Facts About Foodborne Illness

FOOD SAFETY FOR FAMILY DAYCARE PROVIDERS

For young children and other high risk groups, foodborne illness can be deadly. The immune systems of infants and children under the age of 4 years have not fully developed. When they are exposed to high levels of contamination from foods, they can become seriously ill and may even die.

It is important to understand what foodborne illness is and how it occurs so you take steps to prevent it from happening.

I. WHAT IS FOODBORNE ILLNESS?

Foodborne illness, as the term describes is an illness caused by contaminated food that people eat.

There are different types of foodborne illness. You can find more information about over a dozen of these illnesses on the chart MICROBIOLOGICAL FOODBORNE ILLNESSES. In general, you will see that the symptoms of the illness may be similar, but the causes and amount of time it takes for you to get sick can vary.

Foodborne Infection

A foodborne infection, like other infections, happens when a harmful (pathogenic) microorganism gets into your body and grows. The growth and multiplication of the organism causes the symptoms of foodborne illness such as nausea, diarrhea, vomiting and, sometimes a fever. The amount of time it takes for bacteria to grow and cause these symptoms can range from 6 hours to 72 hours. Some microorganisms can take several weeks to cause symptoms. As you can see from the foodborne illness chart, *Salmonella* can cause this type of foodborne illness.

Foodborne Intoxication

A foodborne intoxication happens when a harmful (pathogenic) microorganism grows in a food and produces a toxic chemical waste material. When the food is eaten the toxin causes the foodborne illness. Poisons produced by *Staphylococcus aureus* cause this type of illness. Some fish and mushrooms may have natural toxins that can make you sick, too.

Toxin-mediated Infection

This is another type of illness that results when a living organism is ingested (like with an infection) and the organism produces a chemical toxin that causes the foodborne illness. *Clostridium perfringens* can grow on improperly cooled foods and then produce poisons in your body to make you sick.

II. HOW DOES FOODBORNE ILLNESS OCCUR?

For foodborne illness to occur,

1. YOU NEED TO START WITH FOOD.
2. THIS FOOD BECOMES CONTAMINATED
3. YOU MAY MISHANDLE THE FOOD.
4. YOU EAT THE FOOD.
5. THEN YOU GET SICK.

If you are careful about the first four steps, you can keep the children in your care from getting foodborne illness.

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FACTS ABOUT FOODBORNE ILLNESS

Foods

As a child care provider you are careful to plan your meals and snacks according to Child and Adult Care Food Program patterns. This variety of foods will give the children in your care the nutrients they need to stay healthy, be active and grow. Any of these foods, however, can become risky if they become contaminated.

- POTENTIALLY HAZARDOUS FOODS
- READY-TO-EAT FOODS

POTENTIALLY HAZARDOUS FOODS (PHFs) are especially risky because they have the right combination of nutrients to help bacteria and other pathogens grow under the right conditions. They often include foods from the Meat Group and Milk Group. They also can include some plant foods too. You will learn more about PHFs later on in this lesson.

READY-TO-EAT FOODS are usually foods you eat or serve without cooking. They include:

- raw, washed, cut fruits and vegetables
- whole raw fruits and vegetables that can be eaten without peeling
- meat, dairy products or other high protein foods that have already been cooked or
- other foods that can be eaten without washing or cooking.

These foods can carry harmful microorganisms or other contaminants that can make people, especially young children, sick.

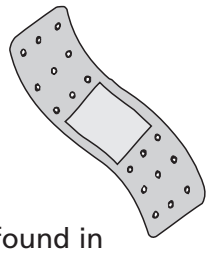
Contamination

When something harmful gets into food it becomes contaminated.

There are three different types of contamination that can make food unsafe.

- PHYSICAL
- CHEMICAL
- BIOLOGICAL

PHYSICAL CONTAMINANTS are things you can see or feel. They include dirt, broken glass or plastic flatware, toothpicks, hair, a fingernail, or bandage.



CHEMICAL CONTAMINANTS are found in some of the materials that you may use to clean, store or protect foods. Chemical contaminants include:

Cleaning chemicals, sanitizing agents

The chemicals you use to clean and sanitize pots, pans, dishes or toys can be a source of chemical contamination if you do not follow the proper cleaning procedures. If you use too strong a concentration of sanitizer, the children in your care can get sick from the residue left on the food contact surface.

Pesticides

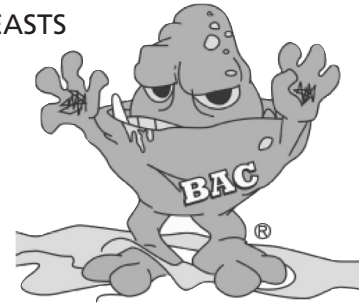
If pesticides are not used properly they can leave residues on foods or food contact surfaces.

Be sure to read labels and follow the directions on any chemicals or pesticides you use.

BIOLOGICAL CONTAMINATION comes from microorganisms. Many of these microorganisms are so small you cannot see them without a microscope. While chemical and physical contaminants can make people sick, it is most often the microorganisms that cause foodborne illness.

Biological contaminants include:

- MOLDS AND YEASTS
- PARASITES
- VIRUSES
- BACTERIA



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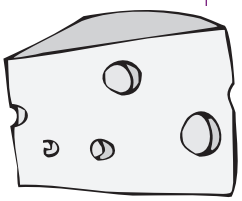
FACTS ABOUT FOODBORNE ILLNESS

These organisms are everywhere — in the environment, in animals and in your body. Most often, the microorganisms are not harmful.

MOLDS AND YEASTS usually cause food to spoil. Some molds and yeasts are beneficial. In controlled conditions, they can help make cheese and penicillin. Yeast is used to ferment beer.

Some mold can be dangerous because it may make toxins or poisons that can make children and other susceptible people sick.

The root-like "mycelium" of molds can grow several inches into the food. When you cut off the surface of the mold you may not remove the poisons.



Yeasts can get into juices and grow in natural sugars in the fruit or juice. Alcohol is produced from the sugars causing the juice to ferment.

Throw away moldy cheese, bread or fruit, and fermented juices. If you buy these types of food in large quantities be sure to break the cheese, bread or juice into portions or amounts that you know you can use in a few days. Freeze what you know you can't use.

PARASITES that have been found in food usually cause diarrhea and sometimes fever, nausea and vomiting.

Cyclospora cayetanensis, carried by water used to grow strawberries and raspberries, made hundreds of people ill from eating these ready-to-eat foods. *Cryptosporidium parvum* from untreated water and unpasteurized apple cider has caused outbreaks of foodborne illness, too.

VIRUSES are very small organisms that can make people sick. They are smaller than parasites or bacteria. They need a living organism (like your body) to reproduce. There are more than 100 types of gastrointestinal viruses but only a few cause foodborne illness.

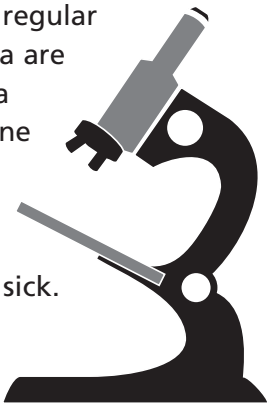
Norovirus is the number one cause of foodborne illnesses. Adults or children who suffer from this illness can spread it very easily. If you have vomiting and/or diarrhea you should not work or have children in your care. Even after these symptoms stop, you can still spread the virus so you should take extra hygienic precautions such as extra handwashing, using gloves to handle food or anything else that might end up in a child's mouth.

Hepatitis A virus infects the liver. This illness can be carried by raw and under-cooked shellfish. It is also caused by a sick person who handles ready-to-eat foods like sandwiches and salads.

Rotavirus is one of the most common causes of diarrhea. It is often spread by people not washing their hands before handling ready-to-eat foods like fresh fruits and vegetables.

As you can see, most foodborne viruses are carried by foods that were touched by people who were sick with the virus. Being in good health and washing your hands properly can help prevent these viruses from spreading.

BACTERIA cause many cases of foodborne illness. The organisms are small but you can see them with a regular microscope. Most bacteria are not harmful. The bacteria described in the foodborne illness chart are harmful. When they are allowed to grow they can make the children in your care sick.



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III. HOW BACTERIA GROW

Bacteria grow by cell division: one cell grows and divides in two. Each of these two cells divide into two more (now 4) and so on. With the right conditions like food, moisture and warm temperatures bacteria can multiply in relatively short periods of time.

The Food

POTENTIALLY HAZARDOUS FOODS (PHFs) tend to be more risky because they support bacterial growth.

They are usually animal foods like meat, poultry, fish, shellfish, milk, or cheese. Tofu is included in this group as well.

Some plant foods are also considered to be potentially hazardous:

- RICE, PASTA AND CEREAL GRAINS
  When plant food like these are dry and in packages they can remain on the shelf for months.
- FRESH UNCOOKED VEGETABLES

When vegetables like carrots, beans or peas are served fresh they are considered ready-to-eat foods.

However when these foods are cooked they provide bacteria with the moisture and nutrients they need to grow. Cooked grain products and cooked vegetables are considered potentially hazardous.

Bacteria and pH

Bacteria grow best in foods that are slightly acidic or neutral.

A "pH" scale is used to measure the acidity of a food or substance. The lower the pH number the more acidic a substance or food is.

BACTERIA WILL GROW BETWEEN PH 4.6 AND 9.0, AND GROW BEST BETWEEN PH 6.6 AND 7.5.

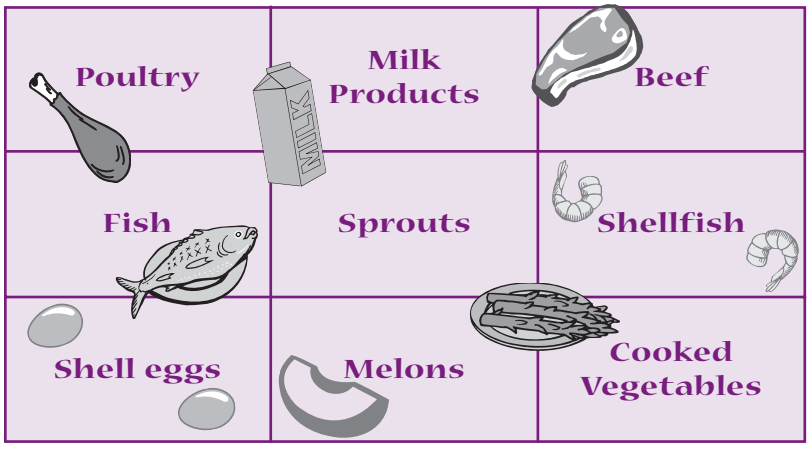
Acid ↓ Alkaline

pH	Foods
0	
2	limes, lemons
	vinegar
	mayonnaise*
4	tomatoes
6	carrots tuna egg yolk milk
8	egg white most sanitizers
10	
12	
14	

High-acid foods will not support bacterial growth. They are foods like:

- Citrus fruits (limes, lemon juice) which contain citric acid
- Vinegar (acetic acid)
- Pickles prepared in a vinegar solution

Foods that are alkaline (have a high pH) include soda crackers and egg whites. Many soaps and sanitizing agents like bleach have a high pH (7.5–8.0) too. Using them helps prevent bacteria growth.



DID YOU KNOW...?

Commercial mayonnaise is acidic.

Most people think mayonnaise is the culprit in cases of FBI because it's made with eggs. While the eggs are PHFs, the vinegar or lemon juice used in mayonnaise brings the pH down. Therefore commercial mayonnaise becomes slightly acidic and will not support bacterial growth.

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Moisture

PHFs contain a certain amount of water that bacteria use to grow.

Dry foods like crackers, cereals, beans, rice and pasta have a small amount of moisture but not enough to support bacterial growth. Therefore these foods can be stored in a cupboard without refrigeration.

Once you cook beans, rice or pasta more moisture is added and bacteria can now begin to grow. These foods then should be treated like potentially hazardous foods.

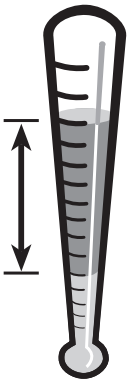
Most PHFs have a lot of water and nutrients like protein to support bacteria.

While water is very moist, it has no other nutrients to support bacterial growth and is not considered a PHF. Water and ice are considered "foods" and need to be safe from contamination. (Remember water can also carry viruses and parasites that may contaminate PHFs.)

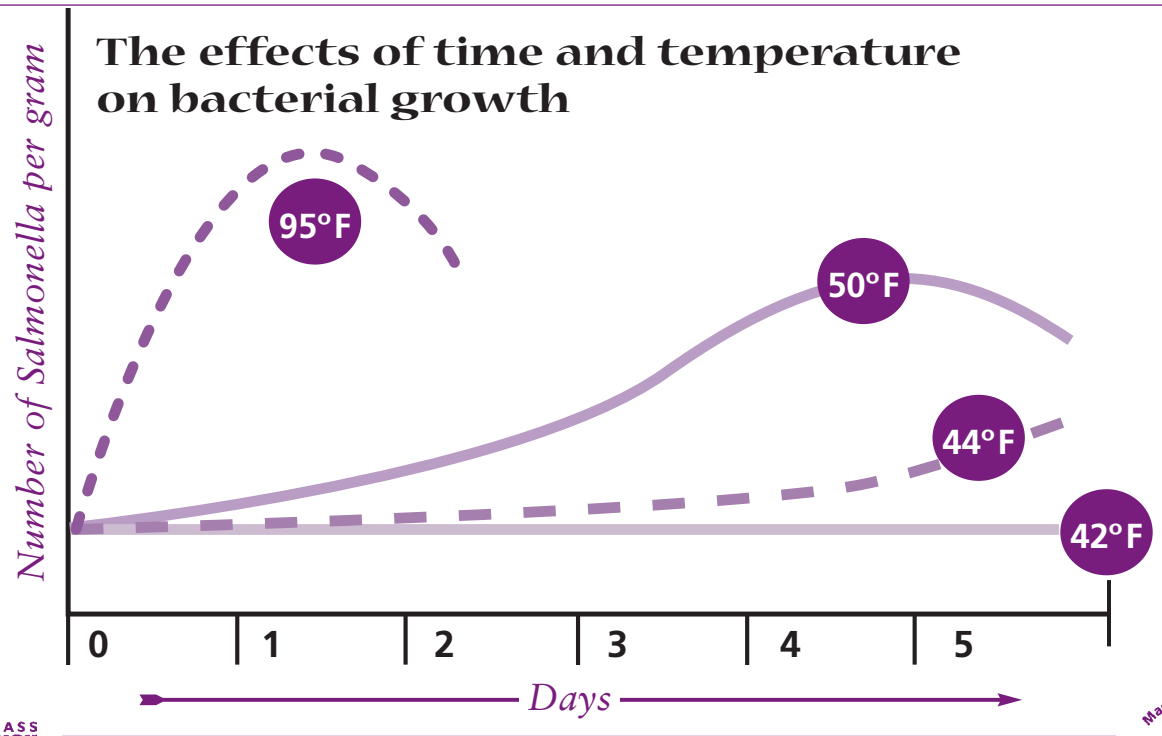
Temperature

Bacteria grow well at temperatures between 40° F and 140° F, the "Danger Zone." As you can see from the chart below bacteria may not grow well but they can survive at cold temperatures in your refrigerator. Most bacteria even stay alive in the freezer!

The number of bacteria cells are shown on the left, the number of hours/days needed to grow are shown across the bottom of the chart. The temperatures are shown in each line on the graph.



- At 42° F (this might be your refrigerator) the straight line shows that the number of bacteria stays the same. While some may be dying, others are reproducing and replacing them. It is enough to keep a population alive.
- 44° F (Maybe your refrigerator with a loose or worn gasket — or a lot of children going in and out of it on a hot day.) At this slightly higher temperature bacteria are reproducing but at a slightly faster pace than 42° F .
- 50° F might be your cool back hall, porch or other storage area that you use to cool foods or to thaw meats. It is still in the "Danger Zone"!



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- 95° F is probably the temperature of your kitchen on a good day or under a shady tree on a warm summer's day. Bacteria grow very quickly at this warm temperature.

Some bacteria such as *Listeria* grow well even in the refrigerator. It's important to handle foods that contain these bacteria carefully and keep all foods out of the "Danger Zone."

Time

When foods are left in the danger zone for more than 2 hours, the number of bacteria can increase to harmful levels.

This chart shows how in a few hours, with the right conditions (food, moisture, pH and temperature) the number of bacteria can grow from a few hundred to over a million! It's important to control these conditions at all times when you are handling food from store to table.

IV. THE BOTTOM LINE

Bacteria and microorganisms are everywhere. When they get in food and are allowed to grow to harmful levels, people, especially young children can become ill.

The good news is that you can prevent foodborne illness.

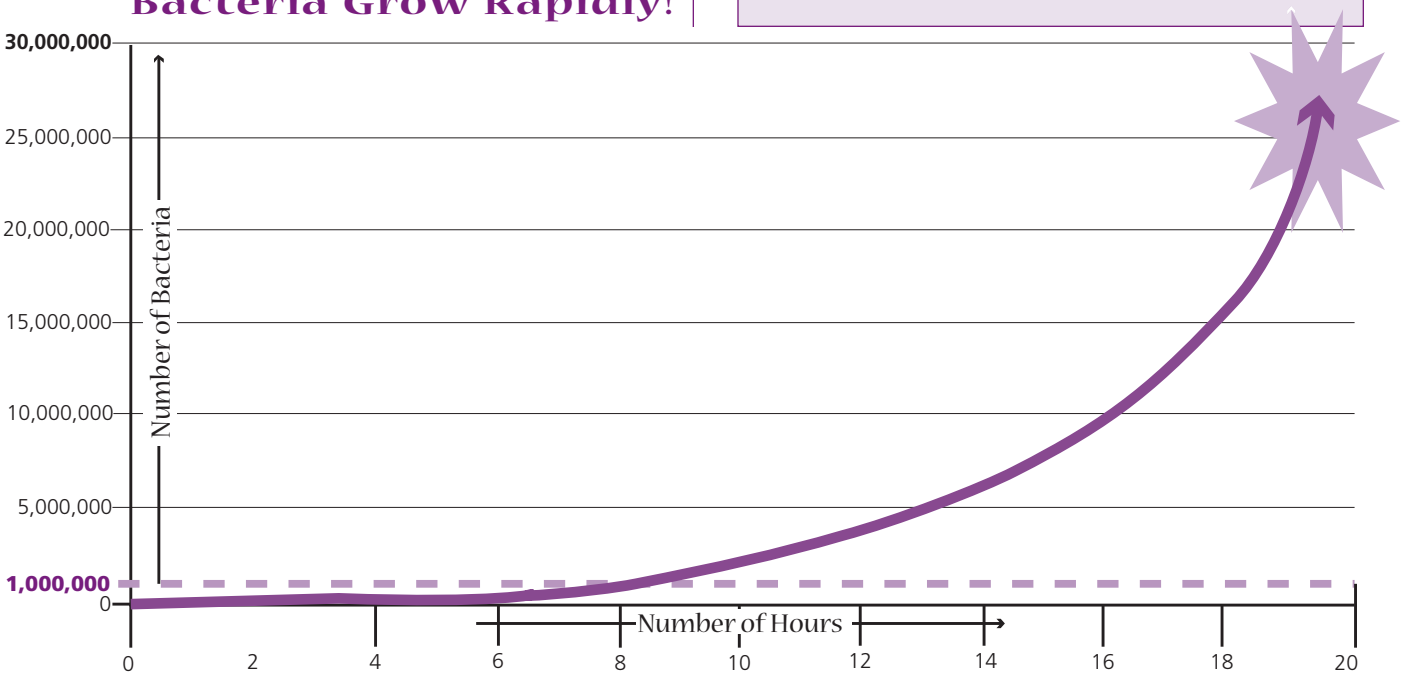
1. Keep harmful microorganisms away from food
2. Keeping bacteria that are in food from growing to harmful levels.

You do this by using good food handling and storage practices. In the next two sections you will learn more about these safe food practices.

IF YOUR CHILD IS SICK

If you think you are having an outbreak of illness, foodborne or otherwise, in your daycare, call your local health department. Your local health department can help you figure out whether or not you have a problem. If you do have a problem your health department will help you to set up ways to control the situation and put preventive measures in place.

With Ideal Conditions, Bacteria Grow Rapidly!



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