Effect of Hatching Time on the Productive Performance of Broilers

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Abstract

This study aimed to determine the extent to which different hatching times affect some production traits and some carcass traits of broilers. For the period from 10/1/2022 to 11/26/2022, for days, were used 900 eggs for a period of 21 days, from Kosar company / Taq Taq Hatchery- Erbil, of the Rose 308 type. The treatments were divided according to hatching times.The rearing stage used 225 one-day-old chicks, distributed into five treatments with three replicates. were as follows: T1: 474–482 h. T2: 483–490 h. T3: 491–498 h. T4: 499–506 h. T5(control): 474-516 h, wait for all the eggs to hatch. The results of the statistical analysis showed that hatching time had a significant effect on live weight, Total feed consumption, homogeneity ratio, production index, and thighs, the time of hatching did not affect the Mortality percentage, vitality, weight of the carcass, percentage of Dressing, Chest and Eaten Parts. T4 gave the best results in terms of live weight and feed consumption, meaning that keeping the chicks in the hatchery for the shortest period after hatching gives the best results in productive performance.

Introduction

The poultry industry suffers from the problem of delayed feeding of chicks due to different hatching periods (9). Chicks may be delayed 24-48 hours in the hatchery and may reach 72 hours as a result of the procedures followed in the hatchery and the transportation process (26). Depriving chicks of feed and water for more than 28 hours leads to negative effects on body weight during the rearing period (22 and5), in addition to dehydration of the chicks, which affects productive performance (1, 18 and21) and exposure to stress (17). Stress resulting from various environmental conditions, such as sterilization, bacterial load, high dust levels, and noise, can affect growth, intestinal development, immune system activity and increase the mortality rate (20). Hatcheries play a major role in poultry production at the present time using modern technologies, but good management plays a major role in the progress of the hatching process and contributes to improving the performance of the chicks, which is reflected in production, as there is a difference in hatching time even when conditions are ideal for artificial incubation. It affects the performance of hatched chicks in the long term (16). The productive performance of chicks is related to the time they remain in the hatchery after hatching (18), and therefore early hatched chicks generally remain in the hatchery for a longer period compared to With late-hatching chicks (12). This negatively affects the rate of live weight, weight gain, and intestinal development (7), and the growth and development of the immune system (16 and 13) as a result of delayed access to feed sources (22 and 4). And it may affect the percentage of hatching (27). Whereas early-hatched chicks weigh less than late-hatched chicks (14). The researchers concluded that late feeding of hatched chicks for more than

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36 hours led to a relative increase (56%) in the mortality of broilers during the rearing period compared to early feeding due to the consumption of remaining egg yolk. It is important for metabolic processes and early growth of chicks (18,23, 7 and 6). This study aimed to determine the extent to which different hatching times affect some production traits and some carcass traits of broilers.

Materials and Methods

This study aimed to determine the extent to which different hatching times affect some production traits and some carcass traits of broilers, from 10/1/2022 to 11/26/2022, for of 57 days. stage of introducing eggs to the hatchery. In this experiment, 900 eggs from (65-68) gm were used for a period of 22 days, which were obtained from a flock Taq Taq - Erbil of 57-week-old broiler breeder. of the Rose 308 type. The treatments were divided according to hatching times and were adopted as study periods, where the parameters were as follows: First treatment: 474–482 hours Second treatment: 483–490 hours. Third treatment: 491–498 hours. Fourth treatment: 499–506 hours. Fifth treatment (control): 474-516 hours all the chicks wait until hatching was completed. The chicks were dealt with through different hatching times, and the chicks that hatched between 474 and 482 hours were considered the first treatment, as were the rest of the treatments. The rearing stage used 225 one-day-old chicks, distributed into five treatments with three replicates. The chicks were raised on the floor in a closed hall on Kosar company. Feed and water were provided free, and the chicks were fed three types of diets prepared according to the National Research Council (19) and according to the following table 1:

Table 1: Diets used in the study.

Diets	Feeding duration(day)	Crude protein %	Energy kcal/kg
Starter diets	1 - 10	23.59	3000
Growth diets	11 - 24	21.7	3018
Finisher diets	25 - 35	19.7	3211

Statistical Analysis:

The experiment data were analyzed using a completely randomized design (C.R.D.) and using the ready-made program (SAS) Statistical Analysis System in a one-way analysis method, and comparison between means was conducted using the Duncan test (10) at a significance level ($p \leq 0.05$).

Results and Discussion:

The results of the statistical analysis recorded in Table 2 for live body weight showed that there were no significant differences on the first day of rearing between the T5 control and the rest of the other treatments. In the first week, the first treatment ($p \leq 0.05$) outperformed the T5 control, which amounted to 144.63 and 133.6 g, respectively. In the second week, the second, third and fourth treatments outperformed the T5 control and the first treatment. In the third week, the third and fourth treatments outperformed the control and the first. While the fourth treatment outperformed the control, the first and the second in the fourth week. In the fifth week, the fourth treatment, which amounted to 2574.8 g, outperformed the first and second treatment, which amounted to 2239.6 and 2439.7 g, respectively, and no significant differences were recorded between the third

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treatment and the control. These results show that keeping chicks in the hatchery for a long period of time negatively affects productive performance, as the first and second treatments that stayed in the hatchery for a longer period gave the lowest results in terms of live weight, and these results are consistent with (14 and 3).

Table 2: Effect of hatching time on average live body weight (g/bird).

	Initial weight	1 week	2 week	3 week	4 week	5 week
T1	45.57±0.54c	144.63±2.6a	403.63±9.47b	888.52±20.2c	1489.17±37.4c	2239.6±40.77 c
T2	46±0.59 bc	140.53±2.9ab	435.5±7.42a	967.98±15ab	1656.8±30.7b	2439.7±45 b
T3	47.77±0.57ab	138.83±2 ab	430.86±6.16a	976.33±11.7a	1715.07±30.1ab	2543.7±35.6 ab
T4	48.63±0.71 a	140.9±2.5 ab	437.19±4.63a	993.81±13.5a	1765.23±37.8a	2574.81±43 a
T5 (control)	46.83±0.9abc	133.6±3.08 b	409.67±6.78b	925.76±17.3bc	1634.17±27.8b	2462.81±45.4ab

***Different letters within one column indicate significant differences at (p≤ 0.05).**

Table (3) shows the average weekly and total feed consumption, where the third treatment was significantly (p≤ 0.05) superior to the control in the first week. There is a significant decrease in the first treatment compared to the rest of the other transactions. No significant differences were recorded in the second and fifth weeks. In the fourth week, the second, third and fourth treatments outperformed the first treatment. As for total feed consumption, the fourth treatment was significantly higher (p ≤ 0.05) than the first treatment, which amounted to (3403.3 and 3083.7 g), respectively. These results agreed with (25) and (18,21 and 8) and differed with (22).

Table 3: Effect of hatching time on weekly and total feed consumption rate (g).

	1 week	2 week	3 week	4 week	5 week	Total feed consumption
T1	138.11±0.97ab	386.14±6.6a	621.29±29.8b	892.3±46.1b	1045.9±85.4a	3083.7±137.9b
T2	135.2±1.13ab	392.43±7.2a	715.76±10.5a	1035.7±19a	1093.3±27.7a	3372.5±38.17ab
T3	140.2±2.07a	390.14±8 a	716.33±6.3a	1013.6±40.1a	1095.2±57.7a	3355.6±96 ab
T4	137.33±1.9ab	402.67±0.8a	715.1±7.83 a	1073±17.9a	1075.2±90.5a	3403.3±81.2a
T5 (control)	132.92±2.9 b	387.14±14.8a	686.86±14.8a	979.57±14ab	1187.6±177.4a	3374.1±216.4ab

***Different letters within one column indicate significant differences at (p≤ 0.05).**

Table 4 indicates that there are no significant differences during the first, second, fourth and fifth weeks in the total food conversion factor between the different treatments in the food conversion factor. In the third week the second treatment was significantly superior (p≤ 0.05) to the first and fourth treatments, which amounted to (1.35, 1.28 and 1.29), respectively. The results obtained in the total conversion factor agreed with (3), as there were no significant differences between the different hatching periods. Likewise, (1 and 18) obtained the same results, and differed with (2). It was noted that the food conversion factor deteriorated with increasing hatching time.In Table (5) which shows the calculation of the percentage of deaths and vitality and the production index, no significant differences

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were observed in the percentage of deaths and vitality during the duration of the experiment. While all experimental treatments outperformed the control in herd homogeneity, As for the productive index, the second and third treatments ($p \leq 0.05$) outperformed the control, which amounted to (522.38, 546.31 and 411.82), respectively.

Table 4: Effect of hatching time on weekly and total Food conversion factor.

	1 week	2 week	3 week	4 week	5 week	Total Food conversion factor
T1	1.40±0.03a	1.51±0.15a	1.28±0.01b	1.5±0.09 a	1.42±0.22a	1.41±0.06 a
T2	1.43±0.04a	1.33±0.02a	1.35±0.01a	1.5±0.06 a	1.42±0.13a	1.41± 0.05 a
T3	1.54±0.06a	1.34±0.04a	1.31±0.01ab	1.37±0.01a	1.33±0.12a	1.34±0.04 a
T4	1.49±0.02a	1.36±0.04a	1.29±0.02b	1.41±0.12a	1.33±0.10a	1.34±0.02 a
T5 (control)	1.54±0.12a	1.40±0.01a	1.33±0.01ab	1.38±0.04 a	1.43±0.21a	1.39±0.07 a

***Different letters within one column indicate significant differences at ($p \leq 0.05$).**

Table 5:Effect of hatching time on mortality rate, vitality, homogeneity and production index.

	Mortality%	Vitality %	Homogeneity %	Production index
T1	3.33 ± 3.33 a	96.66 ± 3.33 a	99.49 ± 3.22 a	477.70 ± 21.40 ab
T2	3.33 ± 3.33 a	96.66 ± 3.33 a	103.73 ± 0.58 a	522.38 ± 5.37 a
T3	0.00 ± 0.00 a	100.0 ± 0.00 a	105 ± 1.39 a	546.31 ± 8.63 a
T4	3.33 ± 3.33 a	96.66 ± 3.33 a	100.43 ± 2.06 a	487.94 ± 24.51 ab
T5 (control)	10.0 ± 5.77 a	90.00 ± 3.77 a	91.33 ± 1.87 b	411.82 ± 41.81 b

***Different letters within one column indicate significant differences at ($p \leq 0.05$).**

The results of Table (6) for the average carcass weight, the percentage of dressing, and the carcass pieces indicate that there are no significant differences in the weight of the carcass, the percentage of dressing, and the chest between all treatments. As for the thighs percentage, the second treatment was significantly superior ($p \leq 0.05$) to the third treatment, which amounted to (42.66 and 31.51 g), respectively and no differences were recorded with the rest of the other treatments. These results agreed with .(18)

Table 6: Effect of hatching time on the average carcass weight, the percentage of dressing and the carcass pieces.

	Carcass weight(g)	Dressing%	Chest %	Thighs %
T1	2006.7±162.27 a	76.74± 0.28 a	39.43 ± 1.22 a	37.11 ± 1.62 ab
T2	1954 ± 177.9 a	76.16 ±0.43 a	40.14 ±2.56 a	42.66 ± 2.34 a
T3	2213.3 ±113.54 a	77.85 ± 0.68 a	36.55 ± 0.63 a	31.51 ± 1.47 b
T4	2035.3± 61.8 a	76.75 ±1.46 a	39.57 ± 1.29 a	35.99 ± 1.23 ab
T5 (control)	1802.7± 161.23a	75.50 ±0.92 a	40.66 ± 1.25 a	36.11 ± 0.58 ab

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***Different letters within one column indicate significant differences at (p≤ 0.05).**

Table (7) shows that there are no significant differences between the treatments in the relative weight of the heart, liver, gizzard and total viscera. These results agreed with (3) and disagreed with (15 and 3) .

Table 7:Effect of hatching time on the percentage of weight of Eaten parts.

	Heart %	Liver %	Gizzard %	Total Viscera %
T1	0.49 ± 0.04 a	2.03 ± 0.15 a	1.84 ± 0.05 a	4.36 ± 0.14 a
T2	0.47 ± 0.03 a	1.93 ± 0.08 a	1.22 ± 0.07 a	3.63 ± 0.12 a
T3	0.50 ± 0.08 a	2.02 ± 0.10 a	1.40 ± 0.39 a	3.93 ± 0.23 a
T4	0.55 ± 0.05 a	2.28 ± 0.29 a	1.64 ± 0.28 a	4.47 ± 0.55 a
T5 (control)	0.48 ± 0.06 a	1.85 ± 0.03 a	1.28 ± 0.13 a	3.61 ± 0.10 a

***Different letters within one column indicate significant differences at (p≤ 0.05) .**

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