



Effect of Olive Leaves Extract on Lipid Profile, Glucose and Feed Intake of Japanese Quail

Tawheed Ali Azeemi¹, Mohammad Asif², Merhatam Niazi³

¹Animal Science Department, Faculty of Agriculture, University of Nangrahar, Afghanistan

²Department of Histopathology, Faculty of Medicine University of Nangrahar, Afghanistan

³Animal Science Department, Agriculture, Faculty, Nangrahar University

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ABSTRACT

In Afghanistan most times people are drinking olive leaf tea for prevention and decline of higher lipid and glucose level, therefore the objective of the current study was to find out whether olive leaf extract is having any effect on blood metabolites. The Japanese quail has been used for biological studies because of its easy management and large numbers in limited area. In this experiment quails (100 male and 100 female) were reared on a farm owned by the Department of Animal Science of Agriculture Faculty of Nangrahar University. Quails were kept under optimum environmental conditions during rearing period (20- 22°C and 65% relative humidity). The adaptation period was 10 days. Feed was given ad libitum during 24 h. In this study we had five treatments T0 served as control without olive leaf extract, T1 (1g/L), T2 (2g/L), T3 (3g/L) and T4 (4g of olive leaf / liter of drinking water). Each treatments continued for 4 weeks at the end of week. By increasing level of the olive Leaf extract blood glucose, cholesterol and triglycerides levels declined significantly from 509 to 422.5, 204 to 44.5 and 245 to 192.5 mg/dl respectively.

* Corresponding Author:

E-mail: tawheedn@gmail.com

Introduction

Olive leaves have been used as medication in different times for its health benefits and flavor. The health benefits included are anti- aging, immunostimulator, antibacterial (Bisignano et al., 2001), antifungal, anti-viral (Fredrickson, 2000) and anti-inflammatory (Benaventa-Garcia et al., 2000).

Olive leaves contain ingredient which possess hypocholesterimic and hypoglycemic activities, these substances are luteolin, arigenine, oleic, maslinic acids and olivine-diglucoside (Dekanski et al., 2007; Botsoglou et al., 2010) stated that microbial growth was inhibited by supplementation of olive leaves in poultry diet.

The Japanese quail has been used for biological studies because of its easy management and large numbers in limited area. According to Deka and Borah, 2008 studies quail possess an excellent resistance to diseases and economical viability compare to chicken.

Kreshi et al. (1997), reported that biochemical analysis of blood is not only a valuable tool for the health animal but is also a best way for clinical monitoring and diagnosis of diseases. Evaluation of blood biochemical

shows the degree of in vital organs. Therefore the objectives of the present study were to investigate the effect and relation of olive leaves extract on feed intake, lipid profile and Blood glucose levels.

Methods and Materials

The quails (100 male and 100 female) were reared on a farm owned by the Department of Animal Sciences of Agriculture Faculty of Nangrahar University. Quails were kept under optimum environmental during rearing period (20- 22°C and 65% relative humidity).

The adaptation period was -10 days. Feed was given ad libitum during 24 h .The calculated nutrient content of diet is below.

ME	:	2925 kcal/kg
Crude Protein	:	21(%)
Crude Fat	:	28(%)
Calcium	:	0.95(%)
Available Phosphorus	:	0.50(%)
Ca/P	:	2.1

Olive leaves were taken from olive orchard in Jalalabad city of Nangrahar province. The olive leaves were dried in shed for 4 days and then milled by grinder. Measured amount of mailed leafs were put in boiled water and left for 12 hours. After this period the extraction was added to drinking water. In this study we had five treatments T0 served as control without any water supplementation, T1 (1g/L), T2 (2g/L), T3 (3g/L) and T4(4g of olive leaf extract/ litter of drinking water). The Experiment continued for 4 weeks at the end of week.

Quails were slaughtered for blood samples. The blood samples for biochemical analysis were collected in sterile tubes without any anticoagulant and serum was separated within two hours of collection.

Total cholesterol concentration in blood serum was measured by Roeschau et al (1974) and the serum triglyceride was measured according to the Fossati and Prencipe (1982) method. The amount of feed was given daily and the refused amount was daily measured for feed intake.

Statistical analysis

The experimental data was analyzed by SPSS 16.0.1 statistical package programme (SPSS In., Chigao, IL, USA.) The general liner model function was used for the analysis of variance (ANOVA).

Results and Discussion

Glucose

The blood glucose level was significantly decreased

from 509 mg/dL to 422.5 mg/dL with the increasing level of olive leaf extract. There was a significant difference between treatments ($P<0.000$) (Table 1). The mean of serum glucose levels was 470 ± 10.85 mg/dL. No differences between sexes have been found (Table 2). Our findings are in the same line with the study of R.Prakash Krupakaran (2013). The large amount of glucose in serum is due to the glucagon secreted by alpha cells of Islets of Langerhan and according to the El-Ghalid (2009) reports higher blood glucose level is due to higher gluconeogenic hormones.

Cholesterol

Serum cholesterol level (173 ± 7.75) was significantly decreased ($P<0.000$) from 206 to 144.5 mg/dL with the increasing levels of supplementation (Table 1). Extract supplementation did not have any effect on sex (Table 2). Lowering of serum cholesterol might be a cardio-protective effect of olive leaf extract.

Triglycerides

Serum triglycerides was significantly decreased from 245 mg/dL to 192 mg/dL with the increased level of olive leaf extraction (Table 2) $P<0.000$. Supplementation levels did not have any effect on sex (Table 2) $P<0.148$.

Feed Intake

Feed intake decreased significantly, as the olive leaf extract supplementation levels was increased (Table 2) The marked decline in above blood biochemical might be o reduced feed intake along alkaloids of olive leaf.

Table 1 Effect of Olive leaf extraction levels on blood biochemical.

Treatments	Glucose mg/dL	Total Cholesterol mg/dL	Triglycerides mg/dL	Feed Intake g/day
T0	509.5	206	245	33.5
T1	495	191	232	30.5
T2	482	173.5	212.5	29.5
T3	445	147	202.5	26.5
T4	422.5	144.5	192.5	25.5
P.Value	0.000	0.000	0.000	0.000

Table 2 Olive leaf extraction levels on blood biochemical of male and female quails.

Sex	Treatments	Glucose mg/dL	Total Cholesterol mg/dL	Triglycerides mg/dL	Feed Intake g/day
Female	T0	510	220	255	33.5
	T1	490	195	240	30.5
	T2	481	178	220	29.5
	T3	442	156	204	26.5
	T4	420	148	190	25.5
Male	T0	506	204	230	31.4
	T1	485	200	229	30
	T2	483	175	210	30.1
	T3	438	140	191	27.8
	T4	424	138	183	26.8
	Overall Means	470 ± 10.85	173 ± 7.75	216 ± 6.47	29.1 ± 0.97

Conculsion

Our finding are in agreement with previous studies done by R.Prakash Krupakaran (2013) showing that olive leaves extract decrease serum glucose, while it is the first time we have reported that olive leaves extract is decreasing other blood metabolites as well. Increased olive leaf extraction decreases the cholesterol level which is a good properties while higher level may decrease egg production due lowering of cholesterol. Olive leaf extraction supplementation should be in medium level for better health and production.

References

- Benavente-Garcia O, Castillo J, Lorente J, Ortuno A, Del Rio JA 2000. Antioxidant activity of phenolics extracted from *Olea europaea* L. leaves. Food Chemistry; 68: 457-462.
- Bisignano G, Lagana MG, Trombetta D, Arena S, Nostro A, Uccella N, Mazzanti G, Saija A 2001. *In vitro* antibacterial activity of some aliphatic aldehydes from *Olea europaea* L. FEMS Microbiology Letters; 198: 9-13
- Botsoglou, E., Govaris, A., Christaki, E. & Botsoglou, N 2010. Effect of dietary olive leaves and/or α -tocopheryl acetate supplementation on microbial growth and lipid oxidation of turkey breast fillets during refrigerated storage. Food Chem.; 121: 17-22.
- Deka K, Borah J. 2008. Haematological and biochemical changes in Japanese Quails *Coturnix coturnix japonica* and chickens due to *Ascaridia galli* infection. International Journal of Poultry Sciences, 7(7): 704-710.
- Dekanski D, Janicijevic-Hudomal S. 2007. Medicinal features of olive leaf (*Olea europaea* L.). Praxis Medica; 35(1-2): 89-92.
- El-Ghalid OAH, 2009. Exogenous Estradiol Blood profile, productive and reproductive performance of female Japanese Quails at different stages of production. Asian J. Poultry Science Journal 3(1): 1-8
- Fossati P, Principe L. 1982. Serum triglycerides calorimetrically with an enzyme that produces hydrogen peroxide. Clin. Chem.; 28: 2077-80.
- Fredrickson WR 2000. Method and composition for antiviral therapy with olive leaves. United States patent 20006117844. 2000 set 12. 6,117,844.
- Karesh WB, Campo AD, Braselton E, Puche H, Cook RA. 1997. Health evaluation of free ranging and hand reared macaws (*Ara spp.*) in Peru. Journal of Zoo and Wild Life Medicine 28: 368-277
- Raksh Krupakaran R. 2013. Serum Biochemical profile of Japanese quail, Indian Journal of Fundamental and Applied Life Sciences ISSN: 2231-6345, Vol.3 (1) January – March , pp. 183-183/Krupakaran.
- Roeschau P, Bernt E, Gruber W .1974, Enzymatic determination of total cholesterol in serum's Kiln Chem. Kiln Biochemist.; 12: 226-27.