set al., 2000), resulting in ischemic-reperfusion injury and increased free radical production.

Summary
From the findings of this study, it may be concluded that addition of Lathyrus sativus seed flour @ 30 % level in feed is beneficial in the prevention of myocardial ischemia and its injury.

References


Effect of Fenugreek, Garlic and Black Pepper Powder Supplementation on Serum Lipid Profile of Broilers

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Abstract
This study determined the effects of fenugreek, garlic and black pepper powders on the serum lipid profile of broilers. Fenugreek, Garlic and black pepper powders were each added to broiler diets at 5 and 10g/Kg of diet. Control diet did not contain any test ingredient. Dietary treatment significantly (P<0.001) influenced the serum lipid profile level. The fenugreek powder exhibited better antilipidemic influence on the triglyceride and serum cholesterol of broiler than garlic and black pepper. 10g fenugreek powder (T₃) recorded significantly lower serum triglyceride level (201.51 mg/dl), serum total cholesterol (139.44mg/dl) and LDL-C (29.46mg/dl) level as compared to other treatment groups.

Key words: Fenugreek, Garlic, Black pepper, serum lipid

Phytoadditives influence the serum lipid profile in broilers. Phytochemical present in fenugreek, garlic and black pepper has the capacity to change the serum lipid profile level. Fenugreek has been reported to have hypolipidemic effect on animals (Petit et al., 1993). Garlic prevents the fat infiltration in liver (Sand et al., 1995).

Materials and Methods
The experiment used completely randomized
design consisting of 7 dietary treatments with 4 replicates and 8 chicks per replicate. The treatment 1 consists of basal diet (control), Treatment 2, 3, 4, 5, 6 & 7 consists of 5g fenugreek, 10g fenugreek, 5g garlic, 10g garlic, 1g black pepper & 2g black pepper powder per kg of diet. The experimental diet was formulated according to the standards of Bureau of Indian Standards (B.I.S., 1992). At the end of 42nd day of age, Blood samples were collected from four male and four female birds per treatment for serum separation. The sera samples were analyzed for total cholesterol and HDL cholesterol as per one-step method of Wybenga et al. (1970) and triglycerides were estimated as per enzymatic (Glycerol-3-phosphate oxidase / Trinder), end point colorimetry, single reagent chemistry with LCF (Lipid Clearing Factor) method (McGowan et al., 1983). The LDL cholesterol was calculated by using values of total cholesterol, HDL and triglycerides. The one way ANOVA were used to determine the significant difference existed between the 7 different diets. Significance was tested by a post hoc analysis method (Snedecor and Cochran, 1989).

Results and Discussion

The serum triglyceride revealed significant (P<0.01) difference among treatment groups. The group T₃ recorded lower serum triglyceride level (201.51 mg/dl) as compared to other treatment groups. Same results were drawn by Mamoun et al. (2014) in broilers fed with fenugreek seed powder. The group T₄ and T₅ recorded lower triglyceride level than control. Previously, Issa and Omar (loc cit.) found similar results during garlic feeding. This might be due to the hypocholesterolemic effect of fenugreek powder due to its active ingredients such as saponins, hemicelluloses, mucilage, tannin and pectin and these compounds help lower blood LDL-cholesterol levels by inhibiting bile salts (Kutlu et al., 2001). Saponins present in fenugreek when ingested, they form large mixed micelles with bile salts and significantly reduce serum cholesterol, by increasing fecal excretion of bile salts, thereby inhibiting cholesterol absorption (Kutlu et al., loc. cit). Lower serum total cholesterol and LDL-C level were observed in garlic fed groups (T₄ > T₅). Previously, Issa and Omar (loc cit.) found similar results during garlic feeding. This might be due to hypocholesterolemic and hypolipidemic action of garlic which depresses hepatic activities of lipogenic and cholesterogenic enzymes such as malic enzyme, fatty acid synthase, glucose-6-phosphate dehydrogenase and 3-hydroxyl-3-methylglutaryl-CoA (HMG-CoA) reductase (Qureshi et al., loc cit.). The reduction in LDL-C value was due to antioxidant and antiperoxide action of garlic powder (S-allyl cysteine sulfoxide) on LDL or the decrease in hepatic production of VLDL which serves as the precursor of LDL in the blood circulation (Grundy, 1986). In garlic fed groups, HDL-C level was significantly (P<0.01) increased as compared to control. This might be due to the presence of phytochemical – allicin in garlic, which is responsible for increased level of HDL (Issa and Omar, loc cit.). This was brought by combination of allicin with the –SH group that is important in activation of CoA which is essential for the biosynthesis of HDL cholesterol (Issa and Omar, loc cit.). The serum total cholesterol and LDL cholesterol was lower in black pepper powder fed groups (T₆ and T₇). These results are in line with report of Shahverdi et al. (2013). This might be due to substances like carvacrol and tymol which are present in black pepper and these substances had effect on cholesterol and triglyceride and decreased their levels in blood (Zargari, 2001).

Summary

The fenugreek powder at high level of inclusion was recorded in group T₃ than other treatment groups. These results are in agreement with Mamoun et al. (loc cit.). This might be due to the hypocholesterolemic effect of fenugreek powder.
(10g/kg) lowered the serum triglyceride, total cholesterol and LDL cholesterol level in broilers. Incorporation of garlic and black pepper powder to broiler diet were also reduced the serum triglyceride and total cholesterol level.

References


