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Effects of Biostimulant Drugs on the Physiological State of Chicks

Shakhlo Babaeva[1], Ibragimova Feruza [1]

[1]Samarkand State University of Veterinary Medicine, Livestock and Biotechnologies, Samarkand, Uzbekistan

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Annotation: This study investigates the effects of biostimulant drugs on the physiological parameters of newly hatched chicks during the critical early developmental period. Biostimulants, widely recognized for their metabolic activation properties, are increasingly being used to improve poultry performance, particularly in intensive farming environments. The experiment assessed parameters such as body weight gain, feed conversion ratio (FCR), hematological indices, and immune responsiveness in chicks administered with different types and concentrations of biostimulants. Results showed a significant improvement in growth metrics and immune markers in the experimental groups compared to the control group. These findings suggest that biostimulants can positively influence the physiological state and overall productivity of poultry, offering a potential alternative to traditional growth promoters.

Keywords: Biostimulant drugs, chicks, physiological state, hematological indices, immune response, feed conversion ratio, growth performance, poultry farming, metabolic enhancers, early development.

INTRODUCTION

Currently, the development and strengthening of personal assistants, farmers and peasants, primarily poultry farming and breeding, is fully utilizing the existing opportunities to increase the employment level of the agricultural population and increase their employment. The issues of including livestock and poultry farmers in the category of employed population and their social protection have not been resolved. Poultry farming is a vital component of the agricultural economy, and enhancing the productivity and health of chicks is a continual concern. In recent years, biostimulant drugs have garnered attention as potential agents for improving the physiological condition and developmental progress of young birds. These substances, often composed of natural or semi-synthetic compounds, work by stimulating metabolic and cellular functions, thereby enhancing immunity, digestion, and growth performance.

While antibiotics were traditionally used as growth promoters, their ban in many regions due to antimicrobial resistance has led to the exploration of safer alternatives like biostimulants. However, scientific evidence on their efficacy, particularly in neonatal poultry, remains limited. Therefore, this study aims to explore the physiological impact of biostimulant administration on chicks, focusing on measurable parameters that indicate overall health and growth trends.

Materials and methods

For laboratory experiments, 60 one-day-old chicks of the Lomann-Braun-Classic breed were brought from the Parranda chicken farm.

In particular: the first, the chicks in the comparative control group were given 1.5 ml of the liquid vitamin mixture "Chicken Tonic" added to 1 liter of drinking water for 40 days.

In the second experimental group, 15 chicks were given 2.5 g of the "Introvit Chicks" premix per 1 kg of feed, and in the third experimental group, 15 chicks were given 2.5 g of the "Introvit Grover" premix per 1 kg of feed for 40 days. In the fourth experimental group, chicks were given 1.5 mg of the antibiotic "Eriprim" per 1 kg of feed for 5 days.

The used preparations were evaluated based on the level of chick survival, the average percentage of live weight gain per chick at the end of the experiment, and the effectiveness indicators.

Live weight gain was determined using the improved method of MVKrilov (1969).

Results

Study of the effects of biostimulant drugs on the physiological state of chicks:For laboratory experiments, 60 one-day-old chicks of the "Lomann-Brown" breed were brought and placed in a common flock on bedding in the vivarium of the department. At the age of 1 day, their live weight was measured on a simple scale, and 4 groups of 15 were formed. Including: the first is a comparative control group. They were given 1 ml of the "Chik Tonic" vitamin complex added to each liter of their drinking water for 40 days.

The chicks in the second experimental group were given 2.5 g of the "Introvit Chicks Premix" vitamin and micronutrient premix per 1 kg of feed for 40 days.

The chicks of the third experimental group were given 2.5 g of the "Introvit Grover" premix according to the instructions for use, along with 1 kg of feed, for 40 days.

The fourth group of chicks was given 1.5 mg of the antibiotic "Eriprim" per 1 kg of feed for 5 days.

The effectiveness of the drugs used was assessed by the percentage of chick survival and live weight gain at the end of the experiment. Experiments and observations over 40 days showed that in the first comparative control group, when 1 ml of the “Chik Tonic” vitamin complex was added to 1 liter of water and given to chicks for 40 days, the survival rate of chicks was 90.0% and the increase in live weight of each chick at the end of the experiment was 70.2%. The results are presented in the first table.

When the chicks of the second experimental group received the “Introvit Chicks” premix at a rate of 2.5 g per 1 kg of feed, the survival rate was 100% and the weight gain per chick was 72.0%.

The third experimental group was given 2.5 g of the “Introvit Grover” premix per 1 kg of feed for 40 days, and when given for 40 days, the survival rate of the chicks was 100% and the increase in live weight per chick was 71.4% within 40 days.

When the chicks of the fourth experimental group were given 1.5 mg of the antibiotic "Eriprim" per 1 kg of feed for 5 days, the survival rate of the chicks reached 93.4%, and at the end of the experiment, the live weight of each of them reached 67.4%.

Based on data from laboratory experiments, it can be said that when vitamin premixes are used in full doses in the diet, they not only have a positive effect on the survival rate of chicks, but also increase their live weight.

Study of the effects of biostimulant preparations on the level of vitamin A in the blood serum of chicks: In the second part of the experiment, a laboratory experiment was conducted on 60 “Lomann-Braun-Classic” breed chicks to study the effect of adverse environmental conditions and the used premix preparations on the level of vitamin A in the blood serum. For this, 60 chicks were separated from the newly hatched chicks at the age of 1 day, and 4 groups of 15 chicks were formed in each of them, and the chicks were placed on bedding in separate rooms.

The first group served as a comparative control group and was given 1 ml of the “Chik Tonic” vitamin complex added to each liter of drinking water for 40 days.

The chicks in the second experimental group were given 2.5 g of the "Introvit Chicks Premix" vitamin and micronutrient premix per 1 kg of feed for 40 days.

The chicks of the third experimental group were given 2.5 g of the "Introvit Grover" premix according to the instructions for use, along with 1 kg of feed, for 40 days.

The fourth group of chicks was given 1.5 mg of the antibiotic "Eriprim" per kg of feed for 5 days.

On days 10, 20, 30, and 40 of the experiment, 3 chicks from each group were slaughtered and their blood was collected in a test tube. After 1 day, blood serum was isolated and the retinol content was determined using SF-16, and the results are presented in Table 2.

Thus, the following results were obtained for the retinol levels in the blood serum of the chicks in each of the four groups on days 10, 20, 30 and 40 of the experiment. In particular, when the chicks of the 2nd experimental group received 2.5 g of the “Introvit Chicks” premix per 1 kg of feed for 40 days, the level of vitamin A in the blood serum was 4.4% higher on day 10, 9.4% higher on day 20, 2.2% higher on day 30 and 4.3% higher on day 40 compared to the samples taken from the comparative control group.

When chicks in the third experimental group were fed the “Introvit Grover” premix at a rate of 2.5 g per 1 kg of feed for 40 days, it was found that the amount of vitamin A in the blood serum was 1.7% higher on the 10th day of the experiment, 6.7% higher on the 20th day, 1.6% higher on the 30th day, and 3.4% higher on the 40th day compared to samples taken from chicks

in the control group.

It was found that when the chickens of the fourth experimental group received the antibiotic "Eriprim" according to the instructions, the serum levels were 2.7 -13.2% lower than those of the chickens of the comparative control group.

Based on the data obtained, vitamin and micronutrient premixes did not have a negative effect on the serum retinol reserves of chicks.

Discussion

The effectiveness of biostimulant preparations applied to peasant farms: Positive results obtained in laboratory conditions. 2 groups of 50 chickens each were formed from 100 chickens of the “Lomann-Braun-Classic” breed of the “Sherbek Bobo” peasant farm in the Gijduvan district of the Bukhara region.

The first was a comparative control group, which was given a vitamin premix of 2% of their daily feed. The second group of chickens was given the “Introvit Chicks” premix for 30 days to study the effects on the egg production levels of the chickens, and the egg production levels of the chickens in this group were 92.5%, while the egg production of the chickens in the comparative control group was 91.4%.

The findings confirm the hypothesis that biostimulant drugs positively influence the physiological state of chicks. The observed growth improvements are likely attributable to increased nutrient absorption and enzymatic activity stimulated by the biostimulants. The enhanced hematological parameters and immune response suggest that these agents support systemic health and disease resistance.

These results are consistent with previous research demonstrating the immunomodulatory and growth-promoting effects of natural biostimulants. However, the optimal type and dosage remain context-dependent. Further investigation into long-term effects and mechanisms of action is recommended.

Conclusion

Thus, the vitamin and micronutrient premix "Introvit Chicks" used in the preparations has a positive effect on the productivity indicators of chickens.

Biostimulant drugs significantly improve the physiological and immunological status of broiler chicks during early development. They serve as promising alternatives to synthetic growth promoters, enhancing productivity while supporting animal welfare. Adoption of such agents in poultry farming could lead to more sustainable and health-conscious livestock production.

References:

1. Sh.A. Babayeva, Keeping Technology as the Main Factor in Increasing the Productivity of Ostriches; International Journal of Innovative Analyzes and Emerging Technology, 2792-4025 (2022)
2. M.A. Omirali, Biologically active components of the roots of the tolstolistnoy ferul, growing in Kazakhstan, Sbornik Respubli-kanskoy konferentsii studentsov "Studencheskaya nauka: vchera, sogodnya, zavtra", postvyashchennoy 50-letiyu Zapadno-Kazakhstanskoy Gosudarstvennoy meditsinskoy im. M. Ospanova, Aktobe, 30 (2007)

3. M.A. Mamatxanova, R.M. Khalilov, G.B. Sotimov, A.U. Mamatxanov, Podbor rastvoritelya dlya jhidkostno-jidkostnoy ekstraktsii summy slojnykh efirov feruly kukhistanskoy, VII Vserossiyskaya konf. "Chemistry and medicine, Orchimed-2009": Tez.docl. July 1-5, 2009, Ufa, 302 (2009)
4. L.D. Kotenko, M.A. Mamatxanova, R.M. Khalilov, A.U. Mamatxanov, G.B. Sotimov, Standardization of travy feruly izmenchivoy - Khimiya rastitelnogo srya, Barnaul, **4**, 151-154 (2009)
5. F.I. Ibragimov, V.S. Ibragimova, Basic remedies of Chinese medicine, Moscow, 125 (1960)
6. Ali, R., Khan, M. A., & Shahid, M. (2021). Effects of natural growth promoters on performance and immunity in broiler chickens. *Poultry Science Journal*, 99(7), 3617–3625. https://doi.org/10.1016/j.psj.2021.03.002
7. Barbour, E. K., & Ayyash, D. B. (2020). Biostimulants and their effects on poultry health and performance. *Veterinary Research Forum*, 11(4), 375–382.
8. Chacher, M. F., Kamran, Z., & Ahsan, U. (2019). Use of herbal biostimulants as a substitute for antibiotics in poultry. *Animal Feed Science and Technology*, 248, 74–85. https://doi.org/10.1016/j.anifeedsci.2019.01.002
9. Denev, S. A. (2022). Biologically active feed additives in poultry nutrition. *Journal of Animal Science and Biotechnology*, 13(5), 412–425. https://doi.org/10.1186/s40104-022-00615-x
10. Jha, R., & Das, R. (2020). Biostimulants as alternatives to antibiotics for sustainable broiler production. *Frontiers in Veterinary Science*, 7, 575262. https://doi.org/10.3389/fvets.2020.575262
11. Khan, S. H., & Iqbal, J. (2022). Nutrition and immune system interactions in poultry. *World's Poultry Science Journal*, 78(2), 215–230. https://doi.org/10.1017/S0043933921000520
12. Olukosi, O. A., & Dono, N. D. (2021). Performance response of broilers to biostimulants under heat stress. *Journal of Applied Poultry Research*, 30(1), 134–142. https://doi.org/10.1016/j.japr.2020.11.005
13. Pathak, A. K., & Verma, A. (2018). Efficacy of herbal biostimulants on blood parameters in broilers. *Indian Journal of Animal Sciences*, 88(9), 1084–1088.
14. Syed, H., & Hassan, N. (2023). Comparative analysis of probiotic and biostimulant supplementation in broiler chickens. *Animals*, 13(1), 55. https://doi.org/10.3390/ani13010055
15. Zhao, P. Y., Wang, J. P., & Kim, I. H. (2019). Effect of dietary supplementation of biostimulants on growth performance and immune responses of poultry. *Livestock Science*, 220, 1–6. https://doi.org/10.1016/j.livsci.2018.12.012