

## HACCP: A State-of-the-Art Approach to Food Safety

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Space-age technology designed to keep food safe in outer space may soon become standard here on Earth.

The Food and Drug Administration has adopted a food safety program developed nearly 30 years ago for astronauts and is applying it to seafood and juice. The agency intends to eventually use it for much of the U.S. food supply. The program for the astronauts focuses on preventing hazards that could cause food-borne illnesses by applying science-based controls, from raw material to finished products. FDA's new system will do the same.

Traditionally, industry and regulators have depended on spot-checks of manufacturing conditions and random sampling of final products to ensure safe food. This approach, however, tends to be reactive, rather than preventive, and can be less efficient than the new system.

The new system is known as Hazard Analysis and Critical Control Point, or HACCP (pronounced hassip). Many of its principles already are in place in the FDA-regulated low-acid canned food industry. FDA also established HACCP for the seafood industry in a final rule December 18, 1995 and for the juice industry in a final rule released January 19, 2001. The final rule for the juice industry will take effect on January 22, 2002 for large and medium businesses, January 21, 2003 for small businesses, and January 20, 2004 for very small businesses. In 1998, the U.S. Department of Agriculture has established HACCP for meat and poultry processing plants, as well. Most of these establishments were required to start using HACCP by January 1999. Very small plants had until Jan. 25, 2000. (USDA regulates meat and poultry; FDA all other foods.)

FDA now is considering developing regulations that would establish HACCP as the food safety standard throughout other areas of the food industry, including both domestic and imported food products.

To help determine the degree to which such regulations would be feasible, the agency is conducting pilot HACCP programs with volunteer food companies. The programs have involved cheese, frozen dough, breakfast cereals, salad dressing, bread, flour and other products.

HACCP has been endorsed by the National Academy of Sciences, the Codex Alimentarius Commission (an international food standard-setting organization), and the National Advisory Committee on Microbiological Criteria for Foods. A number of U.S. food companies already use the system in their manufacturing processes, and it is in use in other countries, including Canada.

### What is HACCP?

**HACCP involves seven principles:**

1. **Analyze hazards.** Potential hazards associated with a food 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 ground glass or metal fragments.
2. **Identify critical control points.** These are points in a food's production--from its raw state through processing and shipping to consumption by the consumer--at which the potential hazard can be controlled or eliminated. Examples are cooking, cooling, packaging, and metal detection.
3. **Establish preventive measures with critical limits for each control point.** For a cooked food, for example, this might include setting the minimum cooking temperature and time required to ensure the elimination of any harmful microbes.

4. **Establish procedures to monitor the critical control points.** Such procedures might include determining how and by whom cooking time and temperature should be monitored.
5. **Establish corrective actions to be taken** when monitoring shows that a critical limit has not been met--for example, reprocessing or disposing of food if the minimum cooking temperature is not met.
6. **Establish procedures to verify that the system is working properly**--for example, testing time-and-temperature recording devices to verify that a cooking unit is working properly.
7. **Establish effective recordkeeping to document the HACCP system.** This would include records of hazards and their control methods, the monitoring of safety requirements and action taken to correct potential problems. Each of these principles must be backed by sound scientific knowledge: for example, published microbiological studies on time and temperature factors for controlling foodborne pathogens.

### **Need for HACCP**

New challenges to the U.S. food supply have prompted FDA to consider adopting a HACCP-based food safety system on a wider basis. One of the most important challenges is the increasing number of new food pathogens. For example, between 1973 and 1988, bacteria not previously recognized as important causes of food-borne illness--such as *Escherichia coli* O157:H7 and *Salmonella enteritidis*--became more widespread. There also is increasing public health concern about chemical contamination of food: for example, the effects of lead in food on the nervous system. Another important factor is that the size of the food industry and the diversity of products and processes have grown tremendously--in the amount of domestic food manufactured and the number and kinds of foods imported. At the same time, FDA and state and local agencies have the same limited level of resources to ensure food safety.

The need for HACCP in the United States, particularly in the seafood and juice industries, is further fueled by the growing trend in international trade for worldwide equivalence of food products and the Codex Alimentarius Commission's adoption of HACCP as the international standard for food safety.

### **Advantages**

**HACCP offers a number of advantages over the current system. Most importantly, HACCP:**

- focuses on identifying and preventing hazards from contaminating food is based on sound science
- permits more efficient and effective government oversight, primarily because the recordkeeping allows investigators to see how well a firm is complying with food safety laws over a period rather than how well it is doing on any given day
- places responsibility for ensuring food safety appropriately on the food manufacturer or distributor
- helps food companies compete more effectively in the world market reduces barriers to international trade.

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