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Article

The impact of including Iraqi probiotics in Chinese ducks' diets on some of their productive features

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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 productive traits of Chinese ducks. Seventy-five unsexed one-day-old Chinese duck chicks were randomly distributed to 5 treatments with 3 replicates (5 chicks for each replicate). The treatments were as follows: T1: control treatment, T2, T3, T4, and T5 were added to the Iraqi probiotic at 2.5, 5, 7.5, and 10 g/ kg of the basal diet. The results indicated a significant improvement ($P \leq 0.05$) in the Iraqi probiotic treatments in the average body weight, weight gain, feed intake and feed conversion factor compared to the control treatment during weeks 4 and 8 of the birds' life. T5 showed a significant improvement ($P \leq 0.05$) in total weight gain, cumulative feed consumption and total feed conversion factor compared to the rest of the treatments.

Keywords: Iraqi probiotics, productive traits, Chinese ducks.

Introduction

The antibiotics growth was used as stimulants and health protection for poultry; with the increasing use of antibiotics, the physical immunity of birds has been reduced, as well as the development of pathogenic bacterial strains that are resistant to these antibiotics with the accumulation of harmful residues thereof, led to its attendance in many countries[1,2].

Therefore, the researchers directed using safe alternatives without side effects, such as medicinal herbs and vital enhancers in poultry diets, as alternatives to antibiotics[3].

Including probiotics in poultry diets enhances productivity and utilization of nutrients, including the protein in the feed, which increases physical immunity[4].

As a result of the positive effects of using probiotics in poultry diets, it reduces the adverse effects of low protein in poultry diets, including ducks, which are one of the most critical domestic birds in the world and famous for their meat production, contribute to the provision of nutritional needs, as well as by-products of liver and feathers, Asian countries rank first in the production of duck meat, it produces more than 84% of global production[5].

As for Iraq, ducks are one of the water birds found in abundance in the southern regions, famous for their meat and eggs; duck meat represents 6% of the meat production.

The main types of ducks in Iraq were used to produce meat and eggs; ducks were characterized by good growth, high fattening capacity, and high resistance to many diseases. Duck meat is red, and the level of fat in it is high[7].
The current study aims to determine the effect of the Iraqi probiotics on some productive traits of Chinese ducks.

Materials 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 productive traits of Chinese ducks.
A total of 75 unsexed, one-day Chinese duck chicks were used, prepared from one of the incubators in Al-Qadisiyah Governorate, were randomly distributed to 4 treatments, and each therapy 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 particular room for raising ducks; it provided all the conditions for breeding ducks. The hall has been divided into 12 pens with dimensions of 200 cm x 125 cm per pen.
Feed materials used in the experiment were 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, they were brought from Baghdad Governorate and added to the feed according to the levels of added experience.
Studied traits

Body weight (BW), Weight gain (WG), Feed intake (FI) and Feed conversion (FC).

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[8], and the significant differences between the means were compared using the Duncan[9] multiple range test.

Results

The effect of Iraqi probiotics on a diet on the average body weight of Chinese was studied, increasing the increase in all Iraqi probiotic treatments compared to T1 at the fourth week of bird life. At the end of the experiment (8 weeks), T5 showed superiority compared to the other experimental treatments; an increase was observed with the increase in the proportion of adding the Iraqi bio-enhancer, which confirms that the Iraqi probiotics have a positive effect on improving the body weight rate.

Treatment	Age		
	1 day	4 weeks	8 weeks
T1	41.8	625 c	1318 d
T2	42.1	690 b	1410 c
T3	42.3	720 ab	1472 b
T4	42.5	736 a	1535 a
T5	42.7	745 a	1565 a
Sig.	NS	0.05	0.05

Table 1: The effect of different levels of the Iraqi probiotic on diet on average body weight of Chinese ducks.

There was a significant increase in all Iraqi probiotic treatments over to T1, no significant differences between T3, T4, and T5, and the coefficients T2 and T3. As for the eighth week of the birds' lives, T5 outperformed the others.

Treatment	Age		Total
	4 weeks	8 weeks	
T1	583.2 c	693 d	1276.2 e
T2	647.9 b	720 c	1367.9 d
T3	677.7 ab	752 b	1429.7 c
T4	693.5 a	799 a	1492.5 b
T5	702.3 a	820 a	1522.3 a
Sig.	0.05	0.05	0.05

Table 2: The effect of different levels of Iraqi probiotics on diet on weight gain of Chinese ducks.

The significant increase in body weight and weight gain in all Iraqi probiotic treatments (Table 3) may be attributed to the effect of beneficial microorganisms in the probiotic. This enhances the secretion of enzymes in the gastrointestinal tract, increases villi height and crypt depth, increases the surface area of the alimentary canal, and increases the efficiency of digestion and absorption of the feed eaten, positively affecting growth and weight gain. Thus, the final weight of the ducks rises.

The effect of adding the Iraqi probiotic to feed on the feed intake rate of Chinese ducks. High mean at the fourth week in T3, T4 and T5 over to T1 and T2, but at the eighth week of age, the treatments T4 and T5 increased, as for the cumulative feed intake rate, T5.

Treatment	Age		Total
	4 weeks	8 weeks	
T1	1755.43 a	3069.99 b	4828.43 c
T2	1665.10 b	2944.8 c	4609.9 e
T3	1714.58 a	3045.6 b	4760.18 d
T4	1726.81 a	3211.98 a	4938.79 b
T5	1734.68 a	3271.8 a	5006.48 a
Sig.	0.05	0.05	0.05

Table 3: The effect of the Iraqi probiotic to diet on the feed intake rate of Chinese ducks.

The significant increase in FI in favor of the Iraqi probiotic treatments at high levels (10 g/kg of diet) is attributed to the rise in beneficial microorganisms, which increases the secretion of organic acids, lowers the pH, which gives a desirable flavor and palatability to the feed, as well as an improvement in digestion and absorption, which increases feed consumption. Alternatively, the reason may be due to the coefficient between the capacity to increase the surface area of the alimentary canal and to accommodate larger quantities of feed.

Table 4 shows the effect of the Iraqi probiotic on the feed conversion factor of Chinese ducks studied (T5); at the fourth and eighth week of life of the birds, significant improvement (P≤0.05) in the treatments T3, T4 and T5, which did not differ significantly between them, which did not differ significantly between them. The moral improvement (P≤0.05) favored all Iraqi bio-promoter treatments at the general average of the feed conversion factor.

Treatment	Age		Total
	4 weeks	8 weeks	
T1	3.01 c	4.43 c	3.78 c
T2	2.57 b	4.09 b	3.37 b
T3	2.53 ab	4.05 a	3.32 ab
T4	2.49 a	4.02 ab	3.30 a
T5	2.47 a	3.99 a	3.28 a
Sig.	0.05	0.05	0.05

Table 4: The effect of different levels of the Iraqi probiotic on the feed conversion factor of Chinese ducks.

Discussion

[10];[11], they noticed a significant increase in body weight and weight gain in birds when using the probiotic; it was explained by the rise in the secretion and activity of some enzymes, such as lipase, amylase and protease, which improved the efficiency of digestion of the feed eaten, thus, a significant improvement in BW and WG. Moreover, [12] indicated that the use of the probiotic in the diet of birds increases the surface area of the alimentary canal as a result of the height of the villi and the depth of the crypts, thus increasing the rate of digestion and increasing the absorption of the alimentary canal for larger quantities of feed, led to an increase in feed consumption. These results agreed with [13 ‘ 11], who noticed a significant improvement in the feed conversion factor in birds that ate food fortified with the probiotic compared to birds fed non-probiotic feed; it may be due to an increase in beneficial microorganisms, increased activity and secretion of digestive enzymes, which improved the protection of the digestibility of the ingested feed, reflected in the food conversion factor[14].

Conclusions

The results indicated a significant improvement (P≤0.05) in the Iraqi probiotic treatments in the average body weight, weight gain, feed intake and feed conversion factor compared to the control treatment during weeks 4 and 8 of the birds' life. T5 showed a significant improvement (P≤0.05) in total weight gain, cumulative feed consumption and total feed conversion factor compared to the rest of the treatments.

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