

Section 3-6: Principle 4: Determine Monitoring Procedures

Principle 4: Determine Monitoring Procedures

Section Overview

The fourth principle of HACCP is to establish CCP monitoring requirements and procedures for using the results of monitoring to adjust the process and maintain control. Properly designed and implemented CCP monitoring procedures are essential to demonstrating that the process is under control and establishes records to document compliance with the HACCP plan.

The following topics will be discussed in this section:

- Definitions and preliminary considerations
- Types of monitoring
- Time required to obtain results
- Monitoring procedures
- Staff responsible for monitoring
- Monitoring records

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Learning Objectives

At the conclusion of this section, the learner will be able to:

- define “Monitoring” and list the three objectives of an effective monitoring procedure for a HACCP plan,
- describe the different types of monitoring procedures and list advantages and disadvantages of each,
- describe the key elements of a well-designed monitoring procedure,
- discuss considerations for persons who will be responsible for monitoring activities in a food facility, and
- describe how to document monitoring procedures in a HACCP plan.

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Definitions and Preliminary Considerations

Monitoring is defined as “The act of conducting a planned sequence of observations or measurements of control parameters to assess whether a CCP is under control.”

In a HACCP system, monitoring procedures must be designed to accomplish the following objectives.

1. Track the operation of the process and enable the identification of trends toward a loss of process control that would necessitate process adjustments.
2. Identify when there is a loss of process control and a deviation occurs at a CCP.
3. Provide written documentation of the process control system.



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Types of Monitoring

There are many different types of monitoring procedures. Monitoring can be based on:

1. quantitative measurements (e.g. such as measurement of temperature, time, pH, water activity, etc.), or
2. observation by a trained individual (e.g. manual sorting)

Monitoring procedures also can either be continuous or discontinuous. Discontinuous monitoring is also commonly referred to as batch or attribute sampling.

Each of these approaches will be discussed in turn.



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Continuous Monitoring

Continuous monitoring using automated equipment or sensors, where feasible, is preferable to discontinuous methods. This is due to the fact that continuous monitoring provides assurance that all products produced have met the criteria for acceptability (i.e. have met the designated critical limit). Continuous monitoring also allows for the effective use of operating limits (as described previously) which enable the operator to apply adjustments if monitoring indicates a trend toward loss of process control.

Continuous monitoring is commonly used for processes that are readily amenable to automated measurement. This includes measurement of parameters such as temperature, time, acidity, etc.

It is critical to recognize that continuous monitoring systems require routine calibration and supervision by trained personnel to verify that these systems are functioning as intended.

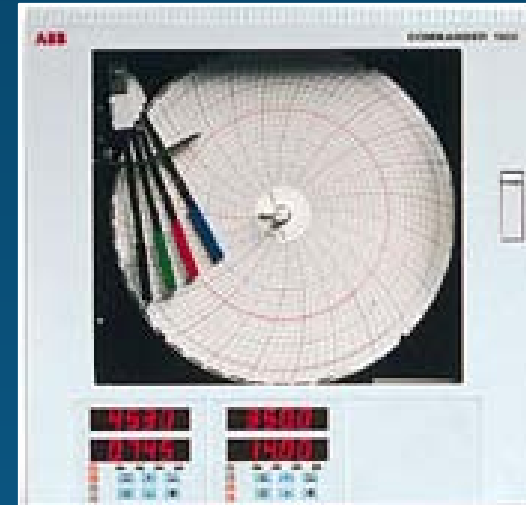


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Discontinuous Monitoring

Discontinuous monitoring also is perfectly acceptable in HACCP systems, and in many cases is the only monitoring approach possible. However, when discontinuous monitoring is used the amount and frequency of monitoring should be sufficient to provide an acceptable level of assurance that the CCP is under control. The higher the frequency of monitoring (i.e. the less time between each instance of monitoring), the less product will be affected when there is a loss of control at the CCP.

When discontinuous monitoring is used, a sampling plan must be devised which will provide reasonable assurance that the process is under control and the designated critical limits have been met. The International Commission on Microbiological Specifications for Foods (ICMSF) has published extensively on statistical sampling methodologies for the food industry and has several useful publications on its web site:

<http://www.icmsf.iit.edu/main/home.html>



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Discontinuous Monitoring

Discontinuous inspection, or attribute sampling, is commonly used to:

- test ingredients (raw materials),
- troubleshoot an out-of-control CCP, and
- spot check a system under continuous monitoring to ensure monitoring procedures are operating as designed.

When statistical sampling of product lots for assessment of defects is used, the probability of detecting a non-conforming sample is related to the defect level of the sampled lot. Therefore, the assurance that all lots conform to the designated specifications is limited compared to continuous inspection methods.



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Time Required to Obtain Results

Another consideration in designing a monitoring system is the time required to achieve a result from the monitoring procedure. In general, monitoring procedures to confirm compliance with a critical limit should be rapid, as the monitoring activity is taking place on dynamic processing lines. Furthermore, many food products are highly perishable and may not allow time for complex monitoring activities. Consequently, there often is limited time for analytical testing.

For this reason physical and chemical measurements or visual observations, which may be done rapidly, are often preferred to microbiological testing or other techniques which require more time. Note that these considerations are becoming less limiting as the technologies for rapid assessment of microbial contamination or other hazards is improving. Nevertheless, testing time is a factor the HACCP team should consider when developing monitoring procedures.



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Monitoring Procedures

A well-designed monitoring procedure will address each of the following points.

1. **Who** is responsible for the monitoring activity (usually by position or job title, not name of an individual)
2. **What** is to be monitored
3. **How** it is to be monitored
4. **When** monitoring will take place, and how often (frequency)

A monitoring procedure that meets each of these requirements and is appropriately implemented will enable the establishment to document that critical limits in the process are being met.



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Staff Responsible for Monitoring

Assignment of the responsibility for monitoring is an important consideration. Personnel who monitor CCPs are often associated with production (e.g., line supervisors, selected line workers and maintenance personnel) and, as required, quality control personnel. The staff responsible for monitoring have clearly defined responsibilities. They must:

- be adequately trained to perform the monitoring procedures and to prepare the monitoring records,
- fully understand the purpose and importance of monitoring,
- be unbiased in monitoring and reporting,
- follow clearly delineated procedures, and
- be responsible for accurately documenting the monitoring activities, and sign or initial the monitoring records.

In addition, employees should be trained on procedures to follow when there is a trend towards loss of control so that adjustments can be made in a timely manner to assure that a process deviation does not occur. The person responsible for monitoring must also immediately report a process or product that does not meet critical limits.

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Monitoring Records

Monitoring procedures performed during the operation should result in written documentation which will serve as an accurate record of the operating conditions.

These records must include the:

- actual monitoring information,
- date and time the activity took place, and
- the signature or initials of person conducting the monitoring procedure.

Accurate monitoring procedures and associated records allow the operator to make decisions on the acceptability of the lot. To complete the monitoring process, data derived from monitoring should be reviewed and evaluated by a designated person (or persons) with knowledge and authority to carry out corrective actions when indicated.



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