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IMPACT OF DIFFERENT SKIP FEEDING PROGRAMS ON CARCASS CHARACTERISTICS OF BROILER CHICKS

S. S. Shawkat* **S. A. Rashid** **Z. A. Mohammed**
College of Agricultural Sciences- University of Sulaimani

***Correspondence to**: Mr. Sarood Samal Shawkat, College of Agricultural Engineering Sciences, Sulaimi University, Iraq.
E-mail: sarood.shawkat@univsul.edu.iq

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Abstract

This experiment was conducted to investigate the effect of various skip feeding programs on some carcass characteristics of mixed sex broiler chicks. Two Hundred- Forty unsexed 1 day-old commercial strain broiler chicks were included in the experiment. Broilers allocated randomly to four treatment groups with four replicates each and 15 chicks per replicate. The feeding programs were as follows; (T0): Control treatment (The feed is placed in front of the birds on a permanent basis), (T1) Skip every 1 day, (T2) Skip every 2 days, and (T3) Skip every 3 days. Birds were fed ad libitum for two weeks. At age 42 days, one male and female were randomly chosen from each replicate to estimate the carcass characteristics. The results showed that during 14-42 days of age, significant differences (P≥0.05) were obtained for (dressing, breast, back, wings, thigh, drumstick, liver, heart, and gizzard) weight (g) in different skipping programs in males and females. Dressing, breast and thigh weights were significantly increases in group (T0) as compare with other groups. Significant increases were recorded for relative weights of liver, heart and gizzard for males in group (T1), while it was mentioned that characteristics and abdominal fat in females of group (T3) were increased in weights. The effect of treatments on chemical composition of breast, thigh and wings in both sexes were not significant differences except the fat percentage was significant improvement (P≥0.05) in breast percentage for (T2). No significant differences were observed in thigh and wings in both males and females except percentage of fat content in breast in group (T2) which recorded high values.

Keywords: Broiler, Feeding programs, Carcass, Chemical composition.

تأثير اتباع برامج حجب الغذاء المختلفة في مواصفات الذبيحة لأفراخ فروج اللحم

سروود سامال شوكت* سامان عبدالمجيد رشيد زينا عباس محمد
كلية هندسة العلوم الزراعية – جامعة السليمانية

***المراسلة الى:** م. م. سروود سامال شوكت، كلية هندسة العلوم الزراعية، جامعة السليمانية، العراق.
البريد الالكتروني: sarood.shawkat@univsul.edu.iq

الخلاصة

اجريت هذه الدراسة لغرض معرفة تأثير اتباع برامج حجب الغذاء المختلفة في بعض مواصفات الذبيحة لافراخ فروج اللحم. استخدم 240 فرخة فروج لحم غير مجنسة بعمر يوم واحد، وزعت الافراخ بصورة عشوائية على اربعة معاملات واربعة مكررات لكل معاملة بواقع 15 طائرا لكل مكرر. البرامج التغذوية المتبعة في الدراسة موزعة كلاتي: T0: معاملة المقارنة (يوضع العلف امام الطيور بصورة دائمية مستمرة)، T1: تقديم العلف للطيور ليوم وحجبه في اليوم التالي وهكذا لنهاية التجربة، T2: تقديم العلف للطيور ليوم وحجبه لمدة يومين وهكذا لنهاية التجربة، T3: تقديم العلف للطيور ليوم وحجبه لمدة ثلاثة ايام وهكذا لنهاية التجربة. تم تقديم العلف للطيور بصورة حرة في الأسبوعين الاوليين من العمر. عند عمر 42 يوم (نهاية فترة التربية)، تم اخذ ذكر واحد وانثى واحدة بصورة عشوائية من كل مكرر لأخذ القياسات المطلوبة الخاصة بمواصفات الذبيحة. خلال فترة التربية من 14 الى 42 يوم من العمر، تشير النتائج الى اختلافات معنوية ($P\leq0.05$) لأوزان (الذبيحة، الصدر، الظهر، الساق، عصى الطبال، الكبد، القلب، والقانصة) بين مختلف المعاملات في التجربة، كذلك بين الذكور والاناث. هناك زيادة معنوية في اوزان (الذبيحة، الصدر، الساق) في المعاملة (T0) مقارنة مع المعاملات الأخرى. سجلت زيادات معنوية في الاوزان النسبية للكبد، القلب، والقانصة لذكور المعاملة (T1)، في حين لوحظت زيادات وزنية في قطعيات الذبيحة دهن البطن لإناث المعاملة (T3). ان تأثير المعاملات المختلفة في التجربة على الصفات الكيموحيوية للصدر، الساق، والاجنحة في كلا الجنسين كانت غير معنوية عدا النسبة المئوية للدهن في الصدر، حيث لوحظ تطور معنوي ($P\leq0.05$) في المعاملة (T2).

كلمات مفتاحية: فروج اللحم، برامج التغذية، قطعيات الذبيحة، التركيب الكيمياوي لقطعيات الذبيحة.

Introduction

Broiler industry become very effective especially with increase of demand in meat of chicken that need 33 days to reach 2 kg of weight (22). Rapid growth requires heavy and possess excellent nutrients, broilers fed ad libitum to increase its maintenance requirements, which may take on various metabolic disorders (14, 27), and much more abdominal fat requirements (17). Large accumulation of abdominal fat in broilers is not a desired market feature, restriction of feed-in early days of age was proven to decrease deposition of abdominal fat (16). High food cost considered a most problem that effective in broiler industry. In commercial broiler guide, benefit may maximize feed costs by reducing that, this constitutes more than half of overall

60-70 % from production cost (24). Current revolutionary technology in livestock industry has received some quality improvements meat production, the study improvement initiatives broiler genetic potentials for growth, as taken lead high mortality to increased deposition of body fat and high prevalence of metabolic and skeletal instability rate (30). To minimized such negative effects, the results of quick genetic selection growing broilers consuming fodder ad libitum, it introduced the concept of feed restriction in develop the sector and to satisfy animals protein requirements (10). There are lots of feed restriction options open to farmers, those involved sporadic, skip-a-day feeding, diet dilution, time limits and limiting quantitative feed (5), So these various forms were all intended to enhance user productivity and weight gain for feed and lowered mortality rate. Skip-a-day feed is a method used to restrict early growth and has not been thoroughly investigated for broiler chickens (8). Skip-a-day feeding programs which provide small feed allocations and widely used in growth restriction systems of broiler breeder. Removing feed for 24 hours decreases early fast growth and increased meat yield in broiler chickens (21). The current study investigates using various skip feeding systems on some carcass traits at second week of age (14 day). It was expected that second week of skipping a day and re-feeding would increase quality of meat and healthy of gut.

Materials and Methods

This procedure was done at Department of Animal Science, College of Agricultural Engineering Sciences, University Sulaimani / Kurdistan Region, Iraq. In current research, a total of 240 at 15 days old Ross chicks 308 unsexed (male and female) were used. The birds were grown in one group for two weeks (Adaptation period). All birds were weighed and reared with similar conditions until 14th day, an average body weight in each cages were almost equal in variations. These were subsequently randomly allocated to four treatment groups, and each one contained four replicates (15 birds per replicate). At 42 days, one male and one female were selected randomly from each replicate (four males and females from each group). All birds provided with water and feed, feeding were ad libitum and feeds were eligible as mash form as shown in table 1. Treatments (groups) were as follows; (T0): Control: (Feed is constantly and permanently given to birds). (T1) Skip every 1 day: (Just provide feed one day and break it next day, and so on, until 42 days of age). (T2) Skip every 2 days: (Just provide feed two day and break it next day, and so on, until 42 days of age). (T3) Skip every 3 days: (Just provide feed three day and break it next day, and so on, until 42 days of age). The observational study scheme however was as shown in (Figure1).

T.	Age (days)																											
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
T_0																												
T_1																												
T_2																												
T_3																												

Figure- 1: Applied skip system, the white colour indicates days of feed provided to chicks, the green colour indicates days when feed was banned from chicks.

Table 1. Ingredient and the Chemical composition calculated of experimental diets.

Ingredient, %	Starter diet (1-21 days)	Growth diet (22-35 days)	Finisher diet (36-42 days)
Wheat	23.6	23	27.5
Corn	35.5	34.8	39.7
Animal protein (40%)	3	0.6	0.4
Soybean meal (%44)	29.9	33.04	23.28
Sunflower Oil	4	5	5
Di-calcium phosphate	2.3	1.94	1.86
Limestone	1.15	1.16	1.11
Salt	0.25	0.25	0.25
Methionine	0.2	0.11	0.8
Premix[1]	0.1	0.1	0.1
Total	100	100	100
Chemical analysis, Calculated[2]			
** **Crude protein %**	22	20	17
* **Metabolizable energy Kcal/kg**	2919	3056	3079
** **Ether extract %**	5.3	6.05	6.12
* **Crude fibre %**	3.57	3.65	4.00
** **Calcium %**	1.19	1.11	1.22
** **Phosphor %**	0.76	0.55	0.57
* **Lysine %**	1.19	1.2	1.01
* **Methionine +Cysteine %**	0.89	0.92	0.89

[1]Premix (Vitamin. A 800.000 IU; Vitamin. D3 170.000 IU; Vitamin. E 980 mg; Vitamin. K 95 mg; Vitamin. B1 13 mg; Vitamin. B2 220 mg; Vitamin. B6 75 mg; Vitamin. B12 800 mg; Folic acid 20 mg; Choline Chloride 12.000 mg; Antioxidant 1.900 mg; Iron 2.500 mg; Copper 400 mg; Zinc 2.600 mg; Selenium 7.5 mg; Calcium 24.00%; Sodium 5.40%; Phosphorus 8.40%; Methionine 5.40%; Methionine + Cystine 5.70% and Lysine 5.60%. The nutritional requirement determined according to (18).

Data collection: The characteristics of the carcass were taken after 42 days of raising: One male and one female were randomly chosen from each replication based on body weight, weighed alive and sacrificed to estimate the percentage of weight for dressing, breast, back, wings, thigh, drumstick and leg. Dressing determined by (11), breast, back, Wings, thigh, drumstick and leg percentage determined by (13).

Relative weights of internal organs: After bird slaughter and edible viscera separation (liver, heart, gizzard, and abdominal fat), each part was determined according to the following equation:

$$\text{Weight of organs } \% = \frac{\text{Weight liver, heart and abdominal fat (g)}}{\text{Live body weight (g)}} \times 100$$

Chemical Analysis of Carcass: Analyze of a meat sample taken at 42 days of age

from breast, thigh, and wings: Determination of protein: by AOAC (4). Determination of fat, the method (Soxhlet), cited by (2), determination of moisture, the method stated in the AOAC (4), and determination of Ash, the process defined by (15).

Statistical analysis: All data obtained from this experiment were analyzed using Excel software. Calculations of criteria for the various treatments will be done. The data were analyzed using XLSTAT (29). A comparison of the means is also performed by using (Duncan) (9) test significant differences at the meaning stage of 0.05.

Results

The impact of different skip feeding on dressing, breast, back, wings, thigh, and dramatics percentage of male broiler chicks were significant differences (P≥0.05), shown in table 2. T0 (control) recorded best percentage of dressing, back, and thigh (77.28%, 21.74%, and 16.96%) respectively, compared with other treatments, while lowest percentage of dressing were (72.71%) in T3. T1 recorded improvement in breast (44.35%), while lowest were in T0 (control), and T3. The effect of treatments on wings, and drumstick significant improvement for T3 which recorded (9.85%, and 12.72%), on the other hand, lowest percentage was for T0 (control).

Table 3 showed significant differences (P≥0.05) between treatments by using different skip feeding programs in all characteristics percentage on female broiler chicks. The highest percentage of each dressing, breast, and thigh were for T0 (control) (74.82%, 44.45%, and 16.15%) respectively, whereas the lowest percentage for dressing and thigh were for T2 (71.88%, and 14.85%) respectively, but T1 showed lowest percentage for breast (36.36%). The better percentage of back, and wings for T1 were (21.90%, and 10.08%), compared with T2 which recorded lowest values in back weights., and in wings for T0 (control). The highest percentage for drumstick was for (14.14%) in T2, and the lowest for T0 (control).

The impact of different skip feeding factors on relative weights of was shown in table 4. The influence of treatments on liver, heart, gizzard, and abdominal fat in males showed significant differences (P≥0.05), and leg percentage was not significant differences between treatments. The highest percentage of liver, heart, and gizzard for T2 were (3.32%, 0.62%, and 1.21%) respectively, while lowest percentage of liver, and gizzard for T1 (control), and T3 for heart percentage. The highest percentage of leg was (3.31%) in T1 (control), whereas T4 recorded lowest percentage. On other hand, better percentage of abdominal fat was (0.89%) in T3, while T1 highest percentage.

Table 5, showed the influence of different skip feeding programs on internal organ weights. The impact of feeding programs on liver, heart, and gizzard in female showed significant differences (P≥0.05), while leg percentage was not significant differences compared with treatments. better weights recorded of liver, heart, and gizzard for T3 were (3.60%, 0.74%, and 1.24%) respectively, whereas lowest weights recorded of liver in T0 (control). Weights of leg for T2 was (3.64%), while T0

(control) recorded lowest weights. As well as, abdominal fat recorded (0.72%) in T2, while T1 showed high weights.

Table 6 showed the influence of different skip feeding on moisture, protein, ash, and fat percentage in breast in both males and females. Groups were not effect in moisture, protein, and ash percentage in males and females. High weights of moisture, protein, and ash percentage in both males and females for T3, whereas T1 lowest values in moisture, and protein of breast. Fat percentage in male and female showed significant differences (P≥0.05), and highest percentage in T3 (0.65%). However, females recorded best weights with (0.45%), whereas T1 recorded high weights.

Table 7 showed effect of different skip regimes on moisture, protein, ash, and fat percentage of thigh in males and females broiler chicks. Moisture, protein, and ash percentage in thigh were not significantly affected. For moisture, and protein percentage in males and femalesthe highest percentage were T1, while the lowest percentage was T0 (control). Ash percentage, the largest percentage were T2, whereas the lowest were T3. fat percentage of thigh were significantly differs (P≥0.05) and better percentage in males and females for T0 (control) and the highest percentage in males for T2, and females for T1.

Table 8 showed effect of different skip feeding programs on moisture, protein, ash, and fat percentage of wings in males and females broiler chicks. Moisture and protein percentage in Thigh were not significantly affected by feeding programs, the high percentage for T1, while lowest percentage for T3. The highest percentage of ash in male and female for T3, whereas T0 (control) recorded lowest weights. The effect of feeding programs on fat of wings were significant differences (P≥0.05), T0 (control) recorded better percentage while high weights for T3.

Table 2. Impact of different skip feeding programs on dressing, breast, back, wings, thigh, and drumstick percentage of male broiler chicks (Mean ± Standard error).

T.	%					
	Dressing	**Breast**	**Back**	**Wings**	**Thigh**	**Drumstick**
T_0	77.28 ± 0.07^{a}	40.93 ± 0.02^{c}	21.74 ± 0.01^{a}	8.82 ± 0.11^{b}	16.96 ± 0.06^{a}	9.93 ± 0.08^{c}
T_1	76.91 ± 0.02^{b}	44.35 ± 0.15^{a}	18.60 ± 0.10^{c}	8.90 ± 0.10^{b}	14.70 ± 0.10^{c}	11.80 ± 0.10^{b}
T_2	73.25 ± 0.03^{c}	43.38 ± 0.01^{b}	18.17 ± 0.02^{d}	9.65 ± 0.01^{a}	15.34 ± 0.02^{b}	12.40 ± 0.10^{a}
T_3	72.71 ± 0.07^{d}	40.71 ± 0.02^{c}	20.44 ± 0.03^{b}	9.85 ± 0.03^{a}	15.46 ± 0.03^{b}	12.72 ± 0.02^{a}

Means with different letters within column were differed significantly ($p<0.05$)
(T0): Control, (T1) Skip every 1 day, (T2) Skip every 2 days (T3) Skip every 3 days.

Table 3. Impact of different skip feeding programs on dressing, breast, back, wings, thigh, and drumstick percentage of female broiler chicks (Mean ± Standard error).

T.	%					
	Dressing	**Breast**	**Back**	**Wings**	**Thigh**	**Drumstick**
T_0	74.82 ± 0.05^{b}	44.45 ± 0.07^{a}	17.63 ± 0.02^{c}	08.87 ± 0.02^{d}	16.15 ± 0.15^{a}	11.54 ± 0.01^{d}
T_1	73.36 ± 0.02^{c}	36.36 ± 0.02^{d}	21.90 ± 0.02^{a}	10.08 ± 0.02^{a}	15.84 ± 0.02^{a}	13.67 ± 0.03^{b}
T_2	71.88 ± 0.02^{d}	41.05 ± 0.02^{b}	16.84 ± 0.02^{d}	09.04 ± 0.02^{c}	14.85 ± 0.02^{b}	14.14 ± 0.02^{a}
T_3	74.43 ± 0.03^{a}	37.75 ± 0.03^{c}	21.56 ± 0.03^{b}	09.57 ± 0.03^{b}	15.65 ± 0.25^{a}	12.68 ± 0.02^{c}

Means with different letters within column were differed significantly ($p<0.05$)
(T0): Control, (T1) Skip every 1 day, (T2) Skip every 2 days (T3) Skip every 3 days.

Table 4. Impact of different skip feeding programs on liver, heart, gizzard, abdominal fat, and leg percentage of male broiler chicks (Mean ± Standard error).

T.	%				
	Liver	**Heart**	**Gizzard**	**Abdominal fat**	**Leg**
T_0	2.65 ± 0.01^{b}	0.54 ± 0.01^{b}	1.02 ± 0.02^{c}	1.31 ± 0.01^{a}	3.31 ± 0.01^{a}
T_1	3.32 ± 0.01^{a}	0.62 ± 0.01^{a}	1.21 ± 0.01^{a}	1.30 ± 0.01^{a}	3.16 ± 0.01^{a}
T_2	3.23 ± 0.07^{a}	0.48 ± 0.02^{c}	1.03 ± 0.02^{c}	0.89 ± 0.18^{b}	3.07 ± 0.57^{a}
T_3	2.65 ± 0.01^{b}	0.53 ± 0.01^{b}	1.09 ± 0.01^{b}	1.12 ± 0.01^{ab}	2.36 ± 0.01^{a}

Means with different letters within column were differed significantly ($p<0.05$)
(T0): Control, (T1) Skip every 1 day, (T2) Skip every 2 days (T3) Skip every 3 days.

Table 5. Impact of different skip feeding programs on liver, heart, gizzard, abdominal fat, and leg percentage of female broiler chicks (Mean ± Standard error).

T.	%				
	Liver	**Heart**	**Gizzard**	**Abdominal fat**	**Leg**
T_0	2.94 ± 0.01^{b}	0.53 ± 0.03^{b}	0.96 ± 0.02^{b}	1.04 ± 0.02^{a}	2.56 ± 0.02^{b}
T_1	3.16 ± 0.19^{b}	0.64 ± 0.08^{ab}	0.95 ± 0.13^{b}	1.21 ± 0.36^{a}	2.82 ± 0.44^{ab}
T_2	3.33 ± 0.03^{ab}	0.48 ± 0.01^{b}	1.02 ± 0.02^{ab}	0.72 ± 0.01^{b}	3.64 ± 0.01^{a}
T_3	3.60 ± 0.10^{a}	0.74 ± 0.01^{a}	1.24 ± 0.02^{a}	0.93 ± 0.03^{ab}	2.66 ± 0.03^{b}

Means with different letters within column were differed significantly ($p<0.05$)
(T0): Control, (T1) Skip every 1 day, (T2) Skip every 2 days (T3) Skip every 3 days.

Table 6. Impact of different skip feeding programs of chemical composition percentage on the breast of male and female broiler chicks (Mean ± Standard error).

T.	**Moisture**		**Protein**		**Fat**		**Ash**	
	Male	Female	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
T_0	75.40 ± 0.75^{a}	74.31 ± 0.81^{a}	20.38 ± 0.21^{a}	20.04 ± 0.14^{a}	0.58 ± 0.04^{c}	0.55 ± 0.02^{b}	1.05 ± 0.04^{a}	1.10 ± 0.20^{a}
T_1	75.10 ± 1.41^{a}	74.87 ± 0.55^{a}	20.29 ± 0.93^{a}	20.06 ± 0.19^{a}	0.63 ± 0.02^{b}	0.61 ± 0.04^{a}	1.02 ± 0.18^{a}	1.14 ± 0.13^{a}
T_2	75.12 ± 0.58^{a}	74.18 ± 0.37^{a}	20.30 ± 0.16^{a}	19.99 ± 0.26^{a}	0.57 ± 0.02^{c}	0.45 ± 0.02^{c}	1.07 ± 0.09^{a}	1.22 ± 0.34^{a}
T_3	75.53 ± 0.39^{a}	75.06 ± 0.54^{a}	20.42 ± 0.11^{a}	20.37 ± 0.17^{a}	0.65 ± 0.02^{a}	0.55 ± 0.03^{b}	1.09 ± 0.18^{a}	1.23 ± 0.11^{a}

Means with different letters within column were differed significantly ($p<0.05$)
(T0): Control, (T1) Skip every 1 day, (T2) Skip every 2 days (T3) Skip every 3 days.

Table 7. Impact of different skip feeding programs of chemical composition percentage on the thigh of male and female broiler chicks (Mean ± Standard error).

T.	**Moisture**		**Protein**		**Fat**		**Ash**	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
T_0	72.54 ± 3.00^{a}	74.21 ± 0.91^{a}	19.61 ± 1.36^{a}	20.06 ± 1.06^{a}	0.59 ± 0.02^{d}	0.61 ± 0.03^{d}	1.11 ± 0.06^{a}	1.02 ± 0.04^{a}
T_1	75.82 ± 0.98^{a}	75.04 ± 1.40^{a}	20.49 ± 0.27^{a}	20.84 ± 0.94^{a}	0.67 ± 0.03^{b}	0.72 ± 0.01^{a}	1.17 ± 0.19^{a}	1.11 ± 0.13^{a}
T_2	74.15 ± 0.94^{a}	74.67 ± 0.89^{a}	20.04 ± 0.26^{a}	20.17 ± 0.37^{a}	0.69 ± 0.01^{a}	0.64 ± 0.02^{c}	1.19 ± 0.08^{a}	1.21 ± 0.10^{a}
T_3	74.24 ± 1.20^{a}	74.92 ± 0.95^{a}	20.07 ± 0.33^{a}	20.21 ± 0.81^{a}	0.61 ± 0.02^{c}	0.67 ± 0.01^{b}	1.08 ± 0.24^{a}	1.01 ± 0.17^{a}
T_3	75.53 ± 0.39^{a}	75.06 ± 0.54^{a}	20.42 ± 0.11^{a}	20.37 ± 0.17^{a}	0.65 ± 0.02^{a}	0.55 ± 0.03^{b}	1.09 ± 0.18^{a}	1.23 ± 0.11^{a}

Means with different letters within column were differed significantly ($p<0.05$)
(T0): Control, (T1) Skip every 1 day, (T2) Skip every 2 days (T3) Skip every 3 days.

Table 8. Impact of different skip feeding programs of chemical composition percentage on the wings of male and female broiler chicks (Mean ± Standard error).

T.	Moisture		Protein		Fat		Ash	
	Male	Female	Male	Female	Male	Female	Male	Female
T_0	76.93 ± 1.34^{a}	76.17 ± 1.17^{a}	20.79 ± 0.36^{a}	20.58 ± 0.42^{a}	0.61±0.03^{bc}	0.59 ± 0.04^{c}	1.14 ± 0.06^{a}	1.17 ± 0.14^{a}
T_1	78.71 ± 1.11^{a}	77.18 ± 1.06^{a}	21.27 ± 0.31^{a}	20.85 ± 0.27^{a}	0.61±0.07^{c}	0.62 ± 0.02^{b}	1.16 ± 0.19^{a}	1.19 ± 0.20^{a}
T_2	76.84 ± 0.54^{a}	76.21 ± 0.92^{a}	20.76 ± 0.15^{a}	20.59 ± 0.19^{a}	0.63 ±0.02^{b}	0.63 ± 0.01^{b}	1.21 ± 0.04^{a}	1.22 ± 0.09^{a}
T_3	75.47 ± 0.62^{a}	75.93 ± 0.76^{a}	20.39 ± 0.17^{a}	20.52 ± 0.23^{a}	0.65±0.01^{a}	0.66 ± 0.03^{a}	1.23 ± 0.19^{a}	1.24 ± 0.23^{a}

Means with different letters within column were differed significantly ($p<0.05$)
(T0): Control, (T1) Skip every 1 day, (T2) Skip every 2 days (T3) Skip every 3 days.

Most studies observed that feed-restricted for birds fed ad libitum were more effective in body weight and carcass yield, although significant differences were very widely reported. Our studies agree partially with this statement. The cause of the superiority of feeding programs in weights of dressing percentage and carcass yield was due to superiority in living body weight means and correlation between live body weight and increase of dressing percentage is positive (26). Significant differences between control group and other groups found in our experiment in males and females may be due to a significant increase in body weight and weight gain for control group compared to the other groups. Its impact on quality of carcasses, especially fat content, is among most controversial effects of restricted feeding of broiler chickens. (7) stated that weights of limited groups for carcass, breast, leg, and abdominal fat were not differs with other groups those and control group. But on other side, (25, 28) have stated that for restricted birds, yield and proportion of breast meat have been reduced. This finding seems to be confirmed by our research since this group of birds showed a tendency for control groups to increase the proportion of breast muscle. (20), reported that increasing quantity of feed intake and increasing quantity of feed intake and this leads to increased frequency of contractions of gizzards and this leads to increase muscle of gizzards and finally size of gizzard, Substantial variations in liver weight, gizzard, and proventriculus were observed in (19, 22). Another of advantages of the restriction is to minimize unhealthy fat in body by preventing the accumulation of fat due to weight gain, since raising of broiler chickens depends on development of high-weight birds, mean weight is full carcass meat and not fat (12). (23) reported that restriction contributed to the birds' relaxation and well-being, which decreases the secretion of stress hormones like corticosterone, which acts to increase body abdominal fat by extracting energy from non-carbohydrate sources. In group T3, the trend for higher crude protein concentration in muscles relative to control group

was also evident, at the same time; however, the muscles of birds were distinguished by higher fat levels than those of other groups. Results of (3) also give a high concentration of crude protein and fat in the breast muscles of feed-restricted broilers. (6, 25) previously reported in broiler and rabbits the higher level of ash that we found in the meat of restricted broilers.

Conclusion: Following the different feeding programs and methods in broiler chicks may affect the characteristics of the carcass. Skipping food from birds in its scientific form has improved these characteristics, as noticeable increases were recorded in all the weights of the carcass cuts despite the cutting of food, which amounted to three skipping days.

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