Blood Biochemical Profile in relation to Carbohydrate and Lipid metabolism in Rabbit

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Introduction

Rearing of rabbit is an established micro livestock industry in many countries where rabbit are domesticated for meat. Broiler breeds of rabbits have also been introduced in India to explore its avenue as an alternative source of animal protein. Rabbit mean has high biological value(21%) and low in fat and cholesterol. Rabbit grow rapidly and their rate is comaparble to that of broiler chicken (Rao,et.al.,1997). Proper nutrition is one of the important aspects of broiler rabbit production.

The protein and energy content of the diet play a vital role in rabbit nutrition. Biochemical characterization of rabbit will help in better understanding of rabbit in relation to growth, meat, fur and wool quality. An attempt was made in present investigation to study the blood biochemical profile in desi rabbit.

Materials and Methods

Desi rabbit 6 each of either sex were divided into two groups, One is honey treated group and other is control group. The experiment was conducted at Ranchi Veterinary College, Rabbit Farm Unit, Kanke, Jharkhand.

Group II had given 5% simple sugar level in drinking water. All the rabbit were kept under uniform management practices till the end of the experiment. Blood sample were collected at the end of experiment directly from heart of rabbit with or without anti-coagulants into sterile test tube. Serum was harvested from whole blood and kept refrigerated until analyzed. Biochemical parameters were studied with the help of seperated serum.

Estimation of total blood glucose:

Blood glucose was estimated by Nelson-Somogyi method (1945). 0.1 ml of blood in a test tube was taken and 9.5 ml of zinc sulphate solution was added and mixed by rotation. Then alkaline copper reagent was mixed by tapping the top of the tube. It was covered with a marble. It was placed upright in a boiling waterbath for 5 minutes. Then 1 ml arsenomolybdate coloring reagent was added and mixed, and then it was diluted to 10 ml with distilled water. A blank and standard was run simultaneously. Then absorbance was recorded at 540 nm in photo-electric colorimeter model AE-11 Japan.

Estimation of serum cholesterol:

Total serum cholesterol in blood was estimated by method of Ziatkis,et.al.(1953). 0.1 ml serum sample was taken in a test tube. Glacial acetic acid 6.0 ml and coloring reagent 0.4 ml were added. The contents were mixed well. Simultaneously, 0.1 ml of water as blank and 0.1 ml of standard cholesterol solution 2 mg /ml were run similarly treated. Then tubes were allowed to cool at room temeperature. The optical density was recorded at 540 nm in photo-electric colorimeter model AE-11 Japan.

Estimation of serum lipid:

The total serum lipid estimation was done by using the method of Marsh and Weinstein (1996). 1 ml of serum was taken with 19 ml of chloroform:methanol (2:1 v/v) mixed well and allowed to stand overnight. The extract was filtered by using Watsman no.1, filter paper in 50 ml of conical flask. Filter paper with residue was cut into pieces and again transferred into 19 ml chloroform kept overnight. This procedure was repeated 3 times. The filtrate was combined with previous extract. The extract was evaporated at 45^{O}C - 50^{O}C in Sand bath for breaking the volume of original lipid extract in chloroform:methanol:water (64:32:4 v/v) and evaporated to dryness in Sand bath at 45^{O}C - 50^{O}C. This step was repeated thrice and dried residue was disolved in chloroform:methanol (2:1 v/v) and transferred to seperating funnel for removing non-lipid impurities. The lipid extract was layered with 1/5th volume of normal saline (0.9% NaCl) and mixed several times by gentle inversion. It was allowed to stand for 6 to 8 hours at room temperature. The lower chloroform layer was collected, evaporated to dryness in sand bath at 45 ^{O}C-50 ^{O}C and was repeated thrice. The extract was dissolved in known

Table-1

Parameter	GroupNo.	Male	Female	Groups
Blood Glucose mg%	Control Treatment	139.3±7.86 206.03±7.86	145.4±4.24 181.40±4.24	142.38±10.89 193.91±7.65
Serum Cholesterol mg%	Control Treatment	48.50±1.96 65.16±1.96	43.83±1.23 54.33±1.23	46.08±4.5 59.75±2.6
Serum Lipid mg%	Control Treatment	5.33±1.15 6.66±1.15	3.66±0.038 3.33±0.038	4.5±0.56 5.0±0.78
Serum Phospholipid mg%	Control Treatment	141.6±5.30 96.6±5.30	116.6±0.94 108.3±0.94	129.0±7.04 102.5±13.68

volume of chloroform. The total lipid extract were determined aluminium/stainless steel planchets and dried at 40 ^{O}C - 50 ^{O}C in an oven until constant weight were reached. Increased weight gives total serum lipid.

Estimation of Phospholipids

The total phospholipid in the serum was estimated by method of Post and Sen (1969). An aliquot 0.1 of lipid extract was taken into microkjeldahl flask and 0.4 ml of 60% perchlororic acid solution was added. It was digested directly on a sand bath for 20 minutes. Glass beads (2-3) were added to each flask to avoid bumping during digestion (Breckhyr,1968). The 0.1 ml of digested solution was taken in a tube and was added to 8 ml water. It was then mixed with 2.0 ml coloring reagent (1 part of 10% ascorbic acid and 6 part of 0.42%) was added. It was incubated in heated water bath at 37 ^{O}C for 1 hour. After mixing absorbance was taken at 660 nm in colorimeter AE model Japan against H2O. Which was expressed as Mg lecithin/ml blood data collected, different traits were analysed as per the standard statistic techniques (Snedecor and Cochran,1989).

Results and Discussion

The mean value of total glucose, total serum cholesterol, serum lipid and serum phospholipid are presented in Table.1. The mean value increase in total blood glucose had significant (P<0.01) effect of honey treatment in rabbit over control group inrrespective of sex. Similar findings were observed with serum cholesterol level in rabbit, but the difference was found between sexes not between groups in case of total serum lipid with higher value in male as compare to female. The mean of serum phospholipids did not differ significantly between groups and sexes (Mausa,et.al.2002).

The biochemical parameters like blood glucose and serum cholesterol had significant effect (P<0.01) on groups and non-significant on sex. Chakukar,et.al.,2002 reported non-significant effect of age,sex,breed and body weight on serum glucose value in rabbit. However the increase in glucose level after honey treatment might be due to high source of carbohydrate by honey. The increase in total serum cholesterol level might be due to increase in acetate bio-synthesis (West,et.al.1966). The present finding revealed that the effect of honey on sex was evident which might be due to differences in bio-synthesis of sex steroid hormone in male and female rabbit.

Summary

Study were conducted by taking the biochemical parameters like blood glucose, serum cholesterol, serum lipid and serum phospholipids to show the effect of honey on rabbit. The honey had significant effect on serum cholesterol and blood glucose, but had non-significant effect of honey on serum lipid and serum phospholipids.

References

1. Rao,D.R., Sunki, G.R., Jhonson,W.M. and Ches, C.P. (1977): J.Anim.Sci. **44**:1021.
2. Ziatkis,A., Zak,B. and Boyl,A.J. (1953): J. Lab. Clin.Med. **41**:486-492.
3. Post,R.L. and Sen, A.K. (1967): Sodium and Potassium ATPase. In method in enzymology, Vol.10, Easterbook, R.W.Eds. Academic Press, New York and London pp.762-768.
4. Snedecor,G.W. and Cochran,W.G. (1989): Statistical methods. Oxford and IBH publishing co. 17 Culcutta.
5. West,F.S.,Todd,W.R.,Masen,H.S.and Bruggn, J.T.V. (1966): Text book of Biochemistry.
6. Mausa,M.R.M. and Abdul Samee,A.M. (2000): Egyptian J. Rabbit Sci. **12(1)**: 59-60.

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