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IMPACT OF PROBIOTIC PREPARATIONS ON THE BODY (A Review of Literature Data)

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Annotatsiya. Ushbu maqola probiotiklarning organizmga ta'siri, immunitet shakllanishidagi roli, normal mikroflorani stimulyatsiya qilishi, ovqat hazm qilishdagi ahamiyati va ekologik jihatdan xavfsizligi haqidagi adabiyot manbalariga asoslangan.

Аннотация. Данная статья основана на литературных источниках, в которых представлена информация о воздействии пробиотиков на организм, роли пробиотиков в формировании иммунитета, стимуляции нормальной микрофлоры, а также их роли в переваривании пищи, об их экологичности.

Keywords: probiotic, antibiotic, microflora, immunity, safety

Relevance of the Topic. One of the leading problems in veterinary medicine is the poor quality, composition, and nutritional value of animal feed. In some cases, the presence of toxic plants, pathogenic microorganisms, or coarse feed components negatively affects the gastrointestinal tract, weakens the body's resistance, and leads to various intestinal diseases. In veterinary practice, different types of antibiotics are used to treat intestinal infections. However, some potent antibiotics not only target pathogenic microorganisms but also harm the beneficial microflora of the organism. Disruption of the normal microflora increases the likelihood of other types of intestinal diseases. In such situations, the use of probiotics proves to be an effective solution.

About Probiotics. The idea of restoring health through the use of probiotics was introduced by the Russian scientist, embryologist, immunologist, bacteriologist, and Nobel Prize laureate in Physiology or Medicine, Ilya Ilyich Mechnikov (1845–1916), who proposed that probiotics are live microorganisms that improve the composition of intestinal microflora. According to modern concepts, probiotics are live microorganisms that, when administered to humans or animals, have a beneficial effect on the host's physiological, biochemical, and immune responses by optimizing the composition of the beneficial intestinal microflora [4].

Probiotics exist in symbiosis with gastrointestinal microorganisms and produce enzymes that enhance the digestion and absorption of nutrients. As a result, they

contribute to improved animal productivity and simultaneously strengthen immune status against infectious diseases [1,8].

Today, in practical animal production, it is crucial not only to increase animal productivity and resistance and accelerate daily weight gain, but also to produce high-quality meat products that are safe for human health. To achieve this, various biologically active substances are widely used in the field of meat production around the world [5,2].

Probiotics not only help normalize the qualitative and quantitative composition of the intestinal microflora after the use of antibacterial agents, but in many cases, they may also serve as the only effective method for the treatment, prevention, and productivity enhancement of farm animals [3,7].

Probiotics are live microorganisms that, when administered in adequate amounts, can have a positive effect on the health of the organism [1,9].

The effect of Bacillus subtilis probiotic on enhancing specific and nonspecific immunity. B. subtilis produces ribosomally synthesized peptides, non-ribosomally synthesized peptides, and non-peptide substances that have a broad antimicrobial effect against a wide range of microbes, including Gram-positive and Gram-negative bacteria, viruses, and fungi [4].

B. subtilis bacteria is one of the most promising probiotics studied in recent decades. B. subtilis enhances protection against pathogens in the intestinal and respiratory systems by stimulating both nonspecific and specific immunity. Nonspecific immunity is defined as a defense system that acts equally against a variety of microorganisms. Specific immunity operates on the “lock and key” principle, producing particular cells or antibodies for a certain pathogen. Generally, nonspecific immunity is considered the first line of defense, while the body's defense system represents the second line [9].

The mechanisms by which B. subtilis activates macrophages are still being studied. One study showed that probiotic exopolysaccharides are responsible for this effect. Another important component of nonspecific immunity is the barrier function of the epithelium [1].

Stimulation of the growth of normal intestinal microflora. Normal microflora occupies various parts of the intestinal tract, starting from the oral cavity and ending in the large intestine. There are approximately 10 types of such bacteria in the human body, which outnumber the body’s own cells by tenfold. The overall metabolic activity of these bacteria exceeds that of the body's cells.

Its probiotic mechanisms include the synthesis of antimicrobial substances, enhancement of nonspecific and specific immunity, stimulation of the growth of normal intestinal microflora, and promotion of digestive enzyme secretion.

The main functions of the normal intestinal microflora are colonization and

protection against the growth of pathogenic microbes, stimulation of nonspecific and specific immunity, and digestion of food components. Clearly, these functions correspond to the roles discussed in this review regarding the probiotic B. subtilis [1,6].

Enhancement of digestion and motility. There are many diseases and conditions that cause digestive disorders. Probiotics containing B. subtilis increase the activity of enzymes involved in the digestive process. Studies have shown that these bacteria synthesize all the enzyme groups necessary for successful food breakdown: amylases, lipases, proteases, pectinases, and cellulases.

Some substances present in food can cause allergic reactions in sensitive organisms. However, enzymes produced as a result of B. subtilis activity can degrade these substances and reduce the allergenic potential of the food [1].

Safety. The safety of B. subtilis has been tested in three main areas: the presence of pathogenic genes, antibiotic resistance, and the accuracy of microbial identification.

According to experimental and clinical research data, the use of B. subtilis as a preservative probiotic is advisable in several cases. First of all, these probiotics can be used for intestinal infections, especially in cases of diarrhea, and for the prevention of respiratory tract infections during cold seasons. Probiotics are beneficial in preventing antibiotic-associated diarrhea when administered orally or parenterally. Probiotics based on B. subtilis are characterized by high efficacy and safety [1].

Conclusion. Probiotics are biologically beneficial; they help maintain the normal state of the intestinal microflora, enhance the activity of enzymes involved in digestion, participate in disease prevention as a prophylactic measure, improve the effectiveness of the immune system, and contribute to obtaining environmentally clean products.

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