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KOFAT© AS AN ALTERNATIVE SOURCE OF FAT IN BROILER DIETS

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ABSTRACT

A study was conducted to investigate the effect of Kofat© as the fat source on the performance of one strain of broiler. A total of 480 1d old Lohamn chicks was obtained from a commercial hatchery and placed in 8 pens. Two corn-soy diets were introduced, one contained soy-oil while the other contained Kofat©, as a source of fat in the diet. Each diet was assigned to 4 pens with 60 chicks in each. The experiment lasted 6 weeks. Data were subjected to ANOVA for a randomized complete block design. Feed conversion, average daily gain and feed consumption were not significantly affected by fat source (P>0.05). Also, parts yield, abdominal fat and cooking loss were not significantly affected by the treatment (P>0.05). Including Kofat© as a fat source of broiler diet resulted in the same performance as those contained soy oil but with low cost. Kofat© will make an excellent fat source for broiler diet from 1 d old until marketing age.

***Key words**:abdominal fat, chicken abdominal fat, fat, Kofat, performance,*

1. INTRODUCTION

Lipid constitutes the main energy source of poultry deits and it has the highest caloric value among all nutrients. Fats are used in broiler diet to increase the energy density. The addition of fat or oil to grower diets can improve feed efficiency and increase digestibility in broiler (Coon *et al*., 1981). The value of various fats or oils depends on price, ME contents, digestibility and absorption (Waldroup *et al*., 1995).

Fats used in poultry diets such as tallow or vegetable oils (soybean oil, rapeseed oil, coconut oil or corn oil) depend on the cost or location, where these oils are available. Vegetable oil such as soybean oil, sunflower oil or cottonseed oil are the major sources of supplemental fat available for use in poultry diets in the Middle East (Barbour *et al*., 2006).

The high cost of supplemental energy necessitates the optimization of fat inclusion in the diets especially during the finisher period where the feed consumption is the greatest. There is also a trend toward using oils from plant origin rather than using animal by-product sources in poultry diets. So, the demand is great toward feeding low-price, vegetable fat sources.

Kofat© is formulated from a mixture of various vegetable oils and is used as a supplement in animal feeds as a source of fat. Therefore, the objective of present study was to evaluate the effect of Kofat© as an alternative fat source on the performance and carcass quality of broiler chickens.

2. MATERIALS AND METHODS

2.1. Birds and management

Four hundred and eighty one day-old Lohamn broiler chicks were obtained from a commercial hatchery and randomly distributed among 8 floor pens with wood shavings with 60 chicks per pen. All pens had similar average of starting live body weight. The birds were reared in a conventional poultry house with raised side windows. The birds were maintained a 24h light schedule.

2.2. Diets and experimental design

Isocaloric and isonitrogenous corn-soybean meal diets were formulated to contain either soy oil or Kofat© as the source of fat in the diet (Table 1). Starter diet was fed from 1 to 21 day old, contained 21% CP and 3058 kcal of ME/kg. Finisher diet (22 to 42 day old) contained CP and ME were 19% and 3140 kcal/kg, respectively. Feed and water were provided *ad- libitum.*

Treatments were followed a randomized complete block design, in which each experimental diet was fed to 4 replicate pens. The experimental unit was the pen mean. Significant treatment effects were determined using ANOVA. All analyses were conducted with general linear model procedure of SAS® Software (SAS Institute, 1992).

2.3. Measurements

Body weight and feed consumption were recorded by pen at 21, 35, and 42 days of age. Feed conversion was computed. At the end of the experiment, representative males per pen were selected, weighed, and slaughtered. All viscera, abdominal fat, shanks and heads were removed. Parts of yield and abdominal fat were weighed and recorded (Izat *et al*., 1990). The left pectoralis muscles were deboned and weighed for cooking losses measurements.

Table (1): Composition and calculated analysis of experimental diets.

	Starter diet		Finisher diet	
	Diet1	Diet 2	Diet1	Diet2
Ingredients(g/kg)				
Corn yellow	605.2	605.2	658.3	658.3
Soybean meal (48% CP)	330.0	330.0	280.0	280.0
Soybean oil	25.0	-	28.0	-
Kofat©	-	25.0	-	28.0
NaCl	3.0	3.0	3.0	3.0
Limestone	7.2	7.2	7.2	7.2
Di Calcium phosphate	23.0	23.0	17.0	17.0
DL-methionine	1.6	1.6	1.5	1.5
Vitamin-mineral premix[1]	3.0	3.0	3.0	3.0
Amprol	0.5	0.5	0.5	0.5
Choline chloride	1.5	1.5	1.5	1.5
Calculated analysis				
CP (%)	21	21	19	19
ME (Kcal/Kg)	3050	3050	3140	3140
Methionine (%)	0.51	0.51	0.48	0.48
Methionine + Cystine (%)	0.90	0.9	0.78	0.78
Lysine	1.10	1.1	1.0	1.0
Linoleic acid	2.80	1.96	3.07	2.12
Calcium	1.0	1.0	0.85	0.85
A.V. Phosphorus	0.45	0.45	0.35	0.35

[1]Amount supplied per Kilogram of diet : calcium carbonate, 1.32 g (calcium,0.5 g); vitamin A (retinyl acetate), 186.000IU ;vitamin D3 (cholecalaiferol), 3.720 ICU vitamin E(DL-ά-tocopheryl acetate), 33.000IU; vitamin k(menadione sodium bisulfide), 5.4 mg; vitamin B1, 2.7mg; vitamin B2, 6.6 mg vitamin B12, 1.65mg ; niacin, 53.1mg; folic acid ,1.65 mg ;pantothenic acid (calcium D-pantothenate) , 15.9 mg D-biotin, 6.6 mg ;choline ,chloride , 300mg vitamin C 100mg ; butylated hydroxytoluene , 150mg ; 108mg;iron , 102 mg ; zinc, 77.4 mg copper, 16.1mg ; cobalt 0.16 mg; iodine 0.60 mg; and selenium,0.4

3. RESULTS AND DISCUSSION

The effect of oil source added in broiler diets on feed efficiency and growth are shown in Table 2. The amount of feed consumed by birds and their body weight gain were not significant (P>0.05). As a result, feed efficiency conversion was similar among the two treatments at 21, 35 and 42 d of age.

Similar response was obtained by Valencia *et al*. (1993) who reported that there were no effects of the sources of oil (refined palm oil, palm oil, corn oil and poultry fat) on weight gain and feed conversion of broilers.

The effect of fats on live performance of broilers is well documented. It was reported that by increasing the proportion of supplemental animal-vegetable blend fat from 0 to 60 g/kg in an isocaloric diets, feed conversion was improved without any effects on the body weight, feed intake, carcass composition, or abdominal fat (Girffiths *et al*., 1997). Growth stimulating property of oil is not just a result of their high energy value, chicks fed diets with soybean oil or corn oil consumed more ME than chicks fed comparable diets that had low fat content (Carew *et al*., 1963).

The value of the various fats and oils is entirely dependent on their ME contents, and the ME content of the fat should be dependent on their digestibility and absorption which are greatly dependent on their fatty acid content. . In this experiment, birds received the two dietary treatments had similar live performance; this led to the conclusion that the two fat sources have similar digestibility and absorbability rate.

Carcass parameters of broiler chickens fed the two dietry treatments are shown in Table (3). Treatment had no significant effects on dressing percentage, breast yield , leg quarter yield, abdominal fat or cooking loss (P>0.05).

Due to the high cost of feed ingredient for poultry especially dietary energy, it is important to continually evaluate the source as well as the level of energy in the diets (Pesti *et al*., 2002). Fat or oil supplementation occurs with major adjustments in corn and soybean meal level (Deaton *et al.*, 1981). Supplementing the diets with fat source maybe more cost effective over the finisher period because of increased digestibility of fat and improved of dietary ME (Wiseman and Salvador 1989). Kofat© is a cheaper source of fat compared to soybean oil or corn oil.

Table (2): Effect of oil source on body weight (BW), feed consumption and feed conversion (FC) of broilers at different ages.

Treatment				
Age	**Soybean oil**	**Kofat©**	**S.E.**	**P-value**
21 d				
BW(g)	690	691	±5.0	N.S
Feed (g)	1161.8	1108.4	±22.7	N.S
FC(g: g)	1.683	1.603	±0.027	N.S
35d				
BW(g)	1770	1796	±47.0	N.S
Feed (g)	3306	3229	±52.3	N.S
FC (g: g)	1.870	1.798	±0.049	N.S
42 d				
BW(g)	2247	2177	±38.2	N.S
Feed (g)	4401	4352	±89.0	N.S
FC (g: g)	1.95	2.000	±064	N.S

The effect of fat and vegetable oil needs to be examined not only for production characteristics but also for meat quality and blood parameters relative to human health (Ozdogan and Aksit, 2003). The results of the present study indicate that there was no differences in meat measurements (Table 3). Kofat© is formulated from a mixture of various vegetable oils supplemented with anti-oxidant and lecitain. The profile of fatty acids is of important to the quality of the utilized lipid, the absorption of these lipids, by and the quality of the fat deposited on the carcass. The fatty acid composition profile of Kofat© is as follows: Myristic acid (C14:0) 6.0, palmitic acid (C16:0) 30-35, stearic acid (18:0) 4.0-5.0, oleic acid (C18:1) 35.0-42.0, and linoleic acid (C18:2) 16-20%. In this study there was no significant effect of fat source on abdominal fat (P>0.05). The location of fat deposition depends on the kind of fatty acid that added to the diet (saturated and polyunsaturated). Birds fed diets rich of animal saturated fatty acids tend to have proportionally larger abdominal and mesenteric fat than other fat deposits (Deaton *et al.,* 1981).

It can be concluded that the replacement of soybean oil or corn oil with Kofat© resulted in good performance in terms of body weight, feed utilization, carcass characteristics for broilers while using Kofat© as a fat source resulted in lowering the feed cost based on the fact that the cost of Kofat© is $200/ton compared with soy oil.

Table (3): Effect of oil source on dressing characteristics of male broiler at 42d of age.

Treatments				
Character	**Soybean oil**	**Kofat©**	**S.E**	**P. value**
Dressing (%)	70.12	70.3	±0.21	N.S
Breast yield (% of dressed weight)	20.6	20.5	±0.12 4	N.S
Leg quarter yield (% of dressed weight)	33.93	33.95	±0.13	N.S
Abdominal fat (% of dressed weight)	2.35	2.48	±0.64	N.S
Cooking loss (%)	26.33	26.55	±0.23	N.S

(Means of four replicate pens of 2 male per replicate)

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إستخدام كوفات كبديل للدهن في علائق الدواجن

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ملخص

أجريت هذه الدراسة لبحث إمكانية استخدام كوفات كمصدر للدهن في عليقه كتاكيت التسمين . تم استخدام 480 كتكوتا من نوع لوهمان عمر يوم واحد وتم توزيعهما على 8 أقفاص بمعدل 60 كتكوتا بكل قفص. تم تقديم عليقه لكل 4 أقفاص لمدة 6 أسابيع . كانت العليقة الأولى تحتوي على زيت الصويا كمصدر للطاقة بينما احتوت العليقة الثانية على كوفات كمصدر للدهن. تم تحليل البيانات إحصائيا بوساطة SAS.

أظهرت النتائج أن معدلات النمو واستهلاك العلف كانت متشابهة ($P>0.05$) مابين المعاملات وكنتيجة لذلك كانت كفاءة التحويل متشابهة معنويا. كما أظهرت النتائج أن القطع المختلفة ومعدل الدهن البطني والفقد الناتج من طبخ عضلة الصدر كانت متشابهة معنويا ما بين المعاملات المختلفة.

و يمكن كنتيجة للدراسة استنتاج إن استخدام كوفات كمصدر للدهن في علائق كتاكيت التسمين ينتج أداء" مماثلا لاستخدام زيت الصويا معنويا لكن التكلفة أقل لذا يعتبرمصدر مناسب للدهن من عمر يوم حتى عمر التسويق لكتاكيت اللحم اعتمادا على أن سعر الطن الواحد لكوفات اقل بقيمة 200 دولار للطن الواحد مقارنة مع زيت الصويا .

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