



July 10

## Culinary Nutrition News: Probiotics: The Friendly Bacteria

Provided through a partnership between ACEF Chef & Child Foundation and Clemson University, and sponsored by French's Foodservice.

When most people think of bacteria, descriptions such as “friendly” and “good” are not the first words that come to mind. However, your digestive tract is filled with billions and billions of bacteria, most of which are beneficial. Friendly bacteria are vital to proper development of the immune system, protection against disease and digestion, as well as absorption of food and nutrients. With the increasing popularity of foods and supplements known as probiotics, these sociable bacteria are gaining more attention from the food industry as well as the general public. Probiotic, which translates to “for life” or “pro-life,” refers to living organisms that provide health benefits when consumed in adequate amounts. However, the suggestion of incorporating more bacteria into your diet does pose many questions, such as, “Huh?”

### Gut instinct

The World Health Organization (WHO) and the Food and Agriculture Organization of the United Nations (FAO) define probiotics as “live microorganisms, which, when administered in adequate amounts, confer a health benefit on the host.” Microorganisms are tiny living organisms, such as bacteria, viruses and yeasts that can only be seen under a microscope. Probiotics — also known as friendly bacteria — are similar to beneficial microorganisms found in the human gut. Probiotics enter food through fermentation and aging processes. While research has shown that probiotic bacteria may reduce the risk of diarrheal illnesses,

assist lactose intolerant people with digestion of lactose and enhance people’s immune function, no one knows exactly what dose or which strains of friendly bacteria work best for what conditions.

Probiotics are mostly used by consumers in the form of dietary supplements and as complementary alternative medicine (CAM) to prevent and treat certain illnesses and support general wellness. The probiotic strains most frequently used in foods and supplements are *lactobacillus* and *bifidobacteria*. Scientifically, a bacterial strain must meet the following minimum criteria to be considered a probiotic:

- 1. It must be pure and scientifically identified.**
- 2. Human studies must show that it is beneficial for human health.**
- 3. It must be safe.**

While scientific understanding of probiotics and their potential for preventing and treating health conditions is still in its early stages, in general, probiotics are considered helpful in maintaining a healthy colon and digestive health. They are also presumed to be safe since some probiotic foods date back to ancient times, such as fermented foods and cultured milk products.

*Lactobacillus plantarum* is one of the lactic acid producing bacteria that has been used for centuries to preserve food. In recent years, it has been shown to decrease Irritable Bowl Syndrome symptoms and

compete and win against unfriendly bacteria. Foods that are naturally rich in *lactobacillus plantarum* are fermented vegetables and grains, such as sauerkraut, brined olives and salted gherkins as well as fermented millet, maize or sorghum. Since pasteurization and heat will kill both good and bad bacteria, the typical American diet is lacking in this probiotic.

### Balancing acts

Probiotics are often consumed to restore ecological balance of intestinal bacteria for digestive and overall health. For instance, antibiotics used to treat certain illnesses may kill friendly bacteria as well as “unfriendly” bacteria. Therefore, probiotics can be used in attempts to counterbalance side effects from antibiotics and rotaviruses, such as gas, cramping and diarrhea. Similarly, they can be used to relieve symptoms of lactose intolerance — a condition which can cause gastrointestinal symptoms due to the gut’s inability to digest significant amounts of the milk sugar lactose. Unfriendly microorganisms such as disease-causing bacteria, yeasts, fungi and parasites can also upset the balance. Researchers are still exploring whether probiotics could halt or suppress the growth and activity in conditions, such as diarrhea, irritable bowel syndrome, inflammatory bowel disease, vaginal infections and skin infections.



Yogurts with live cultures, including this mango yogurt, are perhaps the most recognizable probiotic.

## Around the world

Compared to their fresh counterparts, bacterially cultured or fermented foods supply more probiotics and health-building enzymes. By using cottage cheese and yogurt rather than milk, sauerkraut rather than cabbage, tofu and tempeh rather than soybeans, and wine rather than grapes, you can provide higher dietary levels of nutrients, such as vitamins A, B-complex and K. Historically, people around the world have recognized the health benefits of fermented foods. Europeans have been known to use traditional sauerkraut to combat ulcers and digestive problems, and Asians serve pickled daikon radishes and *kimchi*. The fermented dairy drink *lassi* is a household staple in India, and yogurt-like *leban* is served daily in Israel.

## Pro-gurt

Perhaps the most recognizable probiotic is yogurt. Once upon a time, the only real choices you had to make when shopping for yogurt were plain or flavored and blended or fruit-on-the-bottom. Today, the yogurt aisle is full of choices, from fat-free, artificially sweetened and whipped to extra-thick, reduced-fat and added fiber. To add to this list of choices, many brands are highlighting the use of probiotics by using live active cultures to bolster the digestive system and improve regularity.

Typically, yogurt is made by adding two common bacteria cultures, *lactobacillus bulgaricus* and *streptococcus thermophilus*

to pasteurized milk and allowing it time to ferment. While U.S. Food and Drug Administration (FDA) regulations require that all yogurts be made with active cultures, some yogurt products are heat-treated after fermentation, which kills most of the beneficial active cultures. To help you identify those yogurt products that have retained their live and active cultures, the National Yogurt Association (NYA) has established a special Live & Active Cultures seal.

## Prebiotics

If probiotics are known as foods containing beneficial bacteria, then prebiotics can be regarded as the food that beneficial bacteria like to eat. Specifically, prebiotics are fiber-like, indigestible carbohydrates that are broken down by bacteria in the colon. This breakdown fosters the growth of beneficial bacteria that may help in preventing and treating diarrhea and constipation. They may also aid in the prevention of colon cancer, while decreasing blood triglyceride, glucose and insulin levels. For an ingredient to be considered a prebiotic, it must meet the following criteria:

- 1. It is not broken down and absorbed in the body.**
- 2. It is fermented by the good bacteria in the gastrointestinal tract.**
- 3. It stimulates the growth of these good bacteria in the gut.**

## Buy in

While availability of foods and other products containing probiotics were once more common in Japan and European countries than in the United States, today we are seeing an influx of products claiming the presence of friendly bacteria. In fact, Americans' spending on probiotic supplements nearly tripled from 1994 to 2003. Besides the foods listed below, pre- and probiotics can also be found in a variety of tablets, powders and nutritional beverages.



Probiotics, the friendly bacteria, can be found in many foods, including miso soup, a Japanese culinary mainstay.

## EXAMPLES OF PROBIOTICS AND PREBIOTICS



### PROBIOTICS

Buttermilk	Miso
Cottage cheese	Soy sauce
Dairy spreads with inulin*	Tempeh
Fresh sauerkraut	Yogurt with live cultures

### PREBIOTICS

Barley	Leeks
Chicory	Onions
Garlic	Rye
Jerusalem artichokes	Wheat

\*Inulin, derived from the chicory root, is the most common prebiotic found in yogurt.

*Dr. Margaret D. Condrasky, R.D., C.C.E., is an associate professor of Food Science and Human Nutrition at Clemson University. She leads the CU CHEFS® program for improving culinary nutrition skills.*

*Marie Hegler is a graduate of the Food Science and Human Nutrition department with a culinary science emphasis at Clemson University, which operates the CU CHEFS® program for improving culinary nutrition skills.*

*Shannon Read and Kate Scheele, members of the Undergraduate Research Team, made contributions to this article.*

## About the American Culinary Federation and the Chef & Child Foundation



The American Culinary Federation, Inc., established in 1929, is the premier professional organization for culinarians in North America. With more than 20,000 members spanning 225 chapters nationwide, ACF is the culinary leader in offering educational resources, training, apprenticeship and accreditation. In addition, ACF operates the most comprehensive certification program for chefs in the United States. ACF is home to ACF Culinary Team USA, the official representative for the United States in major international culinary competitions, and to the Chef & Child Foundation, founded in 1989 to promote proper nutrition in children and to combat childhood obesity. For more information, visit [www.acfchefs.org](http://www.acfchefs.org).

## About Clemson University



CU CHEFS® (Clemson University's Cooking and Healthy Eating Food Specialists) instructional program, led by Dr. Marge Condrasky, Associate Professor in Food Science and Human Nutrition, is a registered trademark of Clemson University designed to promote changes in menu planning, food purchasing, food preparation and food consumption behaviors with a goal of fostering good health through healthy nutrition. 'Culinary nutrition' is the application of nutrition principles combined with food science knowledge displayed through a mastery of culinary skills. The results are healthy eating behaviors grounded in culinary confidence and nutrition alertness. CU CHEFS® promotes an awareness of the latest trends in foods and nutrition through the demonstration of proficient culinary skills to produce flavorful, health-inspired menus for schools, churches, restaurants. Clemson University, located in Clemson, S.C., is ranked 22 among the nation's top public institutions. Since 2001, Clemson has doubled external research funding, raised the academic profile of the student body, increased retention and graduation rates, launched high-profile economic development and has earned national accolades, including being named TIME magazine's Public College of the Year.

## About French's Foodservice



French's Foodservice is proud to sponsor this series of nutritional articles authored by Clemson University for the American Culinary Federation's Chef & Child Foundation. At French's Foodservice, we believe that "you are what you serve" and have

built our reputation by providing the highest quality ingredients to meet the ever-changing needs of the foodservice industry. As chefs, restaurateurs, educators and nutritionists, you positively impact the health of our nation by advocating the positive impact of healthy eating, especially among children. We are proud to support this worthy cause.

Over the last 100 years, French's has become one of the most recognized and respected brands in America. Today, the French's Foodservice family of brands delivers the highest quality, most flavorful products possible. For the brands your patrons know and love and the incredible flavors that enhance everything from soups and salads to sandwiches and entrees, entrust your patrons to the flavors of French's.

## FOR MORE INFORMATION

### THE NATIONAL YOGURT ASSOCIATION

(NYA) is a national nonprofit trade organization whose purpose is to sponsor health and medical research for yogurt with live and active cultures, and serve as an information source to the trade and the general public.

Visit: [www.aboutyogurt.com](http://www.aboutyogurt.com)

**USPROBIOTICS.ORG** is a nonprofit research and education site made possible by the California Dairy Research Foundation and Dairy & Food Culture Technologies. This site provides consumers, healthcare professionals and industry professionals with background information on the world of probiotics, including what they are, what is known about them and what to consider for commercial and personal use.

Visit: [www.usprobiotics.org](http://www.usprobiotics.org)

### THE NATIONAL CENTER FOR COMPLEMENTARY AND ALTERNATIVE

**MEDICINE (NCCAM)** is the federal government's lead agency for scientific research on the diverse medical and health care systems, practices and products that are not generally considered part of conventional medicine. An introduction to probiotics can be found on their website.

Visit: <http://nccam.nih.gov/health/probiotics/>