

# Department of Food Science

## *Food Safety*

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### Considerations for Developing a HACCP Plan for Acidified Foods

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Hazard Analysis and Critical Control Point (HACCP) techniques are becoming the accepted norm for controlling the safety of foods. Each plant should have its own written plan to incorporate HACCP principles in the operation.

This material is assembled to provide some generic guidance in developing a HACCP plan for use in an acidified foods operation.

In order for HACCP to effectively prevent food safety hazards, processing plants must be operating in accordance to Good Manufacturing Practices and under sanitary conditions. A written sanitation plan is recommended.

#### **Hazards Analysis**

A hazard analysis of a typical acidified foods operation reveals several potential hazards:

1. Raw materials must be inspected for wholesomeness and be free from decay and unsound tissues which might harbor harmful microorganisms.
2. Raw materials must be purchased from reputable suppliers and be grown

on fields using safe agronomic practices. Any fertilizers from human or animal waste should be properly composted and applied. Pesticides should be approved and applied in accordance with label procedures.

3. Raw produce shall be washed in potable water to remove surface residues and foreign materials.
4. Other ingredients shall be purchased from reputable suppliers, be produced in inspected processing establishments and be of food grade.
5. All ingredients must be protected from contamination or spoilage using refrigeration or other appropriate means.
6. Formulated ingredients which are not shelf stable shall be held under refrigerated conditions to prevent the growth of harmful microorganisms.
7. Workers with communicable diseases and those with skin infections shall be excluded from handling foods or utensils because of the danger of spreading harmful microorganisms.

#### **Control Point**

A critical control point is a step in the process which must be controlled to assure food safety. A finished equilibrium pH of 4.6 or

below to prevent botulism is always a critical control point for acidified foods. Other points such as those considered below may also be critical, depending on the product and process.

- A terminal heat treatment of 180°F will reduce the population of harmful and spoilage microorganisms in the product.
- Materials such as peppers, tomatoes and cucumbers may need to be sliced, chopped or pierced to provide intimate contact with the brine.
- Container closures shall be intact and free from food product on sealing surfaces in order to provide proper hermetic seal.
- The critical control point for acidified foods is a finished equilibrium pH of 4.6 reached within 24 hours.

## Critical Limits/Monitoring

Critical control points are measurable and must have established critical limits. These critical limits should be monitored as in the example below.

**One critical control point for all acidified foods is a finished equilibrium pH of 4.6 or below.**

This determination must be made within 24 hours by the following procedure:

- Drain and rinse the solid material. Chop peppers and such materials as necessary to allow brine to drain.
- Place solids in a blender and blend thoroughly.
- Check the pH with a properly calibrated pH meter calibrated with pH 4 and pH 7 buffers.
- If the pH is below 4.0, record the pH for the lot.
- If the pH is between 4.0 and 4.5, repeat the procedure.
- If the pH is above 4.5, follow the corrective actions and record as a process deviation.
- Record all observations.

## Corrective Actions

When the monitored critical control point indicates loss of control, (e.g. critical limits not met) predetermined corrective actions must be taken. A corrective actions for pH readings outside of the critical limits is indicated below.

If the pH exceeds 4.5 and the product has been held at room temperature more than four hours, discard the contents of the jar and the lids. Jars may be thoroughly washed and recovered. Record the disposition of the product in the process deviation log.

If the pH exceeds 4.5 and the product has been held at room temperature less than four hours, drain the solids, and discard the brine and closures. Reprocess the product with new brine, heat and seal. Record the reprocessing in the process deviation log. Retest for pH within 24 hours as noted above.

## Records

Critical control point measurements such as process conditions, and pH determinations shall be documented for each lot. Coded lots of finished products shall be traceable to all ingredient, quality, process and container records.

All process deviations must be recorded in a separate log together with information on the disposition of affected lots.

## Verification

Logs of pH determinations shall be reviewed and signed by the certified supervisor on a daily basis, within 24 hours of production. A control chart of pH determinations for each product shall be maintained to visually spot trends in pH readings.

To evaluate the effectiveness of the program, records of all consumer complaints should be maintained. Any deviations from the scheduled process shall be discussed with the process authority.