AMERICAN JOURNAL OF BIOLOGY AND NATURAL SCIENCES
https://biojournals.us/index.php/AJBNS
ISSN: 2997-7185

Article

Veterinary Sanitary Examination of Broiler Chicken Meat

Odil Achilov
Doctor of Philosophy (PhD) in Veterinary Sciences, Associate Professor., Samarkand State University of Veterinary Medicine, Livestock and Biotechnologies

Abstract: The article presents the results of physicochemical analyses of carcass meat from broiler chickens whose diets were supplemented with probiotics. The results of laboratory studies assessing the compliance of the meat with state standard requirements, as well as its freshness, are also presented.

Keywords: Broiler Chickens, Probiotic, INNOPROVET™, MAXLAC, Poultry Meat, Veterinary and Sanitary Examination, Physicochemical Properties, Chemical Composition, Energy Value, Meat Quality

Citation: Achilov, O. Veterinary Sanitary Examination of Broiler Chicken Meat. American Journal of Biology and Natural Sciences 2026, 3(5), 261-265.

Received: 30th Mar 2026
Revised: 25th Apr 2026
Accepted: 15th May 2026
Published: 30th May 2026

Introduction

Beef Nowadays, in many countries around the world, considerable attention is being paid to broiler chicken production as a means of providing the population with high-quality meat and meat products. Broiler meat obtained within a short period and at relatively low production costs has attracted the attention of producers due to its dietary properties and easy digestibility. Numerous scientific studies are being conducted to effectively utilize the biological characteristics of poultry, taking into account the morpho functional changes occurring in their organisms, as well as to identify the regularities of physiological processes and the factors influencing them.

At the global level, despite extensive scientific research aimed at developing poultry production on an industrial basis to ensure food security, creating fast-growing breeds and crosses adapted to various changing environmental factors, organizing their management on a scientific basis, reducing the use of antibiotics to maintain meat quality, and increasing the biological potential and disease resistance of poultry through the addition of probiotics, feed additives, and other biologically active substances to their diets, the production of high-quality and environmentally safe products that meet the needs of the population remains one of the major challenges facing agricultural specialists today.

Degree of Problem Investigation

The production of environmentally safe food products is a pressing issue for the agro-industrial complex of our country. This primarily involves reducing the use of chemically hazardous preparations and replacing them with probiotics and other substances, including peptides, peptones, organic acids, oligosaccharides, and other agents that enhance the natural resistance of farm animals and poultry and reduce the activity of pathogenic and putrefactive bacteria.

Probiotics have important practical significance as regulators of the organism. They are capable of producing various enzymes, pectin's, and proteins, as well as broad-spectrum polypeptide antibiotics with pronounced antimicrobial activity against Gram-positive and Gram-negative bacteria. They also contribute to increasing the resistance of young animals to diseases by activating the nonspecific resistance of the organism [1],[2],[3].

The addition of natural components to poultry diets is widely used throughout the world. These components stimulate intensive growth and improve the health of poultry, contributing to improved production performance without harmful effects [4], [5]. According to the authors, the addition of vitamin and mineral supplements to the diets of growing poultry increased their average daily live weight by 12.7% and reduced feed consumption by 5.4%. It also improved the digestibility of major nutrients, with nitrogen, calcium, and phosphorus retention increasing by 2.8%, 7.3%, and 6.5%, respectively [9].

In recent years, newly developed feed additives have been widely used as components of animal and poultry diets. These preparations can improve growth and development indicators, increase competitiveness, and reduce production costs [6][7][8].

Therefore, we consider it necessary to conduct further studies to determine the possibility of using the carcass meat of broiler chickens receiving probiotics for food purposes.

The Aim of the Study

The aim of the study was to conduct a comparative analysis of the organoleptic and physicochemical properties and energy value of broiler chicken meat produced using diets supplemented with probiotics.

Materials and Methods

The research was conducted on 150 broiler chickens of the Ross 308 cross at the "Mironkul Agrozoovetservice Scientific and Practical Center" LLC in Samarkand District. Laboratory examinations were carried out at the Veterinary Sanitary Examination Laboratory of the Department of Veterinary Sanitary Examination at Samarkand State University of Veterinary Medicine, Livestock and Biotechnologies.

The experimental birds were divided into three groups. The control group was fed a complete balanced compound feed without any additional supplements. The first and second groups were considered experimental groups. In the first experimental group, the INNOPROVET™ probiotic suspension was added to the complete balanced compound feed and administered through drinking water at a dose of 0.5 mL/L during the starter period, 1 mL/L during the grower period, and 0.3 mL/L during the finisher period.

The second experimental group received the MAXLAC probiotic in addition to the farm diet at a dose of 30 g/L of drinking water.

The broiler chickens were kept under identical conditions in compliance with all optimal zoo hygienic requirements. Meat sampling, organoleptic examinations, and physicochemical analyses were performed in accordance with state standard requirements.

The primary data were entered and processed using Microsoft Excel 2010. Differences in live body weight between the groups were analyzed using analysis of variance (ANOVA) and the student's t-test.[9]

Results and Discussion

In our study, the percentage contents of moisture, protein, fat, and ash in the breast and thigh muscles of broiler chickens were determined. For the analysis, three breast muscle samples and three thigh muscle samples were collected from each group. The obtained results showed that the values in

the experimental and control groups were generally similar (Table 1). However, certain differences were observed in some parameters.

In particular, a slight decrease in the moisture content of the breast muscle tissue was observed in broiler chickens whose diets were supplemented with probiotics compared with the control group. In the first experimental group, the moisture content was 75.03 ± 0.16% ($p < 0.05$), which was 1.2% lower than that of the control group, while in the second experimental group it was 75.13 ± 0.27% ($p < 0.05$), or 1.1% lower.[10]

At the same time, the protein content was higher than in the control group, reaching 18.46 ± 0.42% ($p < 0.05$) in the first experimental group, which was 3.3% higher, and 18.35 ± 0.43% ($p < 0.05$) in the second experimental group, which was 2.7% higher. The fat content increased to 1.12 ± 0.25% ($p < 0.05$), or by 15.4%, and 1.06 ± 0.08% ($p < 0.05$), or by 9.2%, respectively. The ash content increased to 1.15 ± 0.07% ($p < 0.05$), or by 2.6%, and 1.14 ± 0.08% ($p < 0.05$), or by 1.7%, respectively.

Table 1. Chemical composition and energy value of the muscle tissue of broiler chickens (M ± m), n = 15

Parameters	Groups		
	Control, n=5	Experimental Group 1, n=5	Experimental Group 2, n=5
Breast muscle			
Moisture, %	75,96±0,17	75,03±0,16	75,13±0,27*
Protein, %	17,56±0,44	18,46±0,42	18,35±0,43
Fat, %	0,97±0,04	1,12±0,25*	1,06±0,08*
Ash, %	1,12±0,05	1,15±0,07	1,14±0,08
Energy value, kcal/100 g	80,17	83,92	82,94
Energy value, kJ/100 g	335,5	351,2	347,1
Thigh muscle			
Moisture, %	75,26±0,21	74,83±0,42	74,68±0,35
Protein, %	17,73±0,54	18,62±0,62	18,51±0,73
Fat, %	3,64±0,23	4,02±0,28	3,86±0,34
Ash, %	0,85±0,12	0,89±0,07	0,87±0,08
Energy value, kcal/100 g	103,6	110,6	108,7
Energy value, kJ/100 g	434,1	463,2	455,3

$p < 0,05$

The obtained results indicate that probiotic supplementation may improve the nutritional value of broiler chicken meat, particularly by increasing its protein and mineral content.

At the same time, the overall energy value of the breast muscle was also higher in the probiotic-supplemented groups compared with the control group. In the control group, the energy value of 100 g of breast muscle tissue was 80.17 kcal, whereas it was 83.92 kcal in the first experimental group and 82.94 kcal in the second experimental group. These results indicate increases in energy value of 4.7% and 3.5%, respectively, compared with the control group.[11][12][13]

The increase in energy value was primarily associated with the higher protein and fat contents of the muscle tissue. According to the results of our experiments, the moisture content of the thigh muscle tissue also slightly decreased compared with the control group. Specifically, this parameter was 74.83 ± 0.42% ($p < 0.05$), or 0.5% lower, in the first experimental group and 74.68 ± 0.35% ($p < 0.05$), or 0.7% lower, in the second experimental group.[14]

The protein content was higher than in the control group, increasing to 18.62 ± 0.62% ($p < 0.05$), or by 5.0%, in the first experimental group and to 18.51 ± 0.73% ($p < 0.05$), or by 4.3%, in the second experimental group. The fat content increased to 4.02 ± 0.28% ($p < 0.05$), or by 10.4%, and 3.86 ± 0.34% ($p < 0.05$), or by 6.0%, respectively. The ash content increased to 0.89 ± 0.07% ($p < 0.05$), or by 4.7%, and 0.87 ± 0.08% ($p < 0.05$), or by 2.3%, respectively.[15]

The energy value of the thigh muscles also increased considerably compared with the control group, which did not receive probiotic supplementation. In the control group, the energy value of 100 g of thigh muscle tissue was 103.6 kcal, whereas it was 110.6 kcal in the first experimental group and 108.7 kcal in the second experimental group. These results indicate increases in energy value of 6.8% and 4.9%, respectively, compared with the control group.

The increase in energy value was primarily associated with the increased contents of protein and fat in the muscle tissue.

Conclusion

The addition of probiotics to the diet had a positive effect on the chemical composition of broiler chicken meat. The protein content in the breast muscles was 18.46% in the first experimental group and 18.35% in the second experimental group, representing increases of 3.3% and 2.7%, respectively, compared with the control group. In the thigh muscles, the protein content was 5.0% and 4.3% higher, respectively, than in the control group.

The use of probiotics increased the energy value of broiler chicken meat. The energy value of the breast muscles was 83.92 kcal/100 g in the first experimental group and 82.94 kcal/100 g in the second experimental group, compared with 80.17 kcal/100 g in the control group. In the thigh muscles, these values were 110.6 and 108.7 kcal/100 g, respectively, representing increases of 6.8% and 4.9% compared with the control group.

The results of the study demonstrated that probiotic supplementation improved the nutritional value of broiler chicken meat. In particular, increases in protein, fat, and ash contents, as well as in the energy value of the meat, were observed. Thus, the use of INNOPROVET™ and MAXLAC probiotics may be an effective approach for improving the biological and nutritional value of broiler chicken meat.

REFERENCES

[1] N. B. Boysina and F. B. Ibragimov, "Veterinary and sanitary assessment and laboratory analysis of broiler chicken meat when using Aktivil-3," in *Proc. Republican Scientific and Practical Conference "Current Challenges in Ensuring Food Safety"*, Samarkand, Uzbekistan, 2023, pp. 14–17.

[2] D. V. Gavrilenko and A. G. Koshchaev, "Biotechnology for the production of a complex feed additive for poultry," *Collection of Scientific Papers of the Krasnodar Scientific Center for Animal Science and Veterinary Medicine*, vol. 8, no. 3, pp. 165–168, 2019.

[3] D. M. Galiev, "Sorption-action feed additives in the diets of broiler chickens," *Perm Agrarian Bulletin*, no. 1 (21), pp. 111–116, 2018.

[4] A. A. Grozina, "Composition of the gastrointestinal tract microflora in broiler chickens under the influence of probiotics and antibiotics," *Agricultural Biology*, no. 6, pp. 45–58, 2014.

[5] S. Gulyushin, N. Sadovnikova, and N. Ryabchik, "Effectiveness of the probiotic Agrimos in compound feeds for broilers," *Poultry Farming*, no. 5, pp. 11–12, 2010.

[6] N. Egorov and K. Kharlamov, "Effectiveness of the probiotic Teracid-S," *Poultry Farming*, no. 6, p. 56, 2007.

[7] T. Lenkova, T. Egorova, and I. Menshenin, "A new probiotic A2," *Poultry Farming*, no. 4, pp. 23–26, 2013.

[8] O. Novikova and A. Safonov, "Feed additives for the prevention of bacterial diseases in poultry farming," *Effective Animal Husbandry*, no. 4 (152), pp. 57–60, 2019.

[9] G. M. Uryupina, "The level of natural resistance of poultry under different feed additives," in *Increasing the Natural Resistance of Agricultural Poultry: Collection of Scientific Papers*, Moscow, Russia: Moscow Veterinary Academy, 2006, pp. 3–6.

[10] A. A. El-Ghamry, G. M. El-Mallh, and A. T. El-Yamny, "The effect of incorporating yeast culture, *Nigella sativa* seeds and fresh garlic in broiler diets on their performance," *Egyptian Poultry Science Journal*, vol. 22, pp. 445–459, 2002.

[11] E. T. Yeo and K. I. Kim, "Effect of feeding diets containing an antibiotic, a probiotic, or yucca extract on growth and intestinal urease activity in broiler chicks," *Poultry Science*, vol. 76, no. 2, pp. 381–385, 1997.

[12] J. E. Patterson and K. M. Burkholder, "Application of prebiotics and probiotics in poultry production," *Poultry Science*, vol. 82, no. 4, pp. 627–631, 2003.

[13] G. R. Gibson and R. Roberfroid, "Dietary modulation of the human colonic microbiota: Introducing the concept of prebiotics," *The Journal of Nutrition*, vol. 125, no. 6, pp. 1401–1412, 1995.

[14] S. H. Mountzouris, C. D. Tsirtsikos, E. Kalamara, S. Nitsch, G. Schatzmayr, and K. Fegeros, "Evaluation of the efficacy of a probiotic containing *Lactobacillus*, *Bifidobacterium*, *Enterococcus*, and *Pediococcus* strains in promoting broiler performance and modulating cecal microflora composition and metabolic activities," *Poultry Science*, vol. 86, no. 2, pp. 309–317, 2007.

[15] Y. J. Chen, K. S. Son, B. J. Min, J. H. Cho, O. S. Kwon, and I. H. Kim, "Effects of dietary probiotic on growth performance, nutrients digestibility, blood characteristics and fecal noxious gas content in growing-finishing pigs," *Asian-Australasian Journal of Animal Sciences*, vol. 18, no. 10, pp. 1464–1468, 2005.