

United States Department of Agriculture

Food Safety While Hiking, Camping & Boating

Outdoor activities are popular with Americans nationwide. The fresh air and exercise revives the spirit and the mind. Hiking, camping, and boating are good activities for active people and families, and in some parts of the country you can enjoy the outdoors for 2 or 3 seasons. In many cases, these activities last all day and involve preparing at least one meal. If the food is not handled correctly, foodborne illness can be an unwelcome souvenir.

"Keep Hot Foods Hot & Cold Foods Cold"

Whether you are in your kitchen or enjoying the great outdoors, there are some food safety principles that remain constant. The first is "Keep hot foods hot and cold foods cold." Meat and poultry products may contain bacteria that cause foodborne illness. They must be cooked to destroy these bacteria and held at temperatures that are either too hot or too cold for these bacteria to grow.

Most bacteria do not grow rapidly at temperatures below 40 °F or above 140 °F. The temperature range in between is known as the "Danger Zone." Bacteria multiply rapidly at these temperatures and can reach dangerous levels within 2 hours.

If you are traveling with cold foods, bring a cooler with a cold source. If you are cooking, use a hot campfire or portable stove. It is difficult to keep foods hot without a heat source when traveling, so it's best to cook foods before leaving home, cool them, and transport them cold.

"Keep Everything Clean"

The second principle is that bacteria present on raw meat and poultry products can be easily spread to other foods by juices dripping from packages, hands, or utensils. This is called cross-contamination. When transporting raw meat or poultry, double wrap or place the packages in plastic bags to prevent juices from the raw product from dripping on other foods. Always wash your hands before and after handling food, and don't use the same platter and utensils for raw and cooked meat and poultry. Soap and water are essential to cleanliness, so if you are going somewhere that will not have running water, bring it with you. Even disposable wipes will do.

Food Safety While Hiking & Camping

Sometimes you just have to get out and walk around in the solitude and beauty of our country. You may want to hike for just a few hours, or you may want to hike for a few days. One meal and some snacks are all that's needed for a short hike. Planning meals for a longer hike requires more thought. You have to choose foods that are light enough to carry in a backpack and that can be transported safely.

Hot or Cold?

The first principle is to keep foods either hot or cold. Since it is difficult to keep foods hot without a heat source (although the new insulated casserole dishes will keep things hot for an hour or so), it is best to transport chilled foods. Refrigerate or freeze the food overnight. For a cold source, bring frozen gel-packs or freeze some box drinks. The drinks will thaw as you hike and keep your meal cold at the same time. What foods to bring? For a day hike, just about anything will do as long as you can fit it in your backpack and keep it cold – sandwiches, fried chicken, bread and cheese, and even salads – or choose non-perishable foods.

Clean

The second principle is to keep everything clean, so remember to bring disposable wipes if you are taking a day trip. (Water is too heavy to bring enough for cleaning dishes!)

Safe Drinking Water

It is not a good idea to depend on fresh water from a lake or stream for drinking, no matter how clean it appears. Some pathogens thrive in remote mountain lakes or streams and there is no way to know what might have fallen into the water upstream. Bring bottled or tap water for drinking. Always start out with a full water bottle, and replenish your supply from tested public systems when possible. On long trips you can find water in streams, lakes, and springs, but be sure to purify any water from the wild, no matter how clean it appears.

The surest way to make water safe is to boil it. Boiling will kill microorganisms. First, bring water to a rolling boil, and then continue boiling for 1 minute. Before heating, muddy water should be allowed to stand for a while to allow the silt to settle to the bottom. Dip the clear water off the top and boil. At higher elevations, where the boiling point of water is lower, boil for several minutes.

As an alternative to boiling water, you can also use water purification tablets and water filters. The purification tablets – which contain iodine, halazone, or chlorine – kill most waterborne bacteria, viruses, and some (but not all) parasites. Because some parasites – such as *Cryptosporidium parvum*, *Giardia lamblia*, and larger bacteria – are not killed by purification tablets, you must also use a water filter. These water filtering devices must be 1 micron absolute or smaller. Over time purification tablets lose their potency, so keep your supply fresh. Water sanitizing tablets for washing dishes can also be purchased (just don't confuse the two). Water purification tablets, filters, and sanitizing tablets can be purchased at camping supply stores.

What Foods to Bring?

If you are backpacking for more than a day, the food situation gets a little more complicated. You can still bring cold foods for the first day, but you'll have to pack shelf-stable items for the next day. Canned goods are safe, but heavy, so plan your menu carefully. Advances in food technology have produced relatively lightweight staples that don't need refrigeration or careful packaging. For example:

- peanut butter in plastic jars;
- concentrated juice boxes;
- canned tuna, ham, chicken, and beef;
- dried noodles and soups;
- beef jerky and other dried meats;
- dehydrated foods;
- dried fruits and nuts; and
- powdered milk and fruit drinks.

Powdered mixes for biscuits or pancakes are easy to carry and prepare, as is dried pasta. There are plenty of powdered sauce mixes that can be used over pasta, but check the required ingredient list. Carry items like dried pasta, rice, and baking mixes in plastic bags and take only the amount you'll need.

Cooking at Camp

After you have decided on a menu, you need to plan how you will prepare the food. You'll want to take as few pots as possible (they're heavy!). Camping supply stores sell lightweight cooking gear that nest together, but you can also use aluminum foil wrap and pans for cooking.

You'll need to decide in advance how you will cook. Will you bring along a portable stove, or will you build a campfire? Many camping areas prohibit campfires, so check first or assume you will have to take a stove. Make sure to bring any equipment you will need. If you are bringing a camp stove, practice putting it together and lighting it before you pack. If you build a campfire, carefully extinguish the fire and dispose of the ashes before breaking camp. Likewise, leftover food should be burned, not dumped. Lastly, be sure to pack garbage bags to dispose of any other trash, and carry it out with you.

Use a Food Thermometer

Another important piece of camping equipment is a food thermometer. If you are cooking meat or poultry on a portable stove or over a fire, you'll need a way to determine when it is done and safe to eat. Color is not a reliable indicator of doneness, and it can be especially tricky to tell the color of a food if you are cooking in a wooded area in the evening.

When cooking hamburger patties on a grill or portable stove, use a digital thermometer to measure the temperature. Digital thermometers register the temperature in the very tip of the probe, so the safety of thin foods -- such as hamburger patties and boneless chicken breasts -- as well as thicker foods can be determined. A dial thermometer determines the temperature of a food by averaging the temperature along the stem and, therefore, should be inserted 2 to 2 1/2 inches into the food. If the food is thin, the probe must be inserted sideways into the food.

It is critical to use a food thermometer when cooking hamburgers. Ground beef may be contaminated with E. coli O157:H7, a particularly dangerous strain of bacteria. Illnesses have occurred even when ground beef patties were cooked until there was no visible pink. The only way to insure that ground beef patties are safely cooked is to use a food thermometer, and cook the patty until it reaches 160 °F. For chicken, cook breasts or cutlets to 170 °F; legs and thighs to 180 °F. Pork should be cooked to 160 °F. Heat hot dogs and any leftover food to 165 °F. Be sure to clean the thermometer between uses.

Keeping Cold

If you are "car camping" (driving to your site), you don't have quite as many restrictions. First, you will have the luxury of bringing a cooler. What kind of cooler? Foam chests are lightweight, low cost, and have good "cold retention" power. But they are fragile and may not last through numerous outings. Plastic, fiberglass, or steel coolers are more durable and can take a lot of outdoor wear. They also have excellent "cold retention" power, but, once filled, larger models may weigh 30 or 40 pounds.

To keep foods cold, you'll need a cold source. A block of ice keeps longer than ice cubes. Before leaving home, freeze clean, empty milk cartons filled with water to make blocks of ice, or use frozen gel-packs. Fill the cooler with cold or frozen foods. Pack foods in reverse order. First foods packed should be the last foods used. (There is one exception: pack raw meat or poultry below ready-to-eat foods to prevent raw meat or poultry juices from dripping on the other foods.) Take foods in the smallest quantity needed (e.g., a small jar of mayonnaise). At the campsite, insulate the cooler with a blanket, tarp, or poncho. When the camping trip is over, discard all perishable foods if there is no longer ice in the cooler or if the gel-pack is no longer frozen.

Cleanup

Whether taking a hike or camping at an established site, if you will be washing dishes or cookware, there are some rules to follow. Camping supply stores sell biodegradable camping soap in liquid and solid forms. But use it sparingly, and keep it out of rivers, lakes, streams, and springs, as it will pollute. If you use soap to clean your pots, wash the pots at the campsite, not at the water's edge. Dump dirty water on dry ground, well away from fresh water. Some wilderness campers use baking soda to wash their utensils. Pack disposable wipes for hands and quick cleanups.

Food Safety While Boating

Keeping food safe for a day on the boat may not be quite as challenging as for a hike, but when you are out on the water, the direct sunlight can be an even bigger food safety problem. Remember the "Danger Zone"? It is true that bacteria multiply rapidly at warm temperatures, and food can become unsafe if held in the "Danger Zone" for over 2 hours. Above 90 °F, food can become dangerous after only 1 hour. In direct sunlight, temperatures can climb even higher than that. So bring along plenty of ice, and keep the cooler shaded or covered with a blanket.

Keep Your Cooler Cool

A cooler for perishable food is essential. It is important to keep it closed, out of the sun, and covered, if possible, for further insulation. Better yet, bring two coolers: one for drinks and snacks, and another for more perishable food. The drink cooler will be opened and closed a lot, which lets hot air in and causes the ice to melt faster. Pack your coolers with several inches of ice, blocks of ice, or frozen gel-packs. Store food in watertight containers to prevent contact with melting ice water.

Keep Cold Foods Cold

Perishable foods, like luncheon meats, cooked chicken (Yes, that includes fried chicken!), and potato or pasta salads, should be kept in the cooler. Remember the rule: hot foods hot, cold foods cold? And the 2-hour rule: no food should be in the "Danger Zone" for more than 2 hours? Well, unless you plan to eat that bucket of fried chicken within 2 hours of purchase, it needs to be kept in the cooler. For optimum safety, consider buying it the night before, refrigerating it in a shallow container (not the bucket), and then packing it cold in the cooler.

Of course, some foods don't need to be stored in the cooler: fresh fruits and vegetables, nuts, trail mix, canned meat spreads, and peanut butter and jelly. (However, once canned foods are opened, put them in the cooler.)

If you don't have an insulated cooler, try freezing sandwiches for your outing. Use coarse-textured breads that don't get soggy when thawed. Take the mayonnaise, lettuce, and tomato with you to add at mealtime. In a pinch, a heavy

cardboard box lined with plastic bags and packed with frozen gel packs or ice will keep things cold until lunchtime. Freeze water in milk cartons for your cold source.

Seafood

If you are planning to fish, check with your fish and game agency or state health department to see where you can fish safely, then follow these guidelines:

Finfish:

- Scale, gut, and clean fish as soon as they're caught.
- Live fish can be kept on stringers or in live wells, as long as they have enough water and enough room to move and breathe.
- Wrap fish, both whole and cleaned, in water-tight plastic and store on ice.
- Keep 3 to 4 inches of ice on the bottom of the cooler. Alternate layers of fish and ice.
- Store the cooler out of the sun and cover with a blanket.
- Once home, eat fresh fish within 1 to 2 days or freeze them. For top quality, use frozen fish within 3 to 6 months.

Shellfish:

- Crabs, lobsters, and other shellfish must be kept alive until cooked.
- Store in live wells or out of water in a bushel or laundry basket under wet burlap or seaweed.
- Crabs and lobsters are best eaten the day they're caught.
- Live oysters should be cooked within 7 to 10 days.
- Live mussels and clams should be cooked within 4 to 5 days.
- Eating raw shellfish is extremely dangerous. People with liver disorders or weakened immune systems are especially at risk.

Cleanup

Cleanup on the boat is similar to cleanup in the wild. Bring disposable wipes for handwashing, and bag up all your trash to dispose of when you return to shore.

General Rules for Outdoor Food Safety

Plan ahead: decide what you are going to eat and how you are going to cook it; then plan what equipment you will need.

- Pack safely: use a cooler if car-camping or boating, or pack foods in the frozen state with a cold source if hiking or backpacking. Keep raw foods separate from other foods. Never bring meat or poultry products without a cold source to keep them safe.
- Bring disposable wipes or biodegradable soap for hand- and dishwashing.
- Plan on carrying bottled water for drinking. Otherwise, boil water or use water purification tablets.
- Do not leave trash in the wild or throw it off your boat.
- If using a cooler, leftover food is safe only if the cooler still has ice in it. Otherwise, discard leftover food.
- Whether in the wild or on the high seas, protect yourself and your family by washing your hands before and after handling food.

July 2005