Farm to School Food Safety Webinar Series

March 6, 2-3:30pm - Reduced Oxygen Packaging

April 17, 2-3:30pm - Local Animal Proteins

May 1, 2-3:30pm - Wild Foods & More
Introductions

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Agenda

- What is reduced oxygen packaging (ROP)?
- Food safety considerations in ROP.
- Minnesota Food Code requirements.
- HACCP plan overview.
- Resources.
- Questions.
Learning objectives

- Understand what reduced oxygen packaging (ROP) methods can be safely used in a foodservice operation.

- Apply this information to planning meetings and conversations in your department or school district.

- Know what resources are available and who to contact for assistance in planning for ROP in your foodservice operation.
Poll

Are you familiar with reduced oxygen packaging?

- Yes, I am a ROP pro in the kitchen.

- Yes, it rings a bell but I have never used it.

- No, ROP what?
What is reduced oxygen packaging (ROP)?

Process of placing food into a package, removing all or the majority of oxygen from inside the package, and hermetically (airtight) sealing the package.

Why?

Extend the quality and shelf life of the food.
Types of ROP

Vacuum packaging

- Food placed into appropriate packaging.
- Package placed into chamber.
- Air is removed from inside the package.
- Package is hermetically sealed.

The University of Minnesota Extension, nor the instructor of this webinar, endorse these specific brands. These are only included here as examples of this type of product.
Types of ROP

Cook-chill

- Food is thoroughly cooked to minimum internal temperature.
- Appropriate packaging is filled with the cooked food at a temperature of 135°F or higher.
- Steam forces air out of the package.
- Package is hermetically sealed.
- Food is rapidly cooled.
Types of ROP

Sous vide

- Food is placed into appropriate packaging, air is removed, and hermetically sealed.
- Packaged food placed in water bath to be cooked.
- “Finished” on a hot cooking surface or rapidly cooled.

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FYI - other types of ROP

**Modified atmosphere packaging (MAP)**
- Oxygen is reduced or removed by adding nitrogen and/or carbon dioxide
- Packaging is permeable
- Atmosphere inside package changes with time

**Controlled atmosphere packaging (CAP)**
- Oxygen is reduced or removed by adding other gases
- Package is impermeable
- Use oxygen scavenging products to capture what is produced
# Equipment

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<th>Vacuum packaging</th>
<th>Cook-chill</th>
<th>Sous vide</th>
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<td>Appropriate bags</td>
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<td>chamber/sealer</td>
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<td>Rapid cooling equipment</td>
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</table>
Equipment

- NSF
- ETL
- Intertek
- UL Listed
Equipment - Hutchinson School District

Henkelman POLAR 80
- 15-40 seconds per cycle
- Sealer bar
- Stops vacuum process once liquid detected
- Programmable settings
Equipment - grant opportunities

- Farm to School and Early Care Equipment Grant
- NSLP Equipment Grant (administered by the MDE)
- Statewide Health Improvement Partnership (SHIP) Funds
Benefits of ROP
**Benefits - Hutchinson School District**

- Provide fresh veggies and meats all year round.

- Prepare and store homemade sauces, soups and gravies that can be made during slow periods and served all year round.

- Improve shelf life.

- Long term financial savings.
Harmful microorganisms
Factors that influence growth
Bacteria need a food source to get energy to grow and multiply.
Proteins and carbohydrates (sugars, starches).
**pH**: measurement of acidity of a food

Acidity

- **least acidic**
- **neutral**
- **most acidic**
**Water activity ($a_w$):** the ability of free water molecules to bind with other molecules
Oxygen

Anaerobic environment

Aerobic environment
**Temperature Danger Zone:**
temperature range between 41°F and 135°F that is ideal for pathogen growth

Image credit: Minnesota Department of Health
The number of bacteria can **double** every 20 minutes!
Harmful microorganisms
Clostridium botulinum

Illness symptoms:
- Vomiting
- Diarrhea
- Vision problems
- Difficulty swallowing
- Respiratory failure

Onset: 12 - 72 hours after eating food

Duration: variable

Associated foods:
- Improperly canned or ROP foods
- Garlic in oil mixtures
- Honey (infants)
Clostridium botulinum

Ideal conditions:
- Anaerobic environment
- High moisture
- Low acidity (high pH)
- Time

Control factors:
- Raw foods
- Acidic or low moisture prepared foods
- Refrigeration
- Time

Image credit: CDC Public Health Image Library
Listeria monocytogenes

Illness symptoms:
- Nausea
- Diarrhea
- Fever
- Muscle aches
- Nervous system

Onset: 9 - 48 hours after eating food, sometimes 2-6 weeks later

Duration: variable

Associated foods:
- Unpasteurized (raw) milk
  - Dairy products
  - Cheeses
- RTE foods
  - Deli meats
  - ROP foods

Image credit: CDC Public Health Image Library
Listeria monocytogenes

Ideal conditions:
- Aerobic or Anaerobic environment
- High moisture
- Low acidity (high pH)
- Time

Control factors:
- Raw foods
- Acidic or low moisture prepared foods
- Refrigeration
- Time

Image credit: CDC Public Health Image Library
Accessing MN Food code

Website: https://www.revisor.mn.gov

Search 4626 in the Minnesota Rules field.

Chapter 4626 is the Food Code.
MN Food Code requirements

4626.0415 Specialized processing variance requirements.

A food establishment must obtain a variance from the regulatory authority before:

HACCP Plan
Key points
Details to include
# Food Safety Plan vs. HACCP

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<th>HACCP</th>
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MN Food Code requirements

4626.0415 Specialized processing variance requirements

4626.0420 Reduced oxygen packaging without a variance; criteria
MN Food Code requirements

4626.0415 Specialized processing variance requirements
A food establishment must obtain a variance from the regulatory authority before:

D. packaging TCS foods using a reduced oxygen packaging method except where the growth of and toxin formation by *Clostridium botulinum* and the growth of *Listeria monocytogenes* are controlled as specified in part 4626.0420

Rule we will discuss next
MN Food Code requirements

4626.0420 Reduced oxygen packaging without a variance; criteria

B. [...], a food establishment that packages TCS foods using a reduced oxygen packaging method must have a HACCP plan that contains the information in part 4626.1735 and that:

Contents of a HACCP plan
4626.0420 Reduced oxygen packaging without a variance; criteria

(1) Identifies the food to be packaged.

HACCP Plan

List each food and recipe name.

Notify inspector of changes.
MN Food Code requirements

4626.0420 Reduced oxygen packaging

without a variance; criteria

(2) the packaged food must be
maintained at 41 degrees Fahrenheit or
less and meet at least 1 of the following
criteria:

(a) has an a\text{w} of 0.91 or less;
(b) has a pH of 4.6 or less;

HACCP Plan

Pre-chill or freeze before packaging.

Measure or use tested recipes.
4626.0420 Reduced oxygen packaging without a variance; criteria

(c) is a meat or poultry product cured at a food processing plant regulated by the USDA using substances specified in CFR [...] ;

(d) is a food with a high level of competing organisms such as raw meat, raw poultry, or raw vegetables.

HACCP Plan

Raw foods will NOT be heated before packaging.

Vegetables not blanched.
Examples of foods that meet 4626.0420 Reduced oxygen packaging without a variance; criteria
MN Food Code requirements

4626.0420 Reduced oxygen packaging without a variance; criteria

(3) Describes how the package must be prominently and conspicuously labeled on the principal display panel in bold type on contrasting background, with instructions to:

(a) Maintain the food at 41 degrees Fahrenheit or below; AND

(b) Discard the food if within 30 calendar days of its packaging it is not served for on-premises consumption [...].

HACCP Plan

Include a sample label.

Max # of days at refrigerated temp is 30 days.
ROP food name:

Date packaged: Initials:
Date frozen: Initials:
Date refrigerated/thaw: Initials:
Refrigated use-by date:

Instructions: Immediately after packaging, store food in freezer at ambient temperature 0 to -10°F. Once food is moved to refrigerator, use within 30 days. Day 1 is date the food is removed from freezer.
4626.0420 Reduced oxygen packaging without a variance; criteria

(4) Limits the refrigerated shelf life to no more than 30 calendar days from packaging to consumption, except the time the product is maintained frozen [...].

HACCP Plan

How you will monitor the 30 days once the ROP food is in the refrigerator.
4626.0420 Reduced oxygen packaging without a variance; criteria

(5) Includes operational procedures that:

(a) Prohibit contacting ready-to-eat food with bare hands;

HACCP Plan

Include your no bare hand contact SSOP from your Food Safety Plan.

Rule 4626.0225
4626.0420 Reduced oxygen packaging **without** a variance; criteria

(5) Includes operational procedures that:

(b) Identify a designated work area and method by which:

(i) Physical barriers or methods of separation of raw foods and ready-to-eat foods minimize cross-contamination; AND

HACCP Plan

Describe the area.

Reference existing SSOPs.
MN Food Code requirements

4626.0420 Reduced oxygen packaging without a variance; criteria
(5) Includes operational procedures that:
   (b) Identify a designated work area and method by which:
      (ii) Access to processing equipment is limited to responsible trained personnel familiar with the potential hazards of the operation;

HACCP Plan
List specific positions:
- who will perform ROP
- who will monitor & verify
MN Food Code requirements

4626.0420 Reduced oxygen packaging without a variance; criteria
(5) Includes operational procedures that:
   (c) Delineate cleaning and sanitizing procedures for food contact surfaces.
4626.0420 Reduced oxygen packaging without a variance; criteria

(6) Describes the training program that ensures that the individual responsible for the reduced oxygen packaging operation understands the:

(a) concepts required for a safe operation;
(b) equipment and facilities; AND
(c) procedures in subitem (5) and part 4626.1735
MN Food Code requirements

4626.0420 Reduced oxygen packaging *without* a variance; criteria
(7) Is provided to the regulatory authority prior to implementation as required by 4626.1730.

HACCP plan requirements
4626.0420 Reduced oxygen packaging without a variance; criteria

(C) Except for fish that is frozen before, during and after packaging, a food establishment must not package fish using a reduced oxygen packaging method. Reduced oxygen packaged fish must be held frozen until used or removed from reduced oxygen packaging prior to the thawing process.

HACCP Plan

Receive & freeze.

Package frozen.

Remove from package for thawing.
MN Food Code requirements

*(specific for cook-chill and sous vide)*

4626.0420 Reduced oxygen packaging *without* a variance; criteria

(D) [...] a food establishment that packages TCS food using cook-chill or sous-vide process must:

1. Provide the regulatory authority prior to implementation a HACCP plan that contains the information in part 4626.1735;

Contents of a HACCP plan
MN Food Code requirements

*(specific for cook-chill and sous vide)*

**4626.0420 Reduced oxygen packaging without a variance; criteria**

(2) Ensure the food is:

(a) prepared and consumed on the premises, or prepared and consumed off the premises but within the same business entity with no distribution or sale of the packaged product to another business entity or the consumer;

**HACCP Plan**

State if you are delivering to satellite kitchens within district & final cooking to occur at each kitchen.
MN Food Code requirements

*(specific for cook-chill and sous vide)*

4626.0420 Reduced oxygen packaging without a variance; criteria

(2) Ensure the food is:

(b) Cooked to heat all parts of the food to a temperature and for a time as specified in part 4626.0340;

Cooking raw animal foods

HACCP Plan

Reference existing cooking temp SSOP.
MN Food Code requirements

*(specific for cook-chill and sous vide)*

4626.0420 Reduced oxygen packaging *without* a variance; criteria

(2) Ensure the food is:

(c) Protected from contamination before and after cooking as specific in parts 4626.0225 to 4626.0337 and 4626.0340 to 4626.0367;

*rules on Protection from Contamination*

*rules on Destroying Organisms*
MN Food Code requirements

*(specific for cook-chill and sous vide)*

4626.0420 Reduced oxygen packaging without a variance; criteria

(2) Ensure the food is:

(d) Placed in a package with an oxygen barrier and sealed before cooking (sous vide), or placed in a package and sealed immediately after cooking and before reaching a temperature below 135 degrees Fahrenheit (cook-chill);

HACCP Plan

Reference vacuum packaging plan.

At least 135°F for cook-chill packaging.
MN Food Code requirements

(specific for cook-chill and sous vide)

4626.0420 Reduced oxygen packaging without a variance; criteria

(2) Ensure the food is:

(e) Cooled to 41 degrees Fahrenheit in the sealed package or bag as specific in part 4626.0385 and subsequently:

 Cooling Requirements

HACCP Plan

Use existing cooling SSOP.

Include methods of how you will cool foods.
MN Food Code requirements

*(specific for cook-chill and sous vide)*

4626.0420 Reduced oxygen packaging *without* a variance; criteria

(i) cooled to 34 degrees Fahrenheit within 48 hours of reaching 41 degrees Fahrenheit and held at that temperature until consumed or discarded within 30 days after the date of packaging;

(ii) held at 41 degrees Fahrenheit or less for no more than 7 days, at which time the food must be consumed or discarded;

(iii) held frozen with no shelf life restrictions while frozen until consumed or used.
MN Food Code requirements

*(specific for cook-chill and sous vide)*

**4626.0420 Reduced oxygen packaging without a variance; criteria**

(2) Ensure the food is:

(f) held in a refrigeration until that is equipped with an electronic system that continuously monitors time and temperature and is visually examined for proper operation twice daily;

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### HACCP Plan

- Review your current system.
- Update system if needed.
MN Food Code requirements

*(specific for cook-chill and sous vide)*

4626.0420 Reduced oxygen packaging *without* a variance; criteria

(2) Ensure the food is:

   (g) if transported off-site to a satellite location of the same business entity, equipped with verifiable electronic monitoring devices to ensure that times and temperatures are monitored during transportation; AND

HACCP Plan

Review your current system.

Update system if needed.
MN Food Code requirements

*(specific for cook-chill and sous vide)*

4626.0420 Reduced oxygen packaging *without* a variance; criteria

(2) Ensure the food is:

   (h) labeled with the product name and the date packaged.
MN Food Code requirements

*specific for cook-chill and sous vide*

4626.0420 Reduced oxygen packaging *without* a variance; criteria

(3) Maintain the records required to confirm that cooling and cold holding refrigeration time/temperature parameters are required as part of the HACCP plan and:

(a) Make records available to the regulatory authority upon request; AND

(b) Hold records for at least 6 months.

HACCP Plan

Include copy of logs.
MN Food Code requirements

(specific for cook-chill and sous vide)

4626.0420 Reduced oxygen packaging without a variance; criteria

(4) Implement written operational procedures and a training program

HACCP Plan
Include a copy of the training (initial & annual).
MN Food Code requirements

*(specific for cook-chill and sous vide)*

Examples of foods that meet **4626.0420 Reduced oxygen packaging without a variance; criteria**
MN Food Code requirements

4626.0420 Reduced oxygen packaging without a variance; criteria

- Guidance for cheese (HACCP plan required)
- No HACCP plan required if reduced oxygen packaging TCS food that is:
  - Labeled with production time and date;
  - Held at 41 degrees Fahrenheit or less; AND
  - Removed from the ROP within 48 hours after packaging.
## Food Safety Plan vs. HACCP

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HACCP Plan

1. Assemble your HACCP team.
2. Describe your product.
3. Identify the intended use and consumer.
4. Construct a process flow diagram.
5. Verify the process flow.

6. Conduct a hazard analysis.
7. Identify Critical Control Points (CCPs).
8. Establish critical limits.
9. Establish monitoring procedures.
10. Establish corrective action procedures for deviations.
11. Establish verification procedures.
12. Establish record-keeping procedures.
Sample flow diagram

Prerequisite programs:
● Receiving
● Storage
● Handling
● Cooking
● Holding for service

Source: Minnesota Department of Health
## Principle 1: conduct a hazard analysis

<table>
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<tr>
<th>Operational step</th>
<th>Potential hazard(s)</th>
<th>Preventative measures</th>
<th>Is this a CCP?</th>
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<tbody>
<tr>
<td>Receiving</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparation - washing, trimming, etc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparation - ROP</td>
<td>Anaerobic environment - Clostridium botulinum and Listeria monocytogenes</td>
<td>Time &amp; temperature controls</td>
<td>Yes</td>
</tr>
<tr>
<td>Cold Storage</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Preparation - thawing</td>
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<td></td>
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<tr>
<td>Cooking</td>
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<td></td>
<td></td>
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<tr>
<td>Service</td>
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</tbody>
</table>
Principle 2: identify CCPs

What is the action(s) that can be taken to minimize the risk of the hazard?

- Hold at cold temperature
- Limit the amount of time the food is stored
Principle 3: establish critical limits

What is the desired outcome or parameter to be monitored?

- Hold at cold temperature: 41 degrees Fahrenheit or below
- Limit the amount of time the food is stored: no more than 30 days at refrigerated temperature
Principle 4: monitoring procedures

What will be monitored?
The specific action in the CCP and critical limits

How will it be monitored?
Visual inspection, logs

How frequently will it be monitored?
Daily, twice a shift, at time of packaging

Who is responsible for monitoring?
Supervisor, chef, designated employee
Principle 5: corrective action procedures

What actions must be taken if the critical limit (the outcome or the parameter) have a deviation?

Discard the product!
Principle 6: verification procedures

Who is going to check that the procedures and monitoring actions are happening? How will this be done?
Principle 7: record keeping

What documentation are you going to keep and for how long?
Hutchinson School District

- Ask for help.
- Ask questions.
- Be persistent.
- Be creative.
- Plan for long term investment in your school meals.
Resources

https://www.farmtoschoolmn.org/
Questions
Evaluation survey

Receive a certificate for 1 hour of continuing education credits that can be applied to the renewal of your CFPM certificate.

Complete the survey by Sunday, March 17th.

https://z.umn.edu/F2Swebinar_ROP
Farm to Food Safety Webinar Series

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Contact

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