

HACCP Equipment Requirements for Cashew Processors

Hazard Analysis Critical Control Point (HACCP) is an effective management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement and handling, to processing, distribution and consumption of the finished product. HACCP is an effective and rational means of assuring food safety with the primary goal of preventing problems from occurring through the implementation of a systematic approach to the identification, evaluation, and control of food safety hazards based on the following seven principles: (1) Hazard Analysis; (2) Critical Control Points; (3) Critical Limits; (4) Monitoring; (5) Corrective Actions; (6) Verification; and (7) Record Keeping and Documentation.

The implementation of a HACCP system and its corresponding Critical Control Points (CCP) at a facility that processes cashew kernels requires the acquisition and operation of specific equipment in order to apply the control measures required to control the identified hazards during the processing of the kernels.

A facility that processes cashew kernels that plans to implement a HACCP system should acquire and properly operate the following equipment in order to comply with the HACCP standards:

- **A Pasteurization Machine** to control the biological hazards of the enteric pathogens Salmonella, Escherichia coli, and Staphylococcus aureus. The pasteurization machine must be capable of producing a thermal process equivalent to 80° C kernel output temperature for 2 minutes and of accurately measuring the output kernel temperature of the kernels continuously for monitoring and verification purposes.
- **A Metal Detection Machine** to control the physical hazard of metal fragments. The metal detection machine must be capable of producing ferrous detection of 1 mm and larger, nonferrous detection of 1.5 mm and larger, and stainless steel detection of 2 mm and larger continuously for monitoring and verification purposes.

Determination Process for the HACCP Equipment Requirements for Cashew Processing

A facility must conduct the following principles of HACCP in order to determine the specific equipment that will be required in order to properly implement their HACCP food safety system:

- (1) Hazard analysis to identify the food safety hazards reasonably likely to cause injury or illness if not effectively controlled and identify the preventive measures the facility can apply to control those hazards.
- (2) Determination of Critical Control Points at which control measures can be applied to prevent or eliminate the food safety hazards or reduce them to an acceptable level.
- (3) Establishment of the Critical Limits as maximum or minimum values to which the biological, chemical or physical parameters must be controlled at the CCPs to prevent, eliminate or reduce to an acceptable level the occurrence of the identified food safety hazards.

Hazard Analysis - Principle 1

If a HACCP team were to conduct a hazard analysis for the processing of cashew kernels, then the following two hazards would be identified:

- Enteric pathogens Salmonella, Escherichia coli, and Staphylococcus aureus resulting from human handling during the processing of the cashew kernels; and
- Metal fragments resulting from metal blades used during the processing of the cashew kernels.

After the list of potential hazards is developed, an evaluation of the hazards is conducted. It has been determined that enteric pathogens Salmonella, Escherichia coli, and Staphylococcus aureus have been associated with outbreaks of foodborne illness from cashew kernels. Therefore, a CCP must be created for these enteric pathogens to prevent or eliminate the food safety hazards.

It has also been determined that metal fragments are dangerous if consumed and have been associated with foodborne injuries from cashew kernels. Consequently, a CCP must be created for metal fragments to prevent or eliminate this food safety hazard.

Determine Critical Control Points (CCPs) - Principle 2

Upon completion of the hazard analysis, CCPs and their corresponding control measures must be determined for the hazards that have been identified as reasonably likely to cause injury or illness if not effectively controlled. If a HACCP team were to determine the CCPs and control measures for the hazards that have been identified for the processing of cashew kernels, then the following two CCP's would be identified:

- Pasteurization is a control measure which can be used to eliminate the hazards of enteric pathogens such as Salmonella, Escherichia coli, and Staphylococcus aureus.
- Metal Detection is a control measure which can be used to eliminate the hazard of metal fragments.

Establish Critical Limits - Principle 3

Once the CCPs have been determined, Critical Limits must be established for each CCP.

If a HACCP team were to determine the critical limits for the **Pasteurization CCP**, it would be concluded that a thermal process equivalent to 80° C kernel output temperature for 2 minutes would be necessary to assure the safety of the cashew kernels. Therefore, the critical limits for the CCP of pasteurization and the proper operation of the pasteurization machine are established as 80° C kernel output temperature for 2 minutes to achieve a 5-log kill for pathogens Salmonella, E.coli and Staphylococcus aureus.

If a HACCP team were to determine the critical limits for the **Metal Detection CCP**, it would be concluded that ferrous detection of 1 mm and larger, nonferrous detection of 1.5 mm and larger, and stainless steel detection of 2 mm and larger would be necessary to assure the safety of the cashew kernels. Therefore, the critical limits for the CCP of metal detection and the proper operation of the metal detection machine are established as ferrous detection of 1 mm and larger, nonferrous detection of 1.5 mm and larger, and stainless steel detection of 2 mm and larger to detect and eliminate dangerous metal fragments.