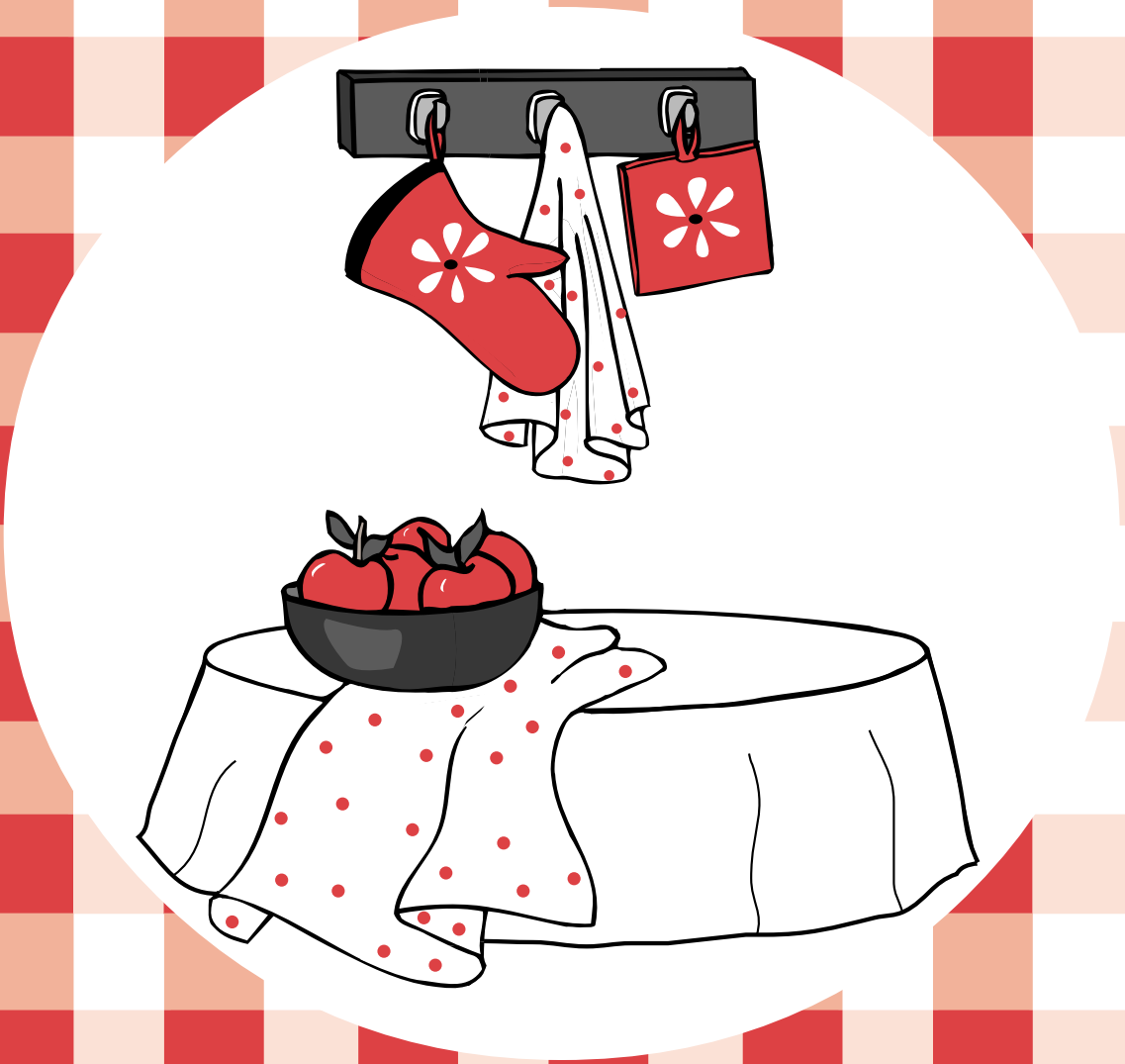
EM4921

Getting Started in Food Preservation

Leader's Guide



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Excerpts from the EM4895 *Food Safety Advisor Handbook* by Val Hillers, Washington State University Extension

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Getting Started in Food Preservation:
A 4-H activity-based approach

How to Use this Manual & the Youth Materials

This food preservation manual is written to assist the parent or club leader in teaching young people about food safety and preservation through hands-on activities. If you are introducing yourself or youth to the world of food preservation, this is a fun place to begin!

As a leader you will need this manual, which includes lists of materials and handouts to be copied. Each youth should have the "Getting Started in Food Preservation" Youth Kit (EM4920). The kit contains four divider pages for their notebooks, four pages of flashcards, and any additional material you may choose to give them.

UNITS

There are five units in this leader's manual:
Unit 1: Playing It Safe: Food Safety
Unit 2: The Delights of Drying: Drying Foods
Unit 3: South Pole Strategies: Freezing Foods
Unit 4: Boil Buddies: Jar Your Foods Using the "Boiling Bath" Method
Unit 5: Out of the Frying Pan...More Activities

Each unit contains
- **Activity Objectives:** Describes purposes of each activity.
- **Unit Shopping List:** Contains a complete list of supplies for each lesson.
- **Food Preserver's Information:** Provides more in-depth information about the activity and methods.
- **Youth Handouts:** The instructions for many of the activities in this book are printed as instructions on the youth handouts. Please copy as many youth handouts as your group needs.
- **Additional Activity Information:** These will provide leaders with additional tips and information (storage, safety, etc.) to accompany specific activities.

YOUTH MATERIALS

A divider page is provided for each of the first four units. They include:
- Definitions for Key Words
- Food Handling Safety Tips
- Historical Footnotes
- Important Charts & Diagrams
- Food Riddles

Quiz Cards: A sheet of flash cards to cut out and use for quizzing one another is provided for the first four units.

Using Life Skills and Experiential Learning

Questions provided in many of these activities will help guide you in structuring an inquiry-based approach to learning, encouraging thought and reflection. Rather than just providing information, we are attempting to ignite curiosity, helping youth formulate their own questions and make their own discoveries.

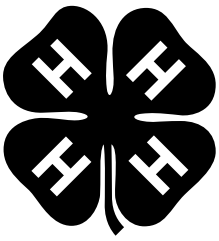
However, rules of safety should be taught rather than discovered. Food poisoning, for example, is not something we want youth to learn through personal experience. Guiding youth in an experiential process requires that you continually make risk assessments. Mistakes are an expected part of learning, but not at the expense of personal safety. Experiential learning coaches clearly define for youth the difference between issues of scientific fact versus personal opinion, between the desire for exploration and the need for safety.

As a leader, you may feel you are expected to "have all the answers," and might feel uncomfortable if you come upon a question for which you don't have a "real" answer. You are not expected to know everything. Keep in mind that the model we instill with our attitude toward learning may be more important than the material we are teaching.

The widely adopted Iowa State Life Skills Model helps identify the special skills that youth attain through the experiential process.

The Life Skills used in this manual include:

- **Head:**
  Wise Use of Resources
- **Heart:**
  Cooperation
- **Hands:**
  Useful/Marketable Skills
- **Health:**
  Disease Prevention



In addition, the curriculum can be used to help address these Washington State Essential Academic Learning Requirements:

READING: 1.2 build vocabulary through reading, 1.5 use features of non-fiction text and computer software, 2.1 comprehend important ideas and details, 3.1 read to learn new information, 3.2 read to perform a task.
MATHEMATICS: 1.1 understand and apply concepts and procedures from number sense, 1.2 understand and apply concepts from measurement, 5.3 understand the connections between mathematics and problem solving skills used everyday at work and at home.
HEALTH: 2.2 understand the transmission and control of communicable and non-communicable diseases, 2.3 acquire skills to live safely, 3.1 understand how environmental factors affect one's health.

The Tradition of Food Preservation

As you know from visits to the grocery store, healthy and delicious foods come in many different kinds of packages and containers that protect the food and make it safe to eat. This wasn't always true, of course.

Because food is so important to survival, food preservation is one of the oldest sciences used by human beings. The astonishing fact about food preservation is that it has been a part of every culture at nearly every stage. In the past few decades, food preservation has become somewhat of a lost art. As supermarkets have replaced the root cellars and gardens, chemicals and preservatives have replaced the natural, fresh vitamins and minerals in our foods.

Are you interested in preserving your own foods from your garden? Concerned about health issues of eating processed food? Are you looking for gift-giving ideas from your kitchen? Or do you just love spending time making "home-made" products? Then this 4-H project is the place for you to start.

Historical Origins of Food Preservation
Brian A. Nummer, Ph.D.
National Center for Home Food Preservation
May 2002

INTRODUCTION

The astonishing fact about food preservation is that it permeated every culture at nearly every moment in time. Ancient people had to harness nature to survive. In very cold climates they froze seal meat on the ice. In tropical climates they dried foods in the sun.

Food naturally begins to spoil the moment it is harvested. Food preservation enabled early humans to put down roots and live in one place to form a community. They no longer had to consume the kill or harvest immediately, but could preserve some for later use. Each culture preserved their local food using the same basic methods of food preservation.

Drying

Sun and wind naturally dry foods. Evidence shows that ancient Middle Eastern and Oriental cultures actively dried foods in the hot sun. Later cultures left more evidence, and each would have methods and materials to reflect their food supplies—fish, wild game, domestic animals, etc.

Vegetables and fruits were also dried from the earliest times. The Romans were particularly fond of any dried fruit they could make. In the Middle Ages "still houses" were purposely built to dry fruits, vegetables, and herbs in areas that did not have enough strong sunlight for drying. A fire was used to create the heat needed to dry foods. In some cases, foods were smoked as well.

Freezing

Freezing was an obvious preservation method in appropriate climates. Any geographic area that had freezing temperatures for even part of a year made use of the temperature to preserve foods. Cold temperatures were also used to prolong storage times. Cellars, caves, and cool streams were put to good use for that purpose.

In America, estates had icehouses built to store ice and food on ice. Soon the "icehouse" became an "icebox." In the 1800s, mechanical refrigeration was invented and quickly put to use. Also in the late 1800s, Clarence Birdseye discovered that quick freezing at very low temperatures made for better tasting meats and vegetables. After some time he perfected his "quick freeze" process and revolutionized this method of food preservation.

Fermenting

Fermentation was a chance discovery rather than an invention. No doubt the first beer was discovered when a few grains of barley were left in the rain. Opportunistic microorganisms fermented the starch-derived sugars into alcohols. This also occurred as fruits fermented into wine, cabbage into kimchi or sauerkraut, and so on. The skill of ancient people to observe, harness, and encourage these fermentations is admirable. Some anthropologists believe that early mankind settled down from nomadic wanderers into farmers so they could grow barley to make beer. Beer was nutritious and the alcohol was considered divine. It was treated as a gift from the gods.

Fermentation was a valuable food preservation method. It not only preserved foods—it created more nutritious foods and was used to make palatable foods from less than desirable ingredients. Microorganisms responsible for fermentation can produce vitamins as they ferment, enhancing the nutrition in the end product.

Pickling

Pickling is preserving foods in vinegar (or another acid). Vinegar is produced from starches or sugars that have been fermented into alcohol. The alcohol is then oxidized to acetic acid by certain bacteria. Wines, beers, and ciders are all routinely transformed into vinegars.

Pickling may have originated when food was placed in wine or beer to preserve it, since both have a low pH. Perhaps the wine or beer went sour and the taste of the food in it was appealing. Containers had to be made of stoneware or glass, since vinegar would dissolve the metal from pots.

Many uses were found for the leftover pickling brine. The Romans made a concentrated fish pickle sauce called "garum." It was powerful stuff, packing a lot of fish taste in a few drops.

There was a spectacular increase in food preservation in the 16th century due to the arrival of new foods in Europe. Ketchup was an oriental fish brine that traveled the spice route to Europe and eventually to America, where someone finally added sugar to it. Spices were

added to these pickling sauces to make clever recipes. Soon chutneys, relishes, piccalillis, mustards, and ketchups were commonplace. Worcestershire sauce was an accident from a forgotten barrel of special relish. It aged for many years in the basement of the Lea and Perrins Chemist shop.

Curing

The earliest curing was actually dehydration. Early cultures used salt to help completely dry foods. Salting was common and even culinary when raw salts were chosen from different sources (such as rock salt, sea salt, and spiced salt). In the 1800s it was discovered that certain sources of salt gave meat a red color instead of the usual unappetizing grey. Consumers overwhelmingly preferred the red colored meat. Nitrites (saltpeter) were used in this mixture of salts. As the microbiology of *Clostridium botulinum* was discovered in the 1920s, scientists realized that nitrites inhibited this organism.

Jam and Jelly

Preservation with the use of honey or sugar was well known to the earliest cultures. Fruits kept in honey were commonplace. In ancient Greece quince was mixed with honey, then dried and packed tightly into jars. The Romans improved the method by cooking the quince and honey, producing a solid texture.

The same fervor of trading with India and the Orient that brought pickled foods to Europe also brought sugar cane. In northern climates without enough sunlight to successfully dry fruits, housewives learned to make preserves by heating the fruit with sugar.

Canning

Canning is the process of placing food in jars or cans, then heating to a temperature that destroys microorganisms and inactivates enzymes. This heating and cooling process forms a vacuum seal. The seal prevents other microorganisms from contaminating the food in the jar or can.

Canning is the newest of the food preservation methods, pioneered in the 1790s. A French confectioner, Nicolas Appert, discovered that the application of heat to food in sealed glass bottles preserved the food from deterioration. He theorized, “If it works for wine, why not foods?” Around 1806, the French Navy successfully tested Appert’s principles on a wide range of foods, including meat, vegetables, fruit, and even milk. An Englishman, Peter Durand, preserved food in cans in 1810, based on Appert’s methods. Appert had found a new and successful method to preserve foods, but he did not fully understand it. He thought that the exclusion of air was responsible for the preservation. The process was not really understood until 1864, when Louis Pasteur discovered the relationship between microorganisms and food spoilage. Prior to Pasteur’s discovery, Raymond Chevalier-Appert patented the pressure retort (canner) in 1851 to process canned food at temperatures higher than 212˚F. However, the significance of this method in relation to *Clostridium botulinum* was not known until the 1920s.

Conclusion

Some historians believe that food preservation developed for cultural reasons as well as sustenance. They point to numerous special occasions in which preserved foods had religious or celebratory meanings. In America more and more people live in cities and procure foods commercially. They have been removed from a rural, self-sufficient way of life. Yet for many, a garden is still a welcome sight and a yearly bounty of vegetables and fruits is produced. It is this cultural nature of preserved foods that survives today. Interests have shifted from preserve "because we have to," to preserve "because we like to."

References and Sources

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WHAT HAPPENS TO FOOD YOU PRESERVE?

From EM4866 *Food Safety Advisor's Volunteer Handbook,*
Washington State University Extension

Primary methods of preserving food

Refrigeration

- Retards growth of microorganisms.
- Slows action of enzymes.

Freezing

- Prevents growth of microorganisms, but does not necessarily kill them.
- Slows, but does not stop enzymatic activity. Enzymes in most fresh vegetables must be inactivated before freezing by a process known as blanching.
- For highest quality, lower the food temperature to 0˚F as rapidly as possible and maintain a 0˚F food temperature.
- Freeze only the amount you can use before the food's shelf life expires (see *Storing Foods at Home*, EB1205).
- To retain quality, use packaging that is moisture-proof, sealable, and impermeable to oxygen.

Canning

- With proper canning practices, air is forced from the jars, leaving a vacuum. Heat destroys most microorganisms capable of growing in food stored at room temperature.
- Molds and some yeast are unable to grow in a vacuum. However, there is a very healthy growth environment for anaerobic bacteria in sealed, home-canned foods. Such foods must be heat processed until a commercially sterile product is achieved, or they must have salts, sugars, acids, or other preservatives added.
- Yeasts and molds are destroyed when food temperatures reach about 190˚F, whereas most bacterial vegetative cells are destroyed in foods heated to a boiling temperature. However, bacterial spores are able to survive for a long period at the temperature of boiling water.
- Pressure enables the processing of canned foods at temperatures higher than boiling water, where kill rates are greatly increased. Pressure canning is required to safely process foods that may support the growth of bacterial spores.

Sweetening and Acidifying Jellies and Jams

- Adding sugar and acids will tie up free water and lower the pH.

Pickling and Fermenting

- These methods (and others, like canning naturally acidic fruits, jams, and jellies) use either naturally produced or added acids to inhibit or prevent the growth of many microorganisms. Foods that contain enough acid to inhibit the growth of *Clostridium botulinum*

are called high acid foods (pH lower than 4.6). The presence of acids in foods, however, does not kill organisms.
- Fermenting uses bacteria to produce lactic acid and lower the pH in products such as fermented pickles and sauerkraut.
- Pickling adds vinegar (acetic acid) to lower pH in fresh pack pickles and other acidified products.

Drying

- Removes water and prevents growth of microorganisms.
- Water in fresh food exists in free and chemically bound forms. Microorganisms require free water for growth. Removal or reduction of free water from a food prevents growth of microorganisms and controls enzyme activity.
- Dried foods must be packaged in oxygen and moisture-proof containers to prevent oxidation of flavors and moisture gain.

Salting

- Chemically bonds water, inhibiting growth of some bacteria.

Packaging

The success of all preservation methods depends on using appropriate packages. Airtight packages prevent recontamination of foods by air and microorganisms and are ideally suited for most preserved foods.

In these introductory activities we will be exploring simple food preservation techniques including drying, freezing, and boiling water bath canning.

Unit I:
Playing It Safe — Food Safety

INTRODUCTION

Before youth begin working with food, they will need to learn some basic elements of food safety. This unit covers handwashing, cross contamination, refrigeration, and natural preservatives. You may also wish to present this information in Unit III on the proper packaging of frozen food. Establishing a method of labeling food is also a good practice for youth to learn.

Activity Objectives

- Practice good handwashing techniques
- Identify and demonstrate safety techniques in the kitchen
- Learn to identify when foods are not ripe, ripe, overripe, and spoiled
- Identify causes of spoilage and effects of food preservatives

Life Skills

Health:

- Disease Prevention

UNIT I: Shopping List

Handwashing Activity

- ☐ Soap
- ☐ Paper towels

- ☐ UV black light (option 1)
- ☐ Fluorescent hand cream (option 1)

- ☐ Baby oil (option 2)
- ☐ Cinnamon (option 2)

Fruit Party Activity

- ☐ A variety of fruit, both for preparing and for examining without cutting*
- ☐ Three plates
- ☐ Cutting knife
- ☐ Toothpicks
- ☐ Lime juice or ascorbic acid

***(This activity can be combined with "Shopping Trip." See Unit V.)**

Kitchen Safety Activity

- ☐ Two pots, one with a lid
- ☐ Metal-handled stirring utensil
- ☐ Jar
- ☐ Matches
- ☐ Knife
- ☐ Cutting board
- ☐ Large oven dish
- ☐ Potholders
- ☐ Towels
- ☐ Colored liquid (like orange juice)
- ☐ Box on a high shelf
- ☐ Stepping stool

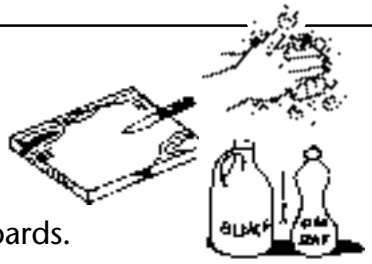
Labeling Foods

- ☐ Refrigerator/Freezer labels (or slips of paper and packaging tape)
- ☐ Permanent markers (different colors) (see Unit I, Handout C)

NOTES

KITCHEN SAFETY

Cleanliness/Sanitation

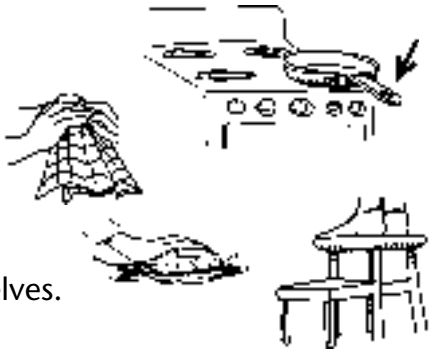


- Wash your hands!
- Cut and handle different foods with different utensils and different cutting boards.
- Use warm soapy water and bleach to clean wooden cutting boards.

Safety—Heat

- Use a dry potholder or towel to grab pot handles.
- Turn handles to the side, but not directly over another hot burner.
- Stir with heat-resistant spoons with long handles.
- Use potholders in both hands when removing items from the stove or oven.
- Tilt and lift covers of hot or steaming pans away from you.
- Keep matches in a closed container, away from fire.
- Don't leave metal spoons in a pot that is heating.

Safety



- Don't leave pot handles sticking out over the edge of the stove.
- When handing someone a utensil, extend the handle to the person.
- Dry your hands before handling equipment.
- Mop up spills on the floor when they happen.
- Use a stepping stool when reaching for items on high shelves.
- Do not leave cupboard doors or drawers open.

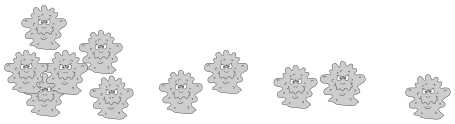
Knives

- When cutting food, always cut away from you.

Electrical

- Plug in and disconnect electrical appliances with dry hands.
- Don't yank electrical cords to unplug appliances.

The Tiny Terrors!



The most common cause of food spoilage is the growth of bacteria, molds, or yeast. These microorganisms are everywhere. They are in the soil, water, and air, and it is normal to find them on the surfaces of fresh foods. Microorganisms are very tiny and only become visible when growing in colonies containing millions of cells. A few of these cells probably wouldn't make you sick or spoil your food. More than 25,000 of them can fit on the head of a pin and you cannot see them! ***How do you think we know they are there?***

These microorganisms, in large enough numbers, can make you sick. But the good news is that washing your foods will remove some of them, and properly cooking your food will kill most of them. Microorganisms are easily killed by heating food to the temperature of boiling water.

What is the temperature of boiling water?

212 degrees Fahrenheit at sea level. The temperature of boiling water drops by one degree Fahrenheit for every 500 feet above sea level.

Are all bacteria unhealthy?

No. A number of bacteria are "good guys" and desirable in food; for example, certain bacteria are used to make cheese, pickles, and sauerkraut.

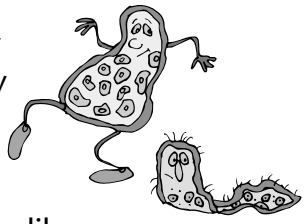
Stand back!

Bacteria can increase in number very quickly; some will double in number every 15 minutes. The following shows how quickly this type of bacterium can multiply to dangerous numbers, given a warm, moist place to grow.

Amount of Time	**Number of Bacteria**
Start	1
30 minutes	4
1 hour	16
1 1/2 hours	64
2 hours	256
2 1/2 hours	1,024
3 hours	4,096
3 1/2 hours	16,384
4 hours	65,536

If bacteria grow and multiply very rapidly on food, they are capable of spoiling the food or causing a foodborne illness **in less than four hours.**

The Fuzzy Fiends: It's Not All on the Surface



MOLDS grow on most foods and require air and water, although they need less water than bacteria. Their masses of growth usually are fuzzy in appearance and can be nearly any color. Some molds produce toxins that are unhealthy for humans to eat.

The *mycelium* ("roots") of mold can spread invisibly through soft foods, like the roots of a tree in the earth.

What are some soft foods that might have mycelium?

Molds grow best at room temperature, but some can grow (slowly) at refrigerator temperatures. Molds require oxygen, so wrapping food tightly will reduce the opportunity for mold growth. Molds are easily killed by heat. Most begin to die at about 140˚F; almost all are dead when food temperatures reach 190˚F.

What to Do with Moldy Food

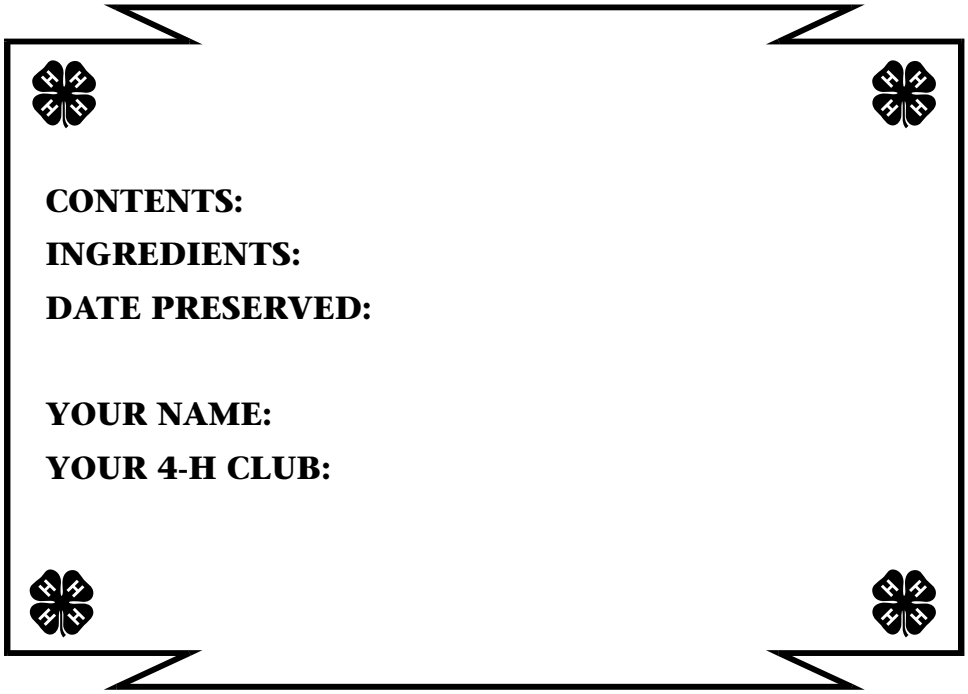
Throw away all moldy foods except **hard** cheeses. A spot of mold growing on a soft food, such as yogurt or an orange, may have spread its **mycelia** and possibly its toxins throughout the food. If mold growth is not all over your hard cheese, trim off the moldy area, removing at least $^1/_2$-inch below the mold.

YEASTS can grow with or without air and require more water than molds. Their masses in or on food appear as slime, scum, or murkiness. Active yeast makes gas bubbles, froth, or foam when it is **fermenting** as it is releasing carbon dioxide gas. Yeast fermentation is used to make vinegar, alcohol, and bread.

Controlling Growth of Yeasts—Yeasts grow best at room temperatures and are destroyed by heating foods to temperatures of 140˚F to 190˚F. They grow slowly on refrigerated foods.

UNIT I: Handout C

Labels aren't nice things to stick on people, but they sure help you recognize an unfamiliar frozen blob in your freezer. Labels are also really important when you enter preserved foods in a contest or fair. Look at the example below to find out what kinds of information you can put on a label:



Try making labels on the computer using address labels.

What information do you think is important to put on leftovers?

Design Your Own Labels:

UNIT I: ACTIVITY INFORMATION

ACTIVITY 1 — HANDWASHING ACTIVITY

Objective

Youth will examine the quality of their handwashing techniques, then practice good handwashing techniques.

Preparation

- Choose one of the following:

  Fluorescent Hand Cream: Mix 10-15 oz. of inexpensive hand cream with 2 ounces of water-soluble fluorescent paint. Have participants apply the hand cream and rub it in well.

  Oil & Cinnamon: Have participants coat their hands with baby oil, then have someone sprinkle their hands with cinnamon.

- Set up a handwashing station with liquid soap and paper towels.

Activity

A. Discuss information about Foodborne Illness on the Unit I Divider Page. Explain to them that food safety should be the number one concern whenever you are handling food, so this is the first thing they are learning.

B. Explain to youth that proper handwashing when handling food is extremely important for reducing the transmission of germs.

C. Have youth apply the fluorescent hand cream or baby oil and cinnamon.

D. Have participants wash their hands for different periods of time (3 seconds, 5 seconds, 10 seconds, 15 seconds). Have them count out loud, "One one thousand, two one thousand, three one thousand... ."

E. Have the youth regroup and hold out their hands for inspection.

F. Group the hands in order from cleanest to dirtiest.

Questions to Ask

- How is the cream/oil like germs or bacteria?
- How is the cream/oil different from germs or bacteria?
- Which person has the least amount of "germs" on their hands?
- Are there areas that everyone seemed to miss? What are they?
- What conclusions can you make, based on this activity?
- Why do you think is it important to wash your hands before handling food?
- What do you suppose "cross-contamination" means?

ACTIVITY 2

KITCHEN SAFETY INSPECTION

Objective

Youth will identify and demonstrate safety techniques in the kitchen.

Preparation

This is a hands-on learning opportunity with two steps. In Step 1 the youth will visually identify safety hazards in the kitchen. In Step 2 the youth will demonstrate proper techniques for handling utensils. In order to set up for this activity, create the following conditions in your kitchen environment:

- Two "boiling" pots (The pots do not have to be boiling, just tell the youth to pretend they are.)
  Pot 1: Handle sticking out over the edge of the stove
  Pot 2: Handle can be over another burner
- One pot with a metal spoon in it, and one with a lid
- A cutting board with a knife sticking out off the edge and a carrot on the cutting board
- A large dish in the oven
- A visible spill on the floor
- A cupboard drawer pulled out
- A cupboard drawer left open
- Some items out of reach on a high shelf
- Matches sitting close to the stove

Activity

A. Go over the kitchen safety handout with youth (Unit I, Handout A). After each safety tip, ask them, "Why is that?"
B. Have each youth stand in the kitchen entryway and identify one thing that is a potential hazard in the kitchen.
C. Have them explain why the situation they have identified is unsafe.
D. Have them go in the kitchen one at a time and correct the problem.
E. Demonstrate the proper handling of knives, potholders, lids, and electrical appliances.

Possible Answers for "Why?"

Food Safety Facts	Why?
Use a dry potholder to grab pot handles.	*To avoid getting burned.*
Turn handles to the side, but not directly over another hot burner.	*So that people won't bump into them.*
Stir with plastic, heat resistant utensils.	*Metal stirring utensils conduct heat and can possibly cause burns.*
Use potholders in both hands when removing items from the oven.	*Heavy items require two hands. Bending over requires two hands for safer balancing.*

(continued on next page)

Food Safety Facts	Why?
When cutting food, always cut away from you.	*So you don't cut yourself if the knife slips.*
Clean cutting boards with warm soapy water and bleach.	*To prevent transfer of bacteria from one food to another.*
Cut and handle different foods with different utensils and different cutting boards.	*To avoid cross-contamination.*
When handing someone a utensil, extend the handle to the person.	*So they don't accidentally grab anything hot or sharp.*
Tilt and lift covers of hot or steaming pans away from you.	*So that escaping steam does not burn your face or hands.*
Dry your hands before handling equipment.	*Things can slip out of wet hands.*
Mop up spills on the floor when they happen.	*So that you or others don't slip.*
Use a stepping stool when reaching for things on high shelves.	*To avoid falling or knocking items down when reaching for high objects.*
Plug in and disconnect electrical appliances with dry hands.	*To avoid electrocution.*
Keep matches in a closed metal container, away from fire.	*To avoid fires.*
Don't leave metal spoons in a pot that is heating.	*They heat up quickly and can burn your hand.*
Do not leave cupboard doors or drawers open.	*You might bump into one of them, fall, or spill something hot.*
Don't yank electrical cords to unplug appliances.	*This damages or ruins the appliance connection.*

A TEACHING TIP:

Turn the Question Around: When a youth asks a question, sometimes it is too easy to give an answer. An excellent approach to teaching is to ask the question back to them instead. For example: "That's a good question, Suzie. Why do you think we have to clean cutting boards and utensils between each food we prepare?" Get them to formulate their own answers to their questions. Use that noggin!

ACTIVITY 3 — LATE FOR THE FRUIT PARTY

Objectives

- Learn to identify stages of maturity: when are foods underripe, ripe, overripe, and spoiled.
- Identify causes of spoilage, and effects of food preservatives.

Preparation

You are going to need whole fruit to cut and fruit in various stages of ripeness to leave uncut. To prepare for this activity you will need to create two plates of ripe sliced fruits in advance. Place similar items on each plate and keep them refrigerated until the start of the activity. Red Delicious apples, peaches, and pears usually brown fast and are good for demonstrating. Prepare a shallow dish with lime juice or powdered ascorbic acid (Vitamin C).

- Prepare one plate 6-8 hours before the activity.
- Prepare one plate 2 hours before the activity.
- Prepare the lime juice or ascorbic acid before the activity.

Activity 3 Part A — Mystery Substance

A. Show the youth the dish of preservative (lime juice or ascorbic acid). Let them taste a little and guess what it is.
B. Wash and cut one piece of fruit in slices.
C. Dip one slice of fruit in the preservative and lay another untreated slice beside it.
D. Ask the youth if they can guess what you are doing and why.
E. Put the plate aside.

Activity 3 Part B — Uncut Fruit

Select fruits at different stages of ripeness. You will want one overripe fruit, a ripe fruit, and an underripe fruit. Spoiled food and molds often fascinate young people. If you have time, acquiring spoiled fruit will add to the dynamics of the activity.

A. Select and wash your fruit under running water.
B. Ask the youth to line the fruits up from unripe to spoiled.

Questions to ask:

- How do you know when a fruit is ripe?
- What does ripe mean?
- Does the ripeness test for apples work for cantaloupe? (Or create a similar comparison, based on fruits available.)
- What can you conclude about testing for ripeness?
- Are there any tools to help you identify freshness? (Yes, the chart on the back of the Unit I Divider.)

Activity 3 Part C

Cut Fruit

A. Demonstrate safe cutting procedures as you cut a piece of washed fruit. (You could use one from the previous activity—ideally, the same fruit that was prepared and refrigerated).
B. Have the youth turn their backs as you put the fresh cut fruit plate next to the other two plates. Show the youth all three plates of food at once. Do not indicate when they were prepared. Ask them to make observations.

Questions to ask:
- How does the appearance of the three plates differ?
- How does the taste differ?
- How does appearance affect the taste and desirability of the fruit?
- How do you feel about tasting the fruit that has turned brown? Why?
- Is mushy, brown fruit safe to eat?
- Did the handling of the fruit have anything to do with its turning brown?
- Why do you think fruit turns brown?

Activity 3 Part D

Natural Preservatives

Show the youth the plate from Activity A.

Questions to ask:
- What has happened?
- Why do you think that happens?

Use Unit I, Handout B, pages 1–2.

ACTIVITY 4

FOOD LABELING

Labeling will become more important as you prepare foods for storage. Teaching proper labeling helps keep refrigerator clutter to a minimum.

Use Unit I, Handout C.

Conclusion to Unit I:
In this unit you have had the opportunity to introduce youth to various elements of food safety and preservation that can be repeated throughout their projects.

Handwashing, utensil safety, proper washing and handling of food, and labeling are all elements that can be revisited in the following units.

Unit II:
The Delights of Drying

INTRODUCTION

Drying foods is easy and inexpensive. It is a natural form of food preservation and can be traced back to very early civilization. Dried foods are inexpensive to store and use little storage space. Refrigeration is not required.

Activity Objectives

In this unit, youth will use food drying methods to make:
- Fruit leather
- Trail mix
- Dried herbs
- Meat jerky

In addition:
- Youth will read and interpret instructions
- Youth will learn how to measure and mix ingredients
- Youth will practice using kitchen appliances and utensils

Life Skills

Head:
- Wise Use of Resources

Hands:
- Useful/Marketable Skills

Health:
- Disease Prevention

UNIT II: Shopping List

Fruit Leather (Conventional Oven)

- ☐ 2 cups of fresh fruit (apples, cherries, plums, strawberries, purple grapes)
- ☐ Lemon juice
- ☐ Vegetable oil spray
- ☐ Knife
- ☐ Spatula
- ☐ Blender
- ☐ Measuring cups & spoons
- ☐ Cookie sheet
- ☐ Plastic wrap
- ☐ Waxed paper

Dried Herbs (Microwave Oven)

- ☐ Herbs of choice
- ☐ Paper towels
- ☐ Labels
- ☐ Small bottles

Trail Mix (Dehydrator)

Choose from the following: 1/4 cup each

- ☐ Nuts (peanuts, cashews, almonds)
- ☐ Dried cranberries
- ☐ Dried apricots
- ☐ Dried bananas
- ☐ Raisins
- ☐ Mini-pretzels
- ☐ Cracker cereal
- ☐ Granola
- ☐ Other ingredients
- ☐ Measuring cups & spoons
- ☐ Mixing spoon
- ☐ Mixing bowl

Meat Jerky (Conventional Oven)

- ☐ Choice of meat (see page 26)
- ☐ 1 cup soy sauce
- ☐ 1/4 cup Worcestershire sauce
- ☐ 1 1/3 Tablespoons garlic salt
- ☐ 1 1/3 Tablespoons black pepper or lemon pepper
- ☐ 1 1/3 Tablespoons liquid smoke
- ☐ Knife
- ☐ Measuring cups and spoons
- ☐ Mixing bowl
- ☐ Cutting board
- ☐ Shallow dish
- ☐ Saucepan

NOTES

UNIT II: FOOD PRESERVER'S INFORMATION

Methods of Drying Foods

Advantages and disadvantages to these different drying methods are listed below.

- Dehydrator
- Sun/Air
- Solar
- Oven
- Microwave

Dehydrators—These produce a better quality dried product than any other method of drying. A dehydrator should have a heat source, a thermostat, and some method of air circulation.

Sun drying—This method can be used when the temperature is at least 90˚F and humidity and air pollution are low. A major advantage is its low cost. The main disadvantage is that it can only be done when the temperature is consistently high and the humidity is low.

Solar drying—This is like sun drying, only better. The sun's rays are collected in a solar box. The drying temperature is higher and drying time is shortened.

Oven drying—This method can be used to dry small amounts at one time. There is little or no investment in equipment and you are not dependent on the weather.

Microwave Drying—Although foods can be dried in a microwave, it isn't a good choice for preserving. Many microwaves do not create convection currents or allow air to escape. Microwaves often do not cook food evenly and bacteria can go unchecked in the cold, moist center spots. Rapid drying can cause case-hardening, in which the outer skin becomes dry and acts as a water barrier, causing a wet interior. Few foods remain edible once they have hardened in a microwave. Herbs are the exception—drying small amounts of herbs works great in a microwave.

Condition Your Dried Foods

It's a good idea to condition dried foods before long-term storage. Loosely pack cooled, dried fruit about 2/3 full in plastic or glass containers. Cover or seal the containers tightly and shake them daily for 2-4 days. Excess moisture in some pieces will be absorbed by the drier pieces. If water collects near the top of your container, you need to continue dehydrating.

Storage of Dried Foods

To prevent mold, dried foods must be protected from moisture. Containers suitable for freezer use work well for dried foods, such as plastic freezer bags, glass jars with lids, and plastic containers with lids. Vacuum packaging in suitable packages is an excellent way to maintain the quality of dried foods.

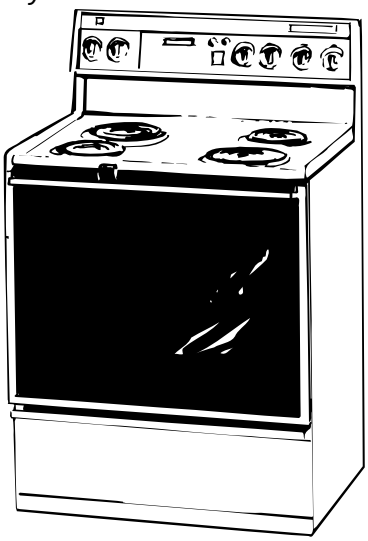
Dried foods maintain the best quality and nutritional value if they are used in less than 12 months. Dried foods may still be edible after many months or years in storage. They may not be as tasty or nutritious. Some people prefer to store dried food in the freezer because it takes up little space and there are no problems with mold or insects.

FRUIT LEATHER

Fruit leather is yummy and you can take it almost anywhere! Fruit leather is made from mashed fruit (puree) that is dried (dehydrated) until it is "leathery."

You need:

- 2 cups of fresh fruit
  (apples, cherries, plums, strawberries, purple grapes)
- Lemon juice
- Vegetable oil spray
- Knife
- Spatula
- Blender
- Measuring cups & spoons
- Cookie sheet
- Plastic wrap
- Waxed paper



1. Select ripe or overripe fruit.
2. Sort and wash the fruit. Remove blemishes. Peel, pit, seed, and core as necessary.
3. Cut into chunks and place in a food chopper, blender, or food processor.*

** If you are using light-colored fruit (pears, peaches, apples), add 1 tablespoon of lemon juice for every 2 cups of fruit to prevent browning.*

4. Blend your fruit into mush (puree).
   If your puree is thick, add a little water. If your puree is tart, add a little sugar or honey (1 tablespoon per 2 cups of fruit).
5. Preheat the oven to 140˚F.
6. Spread a piece of lightly oiled ***plastic wrap*** on a cookie sheet.
7. Spread a thin, even layer of puree on the cookie sheet.
8. Bake in oven ***with oven door open*** about 3–6 inches for 4–5 hours.
9. Leather is ready when an edge can be peeled away from the plastic (it will still be sticky).
10. Cut the dry fruit leather into strips and roll them like tubes in wax paper.

TRY THIS!
Use the same method to dry your favorite fruit yogurt!

Note: Instructions for drying fruit leather in a dehydrator can be found in PNW0397 *Drying Fruits and Vegetables,* available online at http://pubs.wsu.edu and at your local WSU Extension Office.

UNIT II: Handout B

TRAIL MIX

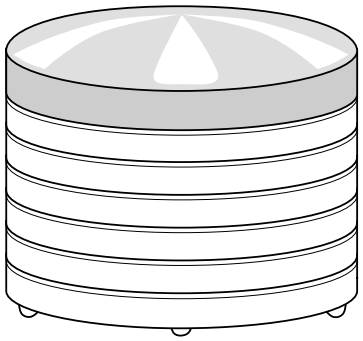
Making trail mix is easy and fun AND you get to choose what goes in it! Different ingredients create different tastes!

Preparing Dried Fruit

Some fruits are good for drying and some are not. Consider what tastes you want to add in your trail mix, and check your divider page for information and instructions about which fruits dry best.

For this activity, you can dry your fruit in a conventional oven, like you did for fruit leather, or you can use a dehydrator.

Using a Dehydrator



1. Arrange your fruit in a single layer on a dehydrator tray.
2. It's important to dry the fruit quickly at first to eliminate the growth of bacteria. If you can control the temperature on your dehydrator, start at 140˚F to 150˚F, then turn it down to 130˚F or 140˚F after 2 or 3 hours.

   Many factors affect drying, including:
   - The type of food you are drying
   - How thick or thin you slice your fruit
   - How well air circulates in and out of the dehydrator
   - The temperature and humidity where you live

   It might take some practice to figure out how to best operate your dehydrator. Different machines will operate in different ways.

3. To check your fruit, remove one slice and let it cool. Check the chart on your divider page to see if it's done.
4. Mix 1/4 cup of your dried fruits in a bowl with 1/4 cup of any of the following:

Rice crackers	Cereal squares	Granola
Cashews	Mini-pretzels	Cheese crackers
Almonds	Soy nuts	Candy-coated chocolate pieces
Cereal O's	Raisins	Sunflower seeds

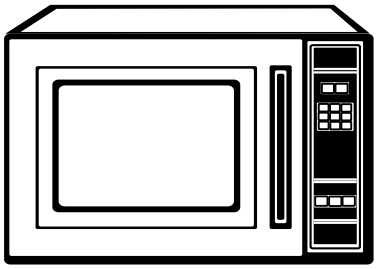
5. Store 1/2 cup servings of your trail mix in zippered plastic bags.
6. Write down your own special mixture recipes.
7. Trade trail mixes with friends.

DRYING HERBS

Variety is the spice of life.
Spice is the life of the party!

Secrets of the Chefs

Nature has hundreds of wonderful herbs that are harvested from plants that can change a dull dish into a fantastic culinary creation! The secret to using herbs is using enough, but not too much. Herbs cooked into foods that are going to be served right away may not be as noticeable as herbs that have simmered in a sauce. Some herbs are best used fresh.



Instant Herbs!

If you grow your own herbs in a garden and want to dry them, a microwave can do it almost instantly.

To dry herbs in the microwave:

1. Place a single layer of herb leaves between paper towels.
2. Place the paper towels in the microwave on high for 1–2 minutes, depending on the thickness of the leaves.
3. Cool and test for brittleness. When the leaves crumble in your hands, they are sufficiently dried.
4. If leaves are not dry, microwave $^1/_2$ –1 minute longer.

Fruits, vegetables, and meats should not be dried in the microwave. These foods contain a lot of water and will be overcooked before the moisture evaporates in the microwave.

For a list of herbs that are easy to dry, see your Divider Page!

UNIT II: Handout D

MEAT JERKY

Selection of Meat

The best jerky is made from lean meat. The leaner the meat, the better the finished product. Either fresh or frozen meat can be used. (Slightly frozen meats can be easier to cut.) The best parts for jerky include flank, round, and sirloin cuts. Do you know which parts of a beef those are?

Meat Preparation

Meat used for jerky should be sliced into long strips that are 3/16" to 1/4" thick. For a tender jerky, cut the meat across the grain. For a tougher, chewier product, cut the meat with the grain. Remove all fat, if possible.

Precooking shortens the drying time and produces a more tender jerky. Although the color and texture will be different from conventional jerky, precooked jerky is still tasty and a safer bet!

Jerky Marinade

Makes enough marinade for 2 pounds of lean meat slices.

Ingredients:

1 cup soy sauce
1/4 cup Worcestershire sauce
1 1/3 Tablespoons garlic salt
1 1/3 Tablespoons black pepper or lemon pepper
1 1/3 Tablespoons liquid smoke (optional)

1. Prepare 1 to 2 cups of marinade brine and put in large saucepan.
2. Bring the marinade to a full rolling boil over medium heat. Add a few meat strips, making sure that they are covered by marinade. Re-heat to a full boil.
3. Remove the pan from the range. Using tongs, immediately remove meat from the hot marinade to prevent over-cooking.
4. Repeat steps 3 and 4 until all meat has been precooked. Add more marinade brine if necessary.

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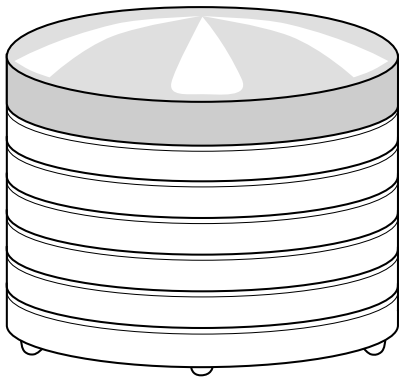
Drying the Meat



Either a dehydrator or smoker can be used to dry the precooked or presoaked meat pieces. Put the meat slices in a single layer on drying racks. The strips should not overlap since air circulation is very important. Dry the meat for 10–12 hours at 145˚F, or until slices are adequately dry. If you choose to use a conventional oven, place a fan beside the open oven door to create convection currents.

Test a sample to see if it is dry enough. When cool, it should crack but not break when bent. There should not be any moist or underdone spots. Refrigerate the jerky overnight in a plastic freezer bag. Then check again for proper dryness. If necessary, dry longer.

UNIT II: ACTIVITY INFORMATION

Directions for using a different drying method have been used in each activity.

Fruit Leather

Do not dry fruit leather on wax paper or aluminum foil.

Shelf Life
Frozen: 1 year
Refrigerated: several months
Room temperature: 3–4 weeks

Trail Mix

Usually trail mix doesn't include chocolate or yogurt covered snacks because they might melt.

Dried Herbs

Dry small amounts of herbs (one layer) at a time.

Meat Jerky

Not too long ago, home-prepared venison jerky in Oregon was the cause of an outbreak of foodborne illness infections due to the pathogen *E. coli*. The electric dehydrator that was used hadn't reached a high enough temperature to kill the harmful bacteria. Research at Colorado State University has identified two recipes that adequately kill these bacteria in homemade jerky. Either precook the sliced meat in marinade before drying or soak the sliced meat in vinegar (5% acetic acid) for 10 minutes. With both methods, it is recommended that you marinate the jerky overnight before drying.

Jerky Storage
Store jerky in plastic freezer bags or glass jars. For long-term storage, put the jerky in a refrigerator or freezer. Properly dried jerky can be stored at room temperature for approximately 2 weeks in a sealed container, but the fat will turn rancid more quickly if the jerky is at room temperature. It will keep for 3 to 6 months in the refrigerator and up to one year in the freezer. Label packages with date and content.

UNIT III:
South Pole Strategies—Freezing Food

INTRODUCTION

We all use a refrigerator and freezer and probably seldom think of it as "food preservation." But that is exactly what it is. In this unit, we introduce some simple recipes and new strategies to help young people learn to use what used to be called the "icebox" most efficiently.

Activity Objectives

In these activities, youth will make the following:
- Fruit smoothies
- Freezer jam
- Cookie dough
- A week's worth of convenience lunch foods

In Addition:
- Youth will read and interpret instructions.
- Youth will practice how to measure and mix ingredients.
- Youth will practice using kitchen appliances and utensils.

Life Skills

Head:
- Wise Use of Resources

Heart:
- Cooperation

Hands:
- Useful/Marketable Skills

Health:
- Disease Prevention

UNIT III: Shopping List

Fruit Smoothies

- ☐ Blender
- ☐ Cookie sheet
- ☐ Paring knife
- ☐ Zip-lock freezer bags

- ☐ 10–15 IQF* strawberries
- ☐ 2 medium ripe bananas
- ☐ 1 cup apple juice

* Individual Quick Freeze

Freezer Jam

- ☐ 3 cups of fruit (washed and cut)
- ☐ 6 cups of sugar
- ☐ 1 cup of water
- ☐ Pectin

- ☐ Mixing bowl
- ☐ Measuring cups and spoons
- ☐ Jars with lids
- ☐ Labels
- ☐ Permanent markers

Cookie Dough

- ☐ 1 cup (2 sticks) of softened butter or margarine
- ☐ 1 cup packed brown sugar
- ☐ 1/2 cup granulated sugar
- ☐ 2 eggs
- ☐ 1 teaspoon vanilla extract
- ☐ 1 1/2 cups flour
- ☐ 1 teaspoon baking soda
- ☐ 1 teaspoon cinnamon
- ☐ 3 cups uncooked oats
- ☐ 1 cup raisins

- ☐ Measuring cups & spoons
- ☐ Mixing bowl
- ☐ Mixing spoon
- ☐ Freezer paper or aluminum foil

Experiments in Food Storage

- ☐ Sandwich bags
- ☐ Aluminum foil
- ☐ Plastic wrap
- ☐ Wax paper
- ☐ Margarine tub
- ☐ Plastic containers/lids
- ☐ Coffee can/lid
- ☐ Zip-lock freezer bags
- ☐ Other storage containers

- ☐ Labels (or slips of paper and packaging tape)
- ☐ Permanent markers (different colors)

NOTES

UNIT III: FOOD PRESERVER'S INFORMATION

The Advantages of Freezing

- Freezing is a quick, convenient, and easy method of preserving foods in the home.
- Frozen foods are easy to serve on short notice because most of the preparation is done before freezing.
- Freezing preserves the nutritive quality of fresh foods better than any other food preservation method used today.

Freezing Principles

Four factors are responsible for most of the quality losses in frozen food: enzymes, air, large ice crystals, and evaporation of moisture.

***Enzymes*—**Chemical and physical changes occur in plant tissues as a fruit or vegetable matures, reaches its peak of quality, and then decays. These changes in maturity and ripening are due in part to naturally occurring substances called enzymes. Enzyme action can be controlled by freezing or by heating. Freezing only slows enzyme activity. Many frozen foods, such as meats and most fruits, will keep satisfactorily with little or no further control of these enzymes.

***Air*—**Some enzymatic reactions require oxygen to occur, so the exclusion of air from food packages helps to prevent these reactions. For example, the surface browning of cut apples and pears occurs when enzymes in the fruit's cells are released by cutting, allowing them to come in contact and react with oxygen and other cell constituents. Coating a food with syrup or dipping it in a vitamin C (ascorbic acid) solution before freezing are two methods of preventing or reducing a browning reaction. Excluding air from frozen food packages also helps prevent water migration and the resulting freezer burn.

***Ice Crystals*—**The goal during freezing is to facilitate the formation of the smallest ice crystals possible. Large ice crystals rupture food cells and cause an undesirable soft, mushy texture. Fast freezing is the most practical way to form small ice crystals. A constant storage temperature of 0°F or lower helps prevent the growth of crystals.

***Evaporation of Moisture*—**The air in a freezer is very dry. If foods are unprotected or not properly packaged, they will lose moisture. This results in loss of color, flavor, and texture.

Food Packaging

Foods to be frozen must be packaged in a way that protects them from the dry climate in the freezer and excludes as much air as possible. Good packing materials are:

- moisture and vapor resistant
- durable and leakproof
- resistant to cracking and brittleness at low temperatures
- resistant to oil, grease, and water
- able to protect foods from absorption of off-flavors and odors
- easy to seal
- easy to label

Preparing Vegetables for Freezing

Foods containing water expand when frozen. Therefore, frozen food containers must be expandable (plastic) or sealed with sufficient headspace for expansion. For rigid containers, leave a headspace of at least 1/2 inch between the food and the rim of the container.

With the exception of green peppers and onions, vegetables maintain better quality during freezer storage if they are blanched before freezing. Blanching is the process of plunging food into boiling water briefly, then into cold water to stop the cooking process. This kills enzymes and improves flavor and color of many fruits and vegetables.

Vegetables are blanched to:

- slow or stop the action of enzymes that can cause loss of flavor, color, texture, and nutrients
- clean the surface of dirt and organisms, which brightens the color of green vegetables
- wilt or soften them, making them easier to pack

Blanching vegetables can be done in a microwave.

Chart for Microwave Blanching Vegetables

(using a 600–650 watt oven on high power)

Vegetable	Amount of Vegetable	Water	Approximate Microwave Time*
Asparagus, cut into 1-inch pieces	4 cups	1/4 cup	4 1/2 minutes
Beans, green, cut into 1-inch pieces	4 cups	1/3 cup	5 1/2 minutes
Broccoli, cut into 2-inch pieces	1 pound	1/3 cup	6 minutes
Carrots, sliced	4 cups	1/3 cup	6 minutes
Cauliflower, cut into flowerets	1 medium head	1/3 cup	6 minutes
Corn, cut from cob	4 cups	none	4 minutes**
Corn, on the cob	6 ears	none	5 1/2 minutes***
Peas, shelled	4 cups	1/4 cup	4 1/2 minutes
Spinach, washed	1 pound	none	4 minutes

* Be sure to stir or rearrange vegetables halfway through cooking time and let stand 1 minute after cooking time.
** To quickly cool corn cut from the cob, transfer the cooked corn from the hot casserole to a metal bowl set in ice water and stir corn until cool.
*** After chilling, corn on the cob can be cut from cob for freezing or frozen on the cob.

Note: You can find more information about blanching vegetables in **PNW0214** ***Freezing Fruits and Vegetables,*** available online at pubs.wsu.edu and at your WSU County Extension Office.

UNIT III: Handout A

FRUIT SMOOTHIES ANYTIME!

Impress your friends with your culinary creativity! To make fruit smoothies, first prepare your own collection of Individually Quick Frozen fruits.

How to Do an Individual Quick Freeze

Ever tried to thaw a 12-ounce block of frozen peas when you only need a few tablespoons? ***Individual Quick Freeze (IQF)*** is a great way to preserve and freeze fruit in small amounts. If you only want to make a little at a time, you don't have to thaw a huge bag.

Individual Quick Freeze (IQF)

1. Wash your favorite fruit.
2. Drain washed fruit.
3. Peel or pit fruit, if needed (see Unit IV on peeling tight-skinned fruit).
4. If it is a large fruit, cut it into bite-sized pieces.
5. Place the bite-sized pieces onto a cookie sheet or tray.
6. Freeze them immediately.
7. Once frozen, put the individual quick frozen pieces in an airtight container.

STRAWBERRY BANANA SMOOTHIE

2 medium ripe bananas
10–12 IQF strawberries
1 cup apple juice

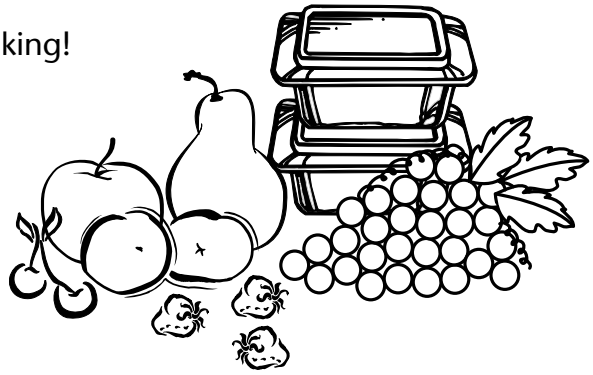
PEACH BANANA SMOOTHIE

2 bananas
10–12 slices of IQF blanched peaches*
1 cup of peach juice

Place all ingredients in a blender and mix until smooth. Pour into glasses and enjoy a delicious, healthy snack!

*See Unit IV to learn how to peel peaches by blanching.

FAST FREEZER JAM



Here is a jam you can make that doesn't require cooking!

What you will need:
3 cups of fruit (washed and cut)
6 cups of sugar
1 cup of water
Mixing bowl
Measuring cups and spoons
Pectin

1. Crush or grind the fruit, depending on the type of fruit you choose.
2. Measure 3 cups of prepared fruit into a large bowl.
3. Add 6 cups of sugar to the unsweetened fruit and stir. Let stand 20 minutes, stirring occasionally.
4. If you use powdered pectin, boil 1 package of pectin and 1 cup of water for one minute, stirring constantly. (Directions may vary with the brand you use. Follow manufacturer's directions if they differ.)
5. Stir prepared pectin into sweetened fruit and stir about 2 minutes.
6. If you use liquid pectin, you don't need to heat it. Add one-half bottle of pectin to 3 cups of sweetened fruit and stir for about two minutes.
7. Pour quickly into jelly glasses or suitable freezer containers. Leave a $^{1}/_{2}$-inch headspace. Cover with lids. Let stand for 24 hours or until the jam sets.
8. Label.
9. Store in the freezer at 0˚F or lower.

IF YOU ARE GOING TO USE YOUR JAM WITHIN 3 WEEKS, you can store uncooked jams in the refrigerator. If kept at room temperature, uncooked jams will mold or ferment in a short time.

What could you add to your jam to vary the flavor?

UNIT III: Handout C

COOKIE DOUGH

Serve fresh-baked cookies at a moment's notice! How? By being prepared, of course. You can make your cookie dough in advance, freeze it in a roll, and then cut as many cookies as you need, whenever you want them.

OATMEAL RAISIN COOKIES

Ingredients:
1 cup (2 sticks) softened butter or margarine
1 cup packed brown sugar
1/2 cup granulated sugar
2 eggs
1 teaspoon vanilla extract
1 1/2 cups flour
1 teaspoon baking soda
1 teaspoon cinnamon
3 cups uncooked oats
1 cup raisins

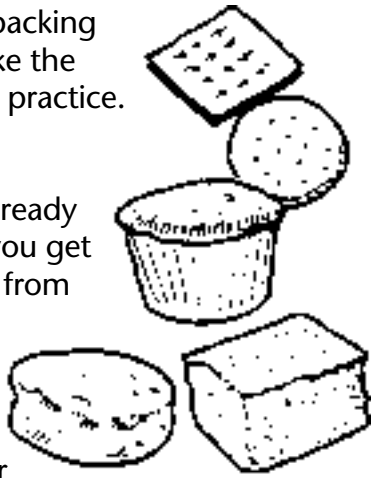
Measuring cups & spoons
Mixing bowl
Mixing spoon
Freezer paper or aluminum foil

1. Beat together margarine and sugars until creamy.
2. Add eggs and vanilla; beat well.
3. In a separate bowl, stir together flour, baking soda, and cinnamon.
4. Add to dough and mix well.
5. Add oats and raisins; stir well.
6. Form dough into a roll on freezer paper.
7. Wrap tightly and freeze.

To Cook:
1. Preheat oven to 400˚F.
2. Unwrap cookie dough.
3. Slice frozen cookies from roll, about 1/4–1/2 inch thick.
4. Place on a cookie sheet, about 2 inches apart.
5. Bake cookies 8–10 minutes.
6. Promptly refreeze any uncooked dough.

Frozen cookie dough will maintain good quality for about six months.

CHILL OUT! LUNCH IS DONE



Ever run out the door to school or a soccer game or a hike without packing anything to eat? By mid-day you start wondering why you didn't take the time to make that sandwich. Managing your time is a skill that takes practice. Here's one way you can save time—be prepared!

Convenience foods are foods that are already made, preserved, and ready to be taken out the door. You can save a lot of time and make sure you get something to eat later in the day. You can either store leftover foods from dinners or prepare foods to freeze or refrigerate.

Whether you are making sandwiches or packaging leftovers for lunch, the freezer can be a big time-saver. How? By preparing a week's worth of lunches at once. Does it save time? Ask your leader about "The Great Lunch Race."

What food safety issues do you think you need to be aware of when packing a lunch?

Using the chart on your Unit III divider page, design a safe lunch with cold foods that can thaw for five hours before being eaten.

WHAT DO YOU THINK?

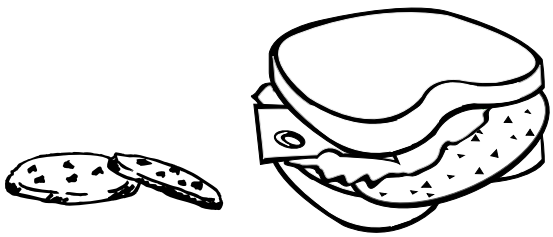
Should you freeze carbonated soda?

Is there a way to stop jelly from turning to liquid when it thaws?

Is it cheaper to pack your own lunch or to buy a prepared snack tray in the store?

How healthy is the snack tray compared to a lunch you prepare?

What's your favorite leftover to take for lunch?



UNIT III: ACTIVITY INFORMATION

ACTIVITY

EXPERIMENTS IN FOOD STORAGE

This activity is also a good introduction to the freezing unit.

Objectives

Practice storing and labeling food.

Preparation

Lay out as many food storage and food wrapping products as you can find around your home.

Activity Part A

1. Ask youth what they think would make a good storage container for refrigerating or freezing food. Ask them to explain their answers.
2. Have each youth select a storage container.
3. Fill each storage container one inch deep with water.
4. Have youth hold their storage container upside down over the sink.
5. Ask *"What do you think happens if moisture escapes in the freezer?"*
6. After the youth make guesses, you can choose some items to freeze in different ways.
7. Make sure to label the containers. There are specific instructions about labeling in Unit I.

Activity Part B

At the next meeting, take the frozen goods out of the freezer and ask the youth what happened in each particular case. Be sure to assist them in noticing:

- Dryness
- Ice crystals (if any)
- Airtight containers
- Ask the youth to describe the perfect freezing environment.
- Participants may want to wait for their food to thaw, then check the flavor and texture.

For additional information about freezing vegetables, be sure to read "Blanching Vegetables" in the Additional Information section of Unit IV.

UNIT IV:
Boil Buddies—Canning

INTRODUCTION

Canning introduces youth to even more complex methods of food preservation. There are several methods of canning; in this youth guide we will not cover pressure canning. Complicated safety precautions are necessary when canning foods in a pressure canner. If you are interested in pressure canning, please refer to the appendix in the back of this book for other Extension publications.

Important:
In this unit, youth are introduced to the "boiling water bath" method of canning. This method can only be used to preserve foods with a ***high acid*** content, which include most fruits, tomatoes, pickles, and fruit spreads. ***Foods with a pH of 4.6 or more are less safe for this type of canning and must be canned in a pressure canner.*** Foods with a pH higher than 4.6 include meats, fish, poultry, and most vegetables.

Remember pH numbers are "backwards." The lower the pH number, the higher the acid content. Be particularly cautious about canning tomatoes as their pH number can vary dramatically. Please read the Food Preserver's Information and refer to the chart on handout A when choosing foods for canning.

Activity Objective

In this unit, youth will use canning techniques to make:
- Fresh-pack dill pickles (raw pack)
- Applesauce
- Peaches (hot pack)

In addition:
- Youth will utilize charts and pH strips.
- Youth will practice kitchen safety.
- Youth will reinforce following instructions and measuring skills.

Life Skills

Head:
- Wise Use of Resources

Heart:
- Cooperation

Hands:
- Useful/Marketable Skills

Health:
- Disease Prevention

UNIT IV: Shopping List

Something pHunny

- ☐ Liquids squeezed from various fruits and vegetables
- ☐ Vinegar, soda (optional)
- ☐ Baking soda
- ☐ Lemon juice
- ☐ Juice glasses
- ☐ pH strips (purchase at a local pharmacy) ***OR*** water from boiled red cabbage

Applesauce

- ☐ 2 lb tart cooking apples
- ☐ 1/2 cup of water
- ☐ 2 teaspoons lemon juice
- ☐ 1 teaspoon cinnamon
- ☐ 1/2 teaspoon ground ginger
- ☐ 1/2 teaspoon ground cloves
- ☐ 1/4 teaspoon allspice
- ☐ Honey or sugar (to taste)

- ☐ Large boiling pot
- ☐ Stirring spoon
- ☐ Paring knife
- ☐ Spatula
- ☐ Colander and pestle, or potato masher
- ☐ Large bowl
- ☐ Canning jars & lids with rings
- ☐ Jar tongs
- ☐ Oven mitt or potholders
- ☐ Canner pot

Raw Pack Dill Pickles

- ☐ 4 lb pickling cucumbers, 3-5 inches long
- ☐ 14 garlic cloves
- ☐ 1/4 cup pickling salt
- ☐ 2 3/4 cups vinegar (5% acidity)
- ☐ 1/4 cup sugar
- ☐ 3 cups water
- ☐ 2 teaspoons whole mustard seed per quart jar
- ☐ 14 heads fresh dill or 1 tablespoon dill seed per quart
- ☐ 28 peppercorns

- ☐ Canning jars & lids with rings
- ☐ Boiling water bath canner
- ☐ Funnel
- ☐ Rack

Blanching & Canning Peaches

- ☐ 3-4 peaches
- ☐ Ice cold water (use ice cubes) in a sink or large bowl

- ☐ 3-4 quart saucepan that has a blanching basket
- ☐ Potholders
- ☐ Canning jars & lids with rings
- ☐ Boiling water bath canner
- ☐ Funnel
- ☐ Rack

NOTES

UNIT IV: FOOD PRESERVER'S INFORMATION

A Canner or a Pot?

Special water bath canners are available for canning fruits and other acid foods. However, you can use any large metal pot as a boiling water bath canner if it is deep enough so that water can boil freely, well above the jar tops. There should be room for one inch of briskly boiling water above the jar tops. The canner must have a cover and a wire or wooden rack to hold jars and keep them from touching the bottom of the canner. Minerals in the boiling water will be deposited onto the container used for the boiling water bath, so most people prefer not to use a good-quality large metal pot if canning is done on a regular basis.

Hot Packing Versus Raw Packing

Many fresh foods contain from 10 to 30 percent air or more. The length of time that canned food retains its quality depends on how much of this air is removed from food before jars are sealed.

Raw packing is the practice of filling jars tightly with freshly prepared, room temperature food. Boiling hot juice, syrup, or water is added to cover the raw food in the jar. Raw packed foods, especially fruit, will float in the jars because air has not been removed by heating the food. If the food floats above the liquid level, the air around the food may cause discoloration within two to three months of storage.

Raw pack is advantageous with foods that lose their shape in cooking because they are usually easier to handle when raw.

Hot packing is the practice of heating freshly prepared food to boiling, simmering it three to five minutes, and promptly filling jars loosely with the heated food. Juice, syrup, or water added to hot-packed (and raw-filled) foods should be heated to boiling before adding to jars. This practice helps to remove air from food tissues, shrinks food, helps keep the food from floating, and increases vacuum in sealed jars. Hot packing is the best way to remove air. Hot packing increases the amount of food that can be added to each jar, since the food shrinks with heating. At first, the color of hot-packed foods may appear no better than that of raw-packed foods, but after storage, both color and flavor of hot-packed foods may be superior.

Boiling Water Canners

Boiling water canners are made of aluminum or porcelain-covered steel. They have removable perforated jar racks and fitted lids. The canner must be deep enough so that at least one inch of briskly boiling water covers jar tops during processing. Half-gallon jars are too tall for most canners because there is no space for the proper

amount of briskly boiling water above the tops of the jars. Half-gallon jars of apple or grape juice may be processed in stockpots that measure 12 inches wide and 12 inches high.

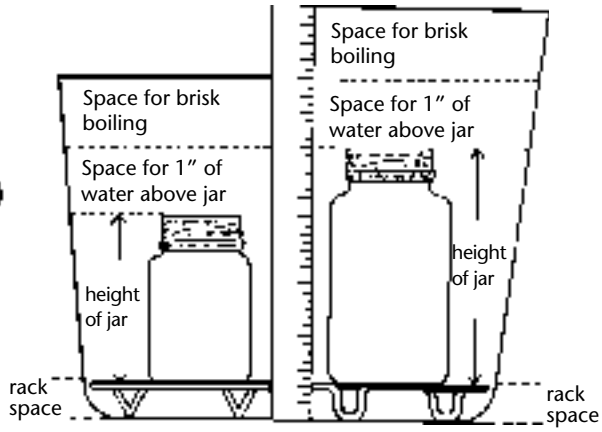
Canning Jars

It is best to use jars made especially for home canning, since mayonnaise and similar jars break more easily during heat processing. You can select jars with regular or wide mouths. The wide mouth jars may have shoulders or may be gradually tapered from top to bottom. The tapered jar is preferred for freezing. But you can use either shape for canning most foods.

Proper Canning Practices

1. Carefully select good quality food. Sort to remove diseased and moldy fruits. This reduces the number of microorganisms on the food.
2. Wash and peel, if appropriate.
3. If hot packing, heat and boil for one to five minutes. This kills most microorganisms, destroys enzymes, and will drive out air.
4. Immediately fill hot jars with food, leaving the appropriate headspace. (If processing time is less than 10 minutes, sterilize jars before filling with food.)
5. Add acids (vinegar, lemon juice, lime juice, or citric acid) to some foods.
6. Apply and tighten self-sealing lids.
7. Process jars for the recommended time in a boiling water canner or pressure canner.
8. Cool jars 12 to 24 hours to form vacuum seals.
9. Remove screw bands, wash, label, and store sealed jars.

Water Bath Canner



Collectively, these practices remove oxygen, destroy enzymes, prevent the growth of undesirable bacteria, yeast, and molds, and help form a high vacuum in jars. Good vacuums form tight seals that keep liquid in, and air and microorganisms out.

Something pHunny is going on here!

pH Levels for Common Foods

pH	Average Values for Common Foods	pH	Average Values for Common Foods
2.0	Limes	5.1	Cucumbers, peppers, papaya
2.1		5.2	Turnips, cabbage, squash
2.2	Lemons	5.3	Parsnips, beets, watermelon
2.3		5.4	Sweet potatoes, bread
2.4		5.5	Spinach
2.5		5.6	Asparagus, cauliflower
2.6		5.7	Beans
2.7		5.8	Meat (5.8 to 7)
2.8		5.9	
2.9	Vinegar, plums (2.8-4.6)	6.0	Tuna
3.0	Gooseberries	6.1	Potatoes
3.1	Prunes, apples, grapefruit (3.0 to 3.3)	6.2	Peas, mushrooms, cantaloupe
3.2	Rhubarb, dill pickles	6.3	Corn, oysters, dates, honeydew melon
3.3	Apricots, blackberries	6.4	Egg yolk, rice, wild rice
3.4	Strawberries, lowest acidity for jelly	6.5	
3.5	Peaches	6.6	Milk (6.5 to 6.7)
3.6	Raspberries, sauerkraut, oranges	6.7	
3.7	Blueberries, oranges (3.1 to 4.1)	6.8	
3.8	Sweet cherries, olives	6.9	Shrimp
3.9	Pears	7.0	
4.0	Acidophilus milk	7.1	
4.1	Mangos	7.2	
4.2	Tomatoes (4.0 to 4.6)	7.3	
4.3	Mayonnaise	7.4	
4.4	Lowest acidity for processing at 100˚C (212˚F)	7.5	
		7.6	
4.5	Buttermilk	7.7	
4.6	Bananas, figs	7.8	
4.7	Asian pears, pimentos	7.9	
4.8		8.0	Egg white (7.0 to 9.0)
4.9		8.1	
5.0	Pumpkins, carrots	8.2	

Color the boxes green or pink, depending on the result of your pH test.
Where do you see a change?

Source: Foods and Nutrition Section, American Home Economics Association, *Handbook of Food Preparation,* 1993, 9th Edition. Dubuque, IA: Kendell/Hunt Publishing Co.

Fresh-Pack Dill Pickles

Ingredients:
4 lb pickling cucumbers, 3 to 5 inches in length
14 garlic cloves
1/4 cup pickling salt
2 3/4 cups vinegar (5% acidity)
1/4 cup sugar
3 cups water
2 teaspoons whole mustard seed per quart jar
14 heads fresh dill or 1 tablespoon dill seed per quart
28 peppercorns

Directions:
1. Wash cucumbers thoroughly and cut in half lengthwise.
2. Heat garlic, salt, vinegar, and water to boiling. Remove garlic and place 4 halves into each pint or quart jar.
3. Pack cucumbers into jars, adding 2 heads dill and 4 peppercorns.
4. Pour hot vinegar solution over cucumbers to within 1/2 inch of top.
5. Adjust lids and process in a boiling water canner for the following time:

Pints	10 minutes at elevations of 1000 feet or less
	15 minutes at elevations between 1001 to 6000 feet
	20 minutes at elevations above 6000 feet
Quarts	15 minutes at elevations of 1000 feet or less
	20 minutes at elevations between 1001 and 6000 feet
	25 minutes at elevations above 6000 feet

6. Remove the jars. Set the jars upright, several inches apart, on a wire rack or folded towel to cool.
7. Cool jars, then test the seal. Label, evaluate, and store.

This method is called ***raw pack*** because you did not cook the cucumbers (pickles) before packing them into the jars. You ***raw pack*** when you are concerned that excessive boiling or heating might ruin the shape of your preserved food.

Pickles date back to at least 2030 BC. It is thought that the pickle's origin is in Chinese culture because workers on the Great Wall of China were known to eat lunches of "salted vegetables." In ancient Mesopotamia, cucumber seeds were planted in the Tigris Valley. The Romans ate pickles because Julius Caesar thought that pickles would keep his men healthy. The taste for pickled foods spread through Europe into the New World. Today pickles are still a favorite on the American table. Each country has its favorite pickled food. In England "cold catsup" is a favorite with cold roast beef and other meats. This is a tomato-and-vegetable combination that many Americans enjoy as a condiment. Truly American pickled foods are pickled melon rinds, peaches, and pears. Pickled boiled eggs are a favorite in many homes, too! And how many of you like sauerkraut?

Boil Bath Canning

This is a simple and reliable method.

You will need:

- Canning jars, lids, and rings
- Rack
- Canner pot and lid

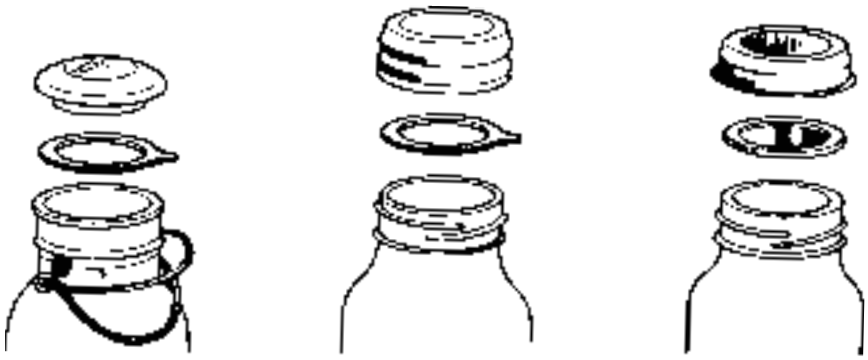
In preparation:

Wash jars, lids, and bands in hot, soapy water. This reduces the number of microorganisms on the jars and lids. The fewer the number of microorganisms present, the easier it is to destroy them during processing. Jars do not need to be sterilized unless they will be processed for less than 10 minutes in the boiling water bath canner.

Directions:

1. Fill the jar with food and hot liquid. Release the air bubbles by inserting a flat plastic spatula between the food and the jar.
2. Wipe the top of the jar with a damp paper towel.
3. Put the metal lid on top of the jar with the rubber ring facing down.
4. Screw on the metal band to a snug fit.
5. Process the jars in a boiling water canner. See your Divider Page for processing times.
6. Remove jars from the canner and cool thoroughly. Do not retighten the screw band when the hot jars are removed from the canner. (If you screw the bands on tighter while the rubber is hot, you may cut through the sealing compound, and then the jar will not seal.)
7. When the jars are cooled, check to be certain that the lids are sealed. Remove metal screw bands before storing so the bands do not rust.

The flat metal lids with rubber gaskets can only be used for sealing jars one time. When the flat metal lids on the jars are heated, the rubber on the lid softens and seals the jar, yet still allows air to escape from inside. You can reuse the screw bands if they are in good condition.



UNIT IV: Handout C

Homemade Applesauce

Have you ever tasted the difference between homemade applesauce and the kind you buy in a store? Careful! Once you try making your own you may never want store bought applesauce again!

You will need:
2 lb tart cooking apples
1/2 cup water
2 teaspoons lemon juice
1 teaspoon cinnamon
1/2 teaspoon ground ginger
1/2 teaspoon ground cloves
1/4 teaspoon allspice
honey or sugar (to taste)

Large boiling pot
Stirring spoon
Paring knife
Spatula
Colander and pestle, or potato masher
Large bowl
Canning jars & lids
Canning jar tongs
Oven mitt or potholders
Canner pot

Directions:
1. Do not peel or core your apples, but remove stems and blossom ends. Cut the apples in half and place them in a pot of boiling water.
2. Cook, covered, until they are tender (about 15 minutes).
3. Press the apples through a colander, adding sugar or honey as you go.
4. Spice according to taste.

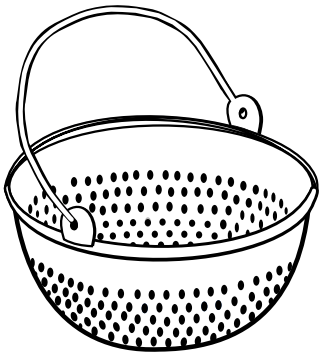
If you have made delicious applesauce, you probably want to save some for later. If you were to can your applesauce right after heating this would be **hot packing**. (Remember raw packing?) **Hot Packing** means the liquid used in the canning jars AND the food is heated. One difference between hot packing and raw packing is that hot packing removes more oxygen, which may mean improved color, flavor, and quantity of your preserved food.

Applesauce is thick and heat penetrates very slowly to the center of the jar, so it is essential that the applesauce be HOT (above 185˚F) when packed into the jars.

Peeling and Canning Peaches

Before you can preserve your peaches, you will need to peel them. Here is a way to remove skins faster than paring.

Boil Peeling



You will need:
3- or 4-quart saucepan with a blanching basket
Potholders
3–4 peaches
Ice cold water (use ice cubes) in a sink or large bowl

Directions:
1. Prepare a solution of water and ascorbic acid. This keeps the blanched peaches from turning dark.
2. Choose peaches without green skin; they should be ripe. Wash.
3. Bring a blanching pot full of water to a boil.
4. Place the peaches in the blanching basket, then submerge the basket when the water begins to boil.
5. Ripe peaches will need 30 to 60 seconds in the boiling water.
6. Using the potholders, remove the blanching basket from the boiling water, and submerge it into the ice water.
7. The skins should now be loose and easy to remove.

Canning Directions:
1. Peel the peaches and remove the pit.
2. Slice peaches.
3. Fill the water bath container with hot water and start to heat it before you prepare your fruit. The water should be 180˚F for hot packed foods.
4. Choose the kind of sugar syrup your family prefers, considering the tartness of your peaches.

   Light syrup: $5\frac{3}{4}$ cups water and $1\frac{1}{2}$ cups sugar
   Medium syrup: $5\frac{1}{4}$ cups water and $2\frac{1}{4}$ cups sugar

5. Alternatively, you can use a fruit juice instead of sugar syrup.
6. Boil syrup until sugar dissolves or bring the fruit juice to a boil.

Hot Pack Your Peaches

1. Prepare peaches as directed above.
2. Heat peaches by covering in hot syrup.
3. Pack hot fruit in desired container to 1/2 inch from the top.
4. Cover with boiling liquid, leaving a 1/2-inch space at top of jar. Apply and tighten self-sealing lids.
5. Process in boiling water bath, adjusting for elevation if needed (see Divider for Unit IV).

   Pint jars — 20 minutes
   Quart jars — 25 minutes

Remove jars of food immediately when the processing time is up. There are many types of tongs for lifting hot jars out of the water bath. Select a type that holds jars securely and is easy for you to use.

UNIT IV: ACTIVITY INFORMATION

ACTIVITY 1 — SOMETHING pHUNNY

Have youth measure and record the acidity of various foods. Ask them to discuss how acid affects preservation. Explain why it is safer to can high acid foods. (The water from boiled red cabbage acts as a pH sensor, indicating acids as pink and bases as green. This method may not be accurate enough to read sensitive pH levels.) They can use the chart on the Unit IV Divider to help them figure out safe high acid foods for boiling water bath canning.

ACTIVITY 2 — FRESH PACK PICKLES (raw pack)

This activity includes an introduction to using the boiling water bath for canning pickles.

ACTIVITY 3 — APPLESAUCE (raw pack)

ACTIVITY 4 — BOIL PEELING AND CANNING PEACHES (hot pack)

Take the jars from the canner. If the liquid boiled out during processing, do not open the jars to add more liquid. Losing liquid does not cause spoilage. However, food that is not covered may discolor and be less attractive.

Let jars cool, right side up. Leave enough room around each jar so that air can circulate. Never put a hot jar on a cold surface. Instead, set jars on a rack or on a folded cloth. Keep hot jars away from drafts, but it is not necessary to slow cooling by covering the jars.
If jars are sealed and cool, carefully remove the screw bands. Wipe all jars clean before storing. Label jars with contents, date, month, and year. If you canned more than one variety, you may wish to note this on the label as well. Store jars in a cool, dry place.

Wash the metal bands and dry them carefully. You can also dry bands by placing them in a 200˚F oven until dry. Store the bands in a cool, dry place to prevent rusting.

Unit V:
Out of the Frying Pan—More Activities

INTRODUCTION

There are many opportunities for 4-H youth to use the skills they learn in food preservation for fun, leadership, and service.

Activity Objectives

- Youth will explore commercially preserved foods sold in their community.
- Youth will use their food preservation skills in presentation and community service.
- Youth will evaluate the quality of their products.

Life Skills

Head:
- Wise Use of Resources

Heart:
- Cooperation

Hands:
- Useful/Marketable Skills

Health:
- Disease Prevention

UNITS 1–4: GAMES & ACTIVITIES

GROCERY GAMES

Food Handling

(Ask permission from a store manager before conducting this observation.) Have youth stand in the produce section and record how often people handle produce. This activity can be particularly meaningful after the Handwashing Activity in Unit I.

What's Ripe?

Produce managers in grocery stores know a great deal about this subject. Call ahead and ask if a produce manager would be willing to talk to your club members about tips for identifying ripening fruit. Youth can use the Unit II Divider page to create a chart.

Expiration Date

Ask a store manager if your youth can watch what they do with food that has spoiled or reached an expiration date.

What's in a Label?

What can you discover about frozen or dried foods from reading the labels? Compare the labels of several different products. Which has the most nutritional value? Which tastes best? Which would you want on a camping trip? Which would you serve at a party?

Frozen Foods

Have youth create a chart to examine a variety of frozen fruits in the grocery store. Elements on their chart might include:

- method of freezing (individual quick, juice, syrup, etc.)
- anti-browning agent used
- price/weight
- nutritional information
- packaging (can, plastic, vacuum-packed, etc.)
- expiration date

If you purchase fruits frozen in a variety of ways, youth can also record flavor, thaw times, and browning times.

Frozen Dinner Night

On a shopping trip, have each family member pick out a different frozen dinner. Serve the dinners on the same night, and bring the packaging to the table as well. You may wish to discuss:

- quality/cost
- nutritional information
- packaging techniques
- whether you could freeze the dinner yourselves

Freezer Exam

Have youth draw a map of the inside of their freezer. Are things stacked? How much room is there? Are there more bags or containers? They can also check for headspace and check the current temperature. Ask them if they can think of a way to map the contents without holding the freezer door open for a long time.

Freezer Burn

Have club members freeze samples of the same product using different packaging:

- fold-over sandwich bag
- zippered sandwich bag
- plastic freezer bag
- freezer paper
- vacuum-packed bag (if available)
- heavy plastic air-tight containers
- glass jar
- aluminum foil

Revisit your samples in three weeks and evaluate their quality. Ask what conclusions they can draw from their observations.

Lunch Prep Race

To demonstrate that preparing foods a week in advance saves time, have youth divide into two teams. Team 1 will prepare everything for the week (five days) at once. Team 2 has to put everything away and take everything out five times. Time them with a stopwatch to see how much longer it takes to make lunch five times.

ACTIVITIES FOR PUBLIC PRESENTATION AND COMMUNITY SERVICE

Community Service

Here are some suggestions for service activities related to your food preservation work:

- Public education presentations on food safety
- Creating food safety teams for school cafeterias
- Creating gift baskets of their preserved foods

Use the simplified form *Unit V Handout A* to help youth plan and report on a community project.

Record Books

Many 4-H youth record their community leadership projects in record books. Record book requirements vary in different county 4-H programs. Contact your county Extension office about local 4-H record book expectations, particularly if you are submitting it to be judged in a record book contest.

Record books also help youth keep track of all they have done, and serve as excellent portfolio pieces. It is more than a scrap book—it serves as a planning guide, a budgeting workbook, and a documentation of project development over time.

Handout A in this unit will help youth plan a service project that they can include in their record books.

Judging a Project

4-H youth often have the opportunity to have their project work appraised (or judged). While competition for blue ribbons appears to be the motivator for judging competitions, the real reason judging exists is to help youth develop comparative critical thinking skills. A young person that becomes focused on being better than someone else risks losing the initiative of self-improvement. By the same token, a youth that becomes too concerned with self-improvement may develop self-criticism or self-defeating beliefs. If youth learn that the purpose of judging is an end in itself, the skill to be a better producer and discriminating consumer, they have learned much.

Take it to the Fair!

Several samples of project scorecards related to the activities youth prepared in this activity guide have been included. Ask the youth to evaluate their own work and a partner's project, based on the scorecards.

In addition to service, many youth may want to take their food preservation projects to the fair. The handout pages of this unit contain samples of Washington State 4-H Fair scorecards for food preservation projects. Contact your county Extension office to find out how youth can enter the fair, or read the Premium Books distributed by your county and state fair associations.

UNIT V: Handout A

Project Activity Planning Sheet

My Name: _____

My Project: _____

Here are three skills I have learned:

1. _____

2. _____

3. _____

Here are three ideas of ways I can use these skills in the community:

1. _____

2. _____

3. _____

Here is what I did in the community:

_____

_____

_____

_____

What I learned about my project is:

_____

_____

_____

_____

C0203 **CANNED FRUIT OR VEGETABLE SCORECARD**

Examine exhibit for the qualities listed below. Place a check in each row to indicate the placing deserved.

Exhibitor's Name (or No.) _____

Class _____ Ribbon _____

	Excellent	Good	Fair	No Placing
A. Appearance Product—free from mold & discoloration				
—holds shape well				
—free from blemishes				
—uniform maturity				
—uniform size and shape				
Liquid—clear				
B. Container Standard canning jars				
Seal intact				
Clean				
Screw band removed for storage				
C. Label Information Type pack listed				
Processing method listed				
Processing time accurate				
Dated				
Product identified				
Adjustments indicated, if any				
D. Pack Good proportion of liquids to solids				
Adequate headspace				
Liquid covers product				
Little or no floating product				

E. Comments: _____

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WASHINGTON STATE UNIVERSITY EXTENSION

C0537

SCORECARD FOR EVALUATION OF PICKLES, RELISHES, OR CHUTNEYS

Examine exhibit for the qualities listed below. Place a check in each row to indicate the placing deserved.

Exhibitor's Name (or No.) _____

Class _____ Ribbon _____

PICKLES, RELISHES, OR CHUTNEYS

MANDATORY REQUIREMENTS:	YES	Disqualified
Label information present		
Adequate processing time		
Recipe present		
Correct vinegar to water ratio for fresh pack pickles		
Salt present in brine pickles or sauerkraut		
Good seal		
Standard jar without ring		
Appropriate jar size		
Multiple ingredients listed		

PRODUCT SAFETY ISSUES—**60 PTS.**	Excellent	Good	Fair	Needs Improvement
Correct headspace				
Clean jar and lid				
No rust on lid/stains on threads				
Produce is blemish free				
No debris in jar				
Jar is not overfull				

PRODUCT AESTHETICS—**40 PTS.**	Excellent	Good	Fair	Needs Improvement
Brine Pickles or Sauerkraut:				
Brine is not cloudy & covers product				
Pickles are olive green				
Attractive pack				
Sauerkraut has bright color				
Sauerkraut pieces are uniform in thickness				
Fresh Pack Pickles—Vegetables:				
Blossom ends removed from cucumbers				
Whole spices preferred				
Liquid is not cloudy & covers product				
Attractive pack				
Fresh Pack Pickles—Fruit:				
Fruit is not overly mature				
Pieces are uniform in size and shape				
Liquid is not cloudy & covers product				
Attractive pack				
Relish:				
Uniformly chopped produce				
Spices evenly distributed				
Bright, attractive color				
Product does not appear dried out or discolored on top				
Chutney:				
Rich color				
Spices evenly distributed				
Not burnt or scorched				
Product does not appear dried out or discolored on top				

C0538

DRIED FOOD SCORECARD

Exhibitor's Name (or No.) _____

Class _____ Ribbon _____

Examine exhibit for the qualities listed below. Place a check in each row to indicate the placing deserved.

	Excellent	Good	Fair	No Placing
A. Appearance Uniform size and shape				
Free from visible mold growth and visible moisture				
Free from large seeds, very thick peelings, cores				
Color appropriate for product and method of pretreatment; not overly dark				
B. Container or Package Moisture-proof				
Air-proof				
Prevents contamination				
Durable				
C. Label Information Kind of food				
Method of drying (oven, dehydrator, sun)				
Total drying time				
Pretreatment used (if any)				
Date				
D. Dryness Fruits: leathery and pliable				
Vegetables: brittle, hard, leathery, or pliable, as applies to each vegetable				
Herbs: dry enough to crumble when crushed				
Fruit leather: leathery, pliable, firm, and peels easily from plastic wrap; free of large pieces of fruit				
Lacks stickiness				

E. Comments _____

4-H LUNCH ON THE GO ACTIVITY SCORECARD

Exhibitor Name_____ **Grade Division (Check one)**

Years in 4-H _____ _____ Jr. (Gr. 3-5)

Years in 4-H Foods _____ _____ Int. (Gr. 6-8)

_____ Sr. (Gr. 9-12)

Judging Criteria	Possible Points	Points Scored	Comments
1. PERSONAL SKILLS – Neat and clean appearance – Courteous – Explained procedures well	15		
2. FOOD PREPARATION SKILL & TIME MANAGEMENT – Preparation done in logical order – Use and care of equipment done correctly and safely – Made accurate measurements; no pre-measurements – Proper packaging used to avoid drying out – Napkins, sanitized wipes, utensils, and condiments included as needed	20		
3. FOOD AND KITCHEN SAFETY – Foods selected would be safe in lunch – Avoided cross-contamination of foods during preparation – Washed hands as needed – Used equipment with ease, skill, and safety – Kept work areas in order – Foods packed to be safe after 5 hours at room temperature – Perishable foods kept below 40 degrees – Appropriate storage container	20		
4. CLEANUP – Done in orderly fashion – Sanitized when and where needed	10		
5. KNOWLEDGE OF PACKED LUNCHES – What Food Groups are represented or missing? – Cost comparison to purchased lunch – How quality is affected by packaging techniques	20		
6. FOODS SERVED/PREPARED – Creative choice of foods – Pleasing combination of flavors, colors, texture, etc. – Is it nutritious? – Does it fit within a day's menus?	15		
TOTAL POINTS	100		

Circle Ribbon Placing

Blue = 90-100 Red = 80-89 White = 70-79 **Judges initials** _____

Developed for Washington State 4-H Youth Development Program 6/15/04

FOR MORE INFORMATION

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PNW0397—*Drying Fruits and Vegetables,* Swanson and McCurdy, 2000.*

*Available online at http://pubs.wsu.edu

College of Agricultural, Human, and Natural Resource Sciences

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