

# Prebiotics Versus Probiotics: What Are They and What Do They Do?

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The terms *prebiotics* and *probiotics* are on all sorts of food products these days. Both are associated with good gut health and helping you maintain a healthy digestive system by feeding the good bacteria in your body. However, the terms often get mixed up. This fact sheet will help define the difference between prebiotics and probiotics and what they do for our bodies.

## What are the good bacteria?

Your body contains billions of bacteria that help you stay healthy. The largest population of these bacteria can be found in your intestines (1). Prebiotics and probiotics have similar health benefits because they both increase the population of healthy bacteria in your body (1).

## Prebiotics

Prebiotics are food components that cannot be digested by the human body and are often indigestible carbohydrates. Not all carbohydrates are prebiotics. Prebiotics serve as the food for the healthy bacteria in your gut and help in the growth and maintenance of good bacteria (1).

## Health Benefits of a Prebiotic-Rich Diet (2)

There are several health benefits that come from a diet high in prebiotics. Prebiotics improve satiety (feelings of fullness), which can help with weight management. They protect against gut infections and may protect against some types of cancer. Prebiotics can also reduce incidence and symptoms of irritable bowel syndrome (IBS), increase uptake of

certain minerals such as calcium and magnesium and improve immune function by decreasing the presence of harmful bacteria.

### Foods That Contain Prebiotics

Bananas	Leeks
Onions	Peas
Garlic	Chicory
Asparagus	Berries
Artichokes	Kiwifruit
Soybeans	Honey
Whole-grain foods	

## Probiotics

The technical definition of a probiotic is a “live microbial feed supplement which beneficially affects the host animal by improving its intestinal balance” (3). In more general terms, probiotics are often called “friendly bacteria” or “good bacteria” and are live microorganisms (in most cases, bacteria that are similar to beneficial microorganisms found in the human gut (4)).

Although a lot of research has been done on probiotics, there is still a lot left to learn. Not all probiotics are the same, and they do not all do the same thing in the body. They also may not have the same benefits in all people (5).

## Health Benefits of Probiotics (4)

Researchers have studied probiotics to find out whether they might help prevent or treat a variety of health problems, including:

- Digestive disorders such as diarrhea caused by infections, antibiotic-

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associated diarrhea, irritable bowel syndrome and inflammatory bowel disease

- Allergic disorders such as atopic dermatitis (eczema) and allergic rhinitis (hay fever)
- Tooth decay, periodontal disease and other oral health problems
- Colic in infants
- Liver disease
- The common cold
- Prevention of necrotizing enterocolitis in very low birth weight infants.

### Foods That Contain Probiotics (6)

- Yogurt
- Kefir
- Aged cheeses
- Miso soup
- Pickled fruit or vegetables
- Tempeh (fermented soybeans)
- Kimchi (Korean pickled cabbage)
- Sourdough bread
- Sauerkraut
- Beer

## Government Regulation of Probiotics

While the research is promising, the Food and Drug Administration (FDA) has not approved any health claims for probiotics (5). Government regulation of probiotics in the United States is complex. Depending on a probiotic product's intended use, the FDA might regulate it as a dietary supplement, a food ingredient or a drug (4).

Many probiotics are sold as dietary supplements, which do not require FDA approval before they are marketed. Dietary supplement labels may make claims about how the product affects the structure or function of the body without FDA approval, but they cannot make health claims (claims that the product reduces the risk of a disease) without the FDA's

## Prebiotic/Probiotic Yogurt Parfait (2)

Makes 1 serving

### Ingredients

- ¼ cup whole grain cereal
- 10 almonds or cashews
- 1 small banana
- 6 ounces of nonfat plain or vanilla yogurt
- 1 tbsp ground flaxseed
- ½ cup berries

### Directions

Place yogurt, flaxseed, nuts and cereal in a bowl. Top with banana and berries. (Recipe analyzed using the following ingredients: toasted oat cereal, almonds, banana, vanilla yogurt, flaxseed, blueberries.

## Nutrition Facts

Serv. size 1 (372g)  
Servings 1  
Calories 420  
Fat Cal. 90

\*Percent Daily Values (DV) are based on a 2,000 calorie diet.

Amount/Serving	%DV*	Amount/Serving	%DV*
<b>Total Fat</b> 10g	<b>15%</b>	<b>Total Carb.</b> 74g	<b>25%</b>
Sat. Fat 1g	<b>4%</b>	Fiber 9g	<b>35%</b>
Trans fats 0g		Sugars 50g	
<b>Cholest.</b> less than 5mg	<b>1%</b>	<b>Protein</b> 15g	
<b>Sodium</b> 170mg	<b>8%</b>		
Vitamin A 0%	Vitamin C 30%	Calcium 40%	Iron 20%

consent. If a probiotic is marketed as a drug for specific treatment of a disease or disorder in the future, it will be required to meet more stringent requirements. It must be proven safe and effective for its intended use through clinical trials and be approved by the FDA before it can be sold (4).

## Are Probiotics Safe? (4)

Whether probiotics are likely to be safe for you depends on the state of your health.

- In people who are generally healthy, probiotics have a good safety record. Side effects, if they occur at all, usually consist only of mild digestive symptoms such as gas.
- On the other hand, there have been reports linking probiotics to severe side effects, such as dangerous infections, in people with serious underlying medical problems. The people who are most at risk of severe side effects include critically ill patients, those who have had surgery, very sick infants and people with weakened immune systems.

If you would like to get more prebiotics and probiotics in your diet, try the yogurt parfait above.

## References

1. Sproule-Willoughby, K. The differences between probiotics and prebiotics, 2015 [cited 2017 January 27]. Available from <http://www.livestrong.com/article/335114-the-difference-between-probiotic-prebiotic/>.
2. Hindle, N., and S. McDonald. Prebiotics: How to feed your good bacteria. Penn State College of Agricultural Sciences: The Pennsylvania State University, 2016.
3. Yoo, J.Y., and S.S. Kim. Probiotics and Prebiotics: Present Status and Future Perspectives on Metabolic Disorders. *Nutrients*. 2016;8(3):173. doi: 10.3390/nu8030173. PubMed PMID: 26999199; PMCID: PMC4808900.
4. Probiotics [cited 2017 January 27]. Available from <https://ncicb.nih.gov/health/probiotics>.
5. McDonald, S. Probiotics: The Good Bugs! Penn State College of Agricultural Sciences: Ag Communications and Marketing, 2013.
6. Marco M.L., D. Heeney, S. Binda, C.J. Cifelli, P.D. Cotter, B. Foligne, M. Ganzle, R. Kort, G. Pasin, A. Pihlanto, E.J. Smid, and R. Hutkins. Health benefits of fermented foods: microbiota and beyond. *Curr Opin Biotechnol*. 2016; 44:94-102. doi: 10.1016/j.copbio.2016.11.010. PubMed PMID: 27998788.

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