

Good Manufacturing Practices (GMPs) and SSOPs are prerequisite programs for HACCP.

Examples of items covered by GMPs are:

- Recurring job requirements
- Time/temperatures
- Laundry
- Sanitation
- Building layout
- Hazardous chemicals
- Airflow
- Product flow
- Personal hygiene
- Waste
- Safety
- Rodents
- Ingredients
- People flow
- Water
- Housekeeping
- Drainage
- Equipment
- Sewage

Sanitation Standard Operating Procedures (SSOPs)

Each SSOP plan must be designed to prevent direct product contamination. The guidelines give special emphasis to the major sources of potential contamination.

- Cross-contamination of cooked product by raw product, such as unclean food contact surfaces,
- Contact of product with non-potable water (e.g. condensation over exposed product) or other unwholesome substances,
- Contact with non-food compounds (e.g. cleaners, pesticides),
- Contact with airborne particulates,
- Employee illness or improper hygiene,
- Foreign objects, and
- Vermin.



Sanitation monitoring can be done by one or more of the following methods:

1. Organoleptic (e.g. sight, feel, smell),
2. Chemical (e.g. checking chlorine level),
3. Microbiological (e.g. swabbing product contact surfaces).

Three C's of good sanitation:

- Keep it clean
- Keep it cold ($\leq 40^{\circ}\text{F}$)
- Keep it covered

Three F's of sanitation problems:

- Filth
- Fingers
- Flies

Helpful References

- HACCP models and guidance and SSOPs:
 - ◆ United States Department of Agriculture, FSIS
 - * www.fsis.usda.gov/OA/haccp/haccp-guide.htm



HACCP Implementation

Hazard Analysis and Critical Control Point Plan Recommendations



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Origins of HACCP

HACCP is an acronym that stands for **H**azard **A**nalysis and **C**ritical **C**ontrol **P**oint. HACCP is a science-based system for assuring the safety of food from chemical, physical and biological hazards from the farm to the table.

Where HACCP Began...

In 1959, Pillsbury, NASA and the U.S. Army Natick Laboratories were involved in developing “space foods” for U.S. astronauts. There were two safety issues in the space capsule under zero gravity conditions, 1) crumbs and water droplets getting into electrical equipment, 2) preventing foodborne illness which would have catastrophic results in a zero gravity environment.



HACCP Benefits and Principles

The original HACCP Principles presented to the food industry in 1971 were:

1. *Identify/Assess hazards,*
2. *Determine critical control points (CCPs),*
3. *Establish systems to monitor CCPs.*

Early uses of HACCP were in low-acid ($\text{pH} > 4.6$) and acidified ($\text{pH} \leq 4.6$) canned food regulations. The 1985 National Academy of Sciences endorsed HACCP as the most effective means of assuring safety of our food supply.

In 1989 there were seven principles adopted for food production by the National Advisory Committee on Microbiological Criteria for Foods (NACMCF).

The 7 Principles of HACCP are:

- *Conduct a hazard analysis,*
- *Determine the critical control points (CCPs),*
- *Establish critical limits,*
- *Establish monitoring procedures,*
- *Establish corrective actions,*
- *Establish verification procedures,*
- *Establish record-keeping and documentation procedures.*



Overview of HACCP

The HACCP concept is a preventive system applied at each food processing step for assuring safe production of foods. To be truly effective, HACCP must encompass all segments of the food chain and can be applied to any food product. HACCP can be applied to production farms, food processing, food service, distribution, and consumer preparation and use. The purpose of HACCP is to prevent, reduce or minimize food safety risks associated with foods. HACCP provides the framework to produce foods safely and to prove they were produced safely. HACCP covers biological, physical and chemical hazards occurring in food.



Food Safety Hazards

Food safety hazards can be divided into three main categories: biological, chemical and physical. These categories are defined as follows:

- **Biological:** The presence of any harmful biological substance in the food being considered. *Salmonella* and *E. coli* O157:H7 are some common examples of biological hazards.
- **Chemical:** The presence of any poisonous or deleterious substance in the food being considered. Some examples include lubricants and pesticides.
- **Physical:** The presence of any items such as bone, metal, plastic, glass or wood fragments in the product capable of causing physical injuries to a consumer including damage to the mouth, teeth, etc. or even choking.

Foodborne Diseases

- 76 million illnesses per year
CDC, 1999, J. of Emerging Infectious Diseases
- 5,000 deaths
CDC, 1999, J. of Emerging Infectious Diseases
- \$1-10 Billion
Todd, 1984, Proceedings of the 2nd Nat'l Conf. for Food Protection, FDA, Washington, D.C.

Foods frequently involved are: Beef, poultry, pork, fish and eggs. Dairy products, fruits and vegetables are also involved.

