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Effects of Different Vegetable Oils and Animal Fat on Performance of Broiler Chicks

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Abstract

This study was carried out to find out effects of different vegetable oil and animal fat on broiler chick's performance. The aim of this research was to identify the effects of different sources of oils on productive performance of broiler chicks. The experimental period was from 8th March 2017 to 27th April 2017. An overall of two hundred sixty, day-old of Ross 308 broiler chicks were distributed randomly on five treatments (4 replicates each with (13 chicks/ replicate). The treatments include T1: Control (without oil and fat addition); T2: Adding canola oil (%4); T3: Adding corn oil (%4); T4: Adding animal fat (%4); T5: Adding sunflower oil (%4). During the period of study, three types of diets were applied: Starter diet (from one to 20 day of the study), grower diet (from 21 to 42 days of study) and finisher diet (from 43 to 49 days of the study). Results indicated that supplementation of diets with different types of oil and animal fat significantly ($p<0.05$) improved live body weight and weight gain and feed conversation ratioratio and feed intake and production index, at periods (1-49) day. However, the effect of different vegetable oil and animal fat had no significant effect on abdominal fat and dressing percentage at period (1-49) day.

Introduction

In broiler diets, oils have continuously been utilized as a source of energy. For integrating oils in poultry diets, there is numerous another benefit such as: reducing dustiness and increasing in palatability, digestion, and absorption of lipoproteins. Leeson and Atteh (1995) *[1]* reported that oils help in absorption of calcium as well as vitamins E and A. Additionally, the passage rate of the digestible through the gastrointestinal tract is reduced by the dietary fat. Consequently, it provides superior utilization and absorption of the nutrients *[2]*; current fast-growing broiler strains have high energy necessities and because oil has high energy concentration, the addition of oil to the diet nearly obligatory *[3 ; 4; 5]*. According to Scaife et al., (1994) *[6]*, the addition of oils to animals feed have a substantial effect on the quantity of abdominal fat and the composition of fatty acid. In fact, as the dietary fatty acids are incorporated into little alteration into the bird's abdominal fat, the composition of fatty acids of oils utilized in poultry feed are reflected in the animal products *[7]*. Saleh et al., (2009) *[8]* indicated that feed cost consists around 70% of the overall expenses of production, and approximately 70% of the feed cost is contributed to the energy alone. Rose , (2001) *[9]* declared that poultry consumes the quantity of feed that almost meets their energy necessities. Furthermore, poultry eats a quantity of food that is nearly 10% of their body weight per day. Therefore, it is recommended that so as to reduce feed expenses one have to utilize the most inexpensive form of energy or the energy source that generates the highest rate of growth per unit cost. Fat should be used to balance poultry rations. Regulating dietary energy by supplementing fat is believed to be one of the effective ways to adjust feed intake of broiler chicks *[10]*. For escalating the energy density of diets in

poultry feeding, the best practical approach is fat and oils supplementation *[2]*. Sanz et al., (2000) *[11]* , Pesti et al., (2002) *[12]* stated that various fatty acids and dietary fats could impact fat digestion and absorption in poultry. The main objective of the present study is to evaluate the different Sources Oils on the performance of broiler chicken from one to 49 days of age in diets that differ in Sources Oils. There is currently much importance in optimizing the amount and type of fat in diets of farm animals, in the cases where better feed conversion rate and faster growth is aimed, fats should be considered as much important as proteins and carbohydrates in animal nutrition. The aim of this research was to identify the effects of different sources of oils on productive performance of broiler chicks.

Material and method

This research was conducted at the Poultry Farm of Animal Sciences Department of College of Agricultural Sciences of the University of Sulaimani. The experimental period from 8th March 2017 to 27th April 2017. A total of 260 unsexed day-old broiler chicks hybrid Ross-308 were used. The experiment was designed to study the effects of different vegetable oils and animal fat on performance and carcass traits of broiler chicks, where the chicks were randomly distributed on the treatments. The treatments include T1: Control (without oil and fat addition); T2: Adding canola oil (%4); T3: Adding corn oil (%4); T4: Adding animal fat (%4); T5: Adding sunflower oil (%4). The chicks were brought up to Poultry farm consisting of two separated part with an area of (10 × 10 m). A total of 260 unsexed one day-old Ross-308 broiler chicks, (average body weight 41.21 g) were used. Chicks were distributed randomly into 20 groups of 13 chicks in each cage. The chicks groups were assigned to 5 treatments with four replicates. The measurements of temperature and humidity of the farm were taken at the height of 30-40 cm from the ground by special electronic tools of measuring temperature and humidity. Environmental conditions during the rearing period were provided with brooders and adequate ventilation. The cages floors were covered by 5 cm deep dry litter. Chicks were feed with plastic chick tray feeder and plastic handing watering one day to 49 days. Ingredient composition of the diet provided to the broilers from one to 49 days of age is shown in the Tables 1, 2, 3 and 4.

Table- 1. The composition of the diet

Without Oil	***Finisher***	***Grower***	***Starter***
Protein Concentration	*7*	*5*	*5*
Soybean meal 45%	*23*	*18*	*16*
Wheat	*20.2*	*28.2*	*28.2*
Corn	*49*	*48*	*50*
Limestone	*0.8*	*0.8*	*0.8*
Total	*100*	*100*	*100*
CP %	*20.833*	*18.668*	*17.878*
Energy Kcal/Kg	*3080.08*	*3127.76*	*3144.4*
Methionine % + Cys	*0.6755*	*0.6005*	*0.5941*
Lysine %	*1.1153*	*0.9233*	*0.8693*
Fat %	*2.9986*	*2.8916*	*2.9576*
Fiber %	*3.26*	*3.161*	*3.091*
Calcium %	*0.8315*	*0.6929*	*0.6881*

Table-2. The composition of the diet canola oil.

Canola Oil*	Starter	grower	finisher
Protein Concentration	5	5	5
Soybean meal 45%	25.8	22	17.2
Wheat	16	20	14.6
Wheat Bran	8	6.8	7
Methionine	0.1	0.1	0.1
Lysine	0.1	0.1	0.1
Canola oil	4	4	4
Limestone	0.8	0.8	0.8
Corn	40.2	41	51
NaCl	0	0.2	0.2
Total	100	100	100
CP %	21.1	19.9	17.685
Energy Kcal/Kg	3112	3161	3208.4
Methionine % + Cys	0.70	0.69032	0.67034
Lysine %	1.21	1.1121	0.9737
Fat %	6.7	6.729	7.0018
Fiber %	4.0	3.739	3.585
Calcium %	0.71	0.7807	0.6914

Table-3. The composition of the diet Corn oil.

Corn oil**	Starter	Grower	Finisher
Protein Concentration	5	5	5
Soybean meal 45%	27.5	20	17
Corn	42.7	42.2	40.2
Corn oil	4	4	4
Methionine	0.1	0.1	0.1
Lysine	0.1	0.1	0.1
Wheat	12	21.6	26.6
Wheat Bran	7.6	6	6
Limestone	0.8	0.8	0.8
NaCl	0.2	0.2	0.2
Total	100	100	100
CP %	21.6495	19.111	18.201
Energy Kcal/Kg	3115.008	3191.744	3205.104
Methionine +Cys %	0.70082	0.6861	0.6815
Lysine %	1.249	1.0593	0.9883
Fat %	6.7121	6.7724	6.7714
Fiber %	3.9865	3.628	3.548
Calcium %	0.71562	0.70002	0.69482

Table- 4. The composition of the diet animal fat and sunflower seed oil.

Animal Fat*** and Sunflower oil****			
	Starter	Grower	Finisher
Protein Concentration	5	5	5
Soybean meal 45%	27	22	18
Sunflower seed oil	4	4	4
Methionine	0.1	0.1	0.1
Lysine	0.1	0.1	0.1
Wheat	11.6	19	16
Wheat Bran	9	6.6	4.6
Corn	42.2	42.2	51.2
Limestone	0.8	0.8	0.8
NaCl	0.2	0.2	0.2
Total	100	100	100
CP %	21.521	19.797	17.922
Energy Kcal/Kg	3088.064	3167.408	3253.408
Methionine +Cys%	0.6991	0.69002	0.67382
Lysine %	1.2403	1.1105	0.9885
Fat %	6.7324	6.7566	6.9546

*In the table (4) sunflower seed oil and animal fat has the same diet, because the two oils have the same proportion of energy and the same proportion of protein in their composition of the diet.
**Protein concentrate used in the diets was produced in Holland *Protein concentrate used in the diets was produced in Holland (WAFI) which contains: 40% crude protein, 2100 kcal ME/kg, 5% (WAFI) which contains: 40% crude protein, 2100 kcal ME/kg, 5% crude fat, 2% crude fiber, 6.5% calcium, 2.50% phosphorus, crude fat, 2% crude fiber, 6.5% calcium, 2.50% phosphorus, 3.85% lysine, 3.70% methionine and 4% cystine.
***Limestone: Super Vita used in the diets: (Vitamin. A 1.800.000 IU; Vitamin. D3 200.000 IU; Vitamin. E 525 IU; Vitamin. B1 200 mg; Vitamin. B2 400 mg; Nicotinamide. 1000 mg; Folic acid 50 mg ; CA-D-Pantothenate 500 mg; Iron 5 gm; Manganese 20 mg; Zinc 25 mg; Cobalt 20 mg; Copper 100 mg).
****The calculated composition of the diets was determined according to NRC, (1994) *[13].* Trt. = Treatment according to NRC, (1994) *[13]*. Trt. = Treatment.
Item: *Canola oil. 884 kcal per 100 g **Corn oil. 900 kcal per 100g *** Animal fat. 886 kcal per 100g **** Sunflower oil. 886 kcal per 100g.

Birds were weighed every week in each experimental unit throughout the experimental period. During rearing period, live body weight (LBW) was recorded at days 7, 14, 21, 28, 35 ,42, 49 of age.
Weight gain was calculated for each replicate after the end of each period. Feed intake in each replicate was recorded and measured at the end of each week. Feed conversion ratio is the amount of feed intake estimated to unit weight for each weight gain estimated in the same unit. Mortality was recorded for each replication, if any, by the date of occurrence.
Viability percentage = 100 – Mortality percentage

Statistical Analysis

All data were analysed by one-way analysis of variance (ANOVA) utilizing *[14]*, version-7.5) program for Windows. The level of significance was chosen at $p < 0.05$ and the results are presented as mean ± SE. Duncan's multiple range tests *[15]* was used to determine the significance of differences among means.

$Yij = \mu + Ti + eij$

Where:

Yij= Observation j in treatment i

μ = Overall mean.

Ti = Effect of treatments (diets)

eij = Experimental error

Results and discussion

The effect of different vegetable oils and animal fat on performance and carcass traits of broiler chicks fed on the diet containing corn oil, canola oil, sunflower oil and animal fat during 1st to 49th day of age. The value of body weight in all treatments at the one day to 49 day old were significant differ ($p<0.05$).

Table 5 showed live body weight of the end of each week of the experiment. In period (one) day old, effective treatments had no significant on body weight. Effect of treatment was significant on body weight in periods (7-14-21-28-35-42-49) day. T5 recorded the highest weight (107.290g), compared with (T1) control which (93.238) in period (7) day old. The best LBW was (193.925g) in T5 for period (14) day old, compared with (T1) control recorded lowest weight (165.05g).T2 reached to (398.800g) which is the highest, compared with T1(control) which (326.475g) the lowest weight, in period (21) day old.T2 reached to (884.750g) the highest weight compared with (T1) which (668.500g) the lowest, in period (28) day old. T3 recorded the highest weight (1476.5g) in period (35) day compared with T1 (control) which (963.5g), and at the same T3 had significant compared with all treatments. T3 recorded highest weight (2128g) in period (42)day old compare with T1 recorded lowest weight (1443g).T3 recorded highest weight (2671g), in period (49) day old compared with T1 (control) which (1918g), and at the same T5 had significant compared with T5.

Chicken fed canola oil caused the better body weight compared to birds fed fat. In addition, Baião, and Lara, (2005) *[16]* reported momentous consequence of feeding canola oil on body weight. In the present

study, chicks fed diets containing corn oil showed the significant difference in body weight. Wiseman, (2003) *[17]* showed that combinations of dietary animal fats did not have any significant impacts on the last body weight of broilers. Vegetable oils are more digestible than animal fats; consequently, they provide more energy. Additionally, the age of bird impacts the availability of the nutrient *[18]*. The amount of fat was significantly increased live weight, Bohnsack et al., (2002) *[19]* showed that inclusion of these level in broiler diet results in the non-significant increase in body weight gain. Bilal et al., (2000) *[20]*, reported that a significant difference in live weight was found between the group fed sunflower oil and the group fed animal tallow. Moreover, Newman et al., (2002) *[21]* declared that a substantial enhancement in body weight is results from the addition of 3% of canola oil in broiler diet. Addition of fats may result in increased body weight in some cases *[22]*. Canola oil has a key influence on best lipid metabolism and following body weight because it is a source of free fatty acids, unsaturated fatty acids (such a-linolenic acid) and omega-3 fatty acids compared with *[23]*. Stanley et al., (1988*)[24]* reported significant improvement in body weight of broiler with increasing levels of supplemental fat. Taylor , (2000) *[23]* found that chickens fed dietary fat showed higher live weight in compared to birds fed with no supplemental fat.

Weight gain shows the effects of different vegetable oils and animal fat on performance and carcass traits of broiler chicks fed on the diet containing corn oil, canola oil, sunflower oil and animal fat during 1th to 49th. The value body weight gain in all treatments at the one to 49 day of age was significant differ ($p<0.05$).

Table 6 show weight gain of the end of each week of the experiment. Effect of treatment was significant on weight gain in periods (1-7), (8-14), (15-21), (22-28), (29-35), (36-42), and (43-49) days.T5 recorded the highest weight (66.513g), compared with (T1) control which (52.038g) in period (1-7) day old. The best weight gain was (87.898g) in T2 (canola oil) for period (8-14) day old, compared with (T1) control recorded lowest weight (71.813g). T2 reached to (207.105g) which the highest, compared with T1 (control) which (161.425g) the lowest weight, in period (15-21) day old. T3(corn oil) reached to (493.200g) the highest weight compared with (T1) which (342.025g) the lowest, in period (22-28) day old.

Table- 5. The effect of different vegetable oil and animal fat on body weight (gm) of broiler chicken.

T	1	7	14	21	28	35	42	49
T1	41.204^{a}	93.24^{b}	165.05^{b}	326.48^{b}	668.50^{b}	963.50^{c}	1443.50^{b}	1918.75^{c}
T2	41.264^{a}	103.80^{a}	191.70^{a}	398.80^{a}	884.75^{a}	1327.756^{b}	2059.00^{a}	2605.00^{a}
T3	41.439^{a}	105.35^{a}	187.50^{a}	371.30^{ab}	864.50^{a}	1476.50^{a}	2128.00^{a}	2671.25^{a}
T4	41.53^{a}	105.81^{a}	191.78^{a}	391.80^{a}	811.50^{a}	1278.50^{b}	1959.257^{a}	2412.50^{b}
T5	40.783^{a}	107.29^{a}	193.93^{a}	393.75^{a}	830.00^{a}	1331.004^{b}	2006.00^{a}	2625.00^{a}

*a, b, c: Means within columns with different superscripts differ significantly ($p<0.05$).

Table- 6. The effect of different vegetable oil and animal fat on weight gain (g) of broiler chicken.

T	1-7	8-14	15-21	22-28	29-35	36-42	43-49
T1	52.04^{b}	71.81^{b}	161.43^{b}	342.03^{b}	295.00^{c}	480.00^{b}	475.25^{ab}
T2	62.54^{a}	87.90^{a}	207.11^{a}	485.95^{a}	443.00^{b}	731.25^{a}	546.00^{ab}
T3	63.93^{a}	82.14^{ab}	183.81^{ab}	493.20^{a}	612.00^{a}	651.50^{ab}	543.25^{ab}
T4	64.28^{a}	85.97^{a}	200.02^{ab}	419.70^{ab}	467.00^{ab}	680.75^{a}	453.25^{b}
T5	66.51^{a}	86.64^{a}	199.839^{ab}	436.25^{a}	501.002^{ab}	675.00^{a}	619.00^{a}

*a, b, c: Means within columns with different superscripts differ significantly ($p<0.05$).

T3 recorded highest weight (612.000g) in period (29-35) day compared with T1 (control) which (295.000g), and at the same T3 had significant compared with T2. T2 recorded highest weight (731.250g) in period (36-42) day old compared with T1 recorded lowest weight (480.000g). In period (43-49) day, effect T2, T3, T4, T5 had no significant on weight gain compared with T1, but T5 had significant increase compared withT4, and T5 recorded the highest weight (619.000g), compared withT4 recorded lowest weight (453.250g).

An increased daily weight gain compared to the group without oil by adding fish oil to the base diet was reported via *[25]*. Sanz et al., (2000) *[11]* , Pesti et al., (2002) *[12]*Showed that digestion and absorption of fat in poultry might be influenced by various fatty acids and dietary fats. Stanley et al., (1988*)[24]* reported significant improvement in body weight gain of broiler with increasing levels of supplemental oil. Even though in several cases body weight gain is similar, however with enhanced feed efficiency *[12]*. Same result of body weight in broilers reported other studies *[21, 26, 27]* . Also Joshi and Sell, (1964) *[28]* reported that addition of fat to poultry diets improved better feed utilization and weight gain. Ahmed et al., (2013) *[29]* showed that combination of canola and olive-canola oils in broilers ration increased body weight gain, improved feed conversion. El Shanti et al., (2011) *[30]* reported that the BWG was improved by 6% oil sediments *[31]*, using graded levels of ground nut oil in broiler ration, showed that the critical differences among the treatments revealed that the addition of oil at 6% level in the diet significantly improved the body weight gain of chicken. [32] reported that Body weight gain improved when supplemental fat was added at 4% level. Bohnsack et al., (2002) *[19]* showed that weight gain increased as the level of fat was increased in the diet containing corn and poultry fats. Abas et al., (2004) *[33]* showed that significant effect of supplementing different sources of oil with the diets of broilers on weight gain.

The effects of different vegetable oils and animal fat on performance and carcass traits of broiler chicks fed on the diet containing corn oil, canola oil, sunflower oil and animal fat during 1th to 49th. The value of feed intake in all treatments at the one day to 49 days old was significant differ ($p<0.05$).

Table 7 show feed intake of the end of each week of the experiment. Shows there are a significant improvement ($p<0.05$) in periods (1-7), (15- 21), (22-28),(29-35) days. In period (1-7) day T2, T3, T4, T5 there are no significant compared with T1 (control), whereas T2 was significant compared with T3, T4, T2 reached to (98.618g) the highest compared with T3 (76.055g) which the lowest, and the same time T1 (control) reached to (86.099g), the cause of significant of T2 because their diet based on animal fat. In period (15-21) day T2, T3, T5 were significant compared with T1 (control), the highest feed intake was (331.332g) in T2 compared with T1control which reached to (290.453g) the lowest. T2 recorded highest feed intake (591.552g), compared with (T1) control the lowest which reached to (415.124g) in period (22-28) day old. T2, T3, T4, T5 were significant compared with T1in period (29-35) day, the highest feed intake was (1000.165g) in T2 compared with T1 which (748.304g) the lowest. Effect treatments were no significant on feed intake in periods (8-14), (36-42), (43-49) days, in the period (8-14) day the recorded highest to T2 (168.008g), whereas the recorded lowest weight in T1 (157.541g) and T4 (157.304g). The highest feed intake was (1312.019g) in T2 for period (36-42) days whereas T1 recorded lowest feed intake was (1210.611g). In period (43-49) day's end of the experiment, the highest feed intake was (1402.404) in T2, compared with other treatments.

This result is in agreement with Nobakht et al., (2011) *[34]*, who report that feed intake increased by the addition of sunflower oil at 4 % of the total composition in the starter diet of broiler chicks. According to what Ahmed et al., (2013) *[29]* and Bryant et al., (2005) *[35]* asserted dietary energy regulation by fat addition is one of the greatest effective approaches for adjusting feed consumption of broilers. On applying different levels and types of fat in the broiler diets; Fuller and Mario, (1977) *[36]* proved that energy and nutrients intake was higher for all diets containing fats. Christmas and Harms, (1988) *[37]* showed that daily feed intake was significantly improved by the addition of 6.8% animal fat in broiler diet. Higher feed intake in broilers fed on dietary tallow than rapeseed oil diets was reported by Scaife et al., (1994) *[6]and* Al Athari and Watkins, (1988) *[38]*. Saleh et al., (2009) *[8]* stated that the addition of 1.5% of oil in chicken diet escalated the consumption of feed which agrees with findings the present research. Increasing feed intake was related to the increasing sensitivity of adult chicks to fishy smell in the supplemented diet with oil [33]. In the result of Jeffri et al., (2010) *[39]* feed intake decreased by increasing fat sources to the diets of broiler chicks. According to Hulan et al., (1988) *[40]*, broilers fed on oil-containing diets have lower feed consumption. In addition, Bryant et al., (2005) *[35] and* Harms and Russeli, (2001) *[41]* indicated that augmenting fat addition or dietary energy reduced feed consumption and enhanced Feed Conversion Ratio

(FCR) of broiler chicks. Rahimi et al., (2011) *[42]* showed that use of oils in the broiler diet had no significant effect on feed consumption. Dieumou et al., (2009) *[43]* showed that the significant effect on feed intake when they study the effect of ginger and essential oils on growth performance of broiler chicks. Atteh et al., (1983) *[44]* reported that increase of and absorption canals and subsequently their further fat content on feed intake were not significant. The results of Nwoche et al., (2003) *[45]* showed that feed consumption was the highest. Olorede and Longe, (1999) *[46]* reported that supplementation of palm oil in broiler diet improved feed intake.

The effects of different vegetable oils and animal fat on performance and carcass traits of broiler chicks fed on the diet containing corn oil, canola oil, sunflower oil and animal fat during 1th to 49th. The value of feed conversation ratio in all treatments at the 1th to 49th old was significant differ ($p<0.05$).

Table 8 show feed conversation ratio of the end of each week of the experiment. The effect of treatments were significant differences ($p<0.05$) on feed conversation ratio in periods (1-7), (8-14), (29-35), (36-42) day, except in periods (15-21), (22-28), (43-49) days, there is no significant differences.T3 was significant compared with T1control, whereas T3 reached to (1.196) the lowest compared with T1 recorded highest feed conversation ratio(1.655) in periods (1-7) days. In period (8-14) days, the effect of T2, T4, T5 had significant on feed conversation ratio compared with T1control, while T4 reached to(1.834) which the lowest, compared with T1reached to (2.228) which the highest. In period (29-35) days T3 was significant compared with T1control, while T3 reached to (1.498) the lowest, compared with T1which was (2.573) the highest. T2, T4 had significant compared with T1control for period (36-42), while T2 reached to (1.845) which the lowest compared with T1which was (2.563) the highest. The effect of treatment were no significant differences, in period (15-21) days, T3 reached to (1.857) the highest while T4 reached to (1.576) the lowest compared with T1control which was (1.812).In period (22-28)days T5 reached to (1.385) the highest, while T2 which was (1.139) the lowest. In period (43-49) day T1control reached to (2.986) the highest, whereas T5 which was (2.341) the lowest.

The effects of different vegetable oils and animal fat on performance and carcass traits of broiler chicks fed on the diet containing corn oil, canola oil, sunflower oil and animal fat during 1st to 49 th. The value of Production Index in all treatments at the 1st to 49 th days old was significant differ ($p<0.05$).

Table 9 showed the effect of treatment were significant differences ($p<0.05$) on production index in periods (1-7),(8-14),(22-28),(29-35),(36-42),(43-49) days, except at the period (15-21) which there are no significant differences found ($p\leq0.05$).In period (1-7)day T3 had significant compared with T1control, while T3 recorded highest production index (140.707), compared with T1recorded lowest production index(80.747). For period (8-14) days T2, T3, T4, and T5 were significant compared with T1control, whereas T4 reached to (74.955) the highest but T1 reached to (53.825) the lowest. In period (22-28) days T3 was significant compared with T1control, while T3 recorded highest production index (273.187) compared with T1 which was (197.309) the lowest. The best production index was (283.076) in T3 for period (29-35) day, compared with (T1) control recorded lowest production index (109.099).In period (36-42) day T2, T3, T4, T5 were significant compared with T1control, whereas the best production index was (276.691) in T2 compared with (T1) control recorded lowest production index(138.585).Effect of treatments were significant at T2, T3,and T5 had a significantly ($P<0.05$) higher Production Index compares with T1control, for period(42-49)day whereas T5 reached to (241.592) which is the highest, compared withT1 reached to (135.076) the lowest, As a result we find out that T5 which is a sunflower oil was the best production index. In period (15-21) day there are no significant differences ($p<0.05$), the best production index was (119.239) in T4 while T1recorded lowest production index (86.812).

Table- 7. The effect of different vegetable oils and animal fat on feed intake (g) of broiler chicken.

Trea	1-7day	8-14day	15-21day	22-28day	29-35day	36-42day	43-49day
T1	86.1^{ab}	157.54^{a}	290.45^{b}	415.12^{b}	748.30^{c}	1210.61^{a}	1378.37^{a}
T2	98.62^{a}	168.01^{a}	331.33^{a}	591.55^{a}	1000.17^{a}	1312.02^{a}	1402.40^{a}
T3	76.06^{b}	163.50^{a}	323.06^{a}	559.23^{a}	914.09^{b}	1211.04^{a}	1392.17^{a}
T4	91.34^{ab}	157.30^{a}	313.75^{ab}	564.02^{a}	957.68^{ab}	1234.88^{a}	1330.15^{a}
T5	96.13^{a}	161.20^{a}	325.91^{a}	587.71^{a}	964.14^{ab}	1300.91^{a}	1370.47^{a}

*a, b, c: Means within columns with different superscripts differ significantly (p<0.05).

Table- 8. The effect of different of vegetable oils and Animal fat on FCR (g) of broiler chicken.

Treatment	1-7day	8-14day	15-21day	22-28day	29-35day	36-42day	43-49day
T1	1.66^{a}	2.23^{a}	1.81^{a}	1.22^{a}	2.57^{a}	2.56^{a}	2.99^{a}
T2	1.58^{a}	1.92^{b}	1.61^{a}	1.23^{a}	2.31^{a}	1.85^{b}	2.66^{a}
T3	1.20^{b}	1.99^{ab}	1.86^{a}	1.14^{a}	1.50^{b}	1.94^{ab}	2.58^{a}
T4	1.43^{ab}	1.83^{b}	1.58^{a}	1.356^{a}	2.19^{ab}	1.859^{b}	2.95^{a}
T5	1.45^{ab}	1.87^{b}	1.64^{a}	1.394^{a}	2.01^{ab}	1.982^{ab}	2.34^{a}

*a, b, c: Means within columns with different superscripts differ significantly (p<0.05).

Conclusion

In this research, we found out that the best oil is corn oil which given the best live body weight and weight gain. The best treatment is T3 which is corn oil which has given the least conversation ratio, so this is evidence that T3 was the best treatment. T2 (canola oil) is the best treatment in production index which had the highest rate in period (36-42) day, and T5 (sunflower oil) for periods (43-49) day which had the highest rate. T1 (control) is the best treatment in abdominal fat, while T3 (corn oil) had given the least abdominal fat.

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