Reduced Oxygen Packaging
Just the Basics

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What is Reduced Oxygen Packaging (ROP) and What are the Food Safety Concerns and Controls? (FDA)

- [http://www.fda.gov/food/foodsafety/retailfoodprotection/industryandregulatoryassistanceandtrainingresources/ucm095463.htm](http://www.fda.gov/food/foodsafety/retailfoodprotection/industryandregulatoryassistanceandtrainingresources/ucm095463.htm)

Vacuum Packaging Training Module (MN Depts. of Agriculture and Health, Hennepin County EH, University MN Extension Service)

What is ROP?

Reduced Oxygen Packaging is the reduction of the oxygen in a package by mechanically evacuating the oxygen, displacing the oxygen with another gas or combination of gases, or otherwise controlling oxygen content to a level below the normal level in the surrounding atmosphere (21 percent oxygen).
What is ROP?

Reduced Oxygen Packaging (ROP) includes methods that may be referred to as:

- modified atmosphere (MAP),
- controlled atmosphere (CAP),
- cook chill,
- vacuum packaging and,
- sous vide
Why ROP in Food Service?

- Prevents moisture loss
- Enhances foods own flavor
- Keeps food products looking fresher
- Same packaging for storage and reheating
- Cost savings by purchasing larger quantities
- Extends shelf life
- Portion control problem eliminated
- Provides more consistent quality
Vacuum Packaging
Hot Bagging is ROP

Cook-Chill Packaging:

1. Cooked food is hot-filled into impermeable bags,
2. air is expelled from bags,
3. bags are sealed or crimped closed,
4. bagged food is rapidly chilled, and
5. food is refrigerated at temperatures that inhibit the growth of pathogens.
Hot Bagging
Sous Vide is ROP

Sous vide packaging:

1. Raw or partially cooked food is placed in a hermetically sealed, impermeable bag,
2. cooked in the bag,
3. rapidly chilled, and
4. refrigerated at temperatures that inhibit the growth of pathogens.
Rapid Cooling after Hot Bagging
Mr. Coffee Sous Vide
Hazards of ROP

- *Clostridium botulinum*
- *Listeria monocytogenes*
Hazards of ROP

- Potential for temperature abuse at retail and in the home is great.
- Cooking and fermentation destroy most vegetative cells but spore formers survive.
- Live competing organisms are reduced ... however, spoilage organisms grow faster than pathogens, and out-compete for nutrients.
Primary Controls

- Temperature/refrigeration
- Types of Food Packaged
- Shelf Life
- Sanitation
Temperature

- Keep cold at 41°F or less
- Minimize time out of refrigeration during processing
Types of Food Packaged

Retail Food Code regulations limit the types of food that can be vacuum packaged to:

- Raw meat or poultry (beef, pork, chicken)
- Hard cheese (colby, cheddar, swiss)
- Cured meats (sausage, ham, smoked turkey)
- Food with a low pH (below 4.6) or low water activity level (below .91)
- Fish **ONLY** if frozen before, during and after packaging
MDA ROP Products List

Food Products That Can/Cannot Be Reduced Oxygen Packaged (ROP)

- ROP Approved Products List
- ROP NOT Approved Products List
- Use of Gases in MAP and CAP

Shelf Life

- Limit the shelf life to 14 days from day of packaging
- Increase in shelf life increases the risk of *Listeria* growth
Finding ROP in Food Establishments

- Ask during inspections/menu review
- Look for vacuum packaged food
- Look for machines
- If unapproved ROP, *stop it!*
Packaging for ROP

- The proper bag is important and is determined by the process and type of food.
- Baggies and Ziplocs are not approved for ROP!
Equipment Used for ROP

Food and beverage equipment shall meet the applicable standards for one of the following:

- National Sanitation Foundation (NSF).
- Edison Testing Laboratories (ETL) to NSF Standards.
- Underwriters Laboratory (UL) to NSF standards.
- Canadian Standards Association (CSA) to NSF Standards.
Meeting Equipment Codes
The Primary ROP Barrier is **Refrigeration**

- All potentially hazardous food requires refrigeration
- Only heat sterilization and irradiation reliably destroy all pathogenic microorganisms in food.
- Other inhibitory factors (hurdles) used in combination with refrigeration can be equally effective at preventing spoilage and growth of foodborne illness pathogens.
Food Establishment Controls

- Cook-chill and sous vide products must remain under control of the food establishment.

- This means:
  - used on the premises, or
  - in satellite operations owned solely by the operator.
HACCP

Hazard Analysis Critical Control Points

1. Hazard Analysis
2. Critical Control Points
3. Critical Limits
4. Monitoring
5. Corrective Actions
6. Recordkeeping
7. Verification
HACCP

- Key Points for a ROP HACCP plan:
- Cold hold at 41°F or less
- Frequency of monitoring temps
- ROP food that has been temperature abused must be discarded
- Maintain records – temperature logs
- Calibrate thermometers
- Written SSOPs
HACCP

- Monitoring: Temperature monitoring
- Corrective actions: Appropriate for safety
- Verification: If unable to verify, must discard
- Record keeping: For cooking, cooling and refrigeration
SSOPs: Written Procedures

- Detailed procedures for cleaning and sanitizing
- Checklist of equipment to be cleaned and the cleaning frequency
- Steps for equipment tear-down and reassembly
- Procedures and schedule for cleaning non-food contact surfaces and facilities
- Instructions for use of sanitation chemicals
More SSOPs

- Employee practices
- Steps for preparing and storing foods
  - Monitoring temperatures
  - Preventing cross contamination
- Pest Control
- Facility and Grounds Maintenance
Summary

- Hazards with ROP products
  - *Clostridium botulinum*
  - *Listeria monocytogenes*

- Controls
  - Temperature of 41° F or less
  - Limiting types of food packaged
  - Shelf life maximum of 14 days
  - Sanitation

- HACCP and SSOP’s
FDA Food Code 2009: Annex 6 - Food Processing Criteria

1. Introduction

From its inception, the retail segment of the food industry has prepared foods in consumer-sized portions using commercially available equipment for cutting, grilling, slicing, cooking, and refrigeration, and applying heat and spices readily available to consumers at their local grocery. Over the past score of years, retail segment operators have expanded into food manufacturing/processing type operations, often using sophisticated new technologies and equipment that are sometimes microprocessor-controlled. Many now desire to alter the atmospheres within food packages, or apply federally regulated chemical additives as a method of food preservation. Food processing operations now being conducted or proposed include cold-smoke, vacuum packaging, sous vide, smoking and curing, freezing, processing and bottling alcoholic beverages, carbonated beverages, or drinking water, and custom processing of animals.

The Food Code specifies that a HACCP plan acceptable to the regulatory authority be the basis for approving food manufacturing/processing operations at retail. The HACCP plans are to be provided and accepted in two ways as follows:

(A) Reduced Oxygen Packaging

Section 3-502.12 of the Food Code provides the criteria that are to be met in the HACCP plans of those operators who are conducting reduced oxygen packaging (ROP) operations. Unless prior approval of the HACCP plan is required by the regulatory authority, the HACCP plan covering this operation along with the related records documenting monitoring and corrective actions need only be available and acceptable to the regulatory authority at the time of inspection.

(B) Other Food Manufacturing/Processing Operations

Except for ROP as discussed in (A) above, the Food Code specifies under 3-502.11, 9-103.10, 9-103.11, and 9-201.12 that the food establishment operator must obtain a variance from the regulatory authority for all food manufacturing/processing operations based on the prior approval of a HACCP plan.

The purpose of this Annex is to provide processing criteria for different types of food manufacturing/processing operations for use by those preparing and reviewing HACCP plans and proposals. Criteria for additional processes will be provided as they are developed, reviewed, and accepted.

2. Reduced Oxygen Packaging

(A) Introduction
Training in September 2012

“Addressing Hazards and Limitations to Reduced Oxygen Packaging Foods in Retail and Foodservice Settings”

- Instructor: Dr. Brian Nimmer, Utah State University
- 1 ½ day training in St. Paul
- More information to be provided
Thank You

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