



PACK FOOD SAFETY IN YOUR LUNCH

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FS289E

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Figure 1. Packing lunch makes \$ense

Packed lunches can be quick, healthy, and easy on the family budget (Figure 1). Whether you're in school, work in an office building, or you're going on vacation, make certain to pack food safety along with your lunch. Understanding and applying food safety recommendations for packed lunches will keep you and your family healthy.

Without proper food handling, *Salmonella*, *Clostridium perfringens*, *Campylobacter*, *Listeria*, *E. coli*, and Norovirus (Norwalk Virus) may be lurking in your packed lunch. Annually, these five bacteria and virus cause the most illness, hospitalizations and deaths in the United States.

If you would like to learn more about the causes, symptoms, and duration of illness caused by these bacteria and virus, visit the [Foodsafety.gov](https://www.foodsafety.gov) website.

All of our recommendations for food safety and food handling are supported by science-based research.

Understanding simple microbiology and virology explain why planning, preparation and storage are crucial to the food safety of packed lunches. Particular types of disease-causing (pathogenic) bacteria cause gastro-intestinal illness (Figure 2) while others produce toxins making us sick.

When foodborne viruses or bacteria, such as Norovirus or *E. coli*, enters our body and replicates, it can trigger illness most commonly nausea, stomach ache, vomiting and/or diarrhea (Figure 2). Sometimes, just a few ingested (swallowed) viral particles or bacteria can cause severe illness when transferred from your hands, to food, into your mouth, and into your gastro-intestinal tract.



Figure 2. Woman experiencing symptoms of foodborne illness

According to the United States Food and Drug Administration (FDA), some people are at greater risk of foodborne illnesses: Pregnant women, young children, people with immune systems weakened by disease or medical treatment, and older adults. If at greater risk, you are more likely to get a foodborne illness, it may last longer, and the symptoms be more severe, possibly requiring hospitalization. For more information visit the [FDA's](https://www.fda.gov) website.

Basics of a Packed Lunch

The basics of packing a safe lunch are simple. Select foods that are non-perishable—safe at room temperature—and carefully control the temperature of perishable foods during preparation by keeping food cold from your table to the lunchroom. Examples of perishable foods include meat, poultry, fish, dairy products, cooked leftovers, and cut fruits and vegetables.

Choose a lunch bag and packing containers that fit your needs.

From nested containers in a backpack, metal lunch boxes, paper bags, to insulated bags (Figure 3), variety abounds. Check on-line and in your neighborhood stores. Some lunch bags are even freezable which eliminates the need for frozen packs.



Figure 3. Photo of insulated lunch bag

Keep perishable foods cold.

If you carry food for lunch and a refrigerator isn't available, always use an insulated bag (Figure 3) with cold or frozen gel packs (Figure 4). They are inexpensive and widely available. Another option for keeping food cold is to freeze a bottle of water or a juice box and add it to your lunch bag. You can also use a freezable lunch bag.



Figure 4. Frozen Packs

Science of Packing Safe Lunches

Without refrigeration or frozen gel packs, bacteria grow rapidly as the perishable food warms into the temperature danger zone (40° F to 140° F). This is especially true when food is stored at room temperatures. In the temperature danger zone, bacteria may double every 20 minutes (Figure 5). Using insulated bags, frozen juice boxes, frozen water bottles and frozen gel packs keeps your perishable food at 40 degrees or below. Alternatively, if you use a brown paper bag store your lunch in a refrigerator.

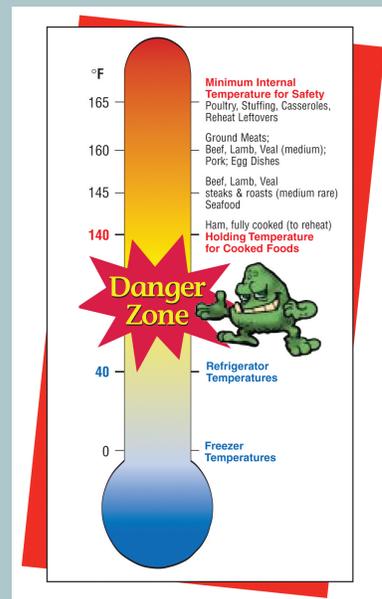


Figure 5. Temperature Danger Zone

After two hours, discard all perishable food held at room temperature. In summer temperatures, at 90° F or above, the USDA Food Safety Inspection Services recommend discarding food after one hour.

Keep Cold Foods Cold!

Throw out any left-over food after you finish lunch, and keep your lunch bag clean.

At the end of the day, thoroughly wash with soap and hot water, rinse, sanitize, and air-dry your bag.

Sanitizing Your Lunch Bag

To make a sanitizing solution, add non-scented bleach to cool water. Non-scented bleach at the grocery store may be available in three bleach strengths: 2.75%, 5.25%–6.25%, or 8.25%. To make your sanitizer, start with cool water in a one-quart spray bottle. Add bleach to the cool water, using the table below.

5.25%	5.25%–6.25%	8.25%
1 teaspoon	½ teaspoon	¼ teaspoon

Always remember to label your one-quart spray bottle with content, ratio, and date mixed. Protect your eyes while mixing the solution. Spray the sanitizer on the clean surfaces of your lunch bag and allow to air dry for two minutes.

If you use a paper bag, start with a new one each day. Avoid re-using plastic bags. If you use a cloth bag, plastic containers, or a lunch bucket, it should be thoroughly cleaned daily. After washing, rinse, sanitize and air dry. If you pack a daily lunch, purchasing an integrated system with space for food safe containers, gel packs, and insulated thermoses may be a cost-effective solution, good for the environment, and deliver safe food.

Use re-useable, food-safe containers.

Food-safe containers lock tightly, protect food and prevent spills (Figure 6). They are good for the environment, and with careful washing, rinsing, and air drying, re-useable containers are beneficial for food safety, too.



Figure 6. Re-useable and environmentally friendly

Science of Packing Safe Lunches

Keeping everything clean is fundamental to food safety. Disease causing bacteria and viruses may be as close as your hands, preparation surfaces, cutting boards, your refrigerator, knives, re-useable lunch bags, food containers, and on food. Starting “clean” and sanitary is essential for prevention of foodborne illnesses.

Prevent Cross Contamination! Keep Things Clean!

Start every lunch preparation with clean hands and clean surfaces.

It’s easy to spread norovirus often called “stomach flu” around families, schools, and in the workplace. To reduce your chance of this foodborne illness, wash your hands with soap and warm running water for twenty seconds (Figure 7). Dry with a paper towel. Wash, rinse, and sanitize kitchen and preparation surfaces prior to and after food preparation.

Science of Hand Washing

Spreading bacteria and viruses is easy if you don’t wash your hands before you prepare food or eat lunch. Poor hand sanitation is one of the leading causes of foodborne illness in the United States.

Wash Hands Often!



Figure 7. Practice effective handwashing

Breakout – Norovirus

You're vomiting, have diarrhea and severe stomach pain. In all likelihood, you have norovirus. According to the Centers for Disease Control and cases of norovirus every year in the United States. Symptoms are so severe affected individuals often seek medical treatment. This is especially true for young children, those who are immune compromised, pregnant women, and the elderly. The costs of medical care for those affected is \$2 billion annually, and illnesses result in 570–800 deaths, 56,000–71,000 hospitalizations, 400,000 emergency department visits, and 1.7 million–1.9 million outpatient visits. Over a lifetime, most people will have this viral infection five times.

Norovirus has a fecal-oral route of transmission. It may not be pleasant to think about, but here's how it works (Figure 8). When an infected person has poor hand hygiene or fails to wash after using the bathroom, they spread the virus through their hands to food, surfaces, handles, and knobs. Next, people touch those surfaces and pick up the virus (fecal) particles on their hands. If you don't wash your hands prior to food preparation or eating, the fecal particles containing the virus enter your mouth, and travel to the stomach and intestines where they develop into an infection.

The CDC states the amount of viral particles on the head of pin would be enough to infect more than 1,000 people. Norovirus spreads easily. Once the viral particles are deposited via hands on surfaces in homes, schools, hospitals, and cruise ships, the viral particles may continue to cause infections.

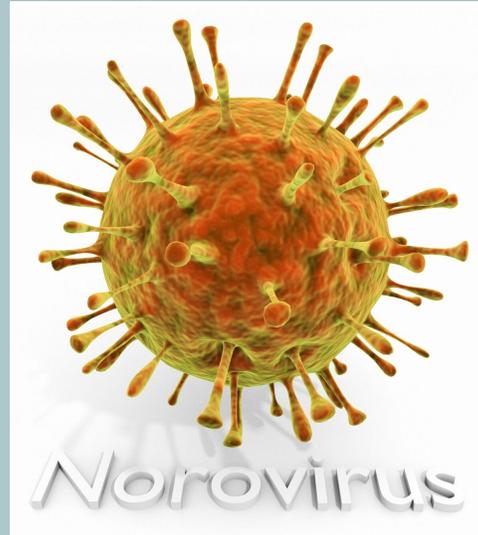


Figure 8. Norovirus is ingested and infects the gastrointestinal (GI) tract

Keep hot foods hot.

For variety, you may choose to use a thermos to keep left overs, carry out foods or prepared foods warm in your lunch bag. When re-heating left-overs, carry-out food, or prepared food, heat to 165° F before packing in the thermos. Use a thermometer to test the food temperature before you pack. Once you've closed the lid, keep it closed until meal time. An insulated thermos heats the food above the temperature danger zone.

Science of Temperature Control

Insulated containers especially made for hot foods keeps them out of the temperature danger zone, above 140° F. Below 140° F, disease causing bacteria may grow and multiply quickly (Figure 5).

Keep Hot Food Hot! Cold Foods Cold!

Choose fruits and vegetables.

Whole fruits such as apples, oranges and pears work great in lunch boxes. Always wash fresh fruits and vegetables with cool, running water before packing (Figure 9). Cut fruits and vegetables are considered perishable. Always keep cut produce at 40° F or below.



Figure 9. Wash whole fruits and vegetables in cool, running water

Science of Food Safety Basics

Fruits and vegetables may be contaminated coming from the farm. For example, bacteria may hide in the uneven surfaces of cantaloupe. Using a vegetable brush and cool running water is effective in removing bacteria from vegetable and fruit surfaces, and reducing risk of foodborne illness.

Choose non-perishable foods to enhance food safety.

Peanut butter and jelly sandwiches (Figure 10), fresh whole fruit, nuts, single serving foods opened at lunch, dried fruits, pretzels, cereal bars, and cookies are low risk foods which can be easily placed into lunch boxes. Involve children when packing school lunches. It's a wonderful opportunity and no matter what their ages they can learn about food safety.



Figure 10. Pack a lunch with non-perishable foods

Learn More About Food Safety Visit

[The Partnership for Food Safety Education.](#)

Centers for Disease Control and Prevention: [Norovirus.](#)

United States Department of Agriculture Food Safety and Inspection Service. "[Keeping Bag Lunches Safe.](#)"

United States Food and Drug Administration. "[Food Safety: It's Especially Important for At-Risk Groups.](#)"

Washington State Department of Health. Disinfecting and Sanitizing with Bleach: Guidelines for Mixing Bleach Solutions in Childcare and Similar Environments. DOH 970-216 January 2015.



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