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## Example HACCP Plan for Reduced Oxygen Packaging of Raw Vegetables, Raw Meat, or Raw Poultry

Using reduced oxygen packaging (ROP) can create serious food safety hazards. The reduced oxygen in these packages can allow the growth of bacteria called *Clostridium botulinum*, which produces a deadly toxin. Some foods (raw meat, raw poultry, and raw vegetables) can be safely packaged in ROP under a HACCP plan with temperature and labeling controls, and careful attention to sanitation. Other foods and processes may require additional controls that will require a variance and a process study. If you have a question whether a food is appropriate for ROP, consult your inspector or a food process authority (Jason Bolton, Ph.D. <http://foodsciencehumannutrition.umaine.edu/faculty/jason-bolton/>).

A HACCP plan is required by the food code. The plan will help you to control the hazard and document the controls for the regulatory authorities. Attached is an example of a plan for raw vegetables, raw meat or raw poultry that is ROP and stored in a refrigerator/cooler. The code requires that the plan contain:

- 1. A list of the foods that are covered by the plan.**
  - This list should be posted in the ROP processing area.
- 2. A flow diagram that breaks down the procedure step by step.**
- 3. A training program.**
  - The training program section of the attached example plan lists minimal requirements for training.
- 4. General operating procedures.**
  - These serve as a reminder of the procedures needed to use ROP safely and should be posted in the ROP processing area.
- 5. Standard operating procedures (SOPs) at Critical Control Point (CCP's).**
  - The SOPs at CCPs section describes how you will be monitoring and documenting the conditions necessary to use ROP safely.
  - Strict temperature control is essential to using this process safely. Best practices would include; pre-chilling or freezing the product before packaging, submerging the products in an ice bath for rapid chilling after packaging; and moving the product to cold storage immediately after packaging. This may need to be considered a CCP unless you have a study to document that temperature abuse is not reasonably likely to occur.
  - You will need to label the ROP packages with a warning statement (see example plan) and a use by date.
  - You will need to install a continuous monitoring thermometer ie. Datalogger (about \$60) in any cold storage areas used to hold ROP foods. You will need to download and review the data from this device daily and keep the data on file for review by regulatory authorities. You will also need to check the device in person twice a day and record the reading.
  - A manager/supervisor will need to review the records at least weekly to make sure they are being kept properly and no critical limits were exceeded. You will need to periodically verify that the thermometer you are using is accurate and calibrated when required.
  - If you find that product has been stored above 41 F, you will need to hold the product for evaluation by a process authority before serving or selling the product.
  - You will want to set operating limits. The operating limits will be stricter than your critical limits. This will enable you to adjust the process before you exceed the critical limit.

**The following foods are covered by this plan:**

Raw vegetables

Raw meats

Raw poultry

Storage – Refrigerated

**Flow diagram - \* indicates CCP**

Receiving	Product is checked for quality and temperature abuse upon receipt from the supplier.
Cooler storage	Product is moved immediately to refrigerated storage
Vacuum packaging	Product is vacuum packaged using a MVS-26 Tabletop Chamber unit and food grade packaging.
Labeling	Product is labeled “Maintain at 41 F or below” and “Use by (14 days from date of pack)”
Chilling	Product is submerged in an ice bath for rapid chilling.
<b>Refrigerated storage*</b>	<b>Product is moved to a refrigerated storage unit and maintained at 41 F or lower until served or discarded after 14 days.</b>
Cook and serve	Product is cooked and served within 14 days of packaging or discarded.

**Training Program**

Employees whose job duties include vacuum packaging will be trained in:

- The foods that are allowed to be vacuum packaged under this plan
- The food safety risks involved in this process
- The proper use of the equipment
- Labeling requirements for vacuum packed foods
- Handling procedures and storage requirements for vacuum packed foods
- The proper cleaning procedures for the equipment
- The critical limits and operating limits at each of the critical control points

Training records will be kept on file with this plan.

## **General Standard Operating Procedures**

Only trained personnel will be allowed to operate the vacuum packaging equipment.

Only the foods covered under this plan will be vacuum packaged.

Only food grade packaging will be used.

Equipment will be cleaned, rinsed, and sanitized after each use, or every 4 hours if the equipment is used for longer than 4 hours.

Product is labeled with a warning statement "Maintain at 41 F or below" and "Use by (14 days from date of packaging)."

Vacuum packaged products will be submerged in an ice bath immediately after packaging and then moved directly to refrigerated storage.

An operating limit of 38 F will be used and the cold storage unit will be adjusted or serviced if necessary any time the temperature exceeds 38 F.

Vacuum packaging will only take place in the designated area for these operations and be separated from other operations by either time or location.

**Standard operating procedures (SOPs) at Critical Control Points (CCPs)**

(1) Critical Control Point	(2) Significant Hazards	(3) Critical Limits for each Preventive Measure	Monitoring				(8) Corrective Actions	(9) Verification	(10) Records
			(4) What	(5) How	(6) Frequency	(7) Who			
Temperature check at refrigerated storage	Pathogen growth due to time-temperature abuse.	Product will be stored at 41 F or lower.	Storage temperature	Calibrated continuous monitoring thermometer with visual check of readout and download and review of unit continuous data	Continuous monitoring with visual check twice a day of readout and daily review of data	Designated employee	If the temperature of the refrigerated storage unit exceeds 41 F., the unit data will be sent to the process control authority to determine if the product is still safe. Product deemed unsafe will be denatured and discarded. The cold storage unit will be repaired or adjusted.	The PIC will review the monitoring log weekly to verify that it is being maintained and no critical limits have been exceeded. The recording thermometer will be calibrated weekly and the results recorded on the calibration log.	Refrigerated Storage Log  Calibration log
Labeling check at refrigerated storage	Lack of labeling or expired use by date leading to pathogen growth	Products are labeled with a warning statement and use by date of 14 days from the date of pack	Labeling	Finished product labels will be checked visually	Once per day	Designated employee	Any unlabeled or out of date product will be discarded.	The PIC will review the monitoring log weekly to verify that it is being maintained and no critical limits have been exceeded.	Refrigerated Storage Log

**Refrigerated Storage Log**

**Critical limits: Temperature must be 41 F or lower**

**Operating Limit = 38 F, notify supervisor if cooler is above 38 F.**

**All ROP products must be labeled with a warning statement “Keep at 41 F or lower” and have a use by date of 14 days from the date of packaging.**

**All ROP products that are unlabeled or whose use by date is expired must be discarded.**

Date	Time 1	Temp 1	Time 2	Temp 2	Data review? Yes/No	Any temps above 41 F? Yes/No	Proper labeling? Yes/no	Out of date product? Yes/no	Corrective action taken	Initials
Reviewed by:					Date					

### Calibration log

#### Calibration instructions

Step 1: Fill a large glass to the very top with ice (crushed ice is preferred but not required).

Step 2: Slowly add very cold water until the water reaches about one half inch (1 centimeter) below the top of the ice.

*Note: If the ice floats up off the very bottom of the glass at all, the ice bath will likely be warmer than 32.0°F (0.0°C). Pour off any excess water.*

Step 3: Gently stir the ice mixture and let it sit for a minute or two.

Step 4: Insert thermometer probe and record results below.

**If the thermometer does not read 32 F then it needs to be recalibrated or replaced. All products produced since the last calibration will need to be evaluated for safety.**

Date	Thermometer reading in ice bath	Corrective action taken if needed	Initials	Reviewer/Date of review