

USING ASTRAGALUS POLYSACCHARIDE HERBAL SUPPLEMENT TO IMPROVE DISEASE RESISTANCE IN POULTRY

Qiao Yingying, postgraduate student.

Kyselov O. B., scientific adviser, PhD

Sumy National Agricultural University of Ukraine

Abstract. *This article reviews the immunomodulatory mechanism of action Astragalus polysaccharide and its effectiveness to preventing disease in of broiler chickens. 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. As a natural plant feed additive, Astragalus polysaccharide can significantly promote the body's non-specific immunity and specific immunity, and improve the body's resistance to disease without causing drug resistance and drug residues. However, there are relatively few systematic studies and related mechanisms on the application of Astragalus polysaccharide in n poultry production.*

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

Использование растительной добавки полисахарида Astragalus для повышения устойчивости к заболеваниям в птицеводстве

Аннотация. *В этой статье рассматривается иммуномодулирующий механизм действия полисахарида астрагала и его эффективность для предотвращения болезней цыплят-бройлеров. Полисахарид астрагала - это один из основных компонентов традиционной китайской медицины. Однако в наше время астрагал - это новый вид кормовой добавки, который может заменить антибиотики. Он улучшает иммунитет животных и способствует их росту. В качестве натуральной кормовой добавки полисахарид астрагала может значительно способствовать неспецифическому и специфическому иммунитету организма, а также улучшать сопротивляемость организма к болезням при этом не вызывая лекарственной зависимости и остатков препарата. Однако существует относительно мало систематических исследований и связанных с ним механизмов применения полисахарида астрагала в отрасли птицеводства.*

Ключевые слова: *полисахарид астрагала, иммунная регуляция, птицеводство, болезни, цыплята-бройлеры.*

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 and promoting animal growth[1]. 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, researchers Gao Xu and other 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[6]. Researcher Wang Junli and other found that the effect of APS on organs is affected by gender and growth stage[7].

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*, that is, increasing the number of beneficial bacteria[9]. Also inhibiting the growth of harmful bacteria, and promoting the digestion and

absorption of intestinal nutrients. Researcher Gao Yang and other 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[10]. Researcher Xu Qinkun and other 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[11].

Improve disease resistance of poultry. Researcher Meng Xianrong and other 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 [12]. Researcher Liu Baoguang and other 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 [13]. APS can prevent colds and reduce the incidence by more than 50%. Combined APS and interferon can reduce the incidence of more than 70%. Researcher Xie Kaichun and other 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 [14]. Researcher Xie Lin and other 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 [15]. Researcher Hu Yuanliang and other discovered 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 in diet [16].

Conclusions 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 researchers. Future development direction we can see:

(1) determine the appropriate amount of APS to be added to the feed of the different stages of growing;

(2) work out 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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