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HACCP: An Overview[1]

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HACCP is a food safety management system that is increasingly utilized in all aspects of the food industry. The objectives of this fact sheet are to introduce the topic and to summarize the key components of a HACCP program.

What is HACCP?

HACCP is a system that relies on process controls to minimize food safety risks in the food processing industry. The acronym HACCP stands for 'Hazard Analysis Critical Control Point' (pronounced 'hás•sip'). It is useful to think of HACCP as a preventative food safety system, and not a traditional quality control inspection system. HACCP is not 'zero risk' and does not eliminate the possibility of a hazard getting into the food product. Rather, HACCP attempts to decrease that possibility to an acceptable level.

How Does HACCP Work?

Significant hazards for a particular food product are identified after a review of all the processing steps and use of scientific information. The steps at which these hazards can be controlled are identified, and critical limits, such as process temperatures and hold times, at key process steps are set. Monitoring procedures are implemented to evaluate conformance with these critical limits. Should the process fall outside these limits, pre-planned corrective actions are taken to prevent the potentially defective product from entering the commerce stream. In addition, the HACCP system relies on extensive verification and documentation to assure that food safety has not been compromised during any step. Thus, HACCP provides a structure for assessing risks or what could go wrong, and for putting the controls in place to minimize such risks.

HACCP History

HACCP is not a new system. The concept was developed in the 1960s by the Pillsbury Company, while working with NASA and the US Army Laboratories to provide safe food for space expeditions. The limitations of end product testing became evident to those who were trying to provide the safest possible food products. In order to ensure that food used for space missions would be safe, almost all the product manufactured would need to be tested, leaving very little for actual use. A new approach was needed. The practical and proactive

system of HACCP evolved from these efforts to understand and control food safety failures. HACCP has been widely used by industry since the late 1970s, and is now internationally recognized as the best system for ensuring food safety. It is endorsed by the Food and Agricultural Organisation (FAO), World Health Organisation (WHO) and, in the US by the National Advisory Committee on Microbiological Criteria for Foods (NACMCF).

HACCP and Food Regulation

The US Food and Drug Administration (FDA) used HACCP-based principles when setting up their low-acid food canning regulations in the 1970s. In 1995, the FDA issued regulations that made HACCP mandatory for fish and seafood products, and in 2001 they issued regulations for mandatory HACCP in juice processing and packaging plants. In addition, a voluntary HACCP program was implemented in 2001 for Grade A fluid milk and milk products under the cooperative federal/state National Conference on Interstate Milk Shipments (NCIMS) program. The FDA has also implemented pilot HACCP programs for a variety of other food processing segments as well as for retail foods. HACCP has also been implemented by the USDA. In 1998, USDA's Food Safety and Inspection Service (FSIS) mandated HACCP for the nation's meat and poultry processing plants. Currently, HACCP systems are utilized for pathogen reduction in over 6,500 raw meat and poultry plants. The US food processing industry will inevitably be faced with more mandatory HACCP programs under FDA and USDA/FSIS regulations in the future. The HACCP system has also been implemented under regulations in other countries (e.g., Europe, Canada, Australia, and New Zealand) and is a high priority program under Codex Alimentarius, the world food standards authority.

Prerequisite Programs

HACCP is not a stand-alone program and prior to its full implementation, the necessary prerequisite programs must be in place. Prerequisite programs are practices and/or conditions needed prior to and during HACCP which are an essential part of the overall food safety plan. Typical prerequisite programs include Good Manufacturing Practices (GMPs), raw

material control programs, vendor certifications, sanitary standard operating procedures (SSOPs), and recall and traceback procedures. Examples of GMPs include sanitary facility design, proper pest control procedures, and the provision and upkeep of handwashing and sanitary facilities. SSOPs can include provisions for minimizing cross-contamination in the plant, maintenance of a potable water supply, and specific practices to ensure the sanitation of the facility and individual pieces of equipment within the facility. A foundation of effective prerequisite programs is necessary for HACCP to be successfully implemented.

What Hazards Need to Be Controlled?

Foodborne hazards controlled through HACCP include physical, chemical, and microbiological agents that have the potential to cause an adverse health effect when a food containing them is consumed and that are reasonable likely to occur if not controlled. While consumers have historically been most concerned with chemical hazards such as pesticide residues and heavy metal contamination, microbiological contaminants and allergens have been the recent focus of public health officials. The HACCP system addresses and controls *all* significant hazards associated with a particular product.

Principles of HACCP

The seven principles of HACCP are:

- Principle 1: Conduct a hazard analysis. Potential hazards associated with a food are identified, along with measures to control those hazards.

- Principle 2: After evaluating all processing steps, determine the critical control points (CCPs). CCPs are points in a food's production and processing at which significant hazards can be controlled or eliminated.

- Principle 3: Establish critical limit(s) for each CCP. Each CCP must operate within specific parameters to ensure the hazard is being appropriately and effectively controlled.

• Principle 4: Set up systems to monitor each CCP. Monitoring involves defining how the CCPs will be assessed, performing the monitoring at the appropriate time intervals, determining who will perform the monitoring and finally maintaining the proper monitoring records.

• Principle 5: Establish corrective actions. When a critical limit is not met (a process deviation), proper actions must be taken. These can be both short- and long-term corrective actions. Appropriate records must be maintained.

• Principle 6: Establish verification procedures. Verification is used to confirm that the system is working properly and that procedures outlined in the HACCP plan are being followed.

• Principle 7: Record-keeping and documentation. This includes all records required in the various parts of the HACCP plan, as well as other key records such as sanitation logs, supplier agreements, and shipping documents.

Future of HACCP

Domestic and international food regulators are increasingly focused on HACCP as a mandatory requirement for food processors and food handlers. Additionally, we can expect HACCP or HACCP-type systems to be required in additional segments of the food system, including retail operations, packers, and farms. HACCP is a tool for managing food safety, and it is important to note that merely legislating HACCP does not guarantee food safety. For HACCP to be truly effective in a food handling or processing facility, the HACCP plan must be properly developed, effectively deployed, and continuously reviewed and improved.

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