EFFECT OF INCORPORATION OF SPENT ROSEMARY LEAF MEAL ON SERUM BIOCHEMICAL PARAMETERS OF MALABARI KIDS

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Abstract:

The effect of varying dietary levels of spent rosemary (Rosmarinus officinalis. L) leaf meal on haematological and serum biochemical parameters of 18 weaned Malabari kids aged between 3-4 months with average initial body weight of 6.2 kg were determined. The kids were randomly allotted to three dietary treatments with six replicates in each. The dietary treatments were: T1 (control), T2 and T3, rations containing 0, 10 and 20 per cent spent rosemary leaf meal, respectively. At the end of 90 days feeding trial, haematological and serum biochemical parameters such asblood haemoglobin, glucose, total protein, blood urea nitrogen (BUN), creatinine, aspartate aminotransferase (AST), alanine aminotransferase (ALT), inorganic phosphorus and calcium were analysed . Results indicated that there was no significant difference between the kids maintained on three dietary treatments on serum biochemical parameters except glucose and AST. However the values were within the normal range reported for the species. Therefore it could be concluded that inclusion of spent rosemary leaf meal in kid starter had no adverse effects on serum biochemical parameters at 10 or 20 per cent levels.

Keywords: *Rosemary leaf meal, kids, serum biochemical parameters*

Rosemary (*Rosmarinus officinalis* L.), a widely distributed aromatic herb, is a source of natural polyphenols suchas rosmanol, carnosol, rosmadial, caffeic acid, rosmarinic acid and carnosic acid (Cuvelier *et al*., 1986; Costa *et al.*, 2007). Rosemary leaves or rosemary extract was used as supplement in animal feeding (Ghazalah and Ali, 2008; Shokrollahi, 2015). Spent rosemary leaf meal contains high dietary fibre and can be considered as a potential unconventional feed resource for livestock.The level of anti-nutritional elements or factors present in the feed influences the haematologicaland biochemical values.The haematological and biochemical indices reflect the availability of nutrientsto the animals for their physiological and metabolic necessities.

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Therefore, the present study was conducted to determine the effect of spent rosemary leaf meal containing ration on haematological and biochemical parameters in Malabari kids.

Materials and Methods

Experimental animals

Eighteen Malabari weaned kids of 3-4 months of age were selected from University Goat and Sheep Farm, Mannuthy. The kids were divided into three groups of six animals each as uniformly as possible with regard to age, sex and body weight. All the experimental animals were fed as per ICAR feeding standard, 2013. Green grass was offered as sole roughage. All the kids were dewormed at first week of the feeding trial followed by once in every month during the experimental period of three months. All the experimental kids were maintained under identical conditions of feeding and management throughout the experimental period

Experimental ration

The kids in all three experimental groups were fed with concentrate mixture containing 22 per cent crude protein and 70 per cent TDN for the entire feeding period of 90 days.

The three experimental rations were

T1 - kid starter (control) (BIS, 2012)

T2 - kid starter containing 10 per cent spent rosemary leaf meal

T3 - kid starter containing 20 per cent spent rosemary leaf meal

All the rations were made isocaloric and isonitrogenous.

Blood samples were collected from the experimental animals at the end of the experiment. Serum samples were separated and were analysed for serum calcium (Christian *et al*., 1967), phosphorus (Bernhart and Wreath, 1955), glucose (GOP - PAP method using standard kits), blood urea nitrogen, creatinine (modified berthlot method, using standard kits), total protein, alanine aminotransferase and aspartate aminotransferase (using standard kits) by using Semi Automated Biochemical Analyser (Master T). Data on various parameters during the course of experiment were subjected to statistical analysis using analysis of variance (ANOVA) (Snedecor and Cochran, 1994).

Results and Discussion

The haematological and serum biochemical parameters of the experimental kids such as blood haemoglobin, serum calcium, phosphorus, total protein, glucose, ALT, AST, creatinine and blood urea nitrogen (estimated at the end of the experiment) are listed in Table 1.

Table1. Haematological and serum biochemical parameters* of kids maintained on three experimental rations

Parameters	T1	T2	T3	P value	F value
Blood haemoglobin, g/dl	10.66 ± 0.17	10.58 ± 0.20	10.67 ± 0.11	0.919	0.085
Total protein, g/dl	6.00 ± 0.26	6.52 ± 0.36	5.98 ± 0.22	0.343	1.149
Calcium, mg/dl	9.92 ± 0.06	10.10 ± 0.09	9.92 ± 0.02	0.115	2.509
Phosphorus, mg/dl	7.16 ± 0.32	7.35 ± 0.14	7.37 ± 0.11	0.729	0.322
Glucose, mg/dl	53.05 ± 1.39^{b}	58.22 ± 1.46^{a}	53.77 ± 1.32^{b}	0.039*	4.043
AST, IU/L	131.03 ±10.91^{b}	159.60 ± 9.07^{a}	119.68 ± 5.93^{b}	0.017*	5.365
ALT, IU/L	21.28 ± 1.85	25.11 ± 1.83	23.04 ± 1.46	0.318	1.237
Creatinine, mg/dl	0.82 ± 0.02	0.82 ± 0.03	0.88 ± 0.05	0.497	0.732
BUN, mg/dl	13.68 ± 0.91	14.37 ± 0.98	14.06 ± 0.29	0.828	0.191

*Mean of six values with SE

a,b- Means with different superscripts within the same row differ significantly* (P<0.05)

The values of haematological and serum biochemical parameters such as blood haemoglobin, serum calcium, phosphorus, total protein, glucose, ALT, creatinine, urea nitrogen recorded in the present study were within the normal range reported for the species (Kaneko *et al*., 2008) and were not significantly different between the treatments. The values of serum glucose and AST were higher in kids fed T2 ration compared with those fed T1 and T3, (P<0.05), but the values were within the normal range reported for the species. The results showed that spent rosemary leaf meal had no deleterious effect on either kidney or liver functions.

Ghazalah and Ali (2008)reported that supplementation of 0.5 per cent rosemary leaf meal in broilers increased total protein concentration and globulin fractions between the groups. Similarly, Chiofalo *et al*., (2012) also reported that total protein concentration was higher (P<0.01) in rosemary supplemented dairy ewes compared to those fed control ration. On the other hand,El-Latif*et al*., (2013) noticed that haemoglobin concentration was higher (P<0.05) in broilers fed basal diet supplemented with 0.01and 0.02 per cent of rosemary essential oil compared to those fed control diet, whereas serum total protein, ALT and AST were similar between the groups. Alagawanyand Abd El-Hack (2015) reported that serum protein was not altered between the laying hens supplemented with 0.3, 0.6 and 0.9 per cent rosemary powder whereas urea was lowered (P<0.05) in 0.3 per cent supplemented group compared to other groups, while Shokrollahi*et al*., (2015) found that there was no differences in haemoglobin concentration in kids fed milk supplemented with 0, 0.01, 0.02 and 0.04 per cent rosemary extract, whereas globulin was higher in kids supplemented with 0.002 per cent rosemary extract compared to those fed control diet. EL-Naggar *et al*., (2016) conducted an experiment in broilers to study the effect of supplementation of rosemary leaves at 0, 0.25, 0.5, 0.75 and 1 per cent levels and found that serum urea, aspartate aminotransferase and creatinine were lowered (P< 0.01) in broilers fed with diet containing 0.25 per cent of rosemary leaves compared to birds of other groups, whereas glucose and total protein were increased at all levels of rosemary supplemented birds compared to those fed control diet.

Conclusion

The non significant effect of diets on most of the biochemical parameters studied shows that inclusion of spent rosemary leaf meal up to 20 per cent level had no adverse effect on serum biochemical parameters of kids. Thus it directly implies that spent rosemary leaf meal could be included in kidstarter at 10 and 20 per cent levels.

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