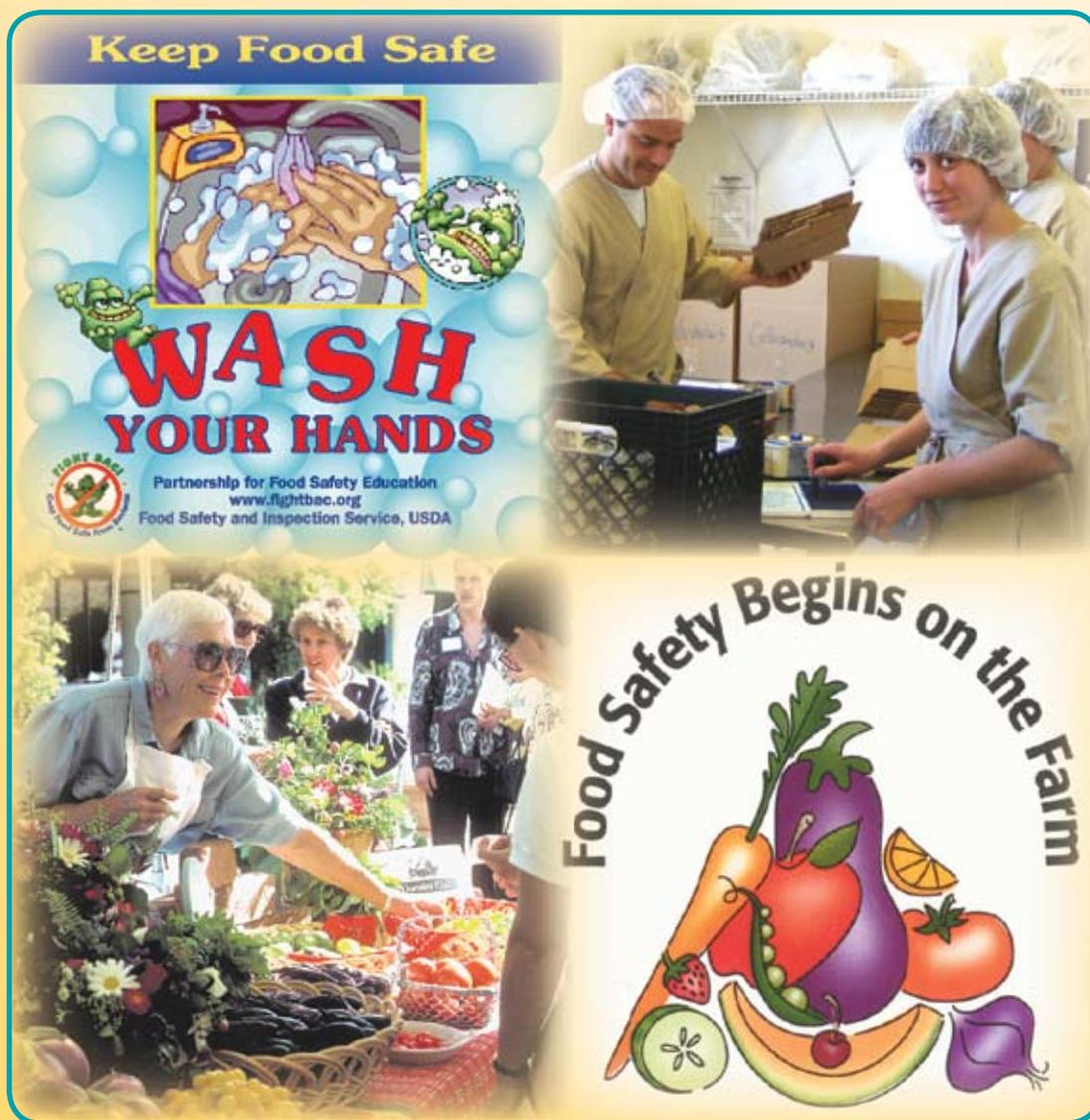


Food Safety at Farmers Markets and Agritourism Venues

A Primer for California Operators



A publication of the UC Small Farm Center

Food Safety at Farmers Markets and Agritourism Venues

Desmond Jolly, Ph.D.

Extension Agricultural Economist
Department of Agriculture and Resource Economics
Director
UC Small Farm Center
University of California Davis

Chris Lewis

Post Graduate Researcher
Small Farm Center
University of California Davis

Contents

Introduction _____	1
What is Food Safety? _____	2
Types of Food-Safety Hazards _____	3
biological food safety – chemical food hazards – physical food hazards	
Assessing Risks and Planning for Controls _____	7
preventive strategies – in the field – produce and other foods – value-added and processed foods – other products – occasional events – handling money and equipment – customer education	
Documentation and Liability Issues _____	19
labeling – recordkeeping – liability insurance – regulatory exemptions for agritourism operations	
Hazard Analysis and Critical Control Points (HACCP) ____	21
critical control points – haccp flowchart – control points table	
Self-Evaluation and Planning Worksheets _____	25
self-evaluation checklist – prioritizing actions worksheet – timetable for implementation	
Food-Safety Resources _____	29
Appendix _____	34



Food Safety at Farmers Markets and Agritourism Venues: A Primer For California Operators

This publication provides a basic guide to understanding food-safety issues relevant to California certified farmers markets and agritourism operations. It is designed for farmers, ranchers, and certified farmers market managers but can also be useful as a resource for educating employees about food-safety concerns and regulations and as a reference for other agricultural professionals. While every effort has been made to insure the information presented here is up to date and accurate, it is intended to be only an introductory guide for developing effective and cost-efficient food-safety practices. Best management practices for food safety will vary depending on each operation's particular characteristics and the specific activities in which it engages. Local environmental health agencies are ultimately responsible for regulating these activities as defined by California law. In addition, forces affecting food safety and its regulation are constantly changing. It is therefore

A busy day at an urban market can draw thousands of visitors.



Even if your operation does not serve prepared foods, this guide may be of use to you if you sell through or operate a:

- farmers market
- farm stand
- agritourism venue
- direct marketing operation

incumbent on operators to gain access to up-to-date information on best practices and regulatory changes as it becomes available.

Food-safety education, assessment, and planning are essential activities for managers and owners of businesses that directly market agricultural products. Informed, well-planned management of food-safety risks helps to ensure that businesses, families, employees, and customers all receive the full health benefits of fresh and processed agricultural products as well as agricultural and rural experiences with minimal exposure to health risks.

What Is Food Safety?

For the purposes of this guide, food safety is a measure of the risk to health and safety posed by handling and consuming agricultural products or prepared foods purchased at a farmers market or agritourism

FOLLOW THE FOOD CHAIN!



Demand for a specific kind of produce is subject to public perceptions of food safety. A single well-publicized incident can significantly reduce sales of a product nationwide. Such a food-safety scare associated with strawberries in 1996 devastated sales of that product nationally. According to one source, "Before that one 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."^a Another example is the 1989 crisis involving apples and Alar, a growth regulator. After CBS' *60 Minutes* aired a segment challenging the safety of apples sprayed with that chemical, "California and Washington apple growers got pounded, losing an estimated \$500 million in sales."^b

^a Stockwin, Will. "Deja Vu . . . Strawberry Industry Fights Back from Media Scare." *Ag Alert*, 9 April 1997.

venue. The lower the risk, the safer the food. Consideration of food-safety issues should enter into every aspect of management, from planning and production to merchandising and marketing. While consumers are usually the first to experience hazards associated with faulty food-safety practices, the consequences can affect everyone in the food chain, from employees to managers to owners and eventually to the public in general. Despite lessons learned from previous incidents, agricultural products continue to pose a risk of infrequent but sometimes widespread food illness outbreaks¹ because foods are biologically active products. As such, they are always targets for bacteria and other potentially hazardous organisms.

Favorable public perceptions of food safety evidenced by a high level of confidence can influence consumer purchasing decisions and result in increased demand

for some products over others and certain markets and venues over others. These preferences may also further translate into a consumer's willingness to pay higher prices for products perceived to be safer. For example, consumer concerns about pesticide residues in food have, in recent years, contributed to growth in the organic produce industry. Its products often receive a price premium over conventionally grown produce. According to a recent U.S. Department of Agriculture (USDA) report, growth in retail sales of organic products has averaged 20 percent or more annually since 1990, and organic products are currently sold in 73 percent of all conventional grocery stores.²

¹ Lee, Mike. "Almond Recall Grows; Nut Processor Is Sued." *The Sacramento Bee*, 25 May 2004.

² Dimitri, Carolyn, and Greene, Catherine. *Recent Growth Patterns in the U.S. Organic Foods Market*. Washington DC: USDA Economic Research Service Agriculture Information Bulletin AIB777, 2002.

Types of Food-Safety Hazards

Food safety can be compromised in a number of ways. Understanding the nature of food-safety hazards helps operators manage them effectively. The three most common types of risks to food safety are biological, chemical, and physical.

Biological Food Safety

According to the Centers for Disease Control (CDC), each year an estimated 76 million persons in the United States contract food-borne illnesses.³ Some of the products that are typically associated with biological food-borne illnesses include meat and dairy products, lettuce, seed sprouts, cabbage, carrots, tomatoes, melons, unpasteurized juices, berries, and other fruits and vegetables. While some foods are generally safer than others, any food can become hazardous when not handled safely. To illustrate, under the right conditions a single bacterium dividing every ten minutes can multiply to more than 500 million in five hours.⁴ Factors that affect biological pathogens and their rates of growth include *pH* (acidity level), *temperature*, *available water and oxygen*, and *access to nutrients*. The five biological causes of risk to human health associated with agricultural products and foods are *bacteria*, *viruses*, *parasites*, *allergens*, and *prions* (causal agent of

A biological pathogen is an organism that can cause disease or

Mad Cow Disease, also known as BSE or bovine spongiform encephalopathy).

Examples of common bacterial pathogens include *Escherichia Coli*, *Salmonella*, and *Shigella*. Viruses include hepatitis A, Norwalk, and

³ Mead P.S., et al. "Food-Related Illness and Death in the United States." *Emerging Infectious Diseases* (5) 1999: 607–625.

⁴ Simmonne, Amy H. *Food Safety: What Can Be Done at a Small Farm Level?* Gainesville FL: University of Florida Institute of Food and Agricultural Sciences. (No date.) Available online in March 2005 at www.smallfarm.ifas.ufl.edu/SFDevelopment/Pubs/FoodSafety.pdf.

Types of Food-Safety Hazards

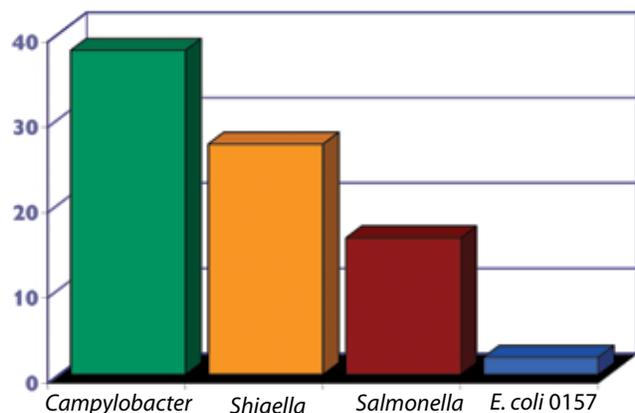
- **Biological** – pathogens and their toxic byproducts plus allergens naturally present in some foods.
- **Chemical** – pesticide, fertilizer, cleanser, and sanitizer residues.
- **Physical** – stones, pits, metal, glass, plastic objects.

rotavirus. Parasites include *Giardia*, *Toxoplasma*, and *Cryptosporidium*. Figure 1 shows the incidence of diagnosed food-borne illness per 100,000 persons in California during 2000 for selected counties chosen to best represent the U.S. population as part of a national disease-surveillance network. It shows that the top four pathogens that cause food-borne diseases are all bacteria.

Bacterial Food-Borne Illnesses

Three different types of food-borne illnesses result from bacteria in the food chain. One type of food-borne infection results from *proliferation of bacteria after consumption*. *Salmonella* and *Listeria* are examples of organisms that

Figure 1. Bacterial Origin of Outbreaks of Food-Borne Illnesses in California in 2000



Centers for Disease Control. "Preliminary FoodNet Data on the Incidence of Foodborne Illnesses—Selected States, United States, 2000." *CDC MMWR Weekly* 50(13) 2001: 241–246.

can cause infection when ingested. *Bacterial intoxication (poisoning)* occurs when an illness is caused by toxins produced in food prior to consumption as with *Clostridium botulinum*, the agent of botulism. *Toxin-mediated food-borne infection* is an illness that is caused by toxins produced by a bacterial infection such as from *Clostridium perfringens*.

Contamination of agricultural products with disease-causing bacteria can occur at any point in the food chain via animals, insects, soil, water, equipment, and human handling. Identifying potential points of contamination is critical since control measures are most effective when targeted at *preventing contamination at the source*. For example, control measures aimed at reducing contamination of fruits and vegetables in the packing shed during post-harvest operations will not prevent contamination that already occurred in the field.

Once food is contaminated, the risk of infection from bacteria increases with improper handling and storage, such as processing that damages the natural protective coating of fruits and vegetables or exposure to temperatures that favor bacterial growth. Cross-contamination can also occur at any step in the process. As a result, when assessing risks of bacterial hazards, effective control measures should take into account critical control points throughout the food chain.

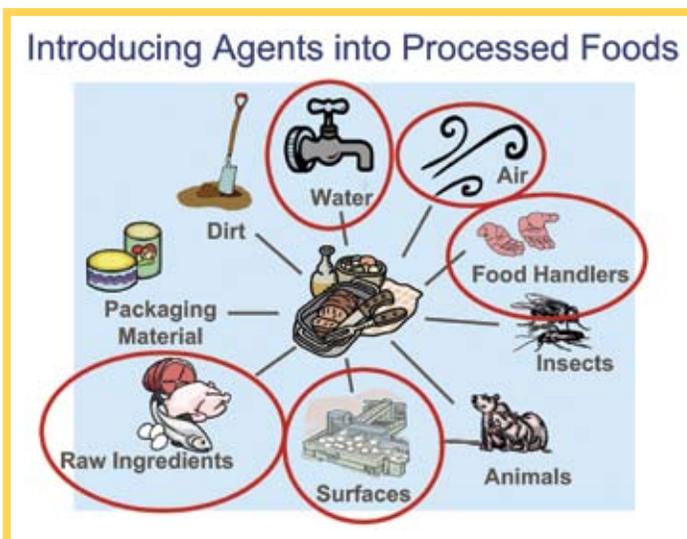
Viruses

Viruses commonly associated with food-borne illness, such as hepatitis A, require a human host in which to reproduce and multiply. Thus, these pathogens often enter the food chain through infected individuals who handle a product before consumption. In this case, employee health and hygiene are critical factors at every point in the food chain at which human contact occurs. Water contaminated with feces from an infected person can also introduce these pathogens (in a tank mix before spraying or in a rinsing phase of postharvest handling, for example). This generates the need for control measures at specific points in the food chain.

Other viruses of concern include ones that cause diseases such as avian flu. While such outbreaks are rare, the impact of these diseases is usually catastrophic, resulting in the slaughter of thousands of animals and billions of dollars in lost sales. Farmers and ranchers should follow reports of these diseases carefully and respond proactively to official recommendations.

Parasites

Parasites that cause food-borne illness include more commonly known organisms such as *Giardia lamblia* and less familiar species such as *Cryptosporidium parvum* and *Cyclospora cayetanensis*. Because reliable methods for detecting parasites in raw produce are lacking, very few incidence studies are available.⁵ Indications are, however, that these pathogens enter the food chain through contamination with fecal matter from infected individuals or animals or through contact with already contaminated water. Therefore, as with other biological pathogens, minimizing this risk requires diligent employee hygiene, careful se-



⁵ U.S. Food and Drug Administration (FDA), Center for Food Safety and Applied Nutrition. *Analysis and Evaluation of Preventive Control Measures for the Control and Reduction/Elimination of Microbial Hazards on Fresh and Fresh-Cut Produce*. Washington DC, 2001. Available online at www.cfsan.fda.gov/~comm/ift3-toc.html.

lection of water sources, and effective control of both domestic and wild animals on a farm or ranch.

Prions

Prions are proteins associated with a group of diseases called *Transmissible Spongiform Encephalopathies* (TSEs). In humans, the illness suspected of being food-borne is *variant Creutzfeldt-Jakob disease* (vCJD). The human disease vCJD and the cattle disease, *bovine spongiform encephalopathy* (BSE), also known as Mad Cow Disease, appear to be caused by the same agent. Other similar but not identical TSE diseases exist in animals, but there is no known transmission of these to humans. Included among these is chronic wasting disease of deer and elk and the oldest known of these diseases—scrapie—which occurs in sheep and goats. No early acute clinical indications for TSEs have been described. After an extended incubation period of years, these diseases result in irreversible damage to the central nervous system. More information on this food-safety risk can be obtained from agencies listed in the *Resources* section of this guide.

Allergens

Food allergens are usually proteins present in foods that can cause an allergic reaction in people. Though estimates are that less than 3 percent of adults have food allergies, the health risks associated with allergic reactions can be severe and even fatal. Therefore, food allergens should be identified and controlled as part of any food-safety plan. According to the U.S. Food and Drug Administration (FDA), the following foods can cause serious allergic reactions and account for more than 90 percent of all food allergies: peanuts, tree nuts, wheat, soybeans, milk, eggs, and fish and other seafood. Any products containing these ingredients should be labeled as such. Because of the risks of cross-contamination, products processed in facilities or with equipment that may have come in contact with potential allergens should also be labeled. For example, a label might note “*may contain traces of tree nuts*” to warn allergic consumers of potential risks.

Another class of potential allergens used in agricultural products such as wine and dried fruits is *sulfites*. Asthmatic persons are particularly sensitive to these chemicals and FDA requires labeling of packaged foods that have sulfites added and on alcoholic beverages that contain 10 parts per million or more of sulfites. Users of this chemical food additive should check with FDA for current labeling requirements.

Chemical Food Hazards

Contamination of food by chemical hazards is a worldwide public health concern and may occur through environmen-

Steps in Hand-Washing for Food Handling





tal pollution of air, water, and soil (as in the case with toxic metals and dioxins) or through intentional use of various chemicals such as pesticides, animal drugs, and other agrochemicals. Food additives and contaminants resulting from food manufacturing and processing can also adversely affect health. Assuring safety from these risks involves not only safe handling and use practices but also requires farmers and ranchers to assess the reliability of the sources for all their inputs and to keep records that allow them to *trace any possible contamination back to its source*. Some agricultural chemicals such as pesticides are regulated specifically to reduce the risks they pose to human health. In California, pesticide use is regulated by the U.S.

Environmental Protection Agency and by the California Department of Pesticide Regulation.

Know the history of the ground you use. Are there residues of chemicals from previous activity at the location on which you intend to graze or grow a crop? Chemical hazards are discussed again in the sections on specific control points.

Physical Food Hazards

Physical food hazards represent a broad category of naturally occurring and man-made substances that generally present risks of choking, lacerations, or tooth damage. These hazards include, for example, stones, small sticks or other pieces of wood, pits, and pieces of plastic, metal, or glass. Such hazards can enter the food chain at almost any step, from field to point of sale. Examples include small stones from the field in dried beans, shell fragments from cracking nuts, plastic and metal fragments from equipment in salad mixes, and any other product or personal object from an employee, including pens, pencils, and jewelry. Manual or automatic sorting and screening can help minimize some of these hazards as can inspection of all equipment and facilities.

Assessing Risks and Planning for Controls

Every small farm, ranch, and other agricultural business involves a chain of activities that leads to delivery of a final product to consumers. These activities can include routine preplanting, cultivating, and harvesting as well as unique value-added processing. Agritourism events also may be offered. For all these enterprises, activities such as employee training, proper labeling, and design of the farm or ranch operation and its physical layout can affect food-safety risks. Each event and activity is a link in a food chain that represents critical points for effectively controlling food-safety risks.

Preventive Strategies

Effective strategies for maintaining, improving, and assuring a high level of food safety depend on successfully preventing contamination at each phase from field to fork. Research clearly demonstrates that once an agricultural product has become contaminated it is very difficult to completely sanitize it. It is therefore critical to focus on *preventing contamination before it occurs.*

In addition to developing effective strategies for providing a high level of food safety, readers of this guide should be aware of the laws and regulatory agencies that address food safety in California. While this guide makes reference to various components of food safety, it does not answer specific questions about regulatory requirements and is not intended to be all-inclusive. See the *Resources* section for an outline of the legal framework affecting food safety in California and for information on other agencies and resources that deal specifically with regulatory issues.

Some of the most pertinent areas of potential risk for direct marketers of agricultural products follow. Additional resources are included under *Self-Evaluation and Planning Worksheets* on page 25, including several worksheets for assessing preparedness and level of assurance

with respect to food-safety hazards. The accompanying flowchart outlines the principal steps involved in assessing, planning, and implementing a successful food-safety program.

Farm and ranch direct marketing often involves unique activities not common to other agricultural enterprises. These activities may require special attention when assessing areas of potential risks to food safety. Small farms and ranches may also have unique conditions and situations that call for further careful planning. Finally, diverse marketing strategies add even more layers of complexity to assessment and planning. The requirements to ensure food safety at farmers markets differ somewhat from those developed for

For detailed self-assessment materials focused on production-related risks to food safety, see *UC Good Agricultural Practices Self-Audit* available in both CD and PDF format from the University of California food-safety website at www.ucfoodsafety.ucdavis.edu.

community-supported agricultural operations (CSAs) or farm subscription services. Likewise, on-farm venues may include animal contact areas and other unique situations. All of these activities and situations should be assessed for potential risks to food safety. The following section identifies a number of specific activities that offer opportunities for improvement in risk management.

In the Field Composts and Manures

Growers are increasingly using organic mulches and composts as part of their overall approaches to soil management and fertility. While these practices have a number of benefits, they also introduce potential biological food-safety risks that require specific assessment and careful management. Disease-causing organisms can be found in soil, animal waste, and decomposing plant material. Production of compost from these materials must be properly managed to destroy pathogens and produce a product that is safe for use on food crops and in areas where customers visit, such as u-pick fields and grassy picnic areas. Likewise, on-farm composting operations must be managed to minimize

potential risks from cross-contamination caused by wind, water, and residues on equipment. The *UC Good Agricultural Practices Self-Audit* (see the *Resources* section) offers the following guiding principles for using composted manure.

- ➔ Learn proper compost management for pathogen reduction and document the method of pathogen elimination for applied compost.
- ➔ Document or obtain documentation about the specific compost management steps employed for each lot.
- ➔ Maximize the time between applications of compost to production areas and harvest.

The California Compost Quality Council administers compost quality guidelines and operates an independent quality-verification program for compost producers. Information on proper on-farm composting procedures that reduce the risk of pathogen survival, cross-contamination, and other hazards is available; see the *Resources* section under compost and manure handling.

Agricultural Chemicals

All agricultural chemicals such as fertilizers and pesticides should be approved for the crop or situation in which they are used. Users of these materials should read labels carefully and use the products only in the approved manner. Specific attention should be given to dilution rates, toxicity levels, and “days before harvest” warnings on labels and to the directions for treatment in case of accidental poisoning. All equipment and containers used should be labeled and dedicated to such use to avoid cross-contamination. Likewise, dispose of empty containers appropriately. *Containers used to store hazardous chemicals should not be reused for any other purpose.*

Employees should be made aware of risks and trained in proper use of agricultural chemicals as well. Contact the *California Department of Pesticide Regulation* for specific information on using pesticides and for a list of approved products by crop. Manufacturers also supply material safety data sheets for chemical products they sell. These can be kept on file along with instructions for different product-use procedures in a reference binder on handling chemicals.



For more information on agricultural chemicals and food safety, see the *UC Good Agricultural Practices Self-Audit* listed in the University of California (UC) section of the *Resources*.

Restrooms and Hand-Washing Facilities for Employees and Customers

Restrooms with hand-washing facilities are essential at all types of direct-marketing venues. According to guidelines for certified farmers markets in California by the California Conference of Directors of Environmental Health (CCDEH), an approved toilet and hand-washing facility should be available within 200 feet of the market or as approved by the enforcement officer. General considerations for customers should account for accessibility that meets a wide range of needs, including those of handicapped persons and children.

A hand-washing facility.



Hand-washing facilities should also be located near animal contact areas such as petting zoos and pony rides. Sinks should be of an appropriate height and clearly marked. Hand-washing signs should provide information in English as well as in other languages when customers and employees may not speak primarily English. Sample signs are available in the *Appendix* of this document and from various agencies indicated in the *Resources* section.

For farm-stay establishments, CCDEH provides the following additional guidelines:

An example of an on-farm hand-washing station for visitors.



- ➔ Clean toilet facilities should be provided for use by employees.
- ➔ Toilet rooms shall be separated from other areas by a well-fitting self-closing door.
- ➔ Toilet rooms shall not be used for storage of food, equipment, or supplies.
- ➔ Toilet paper shall be provided in a permanently installed dispenser at each toilet.
- ➔ Hand-washing facilities shall be provided within or adjacent to toilet rooms.
- ➔ Hand-washing facilities shall be equipped with an adequate supply of hot and cold running water.
- ➔ Hand-washing cleanser and single-use sanitary towels or hot-air blowers shall be provided in dispensers at or adjacent to hand-washing facilities.

In addition, kitchens built or extensively remodeled after January 1, 1996, require a separate hand-washing sink. Older kitchens may use the domestic sink for hand washing. Soap and single-use paper towels in dispensers are still required.

Managing these and other potential risks to food safety requires a program of hazard analysis and control that fits the specific farm or ranch's needs and also adapts to a changing food-safety climate. The HACCP model, which is the most popular and universal food-safety program that meets these conditions, is discussed in detail on page 21.

U-Picks

U-pick operations involve unique activities that bring customers into the field and orchard and

therefore require special attention to maintain adequate food-safety conditions. For example, consumers should be informed that the produce they pick is not considered "ready to eat" and may require washing before consumption. Consumers should also be required to wash their hands before beginning to harvest and after eating or using the bathroom. Adequate hand-washing facilities should be provided in key areas such as bathrooms, around eating and picnic areas, at exits of petting zoos and animal contact areas, and at entrances to harvesting areas. These locations should be clearly marked and include signs on hand-washing policies and procedures.

Another concern with u-picks is excluding pets from crop areas. Signs should be posted to inform customers of the policy and it should be strictly enforced. Exceptions may be made for guide dogs.

Other precautions at u-picks include clearly marking those fields open to harvesting and those which are off-limits due to recent spraying or compost applications and providing restrooms and potable water. Signs should warn customers of any sources of water that are not potable. If there are animals on the farm, see the preceding section on compost and manure handling and the following discussion of live animals.

Live Animals, Petting Zoos, and Other Animal Contact Areas

Live animals, including both pets and livestock, are a common element at many agritourism

[Kids petting baby animals at Impossible Acres in Yolo County.](#)



For information on animals and disease risk, see *Guidelines for Reducing the Risk of Disease at Petting Zoos, Animal Exhibits and Other Areas*, a California Department of Health Services publication available at www.dhs.ca.gov/ps/ddwem/environmental/Institutions/PDFs/GuidelinesReducingRiskPetZoosMD.PDF or from the department's Institutions

farms and ranches. Petting zoos, pony rides, and other events and activities that bring customers into direct contact with live animals have also become popular at both farmers markets and agritourism venues. While these opportunities enrich customer experiences at the farm or market by providing "authentic" experiences, they also require some additional attention to food-safety risks. In particular, hand-washing facilities should be available near the site of animal contact and visitors should be required to wash their hands immediately after engaging in any activities with animals. No food or eating should be permitted around animal contact areas.

Another important concern is the risk of cross-contamination from animal waste. Pets and all other animals should be kept away from crops in the field. Any crop that can come in contact with the soil, including root crops, lettuce and other greens, cole crops, bush berries, and even tree crops such as nuts that may be shaken

to the ground during harvest, is vulnerable to contamination from feces from pets, livestock, and wild animals. This is especially true close to and during harvest time. Areas where animals and their waste are kept should be isolated from crop areas, packing sheds, and any other locations where food is produced, processed, stored, or consumed. Contaminated dust can be blown onto nearby crops and run-off can contaminate fields and water supplies. Animal containment facilities should be located away from wellheads and other vulnerable water-system points, including ponds, irrigation ditches, canals, and natural waterways. See the *UC Good Agricultural Practices Self-Audit* in the *Resources* section for more information on wellhead placement and maintenance to minimize contamination risks.

The guidelines for certified farmers markets require that no live animals, except for guide or service dogs, be allowed within twenty feet of any area where food is stored or held for sale. At agricultural home stays, pets are allowed inside but no live animals should be in any portion of the premises where food is used, stored, served, or offered for sale.

Produce and Other Foods

Produce Sampling

Sales of many fresh and processed agricultural products benefit from opportunities for consumers to sample at a market or farm stand.

Guidelines for Preparing and Distributing Food Samples in a Sanitary Manner

- Samples shall be kept in approved, clean, covered containers.
- Clean, disposable plastic gloves shall be used when cutting food samples.
- Produce should be cleaned and washed with potable water.
- Potable water shall be available for hand washing and sanitizing as approved by the local enforcement agency.
- Potentially hazardous food samples shall be maintained at or below 45°F. All other food samples shall be disposed of within two hours after cutting.
- Utensil and hand-washing water shall be disposed of in a facility connected to the public sewer system or in a manner approved by the local environmental health agency.
- Utensils and cutting surfaces shall be smooth, nonabsorbent, and easily cleaned or disposed of as approved by the local environmental health agency.

Adapted from *Environmental Health Requirements for Certified Farmers' Markets* by the California Conference of Directors of Environmental Health, Carmichael CA, 1999.



An example of a sanitary arrangement for preparing food samples.

With the exception of mobile food facilities operating adjacent to a certified farmers market, preparation of food samples is the only type of food preparation permitted at certified markets in California. Hot food samples are not permitted and potentially hazardous foods must be kept below 45°F.

One prevalent practice that vendors have used to facilitate sanitary and effective sampling is to prepare samples in advance of the market using approved procedures. Samples are then stored in closed containers in an ice chest. This saves time at the market and assures vendors that the produce offered to customers for sampling is of the highest quality and safety.

Instructions for Sanitary Food Sampling from *FarmersMarket.Org*

– www.farmersmarket.org/Health/LA_Health.htm

Provide sanitizer solution: 100 ppm chlorine, 200 ppm quaternary ammonium, or 25 ppm iodine positioned at produce stand or central produce preparation site. Utensils used continuously for slicing (e.g., knives) shall be stored in container of sanitizing solution while not in use. See below for sanitizer solution ratios and water replenishing times.

- 100 ppm Chlorine = 1/2 ounce per gallon* for 4 hours at individual sinks, 2 hours for centralized sinks.
- 200 ppm Quaternary Ammonium = 1/2 ounce per gallon* for 4 hours at individual sinks, 2 hours for centralized sinks.
- 25 ppm Iodine = 1/2 ounce per 2.5 gallons* for 4 hours.

* Note: 1/2 ounce = 1 tablespoon = 2

Mobile Food Facilities

Other types of food preparation are permitted at mobile food facilities operated by vendors under the authority of the farmers market's management to sell in an area adjacent to the market. Mobile food facilities may also be used at on-farm events and other agritourism venues. Sampling from such facilities is permitted but may be more tightly restricted than sampling by agricultural vendors within a farmers market. California's Uniform Retail Food Facilities Law (CURFFL) in Articles 11 and 12 addresses these requirements, and local environmental health agencies should be contacted regarding approved equipment



and procedures. A checklist of the physical requirements for a mobile food facility is provided in the *Appendix* to guide self-assessment for operators.

Storing Hot Foods and Other Products

Product storage and display at direct markets encompass a broad range of situations. Good practices and specific requirements for a variety of storage situations include the following.

- ➔ All food should be stored at least six inches off the floor or ground. This includes produce in boxes not yet opened for sale as well as products on display.
- ➔ Bulk, ready-to-eat agricultural products such as dried fruit and shelled nuts must be protected from contamination. Acceptable methods include prepackaging in an approved facility or displaying food in approved containers with lids.
- ➔ Dispensing methods for bulk sales of ready-to-eat agricultural products should prevent direct hand contact through use of disposable gloves, scoops, or other utensils. All equipment and methods must be approved by the local enforcement agency.
- ➔ Potentially hazardous foods must be held at 45°F or below at farmers markets and below 41°F at agricultural home stays. Hot foods at agricultural home stays must be kept at or above 140°F.
- ➔ Potentially hazardous frozen foods should be stored and displayed in their frozen state until ready to thaw. Ice chests with dry ice provide a mobile storage system for frozen products. Safe thawing methods are discussed later under *Refrigeration and Freezing* on page 15.
- ➔ Sneeze guards should be used to prevent contamination of all products sold as “ready to eat,” including baked goods and produce cut for sampling. Ready-to-eat foods are discussed later in this section. Information on approved sneeze guards should be available from the local county health department.
- ➔ Equipment for on-farm storage of produce and other food products should be dedicated to that purpose and provide ade-

Temperature control in outdoor settings such as at a farm stand or market stall can be achieved in several ways. One of the most effective and basic first steps is to keep produce shaded with a canopy, umbrella, or constructed stand or stall. Another step is to use a spray bottle of potable water to keep produce moist and provide some evaporative cooling. Displaying produce on clean ice is another approach. Ice can be brought to a market or farm stand in coolers if an ice machine is not available. Coolers with ice can also be used to store potentially hazardous products at

quate climate control and protection from vermin. Such facilities should be located safely away from animal containment areas and areas where wastes, composts, and chemicals are kept. See the *UC Good Agricultural Practices Self-Audit* available in both CD and online PDF format from the University of California’s food-safety website at ➔ www.ucgaps.ucdavis.edu for more information.

Community-Supported Agriculture Delivery Points

Often, delivery is an area of potential risk that is poorly controlled by the farm or ranch. Delivery sites can include a front porch of a house, a car port, or a lobby in an apartment complex or high-rise office building. At a minimum, the sites should be clean and shaded or air conditioned and customers should be informed that they should pick up and refrigerate produce promptly upon delivery. It is a good idea to have a subscriber on site who monitors pick-ups and removes any boxes left unclaimed beyond a certain time. Keep in mind that other storage requirements such as keeping boxes off the floor still apply.

Storage of Other Items

Items other than food should be displayed and stored in an area separate from food and only insecticides, rodenticides, and other pesticides that are specifically approved for use in a food facility should be used. All poisonous substances,

detergents, bleach, cleaning compounds, and other injurious or poisonous materials must be used and stored in containers specifically and plainly labeled as to contents, hazards, and use. All poisonous substances and materials also must be stored and used in a manner that is not likely to cause contamination of food, food contact surfaces, utensils, or packing materials.

➡ Specific requirements for using and storing nonfood products can be found in CURFFL, Sections 114025 (a)(b)(c), 114080 (b)(4)(B), and 114395.

Adapted from *Bed and Breakfast/Agricultural Homestay Food Establishment Guidelines*, California Conference of Directors of Environmental Health, Carmichael CA, 2000.

Value-Added and Processed Foods

Value-added agricultural products continue to grow in popularity as consumer demand at farmers markets becomes more sophisticated. Likewise, value-added products make excellent gifts and souvenirs for customers to take home after experiencing a farm stay or visit to an agritourism venue. Value-added products also offer benefits to producers, such as increased and more diversified product sales, a way to preserve highly perishable produce, and an outlet for quality produce that does not meet cosmetic standards for fresh market sales. Producing value-added products, however, demands special attention to potential food-safety risks specific to the type of produce and processing used. Some of these concerns are discussed briefly by product or process type.

Salad Mixes and “Ready to Eat” Claims

Salad mixes that consist of different types of lettuce and other greens combined into one product have become popular at many markets. However, any processing of produce beyond trimming—chopping or shredding or selling a salad mix as “washed, ready to eat”—is considered food preparation and is subject to CURFFL requirements for processed food. These requirements include stainless steel washing facilities and a variety of other conditions that are not typical of a packing



shed that was not designed for processing. Ready-to-eat foods must also be displayed with sneeze-guard protection and sanitized serving utensils. Peeled, sliced, and cut vegetables and salad greens for bulk sale that are not intended to be consumed as ready to eat should be prominently marked with signs declaring “wash before eating.”

Another food-safety concern with salad mixes is an assurance that the mix is free of weeds and also does not contain small stones, twigs, or other physical hazards.

Processed Fruits, Vegetables, and Nuts

Most value-added agricultural products sold directly to consumers involve processed fruits, vegetables, nuts, seeds, or grains. These types of value-added products are considered “non-certifiable agricultural products” at certified farmers markets but may still be sold at farmers markets and directly to consumers through other authorized direct-marketing venues.

These items include processed products such as fruit and vegetable juices, shelled nuts, jams and jellies, flour, dried soup mixes, and wine. Although these products are not certified, they must have been produced or derived from plants produced by the grower and those

Other Resources for Canning Information

Master Food Preservers – University of California Cooperative Extension

Contact your County Extension office or visit the statewide program website at

➔ <http://ucanr.org/CES.CEA.shtml>.

Federal Requirements and Good Manufacturing Practices

FDA Center for Food Safety and Applied Nutrition ➔ <http://vm.cfsan.fda.gov/~comm/lacf-toc.html>.

plants or fresh certifiable products must be listed on the grower's Certified Producer's Certificate. Examples are apples listed for apple juice or fresh apricots listed for dried apricots.

These processed agricultural products may include or have added to them a limited number of ingredients or additives that act only as preservatives or are essential in preparation of the product. Examples include pickles and cucumbers in a brine or vinegar solution, flavorings added to shelled nuts that do not change the visual identity of the product, sulfites added to dried fruits and vegetables, and sugar, fruit juice, and pectin added to fruit to make jams and jellies.



Processing and storage facilities must be under regulation by an authority acceptable to the California Department of Health Services to ensure that sanitary conditions are followed during processing. For processed fruits,

vegetables, juices, jams, and preserves, this is the local environmental health authority.

Canning. One popular method of adding value to agricultural products is canning. Jams, jellies, pickles, and preserves are a few examples of types of value-added products that can be made from fresh produce grown on a farm or ranch. Canning extends the shelf life of agricultural products and makes ideal gift items that customers can transport easily. Canning involves two primary food-safety concerns. *First, because all canned foods are processed foods, operators producing these*

types of value-added products must use a certified kitchen and obtain a permit from the health department in the county where the product is made and in every county in which it is sold. Second, manufacturing some canned products, particularly low-acid foods, also requires registration with the California State Cannery Inspection Program.

To can foods safely, a certain amount of thermal processing is usually required. The amount and type of processing depends not only on the final product but on the nature of the produce being processed. In particular, the acidity or pH of the produce determines what kind of processing is required to ensure safety.

Why Acidity? Acidity is one environmental factor that affects how easily certain pathogens can reproduce or grow in a food medium. Acidity is generally reported using the pH scale, which varies from zero to fourteen. A substance with a pH of less than seven is acidic. Seven is neutral, and a substance with a pH greater than seven is basic. According to FDA's *Current Good Manufacturing Practice Regulations*, "(a) Acid foods or acidified foods means foods that have an equilibrium pH of 4.6 or below."⁶ Of particular importance to canning is the bacterial pathogen *Clostridium botulinum*, which produces toxins that cause the severe illness known as botulism. *Clostridium botulinum* is not favored in acidic environments and, therefore, the type of processing used to reduce the risk from this pathogen depends on the acidity of the raw produce and other ingredients used in the value-added product being canned.

⁶ U.S. FDA, Center for Food Safety and Applied Nutrition. *Industry Affairs Staff Booklet*. Washington DC, 1999. Available online at vm.cfsan.fda.gov/~lrd/part110t.html.

Approximate pH of Foods and Food Products.

The pH or acidity of a food is generally used to determine the processing requirements and applicability of specific regulations.

Approximate ranges of pH values for common food products are provided by FDA in a table available online at

➔ <http://vm.cfsan.fda.gov/~comm/lacf-phs.html>.

California Cannery Regulations. Low-acid and pH-control canned foods (low-acid foods that are acidified, such as pickles) are regulated by the California Cannery Inspection Program, which offers a website regarding regulatory requirements for commercial production of thermally processed low-acid canned foods and pH-control foods in California: ➔ www.dhs.ca.gov/ps/fdb/html/food/indexcan.htm. All operators who produce shelf-stable products (excluding low-water-activity foods such as flour, baking mixes, and nuts) should become familiar with these regulations. Some annual fees are required to register with this program. The fees are based on the size of the business, and some exemptions apply to very small operations.

- ➔ California Department of Health Services
Food and Drug Branch
Cannery Inspection Program
PO Box 997413, MS-7602
Sacramento, CA 95899-7413
Phone: 916.650.6500
Fax: 916.650.6650
Email: fdbinfo@dhs.ca.gov

Refrigeration and Freezing. Refrigerated and frozen foods require additional labels that clearly indicate to consumers that the product must be stored under refrigerated conditions. Labels on frozen foods should include thawing directions. For information on safe thawing procedures, visit the Food Safety and Inspection Service website at ➔ www.fsis.usda.gov. Click on “Fact Sheets” and look under “Safe Food Handling” for the document titled “The Big Thaw—Safe Defrosting Methods for Consumers,” which explains the three safe ways to defrost food—in the refrigerator, in cold water, and in a microwave.

All produce that will be frozen or refrigerated should be processed in accordance with

regulations that ensure safe handling and stored and displayed at safe temperatures. County health inspectors can provide information on safe temperatures for storing refrigerated foods. In general, most potentially hazardous foods (e.g., meat, fish, and cut or peeled fresh produce) should be kept at or below 45°F. As with all processed foods, health permits are required of operators who produce frozen or refrigerated foods.

Drying. Sun drying and dehydrating are processing methods that can add value to agricultural products that have a short shelf life. Smoking fish and meats to make products such as lox and jerky is a similar processing method. Sun drying, dehydrating, and smoking all dramatically reduce the amount of water present, greatly extending shelf life and convenience. The availability of water controls the ability of many biological pathogens to live and reproduce. It also controls the activity of enzymes that contribute to ripening and the eventual break-down of fruits and vegetables. When a food is dehydrated enough to stop both bacterial and enzymatic attacks, it usually can be stored without refrigeration for extended periods of time.

However, such foods are still vulnerable to contamination prior to processing, during processing, and during transport, storage, and marketing. The product to be processed should be clean and free from biological, chemical, and physical contamination. For example, insect-damaged fruits and vegetables should not be used. Actual processing of foods to be dried must be carried out in a certified facility. Cut produce should be protected from flies, birds, mice, and other disease-carrying organisms at every step in the process. Dried products should be stored in airtight containers that protect them from possible contamination. If products are packaged, they should be properly labeled. If they are marketed in bulk, display containers should have lids and approved serving utensils must be used to prevent contamination during sale.

For more information on the use of sulfites and labeling concerns, call 1.800.332.4010, or visit
➔ www.fda.gov.

Sulfites. Additives such as sulfites are sometimes used in processing dried and other processed products, including wine. FDA



requires that the presence of sulfites be disclosed on labels of packaged food. This information should be included in the ingredient portion

of the label, along with the function of the sulfiting agent (for instance, a preservative).

When food is sold in bulk (a barrel of dried fruit or of loose raw shrimp, for example), a sign or other type of label that lists the food's ingredients on the container or at the point of sale is required so that consumers can determine whether the product has been treated with a sulfiting agent.

Juice and FDA. The *Juice HACCP* (hazard analysis and critical control points) *Small Entity Compliance Guide* from FDA's Center for Food Safety and Applied Nutrition explains in plain language the legal requirements concerning safe and sanitary processing of fruit and vegetable juices (Title 21, Part 120 of the Code of Federal Regulations). It is available free from <http://vm.cfsan.fda.gov/~dms/juicgui7.html>.

Retail establishments and businesses that sell juice directly to consumers and do not sell or distribute juice to other businesses are exempt from the juice HACCP regulation but must comply with applicable state regulations.

The Milk and Dairy Food Safety branch of the California Dept. of Food and Agriculture ensures that milk, milk products, and other dairy products are safe and wholesome, meet state and federal microbiological and compositional requirements, and are properly labeled.

Cheese, Yogurt, and Other Dairy Products

Dairy products such as pasteurized milk, cheese, and yogurt are considered potentially hazard-



ous foods and must be stored and displayed at or below 45°F at all times. At certified farmers markets, dairy products are considered noncertifiable agricultural products. They must have been produced or derived from animals raised or produced by the vendor.

Any processing of dairy products, such as the manufacture of yogurt, must be done in an approved facility. The California Department of Food and Agriculture's (CDFA's) Bureau of Milk and Dairy Foods Control has regulatory authority over dairy products in California.

Herbal Teas and Supplements

Caution should be used in marketing herbal tea mixtures or other herbal products, including oils and supplements that may be taken internally. Research herb species and cultivars carefully for known toxicities and allergens and label products carefully in accordance with FDA and other agency requirements. Fields should be kept as free from potentially hazardous weeds as possible and harvested herbs should be inspected for accidental contamination with weeds or other plants not intended to be used with the product.

Flavored Olive Oil

Another popular value-added product is olive oil infused with herbs or other flavors such

California Dept. of Food and Agriculture

Dairy Marketing and Milk Pooling Branches

560 J Street, Suite 150, Sacramento
Mail – 1220 N Street, Sacramento, CA 95814
Website – www.cdfa.ca.gov/dairy
Email – dairy@cdfa.ca.gov

Branch Phone Numbers:

Dairy Marketing – 916.341.5988
Milk Pooling – 916.341.5901
Milk and Dairy Food Safety – 916.654.0773

Shell Egg Quality Control Program

Mail – 1220 N Street, Sacramento, CA 95814
Phone – 916.445.0425
Website – www.cdfa.ca.gov/is/fveqc/eggs.htm

USDA Dairy Website

as chili and garlic. These products currently are not regulated as processed foods but do potentially pose some food-safety risks. In particular, the anaerobic environment present in oils can lead to development of botulism when other conditions are met. Seek a recommendation from your local health authority before producing this type of product for sale.

Other Products

Cosmetics, decorations, and other products that contain hazardous materials that may be accidentally consumed should be appropriately labeled. For example, herb and chili wreaths intended for decorative purposes only that have been treated with a preservative or that incorporate nonfood items such as inedible flowers or seed pods should be labeled with a tag or package label advising customers of these conditions.

Occasional Events

Hosting occasional on-farm events such as seasonal harvest festivals is a good way to offer agritourism without making it a full-time activity. Such events give customers a chance to see and experience a farm or ranch in operation and learn about where food comes from in a

fun and engaging way. Operators can benefit from the added publicity, increased customer loyalty, and perhaps additional income from admission fees while also enjoying meeting new people and a change of pace. Well planned and managed special events can be enjoyable and rewarding for all.

Before starting a special event, operators should apply the same logic to analyzing food-safety hazards as is recommended for general operations. Begin by listing all activities that will take place and the hazards that could be present in each situation. Then list the safeguards that are already in place and those that need to be added or augmented. Some important concerns for special events on the farm or ranch include:

- ➔ How many people will attend?
- ➔ Will prepared foods be served?
- ➔ Is there access to potable water?
- ➔ Are there adequate restroom and hand-washing facilities?
- ➔ Will customers be in contact with live animals?
- ➔ What areas should not be accessible (for example, compost piles, chemical storage areas, recently sprayed fields)?
- ➔ Are there enough signs and postings educating customers about good food-safety practices and facilities such as restrooms and hand-washing stations?
- ➔ Will it be necessary to obtain a permit from the local environmental health authority?

Agricultural Home Stays

Agricultural home stays receive a number of exemptions that do not apply to other food establishments.

Exemptions provided to agricultural home stays do not remove the requirement that the owner or an employee of a food-service establishment shall have passed an approved and accredited food-safety certification exam.

Handling Money and Equipment

Handling Money

The transfer of money from customer to vendor at direct markets often involves hand-to-hand contact as well as other potential sources of cross-contamination. This activity can therefore pose risks to food safety. Ideally, at least one employee at a market or farm stand is dedicated to carrying out customer transactions.

This eliminates the need for frequent hand washing and/or excessive use of disposable gloves as an employee switches from handling money to handling produce.

In addition, produce should not be displayed or stored directly beneath areas where customer transactions take place unless it is covered or otherwise protected as previously suggested on

page 12 under storing products. This reduces the risk of coins or other personal objects falling in and potentially becoming a physical hazard.

Reusing Boxes and Containers

Reusable boxes, crates, tubs, and bins should be washed frequently and inspected for signs of biological and chemical contamination as well as for physical damage. See the UC Good Agricultural Practices website, www.ucgaps.ucdavis.edu, for information on washing procedures. Physical damage increases the risk of contamination from debris, and defects such as cracks and gouges provide areas for microbes and chemical residues to collect. Damaged containers also may injure the skin of produce or packaging, increasing the risk of biological contamination. Broken pallets may damage produce and packaging materials and should be repaired or replaced immediately.

Customer Education

Markets and community-supported agriculture operators can include food-safety tips and information in newsletters. Labels should include

all required FDA elements. Master gardeners may offer workshops and information on food-safety topics such as canning and drying.

Newsletters and Fact Sheets

Newsletters and fact sheets are excellent ways to inform and remind customers as well as employees about food-safety risks and safe handling practices. Often this information is available from local agencies such as county Cooperative Extension offices, statewide programs, and regulatory and enforcement authorities. Federal agencies such as USDA, FDA, and CDC also provide a wide range of useful products geared towards educating the public about safe food-handling and storage procedures.

- ➔ www.usda.gov
- ➔ www.fda.gov
- ➔ www.cdc.gov
- ➔ www.cdfa.ca.gov

Newsletters provide opportunities to remind customers of food-safety issues. Examples of topics to cover in newsletters and fact sheets include:

- ➔ Safe handling and storage of fresh fruits and vegetables.
- ➔ Why wash produce before eating?
- ➔ Safe handling and storage of meat, eggs, and dairy products.
- ➔ Minimum cooking times and temperatures required to kill pathogens.
- ➔ Storing processed foods before and after opening.
- ➔ Canning and freezing requirements.

Demonstrations and Food-Safety Events

A wide variety of food-safety principles and methods can be taught at farmers markets through demonstrations and other events that feature experts in food preparation and storage. Proper procedures can be demonstrated, equipment can be displayed, and customers can be given the opportunity to ask questions and pick up fact sheets or other information on food-safety topics.



Documentation and Liability Issues

Labeling

Labels on packaged foods provide a critical opportunity to educate customers about a product and how to use and enjoy it safely. Labeling requirements may be affected by regulatory agencies such as FDA, USDA's Food Safety and Inspection Service (FSIS) and Organic Program, state and local health departments, and California's Weights and Measures division. Some of the requirements related to food safety address topics such as ingredient lists, "sell-by" or "discard" dates, "refrigerate after opening," and other handling recommendations and warnings.

Vendors should be aware of any food-safety issues related to labeling. For example, ingredient lists that alert consumers with allergies to potential hazards and appropriate labels on inedible plant products intended for decoration only can reduce the risks involved with marketing some value-added products. "Refrigerate after opening" warnings can help to avert unnecessary food-related illness. A label showing various steps that ensure safe food handling and other informational graphics are available from USDA at www.fsis.usda.gov/oa/pubs/image_library/flightbac.htm.

Look for short courses and workshops on merchandising and labeling at trade meetings and meetings sponsored by groups such as

chambers of commerce, the U.S. Small Business Administration, Cooperative Extension offices, and USDA. Visit the UC food-safety website's *Labeling Issues* page for more information and links to other resources: <http://ucce.ucdavis.edu/files/filelibrary/5622/13328.pdf>.

For more information, see USDA's 2002 labeling fact sheet at www.ams.usda.gov/nop/FactSheets/LabelingE.html.

Organic producers should also be aware of labeling requirements by the agency that certifies them (for example, California Certified Organic Farmers and the California Department of Food and Agriculture).

Recordkeeping

Recordkeeping is a critical step in effectively managing food-safety risks and involves maintaining a broad range of documentation. Good documentation includes records of hazards and methods by which they are controlled; maintenance activities and actions taken to correct potential problems; up-to-date codes and regulations along with certificates, permits, and licenses; production, storage, and sales records; compost, fertilizer, and pesticide application records; and records of all material input purchases, including chemicals, composts, and ingredients used in processing.

Labeling and Organic Products

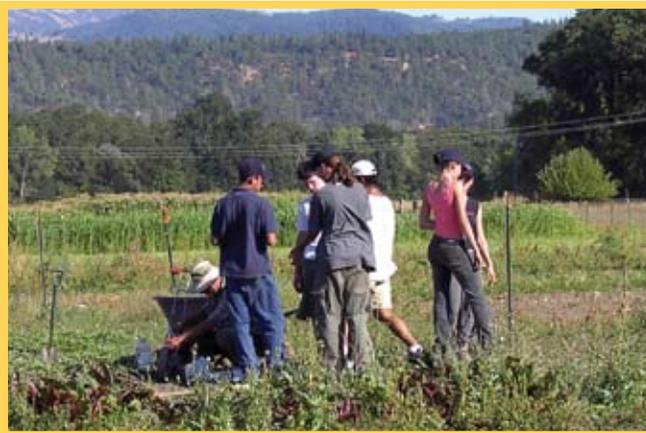
- The Organic Foods Production Act and the National Organic Program (NOP) are intended to assure consumers that organic foods they purchase are produced, processed, and certified according to national organic standards. Labeling requirements under the program apply to raw, fresh products and processed foods that contain organic ingredients. Foods that are sold, labeled, or represented as organic must be produced and processed in accordance with NOP standards.
- Except for operations with gross agricultural income from organic sales totaling \$5,000 or less, farm and processing operations that grow and process organic foods must be certified by USDA-accredited certifying agents. A certified operation may label its products or ingredients as organic and may use the "USDA Organic" seal.
- Labeling requirements are based on the percentage of organic ingredients in a product.

Reprinted from the National Organic Program's *Fact Sheet: Labeling and Marketing Information* at www.ams.usda.gov/nop/FactSheets/LabelingE.html.

Good records not only allow you to monitor and verify your food-safety efforts; they also allow you to trace a problem back to its source, such as to a particular shipment on a given harvest day or a particular batch of compost or delivery of an agricultural chemical from a supplier.

Liability Insurance

In addition to employing best practices for achieving and maintaining a safe system for employees and consumers, it is prudent to invest in adequate liability insurance to protect your business from claims that may arise in regard to safety. Consult with various insurance carriers and compare rates for cost-effective protection.



Regulatory Exemptions for Agritourism Operations

Some of the laws and regulations that concern food safety at agritourism events and farmers markets actually increase marketing opportunities rather than restrict them. For example, Article 18 of CURFFL (California Uniform Retail Food Facilities Law) was amended in 1999 to include *agricultural home stays* as a special type of retail food establishment. Under these provisions, agricultural home stays receive a number of exemptions that do not apply to other food establishments. The intent of the exemptions is to provide less restrictive requirements that make it easier to use a private home as a food and lodging establishment when it is located on a farm that produces agricultural products as its primary source of income. Some constraints do apply though. For example, the CCDEH guide states that:

Such establishments must have six or fewer guestrooms, are restricted to a maximum of fifteen guests, and the lodging and meals must be incidental to, and not the primary function of, the farm or ranch.⁷

Some of the more important exemptions include:

- ➔ An agricultural home stay may serve meals and snacks to its registered guests at any time.
- ➔ Floors in the kitchen area do not have to meet the requirements for a full-service restaurant.
- ➔ Existing walls and ceilings need not meet standards other than those of cleanliness and sanitation.
- ➔ Refrigerators must have an adequate capacity to maintain food at or below 41°F but are not required to meet American National Standards Institute (ANSI) standards for commercial refrigeration.
- ➔ A domestic dishwashing machine is acceptable if it is capable of providing heat of at least 165°F to the surface of utensils.

⁷ California Conference of Directors of Environmental Health. *Bed and Breakfast/Agritourism Homestay Food Establishment Guidelines*. Carmichael CA, 2000.

Hazard Analysis and Critical Control Points: A Risk Management Process

FDA has adopted a food-safety program developed nearly thirty years ago for the space program and applied it to its oversight and regulation of several food production industries, including meat, poultry, seafood, canned food, and juice. The agency intends to eventually use it for much of the U.S. food supply.⁸ The program focuses on *preventing hazards* that could cause food-borne illnesses by applying science-based controls at critical stages of the food chain, from raw materials to finished products. While the program may sound high-tech, its principles are actually fairly simple and logical and can be applied to virtually any system of food production and marketing regardless of size. The system is known as **Hazard Analysis and Critical Control Point** or **HACCP** (pronounced “hassip”).

HACCP involves seven basic principles.

- ➔ **Analyze hazards.** Potential hazards associated with a food process and measures to control those hazards are identified. The hazard could be biological, such as a microbe; chemical, such as a toxin; or physical, such as glass or metal fragments.
- ➔ **Identify critical control points.** These are points in a food chain—from field preparation to harvesting and shipping to consumption by the consumer—at which potential hazards can be controlled or eliminated. Examples are fertilizer application, pesticide spraying, harvesting, cooling, packaging, inspecting, transporting, and displaying.
- ➔ **Establish preventive measures** with critical limits for each control point. For fresh produce, for example, this might include setting maximum storage temperatures and times or adding a sterile rinsing step to ensure elimination of any harmful microbes.
- ➔ **Establish procedures to monitor** critical control points. Such procedures can include

determining how and by whom product storage time and temperature should be monitored. Another example is assigning the task of monitoring pesticide application rates and times to a specific employee—in other words, assigning responsibility.

- ➔ **Establish corrective actions** to take when monitoring shows that a critical limit has not been met—for example, reprocessing or disposing of food if the maximum storage temperature is exceeded.
- ➔ **Establish procedures to verify** that the system is working properly—for example, testing time-and-temperature recording devices to verify that a cooling unit is working properly or checking the flow rate on a sprayer.
- ➔ **Establish effective recordkeeping** to document the HACCP system. This includes records of hazards and their control methods, monitoring of safety requirements, and actions taken to correct potential problems.

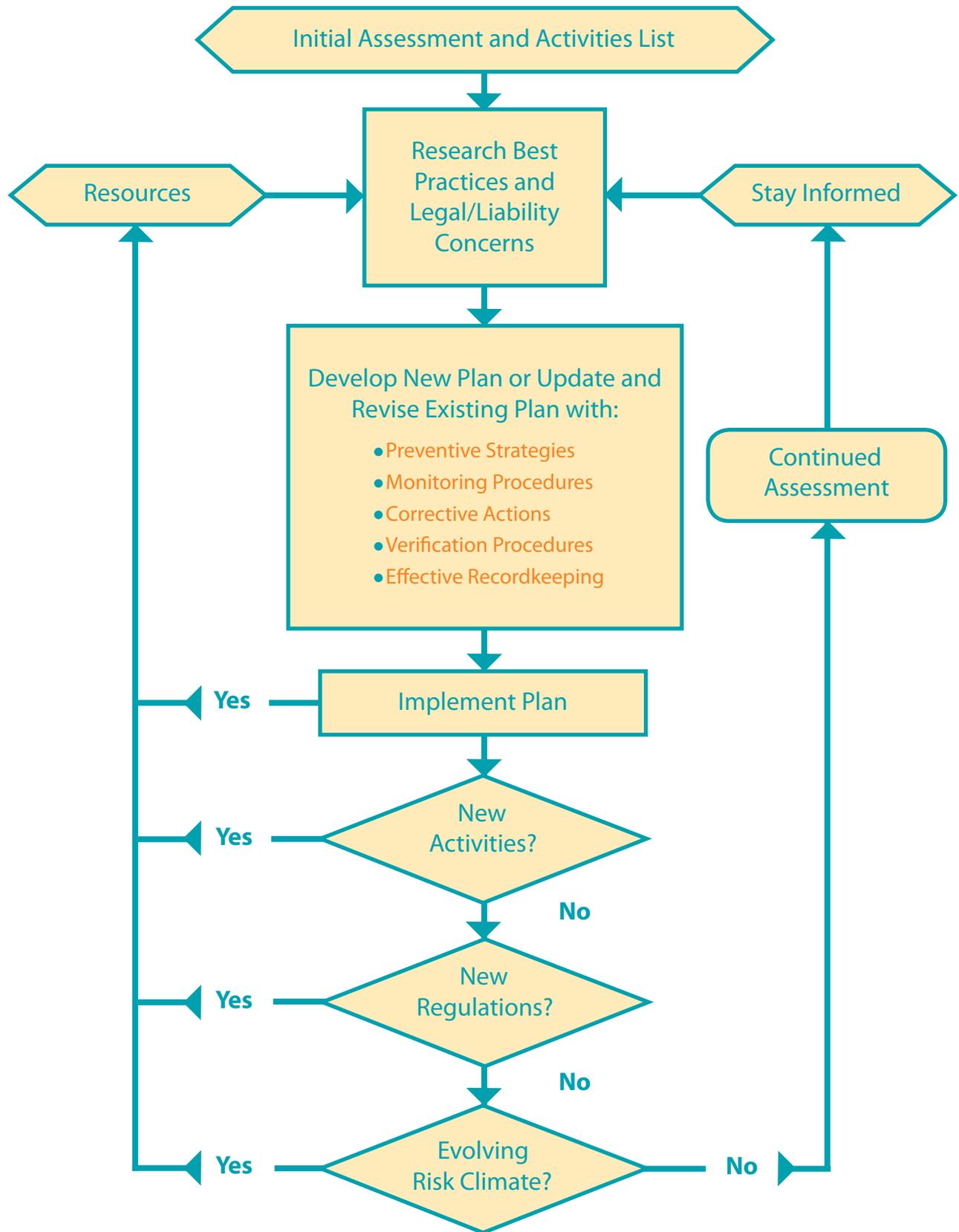
Actions taken on each of these principles must be backed by sound scientific knowledge, such as published microbiological studies on time and temperature factors for controlling food-borne pathogens. Working with trained agricultural and food-safety professionals will help ensure access to up-to-date and accurate information, tools, and technologies.

Critical Control Points

The *flowchart* on the next page outlines the HACCP plan and includes references to points where different activities may affect other events. The chart is followed by a *Control Points Table* that outlines many of the common food-safety risks that occur at each phase of an agricultural direct-marketing operation. The exposures are listed by hazard type—biological, chemical, and physical. A blank table is also provided so users can fill in their own control measures at each phase and for each class of food-safety hazard. Completing the table will help users organize their control strategies visually, aiding in risk assessment.

⁸ U.S. FDA. “HACCP: A State-of-the-Art Approach to Food Safety” *FDA Backgrounder*, October, 2001. Available online in March 2004 at www.cfsan.fda.gov/~lrd/bghaccp.html.

HACCP Critical Control Points



Control Points Table

Potential Risks			
Hazard Phase	Biological	Chemical	Physical
Preproduction	Livestock, wild animals, improperly composted manure, natural soil organisms.	Residues from previous use history or current pesticide and fertilizer use.	Stones and sticks or “trash” from previous crops, syringes, other debris in compost.
Production	Same as above plus contaminated irrigation water.	Fertilizers and pesticides.	See above.
Harvest	Improper worker hygiene; dirty bins, containers, and harvest equipment; domestic and wild animals.	See above plus equipment leaks and cleanser residues.	See above plus poorly maintained or damaged/worn-out equipment, workers’ personal articles (jewelry, pens, etc.).
Postharvest	Contaminated wash/rinse or cooling water, including ice; improper worker hygiene; dirty bins, containers, and sorting equipment; staging areas next to cull or compost piles or livestock areas.	Contaminated wash/rinse or cooling water, including ice; residues from pest control in and around packing shed/buildings; residues in bins and containers.	See above.
Processing	Improper canning temperatures or pH, flies or other vermin around drying racks, employee hygiene.	Residues and water or other additives used in processing.	Damaged containers and equipment, including jars and packaging materials; fragments from walls or ceilings; employees’ personal items.
Storage	Vermin such as mice or insects; improper temperatures or humidity; dirty bins and other types of cross-contamination.	Residues from cleansers and pesticides used to control vermin, residues or cross-contamination from other materials stored in the same facility.	Damaged bins, fragments from walls or ceilings, vermin nesting materials.
Transportation	See above.	See above plus residues from previous transport of chemical materials in vehicles.	Damaged pallets, bins, and containers; fragments from vehicles.
Marketing	Employee and consumer handling, improper sampling hygiene, improper temperature control.	Sanitizing and cleaning residues on display and sampling equipment.	Damaged display equipment; employees’ or customers’ personal items, including coins.
Preparation	Poor worker hygiene, dirty equipment, cross-contamination, improper cooking time or temperature, poor kitchen sanitation.	Residues on equipment, food additives.	Damaged equipment (both cooking and serving), fragments from walls or ceilings, employee’s personal items.
Consumer	Inadequate or improper consumer education such as “refrigerate after opening” and “discard date” advisories.	Inadequate or improper consumer education such as “wash before consuming” advisories.	Inadequate or improper consumer education such as “may contain pits or shell fragments” warnings.

A blank copy of this form is provided on the following page so you can fill in your own control points table.

Control Points Table

Identify Potential Risks in Your Operation			
Hazard Phase	Biological	Chemical	Physical
Preproduction			
Production			
Harvest			
Postharvest			
Processing			
Storage			
Transportation			
Marketing			
Preparation			
Consumer			

Use this table in conjunction with the Control Points Table on the preceding page.

Self-Evaluation and Planning Worksheets

The self-evaluation worksheet in this guide can assist you in identifying your strengths and weaknesses with respect to managing food-safety risks for each type of hazard and at every phase of an operation. Completing this short self-evaluation is a good place to start the process of developing or improving your food-safety risk management plan.

For each phase, rate your satisfaction with the controls you have in place for the three classes of food-safety hazards. For example, if your operation has made significant strides to ensure successful control of biological hazards during production—such as careful management and application of compost, adequate containment of livestock and their waste products, and use of clean irrigation water from a protected source—then place a check mark in Box 4 indicating a Very Satisfied level of assurance. In contrast, if exposure to food-safety risks during the marketing phase of your operation has not received much attention until now, you might place check marks in Boxes 1 or 2 for all three classes of food-safety risk in the Marketing row of the table.

After completing the self-assessment table, use it as a guide to assist you with planning to improve your management of



food-safety risks. The worksheet that follows allows you to group various phases of your operation by level of assurance from your self-assessment. This process generates a priority list from which to plan.

On the final worksheet, you can organize your activities chronologically into a timetable. Use this timetable to implement your management plan for addressing food-safety risk.



Self-Evaluation Checklist

Rate your level of assurance with respect to food-safety hazards at each step of operation as follows:

4 = Very Satisfied 3 = Some Level of Uncertainty 2 = Needs More Attention 1 = No Controls

Assessment Phase	4	3	2	1	4	3	2	1	4	3	2	1
Preproduction												
Production												
Harvest												
Postharvest												
Processing												
Storage												
Transportation												
Marketing												
Consumer Education												
Product Labeling												
Employee Training												
Restroom Facilities												
Signs and Postings												
Food Preparation												
Kitchen Facilities												
Food Storage Areas												
Animal Contact Areas												
Recordkeeping												

Prioritizing Actions

From the Self-Evaluation Checklist

Level 1: Immediate Attention

Research Best Management Practices and begin to implement.

NO CONTROLS

Level 2: Short-Term Goals

Revisit Best Management Practices for these topics and make modifications accordingly.

NEEDS MORE ATTENTION

Level 3: Fine Tuning

As time permits, research these topics in more detail. Make necessary adjustments.

SOME LEVEL OF UNCERTAINTY

Level 4: Continue monitoring and self-assessment regularly.

VERY SATISFIED

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Timetable for Implementation

Use this form to begin building a timetable for implementing food-safety practices. This table will summarize your activity plans for improving food safety in your operation.

Next Three Months	Activity Plan
Next Six Months	Activity Plan
Next Year	Activity Plan

Gateway to Government Food-Safety Information

www.foodsafety.gov

Agencies with Authority over Food Safety Regulations

The following agencies regulate growing or processing of the indicated food products. Acceptance of an approved source is up to the local environmental health agency.

Legend of Agencies

1. County Agricultural Commissioner
2. California Department of Health Services, Food and Drug Branch
3. California Department of Fish and Game
4. California Department of Food and Agriculture (CDFA), Meat and Poultry Inspection Branch
5. California Department of Food and Agriculture (CDFA), Bureau of Milk and Dairy Foods Control
6. U.S. Department of Agriculture, Food Safety and Inspection Service (FSIS)
7. Local environmental health agency

Product	Regulatory Authority
Fruits and Vegetables – fresh, whole	1
Fruits and Vegetables – processed	2 or 7 ^a
Nuts – fresh, whole	1
Nuts – processed	2 or 7 ^a
Sprouts	1
Shell Eggs	1
Honey	1
Juice	2 or 7 ^a
Jams and Preserves	2 or 7 ^a
Low-Acid Canned Foods	2
Poultry – live	none
Poultry – processed	4 ^b or 6
Fish and Shellfish	2 and 3
Red Meat – fresh	6
Red Meat – processed (cured,	4 and 6
Dairy Products	5

^a In most cases the state Food and Drug branch regulates wholesale operations. Food processors who sell only at retail are usually regulated by the local environmental health agency.

^b The exemption from CDFA inspection of poultry does not apply when sales occur at certified farmers markets. Inspection must be requested from CDFA.

Source: California Conference of Directors of Environmental Health, www.ccdeh.com/committee/food/documents/Guidelines/Certified_Farmers_Markets.pdf.

Legal and Regulatory Agencies Involved with Food Safety

Federal Government

Code of Federal Regulations
Title 21 – Food and Drugs
Chapter I – Food and Drug Administration
Part 110 – Current Good Manufacturing Practice in Manufacturing, Packing, or Holding Human Food

The full document is available at www.dhs.ca.gov/ps/fdb/PDF/fsgmp.pdf.

California Health and Safety Code

Sections of California's Health and Safety Code that govern retail food inspection activities in California are:

- ➔ *The California Uniform Retail Food Facilities Law (CURFFL)* – California Health and Safety Code, Sections 113700–114475 as amended. A copy of this law as of 2004 can be found at www.dhs.ca.gov/ps/fdb/pdf/curffl2004.pdf.
- ➔ *The Food Sanitation Act* – California Health and Safety Code, Sections 111950–112055 as amended. A copy of this law as of 2004 can be found at www.dhs.ca.gov/ps/fdb/pdf/food%20sanitation%20act.pdf.
- ➔ *The Sherman Food, Drug, and Cosmetics Laws* – California Health and Safety Code, Sections 109875–111915. A copy of this law as of 2004 can be found at www.dhs.ca.gov/ps/fdb/pdf/Sherman%202005.pdf

Definition of “Potentially Hazardous Food”

Section 113845. “Potentially hazardous food” means food that is in a form capable of (1) supporting rapid and progressive growth of infectious or toxigenic microorganisms that may cause food infections or food intoxications, or (2) supporting the growth or toxin production of *Clostridium botulinum*. “Potentially hazardous food” does not include foods that have a pH level of 4.6 or below, foods that have a water activity value of 0.85 or less under standard conditions, food products in hermetically sealed containers processed to meet the commercial sterility standard as defined in Section 113.3(e) of Title 21 of the Code of Federal Regu-

lations, or food that has been shown by appropriate microbial challenge studies approved by the enforcement agency not to support the rapid and progressive growth of infectious or toxigenic microorganisms that may cause food infections or food intoxications or the growth and toxin production of *Clostridium botulinum*.

California Conference of Directors of Environmental Health (CCDEH)

www.ccdeh.com

The legal section of the California Conference of Directors of Environmental Health's (CCDEH's) website links directly to corresponding sections of the California Department of Health Services' Food-Safety Program website, which is updated whenever changes are approved through legislation: www.ccdeh.com/commttee/food/documents/default.htm.

CCDEH is comprised of environmental health directors from sixty-two jurisdictions, including counties and cities, and associate membership is open to all environmental health professionals. A manager and the executive director are based in Sacramento to support the association's legislative and administrative functions. In addition, there is an executive committee comprised of four officers, each representing a region of California, and four regional representatives.

CCDEH's website offers numerous food-safety publications, including guidelines for various kinds of facilities and operations and references to legal documents that apply to environmental health. Guidelines for the following operations are available at the website.

- ➔ certified farmers markets
- ➔ bed and breakfasts and ag home stays
- ➔ temporary food facilities
- ➔ planning for mobile food facilities

California Cannery Inspection Program

www.dhs.ca.gov/ps/fdb/HTML/Food/indexcan.htm

The California Department of Food and Agriculture's California Cannery Inspection Program website is a guide to regulatory require-

ments for commercial production of thermally processed low-acid canned foods and pH-control foods in California.

University of California and Cooperative Extension Resources

University of California

UC Small Farm Center Website

www.sfc.ucdavis.edu

UC Food-Safety Website

<http://ucfoodsafety.ucdavis.edu>

Research and extension faculty at UC Davis host this site but current information from all UC campuses is included. Viewers can link to presentations, publications, and other websites with information related to food production, harvest, and processing. The site emphasizes microbial food safety but many other subjects related to food (such as biotechnology, food quality, and food security) are also addressed.

UC Good Agricultural Practices (GAP) Self-Audit and Website

<http://ucgaps.ucdavis.edu>

UC Good Agricultural Practices Self-Audit

Available in both CD and online PDF format, this is a very useful resource for farmers and ranchers.

Links also include presentations, publications, and other websites with information related to the production, harvest, and processing of foods.



UC FoodSafe Program Website

<http://foodsafe.ucdavis.edu>

Cooperative Extension Specialists

University of California

One Shields Avenue

Davis, CA 95616

Trevor V. Suslow, Ph.D.

Department of Vegetable Crops, UC Davis

Dr. Suslow's research and extension program centers on studying the effects of microflora on the postharvest quality of perishable produce and emphasizes three broad areas of postharvest pathology:

- ➔ Integrated systems for controlling microbes that cause decay after harvest in whole and fresh-cut produce.
- ➔ Integrated technologies that maintain quality while produce is shipped and distributed.
- ➔ Diagnostic tools that predict a products' tendency to lose quality or spoil.

Email: tvsuslow@ucdavis.edu

Phone: 530.754.8313 / Fax: 530.752.4554

Linda J. Harris, Ph.D.

Department of Food Science and Technology, UC Davis

Dr. Harris' areas of expertise include food microbes, communications, fruits and vegetables, dairy products, meats, and poultry. Her research and extension program broadly covers microbial food safety. She provides educational programs related to all aspects of the food chain and primarily researches antimicrobial treatments that increase the microbial safety and quality of food.

Email: ljharris@ucdavis.edu

Phone: 530.754.9485 / Fax: 530.752.4759

General Food Safety

Video – Consumer Trends in Food Safety;
Interactive Workshop: Planning the Future of
Food Safety Education

www.ocav.usda.gov

Food Safety Preparation and Storage Sample Images

English: www.fsis.usda.gov/oa/pubs/image_library/fightbac.htm

Spanish: www.fsis.usda.gov/oa/pubs/cfg/downloadart_sp.htm

Cooking for Groups:
A Volunteer's Guide to Food Safety
www.fsis.usda.gov/oa/pubs/cfg/cfg.htm

Food Labeling

U.S. Department of Agriculture Food Labeling Fact Sheet

www.ams.usda.gov/nop/FactSheets/LabelingE.html

Food Labeling Information at the UC Food Safety Website

www.ucfoodsafety.ucdavis.edu/Getting_Started_In_The_Food_Business/Labeling_Issues.htm

This web page includes a collection of links to various federal, state, and other sources of information about requirements regarding labeling for food operations, including labeling related to allergenic substances, refrigerated foods, nutrition content, and UPC codes required for retail sales.

Network of Food Compliance Professionals

www.foodcompliance.com

This website is designed to be a resource for food-safety compliance professionals and offers information regarding labeling regulations by agencies such as USDA and FDA.

Markets and Ag and Nature Tourism Venues

California Federation of Certified Farmers Markets

www.cafarmersmarkets.com

Guidelines for Certified Farmers Markets from the California Committee of Directors of Environmental Health

www.ccdeh.com/committee/food/documents/Guidelines/Certified_Farmers_Markets.pdf

Guidelines for Reducing the Risk of Disease at Petting Zoos, Animal Exhibits, and Other Areas

www.dhs.ca.gov/ps/ddwem/environmental/Institutions/PDFs/GuidelinesReducingRiskPetZoosMD.PDF

Hand-Washing Signs for
Petting Zoos and Animal Contact Areas
www.cdfa.ca.gov/fe/HandwashSigns.htm

UC Small Farm Center Website

www.sfc.ucdavis.edu

Producers of Agricultural Products

Video – Food Safety Training Program for Sprout Producers

California Department of Health Services, Food and Drug Branch, and the U.S. Food and Drug Administration

Developed in cooperation with the Centers for Disease Control, university researchers, and industry representatives, the video can be useful to retailers, regulators, and others who want to better understand current recommendations for best production practices, including legal requirements and guidelines, seed production, sprout production, disinfection treatments, sampling and microbial testing, and personnel practices.

California Department of Health Services
Food & Drug Branch (MS 7602)
PO Box 997413
Sacramento, CA 95899-7413
Phone: 916.650.6500

Production of Value-Added Products

Value-Added Products and Food-Safety Website – Washington State University

<http://agsyst.wsu.edu/foodsafte.htm>

The website offers copies of *Producing Value-Added Products For Market: Start With Food Safety* (EB1902), a publication by B. Susie Craig and Sandra G. Brown that can be downloaded at <http://cru.cahe.wsu.edu/CEPublications/eb1902/EB1902.pdf>.

Laboratory for Research in Food Preservation

Keith Ito, Director, UCLRFB

Email: kito@nfpa-food.org

6363 Clark Avenue, Dublin, CA 94568-3097

Phone: 925.828.1790 / Fax: 925.833.8795

Value Added Processing Website – Oregon State University Extension Service

<http://oregonstate.edu/dept/foodsci/foodweb/main.htm>

Contact Yanyun Zhao, Associate Professor/
Value-Added Product Specialist.

Email: yanyun.zhao@oregonstate.edu

Assists the food industry to develop and enhance quality and safety and increase the value of fruit and vegetable products.

National Food Processors Association's Center for Technical Service and Assistance

www.nfpa-food.org

The center, which is funded by the state's Canery Inspection Program, provides laboratory assistance and consulting in food safety, process authority, food microbiology, food chemistry, sanitation, environmental engineering, and waste management. Products typically analyzed include canned and acidified foods—primarily miscellaneous vegetables and specialty foods (sauces, salsas), animal foods, olives, and fish.

Sulfites: Safe for Most, Dangerous for Some

www.fda.gov/fdac/features/096_sulf.html

A 1996 article by Ruth Papazian from *FDA Consumer Magazine* regarding the risks of sulfite use.

Compost and Manure Handling

California Compost Quality Council (CCQC)

www.crra.com/ccqc/ccqchome.htm

A unique alliance of compost producers, scientists, farmers, landscape contractors, and recycling advocates who administer compost quality guidelines in California. The council operates an independent verification program through which compost producers can assure consumers that quality claims have been verified.

University of California Good Agricultural Practices (GAP) Self-Audit and Website –

<http://ucgaps.ucdavis.edu>

From here link to presentations, publications, and other websites with information related to food production, harvest, and processing, including composting and soil amendments in the *GAP Self-Audit*.

Food HACCP Videos and Slides Online

www.foodhaccp.com/online.html

All resources at this site, including the following, are available free of charge.

Slide Presentations

- ➔ Basic Microbiology – *Linda Harris, UC Davis*
- ➔ Cold Storage Sanitation – *Trevor Suslow, UC Davis*
- ➔ Hand Sanitation – *Trevor Suslow, UC Davis*
- ➔ ORP (Oxygen Reduction Potential) Basics for Mushrooms – *Trevor Suslow, UC Davis*
- ➔ Pathogen Testing – *Linda Harris, UC Davis*
- ➔ Food-Safety Systems – *Luke LaBorde, Pennsylvania State University*
- ➔ Key Sanitation Areas – *Luke LaBorde, Pennsylvania State University*

HACCP Video in Spanish

By Dr. M. Brashears in connection with University of Nebraska.



Appendix

Checklist for Physical Requirements for Mobile Food Facilities

The following information summarizes requirements for mobile food facilities from Section 114260 of the California Health and Safety Code as of March 2005. The code can be found at www.leginfo.ca.gov/cgi-bin/calawquery?codesection=hsc.

Types of Mobile Food Facilities

- A = Mobile food facilities that handle only prepackaged food and produce that is not potentially hazardous.
- B = Mobile food facilities that handle prepackaged potentially hazardous food, whole fish and whole aquatic invertebrates, or bulk-dispensed beverages that are not potentially hazardous. Tamales are considered prepackaged if they are dispensed to customers in their original inedible wrapper.
- C = Mobile food facilities that handle food that is not prepackaged, is not potentially hazardous, and requires no preparation other than heating, baking, popping, blending, assembling, portioning, or dispensing; preparation of ingredients that are not potentially hazardous into a food that is not potentially hazardous; and/or churros, hot dogs, cappuccino, and other coffee-based or cocoa-based beverages that may contain cream, milk, or similar dairy products and frozen ice cream bars.

These are the only foods that may be prepared or dispensed on a mobile food facility. Except for preparation of churros, cooking processes (including barbecuing, broiling, frying, and grilling) are not permitted on a mobile food facility.

Regulations That Affect Type A, B, and C Facilities

- Name, address, phone number of the owner/operator/permittee and business name attached to both sides of the facility and legible. Facility's name shall be in letters at least three inches high and rest of information shall be in letters at least one inch high. Letter color must contrast with the exterior of the mobile food facility.
- All equipment, cabinets, and compartments must be smooth, readily accessible, and easy to clean. No unfinished wood surfaces. Construction joints must fit tightly and be

sealed. Equipment and utensils must be made of durable, nontoxic materials.

- All food must remain on the mobile food facility except for approved restocking of product.
- All remaining food products must be stored only in an approved commissary.
- Food, food-contact surfaces, and utensils must be protected from contamination. All single-service utensils must be protected from contamination in approved dispensers. Food contact surfaces and utensils must be cleaned and sanitized in accordance with Section 114090.
- All food must be obtained from an approved source.
- Condiments must be protected from contamination and self-serve condiments must be prepackaged or in approved dispensing devices.
- Must operate within 200 feet of approved and readily available toilet and hand-washing facilities.
- Must operate out of a commissary that is stored at or in an approved location that protects it from unsanitary conditions.

Regulations That Affect Type B and C Facilities

- Potentially hazardous food must be maintained at or below 41°F (refrigerated) or at or above 135°F at all times.
- Potentially hazardous food held at or above 135°F must be destroyed at the end of the operating day.
- All wastewater must be drained by approved methods at the commissary.
- All new and replacement gas-fired appliances must meet applicable ANSI standards. All new and replacement electrical appliances must meet applicable Underwriters Laboratory (UL) standards.

Regulations That Affect Type C Facilities

- Bulk beverage dispensers must be filled only at the commissary unless a hand-washing sink that is large enough to accommodate the largest utensil and vessel is available.
- When food that is not prepackaged is handled for display or sale, food holding and

handling compartments must be completely closable. Openings must be large enough to allow assembly while still providing protection and compartment closures must fit tightly to prevent contamination.

- ➔ Ready-to-eat foods that are not prepackaged must meet the following requirements.

Sinks – Must have a one-compartment metal sink supplied with hot (120°F) running water and cold (less than 101°F) running water through a mixing-type faucet. The sink must be large enough to accommodate cleaning of the largest utensils. The sink, hand-washing cleanser, and single-service towels must be easily accessible and unobstructed.

Potable Water – Minimum water heater capacity is one-half gallon. The potable water tank and delivery system must be constructed of approved materials, provide protection from contamination, and be adequate to handle the level of food handling activity. Hand-washing minimum capacity is five gallons. Additional capacity must be supplied for other uses such as steam tables and utensil and equipment cleaning.

Wastewater – Wastewater tanks must have a minimum capacity of 7.5 gallons and a capacity that is 50% greater than the supply of potable water. Mobile food facilities using ice to store or display food/beverages must provide additional wastewater

holding capacity equal to 33% of the volume of the ice cabinet to accommodate drainage. Product water used to prepare a food or beverage requires that a volume equal to 15% of the product water used be added to the wastewater capacity. Additional wastewater tank capacity may be required where wastewater production or spillage is likely to occur. Connections to wastewater tanks must preclude contamination of food, surfaces, and utensils. Inlets that supply the potable water must prevent backflow and other contamination.

Hoses – Hoses used to fill potable water tanks must be made of food-grade materials and handled in a sanitary manner.

Facilities that portion or dispense only foods that are not prepackaged and not potentially hazardous (except ice) are exempt from sink requirements if an approved supply of gloves or utensils or both are supplied to preclude hand contact with food.

Approved written operational procedures for food handling and for cleaning and sanitizing food-contact surfaces and utensils must be approved and followed.

All storage, display, and dispensing methods must be approved.

Cappuccino and other coffee/cocoa-based beverages that contain cream, milk, or other dairy products must be made to order.

Washing Procedures

Hands. Wash hands with warm running water with soap. Scrub hands with soap for at least fifteen seconds, paying careful attention to areas that are difficult to clean such as around and under nails. Rinse hands with warm running water and dry with single-use paper towels.

Wash hands before starting work, after any absence from a work station, after blowing the nose or touching the face or hair, after restroom use, after breaks, after handling dirty or raw materials, after performing maintenance on equipment, and after picking up objects from the floor.

Bins and Containers. Bins and containers are a risk to food safety because they hold food

products longer and are often reused several times during a day. It is important to wash bins and containers often—between every load if possible. Employees should remove liners from containers before cleaning and give special attention to cleaning the lids. All containers should be made of nontoxic washable materials like plastic and free of loose materials such as nails, splinters, staples, etc. All bins and containers must be approved for use by FDA or USDA. Recondition, repair, or dispose of all damaged containers. Containers should be color-coded according to their function; those that hold finished products, soiled products, or waste should never be interchanged.

From the *UC Good Agricultural Practices Self-Audit*.

Sample Hand-Washing Signs

ANIMAL HANDLING SAFETY TIPS

After petting animals,
Wash Your Hands!



ALWAYS

Use **SOAP** and **WATER**.

RUB hands together for **20** seconds.

WASH backs of hands, lower forearms,
wrists, between fingers, and
under fingernails.



DRY hands with a clean paper towel.

When visiting animals

HEALTH AND SAFETY

**Animals can carry diseases.
Please follow these safety measures
when visiting our animal areas:**

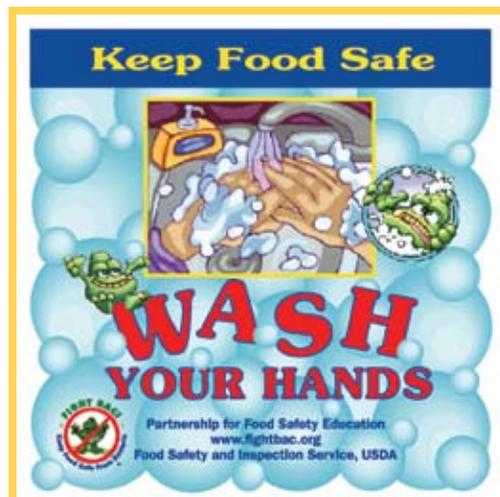
- Do not eat or drink in animal areas.
- Do not allow children to climb on pens and animal enclosures.
- Toys, pacifiers, blankets, and other personal items can be contaminated. Keep personal items away from the animals' environment. Wash contaminated items before returning to children.
- **Always wash hands with soap and water after touching animals, their enclosures, and food containers and after contact with animal bedding, feces, or pens.**
- **Always wash hands before drinking, eating, smoking, or preparing food.**



Touch Tocar



Wash Lavar



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Environmental Health Services Section

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Chris Lewis

Small Farm Center, University of California Davis

Peggy Greb

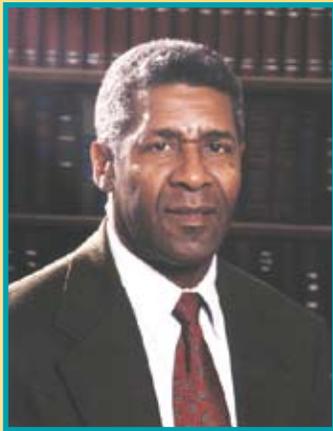
USDA Agricultural Research Service
Photograph of apples on page 2

Editing and Layout

Natalie Karst



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In partnership with the U.S. Department of Agriculture's Risk Management Agency, the University of California Small Farm Center is developing and publishing a series of educational materials focused on managing risks and reducing potential liability for small- and family-scale operations in the agricultural food chain. This publication focuses on

food safety risks at farmers markets and agritourism venues. See also the first publication in this series—*A Guide to Managing Risks and Liability at California Certified Farmers Markets*.

This publication series represents part of the Small Farm Center's continued commitment to helping producers adopt the most current Best Management Practices in support of their innovative approaches to food production, marketing, and farm management.

