

Menus and Cooking In Snow

Food and Water

Food, water, and sanitation are important considerations for cold-weather camping. Food should be easy to carry, store and prepare and provide the calories and bulk necessary to provide you with heat and energy, as well as supply needed nutrients. Plans should be made to collect and purify water as needed. Finally, eating and drinking necessitates plans for sanitary waste elimination.

Nutrition

Except under survival conditions, well-clothed, sheltered, and trained campers use little more food in the cold than in moderate temperatures. However, caloric intake in cold weather increases for two reasons. First, the extra activity required by dressing and the hampering effect and weight of that clothing increases energy needs. Second, the stimulus of the cold gives you a ravenous appetite. However, because the body “fires” burn somewhat hotter in cold weather and because food affects morale, you will want to supply your group well.

Foods come from animal and vegetable sources, and serve three functions in the body:

- Serve as fuel to provide heat energy or calories
- Provide materials for building, repairing, or maintaining body tissues.
- Help regulate body processes.

Calories measure the amount of energy in the food you eat. They are furnished by carbohydrates, fats, and proteins.

Typical energy expenditures for an average size person are as follows:

Sleeping	60 Cal/hour
Lying Awake	70 Cal/hour
Sitting	90 Cal/hour
Standing	150 Cal/hour
Walking	250 Cal/hour
Shivering	Up to 450 Cal/hour
Heavy Activity	400-1100 Cal/hour
Maximum Continuous Output	600 Cal/hour

The best way to meet energy requirements for winter activities is to carry a quantity of high-energy food in your pack. Candy, cereals, or dried fruit provide almost immediate fuel for the muscles and heat for the body.

Carbohydrates. Carbohydrates are the main source of energy. They are grouped together as starches, sugars, and celluloses. Starches and sugars are quick-energy foods because they provide only energy. Starches are found in bread, cereals, flour, and potatoes. Sources of sugar in the diet include ordinary white or brown sugar, milk, and fruit. During digestion, starches and sugars are turned into simple sugars, which are then oxidized to give energy. The body does not digest cellulose (dietary fiber), but fiber helps move food wastes through the digestive tract, making them easier to pass. The best sources of fiber are whole grain cereals and breads, nuts, seeds, fruits, and vegetables.

Fats. Fats are the highest energy food, providing about 9 calories per gram. Carbohydrates and proteins each provide about 4 calories per gram in metabolism. They also furnish the natural sources for the fat-soluble vitamins A, D, E, and K. Fats can be either animal or vegetable in origin. Fats give a diet its “staying” qualities, helping to satisfy your appetite.

Fats and carbohydrates are called “protein spacers” since their presence prevents the body from having to burn its protein (blood and muscle) to give energy. The body selects carbohydrates to burn first, then fat, then protein, because of their relative ease of metabolism. A diet consisting of 40 percent fat, 40 percent carbohydrates, and 20 percent protein appears to be best in cold weather, for a number of reasons.

Protein. Protein is the most common substance, other than water, in your body. Its main function is the growth and maintenance of body structures. Supplying energy is a backup function for protein. Carbohydrates and fats have the primary responsibility for supplying energy. Protein serves this function only if not enough of those nutrients are available to meet the body’s energy needs. Protein can be either of animal or vegetable origin. Proteins are made of building blocks called amino acids. Most of the amino acids can be manufactured in your body, but some cannot, so these essential amino acids must be supplied by the foods you eat. Protein from animal sources (meat, fish, poultry, milk, and eggs) supplies all of the essential amino acids. Protein from vegetable sources (beans, peas, whole grains, and nuts) may have several of the essential amino acids, but rarely all of them.

Protein has another remarkable property: the specific dynamic action by which protein, in its own digestion and oxidation, increases body metabolism by 30 percent. This is a source of heat in addition to that normally produced by the muscles and the liver. In the cold, protein is an additionally protective food. Because the byproducts of protein metabolism are dependent on the kidney for excretion, water intake must be kept up to prevent damaging hard-worked kidneys when increased protein is eaten. This liquid can be in almost any form

(water, fruit drinks, hot thin soups), except coffee. Not only does coffee increase nervous tension in cold climates, but it also causes excess dehydration by stimulating kidney function. This decreases the body's ability to handle protein excretion.

Provisioning

Using *Best and Taylor's Physiological Basis of Medical Practice* as a reference, the best average temperature-climate diet follows, along with a recommended cold-weather diet.

Food Element	Temperate Climate	Cold Weather
Carbohydrates (4.1grms)	53%	40%
Fats (9.2 calories/gram)	35%	40%
Proteins (4.1 calories/gram)	12%	20%

The numbers of calories required per day is based on many factors and should be matched to the individual and the circumstances.

The quantity of calories utilized in winter program depends on many factors: weather, temperature, type of activity, etc. The following example of a day's ration is designed to be adjusted from between 3,000 and 4,000-plus calories per day. This ration should be consumed along with 2 ½ to 3 quarts of water per day. The amount of water can be increased depending upon the amount of work, the temperatures, etc.

Winter Camping Foods

Food for winter camping trips can vary greatly according to individual needs and tastes. Generally, we are trying to travel light, so simple, dehydrated foods that do not require a lot of time and equipment to prepare and which can be purchased at your local supermarket work best. Summer campers can afford the time and energy for an occasional gourmet meal, but with the shorter daylight hours and colder temperatures, it is best for winter campers to plan menus for conservation of time and fuel. By using nutritious and quickly prepared meals, plus serving the foods and beverages hot, you are not putting out body calories to bring cold food or fluids up to or body temperature. Time and fuel may have priority during winter trips, so simple and fast-prepared meals are an advantage.

There are numerous companies such as Mountain House, Richmoor, Chuck Wagon, and others that are marketing a wide variety of freeze-dried trail foods.

Some of them have their own foil packets. All you need to do is add boiling water and wait five to ten minutes for the food to reconstitute and you have a hot, tasty meal. These main dishes are available in a wide variety such as chicken, stew, beef and potatoes, beef and rice, chili, etc.

During the winter when everything is cold, you have to use special effort to keep these packets of food and water hot during the reconstitution period or they might end up tough and chewy. To do this, you can keep the packet submerged in hot water, or on hot rocks after adding the boiling water. If you set it aside on the snow while waiting for it to reconstitute, it will get cold in a hurry.

Retort dinners are fantastic, but are heavier than some dehydrated foods. They are packaged with their own juices in laminated foil packets. Drop these packages into a pot of hot water for several minutes to heat. You end up with a delicious hot meal with no cooking involved. The pouch can be opened and the food eaten without heating if necessary, during emergencies but hot food tastes better and does not take body calories to warm it up. You should experiment and decide if you prefer the slightly heavier retort pouches or the lighter weight meals that require a bit of cooking time in camp. The packets do not have to be kept frozen and have a shelf life of several years.

Winter camping allows you to use more techniques of meal preparation than does summer camping. For example, you can cook up batches of chili, stews, chicken and noodles, etc., at home before your trip. Put these cooked meals into seal-a-meal bags and into the freezer until needed. Make each seal-a-meal bag into an individual serving rather than make the bags contain portions for two, four, or whatever the number in the group. You can then pull out the required number of meals needed per trip. These watertight bags can be dropped into a pot of boiling water in camp, and you soon have a hot steaming meal. The individual serving bags thaw out much quicker than the larger portions do. These precooked packages of food can be kept frozen during winter tours and used as needed. Breads, muffins, cinnamon rolls or fruitcakes can also be baked ahead of time and kept frozen until needed.

You can cook up batches of scrambled eggs and sausage or ham, French toast, or other breakfast ingredients and package them in individual servings and freeze them in seal-a-meal bags. For breakfast in camp, drop these packets into a can of boiling water to thaw and have a hot breakfast with no campfire cooking involved. If you don't mind carrying a few extra items such as honey, jelly, or syrup, you can also bake up pancakes or waffles and package these in individual servings in seal-a-meal bags and freeze them in advance. When the packets are taken out of the hot water, they taste like you have just taken them off of the grill. There is a powdered jelly that is handy to carry. You open up a packet and add enough water to make the correct consistency to spread over French toast or pancakes. Powdered syrup can also be cooked a little at a time over the campfire for those breakfast pancakes and waffles. Open a steaming package of scrambled eggs and ham to go with the pancakes, add a hot beverage, and top it

off with hot Instant Quaker Oats or Cream of Wheat which can also be obtained in individual packets. This gives you a good start for the day with a full fuel tank.

If you prefer not to eat directly out of the plastic bags, you can use a simple plastic or Lexan bowl. Make sure it is shallow enough to accommodate licking it clean when your meal is over. This minimizes clean up and gray-water to dispose of. Once the bowl is licked clean, only a small amount of soap and water are needed to sterilize it and rinse it off. Used packaging should be folded up into as small a package as possible and hauled out. The stews, chicken and noodles, or meal of your choice used for the evening meals can be eaten directly from the bags. It is no problem to keep these packets frozen while enroute during winter excursions by placing them on the outside edge of the backpack or sled exposed to the cold.

During the winter trips, always attempt to have some type of hot beverage such as instant coffee, tea, hot chocolate, hot Jell-O, Tang, or other mixes with each meal. Drinking hot beverages instead of cold helps to put quick heat into your system as well as the fluids that are essential. Coffee is not the best choice, however, because it has no nutritional value, and contains caffeine, which is a diuretic (meaning it dehydrates you).

The noon meal can be much simpler, almost to the point of being just a “snack stop”. Along with a beverage to insure the intake of fluids, carry a few of the firmer backpack crackers or tortillas, a variety of cheeses, and meat sticks and jerky sticks. Cheese has about two hundred calories per ounce and goes a long way toward sustaining you while snow camping all by itself. Mountain House has a very good freeze-dried tuna salad and a chicken salad in small packets. Just add cold water to the watertight package, stir it with a stick, and it goes well with cheese and crackers. Chuck Wagon and other suppliers also have a wide variety of these lunch-type foods plus many items that require only 15 to 20 minutes cooking for a nutritious evening meal. If you do not prefer to purchase the more expensive freeze-dried foods from the specialty outdoor stores, you can find many good items at your local grocery store. These include Minute Rice, different types of instant potatoes, dried soups mixes such as Lipton’s, assortments of instant breakfast cereals, dried fruits, and nuts.

A large assortment of pots and pans should not be necessary. Two or three nesting pots, typically one, two, and three-quart pots, or one very large, six-quart pot for the whole patrol together with a serving spoon should suffice. With these pots, you can always drop in a cooking pouch, or have hot water available for soup, instant cereals, instant drinks, etc. A cloth or plastic bag can be slipped over the pots so the soot on the bottom does not get on other items in your pack.

If metal cups and plates are placed by the fire, they will get too hot to use. If they are placed in the snow, they will get too cold, too quickly. The Sierra Cup, with its cooling metal rim can be serviceable in the winter, however, plastic or Lexan cup and bowl work best. If you use plastic, make sure it can handle boiling

water. These plastic utensils weigh very little and are easy to clean. Generally, you should not need to use a lot of utensils in winter. A large pot for boiling water for your cooking team (two to four members works well – you can cook in a large pot for the whole patrol - at Philmont BSA High Adventure Base, they teach one-pot meals for an entire crew of up to twelve), a pot gripper (I use my Gerber multi-tool pliers), a plastic or Lexan bowl and/or cup, plastic spoon and fork, or a “spork”, and pocket knife should just about do it (again, a Gerber or Leatherman type multi-tool works well). Again, after meals, you can lick everything clean, add a drop of soap and a few drops of water, rub this around with your finger, pour it out, add a small amount of water for rinse, swish it around, pour it out and you are done! By using cooking pouches in the boiling water, the pot should never get dirty.

Even the soap is not essential if each person licks and wipes out his or her own bowl and utensils. Trimming weight and bulk from your pack by eliminating items that are not absolutely necessary is an ongoing challenge.

Pre-cooked breads, bagels, or fruitcakes are also good to take along. When carrying frozen bread, muffins, etc. on winter tours, you can take out the desired quantity ahead of time, put it in a plastic bag, and place it in an inside pocket in your shirt or coat. Body heat will thaw it out for the next meal. If using bread inside plastic wrappings, be careful not to get it too close to heat, or the plastic might melt and be difficult to separate from the bread.

You can prepare ahead of time various types of snack foods for winter excursions. Assortments of these mixtures are ground and mixed together into bars called pemmican, of which there are numerous variations. Each individual or group seems to have their own favorite concoction of trail mix or “GORP” (which stands for “good old raisins and peanuts”), including dried fruit, rolled oats, granola, chocolate pieces, M&Ms, peanut butter, honey, nuts, sunflower seeds, and other ingredients. A favorite of mine is one pound each of raisins, mixed nuts, and M&Ms. Dump them together into a bowl, mix them up and store them in smaller portions in plastic bags. These bags can freeze or thaw with no harm until they are taken from the pack or survival kit as a quick and easy snack.

Summary

The foods for winter camping can vary greatly in content and type, depending on your desire for economy, pre-preparation, weight, bulk, and other factors. To help promote body energy and heat during winter tours, include fatty-type foods such as cheeses, sausage, peanut butter, and nuts. Fatty foods also take longer to digest than sugar and carbohydrate foods. By mid-morning, when the sugar and starch foods are about used up, the fat foods are still digesting and going into your system for body energy and heat.

Exerting energy in traveling over the snow plus the need to produce body heat in

a cold atmosphere requires considerably more calories than are required on summer excursions. Include extra foods for this “double duty”. Remember that fatty foods generally contain more calories per ounce than starch and carbohydrate foods such as breads and noodles. Start with short tours and increase them as you gain experience and confidence. Experience and individual preferences will soon allow you to plan and better prepare your gear and food for excursions into remote areas without being burdened down with unneeded items.

Breakfast

- Hot Tang, or hot cider
- Dried fruit, or dried fruit re-constituted by cooking in water
- Hot cereals – Instant oatmeal, instant cream of wheat, instant cream of rice
- Instant eggs (powdered or freeze-dried)
- Meat bar
- Cake bar, energy bar
- Hot drink- cocoa, hot tea (herbal to avoid caffeine), hot cider

Lunch

- Instant, fruit-flavored drink
- Hot, instant soup
- Cheese sticks
- Meat bars, or meat sticks, Italian dry salami, summer sausage, etc.
- Energy bars, Power Bars, jerky, etc.
- Bagels, mini-bagels, tortillas, pita bread, or crackers
- Peanut butter & jelly

Trail Snacks

- Instant, fruit-flavored drink
- Trail mix (raisins, peanuts, cashews, almonds, M&Ms, dried fruit, granola, coconut, etc.)
- Dried fruit

Dinner

- Instant, fruit-flavored drink
- Instant soup
- Hot main dish- can be a one-dish meal, a retort meal, or a freeze-dried dinner, and should include a starch (rice, noodles, macaroni, or potatoes), broth or gravy (bouillon cubes, instant gravy mixes), meat (canned chicken, beef, chipped beef, or ham), and freeze-dried or dehydrated

- vegetables.
- Crackers, bagels, tortillas, pita bread, etc.
 - Hot drink (cocoa, tea, hot cider)
 - Dessert- can be one that requires preparation and cooling, such as a pudding, or an already prepared item.
 - Extras – Sugar or sweetener, milk powder, cream powder, salt, pepper, Tobasco sauce, and your own favorite spices. Butter or margarine, honey, maple sugar, fruit soup mixes, flavored teas, instant hot soups and bouillons, special soups, extra snack items such as fruits and nuts. Adults may want coffee and tea. Don't forget paper towels and trash bags for leftover packaging to be hauled out!

Water

You should carry some type of canteen or water bottle with you during the winter because the intake of fluids is essential for body efficiency and warmth. When traveling over the snow, there is often no running water visible to filter easily. You should not eat snow, as the process reduces body temperature. You usually do not have time to stop and melt snow and bring it to a rolling boil to prepare it for drinking while you are traveling, thus the importance of carrying a full canteen or water bottle. By adding a little bit of snow to your water bottle periodically, and keeping the water bottle in a pocket near your body, your body heat will keep the temperature of the water above freezing, and the water will melt the snow and keep your bottle full.

If weight is not a big problem, some winter campers like to carry a small thermos jug. This can be filled with hot chocolate or hot soup. At mid-morning you can stop for a "mug-up" consisting of several sips from the hot thermos along with some fruitcake, cookies, or bagels, that have been carried in an inside pocket to thaw. You can finish consuming the contents of the thermos bottle with a similar in mid-afternoon. This pause with a hot drink and a snack helps to warm you up, lets your body rest a bit, and gives you a boost of energy to continue on. The thermos bottle can be washed out in camp each evening and if filled with water, it will not freeze in a tent or lean-to. That way, you can have a drink during the night if desired. In a properly constructed snow cave, a plain canteen of water will not freeze the way it would in a tent or lean-to. Before you leave camp the next morning, again fill the thermos with a hot beverage or soup for the midday stops.

While in camp, more water can be melted or filtered from streams for the following day. A couple of water bottles filled with hot water are also nice to toss into your sleeping bag just before you bed down for the night. Your body heat will help keep them warm and liquid, and their heat will help keep you warm.

A Note on Water Safety

Even in remote areas, water, snow, even fresh snow may be contaminated by three types of water-borne pathogens: viruses, bacteria, and large parasites.

There are three methods for treating water: boiling, chemical treatment with iodine or chlorine, and filtering.

Viruses: Water in wilderness areas in North America are generally free from viruses, however, it never hurts to be safe. Viruses are easily killed by both boiling and chemical treatment. Viruses are too small to be removed by most filters.

Bacteria: Many types of bacteria are found in wilderness waters in North America. Chemical treatment kills most bacteria. Filters are also effective with the smaller sized filters. Boiling kills all bacteria.

Parasites: Parasites include protozoa, amoebas, tapeworms, and flatworms. Giardia lamblia and Cryptosporidium parvum (crypto) are common parasites in North American waters. Some parasites are resistant to chemical treatment, but they can be filtered out and boiling kills them.

Chemical treatment affects the taste of water, and can take a little time. Iodine is more effective than chlorine. Most viruses, bacteria, and parasites are eliminated through chemical treatment.

Filtering can be slow and the filter cumbersome. Filters are also easily contaminated through careless handling, however, they are effective against most viruses and parasites, but less effective against bacteria.

Boiling is most effective against viruses, bacteria, and parasites, but it takes time and uses up fuel. If you are melting snow, remember to put a little water in the pan first, and add the snow slowly. Otherwise, the snow will wick up the water, the water will not be in the bottom of the pan to absorb the heat evenly and you run the risk of burning the pan.

Some experts say the only safe method of purifying water is to bring it to a full boil for five minutes. Others swear by their water filters. The official policy at Philmont BSA High Adventure Base recommends against water filters because of the risk of contamination, and against boiling because of the amount of fuel it is necessary to carry if it is done right, and the risk that campers will be impatient and won't bring it to a full boil long enough. They issue iodine to each crew, teach them to use it correctly, and require it be used.