

Commensally-Probio

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Consumers are becoming more aware of the relationship between lifestyle, diet and good health, which explains the growing demand for substances that can improve health beyond supplying basic nourishment. In addition to the nutritional benefits, consuming lactic acid bacteria (LAB) and their fermented foods has been linked to a variety of health benefits such as immune system modulation, enhanced resistance to cancer, and infectious sickness. The use of commensally microorganisms is somehow restoring the natural microflora to the gut (Czerucka, *et al.* 2002).

The majority of probiotic food items which are classified as functional foods make up a large portion of it. Because of greater consumer consciousness, the demand for functional and healthful foods, particularly probiotics, is fast increasing.

LAB contains many industrially used strains with probiotic properties. In 2002, FAO and WHO defined probiotics as “live microorganisms administered in adequate amounts that confer a beneficial health effect on the host” (FAO and WHO, 2002). Probiotics LAB are applied, essentially in food preservation. It has been attracting much attention due to their effect on the nutritional qualities of the food, their ability to extend its shelf life, and to inhibit spoilage and foodborne pathogens (Ben Salah, *et al.* 2012; 2013; Reis, Paula, Casarotti, and Penna, 2012).

Most probiotic bacteria belong to the *Lactobacillus* and *Bifidobacterium* genera. Other bacteria and yeasts, on the other hand, may have probiotic characteristics. *Lactobacilli* and *Bifidobacteria* are Gram-positive lactic acid-producing bacteria representing a significant portion of the typical intestinal microflora in both animals and humans.

Lactobacilli are non-spore forming rod-shaped bacteria. They have severe fermentative, aerotolerant or anaerobic, aciduric or acidophilic dietary needs.

Lactobacilli are found in a number of settings where rich, carbohydrate-containing substrates are accessible, such as human and animal mucosal membranes, on plants or plant debris, sewage, and fermented milk products fermenting or spoiling food.

Bifidobacteria are an important element of the normal gut microflora in humans throughout their lives.

They first emerge in the stools some days after birth and continue to multiply. The number of *Bifidobacteria* in the colon of adults is 10^{10} - 10^{11} cfu/g. This number, however, declines with age. *Bifidobacteria* are rods that are not motile and do not sporulate. The majority of strains are completely anaerobic.

While traditional starter cultures have been enhanced for technological and flavor properties, culture stability in acidified milk and probiotic microorganism strains have been chosen for their health-promoting qualities from a broad spectrum of lactic acid bacteria and other microorganisms.

A variety of selection criteria were developed for this aim:

- Human-safe, that is, free of pathogenic and harmful consequences.
- Microorganisms that originate in the digestive tracts of healthy people are considered safe for humans and best adapted to the gut ecology.
- Tolerance to gastric and bile toxicity, together with ample resistance to digestive enzymes do not only allow for survival in the stomach and upper intestinal tract but also have health-promoting effects in the gut.

Because the decline in pH of ingested food in the stomach is marginal owing to the buffer capacity of gastric acid, resistance to gastric acid is less important than tolerance of bacteria to bile acid and digestive enzymes in the small bowel.

- It is critical for probiotic strains to have antagonistic action against pathogenic bacteria via antimicrobial agent synthesis or competitive exclusion.
- Adhesion to gut epithelial tissue, this criteria made the bacteria in close contact at the epithelial cells by increasing probiotic retention time. Different methods and models have been used for probiotics adhesion assessment including adhesion to intestinal mucus and adhesion to epithelial cells.

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