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Mini Review

Kefir and Intestinal Health

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Abstract

Probiotics food products contain live microorganisms, which contribute to its preservation, taste, texture and aroma, as well as providing the balance of the natural microbiota of those who consume it, often improving the absorption of nutrients.

INTRODUCTION

The human intestine is responsible for much of the digestive function, and only in this portion of the gastrointestinal tract that occurs absorption of all nutrients ingested in food. Furthermore, the microbiological composition of the intestine has been investigating about its influence on the immune system, energy metabolism and chronic degenerative diseases as diabetes, obesity and cardiovascular diseases [1,2]. Tremaroli & Bäckhed [3] suggested that a reduction in the consumption of fat and carbohydrates with a reduction of body weight increase bacterial intestinal colonization by Bacteroidetes instead of Firmicutes.

The lining of the colon is different from the small intestine in that there exists a large number of bacteria, such as Bacteroides, Clostridia and Lactobacilli, besides Bifidobacteria, Eubacteria and Streptococci. Several studies have shown that colonic bacterial composition is dependent of some factors as food intake, medications used, among others. This microbial dependence can generate beneficial or harmful effects to theupon the health of the host [3].

Probiotics are livemicroorganisms which upon ingestion in adequate quantities confer a health benefit to the host [4]. They are usually found in fermented dairy products [5,6].

Kefir is a fermented milk derivative, originatedfrom the Caucasus region. The origin of the name is Turkish, meaning "good feeling", due to the sense of well-being that was described after ingestion. [7].

Traditionally kefir is produced by milk inoculation with kefir grains, which have color ranging from white to yellow, comprising an inert matrix (polysaccharides and proteins) associated with a large population of lactic acidbacteria, acetic acid bacteria and yeasts [8]; generally distributed in a proportion of 60% of lactic acid bacteria (species of *Lactobacillus*, *Lactococcus* and *Leuconostoc*), 30% yeast (species of *Saccharomyces*, *Kluyveromyces*) and 10% acetic acid bacteria (*Acetobacter* species) approximately [9-13].

BENEFICIAL EFFECTS ON GASTROINTESTINAL TRACT

Countless research has demonstrated the immunomodulatory effects of Kefir, especially on certain types of diarrhea [4,14]. Thoreux and Schmucker [15] demonstrated, in rats, that orally administered kefir affects the intestinal mucosa and systemic immune response. The modulatory effect on the intestinal microbiota is due to the direct action of acid and bacteriocins, as well as competition with pathogenic microorganisms [7].

Rosa et al. [16], performed histological analyses on the ileum, caecum and colon of Wistar rats and concluded that the administration of milk kefir improved the intestinal mucosa. Four weeks of kefir consumption increased villous weight and width. This effect would increase nutrients absorption process since many carbohydrate and protein digestive enzymes are located in absorptive cells from the crypt base differentiated. Take together these events may reduce the development of diarrheas. Also, the animals presented reduced total cholesterol levels. Such beneficial effect was attributed to the production of short chain fatty acids and by the deconjugation of bile acids by microorganisms, forming secondary biliary acids, which are partially lost in the feces.

Recently studies conducted by Rodrigues et al. [17], indicate that beer produced with kefir, as a single fermenter present anti-inflammatory and antiulcer activity. Furthermore, this another study showed that *L.plantarum* MA2 increases the fecal population of lactic acid bacteria and *Bifidobacterium*, but has not been reported interference with the population of *Eschericha coli* [18]. Similar to this study, Liu et al. [19], also describe the significant increase in fecal microbiota, particularly *Lactobacillus* and *Bifibacterium*, and the decrease in *Clostridium perfringens* population, while Zacconi et al. [20], reported the prevention of colonization by *Campylobacter jejuni*.

Studies performed by Santos et al. [21], demonstrated the inhibitory effect of *Lactobacillus*, isolated from kefir, against *Escherichia coli*, *Listeria monocytogenes*, *Salmonella typhimurium*, *Salmonella enteritidis*, *Shigella flexneri* and *Yersinia enterocolitica*. Furthermore, it was observed by Silva et al. [22], the inhibition of *Candida albicans*, *Salmonella typhi*, *Shigella sonnei* and *Staphylococcus aureus* in addition to *Escherichia coli*. Chifiriuc et al. [23], did not observe inhibition of *Candida albicans* and *Pseudomonas aeruginosa*, but has reported the action against

Bacillus subtilis, Staphylococcus aureus, Enterococcus faecalis, besides *Escherichia coli* and *Salmonella enteritidis*.

Miao et al. [24], reported identification of a new antimicrobial peptide isolated from kefir, capable of inhibiting *Escherichia coli*. This peptide is capable of increasing the permeability of the bacterial membranes inner and outer addition to being able to bind to genetic material of *Escherichia coli*.

It has also been described cicatrization and anti-inflammatory activities of kefir [25,26].

Another intestinal benefit promoted by Kefir is the improved lactose digestion, mainly by microbial β-galactosidase of kefir [7,27,28].

CONSIDERATIONS

Kefir is a microbial association of bacteria and yeast, which clearly characterizes a symbiotic relationship that reflects directly on the health of those who consume it. Many studies are still being carried out, not only about the beneficial effects intestinal as wellas the benefits in other systems and organic parameters. All studies ever conducted on the intestinal benefits indicate that this is the main gateway to enjoy the benefits of this food.

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