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# Nutrition for People With Cancer

Nutrition is an important thing to consider when you're getting cancer treatment. Eating healthy foods before, during, and after treatment can help you feel better and stay stronger. But cancer and its treatment can sometimes cause problems that can make it hard to eat. Not everyone with cancer has nutrition-related side effects, but this information can help you address them if and when they come up.

## Nutrition During Cancer Treatment

Learn about nutrition needs during treatment and how to manage treatment side effects that could affect how well you eat.

- [Benefits of Good Nutrition During Cancer Treatment](#)
- [Preparing for Treatment with Good Nutrition](#)
- [Eating Well During Treatment](#)
- [Food Safety During Cancer Treatment](#)
- [High-Fiber and Low-Fiber Foods](#)
- [Managing Eating Problems Caused by Cancer Treatments](#)

## More information

Get more nutrition information from the American Cancer Society.

- [Nutrition for the Person With Cancer During Treatment: A Guide for Patients and Families \[PDF\]](#)
- [Nutrition and Physical Activity During and After Cancer Treatment: Answers to Common Questions](#)
- [Eating Well After Treatment](#)
- [Nutrition for Children with Cancer](#)

- [Diet and Physical Activity](#)

## Where to find help

If you have any questions or concerns about nutrition, you should talk to a doctor, nurse, or dietitian. A registered dietitian can be one of your best sources of information. 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.

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

## From the ACS Bookstore

The second edition of *What to Eat During Cancer Treatment* contains more than 130 recipes. The book provides practical tips and suggestions to help patients and their caregivers anticipate—and overcome—the major challenges of eating well during treatment. Written by Jeanne Besser, an award-winning cookbook author; Barbara Grant, a board-certified specialist in oncology nutrition; and experts in nutrition and cancer care from the American Cancer Society.

For more information or to place an order, visit the [ACS Bookstore](#).

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# Benefits of Good Nutrition During Cancer Treatment

- [Proteins](#)
- [Fats](#)
- [Carbohydrates](#)
- [Water](#)
- [Vitamins and minerals](#)

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 meats 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 or just don't feel well.

Good nutrition is especially important if you have cancer because both the illness and its treatments can change the way you eat. They can also affect the way your body tolerates certain foods and uses nutrients.

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 might need high-protein, 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>1</sup>, your [treatment](#),<sup>2</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.

The nutrition 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 proteins, fats, carbohydrates, water, vitamins, and minerals.

## 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, chemotherapy, or radiation therapy, 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 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** (olive, canola, and peanut oils) and **polyunsaturated** fats (these are found mainly in safflower, sunflower, corn, and flaxseed oils and seafood) more often than saturated fats or trans fats.

**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.

Most **trans fats** in our diets come from snack foods and baked goods made with partially hydrogenated vegetable oil or vegetable shortening. These sources of trans fats have largely been removed from the food supply in the US. Trans fats are also found naturally in some animal products, like dairy products, in smaller quantities. 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. (Phytonutrients are chemicals in plant-based foods that we don't need to live, but that might promote health.)

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 four 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**

Your body needs vitamins and minerals to help it function properly and use the energy (calories) in food. Most are found naturally in foods, but they are also sold as pill and liquid supplements.

If you eat a balanced diet with enough calories and protein you will usually get 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. If you do have side effects, 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 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 doctor 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 (destructive molecules) , 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 cancer treatments and recovery from surgery. If you're interested in using products containing herbs, talk about it with your cancer doctor, nurse, or pharmacist first.

## **Dietary supplement safety considerations**

Many people believe that a pill or supplement they find in stores, is 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](#)<sup>4</sup>.
- 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.

## Hyperlinks

1. [www.cancer.org/cancer.html](http://www.cancer.org/cancer.html)
2. [www.cancer.org/cancer/managing-cancer/treatment-types.html](http://www.cancer.org/cancer/managing-cancer/treatment-types.html)
3. [www.cancer.org/cancer/managing-cancer/side-effects.html](http://www.cancer.org/cancer/managing-cancer/side-effects.html)
4. [www.cancer.org/cancer/managing-cancer/treatment-types/complementary-and-integrative-medicine/dietary-supplements.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/complementary-and-integrative-medicine/dietary-supplements.html)

## References

National Cancer Institute. Nutrition in Cancer Care (PDQ) - Health Professional Version. cancer.gov. March 3, 2022. Updated Accessed at [https://www.cancer.gov/about-cancer/treatment/side-effects/appetite-loss/nutrition-hp-pdq#\\_104](https://www.cancer.gov/about-cancer/treatment/side-effects/appetite-loss/nutrition-hp-pdq#_104) on March 14, 2022.

Rock CL, Thomson CA, Sullivan KR, et al. American Cancer Society nutrition and physical activity guideline for cancer survivors. CA Cancer J Clin. 2022. Accessed at <https://acsjournals.onlinelibrary.wiley.com/doi/full/10.3322/caac.21719> on March 16, 2022.

United States Department of Agriculture. Dietary Guidelines for Americans: 2020-2025. Accessed at [https://www.dietaryguidelines.gov/sites/default/files/2020-12/Dietary\\_Guidelines\\_for\\_Americans\\_2020-2025.pdf#page=31](https://www.dietaryguidelines.gov/sites/default/files/2020-12/Dietary_Guidelines_for_Americans_2020-2025.pdf#page=31) on March 8, 2022.

Last Revised: March 16, 2022

Last Revised: March 16, 2022

# Preparing for Treatment with Good Nutrition

- [Make plans now](#)

Until you start treatment, you won't know what, if any, side effects 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.

## Make plans now

You can lower 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 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 things you have or might 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](#),<sup>1</sup> [weight loss](#),<sup>2</sup> or [nausea](#).<sup>3</sup>



If your 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](#)<sup>4</sup> during treatment.

## Hyperlinks

1. [www.cancer.org/cancer/managing-cancer/side-effects/stool-or-urine-changes/constipation.html](http://www.cancer.org/cancer/managing-cancer/side-effects/stool-or-urine-changes/constipation.html)
2. [www.cancer.org/cancer/managing-cancer/side-effects/eating-problems/weight-changes.html](http://www.cancer.org/cancer/managing-cancer/side-effects/eating-problems/weight-changes.html)
3. [www.cancer.org/cancer/managing-cancer/side-effects/eating-problems/nausea-and-vomiting.html](http://www.cancer.org/cancer/managing-cancer/side-effects/eating-problems/nausea-and-vomiting.html)
4. [www.cancer.org/cancer/managing-cancer/side-effects/eating-problems/fluids-and-dehydration.html](http://www.cancer.org/cancer/managing-cancer/side-effects/eating-problems/fluids-and-dehydration.html)

Last Revised: July 15, 2019

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# Eating Well During Treatment

- [Snack as needed](#)
- [Tips to get more calories and protein](#)
- [Don't forget about physical activity](#)

Try to eat well. A healthy diet helps your body function at its best. This is even more important if you have cancer. You'll go into treatment with reserves to help keep up your strength, your energy level, and your defenses against infection. A healthy diet can also prevent body tissue from breaking down and build new tissues. 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 never have liked before might 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 more fruits and vegetables every day in a variety of colors. Colorful vegetables and fruits and plant-based foods have many natural health-promoting substances.
- Try to stay at a healthy weight, and stay physically active. Small weight changes during treatment are normal.
- Limit or avoid red or processed meats, sugar sweetened beverages and processed foods.

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

## **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 might 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

- 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
- 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
- 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 largest meal when you are hungriest, not matter the time of day.
- 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 to 300 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 300 minutes a week. Listen to your body, and rest when you need to. Do what you can when you're up to it.

## Hyperlinks

1. [www.cancer.org/cancer/managing-cancer/side-effects.html](http://www.cancer.org/cancer/managing-cancer/side-effects.html)
2. [www.cancer.org/cancer/risk-prevention/diet-physical-activity/get-active.html](http://www.cancer.org/cancer/risk-prevention/diet-physical-activity/get-active.html)

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National Cancer Institute. Nutrition in Cancer Care (PDQ) - Health Professional Version. cancer.gov. March 3, 2022. Updated Accessed at [https://www.cancer.gov/about-cancer/treatment/side-effects/appetite-loss/nutrition-hp-pdq#\\_104](https://www.cancer.gov/about-cancer/treatment/side-effects/appetite-loss/nutrition-hp-pdq#_104) on March 14, 2022.

Rock CL, Thomson CA, Sullivan KR, et al. American Cancer Society nutrition and physical activity guideline for cancer survivors. CA Cancer J Clin. 2022. Accessed at <https://acsjournals.onlinelibrary.wiley.com/doi/full/10.3322/caac.21719> on March 16, 2022.

Last Revised: March 16, 2022

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# Food Safety During Cancer Treatment

- [Food-handling tips](#)
- [Do not cross-contaminate](#)
- [Cook foods well](#)
- [Microwave cooking](#)
- [Grocery shopping](#)
- [Dining out](#)

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> 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

defend itself very well. This is because you might not have enough infection-fighting white blood cells for a while. 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.
- Rinse packaged salads, slaw mixes, and other prepared produce again under running water, even when marked pre-washed. Using a colander can make this easier.
- Do not eat raw vegetable sprouts.
- Throw away slimy or moldy fruits and vegetables.
- Do not buy produce that already 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. Do not buy products ( including meats, poultry, or seafoods) that are out of date. Pick only the freshest products.
- 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 .
- Ask for pasteurized fruit juices. 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 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</p>	<p>Raw or lightly cooked fish, shellfish, lox, sushi, or sashimi</p> <p>Raw nuts or fresh nut</p>

	<p>to be sure that meat and poultry reach the proper temperature when 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>	<p>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,</p>

		<p>Stilton, Gorgonzola, and blue cheese</p> <p>Mexican-style cheeses, such as queso blanco fresco, since they are often made with unpasteurized milk</p>
<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>	Fruit pies, cakes, and cookies, flavored gelatin; commercial ice cream, sherbet, sorbet, and popsicles	<p>Unrefrigerated, cream-filled pastry products</p> <p>Raw honey or honeycomb. Select a commercial, grade A,</p>

	<p>Sugar</p> <p>Commercially prepared and pasteurized jam, jelly, preserves, syrup, and molasses</p>	<p>heat-treated honey instead.</p>
<p><b>Water and beverages</b></p>	<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.

## Hyperlinks

1. [www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts/infections.html](http://www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts/infections.html)

Last Revised: July 15, 2019

# High-Fiber and Low-Fiber Foods

Many people with cancer don't have to follow any special diet. But some might be told by their doctor to follow a diet that is either low or high in fiber.

- [Why is fiber important for people with cancer?](#)
- [What is dietary fiber?](#)
- [What is a low-fiber diet?](#)
- [How to eat a low-fiber diet](#)
- [What is a high-fiber diet?](#)
- [How to eat a high-fiber diet](#)

## Why is fiber important for people with cancer?

A person with cancer might need to lower or increase fiber in their diet if they:

- Have digestive problems
- Are getting certain types of surgery or cancer treatment
- Have or are expected to get certain side effects from treatment

If your doctor tells you to follow a low- or high-fiber diet, try to choose foods that you would normally eat. Do not try any foods that caused you discomfort or allergic reactions in the past.

Whether or not you need to be on a diet that restricts or adds fiber, remember these tips:

- It's important to drink enough fluids.
- Getting regular physical activity helps the digestive system to work better.
- Eating frequent, small meals can help digest food better than larger meals because the digestive system doesn't have to work as hard to digest food.

**Always ask your cancer care team if you should follow any special diet before, during, or after treatment. And talk with your cancer care team or a dietitian if you have questions about certain foods or amounts.**

## What is dietary fiber?

Dietary fiber (often just called fiber) is the part of plant foods that we can't digest. Fiber is richly found in certain plant foods, including legumes or beans, whole grains, fruits and vegetables, and nuts and seeds.

### **What is soluble and insoluble fiber?**

Dietary fiber can be either soluble or insoluble.

**Soluble fiber** attracts water into the intestines and becomes a gel. It can help lower blood sugar and cholesterol levels. Foods higher in soluble fiber include:

- Apples
- Bananas
- Citrus fruits
- Beans
- Berries
- Oats
- Peas

**Insoluble fiber** doesn't dissolve in the stomach. It can help move food through your digestive system and bulk up stool to help prevent constipation. But it can also have rough, hard bits that irritate the intestines as it passes through. Foods higher in insoluble fiber include:

- Nuts and seeds
- Some vegetables
- Whole grain foods

### **What is a low-fiber diet?**

A low-fiber diet means you eat foods that do not have a lot of fiber. If you have certain medical problems, are having surgery, or are getting certain treatments for cancer, you may be asked to reduce the amount of fiber in your diet to rest your bowels (or intestines). A low-fiber diet reduces the amount of undigested food moving through your bowels, so that your body makes a smaller amount of stool. Low-fiber foods can be helpful if you have diarrhea, cramping, or trouble digesting food. Foods with little soluble fiber can often be eaten in small amounts (depending on why you're on a low-fiber diet) because the soft fiber gel doesn't irritate the intestines the same way.

## How to eat a low-fiber diet

**Here are low-fiber foods you can eat with tips to help you cook them if you're restricting your dietary fiber.** To see what foods you should avoid while on a low-fiber diet, you can find a list of high-fiber foods on this page. Keep in mind if you are on a "low-residue diet," your food choices are even more restricted than those listed below. (A "low-residue diet" limits fiber plus certain other foods that might be difficult to digest.)

### Low-fiber proteins: meat, fish, poultry, tofu, and nut products

- Tender cuts of meat
- Ground meat
- Tofu
- Fish and shellfish
- Smooth peanut butter
- Eggs

Bake, broil, or poach meats, and use mild seasonings. Try preparing meats as stews, roasts, meatloaves, casseroles, sandwiches, and soups using ingredients on the approved lists. Scramble, poach, or boil eggs; or make omelets, soufflés, custard, puddings, and casseroles, using ingredients noted below. You might want to ask your doctor, nurse, or dietitian about other foods may be OK for you to eat and find out when you can go back to your normal diet.

### Low-fiber dairy foods: milk and cheese

- Milk, chocolate milk, buttermilk, and milk drinks
- Yogurt without seeds or granola
- Sour cream
- Cheese
- Cottage cheese
- Custard or pudding
- Ice cream or frozen desserts (without nuts)
- Cream sauces, soups, and casseroles

You can use these items in desserts, snacks, or breads. Use in small to medium amounts and only if they don't cause problems for you.

### Low-fiber bread, cereals, and grains

- White breads, waffles, French toast, plain white rolls, or white bread toast
- Pretzels
- Plain pasta or noodles
- White rice
- Crackers, zwieback, melba, and matzoh (no cracked wheat or whole grains)
- Cereals without whole grains, added fiber, seeds, raisins, or other dried fruit

Use white flour for baking and making sauces. Grains, such as white rice, Cream of Wheat, or grits, should be well-cooked. Include the above grains in casseroles, dumplings, soufflés, cheese strata, kugels, and pudding.

### **Low-fiber vegetables and potatoes**

- Tender, well-cooked fresh or canned vegetables without seeds, stems, or skins
- Cooked sweet or white potatoes without skins
- Strained vegetable juices without pulp or spices

You can also eat these with cream sauces, or in soups, soufflés, kugels, and casseroles.

### **Low-fiber fruits and desserts**

- Soft canned or cooked fruit without seeds or skins (small amounts)
- Small amounts of well-ripened banana
- Strained or clear juices
- Small amounts of soft cantaloupe or honeydew melon
- Cookies and other desserts without whole grains, dried fruit, berries, nuts, or coconut
- Sherbet and popsicles

Serving suggestions include gelatins, milk shakes, frozen desserts, puddings, tapioca, cakes, and sauces.

### **Other low-fiber foods**

- Mayonnaise and mild salad dressings
- Margarine, butter, cream, and oils in small amounts
- Plain gravies



- Plain bouillon and broth
- Ketchup and mild mustard
- Spices, cooked herbs, and salt
- Sugar, honey, and syrup
- Clear jellies
- Hard candy and marshmallows
- Plain chocolate

### **Liquids and drinks for a low-fiber diet**

Keep in mind that low-fiber foods can cause fewer bowel movements and smaller stools. You may need to drink extra fluids to help prevent constipation while you are on a low-fiber diet. Drink plenty of water unless your doctor tells you otherwise, and use juices and milk as noted above.

### **What is a high-fiber diet?**

A **high-fiber diet** means you eat foods that are high or rich in dietary fiber. Dietary fiber has long been linked to a lower risk of certain types of cancer, including colorectal cancer. Because of this, many people who have not been diagnosed with cancer follow a high-fiber diet to try to prevent getting cancer. And some people living with cancer might choose high-fiber foods to help prevent other cancers from starting. Fiber can also promote heart health and can help a person maintain or lose body weight by helping to control cholesterol and blood sugar levels.

If a person with cancer has no special dietary restrictions to follow during and after treatment, they might choose to follow a high-fiber diet to stay as healthy as possible.

But some cancer treatments can cause problems with the stomach and intestines. Adding high-fiber foods might increase those problems. If this happens, talking to a dietitian and cutting back on fiber can help.

### **How to eat a high-fiber diet**

**Here are high-fiber foods you can eat with tips to help you cook them if you're following a high-fiber diet or want to increase fiber in your diet.** To see what foods you should avoid while on a high-fiber diet, you can also find a list of low-fiber foods on this page.

**High-fiber protein: meat, fish, poultry, and legumes**

- All beans, nuts, peas, lentils, and legumes
- Processed meats, hot dogs, sausage, and cold cuts
- Tougher meats with gristle

**High-fiber breads, cereals, and grains**

- Brown or wild rice
- Whole grains, cracked grains, or whole wheat products
- Kasha (buckwheat)
- Cornbread or cornmeal
- Graham crackers
- Bran
- Wheat germ
- Nuts
- Granola
- Coconut
- Dried fruit
- Seeds

**High-fiber vegetables and potatoes**

- All raw or steamed vegetables
- All types of beans
- Potatoes with skin
- Peas
- Corn
- Cabbage, broccoli, cauliflower, Brussels sprouts, and greens
- Sauerkraut
- Onions

**High-fiber fruits and desserts**

- All raw or dried fruits

- Berries
- Prune juice, prunes, and raisins

### Other high-fiber foods

- Marmalade
- Pickles, olives, relish, and horseradish
- Popcorn
- Potato chips

### References

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Last Revised: February 26, 2024

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## Managing Eating Problems Caused by

# Cancer Treatments

- [Surgery](#)
- [Radiation therapy](#)
- [Chemotherapy](#)
- [Common eating problems](#)

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

## Surgery

After surgery, you will need 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. Your body's ability to use nutrients may also be changed by surgery on any part of the digestive tract (like the mouth, esophagus, stomach, small intestine, pancreas, colon, or rectum).

Be sure to talk to your cancer care team about any problems you're having so they can help you manage them.

For suggestions on coping with treatment side effects, see [Managing Cancer-related Side Effects](#)<sup>1</sup>

For more about information on surgery as a cancer treatment, see [Cancer Surgery](#)<sup>2</sup>.

## 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.

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're having trouble eating and have been following a special eating plan for diabetes or another 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.

See [How Radiation Therapy Can Affect Different Parts of the Body](#)<sup>3</sup> for more information on its side effects.

## Chemotherapy

[Chemotherapy](#)<sup>4</sup> (chemo) side effects depend on what kind of chemo drugs you take and how you take them.

Chemo is often given 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 you can do 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.

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

- [Appetite changes](#)<sup>5</sup>
- [Constipation](#)<sup>6</sup>
- [Diarrhea](#)<sup>7</sup>
- [Fatigue](#)<sup>8</sup>

- [Mouth dryness or thick saliva](#)<sup>9</sup>
- [Mouth sores or sore throat](#)<sup>10</sup>
- [Nausea](#)<sup>11</sup>
- [Swallowing problems](#)<sup>12</sup>
- [Taste and smell changes](#)<sup>13</sup>
- [Weight changes](#)<sup>14</sup>

For more information, see [Managing Cancer-related side effects](#)<sup>15, 16</sup>

## Hyperlinks

1. [www.cancer.org/cancer/managing-cancer/side-effects.html](http://www.cancer.org/cancer/managing-cancer/side-effects.html)
2. [www.cancer.org/cancer/managing-cancer/treatment-types/surgery.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/surgery.html)
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Last Revised: February 26, 2024

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