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THE IMMUNE REGULATION MECHANISM OF ASTRAGALUS POLYSACCHARIDE AND ITS APPLICATION IN POULTRY INDUSTRY

Astragalus polysaccharide this is one of the main components of Chinese traditional medicine. However in the modern time astragalus it is a new type of feed additive that can replace antibiotics. It has the effects of improving animal immunity and promoting animal growth. Its application in animal husbandry production and feed processing has become more and more extensive. The immune regulation mechanism of astragalus polysaccharide and it's the application in poultry production is reviewed in this article.

Keywords: *astragalus polysaccharide, immune regulation, poultry, broiler chickens.*

Formulation of the problem. Traditionally antibiotics have been used as feed additives the feed industry for more than 40 years. They have played a positive role in preventing animal diseases, promoting animal growth, increasing the output of livestock products and improving the efficiency of the breeding industry. However seeking green alternatives to antibiotics has become a hot spot in today's research. Astragalus is the dried root of Astragalus mongolicus (Astragalus membranaceus) from the legume astragalus genus. It is one of the traditional Chinese medicines. Astragalus contains polysaccharides, proteins, alkaloids, amino acids, flavonoids, trace elements and many other active substances. Astragalus polysaccharides (APS) is extracted from astragalus, and is the main biologically active component in astragalus. Many studies have shown that APS has the functions of enhancing animal immunity [1] and promoting animal growth. That's why the present time astragalus has been

widely used in poultry production. This article mainly reviews the immunomodulatory mechanism of APS and its application effects in poultry production, and provides a theoretical basis for the application and research of APS in poultry breeding. The topicality of the research is very important, since, there are relatively few systematic studies and related mechanisms on the application of APS in animal production.

Analysis of recent research and publications. Many studies have shown that adding APS to poultry diets can effectively improve the work of internal organs, increase organ index, and promote the development of some organs [2,3,4,5]. In addition, Gao Xu et al. (2010) [6] studied the effects of different concentrations of APS on the immune function of mice, and the results showed that with the increase of APS concentration, the weight of mouse thymus and spleen increased significantly. Researcher Wang Junli et al. (2010) [7] found that the effect of APS on organs is affected by gender and growth stage.

The purpose and objectives of the research. In recent years, there have been more and more studies on APS, and some of the components and biological effects of APS have gradually been recognized by people. As a natural plant feed additive, APS can significantly promote the body's non-specific immunity and specific immunity, and improve the body's resistance without causing drug resistance and drug residues. However, there are relatively few systematic studies and related mechanisms on the application of APS in animal production.

Research results. Analyzing the influence of astragalus on the productivity of broiler chickens, we can point out the following. The feed additive, APS can significantly improve the morphology and structure of the small intestine, improve the digestive function of the small intestine, and at the same time adjust the balance of intestinal microbial colonies, thereby improving the intestinal function of animals and increasing the utilization of nutrients. Astragalus can significantly increase the height and width of the villi of the duodenum, jejunum and ileum of broilers, the thickness of the mucosa, the ratio of the chorionic glands, and the surface area of the villi [8]. The regulation of APS on the balance of intestinal microflora is reflected in

significantly increasing the number of Lactobacillus, Bacillus, and Bifidobacterium in the intestinal flora of broilers, and reducing the number of Escherichia coli [9], that is, increasing the number of beneficial bacteria. Inhibiting the growth of harmful bacteria, and promoting the digestion and absorption of intestinal nutrients. Researcher Gao Yang et al., (2011) [10] reported that the spleen coefficient was increased significantly, the number of cecal Escherichia coli was extremely reduced, and the number of lactobacilli and bifidobacteria increased significantly for the diet supplemented with APS. Researcher Xu Qinkun et al. (2011) [11] reported that APS can not only regulate the type and quantity of intestinal flora, but also is help to reduce the rate of diarrhea in animals.

Researcher Meng Xianrong et al. (2002) [12] found that APS can enhance the function of the antioxidant enzyme system in chickens, reduce the content of lipid peroxide, and reduce the damage of active oxygen free radicals to the body, thereby reducing the incidence and mortality of Marek's disease. Researcher Liu Baoguang et al. (2010) [13] believe that APS can induce the production of interferon in the animal body, which has a broad-spectrum anti-virus, promotes the formation of antibodies, and enhances the body’s immune function. Combined APS and interferon can reduce the incidence of more than 50-70%. Xie Kaichun et al. (2009) [14] reported that APS can induce endogenous interferons in animals to produce antiviral proteins after acting on cells to inhibit viral protein synthesis, thereby producing antiviral infections. Xie Lin et al. (2002) [15] reported that APS can induce endogenous interferon in animals, which produces antiviral protein after acting on cells and inhibits viral protein synthesis, thereby producing antiviral infection. Hu Yuanliang et al. (2003) [16] studied the inhibitory effect of APS on Newcastle Disease Virus I and Newcastle Disease Virus IV, and the inhibitory intensity increased with the increase of APS concentration.

Conclusions. 1.Future development direction will be determine the appropriate amount of APS to be added to the feed of different animals at different stages, and carry out APS nutrient active substance omics research.

2. Scientifically extract methods of APS components or biological

fermentation to increase the content of effective components environmentally friendly and healthy feed additive products from APS that replace antibiotics will be a new idea and direction for the development of animal husbandry.

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