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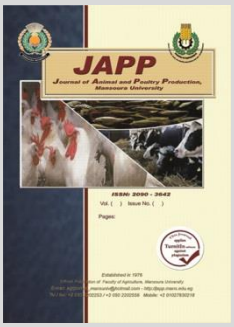
Effect of Feeding Frequency on Productive Broiler Performance

Nasrin Hassan Aziz* ; Rozhgar Baiz Saeed; Shilan Aram Akram and Shahla M. Saeed Kirkuki

Department of Animal Science, College of Agricultural Engineering Sciences, University of Sulaimani, Al-Sulaimaniyah, Kurdistan Region, Iraq.



ABSTRACT

The study was on 120 one-day-old Ross 308 broiler chicks were housed in the well-ventilated hall already antiseptic. Studied the frequency of feeding at different times in the broiler field at Department of Animal Science, College of Agricultural Engineering Sciences at the University of Sulaimani,. In the first two weeks, all chicks were fed a regular starter diet contains 21.8% crude protein and 3049 kcal metabolizable energy/kg feed. At the start of the third week, all chicks were weighed and divided randomly into four experimental groups, each with 3- replicates (10 birds/replicate). The first group was control (ad libitum feeding) (T1), while the second group (T2) was fed 4 times a day. The third group (T3) was fed 3 times a day, and the fourth group (T4) was fed 2 times a day. The light was kept at 16L: 8D. All the birds were fed a regular standard feed as described in the recommended protocol (NRC, 1994). There are significant differences at the end of the experiment between transactions, and the third transaction is superior to other transactions in the qualities of final weight gain, nutritional conversion efficiency, and final body weight.

Keywords : Feeding restriction, compensatory growth, broiler, feed conversion ratio

INTRODUCTION

The two key factors for broiler chickens' effective and economical production are efficient fed conversion and rapid growth. It can be accomplished by effective management activities maintaining disease control and effective prevention, along with the accessibility of high-quality feed ad libitum under continuous lighting (Amakiri *et al*., 2011). The world's most competitive agribusiness is the poultry industry, with feed costs accounting for around 60 to 70 percent of the cost of poultry production (Wilson and Beyer, 2000). Therefore, concerted efforts have become important to reduce the feed costs without losing overall productivity. Broiler chickens' meat is the quickest and most economical source of animal protein. The successful result of broiler rearing depends on maximum weight gain not only on management and broiler chicken breed but also on quality and patterns of feeding (Mahmoud *et al*., 2013).

On the converse, restricted feeding had little impact on feed consumption that is reported (Beer and Coon, 2007) and negatively affected the performance of growth with increased severity of restriction (Makinde, 2012). Zuidhof *et al*. (2014) found that the average pectoral muscle major of broiler chickens increased by 75% in 50 years, and the average daily gain increased by more than 400% at 42 days of age. Some health issues, such as skeletal disorders and cardiovascular disease, have increased along the same lines as broiler chickens (Dawkins and Layton, 2012; Sahraei, 2012).

To decrease these problems, different programs or nutrition restriction technologies have been suggested. They usually refer to a quantitative or qualitative feeding restriction, based on whether the plan involves a nutritional dilution of an animal diet or a reduction in daily feed supplies (Sahrei, 2012). Increasing the cost of feeding and depositing fats early in the few problems of poultry farmers (Smith, 1990). Strategies of feeding in broiler chickens for growing should be aimed at optimizing, body weight gain, feed conversion ratio (FCR) and lean carcass tissue (Teimouri *et al*., 2005; Gous and Cherry, 2004). The nutritional restriction is typically used to treat issues associated with the rapid rate of early growth in broiler chickens, such as increased mortality, increased deposition of body fat, high metabolic disorders and high incidence of structural diseases (Crouch, 2000; Saleh *et al*., 2005; Rezaei *et al*., 2006). The use of complete dietary restrictions at a young age to increase feeding performance, reduce the abdominal fat pad and compensatory growth has received considerable attention (Ibrahim and Al-Talib, 2002; Nagy, 2003). Researchers proposed that restricting physical feeding birds for a limited period of time at a young age induced compensatory growth such that market-age feeding to birds was restricted by a performance equal to that of entire feeding groups. Researchers (Novele, 2008; 2009) also reported that the early period of 75% of AD cravings fed an advantage of economic over feeding libitum mainly by promoting able to obtain full compensation and feed use for live weight before age 42 days.

This study was conducted to enhance the performance quality of broiler chickens through a specific feeding frequency system, which is an important means of preventing feed loss and reducing feed waste costs. The purpose of the study was to investigate the impact of feeding frequency on the broiler chicken's performance standards.

MATERIALS AND METHODS

Preceding this study was the Bakrajo Poultry Breeding Range, Department of Animal Science, College of

* **Corresponding author.**
E-mail address: nasrin.aziz@univsul.edu.iq
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Agricultural Engineering Sciences, University of Sulaimani, Iraq. In a well-ventilated room were housed a hundred and twenty one-day-old Ross 308 broiler chickens. All the chicks were fed a daily diet in the first two weeks, containing 21.8 % raw protein and 3049 kcal of metabolic energy/kg of feed. At the beginning of the third week, all chicks were weighed and randomly divided into four experimental groups, each with 3 replicates (10 birds/repeat). Control (libitum feeding) (T1) was the first group, while the second group (T2) was fed 4 times a day. Fed the third group (T3) 3 times a day and fed the fourth group (T4) 2 times a day. The light was kept at 16L: 8D. All the birds were fed a regular standard feed as described in the recommended protocol (NRC, 1994).

Studied characteristics

The perch weight was weighed on a sensitive scale every weekend. The daily mean increase in body weight was determined by subtracting the initial live average weight for a specific period (which was usually weekly) from the final average live weight for the same period for each chick. The chicks were supplied in each repetition with a certain amount of feed every week. The residue was obtained at the end of the same week, and the amount of feed consumed was determined by the difference between the feed added to the birds at the beginning of each week, and the feed remaining at the end of the week. The feed conversion ratio (FCR) and feed intake were calculated using the Al-Hadme method (1994).

Statistical analysis:

Data analysis was conducted using the factor experience with two factors (2 × 3) in the entire design random Factorial Experiment in- CRD following XL stat program has been tested and the results according to Duncan test multi-term (Duncan, 1955) below the level of 5% probability. The data analysis conducted according to the following mathematical equation:

$$Yijk = \mu + Ai + Bj + (AB)\,ij + eijk$$

RESULTS AND DISCUSSION

The effect of feeding frequency on body weight that showed in Table 1, there were the significant differences between transactions at the end of the experiment i.e. the age of 28 days and the outcome of the finals 1-35, and the third treatment gave the best results, and this is proof that repeated feeding improves the vitality and activity of the meat chicken.

The results showed that the growth of broiler chickens is linked with feeding intake, which confirms evidence that overweight broiler chickens can be inhibited by feeding restrictions (Washburn and Bondari, 1978). Lipins *et al.* (2000) and Urdaneta-Rincon and Leeson (2002) argued that the perceived increase in feeding efficiency by feeding restriction programs is due to lower overall maintenance requirements because birds subject to feeding restrictions appear to have lower body weights before they hit market weight and are unnecessary to do so.

Table 1. Effect of Feeding Frequency on body weight (g; mean ± SE)

	BW7	BW14	BW21	BW28	Overall
C	39.00 a ± 1.16	185.33 a ± 10.73	370.67 a ± 21.46	1380.00 b ± 39.69	2084.67 c ± 117.65
T1	38.33 a ± 0.88	190.33 a ± 6.06	376.67 a± 8.82	2266.00 a ± 182.38	2892.00 ab ± 126.90
T2	39.17 a ±0.93	210.00 a ± 10.00	390.00 a ± 5.77	2314.00 a ± 171.89	2716.00 b ± 148.14
T3	39.67 a ± 0.67	196.67 a ± 3.33	433.33 a ± 35.28	2478.67 a ± 240.37	3223.67 a ± 119.05
Pr > F	0.79	0.24	0.23	0.009	0.002
Significant	No	No	No	Yes	Yes

The different letter in same row means significantly differ (P ≤0.05).

On table 2, showed the effect of feeding frequency on body weight gain, appeared that the frequency of feeding was an effect on weekly and final weight gain and had moral differences between transactions at the age of 21 days. And there are also moral differences in the final experience of a lifetime. 1-35, and the third transaction gave the best results compared to the control transaction. For this study, free nutritional access between 9 and 12 hours/day decreased body weight gains, final body weights, and feed intake compared with ad libitum nutrition results. However, birds with free access to feed within 15 hours/day had an equivalent response to feeding broiler chickens. This result can be due to the time of availability of fed and increased intake of feed during cold night temperatures, allowing broiler chickens to meet the growth nutrient requirements. The effect of restricting feeding time during the growing period on the broiler chicken's performance (Abdul Azis and Afriani, 2017). In this study, the body weight of those hens that were not reached for nutrition decreased compared to those groups that were fed by the initial diet directly after hatching, this has been confirmed by other research (Dayton, 1995).

Table 2. Effect of Feeding Frequency on body weight gain (g; mean ± SE)

	W.G 7	W.G 14	W.G 21	W.G 28	W.G 35
T3	152.67 a ± 9.71	236.67 a ± 10.73	2045.33 a ± 43.54	745.00 a ± 79.70	3179.67 a ± 117.22
T1	145.33 a ± 6.06	186.33 a ±3.18	1889.33 a ± 175.47	626.00 ab ± 60.00	2847.00 ab ± 126.90
T2	168.00 a ± 10.00	180.00 a ± 5.77	1889.33 a ±175.47	402.00 b ± 25.15	2674.00 b ± 148.14
C	146.00 a ± 3.33	185.33 a ± 32.83	1009.33 b ± 252.84	704.67 a ± 140.56	2045.33 c ± 119.05
Pr > F	0.22	0.16	0.01	0.09	0.002
Significant	No	No	Yes	No	Yes

The different letter in same row means significantly differ (P ≤0.05).

On table 3, the effect of feeding frequency on fed intake, by the ratio of feed consumption, there are moral differences between the currencies per week, but there are no moral differences for the end of the experiment.

On table 4, the effect of feeding frequency on fed confections ratio. There are best differences significant between the treatment of fed conversion compensation compared to control, the treatment of control is more

efficient and the treatment of the second gave the best significant compared to the treatment of control. Al-Zubair and Wilson (1994) concluded that this effect is simply related to the reduction of maintenance energy needs for a lower body mass at any time up to the time of compensation for growth. For broilers exposed to a higher level and a longer feeding restriction period (40 % for 6 weeks) the gain rate was higher compared to the birds in the appetite period. The feed conversion ratio for broiler chickens fed within 9 hours/day was higher than other treatment rates during the first week of fed restriction (21-28 days old) (Abdul Azis and Afriani, 2017). However, between treatments, there was a similar feeding conversion ratio during of age 29-35 days and the total feed restriction period (21-35 days of age). In the current study, feed utilization did not improve at restricting feeding time. Our assumption is not supported which can decrease fed consumption at feeding time restrictions. Reduced may not occur of fed consumption during the night due to longer periods of fed availability, allowing broiler chickens to compensate by spending more time with feeds and consuming more feeds (Svihus, 2013).

Table 3. Effect of Feeding Frequency on feed intake (g; mean ± SE)

	F.I 7	F.I 14	F.I 21	F.I 28	F.I 35
C	297.13 a ± 3.77	416.67 a ± 24.80	1810.67 b ± 18.43	1301.33 a ± 141.45	5625.33 ab ± 155.44
T3	167.17 b ± 4.18	250.00 b ± 0.00	1833.33 b ± 76.81	910.00 b ± 132.90	6136.67 a ± 187.02
T1	168.33 b ± 18.44	194.40 c ± 0.00	2107.33 a ± 14.01	808.33 b ± 71.17	5252.33 ab ± 59.67
T2	185.33 b ± 11.33	250.00 b ± 0.00	1989.00 a ± 35.24	657.80 b ± 84.46	5018.33 b ± 466.54
Pr > F	0.00	0.00	0.004	0.02	0.07
Significant	Yes	Yes	Yes	Yes	No

The different letter in same row means significantly differ (P ≤0.05).

Table 4. Effect of Feeding Frequency on feed confections ratio

	F.E 7	F.E 14	F.E 21	F.E 28	F.E 35
C	2.05 a ± 0.14	2.28 a ± 0.26	1.80 a ± 0.06	1.85 a ± 0.06	2.76 a ± 0.11
T2	1.10 b ± 0.03	1.39 b ± 0.02	1.05 b ± 0.10	1.63 ab ± 0.12	1.90 b ± 0.12
T1	1.16 b ± 0.05	1.04 b ± 0.05	1.13 b ± 0.10	1.28 b ± 0.11	1.85 b ± 0.13
T3	1.09 b ± 0.06	1.30 b ± 0.09	0.92 b ± 0.11	1.28 b ± 0.15	1.94 b ± 0.07
Pr > F	0.00	0.001	0.001	0.02	0.001

The different letter in same row means significantly differ (P ≤0.05).

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دراسة تأثير تكرار التغذية على الاداء الانتاجي لفروج اللحم

نسرين حسن عزيز ، روزكار بايزسعيد ، شيلان ارام أكرم و شهله محمد سعيد

قسم علم الحيوان – كلية علوم الهندسة الزراعية – جامعة السليمانية – السليمانية- اقليم كوردستان - العراق

الدراسة كانت على ١٢٠ فروج اللحم بعمريوم واحد روس ٣٠٨ .تمت تربيتها في قاعة جيدة التهوية مطهر بالفعل. درس تكرار التغذية في أوقات مختلفة في حقل الدجاج اللاحم بقسم علوم الحيوان بكلية علوم الهندسة الزراعية بجامعة السليمانية.. في الأسبوعين الأولين، تم تغذية جميع الافراخ نظام غذائي منتظم بداية يحتوي على ٢١,٨٪ من البروتين الخام و ٣٠٤٩ سعرة حرارية قابلة للاستقلاب/كجم تغذية الطاقة. في بداية الأسبوع الثالث، تم وزن جميع الافراخ وتقسيمها بشكل عشوائي إلى أربع معاملات تجريبية، لكل معاملة ٣مكررات وكل (١٠ طيور/تكرار). االمعاملة الأولى كانت السيطرة اي تغذية حرة *at libitum)*، المعاملة الثانية t2 تم تغذيتها اربع مرات يوميا. أما المعاملة الثالثة (T3) فقد تم إطعامها ثلاث مرات في اليوم، أما المجموعة الرابعة (T4) فقد تم إطعامها مرتين في اليوم. تم الاحتفاظ بالضوء في ١٦ L: 8D.وتم تغذية جميع الطيور بالأعلاف العادية على النحو المبين في البروتوكول الموصى به (NRC، ١٩٩٤). هناك اختلافات كبيرة في نهاية التجربة بين المعاملات ، والمعاملة الثالثة متفوقة على المعاملات الأخرى في صفات زيادة الوزن النهائي ، وكفاءة التحويل الغذائي ، ووزن الجسم النهائي.