Establishing Critical Limits for Critical Control Points

Lloyd J. Moberg

**Principle 3.** *Establish the critical limits which must be met at each identified CCP.*

**INTRODUCTION**

To achieve maximum success in food product protection, HACCP programs should be restricted to safety. HACCP Critical Control Points (CCPs) should only be used to control those points in a food manufacturing process where lack of control will likely result in the development of a potential safety hazard. They should not be used to control nonhazardous situations. Too many control points to monitor, by inclusion of nonhazardous points, will dilute the focus on safety. With manufacturing resources to monitor HACCP CCPs already limited in most cases, inclusion of nonhazardous points will result in the personnel not understanding which are the truly critical points. The end result of such a disparate program will be that nothing is being adequately monitored. There will then be no assurance that the product being released meets all the safety requirements; a potential hazard may be delivered to consumers. Nonsafety related monitoring procedures should instead be part of a standard quality assurance program.

HACCP Principles No. 1 and No. 2 (NACMCF 1990) have been introduced and discussed in previous chapters. Examples of potential hazards of a chemical, physical and biological nature have been identified and their risks assessed. Flow diagrams have been generated for the entire production process, from raw material growth through consumer use. Critical Control Points to control the identified hazards have themselves been identified and placed on the flow diagram. The next part of the HACCP process focuses attention to establishing the Critical Limits for these Critical Control Points.

The questions now become “How does one identify the Critical Limits associated with the Critical Control Points? How are the parameters for Critical Limits established? How does one determine when a safety hazard may develop?”
The purpose of this chapter is to help answer these questions. The chapter is divided into two areas: general definitions and guidelines on establishing limits; and, examples of established limits for biological, chemical and physical Critical Control Points.

LIMITS: DEFINITION & GUIDELINES

Definition

Principle No. 3. Establish the critical limits which must be met at each identified CCP (NACMCF 1990).

Description. A critical limit is defined as one or more prescribed tolerances that must be met to insure that a CCP effectively controls a microbiological, chemical or physical health hazard. Critical Limits on these CCPs represent the boundaries for safety.

Guidelines

In determining the Critical Limit for each CCP, the first question that needs to be answered is:

1. What are the critical components associated with the CCP?

   Critical components associated with a CCP are those factors critical to safety, where failure to provide sufficient control may result in a safety hazard. A Critical Control Point may have multiple factors or components which need to be controlled to assure product safety. For example, the thermal process for a canned food product has numerous factors, all of which are important to food safety (e.g., product consistency/type/viscosity, initial fill weight/temperature, etc.). Failure to control any of these variables may result in an underprocessed canned food, which would be a potential consumer health hazard. Examples of other CCPs and potential critical components are shown in Table 6-1.

   Prior to determining Critical Limits, all components or factors associated with the CCPs must first be identified; the Critical Limits can then be established for each of these components. The Critical Limits would be determined by identifying the point or level at which the component would become a potential hazard. Critical Limits are the boundaries of safety for the factors associated with the CCPs. The limit may be in various forms: a minimum holding temperature for a heated product, a maximum pH for an acidified beverage, an initial fill weight for a canned retorted product, a maximum holding temperature and time for a refrigerated, ready-to-eat product, etc.

   In one example, a canned food product would have a recommended thermal