Chapter 6
Pro-/Anti-Inflammatory Food Supplements: Probiotics and Prebiotics

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ABSTRACT

Probiotics are living microorganisms, meaning “for life” and consist of two parts, “pro” and “biota,” and prebiotics are indigestible carbohydrates that increase the number and activities of colon bacteria and the effectiveness of probiotics. Probiotic consumption has been reported to have many positive effects, such as increasing immune response, balancing the colony, and increasing endogenous defense capacity of cells. The aim of prebiotics is to grow probiotic bacteria, thus improving the gastrointestinal and immune systems. Recent studies have shown that probiotics may have an impact on gastrointestinal system diseases. It has been shown to stimulate the proliferation of beneficial microorganisms in prebiotics and assist in the probiotic effect. The most commonly used probiotics and prebiotics are lactic acid bacteria that are types of Lactobacillus and Bifidobacterium. Prebiotics are naturally present in nutrients. Probiotics and prebiotics are used to prevent many diseases.

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DEFINITION AND HISTORY OF PROBIOTICS

The term probiotic has been used frequently in the last 10-15 years. Elie Metchnikoff, winner of the 1912 Nobel Prize in medicine, reported that the Bulgarian people lived longer than other nations, and that this was due to the intake of dairy products containing living bacteria. Metchnikoff emphasized the positive effects of some bacteria and suggested that it would be possible to replace harmful bacteria with beneficial bacteria by giving beneficial microorganisms. He stated that what prolongs life is beneficial microorganisms found in sour milk (Parkes, 2007; Uriot et al., 2017).

The term probiotic comes from the “pro bios” origin in Greek (pro: for, bios: life) and means “for life”. The use of probiotics by humans dates back to ancient times. Fermented dairy products, which are widely known in the Greeks and Romans, have been used especially in the treatment of children and convalescent patients. The term probiotic was first proposed by Vergin in 1954 as an antithetical term (Sekhon, 2010). One year later, Kolb suggested that the undesirable effects of antibiotics could be prevented by probiotics. It was used in 1965 by Lilly and Stillwell, the first to use the term probiotic to describe the development of the product produced by one microorganism. In 1974, Parker described probiotics as organisms that help maintain bowel balance (Fuller, 1992). In 1996, Schaffsma described them as living microorganisms that had positive nutritional effects as well as basic nutritional properties (Schaffsma, 1996).

Today, the definition of probiotics is used and agreed upon by FAO and WHO (2002). According to this definition, probiotics are “living microorganisms that, when taken in sufficient amounts, have beneficial health effects on the host.”

PROBIOTIC BACTERIA

So far, many species have been isolated and studied. Probiotic microorganisms may be bacteria or yeast. The most studied and used bacteria are from the family of *Lactobacillus* and *Bifidobacterium* (Roberfroid, 2000). Among these species, *Lactobacillus rhamnosus* GG is the most studied probiotic bacteria on *Saccharomyces boulardii*.

The main probiotic microorganisms are: *Lactobacillus acidophilus*, *L. casei*, *L. lactis*, *L. helveticus*, *L. salivarius*, *L. plantarum*, *L. bulgaricus*, *L. curvatus*, *L. gasseri*, *L. rhamnosus*, *L. johnsonii*, *L. reuteri*, *L. fermentum*, *L. delbrueckii*, *L. vaginalis*, *L. cellobiosus*, *L. brevis*, *L. curvatus*, *Bifidobacterium bifidum*, *B. breve*, *B. longum*, *B. thermophilum*, *B. adolescentis*, *B. angulatum*, *B. pseudeocatenulatum*, *B. animalis* and *B. infantis*, *Streptococcus thermophilus*, *S. cremoris*, *S. thermophilus*, *S. thermopilus*.
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