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**Presentation Goals**

After this class, you should be able to

- Recognize why saving food is important
- Understand why food goes bad & how to prevent it
- Be able to extend the shelf-life for fruits & vegetables
- Know where to get more information



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**Food Waste**

Learn more in our Home Composting class

- **18%** of waste comes from food scraps in MN
  - 30-40% of all food
  - \$1200 annual loss per household
- Proper food storage helps combat climate change
  - Preserves natural resources
  - Uses less plastic (packaging & trash bags)
  - Less energy waste (transportation & agricultural costs)
  - Fewer CO2 & methane emissions (trucks & anaerobic decomposition)



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**Why Good Food Goes Bad**

- Naturally-occurring enzymes
- Physical damage
- Oxidation
- Microorganisms



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**Slowing Deterioration – F.A.T.T.O.M.**

- Change the conditions
  - Food Source (protect)
  - Acidity (increase)
  - Time (limit before use)
  - Temperature (lower or raise)
  - Oxygen (remove)
  - Moisture (prevent access)



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### Choose Good Produce

- Undamaged foods last longer
  - Keep foods whole until use
  - Wash right before use
- Fresh produce has better nutrition & flavor
  - Store or process as soon as possible



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### Follow the Instructions

- Use research-based recipes from trusted sources
  - Lab-tested for safety
  - Follow recipe exactly
- Avoid hand-me-down & homemade recipes
  - Recipes older than 1994 should not be used
  - When in doubt, refrigerate & use quickly



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### Control Temperature & Humidity

- Cool & Dry
  - 50-60°F with 60% humidity
  - Example: Basement
- Cold & Dry
  - 32-40°F with 65% humidity
  - Example: Refrigerator
- Cold & Damp
  - 32-40°F with 95% humidity
  - Example: Root cellar OR Refrigerator with closed crisper drawer



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### Store in Ideal Locations

- Store in cool, dry & dark place
  - 50-60°F & 60% humidity
  - Avoid areas that get hot/cold
  - Avoid direct sun exposure
- Clean storage areas regularly
- Avoid storing near waste, raw meats & cleaning chemicals



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### Storing Food

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## Food Saving Options

- “Fresh”
  - Raw produce
  - Retains texture
  - Best used within 1-2 weeks\*
- “Preserved”
  - Freezing, dehydrating, canning & fermenting
  - Retains nutrition & flavor
  - Best used within 1 year\*




\* Varies based on produce, storage condition, and recipe




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## Fresh Storage

Compared to Harvest Quality		
Flavor	Texture	Nutrition
✓	✓	✓

- Why it works
  - Protects FOOD
  - Lowers TEMPERATURE (only cold conditions)
- Benefits
  - Retains texture
  - Does not require additional equipment
- Considerations
  - Limited time to use
  - Nutrition & flavor decreases






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## Freezing

Compared to Harvest Quality		
Flavor	Texture	Nutrition
✓		✓

- Why it works
  - Lowers TEMPERATURE
- Benefits
  - Easy & fast
  - Little equipment required
- Considerations
  - Requires thawing time
  - Limited by freezer space






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### Blanch Before Freezing

How to Blanch Vegetables Before Freezing  
Source: Mississippi State University Extension  
YouTube, Runtime 1:00

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### Dehydration

Compared to Harvest Quality		
Flavor	Texture	Nutrition
✓		✓

- Why it works
  - Removes MOISTURE
- Benefits
  - Lightweight & compact
  - Many methods available
- Considerations
  - May need rehydration time
  - May need specialized equipment

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### Dehydration Methods

Compared to Harvest Quality		
Flavor	Texture	Nutrition
✓		✓

- Hang in bunches
  - 3-14 days
  - Cool, dark & dry location
- Use dehydrator or oven
  - 4-16 hours
  - Temperature 90-170° F
- Use microwave (check owners manual)
  - 1-5 minutes
  - Only good for leafy foods

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### Jelly, Jam & Preserves

Compared to Harvest Quality		
Flavor	Texture	Nutrition
✓		

- Why it works
  - Increases ACIDITY
  - Removes MOISTURE
- Benefits
  - Many recipes available
- Considerations
  - Sugar overwhelms natural flavor of produce
  - Sugar reduces nutritional value



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### Pickling

Compared to Harvest Quality		
Flavor	Texture	Nutrition
		✓

- Why it works
  - Increases ACIDITY
  - Removes MOISTURE
- Benefits
  - Many recipes available
- Considerations
  - Salt & vinegar overwhelms natural flavor of produce
  - Salt reduces nutritional value



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### Fermenting

Compared to Harvest Quality		
Flavor	Texture	Nutrition
		✓✓

- Why it works
  - Increases ACIDITY
  - Removes OXYGEN & MOISTURE
- Benefits
  - Increases nutrition
  - Many recipes available
- Considerations
  - Natural flavor of produce lost
  - Takes more time to complete
  - Requires specialized equipment



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**Canning**

- Why it works
  - Raises TEMPERATURE
  - Removes OXYGEN
- Benefits
  - Shelf-stable for long time
  - Reusable containers
- Considerations
  - Needs specialized equipment
  - Minnesota altitude = 1001-2000 ft; this can affecting canning time

Compared to Harvest Quality		
Flavor	Texture	Nutrition
✓		✓

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### Canning Basics

- Prepare food using research-based recipe
- Clean glass jars, rings & lids
  - Sterilize jars if canning less than 10 minutes
  - Keep jars warm
- Following canning instructions
  - Use proper canning method
  - Follow instructions for filling & timing
  - Let jars rest 12-24 hours & label
- Store in cool, dry & dark location 6-18 months



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### Water Bath Canning\*

Compared to Harvest Quality		
Flavor	Texture	Nutrition
✓		✓

- Heats contents to 212° F (boiling)
  - Uses boiling water
  - Kills most pathogens
  - Seals jars
- Use for acidic foods
  - Most fruit
  - Jams, jellies & preserves
  - Pickles
  - Fermented foods



\* Follow recipe to determine canning method & timing

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### Pressure Canning\*

Compared to Harvest Quality		
Flavor	Texture	Nutrition
✓		✓

- Heats contents to 240° F (above boiling)
  - Uses pressure & steam
  - Kills botulism pathogens
  - Seals jars
- Use for non-acidic foods
  - Many vegetables
  - Meats & soups



\* Follow recipe to determine canning method & timing

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**U of MN Extension – Food, Health & Nutrition**

<https://extension.umn.edu/food-health-and-nutrition>

- Lots of information on food safety & food preservation
  - Research-based advice
  - Video tutorials
  - Tips & best practices
  - Links to more resources




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**National Center for Home Food Preservation**

<https://nchfp.uga.edu/>

- Run by the Cooperative State Extension Service & U.S. Department of Agriculture (USDA)
- Research-based advice for food preservation
  - Tested & certified recipes
  - Tips & best practices
  - Links to more resources




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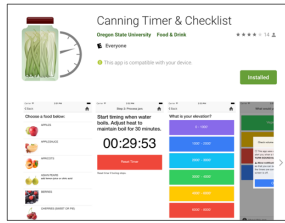
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### Canning Timer & Checklist app

[Android & iOS compatible](#)

- Developed by Oregon State Extension services
  - Lists steps to prepare jars & canning pots
  - Creates customized timer based on jar size & location
  - Designed for people with some canning experience




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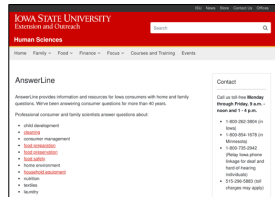
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### Extension Answer Line

<https://www.extension.iastate.edu/humansciences/answerline>

- Supported by Extension services
  - Monday through Friday 9am-4pm
  - Call toll-free 1-800-854-1678 (MN)
- Provides answers to home & family questions about
  - Child development
  - Cleaning, household equipment, textiles & laundry
  - **Food preparation, food preservation, food safety & nutrition**




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### Food Scraps Drop-off Sites

<https://www.ramseycounty.us/residents/recycling-waste/collection-sites/food-scraps>

- Supported by Ramsey County
  - For food scraps that would otherwise be thrown in the trash
  - 7x Seasonal locations & 8x Year-round locations
  - Photo ID is required




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**Class Recap**

After this class, you should

- Recognize why saving food is important
- Understand why food goes bad & how to prevent it
- Be able to extend the shelf-life for fruits & vegetables
- Know where to get more information




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**Case Study: Peppers**

Compared to Harvest Quality			
Method	Flavor	Texture	Nutrition
Fresh Storage	✓	✓	✓
Freezing	✓		✓
Dehydrating	✓		✓
Canning	✓		✓
Jelly	✓		
Pickling			✓
Fermenting			✓✓

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## Learn More about Food Preservation

To download the slides for this presentation, go to:

[www.RamseyMasterGardeners.org/index.php/Resources/Class-Downloads](http://www.RamseyMasterGardeners.org/index.php/Resources/Class-Downloads)

To sign-up for other classes like this, visit:

[www.RamseyMasterGardeners.org/index.php/Events/RCMG-Classes](http://www.RamseyMasterGardeners.org/index.php/Events/RCMG-Classes)

Other Extension Websites (PRO-TIP: Start searches with "site:edu" for research-based advice)

- o University of MN Extension <https://extension.umn.edu/food-safety/preserving-and-preparing>
- o National Center for Home Food Preservation [https://nchfp.uga.edu/publications/publications\\_usda.html](https://nchfp.uga.edu/publications/publications_usda.html)
- o Extension AnswerLine <https://www.extension.iastate.edu/humansciences/answerline>

**Books**

- o Ball Blue Book Guide to Preserving (37th Edition) published by Ball
- o So Easy to Preserve (6th Edition) by Elizabeth Andress & Judy Harrison

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MASTER GARDENER VOLUNTEER PROGRAM 

# Thank You!

University of Minnesota Extension  
 Ramsey County Master Gardener Volunteer Program  
[ramseymastergardeners.org](http://ramseymastergardeners.org)

*The Master Gardener Volunteer Program is growing with the Minnesota Landscape Arboretum.*

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