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Research Article

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Comparing the Effects of Slaughterhouse Waste Products and Herbal Fats on Fat Level of Japanese Quail

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ABSTRACT

Current study was carried out to investigate the effects of slaughterhouse waste products and herbal fats on fat level of Japanese quail. 300 quail pieces were studied in a completely randomized design with six treatments and fivereplications (10 quails for each replication). Treatments were control (no-fat diet), control plus (no-fat diet plus lecithin emulsifiers), 20% slaughterhouse waste products fat plus 80%herbal fat,40% slaughterhouse waste products fat plus 60% herbal fat, 60% slaughterhouse waste products fat plus 40% herbal fat, and 80% slaughterhouse waste products fat plus 20% herbal fat. Obtained data were analyzed using SAS program. At the end of period, blood samples were taken in two replications from wing vein to measure HDL, LDL, triglyceride and total cholesterol. Results showed that 20-80SH had the highest HDL amount whereas 80-20SH had the highest cholesterol and LDL amounts. According to results, by using cheaper fat resources (slaughterhouse waste products), economical diets can be prepared without reduction in quails yield.

Keywords: Slaughterhouse waste products; Fat; Herbal fat; Lecithin quail

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INTRODUCTION

Industrial quail farming is one of poultry farming fields. The entire activity from production of hatching eggs to the slaughter and packaging is done in a complex. Therefore, managing these farms is very important. Cereal grains are the main energy source of diet. In most diets, animals' fats and herbal fats are also used to provide higher levels of energy [1]. Lecithin has been used lately in diets as an emulsifier. This is an energizer material which prevents cholesterol accumulation in body. Vegetable oil shaves more digestibility and absorption and produce higher metabolic energy in spite of their higher prices. On the other side, using cheaper resourcessuch as slaughterhouse waste products' fats in place of expensive resources including soybean oil, corn oil and canola oil can reduce diet costs [2]. Nowadays, poultries have high growth rate and improved conversion ratio because of geneticselections, management and good nutrition.Such features lead to increased work of modified birds' cardiovascular system which puts the birds at risk of metabolic disorders. High amounts of slaughterhouse waste products are thrown away annually which can be a considerable fat resource for poultry diet by appropriate processing. On the other hand, processing these waste products is a brand new industry in Iran which needs institutional cooperation, including breeders of livestock and poultry. Therefore, adding lecithinemulsifier to diet can improve fat digestibility in quail chickens. Current study was carried out to compare the effects of slaughterhouse waste products and herbal fats on fat level of Japanese quail.

EXPERIMENTAL SECTION

The experiment was carried out in 2015 summer in a 10'000 quail houselocated in Isfahan east. Thirty beds were used. Six treatments with five replications and 10 pieces for each replication were selected. Diet was prepared by UFFDA software according to national researches association recommendation, separately for beginning and terminal stages. Treatments were: control (no-fat diet), control plus (no-fat diet plus lecithin emulsifiers), 20% slaughterhouse waste products fat plus 80% herbal fat, 40% slaughterhouse waste products fat plus 60% herbal fat, 60% slaughterhouse waste products fat plus 40% herbal fat, and 80% slaughterhouse waste products fat plus 20% herbal fat. (Fat level was 3% in all fat having diets). Herbal fats were bought from *A'alaRoghan Sepahan Company*. This fat which was obtained from industrial slaughter houses was used in this study for first time as fat for poultry feed Instead of edible oil such as soybean. Total blood fat divides into cholesteroland triglyceride. Cholesteroldividesitself into harmful cholesterol (LDL) and useful cholesterol (HDL). Triglyceride enters body orally up to 90%.Fat amounts were measured in the study using auto analyzer. Obtained data were analyzed using SAS (2008) in a completely randomized design. Means were compared using LSD test. Statistical model of this study was:

$$Y_{ij} = \mu + \alpha_{jikl} + e_{ijkl}$$

Which

Y_{ijkl} - The amount of each observation

μ - population average

α_{jikl} - treatments effects

e_{jikl} -Experimental error effect

RESULTS AND DISCUSSION

The highest HDL amount was obtained from third treatment (20-80SH) which was different from other treatments significantly ($p<0.05$). The lowest HDL amount was obtained from sixth treatment (80-20SH) which was also different from other treatments significantly ($p<0.05$). Sixth treatment produced the highest LDL amount which was significantly ($p<0.05$) different from other treatments and third treatment had the lowest LDL amount. Cholesterol amount of sixth treatment was higher than other treatments significantly ($p<0.05$) whereas the lowestcholesterol amount was obtained from first treatment (control group).

Table1: Blood parameters amounts of treatments

Treatment	Parameters			
	HDL	LDL	Cholesterol	Triglyceride
1	73.6^{e}	68.1^{d}	154.8^{f}	162.3^{e}
2	75.8^{d}	66.4^{e}	156.2^{e}	166.4^{e}
3	98.1^{a}	64.8^{f}	162.2^{d}	192.6^{b}
4	86^{b}	70.7^{c}	174.4^{c}	196.4^{a}
5	81.9^{c}	73.8^{b}	186.8^{b}	184.4^{c}
6	71^{f}	76^{a}	194.4^{a}	178.2^{d}
SEM	0.38	0.31	0.77	0.47

There is no significant difference between the numbers of each column with at least one similar letter ($p<0.05$)

Fourth treatment (40-60SH) showed the highest triglyceride amount which was statistically different from other treatments ($p<0.05$) but first and second treatments (control and control plus emulsifier) had the lowest triglycerides.Scientists have announced that increased excretion of bile acids from the intestine makes liver cells to convert morecholesterol to these acids to replace them; therefore liver cells will require more cholesterol and then the expression of LDL-c genes will be increased in these cells which is followed by increase in the number of LDL-C receptors on liver cells surfaces [3]. At this time, more LDL_C lipoproteins will be collected from blood by these receptors and enter liver cells to be analyzed and extant cholesterol in them will be used in synthesis of bile acids. So, the concentration of LDL-C and total cholesterol in the blood will be reduced. These subjects are in agreement with results of this study [3]. Herbal oils including diets are rich of linoleic and linolenic acids which play roles in reducing cholesterol [4, 5]; this is in agreement with our results.

CONCLUSION

On the whole, it seems that by using cheaper fat resources (poultry waste products) more economical diets can be prepared without reduction in quail yield.

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