



Scholars Research Library

Annals of Biological Research, 2011, 2 (3) : 94-98
(<http://scholarsresearchlibrary.com/archive.html>)



ISSN 0976-1233
CODEN (USA): ABRNBW

Effects of canola oil on the Iranian native Turkey's growth performance (Meleagris Gallopavo)

Ramin Salamatdoust nobar¹, Abolfazl Ghorbani¹, K. Nazerad¹, Habib Aghdam
Shahriyar¹, A. Fani², A. Ayazi², A. Hamidiyan² and Jamshid Ghiyasi¹

¹Department of Animal Science, Shabestar Branch, Islamic Azad University Shabestar, Iran

²Department of Animal Science, East Azerbaijan Research Center for Agriculture and
Natural Resources, Tabriz, Iran

ABSTRACT

The main objective of the poultry meat industry was to improve body weight and feed efficiency of the birds. For this propose an experiment was conducted to evaluation canola oil effects on the Iranian native turkeys performance. Ninety male turkey chicks were randomly distributed into three experimental with three replicate for each groups. Diets were isonitrogenous and isoenergetic were given to turkey chicks throughout four period of breeding (4th-8th, 8th-12th, 12th-16th and 16th-20th). Data was analyzed with one way ANOVA and means compared with Duncan test. As a result in this study, the use of canola oil in the turkey's diet affected growth performance, live weight and some of carcass characteristics, FCR improved and affected under feeding experimental diet but this effects not significant.

Keywords: Iranian native turkey, canola oil, growth performance.

INTRODUCTION

Poultry industry is one of the most important parts in Iran agricultural, and because of its relatively low price compared with meat has been considered most societies. Turkey's meat is an excellent protein source [1]. In east Azarbaijan Research Center for Agriculture and Natural Resources (Tatar Research Station) recently native turkeys of Azerbaijan collected and with some of genetically methods could improve that's genetically potential and compared with native turkeys in villages have significantly higher performance. The most practical method for increasing the energy density in poultry diets has been by the addition of fats and oils [2]. Lipids constitute the main energy reserve of animals, and it has the highest caloric value among all

nutrients (2.25 times more energy than carbohydrates and proteins). Oils of plant origin, such as canola oil (SO), contain high levels of unsaturated fatty acids and are more completely digested by fowl than animal fats such as tallow, which contain higher proportions of saturated fatty acids [3, 4, 5]. Therefore, the objective of the present study was to determine the effects of different levels of canola oil on the native turkey growth performance.

MATERIALS AND METHODS

2.1. Animals and Diets

The investigation was performed on 90 male native Iranian turkeys in their fattening period (from 4th to 20th week of age). The turkey chicks with completely randomized design of three treatments, with three repetitions and 10 chicks in each box were fed experimental diets containing 0% CO, 2.5% CO and 5%CO in the fattening period Data's recording was performed at 4 weeks period 4-8, 8-12, 12-16 and 16-20 week. The experimental diets formulated isonitrogenous and isoenergetic, accordance with the 1994 recommendations of the National Research Council [6] (table 1). The birds were given access to water and diets ad-libitum. The composition and calculated nutrient composition of the treatment diet is shown in Table 1. At the end of the growing period the number of four pieces from each pen randomly selected and slaughtered with cutting the neck.

2.2. Statistical Analysis

The performance and analytical data obtained were analyzed by variance analysis using the procedure described by the SAS version 8.2 [7]. The Duncan mean separation test was used to determine significant differences between mean values.

$$y_{ij} = \mu + a_i + \varepsilon_{ij}$$

Where

y_{ij} = all dependent variable

μ = overall mean

a_i = the fixed effect of oil levels ($i = 1, 2, 3$)

ε_{ij} = the random effect of residual

RESULTS AND DISCUSSION

Results of native turkey's performance were presented table1. Results show that with using canola oil body weight significantly affected and from 3568.2 g in the control group reached to 3965.6 and 3711.1 g for experimental treatments. Furthermore, carcass performance increased with usage canola oil in the diets and from 2649.1 g in the control group significantly reached to 2751.1 and 2895.6 g respectively.

Breast muscle weight also significantly affected the levels of canola oil and from 718.18 g for control group reached to 738.89 g and 781.11, respectively, but the other traits include thigh weight, wings, tie, proventriculus, gizzard, liver, spleen and heart were not affected on the canola

oil levels, but content of abdominal fat significantly affected, and 32.92 g of the control treatment, respectively reached to 96.23 and 84.34 g in the experimental treatments. Birds, particularly when young, use vegetable fats, more efficiently growth performance because they are predominantly unsaturated, compared with animal fats [8, 9, 10]. According to the results related to the feed conversion ratio (FCR) performance of turkeys in the table 2 to be seen turkeys FCR using canola oil was impressed. In comparison with control group FCR had been decreasing rate. In the 4-8 week of breeding period FCR from 6.42 in the control group reached to 6.47 and 6.39, respectively, in the experimental treatments this decreasing rate trend in the other breeding period and (8-12 and 12-16 weeks), but be seen in the 16-20 week growing period apparently some changes in turkeys and growth of sexual organs, weight gain compared with prior periods were lower and FCR in the range of 12, which is unsuitable economically. However, in treatments containing canola oil, respectively, 0.1 and 0.2 compared to control treatments FCR improved. During the total of breeding period a native turkey had a bad FCR and approximately is the range of 8. The results indicate that canola oil as an energy source contains the unsaturated fatty acids and affected growth rate of turkeys and about 0.3 to can improve FCR. The results indicate that native turkey performance is not good and require to genetic modification and for reducing cost of rearing must be keeping in the range.

Table1: Performance of turkey chicks fed the experimental diets

Traits	Control	2.5 percent oil	5 percent oil	SEM	P value
Carcass weight	2649.1	2751.1	2895.6	267.7822	0.0079
Live weight	3568.2	3711.1	3965.6	320.0512	0.0083
thighs weight	738.18	743.33	785.56	75.9904	0.0097
breast weight	718.18	738.89	781.11	77.16145	0.0164
wing weight	369.09	363.33	378.89	35.25323	0.0102
tie weight	114.545	112.778	111.811	11.30495	0.2060
Abdominal fat weight	32.92	96.23	84.34	19.86416	0.0018
proventriculus weight	15.336	8.689	9.656	8.891081	0.7575
Gizzard weight	94.500	86.889	97.378	10.9021	0.0313
Spleen weight	1.8545	2.0889	2.0778	0.37727	0.3632
heart weight	20.173	23.467	24.033	1.854748	0.0003
liver weight	70.636	70.122	69.289	6.963393	0.0491

Table2: Feed conversion ratio of turkey chicks fed the experimental diets

Treatments	FCR 4-8 WK	FCR 8-12 WK	FCR 12-16 WK	FCR 16-20 WK	FCR Total breeding period
Control	6.592	7.71	5.261	12.457	8.549
2.5 percent oil	6.471	7.596	5.217	12.300	8.205
5 percent oil	6.396	7.583	5.181	12.207	8.214
P value	0.7717	0.9471	0.1828	0.6367	0.8977
SEM	0.7743	1.7626	0.7216	0.6368	0.4845

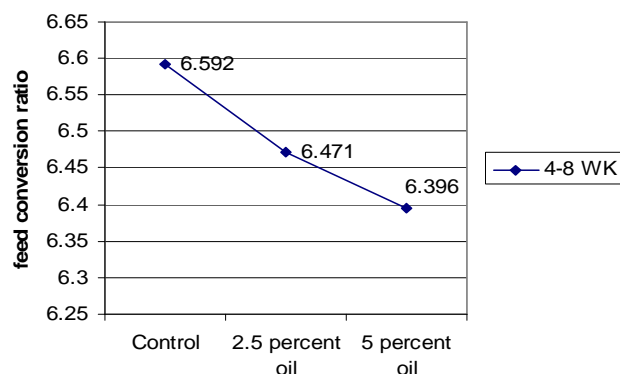


Figure1: Feed conversion ratio of turkey chicks fed the experimental diets(4-8 wk)

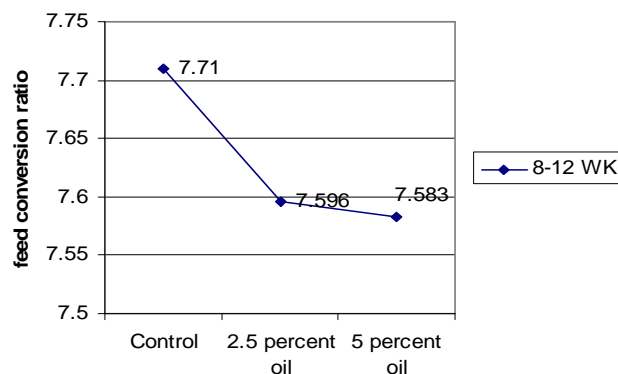


Figure 2: Feed conversion ratio of turkey chicks fed the experimental diets(8-12 wk)

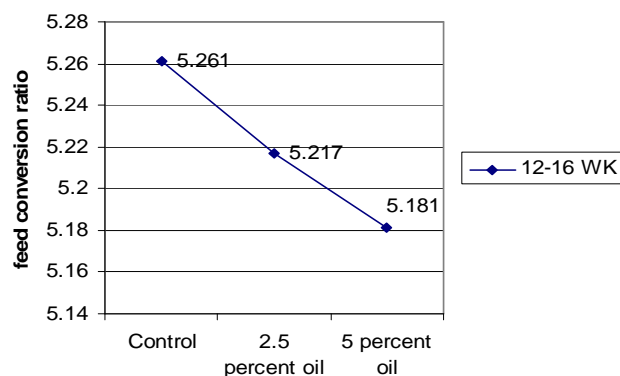


Figure 3: Feed conversion ratio of turkey chicks fed the experimental diets(12-16 wk)

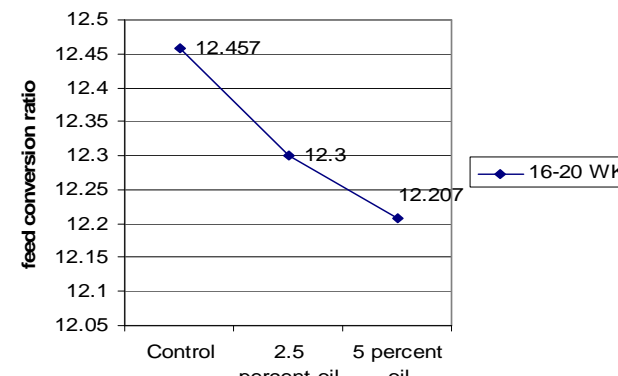


Figure 4: Feed conversion ratio of turkey chicks fed the experimental diets(16-20 wk)

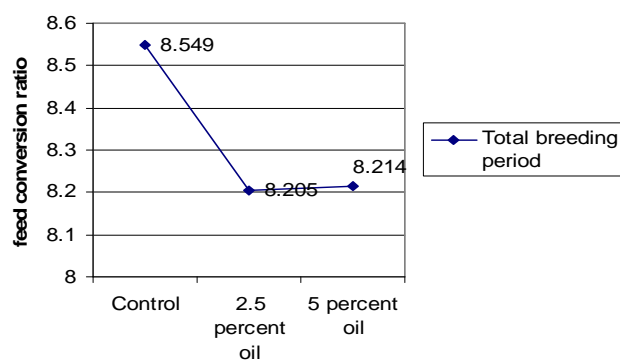


Figure 5: Feed conversion ratio of turkey chicks fed the experimental diets(total breeding period)

TABLE 1. Percentage composition of experimental diets in four period

Ingredients'	4 -8 week			8 - 12 week			12 - 16 week			16 - 20 week		
	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
Corn	42.50	38.00	36.00	45.60	43.00	35.00	56.64	48.50	40.00	64.41	58.00	48.00
SBM	34.40	36.00	31.15	28.25	27.30	28.24	26.00	27.00	27.50	21.00	21.00	21.00
Oi	0.00	1.25	2.50	0.00	2.50	5.00	0.00	2.50	5.00	0.00	2.50	5.00
Fish	4.80	3.70	6.60	8.00	8.00	8.00	2.64	1.82	1.50	0.65	0.70	0.67
Starch	3.10	3.22	1.56	7.46	3.32	3.37	6.57	6.51	6.50	7.10	5.56	6.71
Alfalfa	3.47	5.00	6.00	3.00	5.00	6.00	1.50	4.00	6.00	1.00	3.80	6.00
DCP	1.38	1.52	1.11	0.63	0.61	0.62	1.03	1.15	1.18	1.17	1.15	1.15
Met	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Lys	1.50	1.50	1.50	1.50	1.50	1.50	1.40	1.50	1.50	1.50	1.50	1.50
Oyster	1.02	1.02	0.86	0.73	0.67	0.62	0.92	0.87	0.82	0.90	0.81	0.73
wheat bran	2.00	3.00	6.00	2.50	5.00	6.00	1.00	3.00	6.00	0.00	1.70	5.00
Vit supp ¹	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Min supp ²	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Sand	3.58	3.54	4.47	0.08	0.85	3.40	0.05	0.90	1.75	0.02	1.03	1.99
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Calculated nutrient content												
ME kcal/kg	2755	2755	2755	2850	2850	2850	2945	2945	2945	3040	3040	3040
Crude protein (%)	24.7	24.7	24.7	20.9	20.9	20.9	18.1	18.2	18.1	15.7	15.7	15.7
Calcium (%)	0.95	0.95	0.95	0.81	0.81	0.81	0.71	0.71	0.71	0.62	0.62	0.62
Available P (%)	0.48	0.48	0.48	0.40	0.40	0.40	0.36	0.36	0.36	0.31	0.31	0.31
ME/CP	112	112	112	136	136	136	163	162	163	194	194	194
Ca/P	2	2	2	2	2	2	2	2	2	2	2	2

¹Vitamin content of diets provided per kilogram of diet: vitamin A, D, E and K.

² Composition of mineral premix provided as follows per kilogram of premix: Mn, 120,000mg;

Zn, 80,000 mg; Fe, 90,000 mg; Cu, 15,000 mg; I, 1,600 mg; Se, 500 mg; Co, 600 mg

CONCLUSION

As a result in this study, the use of canola oil in the turkey's diet affected growth performance, live weight and some of the carcass characteristics. FCR improved and affected under feeding experimental diet but this affects not significant.

REFERENCES

- [1] MM Castro Ferreira; MA Morgano; SC Nascimento de Queiroza; DMB Mantovani; Food Chemistry, **2000**, 69, 259-265.
- [2] G Hill; L Dansky; *Poultry Sci*, **1954**, 33, 112–119.
- [3] D Sklan; *Poultry Sci*, **1979**, 58, 885–889.
- [4] C Corino; V Dell'orto; O Pedron; *Riv. Zootec Vet*, **1980**, 2, 94–98.
- [5] S Leeson; JO Atteh; *Poultry Sci*, 1995, 74, **2003–2010**.
- [6] NRC. Nutrient Requirements of Poultry. 9th rev. ed. Natl. Acad. Press, Washington, DC, **1994**;
- [7] SAS Institute. SAS User's Guide: Statistics. SAS Inst. Inc., Cary, NC, **2003**;
- [8] RJ Young; *Poultry Sci*, **1961**, 40, 1225–1233.
- [9] J Wiseman; F Salvador; *Br. Poult. Sci*, **1989**, 30, 653–662.
- [10] J Wiseman; F Salvador; *Poultry Sci*, **1991**, 70, 573–582.