Probiotics: Healthy Bacteria With a Host of Benefits

Just what are probiotics?

The most common definition of probiotics is “live microorganisms that, when administered in adequate amounts, confer a health benefit on the host.” Simply put, probiotics are bacteria that benefit people’s health when in the stomach and intestines.

In order to be called probiotics, bacteria must be alive when consumed, and their health benefits must be confirmed through scientific research. Some of their benefits include:

- promoting intestinal health;
- improving the immune system to help maintain health;
- preventing chronic diseases like cancer, high blood pressure, obesity and diabetes; and
- improving mental health.

Why are probiotics so popular?

Probiotics are getting lots of attention due to research on their health benefits and interest in “functional” foods—those that provide health-enhancing properties beyond their nutrients. As people become more aware of how diet impacts their health and disease risk—and seek out foods that meet their specific needs—there will likely be more probiotic-containing foods in stores.

Today, lactic acid bacteria, especially those that survive in the intestinal tract, are often used as probiotics. Some common probiotic species are *Lactobacillus rhamnosus*, *L. casei* and *Bifidobacterium lactis*. These and other probiotics can be found in cultured dairy foods like yogurt, fermented vegetables like kimchi and sauerkraut, some beverages, nutrition bars and other foods fortified with probiotics.
How do probiotics work?

The trillions of bacteria in the digestive tract—both good and bad—make up the gut microbiota, which is considered a key to health. The “good” bacteria in the intestines have a symbiotic relationship with the body—they get energy from the foods people eat and provide health benefits (listed below) to the entire body. Probiotics in the diet can enhance the good bacteria in the gut and improve health and disease risk.

What kinds of health benefits do probiotics provide?

Scientists are looking at many benefits of probiotics. Those with the most evidence are outlined below. Because studies are done with a specific strain or combination of strains, this is only a general description of probiotic benefits.

**Gastrointestinal health**

Probiotics have been shown to help reduce duration of pediatric acute diarrhea, decrease symptoms associated with taking antibiotics, manage symptoms of irritable bowel syndrome, reduce crying time in infants with colic and reduce relapses of ulcerative colitis. Certain probiotics may also inhibit the growth of Helicobacter pylori, bacteria that colonize the stomach and can cause ulcers and stomach cancer.

One of the best-studied effects of probiotics has been on the reduction in diarrhea severity and duration. Probiotics can prevent as well as reduce duration of several types of diarrhea. Lactobacillus has been found to be a safe and effective treatment for children with acute infectious diarrhea. Certain probiotics may also offer a safe and effective method to prevent traveler’s diarrhea, but research in this area is emerging.

Many studies have shown that probiotics reduce diarrhea associated with taking antibiotics in both adults and children. In fact, it is common for physicians and pharmacists to recommend eating a probiotic-fortified yogurt every day during a course of antibiotics to prevent diarrhea. More research is needed to determine which probiotics are associated with the greatest effect for specific antibiotics.

**Immune health**

Probiotics have also been researched for how they support the immune system. Studies suggest that probiotics can improve how the immune system functions such as by decreasing upper respiratory tract infections in adults and reducing the need for antibiotics. Studies in children show that a regular diet including probiotics reduces colds and flu-like symptoms and improves attendance in preschool and day care settings.

Maintaining a healthy immune system is important for everyone. In other words, probiotics provide an additional tool to help the body protect itself from getting sick.
**Lactose intolerance**
It is well known that people with lactose intolerance can often consume yogurt with few symptoms. This is because the probiotics in yogurt help digest the lactose in the small intestine, before it reaches the colon. In addition, the yogurt starter cultures *L. bulgaricus* and *Streptococcus thermophilus* help to break down the lactose. Because of its probiotics, yogurt is a good way for people with lactose intolerance to consume the recommended servings of dairy without experiencing uncomfortable symptoms they may get from other dairy products.

**Obesity and diabetes**
More and more evidence shows that the gut microbiota may play an important role in the development of obesity, obesity-associated inflammation and insulin resistance. Obesity and Type 2 diabetes are associated with changes in gut microbiota. Several studies describe differences between the microbiota of lean individuals and those who are obese. The potential for using probiotics in weight management and obesity and diabetes prevention is exciting.

**Brain and mental health**
This is one of the newer areas of probiotic research. Described as the “gut-brain axis,” researchers believe that the communication between the gut and the brain affects not just physical but also mental health and behavior. For example, a recent study found that probiotics can reduce anxiety, relieve stress and improve mental outlook. Another study found that the probiotics *L. helveticus* and *Bifidobacterium longum* reduced depression, anger, hostility and self-blame and improved problem-solving ability. Another study showed a difference in brain activity between women consuming yogurt and those consuming a placebo. More research needs to be done to confirm the effect of probiotics on mental and emotional health.

Other areas of research are investigating the role of probiotics in preventing cancer, high blood pressure and allergies and reducing cholesterol levels. Probiotics obviously have an immense ability to affect a wide range of health outcomes.

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**Dr. Daniel Merenstein,**
family practice physician and Associate Professor at Georgetown University Medical Center, summarizes the use of probiotics in his practice:

“Probiotics are very promising and used quite often in practice. Many physicians, including myself, use them regularly for many gastrointestinal issues and other issues like infant colic, preventing diarrhea in patients taking antibiotics and for overall immune and respiratory health. There is still a lot more research that needs to be conducted but it is clear that they are here to stay, and the research base is likely only going to lead to increased use in many other conditions in both preventing and treating diseases.”
Who needs probiotics?
Many people can benefit from regular consumption of probiotics. Traditionally, probiotics were recommended to people on antibiotics to reduce side effects like diarrhea. Now it is known that there are benefits to people with lactose intolerance and intestinal diseases, and even colicky infants. In addition, probiotics can help healthy people stay healthy and ward off colds, flu-like symptoms and chronic diseases.

How much probiotic is needed?
The amount needed for health effects varies widely, depending on the strain and species of probiotic and what health benefit is desired. Different probiotics are effective at different levels; some products are effective at a level of 50 million live cells per day and others at over one trillion. Yogurt commonly contains between 100 million and 10 billion live probiotics per serving. Follow manufacturers’ recommendations for the levels needed from specific products.

Because probiotics do not permanently stay in the intestinal tract, daily consumption of probiotics is generally recommended. In some cases, multiple times per day (with every meal) may be recommended.

Where can probiotics be found?
Probiotics come from either supplements or foods. Supplements have the advantages that they may contain higher levels of probiotics, and they are convenient and calorie-free. Food sources provide nutrition as well as probiotics, and because people eat foods daily, probiotics can become a regular part of dietary habits. Most important is to get enough of the strain or combination of strains that have been shown effective and that work to meet desired health effects.

What are the best food sources?
Probiotic bacteria have long been associated with dairy products. This is because some of the same bacteria that are used in fermented dairy products (yogurt, cheese, kefir and the like) also make up the intestinal microbiota.

Dairy products are a desirable probiotic “delivery vehicle” for several reasons:

- Dairy foods can protect probiotic bacteria from high acid levels in the stomach, allowing higher levels of probiotics to reach the intestine.
- Refrigeration of dairy products helps promote the stability of probiotics.
- People are often afraid of bacteria in foods but have a positive perception of the terms “live, active cultures” linked to fermented dairy foods.
- Probiotic-containing dairy products make healthy functional-food packages. Probiotics provide an added value to milk products that already have high levels of vitamins, minerals and protein needed for healthy growth and development in children and health and disease prevention in adults.
Which strain or combination of strains is effective?
Not all probiotics are the same, and every person has a unique gut microbiota that responds to probiotics differently. The best advice is to choose a probiotic that is made by a reputable company, has been tested for the desired effects and works for the individual.

For product recommendations, go to:
- Probiotics: A Consumer Guide for Making Smart Choices
- Recommendations for Probiotic Use: 2011 Update
- WGO Handbook on Gut Microbes

How do people know what they are getting in a probiotic?
Although there may be hundreds of different probiotic products in the marketplace, many products may contain the same strains. Probiotics are identified by genus (for example, Lactobacillus), species (for example, acidophilus) and strain (for example, NCFM). Manufacturers should provide information on their product labels or website that includes:
- The genus, species and strain of all probiotics in the product.
- The level of all probiotic strains in the product expected at the end of shelf life.
- The health benefit(s) associated with the product, including references when possible.
- Proper storage conditions of the product.
- Recommended usage based on the level shown to be effective in studies.
- Contact information for the company.
Resources and continuing education

California Dairy Research Foundation, USProbiotics. This site is a science-based reference on probiotics research, development and health benefits. www.USProbiotics.org

International Scientific Association for Probiotics and Prebiotics (ISAPP). Read the latest news and find out about events and activities around probiotics and prebiotics. www.isapp.net.

- Probiotic guidelines
- Prebiotic guidelines
- Useful Information About Probiotics for Clinicians – Mary Ellen Sanders, Ph.D.
- Consensus statement on the scope and appropriate use of the term probiotics

Probiotics for GI Health in 2012: Issues and Updates (CME-certified, targeted for primary care physicians).

Probiotic Supplementation: What Nurse Practitioners Need to Know to Recommend Safe and Effective Formulations.

Probiotics Supplementation: What Pharmacists Need to Know to Recommend Safe and Effective Formulations.

University of Redding. This is a 13-minute video on Prebiotics: What They Are, What They Do and How We Find Out. Glenn Gibson, Ph.D.

World Gastroenterology Organisation. This site provides global guidelines on digestive health, publications and information on meetings and events. www.worldgastroenterology.org/

- Practice Guideline: Probiotics and Prebiotics
- Handbook on Gut Microbes

For questions and comments please contact us at info@DairyCouncilofCA.org.