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The Effect of Yogurt on Human lifespan——Take the Digestive and Immune Systems as Example

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Abstract. At present, the effect of yogurt products on human beings is still in the exploration stage, and the current research on this topic is mainly focused on the improvement of intestinal flora and inflammation. With the further expansion of the yogurt market, it is becoming more and more necessary to explore the impact of yogurt on various parts of the human body. The main objective of this paper is to study the influence of yoghurt on human life. Starting from the influence of yoghurt on human immune function and digestive system, this paper analyzes the influence on life after the change of immune function and digestive system, so as to obtain the influence of regular consumption of yoghurt on life.

Keywords: yoghurt, immune system and digestive system, life span

1. Introduction

The yogurt market in China grew from 28.33 billion yuan to 267.98 billion yuan from 2014 to 2018, with an average annual growth rate of 24.5%. The market size is expected to exceed 250 billion yuan by 2025. With the further expansion of the yogurt market, it is becoming more and more necessary to explore the impact of yogurt on the human body in various aspects.

At present, the scientific community has discovered the main role and function of yogurt. First, it can break down lactose and protein in dairy products, so that the human intestinal system can absorb them more easily. Secondly, yogurt can promote the secretion of gastric juice, and can improve appetite, and finally has the role of strengthening digestion. Third, lactic acid bacteria can effectively reduce the production of some carcinogens, thus reducing the probability of cell carcinogenesis. Fourthly, it can inhibit the reproduction of mites in the intestine and weaken the toxins produced in the intestine. Fifth, it can reduce the cholesterol content in the human body, especially suitable for people with high blood lipids to drink. Sixth, both patients after surgery or with acute or chronic disease, have taken a large number of antibiotics during the recovery period, so that the intestinal flora has a great change, and even some beneficial intestinal bacteria are all killed, resulting in dysbiosis, but drinking yogurt and lactic acid bacteria can regulate the intestinal beneficial flora to the normal level. Therefore, moderate consumption of yogurt for the newly recovered patients with serious illness can not be replaced by other foods.

In today's world, research on the effects of yogurt on the human body is becoming more transparent. But research on the effects of yogurt on human longevity is rare, and that's where this article comes together.

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2. The effect of yogurt on life span

2.1. Immune system

Many studies have shown that yogurt can boost the body's immune function. In animal studies, gut-associated lymphoid tissues were stimulated by this surviving LAD, resulting in increased cytokine and antibody production (sIgA), and increased mitotic activity of lymphoid aggregation (PP) cells and splenocytes. Human studies showed that yogurt consumption increased cytokine and antibody production, phagocytic activity, T cell function, and natural killer cell activity. However, these effects were lost when yogurt was heated [1]. Experiments have shown that dead lactic acid bacteria are less immunocompetent than live bacteria.

After crossing the gastric acid barrier, lactic acid bacteria maintained their dominance in the intestinal flora through a series of reactions. Some scholars have studied the changes of immune activity and survival rate of mice infected with specific bacilli after feeding the diet mixed with yogurt to mice, and found that the immune ability and survival rate of mice were significantly improved after continuous feeding with LAB yogurt for four weeks. In addition, it was also found that yogurt products can promote the growth and reproduction of SIGA-producing cells, so that the level of sIgA in the body can be improved to a certain extent, which can make the body immune response to virus infection, so as to alleviate a series of physiological problems caused by it.

At present, the immunomodulatory effects of lactic acid bacteria found in the scientific community are basically similar, including activating immune cells such as macrophages through certain reactions, increasing the production of IgA in the human intestinal system, increasing the production of cytokines such as IL-1, IL-4, IL-5, IL-6, and T NF-α. Some studies have found that the immunomodulatory effect of L actobacillus is similar to that of Bif idobacter-i um. Recent studies have shown that L actobacillus casei can significantly enhance the immune function of human cells, promote the development of T h1 cells, induce the production of various cytokines, prevent IgE-mediated allergic reactions and other functions. Studies have also shown that L actobacillus casei can inhibit the development of diabetes [2].

Various physiological functions of yogurt are inseparable from lactic acid bacteria, and the storage of yogurt will affect the survival of lactic acid bacteria.

In order to explore the effects of yogurt consumption on the immune system, we will use mice to explore the effects of yogurt on the immune system. In the experiment, the mice that met the experimental conditions were randomly divided into four groups, with 10 mice in each group. The mice were continuously fed yogurt at 4 degrees Celsius stored for 0 days after expiring the factory date (control group), yogurt stored for 3 days after expiring the factory date (experimental group 1, E1), and yogurt stored for 6 days after expiring the factory date (experimental group 2, E2), yogurt (experimental group 3, E3) that was stored for 9 days after expiring the factory date in the same time, respectively, and the experiment was terminated on the ninth day. Lymphocyte transformation test, phagocytic function of peritoneal macrophages and intestinal fluid sIgA level were measured.

The results showed that, with the increase of the number of lactic acid bacteria, both the level of sIgA in intestinal fluid and the phagocytic activity of macrophages were significantly improved, so it can be inferred that the immunity of mice was indeed significantly improved.

The immunity of human body will gradually decline with aging. The decline of human immunity is mainly reflected in the decrease of cellular and humoral immune response activity and the gradual increase of inflammation in the body. Clinical studies have shown that the decline of immunity is one of the most intuitive factors affecting the life span of the elderly.

2.2. Digestive system

It is well known that there are many flora in the gut, which maintain balance and control each other, and jointly promote the health of the intestinal system. Under the condition of human health, the intestinal flora is dominated by beneficial bacteria such as bifidobacterium and Lactobacillus. However, this balance may be broken under pathological conditions or certain special periods. For

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example, long-term high-fat diet conditions are very likely to cause harmful changes in intestinal microbiota, which can lead to clinical reactions such as diarrhea and stomachache, or irreversible damage to intestinal health [3].

Studies have shown that drinking drinks containing probiotics can improve the composition of the gut microbiota and maintain a balanced and healthy gut microbiota. This is why the improvement of gut microbiota by lactic acid bacteria has become the focus of numerous studies in recent years. In order to explore how yoghurt will affect the number of beneficial bacteria in the gut, some studies have used animal experiments, using real-time fluorescence quantitative polymerase chain reaction method, gas chromatoc-mass spectrometry, Illumina high-throughput sequencing technology, to analyze the number and types of intestinal flora in mice, as well as the content of the main metabolites, short-chain fatty acids. Several experimental mice were selected and divided into experimental group and control group. The mice were first cultured in a suitable environment with low glucose and low fat for several weeks, and then cultured in high fat and high sugar for three weeks. During this period, the control mice were intragastric with normal saline, while the experimental mice were intragastric with yogurt. At the end of the incubation period, SYBR Green I dye method was used to quantitatively analyze the main beneficial bacteria in the intestinal tract of mice feces. Spss software was used for data analysis, and the test level $\alpha = 0.05$ was used for data analysis. The results showed that the number of beneficial bacteria in the intestinal tract of mice perfused with yogurt was significantly increased. For example, the mean value of Lactobacillus in the control group was 7.17±0.12a lg (copies/g), while the mean value of Lactobacillus in the yoghurt group was 9.12±0.12b lg (copies/g). Similarly, the mean test value of bifidobacterium in control mice was 7.01±0.07a lg (copies/g), while the test value of bifidobacterium in experimental mice was 8.80±0.05b lg (copies/g). In conclusion, yogurt products can effectively increase the number of beneficial bacteria in the intestinal tract.

In the case of dysregulation of intestinal beneficial bacteria, the human body is extremely prone to intestinal diseases. Taking tumors as an example, the annual incidence of digestive system tumors in Yantai City of China was 7567, accounting for 49.70% of the total number of cancer cases, and 7054 people died, accounting for 53.23% of the total number of cancer deaths. Liver cancer, gastric cancer and colorectal cancer accounted for the top three mortality rates. Statistical data show that digestive system tumors are more common in men, and more common in middle-aged and elderly people over 50 years old. After removing the cause of death of digestive system tumors, the average life expectancy can be increased by an astonishing 1.83 years. It can be seen that intestinal health plays an important role in human health and longevity [4].

3. Conclusion

By means of literature review and summary, combined with experimental data, this study concluded that proper consumption of yogurt can have positive effects on immune system and digestive system. Among them, yogurt can stimulate macrophages and other immune cells through some reactions after entering the human body, and improve immunity by increasing the secretion of antibodies and IL-1, IL-4, IL-5, IL-6, T NF-α and other substances. Animal experiments have been conducted to prove the above theory, that is, quantitative consumption of yogurt can improve immunity and achieve the purpose of increasing life span. Second, yogurt can also improve intestinal health by improving the proportion of beneficial bacteria in the gut. In order to test this conclusion, experiments were conducted. According to the analysis, the test level $\alpha = 0.05$ was used for data analysis. The results showed that the number of beneficial bacteria in the intestine of mice perfused with yogurt was significantly increased. For example, the mean value of Lactobacillus in the control group was 7.17±0.12a lg (copies/g), while the mean value of Lactobacillus in the yoghurt group was 9.12±0.12b lg (copies/g). Similarly, the mean test value of bifidobacterium in control mice was 7.01±0.07a lg (copies/g), while the test value of bifidobacterium in experimental mice was 8.80±0.05b lg (copies/g). These results suggest that yogurt products are indeed helpful to the intestinal system.

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