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EFFECT OF *SACCHAROMYCES CEREVISIAE* AND *LACTOBACILLUS ACIDOPHILUS* ON BIOCHEMICAL PARAMETERS OF BARBARI KIDS

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ABSTRACT

The present study was conducted on Barbari kids to assess the effect of probiotics supplementation on biochemical parameters. A total 18 Barbari kids were selected and randomly distributed in three groups. The 1st group (T_1, n=6) was kept control fed (basal ration) without supplementation, the group 2nd (T_2, n=6) was supplemented with *Lactobacillus acidophillus* @ 2g/animal/day and group 3rd (T_3, n=6) was supplemented with *Saccharomyces cerevisiae* @ 2g/animal/day. Higher serum blood glucose, total protein and albumin level was observed at monthly interval in probiotics supplemented group as compared to unsupplemented group. Lower serum cholesterol level was observed in supplemented group T_2 and T_3 as compared to control group T_1.

Key words: Barbari kids, Biochemical parameters, Probiotics, Supplementation.

Among the small ruminants, goats are widely distributed and play an important role in the livelihood of a large proportion of farming communities of Madhya Pradesh. It is particularly suitable for weaker section of households with small land base and abundant labour force. They represent a more liquid form of capital than cattle and are readily tradable hence, goat is popularly known as 'Poor Man's Cow'. According to[1] the total goat population of India is 157 million and it contributes 16.9 per cent world's goat population. Now a day's many growth promoters are available in market and probiotics is one of these. The term "probiotics" comes from the Greek words "pro" (in favour) and "biotic" (life) was first used by [2]. According to [3] the micro organism, currently is using as a probiotic in animal are a) Bacterial origin - *Bacillus* Spp., *Lacto-bacillus* Spp., *Bifidobacterium* Spp., *Streptococcus* Spp. and b) Yeast origin- *Aspergilus oryzae, Saccharomyces cerevisiae, Lactobacillus brevis.* Using probiotics in small ruminants diet it was found to increase blood total protein [4], glucose concentration [5] and decrease cholesterol [6]. Keeping in view of the above facts the study was designed to illustrate the effect of two type of probotics i.e. bacterial (*Lactobacillus acidophillus*) and fungal (*Saccharomyces cerevisiae*) origin supplementation on biochemical parameters growing kids.

MATERIALS AND METHODS

The present study was conducted for a period of three months at Livestock Farm, Adhartal, NDVSU, Jabalpur, (M.P.). A total 18 Barbari kids were selected just after weaning at the age of 2 month of either sexes and randomly distributed in three groups six in each. All the three groups will received the same basal ration except bacterial and fungal origin probiotics. The 1st group T_1 (control) was fed Basal ration without treatment, the 2nd group (T_2) was fed Basal ration + probiotic (*Lactobacillus acidophilus*, 6× 10^9 cfu/g) @ 2g/animal/day and 3rd group (T_3) was fed Basal ration + probiotic (*Saccharomyces*

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cerevisiae, 4×10^9 cfu/g) @ 2g/animal/day**.** Kids had access *adlib* to water for 1 hr in the morning as well as in the evening and all kids had access *adlib* to basal ration and green chaffed fodder. Feed consumption of each animal was recorded on the basis of feed offered and left over.

Three ml blood samples were collected from each kids at monthly interval in dried clean test tubes from jugular vein by taking all aseptic precautions in the morning period of just before feeding. The test tube was kept in inclined position for 6 hrs for harvesting clear serum. Mean and Standard error (S.E.) of different treatments groups were analyzed, using standard statistical method as described by [7].

RESULTS AND DISCUSSION

In the present study serum biochemical parameters comprising serum glucose, total protein, serum albumin, serum globulin, serum albumin globulin ratio (A:G) and serum cholesterol were evaluated in different treatments of kids at monthly interval and presented in Table 1.

Serum glucose

Supplementation of probiotics in basal diet of Barbari kids results increase serum glucose level, but overall average mean were did not differed significantly with each other Table 1. In earlier studies [8] explained that effect of yeast culture through activity of amylase that lead to increasing carbohydrate hydrolysis in the small intestine leads to higher level of glucose. Morever supplementation of yeast results increases the activity of cellulolytic bacteria that act on cellulose fibers degradation and thus produced more glucose and increase the glucogenic precursor propionate in rumen or decrease plasma insulin and insulin glucose ratio leading to an increase in gluconeogenesis, ultimately the higher blood glucose level as reported by [9] In contrary to our finding [10] reported no increase in blood glucose concentration in lambs.

Serum total protein, albumin, globulin and A:G ratio

Higher value were achieved for serum total protein, albumin, globulin and A:G ratio was observed in kids supplemented with probiotics based ration T_3 and T_2 as compared to control group T_1. Table 1 revealed that overall there was significant difference in serum total protein ($P<0.01$) between control group T_1 and treatment groups T_2 and T_3 and for serum albumin level overall there were significant differences ($P<0.01$) between T_1 and T_3 groups.

Table1 revealed that overall there was significant difference ($P<0.01$) between control group (T_1) and treatment group (T_2 and T_3) in respect to blood serum globulin level. Higher serum albumin globulin ratio were observed in groups fed on probiotics based ration T_3 and T_2 as compared to control group T_1. The results are in accordance with [11] who reported that the addition of *Saccharomyces cerevisiae* into ration of sheep and showed higher total serum protein concentration. Similar findings reported by [4] using yeast culture in ruminants' diet.

The reason of higher serum protein level indicated the balance between anabolism and catabolism of protein in the body. The serum protein level at any given time in turn is a function of hormonal balance nutritional status water balance and other factors affecting the state of health. Serum total protein consists mainly of albumin and globulin. They are the most availed groups of protein and carry out a wide variety of biological functions. The main function of albumin in blood is to act as a buffer and assist in ion transport and in particular those of water insoluble vitamin and cofactors. Significant increase in albumin suggest normal status of liver function since liver is the main organ of albumin synthesis so higher or normal albumin means that probiotic supplementation did not damage or affect the liver function. In earlier studies [12] reported that total protein (g/dl) and globulins (g/dl) tended to increase, but the differences were similar and level of albumin (g/dl) and A/G ratio in the blood plasma were similar between two groups

Serum cholesterol

The overall average means were 61.08±2.43, 59.39±3.10 and 57.85±2.34 respectively for T_1, T_2 and T_3 group. There were no significant difference between T_1, T_2 and T_3 groups but diet supplemented with probiotics results decrease serum cholesterol level, which may be attributed to stimulation of

bacterial lipid synthesis [8] and /or due to anti-cholesterolaemic effect of yeast culture treatments [13]. In earlier studies [14] supplemented the live dried yeast (*Saccharomyces cerevisiae*) to the Rahmani sheep and observed that by supplementation of yeast treated group has decrease in cholesterol in comparison to control group.

Table 1. Effect of probiotics supplementation on serum biochemical parameters of Barbari kids

Biochemical parameters	T_1	T_2	T_3
Serum glucose(mg/dl)	44.99±1.21	46.63±2.22	49.06±2.71
Serum total Protein(g/dl)	5.13^{A}±0.13	5.77^{B}±0.13	6.03^{B}±0.14
Serum albumin(g/dl)	2.31^{A}±0.10	2.58^{AC}±0.14	2.85^{BC}±0.127
Serum globulin(g/dl)	2.81^{A}±0.08	3.19^{B}±0.08	3.18^{B}±0.10
A:G ratio	0.84±0.04	0.83±0.04	0.93±0.06
Serum cholesterol(mg/dl)	61.08±2.43	59.39±3.10	57.85±2.34

Means bearing different superscripts in a row differ significantly (^{ABC}, P<0.01)

CONCLUSION

Higher serum blood glucose, total protein and albumin level was observed at monthly interval in probiotics supplemented group as compared to unsupplemented group. Lower cholesterol level was observed in probiotics supplemented groups.

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