HACCP Principles 4 & 5: Define Procedures for Monitoring and Corrective Actions

Principle 4. Define procedures for monitoring the Critical Control Points.

"Monitoring is a planned sequence of observations or measurements to assess whether a CCP is under control and to produce an accurate record." (National Advisory Committee on Microbiological Criteria for Foods, 1992)

Approach: continuous or discontinuous (attribute sampling)

- Continuous monitoring, with continuous recording, is preferred.
- If monitoring is discontinuous, intervals must be specified.
- Try to avoid sending samples to a laboratory, and destructive testing in general.

Types of monitoring

- Observation: color, odor, appearance ("organoleptic")
- Chemical: often discontinuous, unless a specific electrode is available (Cl in water, sodium nitrite in pasteurized canned meat, etc.)
- Physical: usually continuous (time-temperature, pH, water activity-moisture level most often via conductivity); may include dimensional checks, as in can closures
- Microbiological: none of these yields "real time" results; better used in validation tests or in supplier specifications

Instruments for monitoring

- Striving for continuous, "real-time" measurement
- Instrument must be sufficiently accurate to detect variations from the Critical Limit.
- Instrument must be calibrated regularly, to ensure that measurements are accurate.
- Ideally, the measurements should be continuously recorded in a visible format, with some kind of alarm or red light to call attention promptly if a Critical Limit is violated.

Monitoring raw materials

- May visit supplier, set specifications (certificate of analysis), or audit the supplier's HACCP plan
- Validation may be done by in-house or 3rd-party testing

Monitoring cleaning and disinfection: ideally part of SSOP; if a CCP, may measure temperatures, concentrations of cleaners and sanitizers; validation of surface cleanliness may be done rapidly with ATP-bioluminescence kit.

Responsibility for monitoring: a specific employee should be responsible for each monitoring task; paper records, signed or initialed by the monitor (+ date, time), are useful, probably required.

Principle 5. Define the corrective actions to be taken whenever a deviation is identified by the monitoring procedures.

The reason for selecting rapid monitoring methods is to give prompt notice of out-of-control situations (critical limit violated or exceeded).

In many instances (but not all), causes of out-of-control situations can be anticipated and remedial actions specified in advance. Remedial actions include correcting the out-of-control process and providing for the suspect product.

In any case, the deviation must be recorded and means to correct it devised and applied — remember that the selection of Critical Control Points was intended to relate directly to the safety of the product.

The remedial action taken must be recorded.

Product that has been inadequately or improperly processed may be able to be reprocessed, or may have to be destroyed. Questions to answer:

- Does review of the data show a serious risk that the product is unsafe?
- Are tests available to verify the safety of the product?
- Can this product be diverted to use in another product whereby its safety is assured?
- Can the product be reprocessed or reworked to yield a high level of confidence of its safety?
- If the product can't be reused, what to do with it?
  - Send to animal feed (inedible, unfit for human consumption)
  - Bury in land fill
  - Incinerate the product
- What records and HACCP forms are required?

Recalls

A recall is the retrieval of product that has already left the production or processing facility and has entered distribution. These are initiated by food companies, often on the "advice" of a regulatory agency.

Recalls should not be necessary if HACCP monitoring has been done properly. In some degree, the absence of recalls is as indicative as the absence of consumer illnesses that a HACCP plan is successful. All the same, most food processors have recall plans in place in anticipation of a "worst-case" event.

Classifications of recalls, based on perceived level of risk:

Class I: Used in situations where there is a reasonable probability that use of or exposure to a product will cause serious adverse health consequences or death.

Class II: For cases in which use of or exposure to a product may cause temporary or medically reversible adverse health consequences or where the probability of serious adverse health consequences is remote.

Class III: Employed when use of or exposure to the product is not likely to cause adverse health consequences.

A recall attempts to move product through the distribution system in a direction opposite to that for which the system is designed, and to record the acquisition and disposition of every unit of product when (often) the system is in a completely chaotic state. Every food company of any size should have a recall plan in place that, at a minimum, lists the people (or their positions) who will be mobilized in the event of a recall. Recall insurance is now being offered to food processors — the target clientele is the "medium-sized" operations.

The situation is very different when the product to be recalled is still in a distributor's warehouse somewhere, rather than on retail shelves where it may already have passed into consumers' hands. Clearly, no company wants the publicity that goes with a publicly announced (e.g., via newspapers and television) recall; but this is what is required if the product has already gone to retail and the recall is Class I.

Although a great deal more could be said about the design and execution of recalls, the above should suffice to show why properly operated HACCP is important as a safeguard against this kind of disaster. To the extent that a HACCP plan's only CCP is of the type that should *reduce* the hazard to acceptable limits, recalls are a distinct possibility.

Reading:

Delazari, I., Riemann, H.P., and Hajmeer, M.N. 2006. Preharvest and animal production food safety. Ch. 19. In Foodborne infections and intoxications. 3rd Ed. Riemann, H. and Cliver, D.O. (Eds.) Academic Press, New York, NY. pp. 833-877.

Stevenson, K. E., and Bernard, D.T. (eds.). 1999. HACCP: A Systematic Approach to Food Safety. Food Processors Institute, Washington, D.C.