



The effect of added the Iraqi probiotics to diet on some blood traits of Chinese ducks

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Abstract

This study was conducted in one of the private fields, from 6/12/2021 to 2/2/2022, to determine the effect of adding the Iraqi bio-enhancer to feed on some blood traits of Chinese ducks. A total of 75 unsexed one-day-old chicks of Chinese ducks, it was randomly distributed to 5 treatments with 3 replicates for each treatment (5 chicks for each replicate). The treatments were as follows; T1: control treatment, T2, T3, T4 and T5 were added the Iraqi probiotic at levels of 2.5, 5, 7.5 and 10 g/ kg of the basal diet, respectively. The results indicate a significant increase in glucose and LDL cholesterol albumin, globulin, total protein, calcium and phosphorous and a decrease in triglycerides, with no significant differences in HDL.

Keywords: Iraqi probiotics, ducklings, blood traits.

Introduction

Poultry of all kinds, it is the most economic investment for workers in the agricultural sector in the world, because it is fast growing and highly efficient at converting food, contributes significantly to the provision of important nutrients in human nutrition, such as high-quality animal proteins, fats, vitamins and minerals, by its production of meat and eggs (FAO, 2014). At the same time, poultry farming led to an increase in

economic activity in the world, as a result of those investments in poultry (Naji et al., 2011).

The continued use of antibiotics as growth stimulants and health protection for poultry of all kinds, the emergence of disease strains resistant to antibiotics, led to increased concern about the consequences of using these antibiotics, may have caused a decrease in the physical immunity of birds, with the development of pathogenic bacterial strains resistant to these

antibiotics, the accumulation of toxic waste and environmental conditions, risks while raising poultry and for all these reasons and others, antibiotics have been banned in many countries (Al-Gharawi, 2012).

Therefore, the attention of researchers turned towards the use of sound alternatives, without side effects or cumulative in bird food, such as medicinal herbs and vital enhancers, which are promising and effective alternatives to antibiotics (Bozkurt et al., 2014).

The inclusion of probiotics in poultry diets enhanced the productive performance and utilization of the feed protein and raised the physical immunity (Dhama, 2015). As a result of the positive effects of using probiotics in poultry feeds, low in protein, it is expected that the use of these reinforcers will reduce the negative effects, for the low percentage of protein in the diets of poultry, including ducks, which is the second most important species of poultry in the world, which is famous for its meat and eggs production, which contributes to the provision of nutritional needs, as well as by-products of livers and feathers, the global production of duck meat increased between 2000-2011, reaching 3.1 tons, Asian countries are in the first place in the production of duck meat, as they produce approximately 84% of the total global production (FAO, 2014).

China contributes 73% of the world's production of duck meat, while it constitutes about 83% of Asia's production of this type of waterfowl (Cherry and Morris, 2008). Its consumption has increased rapidly over the past decade as a food rich in unsaturated fatty acids and therefore preferred by consumers (Miffaf, 2013).

The current study aims to show the effect of the Iraqi probiotic on some blood traits of Chinese ducks.

Material and methods

This study was conducted in one of the private fields, from 6/12/2021 to 2/2/2022. The field experiment was included to study the effect of the Iraqi probiotics on some blood traits of Chinese ducks.

A total 75 unsexed, one day Chinese duck chicks were used, prepared from one of the hatcheries in Al-Qadisiyah Governorate, were randomly distributed to 4 treatments, and each treatment included 3 replicates, (5 chicks each replicate), the treatments were as follows:

T1: control treatment (without addition).

T2: added 2.5 gm Iraqi probiotics / kg diet.

T3: added 5.0 gm Iraqi probiotics / kg diet.

T4: added 7.5 gm Iraqi probiotics /kg diet.

T5: added 10.0 gm Iraqi probiotics /kg diet.

The chicks were reared on the floor in a special room for raising ducks, it provided all the conditions for breeding ducks. The hall has been divided into 12 pens with dimensions 200 cm x 125 cm per pen.

Feed materials that were used in the experiment, brought from local markets in Al-Muthanna Governorate. The birds were fed according to the requirements of the Chinese ducks for the starter and growth periods, as for the Iraqi probiotics, it was brought from Baghdad Governorate, it was added to the feed according to the levels of added experience.

Studied traits

Biochemical characteristics of blood:

Blood was collected from birds from the caudal tibial vein puncture (median tibial vein). The amount of blood required to measure biochemical characteristics was taken and placed in blood collection tubes with a volume of 5/ml until being placed in the centrifuge or other characteristics. (Al-Daraji et al., 2008).

Glucose (mg/100ml serum)
Followed by Barham and Trinder (1972).

Total cholesterol (mg/100ml serum) according to Richmond (1973).

using ready-made kits from the Stain bio laboratory (American).

Triglycerides (mg/100ml serum)

Total protein (g/100ml serum)
according to

The total protein concentration in serum was determined according to the method accompanying the kit produced by the Tunisian company Biomaghreb, which depends mainly on the specificity of the interaction of copper in the base medium with the peptide bonds of the protein, and the formation of the pink color, which gradually turns to the purple color of the biuret complex. The potassium and sodium tartrate present in the reagent prevents the precipitation of copper hydroxide, Potassium iodide prevents copper from being reduced automatically, the intensity of the color formed is proportional to the concentration of protein in the solution.

Total albumin (gm/100ml serum)
The method indicated by Doumas et al. (1971).

Total globulin (gm/100ml serum)

The statistical analysis

The statistical analysis of the studied traits was carried out according to a complete random design (CRD) using the ready-made statistical program and the significant differences between the means were compared using the Duncan multiple range test.

Results and Discussion

Table (1) shows the effect of using the Iraqi probiotic in the diet on some blood characteristics of ducks, as a significant decrease ($P \leq 0.05$) was observed in the concentration of glucose and cholesterol in all duck blood. The ones who consumed the diets to which the probiotic was added in proportions of 2.5, 5, 7.5, 10 g Iraqi probiotic / kg of fodder, compared with the groups of ducks belonging to the control treatment and fed on a diet free of the Iraqi probiotic, with the appearance of a significant decrease in the concentration of triglycerides, as the T5 treatment, which contains the Iraqi probiotic in the proportions of 10 grams of Iraqi probiotic/kg of feed, was more low, compared to the rest of the treatments, followed by T4 to which 7.5 g Iraqi probiotic was added/kg feed, then T3 to which was added 5g Iraqi probiotic/kg feed, and the last T2 was added to Iraqi probiotic 2.5g Iraqi probiotic/kg feed compared to the control treatment, with the emergence of significant differences between treatment T4 and T5 on the one hand and between treatments T2 and T3 and treatment T1 on the other hand in the concentration of triglycerides. The same table indicates a significant decrease in the concentration of low-density lipoproteins (LDL) in duck blood serum, took the

fodder to which the Iraqi probiotic was added in proportions of 10 grams of the Iraqi probiotic/kg feed compared to the rest of the treatments in the experiment, with the emergence of significant differences between the rest of the treatments in the experiment in this trait and the moral decline increased in the blood of birds with an increase in the proportion of the Iraqi probiotic in the diet compared to the control treatment T1 devoid of the Iraqi probiotic, while there were no significant differences ($P \leq 0.05$) in the concentration of high-density lipoproteins (HDL) between all treatments in the experiment.

The results of this study are in agreement with the findings of Khattab et al. (2021); Mohamed Ali (2005), noticed a significant decrease in blood sugar in birds fed the feed added to the Iraqi probiotic compared to the birds fed the feed free of the probiotic, explained this decrease, due to the addition of the bio-enhancer to the diet, which works on regulating blood sugar and makes it normal concentration under normal conditions or stress, while the result of this study was not in agreement with what Puspani et al. (2016) indicated when feeding male ducks on rations containing different levels of bacteria separated from the buffalo rumen fluid as a source of probiotic in the ration compared to the control treatment.

The result of this study is in agreement with Bidura et al. (2019); Khattab et al. (2021); Tallba et al (2007), who noticed a significant decrease in the concentration of cholesterol in the blood of birds fed on rations supplemented with the probiotic in the rations compared to the birds fed on the forage free of the

probiotic. This was reached by Abd El-Azeem, (2001); Tallba et al. (2007) to the same study results, when they noticed a significant decrease in the concentration of triglycerides in the concentration of the blood of birds fed with the forage added to the probiotic, compared to the control treatment, the results of the study were inconsistent with the findings of Puspani et al. (2016); Bidura et al (2019), did not find any significant differences in the concentration of sugar and triglycerides in the blood of birds fed on diets to which the probiotic was added compared to the blood

of birds fed on rations free of the probiotic. The same table also indicates a significant decrease ($P \leq 0.05$) in the high-density lipoproteins (HDL) in the blood of birds fed the Iraqi fodder, compared to the blood of birds fed on the Iraqi fodder free of the probiotic, this moral decline in this trait increases with the increase in the proportion of the Iraqi vital enhancer in the relationships, with no significant differences between all treatments in the experiment in the concentration of low-density lipoproteins (LDL).

Table (1) The effect of using the Iraqi probiotic in the diet on the concentrations of glucose, cholesterol, triglycerides, high-density lipoproteins (HDL) and low-density lipoproteins (LDL) in duck blood.

Treatments	Glucose (mg/ 100 ml)	Cholesterol (mg/ 100 ml)	Triglycerides (mg/ 100 ml)	LDL (mg/ 100 ml)	HDL (mg/ 100 ml)
T1	203.64b ± .87 0	283.98b ±0.76	144.24c± 0.21	220.18d ± 0.16	37.16 ± .15 0
T2	197.97a ±.08 0	278.43a ± 0.05	141.89b± 0.08	217.39c ±0.02	38.11 ± .099 0
T3	197.76a ± 0.09	278.25a±0.03	141.76b± 0.03	13.22bc ±0.03	38.55 ± .046 0
T4	197.31a ±.05 0	278.25a± 0,02	141.53b± 0.05	217.00b ±0.014	39.04 ± .049 0
T5	196.94a ±.07 0	277.97a ± .029 0	140.95a± 0.06	216.83a ± 0.037	39.53 ± .10 0

Sig.	*	*	*	*	N.S
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Table (2) shows the effect of using the Iraqi probiotic in the diet on the concentrations of albumin, globulin and total protein in the blood of ducks at the age of 8 weeks. The table indicates a significant increase ($P \leq 0.05$) in the concentration of albumin in the blood of birds fed with treatment T5 compared to treatments T3, T2 and T1, while there were no significant differences between T4 and T5 treatments. On the one hand, and between the two treatments T2 and T3 on the other hand, with a significant increase ($P \leq 0.05$) in the concentration of globulin in the blood of ducks fed on treatment T5 compared to treatments T1, T2 and T3, with no significant differences appearing between treatments T4 and T5 on the one hand and between treatments T2 and T3 on the other hand, and a significant decrease in treatment T1 compared to treatments T2 and T3. The same table also indicates a significant increase ($P \leq 0.05$) in the

concentration of total protein in the blood of ducks fed on treatment T5 compared to treatments T1, T2 and T3, with no significant differences appearing between treatments T4 and T5 on the one hand, and between treatments T1, T2 and T3 on the other hand in this trait, this finding is in agreement with that of Tallba et al. (2007); Abd El Azeem and others (2002), who noticed a significant increase in the concentration of albumin, globulin and total protein in the blood of ducks fed on rations, added probiotics compared to duck blood fed on probiotic-free feed, those who explained that this is due to the addition of the probiotic to the feed, which led to an increase in the activity and stimulation of digestive enzymes in the alimentary canal, increasing the nutritional value of the feed and increasing the readiness of the absorbed protein, and thus increasing its concentration in the blood of birds.

Table (2) The effect of using the Iraqi probiotic in the diet on the concentrations of albumin, globulin and total protein in the blood of ducks at the age of 8 weeks.

Treatments	Albumin (mg/ 100 ml)	Globulin (mg/ 100 ml)	Total protein (mg/ 100 ml)
T1	0 .011± 2.39c	0 .012 ± 2.196c	0 .023 ± 4.58b
T2	0 .015 ± 2.47b	0 .020 ± 2.25b	0 .020 ± 4.72b
T3	0 .014 ± 2.50b	0 .012 ± 2.29b	0 .026 ± 4.80b
T4	0 .014 ± 2.60a	0 .011 ± 2.35a	0.023 ± 4.95a
T5	0 .020 ± 2.64a	0 .011 ± 2.37a	0 .031 ± 5.01a
Sig.	*	*	*

Table (3) shows the effect of using the Iraqi probiotic in the diet on the

concentration of phosphorous and calcium in the blood of ducks at the age of 8 weeks. The table indicates the appearance of a significant increase ($P \leq 0.05$) in the phosphorous concentration in the blood of ducks fed on the feed added to the Iraqi probiotic by 10 g of Iraqi probiotic/kg feed T5 compared to the treatments T1, T2 and T3, differed significantly ($P \leq 0.05$) in the phosphorous concentration, with no significant differences between treatments T4 and T5 in this trait. The table also indicates the appearance of a significant increase ($P \leq 0.05$) in the calcium concentration in the blood of ducks fed on the feed added to the Iraqi probiotic by 10g of Iraqi probiotic/kg of feed T5 compared to the treatments T1 and T2, while there were no significant differences in calcium concentration between treatments T3, T4 and T5 on the one hand, and between treatments T1 and T2 on the other hand. This result was in agreement with what was noted by Al-Khafaji (2008); Naji and others (2011), who noted that adding the Iraqi bio-enhancer to the diets and feeding

birds on them, led to an increase in the concentration of minerals in the blood of birds compared to the birds fed the forage free of the probiotic, they explained that it is due to the addition of the biological enhancer to the diets, led to an increase in the rate of digestion and an increase in the readiness of nutrients, including minerals such as phosphorous and calcium, it has been observed that many beneficial bacteria and yeasts used in the bio-booster, secretes digestive enzymes that enhance the effect of digestive enzymes, which was naturally secreted inside the digestive canal, as well as it disengages some of the mineral elements associated with grains such as phosphorous, of which only a third is available or available to the bird and when the probiotic is added to the feed. The available makes of these minerals a greater quantity, its absorption in the alimentary canal is greater, and then its concentration in the blood of birds increases.

Table (3) The effect of using the Iraqi probiotic in the diet on the concentration of phosphorous and calcium in the blood of ducks at the age of 8 weeks.

Treatments	Phosphorus (mg/ 100 ml)	Calcium (mg/ 100 ml)
T1	6.49c ± .018 0	12.82b ± 0.17
T2	6.47c ± .026 0	13.06ab ± 0.020
T3	6.60b ± .017 0	13.22a±0.017
T4	6.67a ± .014 0	13.34a ± 0.014

T5	6.67a ± .014 0	13.47a ±0.032
Sig.	*	*

With the increase in studies on the importance of using probiotics in improving the health status and productive performance of domestic birds, by the great role it plays in maintaining the microbial balance within the gut. The peculiarity of his work can be traced back to the peculiarity of his microbiology and adhesion, scientific research has indicated that the microorganisms used in the probiotic, it has a broad spectrum effect against pathogenic and spore-forming bacteria, this is through its implementation of twomechanisms, namely, antagonists activity and competitive exclusion (Speck, 1976).

References

Abd El-Azeem, F., A. Faten, A. Ibrahim and G.M.A. Nematallah. 2001. Growth performance and some blood parameters of growing Japanese quail as influenced by dietary different protein levels and microbial probiotcis supplementation. Egypt. Poult. Sci.,21: 465-489.

Abd-El-Azeem, 2002. Digestion,neomycin and yeast supplementation in broiler diets under Egyptian summer condition Egypt.poultry.sci., 22:235-257.

Al-Gharawi, J.K.M. 2012. Effect of injecting hatching eggs with biostimulants on some productive, immunological, histological and microbial traits of broilers.

Conclusion

It is concluded that the Iraqi probiotic, especially at high levels, led to a significant improvement in all studied blood traits, which indicates an improvement in the health status of Chinese ducks.

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PhD thesis. faculty of Agriculture. Baghdad University.

Al-Khafaji, Z.M. 2008. Therapeutic Biology (for life). Ministry of Higher Education and Scientific Research - University of Baghdad.

Baeza, E. (2006). Effect of genotype, age and nutrition on intramuscular lipids and meat quality. Tainan (Taiwan, R. O. C) November, 7-10.

Baeza, E., DESSAY, C., Wacrenier, N., Marcha, G. and Listrat, A. 2002 Effect of selection for improved body weight and composition on muscle and meat characteristics in muscovy duck. Br. Poult. Sci., 43: 560-568.

Bidura, G.N.G., N.W. Siti and B.G. Partama. 2019. Effect of Probiotic,

Saccharomyces spp.Kb-5 and Kb-8,in diets on growth performance and cholesterol levels in ducks. S. Afr. J. Anim. Sci., 49: 219-223.

Bozkurt, M., N. Aysul, K. Küçükyılmaz, S. Aypak, G. Ege, A.U. Çatli, H. Akşit, F. Çöven, K. Seyrek, M. Çinar. 2014. Efficacy of in-feed preparations of an anticoccidial, multienzyme, prebiotic, probiotic, and herbal essential oil mixture in healthy and Eimeria spp.-infected broilers. Poult. Sci. 93 :389-399.

Cherry, P. & Morris, T. R. 2008. Domestic duck production: science and practice. CABI.

Dhama, K. , S.K. Latheef, S. Mani, H.A. Samad, K. Karthik, R. Tiwari, R.U. Khan, M. Alagawany, M.R. Farag, G.M. Alam, V. Laudadio, V. Tufarelli. 2015 .Multiple beneficial applications and modes of action of herbs in poultry health and production-a review. Int. J. Pharmacol., 11: 152-176.

FAO (Food & Agriculture Organization of the United Nations). 2014. Global Poultry Trends 2013: Record World Duck Meat Production in 2013, ISSN 0251-1959.

Khattab, A.A., M.F.M. El Basuini, I.T. El-Ratel, and S.F. Foudax. 2021. Dietary probiotics as a strategy for improving growth performance, intestinal efficacy, immunity, and antioxidant capacity of white Pekin ducks fed with different levels of CP. Poultry Science 100:1898-1906.

MIFFAF, (Ministry for Food, Agriculture, Forestry). (2013). Primary Statistics of food, Agriculture, Forestry and Fisheries, Sejong, Korea.

Mohamed, M.A. 2005. Studies on physiological and immunological traits in quail. thesis of doctor of philosophy Cairo university-Egypt.

Naji, S.A., M.A. and R.A. Mirza. 2011. Manufacture of a local synbiotic mixture and its use as an early feed in improving the productive traits of broiler flocks. The ingenuity of the invention. The Central Agency for Standardization and Quality Control. The Ministry of Planning.

Puspani, E., D.P. Candrawati and I.G. Bidura. 2016. Implementation of probiotics cellulolytic B-7 bacteria (isolation from buffalo rumen) into ration on the performance, abdominal fat and serum cholesterol of duck. Int. J. Curr. Microbiol. App. Sci., 5(11): 432-441.

Speck ,M. L. 1976. Interaction among Lactobacilli and man. J. Dairy Sci., 55:1019-1022.

Tallba, A.A.H., A.Z. Wagdy and S.A.M. Shabaan. 2007. Improvement of Fayoumi Laying hens performance under hot climate conditions. 1- Probiotic and prebiotic . Egypt Poultry Sci., 27(1): 1-20.

