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THE EFFECT OF EARLY FEEDING IN THE HATCHING MACHINE ON THE PHYSIOLOGICAL TRAITS OF BROILERS

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Abstract

The access of early chicks to food and water is of great importance in enhancing future production performance. The current study was conducted to find out the effect of early feeding in the hatching machine on the physiological traits of broilers. The experiment was designed using a completely randomized design (CRD) and 300 broiler chicks of the type Ross 308 were used, chicks were distributed on 5 treatments for each treatment 3 replicates (20 birds for each replicate).The treatments were: T1: the control was given the starter ration and water directly upon reaching the breeding hall, T2, T3: the introduction of the starter diet and water was delayed for 4, 8 hours, respectively, after reaching the breeding hall, T4: early feeding inside the hatching machine with a pre-starter diet , T5: Early feeding in the hatcher after the chicks leave the hatching machine directly with a pre-starter diet . It showed the following results: Significantly excelled in blood glucose ($p<0.05$) in favor of T4 treatment compared with T1 and T3. There were no significant differences in the percentage of total protein, albumin and globulin among all experimental treatments. A significant decrease in the level of uric acid in the blood ($p<0.01$) for treatments T2 and T4 compared to treatments T1 and T5. A significant decrease in triglycerides ($p<0.01$) for treatment T4 compared with T1, T2 and T3, with a significant decrease for treatment T5 compared to T1 and T2. Significant improvement in cholesterol ($p<0.01$) in favor of treatment T4 compared with all other experimental treatments. There are no significant differences in measuring the bird's body temperature in the third, fourth and fifth weeks in the cold and hot times of the day.We recommend, through this study, the necessity of using early feeding inside the hatching machine for its importance in improving some physiological treatments of broilers.

Keywords: early feeding, hatching machine, physiological traits

Introduction

The increase in the demand for poultry meat more than any other animal product as a result of the continuous increase in the world population has led to an increased interest in the poultry sector to provide meat and eggs (Jha et al., 2019), Therefore, the great importance of the poultry industry emerged, which prompted many researchers to find new methods, which in turn lead to increasing production and improving the efficiency of birds. Among these methods, which may be the most important, is Early Feeding, because it has a positive impact on improving performance and relieving stress on chicks as a result of hatching and administrative processes. Others, such as counting, sorting, sexing, vaccination, and transportation to breeding halls, require a long time to reach feed and water, It may take more than 24 hours, which causes the muscle protein to be destroyed for energy, where early nutrition during the first period provides carbohydrates, vitamins, and minerals, which in turn reduces the process of protein breakdown and works mainly to raise immunity (Bello et al., 2013). It improves the process of digestion and absorption and

stimulates the work of the immune system, which in turn reduces the mortality rate (Bakhit, 2016).Early feeding provides the energy needed to meet the needs of the body, allowing the body to benefit from the great functional value of the nutrients inside the yolk sac, which is the transfer of maternal immunity to the body of the chicks and the development of the cell membrane through the absorption of triglycerides (Van and others, 2020).The exposure of newly hatched chicks to dehydration is due to the increase in the speed of consumption of the yolk sac, which means an increase in the decomposition of fat, which leads to an increase in the amount of water resulting from the decomposition of fat, and it is called metabolic water (Al-Fayyad et al., 2011).Accordingly, this study was conducted, which aims to study the effect of early feeding in hatcheries using pre-starter feed on the physiological performance of broilers.

Materials and methods:

The study was conducted in Al-Anwar commercial hatchery in Babylon province and then in the poultry field, affiliated to the Department of Animal Production at the College of Agriculture ,University of Kufa for the period from September 2 to October 6, 2021 for a period of 5 weeks. The effect of early feeding after hatching using the pre-starter chick care type and at different periods on the physiological performance of broiler chicks, and the experiment included 300 unsexed broiler chicks from Ross308 crosses of one day age, prepared from the lights hatcher, Feed and water were provided to the chicks of the fourth treatment, by 60 chicks inside the hatching machine, by placing a basket at the bottom of the basket in which the eggs were placed, containing the feed (pre-starter) and water so that the hatched bird would fall directly and find feed and water in front of it to start feeding and the fifth treatment by 60 chicks fed with the same diet inside the hatcher after chicks out of the hatching machine ,The chicks were divided according to the transactions, at an average of 60 chicks for each treatment, and with three replicates (each replicate 20 chicks), the division was made according to the following treatments:

T1: The control provided her with a starter diet and water directly upon reaching the breeding hall.

T2: The introduction of the starter diet and water is delayed for 4 hours after reaching the breeding hall

T3: The introduction of the starter diet and water is delayed for 8 hours after reaching the breeding hall

T4: Early feeding inside the hatching machine with a pre-starter diet (chick care)

T5: Early feeding of the hatcher after the chicks leave the hatching machine directly using the pre-starter diet (chick care)

Chicks were randomly distributed to the replicates, where each replica was placed in a cage, and the cages were cut with wire mesh screens B.R.C. The area of each cage is 3 m^2,Chicks were weighed upon arrival at the breeding hall. The average chick weight was 40.63, 41.3, 41.04, 44.75, 45.64 for the treatments T4, T3, T2, T1 and T5, respectively. The feeds were raised for 2 hours for the T4 and T5 treatments before being weighed for the purpose of emptying the alimentary canal of the feed.

Table (1) the percentage of protein and energy in the diets used in the experiment

Feed material	starter diet% days 10-1	growth diet% 24-11 days	% final diet days 35-25
Energy represented Kcol/Kg	3015	3081	3210
crude protein %	23.11	21.51	19.58
Energy/crude protein ratio	130.4	143.2	163.9

Results and discussion

The effect of early feeding in the hatching machine on blood biochemical traits

Table 2 that there was a significant increase for treatment T4 in blood glucose at the level of probability ($p<0.05$) compared to the control treatment T1 and T3. While non-significant differences were recorded between treatments T1, T2, T3 and T5, as well as between treatments T2, T4 and T5. The significant rise in the glucose concentration within the normal levels is one of the important things to provide the necessary energy that the bird needs to carry out the various activities of the body, where glucose is a major source of energy in the brain and nervous system of the bird (Almayali and Alshukri, 2021).While non-significant differences were recorded in the percentage of albumin, protein, and globulin among all the experimental treatments, this may indicate that birds are not exposed to stress in the process of releasing energy and building the body, where the percentage of protein decreases and the percentage of uric acid rises when exposed to chronic or acute stress, and a significant decrease in the percentage of uric acid was found. Uric for the two treatments T2 and T4 at the level of probability ($p<0.01$) compared with the control treatment T1 and T5 and no significant differences were recorded between treatments T1, T3, and T5 and between treatments T2, T3, and T4.These results were in line with what was mentioned by Mustafa (2021, who indicated that the delay in providing feed and water for a period of 24.12 hours to newly hatched chicks led to a significant increase in the level of uric acid in the blood compared to chicks that arrived early to food and explain the high uric acid in the blood of the chicks that arrived at food late, it may be caused by the waste of protein, considering that uric acid is a function that expresses the quality of the protein, and its high indicates the low efficiency of the protein used ,The results indicated that there was a significant decrease for treatment T4 in the percentage of triglycerides in the blood at the level of probability ($p<0.01$) compared with the control treatment T1, T2 and T3, while it recorded a significant decrease for treatment T5 compared with the control treatment T1 and T2, and non-significant differences were recorded between the two treatments T1 and T2 The same is true between treatmentsT2 and T3, and between T3 and T5, and between T4 and T5.As for the level of cholesterol in the blood, a significant improvement was observed for treatment T4 at the level of probability ($p<0.01$) compared with all other experimental treatments, while no significant differences were observed between treatments T1, T2, T3 and T5. The decrease in the level of cholesterol and triglycerides in T4 treated birds ,It may be due to the role of early feeding, which in turn affects the diet of chicks after hatching (Pourrezaa et al., 2012) or it may be due to the high intestinal flora in the intestine, which reduces

the rate of cholesterol absorption, due to the termination of its association with bile salts, which reduces its absorption in the intestine. outside the body (Ali et al., 2019).

Table (2) The effect of early feeding in the hatching machine on the internal biochemical blood traits of broilers.

Treatments	cholesterol mg/100ml blood serum	Triglyceride mg/100 ml blood serum	uric acid mg/100 ml blood serum	Globulin g/100 ml blood serum	albums g/100ml blood serum	total protein g/100ml blood serum	glucose mg/100 ml blood serum
T1	a 4.89±154.33	a 4.041±110.00	a 0.29±4.26	0.22±2.2	0.04±1.06	0.27±3.26	b 2.31±236.00(^{2})
T2	a 6.44±156.33	ab 4.67±107.67	b 0.10±3.56	0.38±1.86	0.06±1.00	0.24±2.86	ab 5.03±250.00
T3	a 3.76±152.33	bc 1.01±94.17	b 0.14±3.50	0.20±1.76	0.05±1.00	0.28±2.76	b 10.21±239.00
T4	b 3.18±125.66	d 2.73±74.67	ab 0.27±4.06	0.21±1.76	0.05±1.00	0.19±2.76	a 0.33±262.66
T5	a 3.50±154.33	cd 7.80±82.33	a 0.25±4.26	0.20±2.2	0.07±1.06	0.33±3.26	ab 1.15±252.00
significant level	**	**	**	N.S	N.S	N.S	*

*** The different letters vertically indicate the presence of significant differences P<0.05 between the treatments, N.S the absence of significant differences between the treatments**

**** The vertically different letters indicate a significant difference (p<0.01) between the treatments.(1) treatments T1 - control group T2 and T3 delaying the introduction of feed and water for 4 and 8 hours, respectively T4 - early feeding using the pre-starter inside the hatching machine - T5 early feeding using the pre-starter outside the hatching machine 0 (2) (mean ± standard error)**

Temperature

Table 3 shows the effect of early feeding in the hatching machine in measuring the bird's body temperature, which was measured in the hours 600 and 1800 during the cold and hot time of the day in the third, fourth, and fifth weeks, that there were no significant differences between all experiment treatments.

Table 3 - The effect of early feeding in the hatching machine in measuring the temperature of the bird for weeks 3, 4 and 5 for broilers.

Treatments	For the third, fourth and fifth weeks in cold and hot times of the day, respectively					
	600	1800	600	1800	600	1800
T1	3.44±40.1	3.44±39.97	3.15±39.57	1.10±41.17	3.20±40.37	3.33±40.37

T2	**3.05±39.93**	**2.16±40.87**	**2.99±39.17**	**1.33±41.67**	**2.77±41.17**	**3.04±39.97**
T3	**2.99±39.75**	**3.31±40.32**	**4.01±39.3**	**1.77±41.1**	**2.54±41.10**	**2.56±40.47**
T4	**2.18±39.52**	**3.12±40.8**	**3.14±38.4**	**2.07±41.23**	**2.27±41.33**	**2.45±40.4**
T5	**1.90±39.68**	**2.27±40.37**	**2.88±39.17**	**1.96±41.00**	**2.80±41.10**	**2.29±40.03**
significant level	**N.S**	**N.S**	**N.S**	**N.S**	**N.S**	**N.S**

*** The different letters vertically indicate the presence of significant differences P<0.05 between the treatments, N.S the absence of significant differences between the treatments**
**** The vertically different letters indicate a significant difference (p<0.01) between the treatments.**
(1) treatments T1 - control group T2 and T3 delaying the introduction of feed and water for 4 and 8 hours, respectively T4 - early feeding using the pre-starter inside the hatching machine - T5 early feeding using the pre-starter outside the hatching machine 0 (2) (mean ± standard error)

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