LIFEPAC®

ELECTIVE

STUDENT BOOK

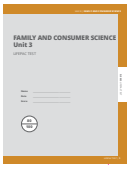
Family and Consumer Science

Unit 3

AOP

FAMILY AND CONSUMER SCIENCE

FOOD SAFETY AND PREPARATION



LIFEPAC Test is located at the back of the booklet. Please remove before starting the unit.

Food Safety and Preparation

Introduction

Knowing how to safely store and prepare the food in your home is a big part of maintaining a healthy home. No one wants to get food poisoning, as it's a miserable experience. And there are other potential food-borne illnesses that can be much more serious, with lasting health consequences. The first section of this unit will provide a detailed overview of potential food safety hazards and ways prevent food spoilage and contamination.

In the other two sections, you'll learn cooking and baking techniques for foods in MyPlate's five food groups of protein, grains, fruits, vegetables, and dairy. You'll learn everything you need to know to create healthy, enjoyable meals, snacks, and desserts. Once you have mastered the basics of food preparation, you can begin to experiment on your own to create dishes that meet your own preferences. Let's get started!

Objectives

Read these objectives. The objectives tell you what you will be able to do when you have successfully completed this LIFEPAC®. When you have finished this LIFEPAC, you should be able to:

1. Understand the importance of food safety.
2. Understand safe food handling practices.
3. Understand types of food contamination.
4. Recognize the symptoms of an allergic response.
5. Understand the role of personal hygiene in food safety.
6. Know the safety rules for cooling and heating foods.
7. Know the safety rules for storing different types of food.
8. Know the steps to keep a clean, sanitary kitchen.
9. Describe the rules for accident prevention.
10. Understand a variety of cooking techniques for meats, starches, and vegetables.
11. Recognize safe preparation and storage practices for meats, starches, and vegetables.
12. Become familiar with spice combinations that complement certain foods.
13. Become familiar with different types of cheese, their sources, and uses.
14. Become familiar with different types of fruits and their seasonal availability.
15. Understand methods of preparing and serving fruit.
16. Recognize the chemical reactions required in baking versus cooking.
17. Gain practical knowledge of using milk in cooking and baking.
18. Become familiar with the steps to bake yeast bread and self-rising bread.

1. FOOD STORAGE & KITCHEN SAFETY

Food safety is an important topic. Improper food storage, handling, and cooking can lead to food poisoning, which can make for a miserable day in a less serious circumstance and severe illness or even death in a more serious one. For example, in August 2010, 380 million eggs were recalled by egg companies after nearly 200 people contracted salmonella poisoning, which is a **food-borne illness** caused by **bacteria**. In 2011, the Centers for Disease Control and Prevention (CDC) reported 146 people were infected with strains of Listeria monocytopenes, another bacterium that causes food-borne illness. Thirty deaths were reported. The source was bacteria found in cantaloupes.

Young children under the age of four, elderly people, and pregnant women are most susceptible to food poisoning. Anyone with an impaired immune system is also more susceptible. While large-scale food-borne illnesses like these examples are often the result of a toxin in the soil or **contamination** during transport, they can also happen in the home. The ways that food is stored, washed, and prepared can all impact how safe it is to eat. In this section, you'll learn more about food safety hazards and steps you can take to prevent food-borne illness.

Section Objectives

Review these objectives. When you have completed this section, you should be able to:

1. Understand the importance of food safety.
2. Understand safe food handling practices.
3. Understand types of food contamination.
4. Recognize the symptoms of an allergic response.
5. Understand the role of personal hygiene in food safety.
6. Know the safety rules for cooling and heating food.
7. Know the safety rules for storing food.
8. Know the steps to keep a clean, sanitary kitchen.
9. Describe the rules for accident prevention.

Vocabulary

Study these words to enhance your learning success in this section.

anaphylaxis
bacteria
contamination
food-borne illness
fungi
microorganisms
pathogens
sanitation
spore
toxic
virus

Note: All vocabulary words in this unit appear in **boldface** print the first time they are used. If you are unsure of the meaning when you are reading, study the definitions given.

Potentially hazardous foods. The FDA defines potentially hazardous food as "any perishable food which consists in whole or in part of milk or milk products, eggs, meat, poultry, fish, shellfish, or other ingredients capable of supporting rapid and progressive growth of infectious or toxigenic micro-organisms."

In the following table, you will see the most common food sources for bacteria. Some foods are more likely to have the right conditions (high in protein, mildly acidic pH) for bacteria growth than others. For example, you will notice that eggs and poultry are a source of salmonella. Red meat and dairy products also provide protein-rich environments. Fish and shellfish can be another source of bacteria.

It's not just meat and dairy products that are fertile ground for bacteria, however. Potatoes, cooked rice, and beans (especially refried) can become breeding grounds for bacteria under the right conditions. To prevent those conditions, you'll want to make sure your foods are prepared and stored at safe temperatures for safety.

Even fruits and vegetables, which are not protein-rich, may be contaminated and be the source of illness-causing bacteria.

Food Toxins. The CDC lists thirty-five types of bacteria that cause food-borne illnesses. These bacteria cause illness either through food infection or through food intoxication. Notice that the word toxic is embedded in the word "intoxication." A toxin is a poison. Some bacteria create a toxin in the body after ingestion, and the toxins create illness. One example of a food toxin is salmonella.

According to the Mayo Clinic, the symptoms of salmonella poisoning include:

- nausea and vomitting
- abdominal pain
- diarrhea
- fever
- chills
- headache
- muscle pain
- blood in stool

| Foodborne Pathogen

Let's look at some of the most common food sources for bacteria.

Bacteria	Food Source	Symptoms	Prevention
Bacillus cereus	meats, milk, vegetables, rice, starchy foods, grains and cereals	diarrhea or vomiting	Properly heat, cool, and reheat foods.
Campylobacter jejuni	raw or undercooked poultry meat or cross-contamination of other foods by these items	diarrhea, cramping, abdominal pain, and fever—typically lasts one week	Cook all poultry products thoroughly: meat should be cooked throughout (until no longer pink), and any juices should run clear.
Escherichia coli (E. coli) *	unpasteurized (raw) milk, water that has not been disinfected, contact with cattle, contact with the feces of infected people, unpasteurized apple cider, and soft cheeses made from raw milk	diarrhea, urinary tract infections, respiratory illness and pneumonia, and other illnesses	Wash hands thoroughly after using the bathroom or changing diapers, before preparing or eating food, and after contact with animals or their environments—cook meat thoroughly.
* Although most strains of E. coli are harmless, others can make you sick.			
Clostridium perfringens (C. perfringens)	red meat and poultry	watery diarrhea and abdominal cramps within six to twenty-four hours (typically eight to twelve hours)	Cook meat thoroughly to an internal temperature of at least 145 degrees F, then keep warmer than 135 degrees F or cooler than 41 degrees F after cooking; serve meat dishes immediately after cooking; refrigerate leftovers immediately and reheat to at least 165 degrees F before serving.
*Listeriosis**	raw foods, uncooked meats and vegetables; unpasteurized (raw) milk and cheeses and foods made from unpasteurized milk; in some ready-to-eat foods, such as hot dogs and deli meats	diarrhea, nausea, fever, miscarriage, meningitis, possible death	Check the temperature inside your refrigerator, which should be 40 degrees F or lower and 0 degrees F or lower in your freezer.
Warning: Listeria can grow and multiply in some foods in the refrigerator.			

Any cleaning products or other chemicals should be stored in locked storage areas away from food preparation areas. Always follow the instructions for use when using cleaners, polish, drain blockage removers, etc.

The federal government publishes a list of additives that are Generally Recognized As Safe (GRAS). The federal government must regulate additives because some food additives have been linked to illness. Monosodium glutamate (MSG) is a flavor enhancer that, when used in excess, can cause headaches, dizziness, burning throat, and nausea. Checking ingredient labels in the foods you buy can help you avoid additives like MSG in the food you purchase.

Food allergies. You learned about food allergies in Unit 2. It's important to prevent anyone in your home from having an allergic response to food. Some allergies can be so severe, even cross-contamination from an allergen food touching the same countertop, cutting board, or plate as a non-allergen food can cause a response.

According to the National Institute of Allergies and Infectious Diseases, the foods that cause most allergic reactions in adults include:

Common problem allergies or intolerance for children and infants include:

According to the National Institute of Allergy and Infectious Diseases, "a food allergy frequently starts in childhood, but it can begin at any age. Fortunately, many children will outgrow their allergy to milk, egg, wheat, and soy by the time they are 5 years old if they avoid the offending foods when they are young. Allergies to peanuts, tree nuts, and shellfish tend to be lifelong."

Cleaning and sanitizing equipment. To keep large or in-place equipment such as mixers, choppers, stoves, and tables free of dangerous levels of bacteria or other contaminants, sterilize any surfaces that come into contact with food. Be sure to always wash, rinse, and sanitize large cooking utensils and equipment after each use. Be sure to clean cutting boards and other equipment as well. Synthetic cutting boards can be sanitized in a dishwasher, but wood cutting boards must be cleaned by hand. You can use a cloth and dish soap to clean the surface. If you apply any cutting board oil, be sure to read the manufacturer's instructions and check that it is food safe.

Read and follow the manufacturer's directions for cleaning and sanitizing any kitchen equipment. Note the following recommendations:

- All electrical equipment should be unplugged prior to cleaning.
- Food participles and scraps should be removed.
- Any removable parts should be sterilized "by washing by hand."
- When finished, rinse all dishes until all soap is clear, and place them in a drying rack.
- Wash all surfaces and rinse with clean water, then wipe down all surfaces using a disinfectant.
- Any equipment surfaces that do not come into contact with food should be cleaned using a clean cloth; all parts should be air dried prior to reassembling.

Complete the following activities.

1.38 List the six conditions necessary for bacteria to grow.

_____ _____

_____ _____

_____ _____

1.39 List the three factors that can cause food contamination.

_____

_____

_____

CHECK _____ _____
Teacher Date

COOKING STARCHES

You learned in Unit 2 that in nutrition, starches are a type of carbohydrate. Examples of **starch** foods include rice, pasta, potatoes, bread, and cereals. In this context, cereal isn't necessarily the kind you pour in a bowl and add milk to for breakfast, although that kind of cereal includes the edible grains of cereal. For our purposes here, **cereal** is grass **cultivated** for edible **grains**, such as wheat, rice, rye, oats, barley, corn, and sorghum. In the foods we eat, cereals are in their raw grain form or used as ingredients of different food products.

There are starchy vegetables as well, but to start, let's dive into preparing some common starch foods.

Rice and Pasta. Rice and pasta require very rapid cooking in a large amount of boiling water. Pasta and rice both swell in size during cooking, so when measuring the amount of rice or pasta you plan to cook, you'll need to keep that in mind. For rice, 1/2 cup of rice is typically enough for two people, or 1 cup is an approximate serving for four. For pasta, a good rule of thumb is 2 oz of dry pasta per person. Pasta comes in many shapes, so a few examples would be 1/2 cup of elbow macaroni is equivalent to 2 oz or 3/4 cup rigatoni is equivalent to 2 oz.

When preparing rice, you'll double the amount of water compared to the amount of rice you measure to cook. For example, if you are preparing 1 cup of rice, you'll need 2 cups of water. Add the water to a saucepan with a lid and bring the water to a full boil before adding your rice. Once the rice is added, turn the stovetop burner temperature down to low, cover again with a lid, and simmer for 20 minutes. If you cook brown rice, you may need to add a little additional water and simmer for an extra 2-5 minutes. The water will evaporate while cooking and you'll be left with cooked, fluffy rice!

NOTE

Rice should be rinsed before cooking. This is done to remove the loose starch that coats it. Wash your rice in a strainer with cold water until the water runs clear.

When preparing pasta, be sure you have a large saucepan or pot and add plenty of water. A rule of thumb is that the water level should be at least a few inches above the pasta. Bring the water to a full boil, and then add your pasta. No lid is needed for the pot when cooking pasta. Follow the directions on the box for cooking times, which usually direct you to boil the pasta on medium heat for 7-10 minutes. You can do a taste test to check if your pasta is cooked. Just be careful of the heat and boiling water!

When the timer goes off, pour the water and pasta into a strainer in your sink, and then rinse the pasta with cold water, which rinses the starches from the surface and helps firm pasta if it's a little too soft.

NOTE

If you add a bit of butter to melt on cooked pasta, it will keep it from sticking together as you finish preparing your sauce!

PREPARING VEGETABLES

Vegetables are often prepared as savory dishes, but like meats, you can certainly add sweet ingredients and sauces to liven up a dish. You can of course eat many vegetables raw, but there are also many ways to cook vegetables that are quite delicious! Let's go over the basics.

Vegetables. Vegetables are classified according to how they grow. Study the following chart.

Types of Vegetables	
Root Vegetables	beets, onions, potatoes, yams, carrots, radishes and jicama
Stem Vegetables	asparagus, celery, rhubarb, leek, swiss chard and fennel
Flower Vegetables	artichokes, broccoli, cauliflower and cabbage
Seed Vegetables	beans, cucumbers, okra, peas, pumpkin, corn, green beans, peppers, and squash
Leafy Vegetables	cabbage, collards, escarole, lettuce, romaine, kale, parsley, spinach and various greens

No matter how they are prepared, from steamed to creamed, vegetables make your meal more complete and certainly more colorful. They are nutritious and delicious.

Fresh is always best when serving vegetables plain. When lightly steamed, they add a delectable crunchiness to your meal. You can also use frozen or canned vegetables to save money, especially when you plan to combine them in a casserole, sauce, or soup.

Some quick helpful hints for preparing vegetables:

1. Freeze fresh herbs in small quantities and add, still frozen, to any dish before it's cooked. (See the Herbs and Spices Chart on p.46.)
2. Green vegetables stay bright green if cooked uncovered. Adding a little lemon to the water will also help them stay green.
3. Rule of thumb for cooking vegetables: For vegetables grown underground, cook covered. For vegetables grown above ground, cook uncovered.
4. Remember, fresh vegetables stay fresh longer if stored in covered containers or plastic bags in the refrigerator.
5. If you double the vegetable recipe, increase the liquids, herbs, and spices by less than one-half.
6. Cooking vegetables in salted water tends to draw the vitamins out of the vegetables and into the water. Add salt just before you serve. Cook vegetables in a minimum amount of water.
7. When you prepare creamed vegetables, use evaporated milk instead of fresh milk for a richer flavor in the cream sauce.
8. Heat canned vegetables only to the simmering point before serving.
9. You can freeze leftover vegetables to use in future soups.
10. Sautéing can be the most delicious way to cook vegetables, but not if you let them get mushy. Watch the pan closely.

A word of caution. Yeast breads are probably the most difficult thing to bake. Bread can be temperamental, so don't be discouraged if your first try at yeast bread fails to rise or has other structural issues.

You can make yeast bread with or without a bread maker, which is an appliance that does the kneading for you and helps control the temperatures required for yeast bread to rise properly. With any yeast bread recipe you choose, these tips will help you be successful:

- Choose a high-quality flour. Wheat flour usually has the best results.
- Measure flour very carefully.
- Softer loaves require more liquid, so if you find our bread is dry, you may need more liquid.
- Salt prevents yeast from growing too quickly. If your bread isn't rising, you may have too much salt. If it's rising too much, you may have too little.
- The fresher your yeast is, the better it will work. Be sure the yeast you use—instant, rapid or quick-rising, or active dry—is the one required in the recipe you use.

Kneading your bread dough develops the gluten, stretching and strengthening it so it can trap the gas created by the yeast. This makes the dough rise. You can knead by hand, using a stand mixer, or using a bread machine. The amount of time you'll need to knead the dough can vary, with some requiring 3-5 minutes and others requiring up to 10-15 minutes. To tell if you've kneaded long enough, press with a finger or tug on a piece of the dough. If the dough springs back immediately with a light press of the finger and it does not tear when you pull, it's been kneaded long enough.

Once your dough is thoroughly kneaded, you'll need to transfer it to a lightly greased bowl. The dough should double in size so be sure your bowl is large enough. You'll cover the dough with plastic or a clean towel and keep it in a room warm, dark place. A warm, humid environment is best for rising bread. It can take from 1-3 hours for bread to rise.

Once your bread has risen, you'll deflate it by simply pushing down on it. Then you can shape it to the desired shape to bake it in the oven according to your recipe.

DESIRABLE CHARACTERISTICS OF YEAST BREAD

- Evenly shaped with no humps or large cracks
- Tender and crisp crust
- Mellow flavor characteristic of ingredients
- Golden brown or darker color
- Soft, tender, and moist texture with no tunnels
- Pleasant odor characteristic of ingredients

LET'S REVIEW!

In this section, you continued to learn techniques for food preparation, this time focusing on fruits and baking. You've learned about different types of fruits, classified according to how they grow, as well as the seasons fruits are harvested. Remember, fruits will be more accessible and affordable when they are in season. You also learned about different ways to prepare fruits for salads, in dishes, and in marinades and preserves. You learned that baking involves chemical reactions that make it more challenging than cooking, as well as tips for preparing cookies, cakes, pies, and more. Lastly, you learned the steps to making home-made breads, both those that require yeast and those that don't. Baking can require practice, but with a little practice, you'll be a pro!

Before you take this last Self Test, you may want to do one or more of these self checks.

1. _____ Read the objectives. Determine if you can do them.
2. _____ Restudy the material related to any objectives that you cannot do.
3. _____ Use the **SQ3R** study procedure to review the material:
   a. **S**can the sections.
   b. **Q**uestion yourself again (review the questions you wrote initially).
   c. **R**ead to answer your questions.
   d. **R**ecite the answers to yourself.
   e. **R**eview areas you did not understand.
4. _____ Review all vocabulary, activities, and Self Tests, writing a correct answer for every wrong answer.

FAMILY AND CONSUMER SCIENCE
Unit 3

LIFEPAC TEST

Name _____

Date _____

Score _____

80
100

Fill in the blanks (each answer, 5 points).

31. List the six conditions necessary to grow bacteria.

_____ _____

_____ _____

_____ _____

32. List the three factors that can cause food contamination.

_____

_____

_____

Complete the activities (each answer, 5 points).

33. In two to three sentences, describe safety measures that should be taken when preparing and cooking raw chicken.

_____

_____

_____

_____

_____

34. In one to two sentences, describe the function of salt in baking yeast bread.

_____

_____

_____

_____

_____

AOP

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