

Sanitation and Food Handling in the Field 2001 Edition

SANITATION AND FOOD HANDLING IN THE FIELD

This is a discussion of the proper methods of food handling and preparation from its acquisition to the disposal of its waste products in an outdoor camping environment. We should ensure a good, safe environment for the preparation and consumption of food. We should ensure that waste products be handled and disposed of in a safe manner. We, of course, don't expect to be working in an all stainless steel commercial kitchen environment, but we should expect that our camping area, which is our outdoor kitchen be kept as neat and clean as possible. We also expect that food be stored and handled in a reasonably safe manner in order to prevent Food Borne Illness. At this point there are a few concepts we have to deal with. First, what is FOOD BORN ILLNESS, Second, What is POTENTIALLY HAZARDOUS FOOD, and last, What is the TIME TEMPERATURE EQUATION.

A) FOOD BORNE ILLNESS is a illness or a disease that is carried or transmitted to humans by food.

1) BACTERIA are single cell living organisms that grow on food at an amazingly fast rate. There are two ways in which BACTERIA cause illness.

a. It can be a pathogen or a direct infecting agent.

b. Bacteria can produce poisons or toxins as waste products.

2) VIRUSES can be transmitted to food by infected animals or people. Viruses can only live outside of living cells for a short period of time. It should be noted that under the right conditions viruses can survive for up to 4 hours on a work surface. (Hepatitis B can survive up to 8 days)

3) PARASITES are also potentially dangerous to humans. The most parasite is cyclospora. This is found on fruits with more than 1,300 cases reported in 1997. This parasite is not seen, is not removed by normal washing and is linked to imported berries.

4) MOLD and YEAST not only spoil the look and taste of food, but can also contribute to disease.

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- 5) There are certain INGREDIENTS in prepared or processed foods that seem to be appearing with much greater frequency and are undigestible to a significant percentage of the population. It is estimated that up to 15% of the population is lactose intolerant, especially Asian and Native Americans. The heavy use of whey as a milk substitute in foods such as coco mix, cheap cake mixes, bread and even margarine has amplified this problem for many people.
- B) POTENTIALLY HAZARDOUS FOOD is food that because of its moisture content, nutrient content, and pH will easily become a vehicle or host for Micro-organisms under normal household temperatures.
- 1) Moisture--In food industry there is a moisture index called Water Activity. The magic number 0.85, is the minimum moisture level required for bacteria to grow. Below this level are things such as jellies, candy, flour and dry noodles. Above this every thing is in the Potentially Hazardous Food category, including meat, soft cheese and eggs.
 - 2) Acidity (pH) ---Bacteria grow best when food is neutral or slightly acidic. The magic number here is a pH of 4.6.

Below pH 4.6 food is too acid to grow bacteria.

Above pH 4.6 there is potentially Hazardous Food.
- C) THE TIME-TEMPERATURE EQUATION-- The basic concept in time-temp is that the longer you expose food to the temperatures that encourage bacteria growth which is between 40° and 140°F the faster that food is going to spoil.
- 1) Below 40°F--All Potentially Hazardous food must always be stored at this temp range
 - 2) Above 140°F-- Food that has been cooked and being held to be eaten later must be kept at a minimum temp. of 140° F.

Acquisition of Food

A little planning when acquiring food for camp can make an enormous difference in the cost, the amount of handling and safety of our food. The cost of food must be considered or some scouts will be priced out of the camping experience. In camp, most of us have seen, decent meals for as little as \$2 per scout and occasionally some really lousy ones for \$10. When the scouts do their menu planning we need to help them plan to use foods that can be safely stored and easily prepared.

- A) Refrigeration--Potentially Hazardous Food must always be stored below 45°F at all times.
- B) Food Source-Be careful about the Source of your food. Use only fresh food. Food that has been sitting in someones refrigerator for some time may not be safe under field conditions where there is not good temperature control. Don't use out of date food. Under conditions of prolonged refrigeration, microorganisms will have a jump start when they are inadvertently exposed to temperatures above 45° degrees F.
- C) Water - We all need water for drinking, food preparation and washing. In the field there are only two possible ways to acquire potable water, through filtration or boiling.
 - 1. Filtering water -- There are a number of filtering systems. The most important thing to look for when purchasing a filter is that it will filter Giardia. A 3 micron filter is required to filter Giardia.
 - 2. Boiling water -- When boiling water it is important to bring it to a full rolling boil for at least 5 minutes to kill all bacteria.

Proper Storage of Foods

We must remember that all food is perishable. The perishability of potentially hazardous food is rather obvious sometimes, while other less obvious foods may be overlooked (dried or sealed foods). We must think of the storage of foods as we bring them into camp and those meals that have already been cooked. For example, if we fix a Dutch oven full of our favorite camp chef's delight and several hours later decide to eat some more it may not be safe especially under field conditions.

A) Refrigeration - As stated before, all potentially hazardous foods must be stored below 45°F. Any time food is above 45°F there will be rapid bacteria growth. If food is stored for more than 3 hours above 45°F it should not be used. Usually the only field refrigeration available is either a cooler with ice or the outside air on cold days. Coolers are only as reliable as the ice that's in them. With large quantities of food in a cooler that may not be good enough. Even under commercial restaurant conditions a food manager will check the temp. of stored food. A pocket thermometer is a requirement for commercial food managers and every Scoutmaster should also consider using one. It is the only way that you will truly know what your food temperature is and, therefore, how safe the food is. Relying on the outside air can be a risky business. If the temp gets above 45°F you're out of luck. You also have to be careful about exposing the food you are trying to keep cool to direct sunlight. One other hazard of relying on outside cool air is danger of airborne contaminants. You should also be careful when relying on outside air not to insulate food in the middle of your pack.

B) Dry Food - Dry food is considerably easier to store, as long as it is kept dry. Plastic bags are the obvious way to deal with that. If dry food picks up moisture it may very well become potentially hazardous. Dried or packaged foods stored for prolonged periods of time are excellent breeding grounds for bugs or insects. Don't store things like cake mixes or packaged instant oatmeal in your patrol boxes over the summer. Store dry foods in a cool, dry place. They will last a lot longer.

FOOD PREPARATION

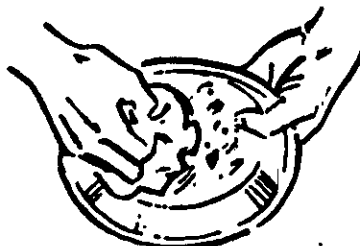
This is the time when food contamination most often occurs. In the field it becomes much more difficult to prevent and control contamination. So far, we have talked mostly about biological contamination, but in the field physical contamination such as particles of dirt, glass, metal, tree bark, etc. are much more difficult to control. During food preparation, we must consider what kind of surface we have to work on. Is an old chunk of plywood, the ground, or a log a safe place to lay out food during preparation? Do the Scouts who are handling food have clean hands? Is the food getting cross-contaminated? Is some of our food sitting at temperatures above 45°F too long? Are our utensils clean or were they just simply wiped off from the last meal because it is was difficult to wash them in the field? These are questions that we must deal with every time we prepare food especially with young Scouts who just don't think about sanitation when mom is not there.

- A) Hand Washing - The lack of hand washing may very well be the most dangerous problem and the biggest cause of food contamination, not only in camp, but also in commercial food operations. It is essential that a Scout or anyone who handles food wash their hands before handling any food. Do the scouts always wash their hands after using the latrine? Hand washing is sometimes difficult in the field but it is a must and can not be stressed enough.
- B) Cross Contamination--Cross contamination is the movement of bacteria from one food item to another usually by way of utensils or the work surface on which the food is being prepared. In the field when dealing with raw meat cross contamination can be a very difficult problem to deal with. Most often there is very limited surface to work on. It is not unusual for Scouts to handle meat and then fruit or vegetables with out rewashing their hands or work surface. This can be a very dangerous practice especially when handling poultry. The contamination of poultry with salmonella is well known.
- C) Clean Utensils--In the field with limited water it is difficult to wash utensils but this is one of the skills that all Scouts need to learn from the beginning. There are several methods of washing and rinsing in which we conserve water but it is also important to sanitize on your

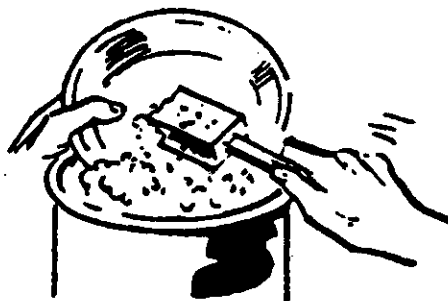
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last rinse. Cleaning utensils in the field is never as good as at home, therefore we really need this extra measure. When using chlorine bleach as a sanitizer in commercial kitchens, the requirement is that you have a solution of between 50 and 200 parts per billion of chlorine. This can be easily done by using an eye dropper bottle. It takes about 6 drops of household laundry bleach to a $\frac{1}{2}$ gallon of water to get the proper solution.

FOR OTHER SCOUTS

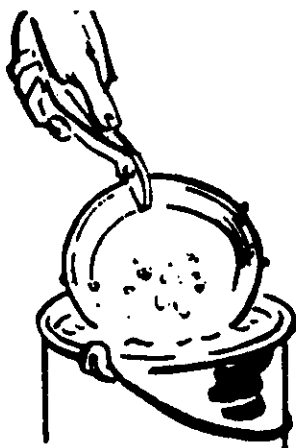


1. Each Scout wipes off his own eating utensils.



WASH

2. He washes them in a pot of wash water.



RINSE

3. He removes cleanser (soap or detergent) by immersing in warm rinse water.



SANITIZE

4. He sterilizes utensils by dunking them in a pot of boiling water.
- Note: Rinsing and sanitizing are two steps—not one!

Cooking of Foods

The proper cooking of foods is, of course, very important. Cooking of food is our last line of defense against microorganisms. This is the only way that we have of eliminating any bacteria that may be on your food. Although we try, it is impossible, especially in the field, to completely prevent the contamination of food. Although many of us like rare meat, camp is not the place for such things. We are unable to take our steak out of the freezer on to the grill as at home. There are just too many chances for contamination and bacterial growth in the field. We need to be sure that all food is well done. We need to check the temperature. This is where our pocket thermometer comes in handy again. You would not want your scouts eating a Dutch oven full of chicken that was not thoroughly cooked. How do you tell when it is ready? Do you shake the chicken leg too see how loose it is? Do you assume that after one hour in a Dutch oven there was enough heat to thoroughly cook your food? No, we can't assume anything. The only real way to tell is to check the temperature. Lift the lid of a Dutch oven and put your thermometer in. Make sure that your food has reached 165°F.

- A) Safe Temperatures for food (internal temp for 15 sec) --
 - Pork +165° F
 - Poultry +165° F
 - Beef +165° F
 - All potentially hazardous food that has been previously served and cooled that are reheated +165° F

- B) Precooking Foods - Never partially precook foods for camp. This could greatly accelerate bacterial growth.

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Proper Disposal and Storage of Garbage

It is very important to properly store and eliminate trash and garbage in camp. Keep your trash and garbage at least 90 feet from the food storage and cooking areas. It is desirable to keep your campsite clean. This is only common sense. It eliminates pests such as insects, rodents and other larger wild animals from your camp. It is at times possible to burn some trash (check with local regulations). It is very dangerous to burn plastic bags. All plastics give off toxic fumes when burned. It's just not appropriate to allow Scouts to be exposed to these very toxic and poisonous gasses. All trash and garbage should be stored in heavy duty plastic bags in a place where animals won't get into it. Any trash that can't be burned must be carried out.

Always consider the placement of your latrine. Latrines should be located at least 300 feet or more from the food storage and cooking areas. Latrines should be located on level ground. Never uphill from the campsite or water supplies. You don't want the latrine in a place where a heavy rain fall could cause it to contaminate either your water source or your camp site.

It is the responsibility of the Scoutmaster and Senior Patrol Leader to inspect their camp for proper cleanliness. It is the policy of the BSA to always leave your site neater and cleaner than before (leave no trace).

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List of References

1. Food and Drug Administration, 2001. FOOD CODE. U.S. Public Health Service, U.S. Department of Health and Human Services. Washington, D.C.20204.
2. U.S. Department of Agriculture, 1990. Preventing Foodborne Illness, A Guide to Safe Food Handling. USDA, Food Safety and Inspection Service, Home and Garden Bull.# 247.
3. Boy Scouts of America, 1984. Fieldbook 3rd Edition. BSA, Irving,Tx 75038-3096.
4. Boy Scouts of America, 1979. Official Boy Scout Handbook. BSA, Irving,Tx 75038-3096.
5. Food and Drug Administration, 1995. *Salmonella enteritidis* From the Chicken to the Egg. FDA Consumer Magazine DHHS Pub. no.(FDA) 91-2238. Washington D.C.
6. Massachusetts Medical Society, 1995. *Escherichia coli* o157:H7 Outbreak at a Summer Camp-Virginia, 1994.Morbidity and Mortality Weekly Report Vol. 44/no. 22.
7. IAMFES, Pocket Guide to Dairy Sanitation
8. Department of the Army, 1988. Field Hygeine and Sanitation. FM 21-10. Washington D.C.