Determine Critical Control Points

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**Principle 2.** Determine the Critical Control Points required to control the identified hazards.

**INTRODUCTION**

Rather than organize this chapter according to the types of hazards present in a food system—physical, chemical or biological—I have chosen to discuss Critical Control Points (CCP) according to a typical product flow from:

- production, growing or procurement of raw materials,
- ingredient receiving and handling,
- processing,
- packaging,
- distribution, and
- handling at retail, foodservice or in the home.

At each of these stages we will consider a number of CCPs for representative physical, chemical or biological hazards. Obviously, not every specific hazard and its CCP can be discussed in this chapter. However, an attempt is made to give a very comprehensive coverage of the possible CCPs.

Which type of hazard—physical, chemical, or biological—is the most commonly detected in food production? Physical hazards are the most common because of the many chances for foreign material contamination. Biological hazards, however, justifiably receive more attention because of the ability of microorganisms to multiply in food and potentially affect more people. For example, a stone or piece of glass in a package of vegetables may cause injury to a consumer, but it would affect only one individual and the injury would likely be minor. In contrast, *Salmonella* contamination in a pasteurized milk
packaging operation could affect many thousands of consumers and some of the resulting illnesses could lead to death.

Remember, a CCP is defined as: any point or procedure in a specific food system where loss of control may result in an unacceptable health risk.

The hazard analysis and risk assessment process described in the preceding chapter requires the involvement of technical experts from a variety of disciplines including microbiology, toxicology, engineering, and regulatory compliance. It is unlikely that any one person could identify all of the potential hazards in a given food production system. Therefore, the same group of experts needs to be involved in the determination of CCPs since a CCP must be established for each identified hazard.

**REPRESENTATIVE CCPs**

**Growing**

All types of hazards—physical, chemical and biological—are potentially associated with the growing of animals and plants.

Often antibiotics are used to treat diseases in animals. Only approved antibiotics can be used and often they cannot be administered within a certain period before slaughter. This CCP is necessary to protect consumers who are sensitive to specific antibiotics and to reduce chances for evolution of antibiotic resistant pathogens in the human population.

The application of pesticides to crops is another CCP. Only approved pesticides can be applied and then in the amounts specified by regulation or by the manufacturer. The types of pesticides will vary with individual crops. The timing of application before harvest is important so that residues do not persist in the consumer product. Many processors will grow crops under contract with individual farmers and closely regulate the use of pesticides.

Even the location of the growing field is a CCP. It is important to know the pesticide history of the field. Only approved irrigation water and systems should be used. For example, trench irrigation may be more appropriate than spray irrigation in some situations. Some processors require that fields not be located next to roads or former dump sites in an effort to minimize glass contamination. Fields should be carefully inspected before planting and objects such as glass bottles must be removed.

**Ingredient receiving**

Food ingredients should be shipped only in vehicles which are clean and sanitary. Nonfood chemicals, such as pesticides, cannot be permitted in the same shipment