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## **Nutrition for the Person With Cancer During Treatment**

Nutrition is an important part of cancer treatment. Eating the right kinds of foods before, during, and after treatment can help you feel better and stay stronger. Chances are, if you are reading this booklet either you or someone you care about is going through cancer treatment. The American Cancer Society has prepared this guide to help you and your loved ones cope with treatment side effects that might affect how well you can eat.

Not everyone has nutrition-related side effects, but this guide will help you address them if and when they come up. You don't have to read straight through all of the information here. You can just read the sections you need and use the information that applies to you.

The information in this guide is not meant to replace the advice of a medical professional. If you have any questions or concerns, you should talk to a doctor, nurse, or dietitian about your nutritional needs. A registered dietitian (RD) can be one of your best sources of information about your diet. If you are going to meet with a dietitian, be sure to write down your questions before your meeting so you won't forget anything. And be sure to ask the dietitian to repeat or explain anything that's not clear. If you have questions about something in this guide, a dietitian can give you a more detailed explanation.

You can find more detailed discussion of nutrition before, during, and after cancer treatment in our book called [American Cancer Society Complete Guide to Nutrition for Cancer Survivors: Eating Well, Staying Well During and After Cancer](#)<sup>1</sup>.

For more information or to find a registered dietitian, contact the [Academy of Nutrition and Dietetics](#)<sup>2</sup>.

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## Benefits of good nutrition during cancer treatment

Good nutrition is especially important if you have cancer because both the illness and its treatments can change the way you eat. [Cancer](#)<sup>1</sup> and [cancer treatments](#)<sup>2</sup> can also affect the way your body tolerates certain foods and uses nutrients.

The nutrient needs of people with cancer vary from person to person. Your cancer care team can help you identify your nutrition goals and plan ways to help you meet them. Eating well while you're being treated for cancer might help you:

- Feel better.

- Keep up your strength and energy.
- Maintain your weight and your body's store of nutrients.
- Better tolerate [treatment-related side effects](#)<sup>3</sup>.
- Lower your risk of infection.
- Heal and recover faster.

Eating well means eating a variety of foods to get the nutrients your body needs to fight cancer. These nutrients include protein, carbohydrates, fat, water, vitamins, and minerals.

## Nutrients

### Proteins

We need protein for growth, to repair body tissue, and to keep our immune systems healthy. When your body doesn't get enough protein, it might break down muscle for the fuel it needs. This makes it take longer to recover from illness and can lower resistance to infection. People with cancer often need more protein than usual. After [surgery](#)<sup>4</sup>, [chemotherapy](#)<sup>5</sup>, or [radiation therapy](#)<sup>6</sup>, extra protein is usually needed to heal tissues and help fight infection.

Good sources of protein include fish, poultry, lean red meat, eggs, low-fat dairy products, nuts and nut butters, dried beans, peas and lentils, and soy foods.

### Fats

Fats play an important role in nutrition. Fats and oils are made of fatty acids and serve as a rich source of energy for the body. The body breaks down fats and uses them to store energy, insulate body tissues, and transport some types of vitamins through the blood.

You may have heard that some fats are better for you than others. When considering the effects of fats on your heart and cholesterol level, choose monounsaturated and polyunsaturated fats more often than saturated fats or trans fats.

**Monounsaturated fats** are found mainly in vegetable oils like olive, canola, and peanut oils.

**Polyunsaturated fats** are found mainly in vegetable oils like safflower, sunflower, corn, and flaxseed. They are also the main fats found in seafood.

**Saturated fats** are mainly found in animal sources like meat and poultry, whole or reduced-fat milk, cheese, and butter. Some vegetable oils like coconut, palm kernel oil, and palm oil are saturated. Saturated fats can raise cholesterol and increase your risk for heart disease. Less than 10% of your calories should come from saturated fat.

**Trans-fatty acids** are formed when vegetable oils are processed into solids, such as margarine or shortening. Sources of trans fats include snack foods and baked goods made with partially hydrogenated vegetable oil or vegetable shortening. Trans fats are also found naturally in some animal products, like dairy products. Trans fats can raise bad cholesterol and lower good cholesterol. Avoid trans fats as much as you can.

## Carbohydrates

Carbohydrates are the body's major source of energy. Carbohydrates give the body the fuel it needs for physical activity and proper organ function. The best sources of carbohydrates – fruits, vegetables, and whole grains – also supply needed vitamins and minerals, fiber, and phytonutrients to the body's cells. (Phytonutrients are chemicals in plant-based foods that we don't need to live, but that might promote health.)

**Whole grains** or foods made from them contain all the essential parts and naturally occurring nutrients of the entire grain seed. Whole grains are found in cereals, breads, and flours. Some whole grains, such as quinoa, brown rice, or barley, can be used as side dishes or part of an entrée. When choosing a whole-grain product, look for the words "whole grain," "stone ground," "whole ground," "whole-wheat flour," "whole-oat flour," or "whole-rye flour." Note that some bakeries will use whole-wheat flour along with white flour but label the product "whole wheat." Look at the ingredient list to find out. Breads and other products labeled "100% whole wheat" don't contain refined flour.

**Fiber** is the part of plant foods that the body can't digest. There are 2 types of fiber. Insoluble fiber helps to move food waste out of the body quickly, and soluble fiber binds with water in the stool to help keep stool soft.

Other sources of carbohydrates include bread, potatoes, rice, spaghetti, pasta, cereals, corn, peas, and beans. Sweets (desserts, candy, and drinks with sugar) can supply carbohydrates, but provide very little in the way of vitamins, minerals, or phytonutrients.

## Water

Water and liquids or fluids are vital to health. All body cells need water to function. If you don't take in enough fluids or if you lose fluids through vomiting or diarrhea, you can become dehydrated (your body doesn't have as much fluid as it should). If this happens,

the fluids and minerals that help keep your body working can become dangerously out of balance. You get water from the foods you eat, but a person should also drink about eight 8-ounce glasses of liquid each day to be sure that all the body cells get the fluid they need. You may need extra fluids if you're vomiting, have diarrhea, or even if you're just not eating much. Keep in mind that all liquids (soups, milk, even ice cream and gelatin) count toward your fluid goals.

## **Vitamins and minerals**

The body needs small amounts of vitamins and minerals to help it function properly. Most are found naturally in foods. They are also sold as supplements in pill and liquid form. They help the body use the energy (calories) found in foods.

A person who eats a balanced diet with enough calories and protein usually gets plenty of vitamins and minerals. But it can be hard to eat a balanced diet when you're being treated for cancer, especially if you have treatment side effects that last for a long time. In this case, your doctor or dietitian may suggest a daily multivitamin and mineral supplement. If your food intake has been limited for several weeks or months because of the effects of treatment, be sure to tell your doctor. You might need to be checked for vitamin or mineral deficiencies.

If you're thinking of taking a vitamin or supplement, be sure to discuss this with your doctor first. Some people with cancer take large amounts of vitamins, minerals, and other dietary supplements to try to boost their immune system or even destroy cancer cells. But some of these substances can be harmful, especially when taken in large doses. In fact, large doses of some vitamins and minerals may make chemotherapy and radiation therapy less effective.

If your oncologist says it's OK for you to take a vitamin during treatment, it may be best to choose a supplement with no more than 100% of the Daily Value (DV) of vitamins and minerals and one without iron (unless your doctor thinks you need iron).

## **Antioxidants**

Antioxidants include vitamins A, C, and E; selenium and zinc; and some enzymes that absorb and attach to free radicals, preventing them from attacking normal cells.

If you want to take in more antioxidants, health experts recommend eating a variety of fruits and vegetables, which are good sources of antioxidants. Taking large doses of antioxidant supplements or vitamin-enhanced foods or liquids is usually not recommended while getting chemo or radiation therapy. Talk with your doctor to find out

the best time to take antioxidant supplements.

## **Phytonutrients**

Phytonutrients or phytochemicals are plant compounds like carotenoids, lycopene, resveratrol, and phytosterols that are thought to have health-protecting qualities. They're found in plants such as fruits and vegetables, or things made from plants, like tofu or tea. Phytochemicals are best taken in by eating the foods that contain them rather than taking supplements or pills.

## **Herbs**

Herbs have been used to treat disease for hundreds of years, with mixed results. Today, herbs are found in many products, like pills, liquid extracts, teas, and ointments. Many of these products are harmless and safe to use, but others can cause harmful side effects. Some may even interfere with proven cancer treatments, including chemo, radiation therapy, and recovery from surgery. If you're interested in using products containing herbs, talk about it with your oncologist or nurse first.

## **Safety considerations**

Many people believe that if they find a pill or supplement in stores, it's safe and it works. The Food and Drug Administration (FDA) has rules to help ensure that supplements contain what their labels claim they do, but the supplement's safety and its effects on the body are not addressed by any FDA rules. The FDA does not make manufacturers of these products print possible side effects on their labels. And the FDA can't pull a dietary supplement or herbal product from the market unless they have proof that the product is unsafe.

It's also been shown that many herbal products aren't what the label says they are. Some products don't contain any of the herb they're supposed to. Some also contain potentially harmful drugs, additives, or contaminants that aren't listed on the label. This means there's no sure way to know if a supplement is safe or how it will affect you.

Tell your cancer care team about any over-the-counter products or supplements you're using or are thinking about using. Take the bottle(s) to your doctor to talk about the dose and be sure that the ingredients do not interfere with your health or cancer treatments. Some other safety tips:

- Ask your cancer care team for reliable information on dietary supplements.
- Check the product labels for both the quantity and concentration of active

ingredients in each product.

- Stop taking the product and call your cancer care team right away if you have side effects, like wheezing, itching, numbness, or tingling in your limbs.

## Cancer and cancer treatment affect nutrition

When you're healthy, eating enough food to get the nutrients and calories you need is not usually a problem. Most nutrition guidelines stress eating lots of vegetables, fruits, and whole-grain products; limiting the amount of red meat you eat, especially those that are processed or high in fat; cutting back on fat, sugar, alcohol, and salt; and staying at a healthy weight. But when you're being treated for cancer, these things can be hard to do, especially if you have [side effects](#)<sup>1</sup> or just don't feel well.

During cancer treatment you might need to change your diet to help build up your strength and withstand the effects of the cancer and its treatment. This may mean eating things that aren't normally recommended when you are in good health. For instance, you may need high-fat, high-calorie foods to keep up your weight, or thick, cool foods like ice cream or milk shakes because sores in your mouth and throat are making it hard to eat anything. [The type of cancer](#)<sup>2</sup>, your [treatment](#)<sup>3</sup>, and any side effects you have must be considered when trying to figure out the best ways to get the nutrition your body needs.

When your cancer was first diagnosed, your doctor talked with you about a treatment plan. This may have meant [surgery](#)<sup>4</sup>, [radiation therapy](#)<sup>5</sup>, [chemotherapy](#)<sup>6</sup>, hormone therapy, biologic therapy ( [immunotherapy](#)<sup>7</sup>), or some combination of treatments. All of these treatments kill cancer cells. But in the process, healthy cells are damaged, too. This damage is what causes cancer treatment side effects. Some of the more common side effects that can affect eating are:

- Loss of appetite
- Sore mouth or throat
- Dry mouth
- Dental and gum problems
- Changes in taste or smell

- Nausea
- Vomiting
- Diarrhea
- Constipation
- [Feeling very tired all the time \( fatigue\)](#)<sup>8</sup>
- [Depression](#)<sup>9</sup>

You might – or might not – have any of these side effects. Many factors determine whether you'll have side effects and how bad they'll be. These factors include the type of cancer you have, the part of the body affected, the type and length of treatment, and the dose of treatment.

Many side effects can be controlled, and most go away over time after treatment ends. Talk with your cancer care team about your chances of having side effects and what can be done to help control them. After your treatment starts, tell your cancer care team about any side effects that aren't controlled. Let them know if the medicines they've given you to help with side effects do not work, so that others can be used.

We have a lot more information on the [different side effects of cancer treatment](#)<sup>10</sup>. Call us or visit our website for more details.

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## Before treatment begins

Until you start treatment, you won't know what, if any, [side effects](#)<sup>1</sup> you may have or how you will feel. One way to prepare is to look at your treatment as a time to focus on yourself and on getting well. Here are some other ways to get ready:

### Make plans now

You can reduce your anxiety about treatment and side effects by taking action now. Talk to your cancer care team about the things that worry you. Learn as much as you can about the cancer, your treatment plan, and how you might feel during treatment. Planning [how you'll cope with possible side effects](#)<sup>2</sup> can make you feel more in control and ready for the changes that may come.



Here are some tips to help you get ready for treatment:

- Stock your pantry and freezer with your favorite foods so you won't need to shop as often. Include foods you know you can eat even when you're sick.
- Cook in advance, and freeze foods in meal-sized portions.
- Talk to your friends or family members about ways they can help with shopping and cooking, or ask a friend or family member to take over those jobs for you. Be sure to tell them if there are certain foods or spices you have trouble eating.
- Talk to your cancer care team about any concerns you have about eating. They can help you make diet changes to help manage side effects like [constipation](#), [weight loss](#)<sup>3</sup>, or [nausea](#)<sup>4</sup>.

For those whose cancer treatment will include radiation to the head or neck, you may be advised to have a feeding tube placed in your stomach before starting treatment. This allows feeding when it gets hard to swallow, and can prevent problems with nutrition and dehydration during treatment.

For more information on coping, see the "[To learn more](#)" section and/or call your American Cancer Society at 1-800-227-2345.

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## Once treatment starts

### Eat well

Your body needs a healthy diet to function at its best. This is even more important if you have cancer. With a healthy diet, you'll go into treatment with reserves to help keep up your strength, prevent body tissue from breaking down, rebuild tissue, and maintain your defenses against infection. People who eat well are better able to cope with [side effects of treatment](#)<sup>1</sup>. And you may even be able to handle higher doses of certain drugs. In fact, some cancer treatments work better in people who are well-nourished and are getting enough calories and protein. Try these tips:

- Don't be afraid to try new foods. Some things you may never have liked before may taste good during treatment.
- Choose different plant-based foods. Try eating beans and peas instead of meat at a

few meals each week.

- Try to eat at least 2½ cups of fruits and vegetables a day, including citrus fruits and dark-green and deep-yellow vegetables. Colorful vegetables and fruits and plant-based foods contain many natural health-promoting substances.
- Limit high-fat foods, especially those from animal sources. Choose lower-fat milk and dairy products. Reduce the amount of fat in your meals by choosing a lower-fat cooking method like baking or broiling.
- Try to stay at a healthy weight, and stay physically active. Small weight changes during treatment are normal.
- Limit the amount of salt-cured, smoked, and pickled foods you eat.

If you can't do any of the above during this time, don't worry about it. Help is available if or when you need it. Sometimes diet changes are needed to get the extra fluids, protein, and calories you need. Tell your cancer care team about any problems you have.

## **Snack as needed**

During cancer treatment your body often needs extra calories and protein to help you maintain your weight and heal as quickly as possible. If you're losing weight, snacks can help you meet those needs, keep up your strength and energy level, and help you feel better. During treatment you may have to rely on snacks that are less healthy sources of calories to meet your needs. Keep in mind that this is just for a short while – once side effects go away you can return to a healthier diet. Try these tips to make it easier to add snacks to your daily routine:

- Eat small snacks throughout the day.
- Keep a variety of protein-rich snacks on hand that are easy to prepare and eat. These include yogurt, cereal and milk, half a sandwich, a bowl of hearty soup, and cheese and crackers.
- Avoid snacks that may make any treatment-related side effects worse. If you have diarrhea, for example, avoid popcorn and raw fruits and vegetables. If you have a sore throat, do not eat dry, coarse snacks or acidic foods.

If you're able to eat normally and maintain your weight without snacks, then don't include them.

## **Some quick-and-easy snacks**

- Angel food cake
- Cereal (hot or cold)
- Cheese (aged or hard cheese, cottage cheese, cream cheese, and more)
- Cookies
- Crackers
- Dips made with cheese, beans, yogurt, or peanut butter
- Eggnog (pasteurized)
- Fruit (fresh, frozen, canned, dried)
- Gelatin made with juice, milk, or fruit
- Granola or trail mix
- Homemade milk shakes and smoothies
- Ice cream, sherbet, and frozen yogurt
- Juices
- Microwave snacks
- Milk by itself, flavored, or with instant breakfast powder
- Muffins
- Nuts, seeds, and nut butters
- Popcorn, pretzels
- Puddings, custards
- Sandwiches such as egg salad, grilled cheese, or peanut butter
- Soups (broth based or hearty)
- Sports drinks
- Vegetables (raw or cooked) with olive oil, dressing, or sauce
- Yogurt (low fat or Greek)

## **Tips to get more calories and protein**

- Eat several small snacks throughout the day, rather than 3 large meals.
- Eat your favorite foods at any time of the day. For instance, eat breakfast foods for dinner if they appeal to you.
- Eat every few hours. Don't wait until you feel hungry.
- Eat your biggest meal when you feel hungriest. For example, if you are most hungry in the morning, make breakfast your biggest meal.
- Try to eat high-calorie, high-protein foods at each meal and snack.
- Exercise lightly or take a walk before meals to increase your appetite.
- Drink high-calorie, high-protein beverages like milk shakes and canned liquid supplements.
- Drink most of your fluids between meals instead of with meals. Drinking fluid with

meals can make you feel too full.

- Try homemade or commercially prepared nutrition bars and puddings.

## **High-protein foods\***

### **Milk products**

- Eat cheese on toast or with crackers.
- Add grated cheese to baked potatoes, vegetables, soups, noodles, meat, and fruit.
- Use milk in place of water for hot cereal and soups.
- Include cream or cheese sauces on vegetables and pasta.
- Add powdered milk to cream soups, mashed potatoes, puddings, and casseroles.
- Add Greek yogurt, powdered whey protein, or cottage cheese to favorite fruits or blended smoothies.

### **Eggs**

- Keep hard-cooked eggs in the refrigerator. Chop and add to salads, casseroles, soups, and vegetables. Make a quick egg salad.
- All eggs should be well-cooked to avoid the risk of harmful bacteria.
- Pasteurized egg substitute is a low-fat alternative to regular eggs.

### **Meats, poultry, and fish**

- Add cooked meats to soups, casseroles, salads, and omelets.
- Mix diced or flaked cooked meat with sour cream and spices to make dip.

### **Beans, legumes, nuts, and seeds**

- Sprinkle seeds or nuts on desserts like fruit, ice cream, pudding, and custard. Also serve on vegetables, salads, and pasta.
- Spread peanut or almond butter on toast and fruit or blend in a milk shake.

## **High-calorie foods\***

### **Butter**

- Melt over potatoes, rice, pasta, and cooked vegetables.
- Stir melted butter into soups and casseroles and spread on bread before adding other ingredients to your sandwich.

### **Milk products**

- Add whipping or heavy cream to desserts, pancakes, waffles, fruit, and hot chocolate; fold it into soups and casseroles.
- Add sour cream to baked potatoes and vegetables.

### **Salad dressings**

- Use regular (not low-fat or diet) mayonnaise and salad dressing on sandwiches and as dips with vegetables and fruit.

### **Sweets**

- Add jelly and honey to bread and crackers.
- Add jam to fruit.
- Use ice cream as a topping on cake.

\*Adapted from Eldridge B, and Hamilton KK, Editors, *Management of Nutrition Impact Symptoms in Cancer and Educational Handouts*. Chicago, IL: American Dietetic Association; 2004.

## **Don't forget about physical activity**

[Physical activity](#)<sup>2</sup> has many benefits. It helps you maintain muscle mass, strength, stamina, and bone strength. It can help reduce depression, stress, fatigue, nausea, and constipation. It can also improve your appetite. So, if you don't already exercise, talk to your doctor about aiming for at least 150 minutes of moderate activity, like walking, each week. If your doctor approves, start small (maybe 5 to 10 minutes each day) and as you are able, work up to the goal of 150 minutes a week. Listen to your body, and rest when you need to. Now is not the time to push yourself to exercise. Do what you can when you're up to it.

# Managing eating problems caused by surgery, radiation, and chemotherapy

Different cancer treatments can cause different kinds of problems that may make it hard to eat or drink. Here are some tips on how to manage nutrition problems depending on the type of treatment you receive:

## Surgery

After surgery, the body needs extra calories and protein for wound healing and recovery. This is when many people have pain and feel tired. They also may be unable to eat a normal diet because of surgery-related side effects. The body's ability to use nutrients may also be changed by surgery that involves any part of the digestive tract (like the mouth, esophagus, stomach, small intestine, pancreas, colon, or rectum).

See the section called "[How to cope with common eating problems](#)" for tips on dealing with some of the problems that can result from surgery. Be sure to talk to your cancer care team about any problems you're having so they can help you manage them.

Visit our website at [www.cancer.org](http://www.cancer.org) to find out more about surgery as a cancer treatment.

## Radiation therapy

The type of side effects radiation causes depends on the area of the body being treated, the size of the area being treated, the type and total dose of radiation, and the number of treatments.

The following chart shows possible eating-related side effects of radiation, according to the part of body being treated. Some of these side effects happen during treatment while others may not happen until after treatment.

Part of body being treated	Eating-related side effects that might happen during treatment	Eating-related side effects that might happen more than 90 days after treatment
Brain, spinal column	<a href="#">Nausea</a> <sup>1</sup> , vomiting	Headache, <a href="#">tiredness</a> <sup>2</sup>

Head or neck: tongue, voice box, tonsils, salivary glands, nasal cavity, pharynx (throat)	<a href="#">Sore mouth</a> <sup>3</sup> , <a href="#">hard to swallow or pain with swallowing</a> <sup>4</sup> , <a href="#">change in taste or loss of taste</a> <sup>5</sup> , <a href="#">sore throat</a> <sup>6</sup> , <a href="#">dry mouth</a> , <a href="#">thick saliva</a> <sup>7</sup>	<a href="#">Dry mouth</a> <sup>8</sup> , damage to jaw bone, lockjaw, <a href="#">changes in taste and smell</a> <sup>9</sup>
Chest: lungs, esophagus, breast	<a href="#">Trouble swallowing</a> <sup>10</sup> , heartburn, <a href="#">tiredness</a> <sup>11</sup> , <a href="#">loss of appetite</a> <sup>12</sup>	Narrowing of the esophagus, chest pain with activity, enlarged heart, inflammation of the pericardium (the membrane around the heart), lung scarring or inflammation
Belly (abdomen): large or small intestine, prostate, cervix, uterus, rectum, pancreas	<a href="#">Loss of appetite</a> <sup>13</sup> , <a href="#">nausea</a> <sup>14</sup> , vomiting, <a href="#">diarrhea</a> <sup>15</sup> , gas, bloating, trouble with milk products, changes in urination, <a href="#">tiredness</a> <sup>16</sup>	<a href="#">Diarrhea</a> <sup>17</sup> , blood in urine, bladder irritation

Side effects usually start around the second or third week of treatment and peak about two-thirds of the way through treatment. After radiation ends, most side effects last 3 or 4 weeks, but some may last much longer.

If you have eating-related side effects, see the “[How to cope with common eating problems](#)” section for tips on how to deal with them.

If you're having trouble eating and have been following a special eating plan for diabetes or some other chronic health condition, some of these general tips may not work for you. Talk to your cancer care team about how best to change your eating habits while you're getting radiation.

Tell your cancer care team about any side effects you have so they can prescribe any needed medicines. For example, there are medicines to control nausea and vomiting and to treat diarrhea.

Visit [www.cancer.org](http://www.cancer.org) for more information on radiation therapy and how to manage the side effects of it.

## Chemotherapy

[Chemotherapy](#)<sup>18</sup> (chemo) side effects depend on what kind of chemo drugs you take and how you take them. Many of the common side effects of chemo that can cause eating problems are covered in the section called “[How to cope with common eating problems](#).”

Most people get chemo at an outpatient center. It may take anywhere from a few minutes to many hours. Make sure you eat something beforehand. Most people find that a light meal or snack an hour or so before chemo works best. If you'll be there several hours, plan ahead and bring a small meal or snack in an insulated bag or cooler. Find out if there's a refrigerator or microwave you can use.

Some side effects of chemo go away within hours of getting treatment. If side effects last longer, tell your cancer care team. There are things that can be done to lessen eating-related side effects. And prompt attention to eating-related side effects can help keep up your weight and energy level and help you feel better.

If you're having trouble eating and have been following a special eating plan for diabetes or some other chronic health condition, talk to your cancer care team about how best to change your eating habits while getting chemo.

Visit our website, [www.cancer.org](http://www.cancer.org), for more information on chemo and managing chemo side effects.

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## For people with weakened immune systems

Cancer and its treatment can weaken your body's immune system by affecting the blood cells that protect us against disease and germs. As a result, your body can't fight [infection](#)<sup>1</sup>, foreign substances, and disease as well as a healthy person's body can.

During your treatment for cancer, there will be times when your body won't be able to protect itself very well. This is because you might not have enough infection-fighting white blood cells for a while. During this time, you may be told to try to avoid exposure to possible infection-causing germs. It's important to know that you can't raise your



white blood cell counts by avoiding or eating certain kinds of foods. But here are some tips for handling, planning, and preparing food when your immune system is recovering:

## **Food-handling tips**

- Wash your hands with warm, soapy water for 20 seconds before and after preparing food and before eating.
- Refrigerate foods at or below 40° F.
- Keep hot foods hot (warmer than 140° F) and cold foods cold (cooler than 40° F).
- Thaw meat, fish, or poultry in the microwave or refrigerator in a dish to catch drips. Do not thaw at room temperature.
- Use defrosted foods right away, and do not refreeze them.
- Put perishable foods in the refrigerator within 2 hours of buying or preparing them. Egg dishes and cream- and mayonnaise-based foods should not be left unrefrigerated for more than an hour.
- Wash fruits and vegetables well under running water before peeling or cutting. Do not use soaps, detergents, chlorine bleach solutions, or commercial produce rinses. Using a clean vegetable scrubber, scrub produce that has a thick, rough skin or rind (melons, potatoes, bananas, etc.) or any produce that has dirt on it.
- Rinse leaves of leafy vegetables one at a time under running water.
- Packaged salads, slaw mixes, and other prepared produce, even when marked pre-washed, should be rinsed again under running water. Using a colander can make this easier.
- Do not eat raw vegetable sprouts.
- Throw away fruits and vegetables that are slimy or moldy.
- Do not buy produce that has been cut at the grocery store (like melon or cabbage).
- Wash tops of canned foods with soap and water before opening.
- Use different utensils for stirring foods and tasting them while cooking. Do not taste the food (or allow others to taste it) with any utensil that will be put back into the food.
- Throw away eggs with cracked shells.
- Throw out foods that look or smell strange. Never taste them!

## **Do not cross-contaminate**

- Use a clean knife to cut different foods.
- In the refrigerator, store raw meat sealed and away from ready-to-eat food.

- Keep foods separated on the countertops. Use a different cutting board for raw meats.
- Clean counters and cutting boards with hot, soapy water, or you can use a fresh solution made of 1 part bleach and 10 parts water. Moist disinfecting wipes may be used if they're made for use around food.
- When grilling, always use a clean plate for the cooked meat.

## **Cook foods well**

- Put a meat thermometer into the middle of the thickest part of the food to test for doneness. Test a thermometer's accuracy by putting it into boiling water. It should read 212° F.
- Cook meat until it's no longer pink and the juices run clear. The only way to know for sure that meat has been cooked to the right temperature is to use a food thermometer. Meats should be cooked to 160° F and poultry to 180° F.

## **Microwave cooking**

- Rotate the dish a quarter turn once or twice during cooking if there's no turntable in the microwave oven. This helps prevent cold spots in food where bacteria can survive.
- Use a lid or vented plastic wrap to thoroughly heat leftovers. Stir often during reheating.

## **Grocery shopping**

- Check "sell-by" and "use-by" dates. Pick only the freshest products.
- Check the packaging date on fresh meats, poultry, and seafood. Do not buy products that are out of date.
- Do not use damaged, swollen, rusted, or deeply dented cans. Be sure that packaged and boxed foods are properly sealed.
- Choose unblemished fruits and vegetables.
- Do not eat deli foods. In the bakery, avoid unrefrigerated cream- and custard-containing desserts and pastries.

- Do not eat foods that are bought from self-serve or bulk containers.
- Do not eat yogurt and ice cream products from soft-serve machines.
- Do not eat free food samples.
- Do not use cracked or unrefrigerated eggs.
- Get your frozen and refrigerated foods just before you check out at the grocery store, especially during the summer months.
- Refrigerate groceries right away. Never leave food in a hot car.

## Dining out

- Eat early to avoid crowds.
- Ask that food be prepared fresh in fast-food restaurants.
- Ask for single-serving condiment packages, and avoid self-serve bulk condiment containers.
- Do not eat from high-risk food sources, including salad bars, delicatessens, buffets and smorgasbords, potlucks, and sidewalk vendors.
- Do not eat raw fruits and vegetables when eating out.
- Ask if fruit juices are pasteurized. Avoid “fresh-squeezed” juices in restaurants.
- Be sure that utensils are set on a napkin or clean tablecloth or placemat, rather than right on the table.
- If you want to keep your leftovers, ask for a container, and put the food in it yourself rather than having the server take your food to the kitchen to do this.

## Tips for when your white blood cell count is low<sup>+</sup>

	Recommended	Avoid (do not eat)
<b>Meat, poultry, fish, tofu, and nuts</b>	<p>Ensure all meats, poultry, and fish are cooked thoroughly.</p> <p>Use a food thermometer to be sure that meat and poultry reach the proper temperature when</p>	<p>Raw or lightly cooked fish, shellfish, lox, sushi, or sashimi</p> <p>Raw nuts or fresh nut butters</p>

	<p>cooked.</p> <p>When using tofu from the refrigerated section (not shelf-stable), cut it into 1-inch cubes or smaller and boil 5 minutes in water or broth before eating or using in recipes. You don't have to do this if using aseptically packaged, shelf-stable tofu.</p> <p>Vacuum-sealed nuts and shelf-stable nut butters</p>	
<b>Eggs</b>	<p>Cook eggs until the yolks and whites are solid, not runny</p> <p>Pasteurized eggs or egg custard</p> <p>Pasteurized eggnog</p>	<p>Raw or soft-cooked eggs. This includes over-easy, poached, soft-boiled, and sunny side up.</p> <p>Foods that may contain raw eggs, such as Caesar salad dressing, homemade eggnog, smoothies, raw cookie dough, hollandaise sauce, and homemade mayonnaise</p>
<b>Milk and dairy products</b>	<p>Only pasteurized milk, yogurt, cheese, or other dairy products</p>	<p>Soft, mold-ripened or blue-veined cheeses, including Brie, Camembert, Roquefort, Stilton, Gorgonzola, and blue cheese</p>

		Mexican-style cheeses, such as queso blanco fresco, since they are often made with unpasteurized milk
<b>Breads, cereal, rice, and pasta</b>	Breads, bagels, muffins, rolls, cereals, crackers, noodles, pasta, potatoes, and rice are safe to eat as long as they are purchased as wrapped, pre-packaged items, not sold in self-service bins.	Bulk-bin sources of cereals, grains, and other foods
<b>Fruits and vegetables</b>	Raw vegetables and fruits and fresh herbs are safe to eat if washed under running water and lightly scrubbed with a vegetable brush.	<p>Fresh salsas and salad dressings found in the refrigerated section of the grocery store. Choose shelf-stable salsa and dressings instead.</p> <p>Any raw vegetable sprouts (including alfalfa, radish, broccoli, or mung bean sprouts)</p>
<b>Desserts and sweets</b>	<p>Fruit pies, cakes, and cookies, flavored gelatin; commercial ice cream, sherbet, sorbet, and popsicles</p> <p>Sugar</p> <p>Commercially prepared</p>	<p>Unrefrigerated, cream-filled pastry products</p> <p>Raw honey or honeycomb. Select a commercial, grade A, heat-treated honey instead.</p>

	and pasteurized jam, jelly, preserves, syrup, and molasses	
<b>Water and beverages</b>	<p>Drink only water from city or municipal water services or commercially bottled water.</p> <p>Pasteurized fruit and vegetable juices, soda, coffee, and tea</p>	<p>Water straight from lakes, rivers, streams, or springs</p> <p>Well water unless you check with your cancer care team first</p> <p>Unpasteurized fruit and vegetable juices</p> <p>Sun tea (Make tea with boiling water, and use commercially prepared tea bags instead.)</p> <p>Vitamin- or herbal-supplemented waters (These provide little, if any, health benefit.)</p>

<sup>+</sup> Adapted from Grant BL, Bloch AS, Hamilton KK, Thomson CA. *American Cancer Society Complete Guide to Nutrition for Cancer Survivors, 2nd Edition*. Atlanta, GA: American Cancer Society; 2010.

## How to cope with common eating problems

Cancer and cancer treatments can cause many problems that affect how well you can eat and drink. Here are some of the more common problems and tips on how to deal with them. Always tell your cancer care team about any problems you have. There are often things that can be done to treat the problem or keep it from getting worse.

Common eating problems include:

- [Appetite changes](#)
- [Constipation](#)
- [Diarrhea](#)
- [Fatigue](#)
- [Mouth dryness or thick saliva](#)
- [Mouth or throat pain or sores](#)
- [Nausea](#)
- [Swallowing problems](#)
- [Taste and smell changes](#)
- [Weight gain](#)

## Appetite changes

Cancer and its treatment can cause changes in your eating habits and your desire to eat. Not eating can lead to weight loss, and this can cause weakness and [fatigue](#). Eating as well as you can is an important part of taking care of yourself. Treatment-related side effects like [pain](#)<sup>1</sup>, [nausea](#), and [constipation](#) can also cause loss of appetite. Managing these problems may help you eat better.

### What to do

- Eat several snacks throughout the day, rather than 3 large meals.
- Avoid liquids with meals, or take only small sips of liquids to keep from feeling full early (unless you need liquids to help swallow or for dry mouth). Drink most of your liquids between meals.
- Make eating more enjoyable by setting the table with pretty dishes, playing your favorite music, watching TV, or eating with someone.
- Be as physically active as you can. Start off slowly, and increase your activity over

time as you feel stronger. Sometimes a short walk an hour or so before meals can help you feel hungry.

- Keep high-calorie, high-protein snacks on hand. Try hard-cooked eggs, peanut butter, cheese, ice cream, granola bars, liquid nutritional supplements, puddings, nuts, canned tuna or chicken, or trail mix. (See the table of high-protein foods under “Tips to increase calories and protein” in the section “ [Once treatment starts.](#)”)
- Review the tips on adding calories and protein to foods in the “Once treatment starts” section, and include these in meals and snacks throughout the day.
- Eat your favorite foods any time of the day; for instance, if you like breakfast foods, eat them for dinner.

## Constipation

Pain medicines, changes in your eating habits, and being less active can cause your bowels to move less often and stools to become harder to pass (constipation). If you're constipated, try eating high-fiber foods. Also drink extra fluids during the day, eat at regular times, and try to increase your physical activity, if possible.

### What to do

- Try to eat at the same times each day.
- Try to have a bowel movement at the same time each day.
- Drink 8 to 10 cups of liquid each day, if it's OK with your doctor. Try water, prune juice, warm juices, teas, and hot lemonade. (A hot beverage may help to stimulate a bowel movement.)
- If you're prone to constipation, try to set up a regular bowel plan. This may include an over-the-counter stool softener or psyllium fiber. Talk to your cancer care team about what to use.
- Use laxatives only as directed by your cancer care team. Contact your team if you haven't had a bowel movement for 3 days or longer.
- If it's OK with your cancer care team, eat high-fiber and bulky foods, like whole-grain breads and cereals, fruits and vegetables (raw and cooked with skins and peels on), and dried beans. Add these slowly to your diet to help avoid bloating and gas.



- Eat breakfasts that include a hot drink and high-fiber foods.
- Ask your dietitian to recommend a high-calorie, high-protein, fiber-containing liquid supplement if you need more of these.
- Limit drinks and foods that cause gas if it becomes a problem. (See list below.)
- To help lessen the amount of air you swallow while eating, try not to talk much at meals and don't use straws to drink. Avoid chewing gum and carbonated drinks.

### **Foods that might cause gas**

- Apples (raw), apple juice
- Asparagus
- Avocado
- Beans and peas, dried
- Beer
- Broccoli
- Brussels sprouts
- Cabbage
- Cauliflower
- Collards
- Corn
- Cucumbers
- Eggs
- Fish
- Kohlrabi
- Lentils
- Melons
- Milk
- Mushrooms
- Mustard
- Nuts
- Onions, leeks, scallions
- Peppers
- Pickles
- Radishes
- Rutabaga
- Sauerkraut
- Spicy foods

- Spinach
- String beans
- Strong cheese
- Sweet potatoes
- Turnip greens

**Gas might also be caused by:**

- Chewing gum
- Not taking in enough fluids
- Drinking carbonated or fizzy drinks
- Not getting exercise
- Chewing with your mouth open
- Constipation
- Eating a lot of high-fiber foods
- Eating foods and candies, chewing gum, and having drinks with sugar alcohols such as maltitol, mannitol, and xylitol (These products are often labeled “sugar free” or “no sugar added.”)

High-fiber foods to choose more often*	Serving size	Dietary fiber (in grams)
<b>Breads and cereals</b>		
Bran cereals	½ cup	3-13
Popcorn	2 cups	5
Brown rice	½ cup	6
Whole-wheat bread	1 slice	1-2
Whole-wheat pasta	¼ cup	6
Wheat bran, raw	¼ cup	6
<b>Legumes</b>		
Kidney beans	½ cup	8
Navy beans	½ cup	9
Nuts	1 ounce	1-3

<b>Vegetables</b>		
Broccoli	½ cup	4
Brussels sprouts	½ cup	3
Carrots	½ cup	2
Corn	½ cup	5
Green peas	½ cup	3
Potato with skin	1 medium	3
<b>Fruits</b>		
Apple with peel	1 medium	4
Banana	1 medium	2
Blueberries	½ cup	2
Pear with skin	1 medium	5
Prunes	3	3
Orange	1 medium	3
Raisins	¼ cup	3
Strawberries	1 cup	3

\*Adapted from Eldridge B, and Hamilton KK, Editors, *Management of Nutrition Impact Symptoms in Cancer and Educational Handouts*. Chicago, IL: American Dietetic Association; 2004.

## Diarrhea

Cancer treatments and medicines can cause your bowels to move much more often and become very loose. Three or more loose or watery stools a day is called diarrhea.

Uncontrolled diarrhea can lead to fluid loss (dehydration), weight loss, poor appetite, and weakness.

Avoid high-fiber foods, which might make diarrhea worse. These include nuts, seeds, whole grains, legumes (beans and peas), dried fruits, and raw fruits and vegetables. You should avoid high-fat foods, like fried and greasy foods, too, because they can also make diarrhea worse. After stomach or bowel surgery, some people may be sensitive to very sweet or high-carbohydrate foods as well. Stay away from gassy foods and carbonated drinks, too. Be sure to sip fluids during the day to prevent dehydration. Once the diarrhea has stopped, slowly start eating foods with fiber.

### What to do

- Drink plenty of mild, clear, non-carbonated liquids during the day. Drink liquids at room temperature. This may be easier to take than very hot or cold drinks.
- Eat small, frequent meals and snacks during the day.
- Avoid greasy, fried, spicy, or very sweet foods.
- Limit milk or milk products to 2 cups a day. Yogurt and buttermilk are OK.
- Avoid drinks and foods that cause gas, like carbonated drinks, gas-forming vegetables, and chewing gum. (A list of foods that might cause gas is in the section on [constipation](#).) Allow carbonated drinks to become slightly “flat” before drinking by pouring them into a glass and letting them sit at least 10 minutes.
- Drink and eat high-sodium (salt) foods like broths, soups, sports drinks, crackers, and pretzels.
- Drink and eat high-potassium foods like fruit juices and nectars, sports drinks, potatoes with the skin, and bananas.
- Increase soluble-fiber foods like applesauce, bananas, canned peaches and pears, oats or oatmeal, and sweet potatoes.
- Drink at least 1 cup of liquid after each loose bowel movement. Try water, sports drinks, or bouillon.
- Do not chew sugar-free gum or eat candies and desserts made with sugar alcohol (i.e., sorbitol, mannitol, or xylitol).
- Call your cancer care team if diarrhea continues or increases, or if your stools have an unusual odor or color.

### What to eat or not eat when you have diarrhea\*

	Eat	Foods that may cause problems
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<b>High protein</b>	<ul style="list-style-type: none"> <li>• Baked or broiled beef, pork, chicken, turkey, veal, fish</li> <li>• Eggs, buttermilk, cheese, yogurt</li> </ul>	<ul style="list-style-type: none"> <li>• Fried meats, high-fat cuts of meats, meats with gristle</li> <li>• Dairy products other than buttermilk or yogurt</li> </ul>
<b>Breads, cereals, rice, and pasta</b>	<ul style="list-style-type: none"> <li>• Bread, rolls, and pasta made from refined, white flour; converted or instant rice</li> <li>• Refined cereals like farina, Cream of Wheat, Cream of Rice, oatmeal, cornflakes</li> <li>• Pancakes, waffles, cornbread, muffins, graham crackers</li> </ul>	<ul style="list-style-type: none"> <li>• Whole-grain breads and cereals like whole wheat, oat, and rye; bran</li> <li>• Shredded wheat</li> <li>• Granola</li> <li>• Wild rice</li> </ul>
<b>Fruits and vegetables</b>	<ul style="list-style-type: none"> <li>• Soups made with vegetables listed here: cooked asparagus tips, beets, carrots, peeled zucchini, mushrooms, celery</li> <li>• Tomato paste, tomato puree, tomato sauce</li> <li>• Baked potato without skin</li> <li>• Canned, frozen, or fresh fruit</li> </ul>	<ul style="list-style-type: none"> <li>• Fresh, unpeeled fruit; pears; melon</li> <li>• All other vegetables</li> </ul>
<b>Drinks, desserts, and other foods</b>	<ul style="list-style-type: none"> <li>• Butter, margarine</li> <li>• Mayonnaise, salad dressing, vegetable oil</li> <li>• Cake, cookies, flavored gelatin desserts, sherbet</li> <li>• Decaffeinated beverages</li> <li>• Salt, pepper, spices, and gravy as</li> </ul>	<ul style="list-style-type: none"> <li>• Desserts with nuts</li> <li>• Coconut, dried fruit</li> <li>• Chocolate, licorice</li> <li>• Pickles</li> <li>• Popcorn</li> <li>• Foods with a lot of</li> </ul>

	tolerated	pepper, chili seasoning, or taco seasoning; hot sauces
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\*Adapted from Eldridge B, and Hamilton KK, Editors, *Management of Nutrition Impact Symptoms in Cancer and Educational Handouts*. Chicago, IL: American Dietetic Association; 2004.

## Fatigue

[Fatigue](#)<sup>1</sup> is feeling very tired all the time. It doesn't get better when you rest. It's a common problem for people with cancer and those getting cancer treatment. If you're feeling tired or lack energy, talk to your cancer care team.

Fatigue can have many causes, including cancer treatments, not eating enough, lack of sleep, depression, low blood counts, and some medicines. When the cause of the fatigue is medical, your doctor may be able to treat the cause to help you feel better. Along with treatment, there are many nutrition steps you can take and other things you can try to help you cope with fatigue.

### What to do

- Talk to your cancer care team about your fatigue. If there's a medical cause, there may be treatment for it. They can help you figure out self-care measures that may help with the fatigue, too.
- Try to prioritize your activities. Do the most important ones when you have the most energy.
- Take short walks or get regular exercise, if you can. More and more research tells us that being moderately active can help decrease cancer-related fatigue.
- Drink plenty of fluids. Dehydration can make fatigue worse. Be sure to get at least 8 cups of fluid each day. If you are losing weight, be sure to include some fluids that have calories, like juices or milk.
- Make sure you get enough rest. Take 3 or 4 short naps or rest breaks during the day instead of 1 long rest. Plan your day to include rest breaks, and make rest time special with a good book in a comfortable chair or a favorite movie with a friend. Try

- to balance rest and activity so that it doesn't interfere with nighttime sleep.
- Try easier or shorter versions of your usual activities. Don't push yourself to do more than you can manage.
  - Ask for a referral to a dietitian who can work with you to choose the best diet for you.
  - Try eating some protein, fat, and fiber with each meal and snack to help keep blood sugar levels more stable. This will give you a more sustained feeling of energy from the food you eat. For instance, instead of eating 2 pieces of fruit, try eating 1 piece plus a small handful of walnuts, almonds, peanuts, or other nuts. Or try fruit with cottage cheese.
  - Be sure to meet your basic calorie needs. (See "Tips to get more calories and protein" in the "[Once treatment starts](#)" section.)
  - Do not take large amounts of vitamins or minerals without first talking with your cancer care team. Some dietary supplements can interfere with your cancer treatment, and large doses of some supplements can have harmful effects.
  - Stress can make fatigue worse. Ask your cancer care team about stress management.
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## Mouth dryness or thick saliva

[Radiation therapy](#)<sup>1</sup> to the head and neck areas, some types of [chemo](#)<sup>2</sup>, and certain other medicines can cause dry mouth or thick saliva. The glands that make saliva can become irritated and make less saliva, or your saliva can become very thick and sticky. Dryness can be mild or severe.

A dry mouth can increase your risk of cavities and mouth infection. If you smoke, chew tobacco, or drink alcohol, the dryness can be worse.

If you have either of these side effects, drink plenty of fluids throughout the day and eat moist foods as much as possible. Also brush your teeth and rinse your mouth often with a baking soda, salt, and water solution to help keep it clean and prevent infection (recipe follows).

### What to do

- Drink 8 to 10 cups of liquid a day, and take a water bottle wherever you go. (Drinking lots of fluids helps thin mucus.)
- Take small bites, and chew your food well.
- Eat soft, moist foods that are cool or at room temperature. Try blenderized fruits and vegetables, soft-cooked chicken and fish, well-thinned cereals, popsicles, smoothies, and slushies.
- Avoid foods that stick to the roof of the mouth like peanut butter or soft bread.
- Moisten foods with broth, soup, sauces, gravy, yogurt, or creams.
- Suck on sugarless candy or chew sugarless gum to stimulate saliva. Citrus, cinnamon, and mint flavors often work well.
- Keep your mouth clean. Rinse your mouth before and after meals with plain water or a mild mouth rinse (made with 1 quart water, 1 teaspoon salt, and 1 teaspoon baking soda – shake well before using). Use a soft-bristle toothbrush. It's a good idea to gently brush your tongue, too. Ask your doctor if it's OK to floss.
- Avoid commercial mouthwashes, alcoholic and acidic drinks, and tobacco.
- Limit caffeine intake, from coffee, tea, energy drinks, and caffeinated soft drinks.
- Use a cool mist humidifier to moisten room air, especially at night. (Be sure to keep the humidifier clean to avoid spreading bacteria or mold in the air.)
- Fresh pineapple or papaya may help to thin saliva, but only try this if your mouth is not sore.
- Saliva substitutes are helpful if your salivary glands have been removed by surgery or damaged by radiation therapy. These products add moisture to your mouth.
- Nutritional supplements, like liquid meal replacements, may be helpful. If you can't get enough calories and nutrition through solid foods, you may need to use liquid supplements for some time. Talk to your cancer care team about this.

### What to eat or not eat when you have a dry mouth\*

	Eat	Foods that may cause problems
<b>High protein</b>	<ul style="list-style-type: none"> <li>• Meats, poultry, and fish in sauces and gravies</li> <li>• Casseroles, soups, and stews</li> </ul>	Dry meats, poultry, and fish without sauces



<b>Breads, cereals, rice, and pasta</b>	<ul style="list-style-type: none"> <li>• Bread, rolls</li> <li>• Cooked and cold cereals, cereal with milk</li> <li>• Rice soaked in gravy, sauce, broth, or milk</li> </ul>	<ul style="list-style-type: none"> <li>• Dry breads, rolls</li> <li>• Pasta, rice</li> <li>• Pretzels, chips</li> <li>• Dry cereal</li> </ul>
<b>Fruits and vegetables</b>	<ul style="list-style-type: none"> <li>• Canned and fresh fruits that have a lot of moisture, like oranges and peaches</li> <li>• Vegetables in sauce</li> </ul>	<ul style="list-style-type: none"> <li>• Bananas, dried fruit</li> <li>• Vegetables, unless in a sauce or with a high moisture content</li> </ul>
<b>Drinks, desserts, and other foods</b>	<ul style="list-style-type: none"> <li>• Club soda, hot tea with lemon (decaf), fruit-ades, diluted juices, sports drinks</li> <li>• Commercial liquid nutrition supplements</li> <li>• Homemade milk shakes; ice cream, sherbet, pudding</li> <li>• Butter, margarine</li> <li>• Salad dressing</li> <li>• Sour cream, half-and-half</li> </ul>	Cookies, cake, pie, unless soaked in milk

\*Adapted from Eldridge B, and Hamilton KK, Editors, *Management of Nutrition Impact Symptoms in Cancer and Educational Handouts*. Chicago, IL: American Dietetic Association; 2004.

# Mouth or throat pain or sores

Certain [chemo](#)<sup>1</sup> drugs or [radiation](#)<sup>2</sup> to the head and neck can cause a sore mouth, mouth sores, or a sore throat.

If you have these problems, eating soft, bland foods and lukewarm or cool foods can be soothing. On the other hand, foods that are coarse, dry, or scratchy may make you feel worse. You may also find that tart, salty, or acidic fruits and juices; alcohol; and spicy foods are irritating.

Rinse your mouth regularly with a salt, baking soda, and water solution (1 teaspoon of baking soda and 1 teaspoon salt mixed in 1 quart water). This helps prevent infections and helps your mouth feel better. Gargle with the mixture to relieve a sore throat, but don't swallow it.

## What to do for a sore throat

- Avoid tart, acidic, or salty foods, as well as pickled and vinegary foods, tomato-based foods, and some canned broths.
- Avoid rough-textured or hard foods, like dry toast, crackers, chips, nuts, granola, and raw fruits and vegetables.
- Choose lukewarm or cold foods that are soothing. Very hot foods can cause discomfort. Try freezing fruits, and suck on frozen fruit pops, fruit ices, or ice chips.
- Stay away from alcohol, caffeine, and tobacco.
- Avoid irritating spices like chili powder, cloves, curry, hot sauces, nutmeg, and pepper. Season foods with herbs like basil, oregano, and thyme.
- Eat soft, creamy foods like cream soups, cheeses, mashed potatoes, yogurt, eggs, custards, puddings, cooked cereals, and canned liquid food supplements (see chart).
- Blend and moisten foods that are dry or solid. Mix them in with soups or sauces, gravies, and casseroles.
- Avoid using mouthwashes that contain alcohol (which will cause burning).
- Your doctor can prescribe a “swish and swallow” numbing mouthwash. Ask about this.
- Puree or liquefy foods in a blender to make them easier to swallow.

## What to eat or not eat when your throat is sore\*

	<b>Eat</b>	<b>Foods that may cause problems</b>
<b>High protein</b>	<ul style="list-style-type: none"> <li>• Soft, bland meats and casseroles like chicken and rice, macaroni and cheese, and tuna noodle casserole</li> <li>• Ground meats</li> <li>• Creamed soups</li> <li>• Eggnog, milk, milk shakes</li> </ul>	<ul style="list-style-type: none"> <li>• Spicy foods like spaghetti, tacos, chili</li> <li>• Whole meats if not well tolerated</li> </ul>
<b>Breads, cereals, rice, and pasta</b>	<ul style="list-style-type: none"> <li>• Bread, if tolerated</li> <li>• Cooked cereals, cold cereals with milk</li> </ul>	Crackers, hard-crust breads, salted rolls
<b>Fruits and vegetables</b>	Soft, non-acidic fruit and vegetables, if tolerated	Citrus fruit and raw vegetables
<b>Drinks, desserts, and other foods</b>	<ul style="list-style-type: none"> <li>• Non-acidic juices like apple juice and pear nectar</li> <li>• Decaffeinated coffee, tea, and soft drinks</li> <li>• Pudding, cake, cookies (as tolerated), pie</li> <li>• Gelatin</li> <li>• Ice cream, sherbet</li> </ul>	<ul style="list-style-type: none"> <li>• Citrus juices (grapefruit, orange, lemon, and lime), tomato juice</li> <li>• Caffeinated drinks, alcohol</li> <li>• Pickles, vinegar, spices</li> <li>• Potato chips, pretzels, popcorn, snack chips</li> </ul>

\*Adapted from Eldridge B, and Hamilton KK, Editors, *Management of Nutrition Impact Symptoms in Cancer and Educational Handouts*. Chicago, IL: American Dietetic Association; 2004.

### What to do for mouth sores

- Eat soft, bland foods like creamed soup, cooked cereal, macaroni and cheese, yogurt, and pudding.
- Puree or liquefy foods in a blender to make them easier to swallow.

- Eat foods cold or lukewarm, rather than hot, to reduce mouth irritation.
- Tilt your head back to help foods and liquids flow to the back of the throat for swallowing.
- Drink through a straw to bypass mouth sores.
- Avoid irritating spices, seasonings, and condiments like pepper, chili powder, cloves, nutmeg, salsa, pepper sauces, and horseradish.
- Avoid rough, dry, or coarse foods.
- Eat high-protein, high-calorie foods to speed healing.
- Look for yogurt made without citric acid.
- Avoid alcohol, carbonated beverages, and tobacco.
- Rinse your mouth often with a baking soda, salt, and water mouthwash (made with 1 quart water, 1 teaspoon baking soda, and 1 teaspoon salt – shake well before each use) to help keep your mouth clean and make you more comfortable.
- Your doctor can prescribe a “swish and swallow” mouthwash with a numbing agent if needed. Ask about this.

#### What to eat or not eat when you have mouth sores\*

	Eat	Foods that may cause problems
<b>High protein</b>	<ul style="list-style-type: none"> <li>• Ground, chopped, or blenderized meats, poultry, or fish</li> <li>• Casseroles</li> <li>• Egg, cheese, and bean dishes</li> <li>• Milk shakes, yogurt, and commercial liquid nutritional supplements</li> </ul>	Whole meats, poultry, fish, dry meats
<b>Breads, cereals, rice, and</b>	<ul style="list-style-type: none"> <li>• Moistened breads</li> <li>• Cooked cereals,</li> </ul>	Dry toast, hard rolls, dry crackers, English muffins, bagels

<b>pasta</b>	cold cereal soaked in milk <ul style="list-style-type: none"> <li>• Pasta and rice in sauce</li> </ul>	
<b>Fruits and vegetables</b>	Cooked or blenderized fruits and vegetables	<ul style="list-style-type: none"> <li>• Fresh fruits and vegetables (unless very ripe, soft, and juicy, like applesauce, bananas, and watermelon); citrus fruit, pineapple, and other acidic fruits</li> <li>• Pickled fruit; raw and pickled vegetables</li> <li>• Tomatoes</li> </ul>
<b>Drinks, desserts, and other foods</b>	<ul style="list-style-type: none"> <li>• Fruit nectars</li> <li>• Flavored gelatin</li> <li>• Ice cream, sherbet, pudding</li> <li>• Butter, margarine, and vegetable oils</li> </ul>	<ul style="list-style-type: none"> <li>• Carbonated drinks</li> <li>• Cookies and cakes unless soaked in milk</li> <li>• Crunchy snacks like pretzels and chips</li> <li>• Vinegar</li> <li>• Condiments like pepper, pepper sauces, chili powder, cloves, nutmeg, salsa</li> </ul>

\*Adapted from Eldridge B, and Hamilton KK, Editors, *Management of Nutrition Impact Symptoms in Cancer and Educational Handouts*. Chicago, IL: American Dietetic Association; 2004.

## Nausea

A person can have [nausea with or without vomiting](#)<sup>1</sup>. If it's caused by chemo, nausea can happen on the day you get your treatment and/or can last for a few days – depending on what drugs you get. If you're getting [radiation therapy](#)<sup>2</sup> to the belly, chest, brain, or pelvis, nausea can start shortly after treatment and last for several hours. Nausea and vomiting can have other causes, too.

Be sure to tell your cancer care team if you have nausea or are vomiting because there are medicines that can help. These medicines should be taken on a regular schedule, or around the clock, as prescribed by your doctor. And if a certain medicine doesn't work, your cancer care team may be able to recommend another one. It may take a few tries to find the medicines that work best for you.

## What to do

- Eat 6 to 8 snacks or small meals a day, instead of 3 large meals.
- Eat dry foods, like crackers, toast, dry cereals, or bread sticks, when you wake up and every few hours during the day.
- Eat foods that don't have strong odors.
- Eat cool foods instead of hot or spicy foods.
- Avoid foods that are overly sweet, greasy, fried, or spicy.
- If you need to rest, sit up or recline with your head raised for at least an hour after eating.
- Sip clear liquids frequently to prevent dehydration. Clear liquids include broth, sport drinks, water, juice, gelatin, and popsicles.
- Ask your doctor about medicines to prevent or stop nausea.
- Try bland, soft, easy-to-digest foods on scheduled treatment days. Foods like Cream of Wheat and chicken noodle soup with saltine crackers may settle the stomach better than heavy meals.
- Avoid eating in a room that's warm, or that has cooking odors or other smells. Cook outside on the grill or use boiling bags to reduce cooking odors.
- Suck on hard candy, like peppermint or lemon, if there's a bad taste in your mouth.
- If you're vomiting, dehydration can become a problem. You'll need to drink clear liquids as often as possible during this time. After you have vomited, rinse your mouth, wait for about 30 minutes, then try to drink sips of a clear liquid like apple juice, cranberry juice, flat soda, or broth, or take bites of frozen flavored ice.

## What to eat or not eat on days that you have nausea\*

	Eat	Foods that may cause problems
High protein	<ul style="list-style-type: none"> <li>• Boiled or baked meat, fish, and poultry; cold meat or fish salad</li> <li>• Eggs</li> </ul>	<ul style="list-style-type: none"> <li>• Fatty and fried meats, like sausage or bacon</li> <li>• Fried eggs</li> </ul>

	<ul style="list-style-type: none"> <li>• Cream soups made with low-fat milk</li> <li>• Non-fat yogurt</li> </ul>	<ul style="list-style-type: none"> <li>• Milk shakes (unless made with low-fat milk and ice cream)</li> </ul>
<b>Breads, cereals, rice, and pasta</b>	<ul style="list-style-type: none"> <li>• Saltines, soda crackers, bread, toast, cold cereal, English muffins, bagels</li> <li>• Plain noodles, rice</li> </ul>	Doughnuts, pastries, waffles, pancakes, muffins
<b>Fruits and vegetables</b>	<ul style="list-style-type: none"> <li>• Potatoes (baked, boiled, or mashed)</li> <li>• Juices</li> <li>• Canned or fresh fruits, vegetables as tolerated (do not eat if appetite is poor or nausea is severe)</li> </ul>	<ul style="list-style-type: none"> <li>• Potato chips, French fries, hash browns</li> <li>• Breaded, fried, or creamed vegetables; vegetables with strong odor</li> </ul>
<b>Drinks, desserts, and other foods</b>	<ul style="list-style-type: none"> <li>• Cold fruit-ades, decaffeinated soft drinks, iced decaf tea, sports drinks</li> <li>• Sherbet, fruit-flavored gelatin</li> <li>• Angel food cake, sponge cake; vanilla wafers</li> <li>• Pudding</li> <li>• Popsicles, juice bars, fruit ices</li> <li>• Pretzels</li> <li>• Butter or margarine in small amounts, fat-skimmed gravy</li> <li>• Salt, cinnamon, spices as tolerated</li> </ul>	<ul style="list-style-type: none"> <li>• Alcohol</li> <li>• Coffee</li> <li>• Pie, ice cream, rich cakes</li> <li>• Spicy salad dressings</li> <li>• Olives</li> <li>• Cream</li> <li>• Pepper, chili powder, onion, hot sauce, seasoning mixtures</li> </ul>

\*Adapted from Eldridge B, and Hamilton KK, Editors, *Management of Nutrition Impact Symptoms in Cancer and Educational Handouts*. Chicago, IL: American Dietetic Association; 2004.

# Swallowing problems

Cancer and its treatments can sometimes cause trouble with swallowing. If you're having problems swallowing, try eating soft or liquid foods. You may be able to swallow thick fluids more easily than thin liquids. If you're unable to eat enough regular foods to meet your nutritional needs, drink high-calorie and high-protein liquids.

Your doctor may refer you to a speech therapist. This is an expert health professional who can teach you how to swallow better and how to decrease coughing and choking when you eat and drink.

## What to do

- Follow your speech therapist's instructions for any special eating techniques.
- Call your cancer care team right away if you cough or choke while eating, especially if you have developed a fever.
- Eat small, frequent meals.
- Use canned liquid nutritional supplements if you're unable to eat enough food to meet your needs.
- Chop or puree your food in a blender or food processor.
- Drink 6 to 8 cups of fluid each day, and thicken the fluid to the consistency that's easiest for you to swallow.
- Try these thickening products: **Gelatin:** Use to help soften cakes, cookies, crackers, sandwiches, pureed fruits, and other cold food. Mix 1 tablespoon unflavored gelatin in 2 cups hot liquid until dissolved; pour over food. Allow food to sit until saturated. **Tapioca, flour, and cornstarch:** Use to thicken liquids. Note that these must be cooked before using. **Commercial thickeners:** Follow label instructions, and use to adjust a liquid's thickness. **Pureed vegetables and instant potatoes:** Use in soups. Note that these change the food's flavor. **Baby rice cereal:** Use to make a very thick product.
- If thin liquids are recommended for you, try these: coffee, tea, soft drinks, liquid nutritional supplements, Italian ice, sherbet, broth, and thin cream-based soups.
- If thick liquids are recommended for you, try these: buttermilk, eggnog, milk shakes, yogurt shakes, and ice cream.

## What to eat when you have trouble swallowing (puréed and thick-liquid diet)<sup>+</sup>



	<b>Puréed thick-liquid diet</b>	<b>Mechanical soft diet</b>
<b>Protein</b>	<ul style="list-style-type: none"> <li>• Thickened milk, yogurt without fruit, cottage cheese, sour cream</li> <li>• Casseroles</li> <li>• Soft-scrambled eggs</li> <li>• Puréed meat, poultry, and fish</li> </ul>	<ul style="list-style-type: none"> <li>• Milk, yogurt, cheeses, sour cream</li> <li>• All eggs</li> <li>• Ground meats and ground-meat casseroles, fish, sandwiches made with ground meats or spreads</li> </ul>
<b>Breads, cereals, pasta, and rice</b>	Slurry <sup>^</sup> of cooked cereals like Cream of Wheat and Cream of Rice	<ul style="list-style-type: none"> <li>• Soft breads</li> <li>• Graham crackers, cookies</li> <li>• Soft cold cereals in milk</li> <li>• Pancakes, waffles</li> <li>• Pasta, rice</li> </ul>
<b>Fruits and vegetables</b>	<ul style="list-style-type: none"> <li>• Puréed fruit and vegetables without seeds and skins</li> <li>• Mashed potatoes</li> </ul>	<ul style="list-style-type: none"> <li>• Bananas</li> <li>• Canned fruit</li> <li>• Soft, well-cooked, or puréed vegetables</li> </ul>
<b>Drinks, desserts, and other foods</b>	<ul style="list-style-type: none"> <li>• Thickened juices and nectars</li> <li>• Thick milk</li> </ul>	<ul style="list-style-type: none"> <li>• All beverages</li> <li>• Soft desserts that don't require much chewing (like ice cream, sherbet,</li> </ul>

	shakes <ul style="list-style-type: none"> <li>• Thickened broths and cream soups</li> <li>• Custards, puddings</li> <li>• Slurried<sup>^</sup> cakes and cookies</li> <li>• Syrups, honey, butter, margarine</li> <li>• Spices as tolerated</li> </ul>	flavored gelatin, pudding, custard), soft cakes and cookies <ul style="list-style-type: none"> <li>• Syrups, honey, butter, margarine</li> <li>• Spices</li> </ul>
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<sup>^</sup> A slurry is a thin paste of water and cereal or flour that can be stirred into hot preparations as a thickener. A slurry on top of bread or cake makes it moist and easier to swallow.

<sup>+</sup> Adapted from Grant BL, Bloch AS, Hamilton KK, Thomson CA. *American Cancer Society Complete Guide to Nutrition for Cancer Survivors, 2nd Edition*. Atlanta, GA: American Cancer Society; 2010.

## Taste and smell changes

Cancer and its treatments can change your senses of taste and smell. These changes can affect your appetite and are often described as a bitter or metallic taste. Food can also taste too salty or sweet. If you're having these problems, try foods, marinades, spices, drinks, and ways of preparing foods that are different from those you usually use. Also, keep your mouth clean by rinsing and brushing, which may help foods taste better. The good news is these changes usually go away after treatment ends.

### What to do

- Try using plastic forks, spoons, and knives and glass cups and plates.
- Try sugar-free lemon drops, gum, or mints.
- Try fresh or frozen fruits and vegetables instead of canned.
- Season foods with tart flavors. Use lemon wedges, lemonade, citrus fruits, vinegar, and pickled foods. (If you have a sore mouth or throat, do not do this.)
- Try flavoring foods with new tastes or spices – with onion, garlic, chili powder, basil, oregano, rosemary, tarragon, BBQ sauce, mustard, ketchup, or mint.
- Counter a salty taste with added sweeteners, a sweet taste with added lemon juice and salt, and a bitter taste with added sweeteners.
- Rinse your mouth with a baking soda, salt, and water mouthwash before eating to help foods taste better. (Mix 1 teaspoon salt and 1 teaspoon baking soda in 4 cups of water. Shake well before swishing and spitting.)
- Keep your mouth clean and brush your teeth to help ease bad tastes.
- Serve foods cold or at room temperature. This can decrease the foods' tastes and smells, making them easier to tolerate.
- Freeze fruits like cantaloupe, grapes, oranges, and watermelon, and eat them as frozen treats.
- Eat fresh vegetables. They may be more tempting than canned or frozen ones.
- Try marinating meats to make them tender.
- If red meats taste strange, try other protein-rich foods like chicken, fish, beans or peas, tofu, nuts, seeds, eggs, or cheese.
- Blend fresh fruits into shakes, ice cream, or yogurt.
- To reduce smells, cover beverages and drink through a straw; choose foods that don't need to be cooked; and avoid eating in rooms that are stuffy or too warm.

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## Weight gain

Some people find they don't lose weight during treatment. They may even gain weight. This is particularly true for people with [breast](#)<sup>1</sup>, [prostate](#)<sup>2</sup>, or [ovarian cancer](#)<sup>3</sup> who are taking certain medicines or getting hormone therapy or [chemotherapy](#)<sup>4</sup>.

If you notice you're gaining weight, tell your cancer care team so you can find out what

may be causing this change. Sometimes you gain weight because certain cancer-fighting drugs cause your body to hold on to extra fluid. If this is the case, your doctor may ask you to talk with a registered dietitian for help with limiting the amount of salt you eat. This is important because salt might cause your body to hold extra water.

Many women with breast cancer gain weight during treatment. Because of this, many of the recommendations for breast cancer patients include a reduced-calorie diet much like those suggested for patients after cancer treatment has been completed. If you have any questions, talk to your cancer care team about the best diet for you.

Weight gain may also be the result of increased food intake and decreased physical activity. Some people find it helps their nausea to have something in their stomachs, so they eat more. Other people eat more when they're stressed or worried.

If you want to stop gaining weight, here are some tips that can help:

### **What to do**

- Ask your cancer care team for a referral to a registered dietitian to help you get your nutrition needs met without gaining weight.
- Try to walk daily if you can and if it's OK with your doctor. Talk with your cancer care team about referral to a physical therapist to help you safely increase activity levels.
- Limit food portion sizes, especially with high-calorie foods.
- Choose fish, poultry, or beans and peas instead of red meat. If you eat red meat, choose only lean cuts and eat smaller portions.
- Choose whole-grain breads, pasta, and cereals (such as barley and oats) instead of breads, cereals, and pasta made from refined grains, and brown rice instead of white rice.
- Limit your intake of refined carbohydrate foods, including pastries, candy, sugar-sweetened breakfast cereals, and other high-sugar foods.
- Read food labels to become more aware of portion sizes and calories. Be aware that "low-fat" or "non-fat" doesn't always mean "low-calorie."
- Choose vegetables, whole fruit, and other low-calorie foods instead of calorie-dense foods such as french fries, potato and other chips, ice cream, donuts, and other sweets.
- Choose low-fat dairy products (skim or 1% milk, light yogurt, reduced fat cheese). Cut back on added butter, mayonnaise, and other fats.
- Choose low-fat and low-calorie cooking methods (such as broiling and steaming).

- Limit high-calorie snacks between meals.
- Limit or avoid intake of sugar-sweetened beverages such as soft drinks, sports drinks, and fruit-flavored drinks.
- When you eat away from home, be especially mindful to choose food low in calories, fat, and added sugar, and avoid large portion sizes.
- Include activities that will help relieve your stress. .

## Nutrition after treatment ends

Most eating-related side effects of cancer treatments go away after treatment ends. Sometimes side effects like [poor appetite](#), [dry mouth](#), [change in taste or smell](#), [trouble swallowing](#), or [weight changes](#) last for some time. If this happens to you, talk to your cancer care team and work out a plan to deal with the problem.

As you begin to feel better, you may have questions about eating a healthy diet. Just as you wanted to go into treatment with the best nutrient stores that your diet could give you, you'll want to do the best for yourself at this important time, too. Eating well will help you regain your strength, rebuild tissue, and feel better overall.

### Tips for healthy eating after cancer

- Check with your cancer care team for any food or diet restrictions.
- Ask your dietitian to help you create a nutritious, balanced eating plan.
- Choose a variety of foods from all the food groups. Try to eat at least 2½ cups of fruits and vegetables each day; include citrus fruits and dark-green and deep-yellow vegetables.
- Eat plenty of high-fiber foods, like whole-grain breads and cereals.
- Buy a new fruit, vegetable, low-fat food, or whole-grain product each time you shop for groceries.
- Decrease the amount of fat in your meals by baking or broiling foods.
- Limit your intake of red meat (beef, pork, or lamb) to no more than 3 to 4 servings a week.
- Avoid salt-cured, smoked, and pickled foods (including bacon, sausage, and deli meats).

- Choose low-fat milk and dairy products.
- If you choose to drink alcohol, limit the amount to no more than 1 drink per day for women, and 2 for men. Alcohol is a known cancer-causing agent.

If you're overweight, consider losing weight by cutting calories and increasing your activity. Choose activities that you enjoy. Be sure to check with your cancer care team before starting any exercise program.

Visit [www.cancer.org](http://www.cancer.org) or call us to learn more about choosing foods for a well-balanced meal plan.

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## To learn more

### National organizations and websites

**American Institute for Cancer Research (AICR)** Toll-free: 1-800-843-8114 Website: [www.aicr.org](http://www.aicr.org)<sup>1</sup>

- Offers information and conferences on diet, nutrition, exercise, and cancer, as well as personalized answers to your nutrition questions

**Academy of Nutrition and Dietetics** Toll-free: 1-800-877-1600, ext. 5000 (for referral to a local dietitian) Website: [www.eatright.org](http://www.eatright.org)<sup>2</sup>

- Their website contains information on diet and nutrition; also has a directory of registered dietitians that can be searched by location and specialty. You can also get a referral to a local dietitian using the toll-free phone number.

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## Recipes to try during cancer treatment

## High-calorie, high-protein shake and drink recipes

If you need more calories or have trouble swallowing, try the following recipes – but keep in mind that they might not be right for everyone. If you want to increase calories but not fat, use reduced-fat dairy products. If you're eating well and maintaining your weight, there's no reason to increase your calorie intake.

Follow these basic instructions for all the drink recipes below:

- Place all ingredients in a blender container, or mix in a large container with a hand-held blender.
- Cover and blend on high speed until smooth.
- Chill before serving.
- Store unused drinks in the refrigerator or freezer.
- Add 1 to 2 tablespoons of powdered milk to each recipe to increase protein.

**Note:** If you can't tolerate milk or milk products, or if you have diabetes, ask your nurse or dietitian for other recipe ideas.

### Fortified milk

- *Drink or use in cooking to add protein*
- 1 quart whole or low-fat milk 1 cup powdered non-fat dry milk
- Blend and chill at least 6 hours. Can also be made with buttermilk or dry buttermilk.
- (211 calories and 14 grams of protein per cup)

### Sherbet shake

- *A refreshing shake*
- 1 cup sherbet  $\frac{3}{4}$  cup low-fat milk  $\frac{1}{2}$  teaspoon vanilla extract
- (320 calories and 8 grams of protein)

### Tangy protein smoothie

- *A thick, protein-packed drink*
- 1 cup cottage cheese or plain yogurt ½ cup vanilla ice cream ¼ cup prepared fruit-flavored gelatin (can use individual ready-to-eat snack pack) ¼ cup low-fat milk
- (275 calories and 13 grams of protein)

### **Classic instant breakfast milk shake**

- *A protein- and calorie-packed favorite*
- ½ cup low-fat milk or fortified milk (see first recipe) 1 envelope instant breakfast mix 1 cup vanilla ice cream (add flavorings or different flavor ice creams for variety)
- (450 calories and 14 grams of protein)
- Increase flavor and calories by adding fresh or frozen fruit or chocolate or strawberry syrup. Add peanut butter or dry milk for extra protein.

### **Peach yogurt frost**

- *A frosty, mild drink*
- 1 envelope vanilla instant breakfast mix 1 cup low-fat milk or fortified milk (see first recipe) 1 (6-ounce) container low-fat peach yogurt 1 cup frozen peaches
- (Makes 3 servings; 155 calories and 7 grams of protein per serving)
- Try substituting other fruit combinations that appeal to you.

## **Homemade soup recipes**

### **Chicken and white bean soup**

- 1 rotisserie chicken breast section or 3 cups chopped white chicken meat 1 tablespoon canola oil 3 carrots, sliced 2 celery stalks, sliced 1 onion, chopped 2 cups water 6 cups reduced-sodium chicken broth 1 (15-ounce) can Great Northern



beans, rinsed and drained Pepper and salt to taste

- Remove wings from chicken and reserve. Remove skin from breast and discard. Shred the meat from the breast and break off breast bones.
- Heat oil in a stock pot over medium heat. Sauté the carrots, celery, onion, chicken wings, and breastbones for 8 to 10 minutes, or until vegetables soften.
- Add water and chicken broth and bring to a boil, stirring to combine. Reduce heat, cover, and simmer for 15 to 20 minutes. Add beans and chicken meat and cook for 5 minutes. If too thick, add more broth or water. Discard bones and wings before serving. Season with salt and pepper. Makes 6 servings.
- Approximate nutrients per serving: 235 calories, 5 grams of fat, 28 grams of protein

### **Hearty turkey minestrone soup**

- 1 pound ground turkey breast or lean ground beef 1 onion, chopped 2 carrots, chopped 2 celery stalks, chopped 8 cups reduced-sodium chicken broth or beef broth 1 (14.5-ounce) can diced tomatoes 1 teaspoon dried basil 1 teaspoon dried oregano ½ cup small pasta, such as orzo or pastini 1 (10-ounce) package frozen chopped spinach 1 (15-ounce) can chickpeas or white beans, rinsed and drained Pepper and salt to taste Grated Parmesan cheese, optional
- In a stockpot over medium-high heat, sauté the turkey and onion until the turkey is cooked through. Add the carrots and celery and sauté for 10 minutes, or until softened. Add the broth, tomatoes, basil, and oregano and stir to combine. Bring to a boil. Reduce the heat and simmer for 20 minutes, stirring occasionally.
- Add the pasta, frozen spinach, and chickpeas or beans and cook for 10 minutes, or until pasta is tender, stirring occasionally. Season with salt and pepper. Serve with Parmesan cheese. Makes 14 servings.
- Approximate nutrients per serving: 120 calories, 1 gram of fat, 13 grams of protein

### **Spicy cream of broccoli soup**

- 3 cups broccoli florets and peeled stems, coarsely chopped 1½ cups reduced-

sodium chicken broth, vegetable broth, or water 1 tablespoon olive oil 1 small onion, finely chopped 1 tablespoon all-purpose flour 3 cups low-fat milk ½ teaspoon salt (optional) ½ teaspoon pepper ¼ teaspoon paprika ¼ teaspoon celery seed Pinch cayenne pepper, optional

- In a large saucepan over high heat, bring the broccoli and broth to a boil. Reduce heat, cover, and simmer for 8 to 10 minutes, or until very tender. Cool slightly. Transfer to a blender or food processor and purée. Set aside.
- In the same saucepan over medium heat, add the oil and onion. Sauté the onion for 3 to 5 minutes, or until softened. Add the flour and cook until fully incorporated, stirring constantly. Gradually add the milk and cook until thickened, stirring constantly. Add the reserved broccoli purée, salt, pepper, paprika, celery seed, and cayenne pepper and stir well to combine. Makes 5 servings.
- Approximate nutrients per serving: 115 calories, 4.5 grams of fat, 7 grams of protein

## Potato soup

- 3 medium potatoes, peeled and cubed 2 celery stalks, coarsely chopped ½ onion, coarsely chopped 2 cups reduced-sodium chicken broth or vegetable broth 1 tablespoon butter 1 tablespoon flour 2 cups low-fat milk Pepper and salt to taste
- In a large saucepan over high heat, bring the potatoes, celery, onion, and broth to a boil. Reduce heat, cover, and simmer for 15 to 20 minutes, or until the potatoes are tender, stirring occasionally. Cool slightly. Transfer to a blender or food processor and purée. Set aside.
- In the same saucepan over low heat, melt the butter. Add the flour and cook until fully incorporated, stirring constantly. Gradually add the milk and cook until thickened, stirring constantly. Add the reserved potato mixture to the saucepan and stir well to combine. Season with salt and pepper. (This soup thickens when chilled and may need to be thinned with more chicken broth or milk.) Makes 6 servings.
- Approximate nutrients per serving: 125 calories, 3 grams of fat, 5 grams of protein