

Probiotics: Friendly Bacteria

Ingrid Adams, Nutrition and Food Science



Probiotics are live microorganisms, mainly bacteria and some yeasts, that may provide some health benefits. They also help to digest the foods we eat. “Probiotic” is a broad term for many different living organisms that can be found in foods, drinks, and supplements. The type and number of bacteria in our guts can change depending on our consumption of these items, in addition to other factors including health status, antibiotic and medication use, where we live, and even stress levels. Many of these probiotics found in food sources and supplements are like the bacteria found naturally in our bodies.

Although they sound similar, probiotics are not to be confused with prebiotics. Prebiotics are not living organisms. Prebiotics are types of fiber found naturally in fruits, vegetables, and whole grains that our bodies cannot digest. They are also added to some processed foods and sold as dietary supplements. These fibers act as fuel sources to support the friendly bacteria in our guts. The term “synbiotics” is used to define foods or supplements that include both probiotics and prebiotics.

How probiotics work in the body

When we think of bacteria, we often think of germs that make us sick and spoil food. Seldom do we think of bacteria as being “good” or “friendly.” However, trillions of bacteria naturally grow

and flourish in our guts. Most of these bacteria are not harmful and do not cause illness; rather they support health and bodily functions.

The gut contains a balance of good bacteria and harmful bacteria. This balance can be thrown off by antibiotics, some surgeries or procedures, and certain conditions and diseases. This imbalance can have an impact on health. When foods containing probiotics are eaten, the bacteria present in these foods helps increase the number of healthy bacteria found in the gut. In other words, they tip the scale in favor of healthy, good bacteria.

Health effects

Probiotics may provide some relief for gut-related conditions and may provide additional benefits for some broader health conditions, including skin issues. Probiotics may:

- manage diarrhea, especially following antibiotic use;
- restore good gut bacteria following antibiotic use;
- reduce symptoms of irritable bowel syndrome and inflammatory bowel disease such as Crohn’s disease;
- promote regular movement of food through the gut;
- decrease lactose intolerance;
- improve blood cholesterol levels;
- manage or reduce the development of certain allergies; and
- reduce or shorten the risk of certain intestinal infections.

What amount of probiotics is needed for health effects?

The dose of probiotics needed for health benefits is unknown. More research is needed to identify type, frequency, dosage, and duration related to the potential benefits listed in this publication.

The number of live microbes in a probiotic is measured in colony forming units (CFUs). A higher number of CFUs listed on a package does not mean more health benefits. The CFUs present at the time of production may change before consumption. Some probiotics may need refrigerated storage, and others may be stored at room temperature. Follow instructions on the package and use before the “best by” date, because the bacterial count goes down over time.

Understanding names of probiotics

Probiotics are identified by their genera. The genus name is like a family name. Several different species of bacteria may be part of the same family. *Lactobacillus* and *Bifidobacterium* are two common bacterial families found in probiotic foods and products. You will often see *Lactobacillus* shortened as “L.” and *Bifidobacterium* as “B.” when listing bacterial strains on food and supplement labels (Table 1).

Different species of probiotics have different characteristics and benefits. The different strains may have different effects on the body. The beneficial effects of one probiotic may not apply to another. Sources of probiotics may list a variety of microorganisms even though they have not been studied or shown to provide health benefits. Look for products that contain strains from the *Lactobacillus*, *Bifidobacterium*, or *Saccharomyces* families, or from the species *Streptococcus thermophilus*, as they have been researched the most and have been shown to be safe for healthy individuals.

Table 1. Examples of common bacterial strains.

Lactobacilli	Bifidobacteria
<i>L. acidophilus</i>	<i>B. bifidum</i>
<i>L. casei</i>	<i>B. breve</i>
<i>L. reuteri</i>	<i>B. infantis</i>
<i>L. rhamnosus</i>	<i>B. longum</i>
<i>L. bulgaricus</i>	
<i>L. plantarum</i>	

Table 2. Food sources of probiotics.

Cultured dairy products	Fermented vegetables	Fermented soy products	Others
Buttermilk	Kimchi (Korean fermented dish made of vegetables with varied seasonings)	Miso (Japanese food made by fermenting rice, barley, and/or soybeans with salt and fungus)	Kombucha (fermented drink made with tea, sugar, and probiotic bacteria and yeast)
Cottage cheese	Pickled ginger	Natto (fermented soybeans)	
Kefir (cultured or fermented milk beverage that is like yogurt)	Pickles (brine-cured, without vinegar)	Shoyu and tamari (types of soy sauce)	
Sour cream	Sauerkraut	Tempeh (made from partially cooked, fermented soybeans)	
Yakult (Japanese milk-like product)			
Yogurt			

Sources of probiotics

Probiotics may be present naturally in many foods that are fermented or may be added to foods, beverages, and supplements. The number of probiotics present in a food may be impacted by food processing and storage. This includes home-canned sauerkraut and pickles. See Table 2 for some foods that include probiotics.

Identifying probiotics in food sources

The labels of some foods, often dairy products, may contain the label “live culture” or “live and active culture.” This term was developed by the National Yogurt Association and is found on many refrigerated and frozen yogurts. Products with this seal have a certain number of bacteria when the product is manufactured. Even if a product label states it contains “live cultures” or “live and active cultures,” the product might not be a probiotic. These live microorganisms may be used for the fermentation process but may not be identified as a probiotic that provides health benefit.

Similarly, the process of making alcoholic beverages, like beer and wine, may use bacteria and yeast in the beginning, but often the beneficial bacteria are killed off over time. These products generally do not provide the benefits of traditional probiotic sources.

When you eat food sources of probiotics, you obtain the good bacteria and the nutrients present in the food. For example, when you eat probiotic yogurt, you may get a range of probiotics as well as the nutrients present in dairy products, like calcium, vitamin D, vitamin B₁₂, and protein.



When choosing probiotics:

- Check the bacteria. Look for products with strains that are well studied, such as *Lactobacillus*, *Bifidobacterium*, *Streptococcus thermophilus*, and *Saccharomyces*.
- Consider adding more probiotic foods into your eating pattern to support gut health.
- Be sure to check the best way to store probiotic foods and supplements.

As with any dietary supplements, common red flags include:

- claims of miraculous cures and quick weight loss;
- promises of quick and easy remedies for complex health-related problems;
- claims that are too good to be true;
- testimonials used as evidence of effectiveness;
- the use of vague terms, such as “clinically tested,” “patented,” etc.; or
- recommendations based on a single study.

Probiotics should not be used to treat a health condition, replace prescribed medications, or postpone seeing your provider for any reason. Older adults, and also those with some health conditions or compromised immune systems, should proceed with caution. Always talk to your health care provider if you are thinking about using probiotics. More research is needed to better understand the amount, type, and function that may lead to potential health benefits.

References

- Shahrokhi M, Nagalli S. *Probiotics*. [Updated 2023 Jul 3]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK553134/>
- National Center for Complementary and Integrative Health. (2019, August). *Probiotics: What You Need To Know*. NCCIH. <https://www.nccih.nih.gov/health/probiotics-what-you-need-to-know>
- National Institutes of Health. (2017). *Probiotics*. Nih.gov. <https://ods.od.nih.gov/factsheets/Probiotics-HealthProfessional/>
- Lactobacillus: MedlinePlus Supplements*. (2022, June 23). Medlineplus.gov. <https://medlineplus.gov/druginfo/natural/790.html>
- Bacillus Coagulans: MedlinePlus Supplements*. (2019, September). Medlineplus.gov. <https://medlineplus.gov/druginfo/natural/1185.html>
- Bifidobacteria: MedlinePlus Supplements*. (n.d.). Medlineplus.gov. <https://medlineplus.gov/druginfo/natural/891.html>
- Saccharomyces Boulardii: MedlinePlus Supplements*. (n.d.). Medlineplus.gov. <https://medlineplus.gov/druginfo/natural/332.html>
- Roberta Larson Duyff, & And, N. (2017). *Academy of Nutrition and Dietetics Complete Food and Nutrition Guide*. Houghton Mifflin Harcourt.

This publication provides information about health and wellness.
Readers are encouraged to use it for education, but not as a substitute for professional medical advice.

Revised by Anna M. Cason, October 2024.

Cooperative Extension Service

Agriculture and Natural Resources
Family and Consumer Sciences
4-H Youth Development
Community and Economic Development

MARTIN-GATTON COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Educational programs of Kentucky Cooperative Extension serve all people regardless of economic or social status and will not discriminate on the basis of race, color, ethnic origin, national origin, creed, religion, political belief, sex, sexual orientation, gender identity, gender expression, pregnancy, marital status, genetic information, age, veteran status, physical or mental disability or reprisal or retaliation for prior civil rights activity. Reasonable accommodation of disability may be available with prior notice. Program information may be made available in languages other than English.
University of Kentucky, Kentucky State University, U.S. Department of Agriculture, and Kentucky Counties, Cooperating.
Lexington, KY 40506 Issued 10-2024



Disabilities
accommodated
with prior notification.