Effect of concentrate and urea molasses mineral block supplementation on the blood biochemistry of off season Mecheri lambs

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ABSTRACT

A study was undertaken to assess the blood biochemical parameters of off season Mecheri male lambs, under concentrate and urea molasses mineral block (UMMB) supplementation. In the growth trial, 24 lambs in three groups of eight lambs each were reared under grazing for a period of 180 days; T1 - Grazing alone, T2 - Grazing + concentrate supplementation, T3 - Grazing + UMMB supplementation. Blood samples were collected at 30, 60, 90, 120, 150 and 180 days of experiment. Serum protein increased (P < 0.05) in supplemented groups whereas, serum albumin increased significantly (P < 0.05) only in concentrate supplemented group (T2). Serum calcium (P < 0.01) and phosphorus (P < 0.05) values were higher in supplemented groups Concentrate supplemented group had higher (P < 0.05) serum cholesterol than unsupplemented group. UMMB supplemented group had significantly (P < 0.01) higher BUN values than the unsupplemented group. It was concluded that blood biochemical parameters of off season Mecheri lambs were influenced by supplementation.

Key words: Blood biochemistry, Concentrate, Mecheri lambs, Supplementation, UMMB.

Because of decline in grazing lands and low productivity of animals, coupled with irregular pattern of rainfall, grazing with supplementation is nowadays adopted by the farmers in sheep production. Shortage of feed and fodder and their poor nutritive value could be tackled to some extent by way of supplementation. Use of NPN substances like urea was tried to replace the costly source of proteins in ruminant diet. Urea Molasses Mineral Block (UMMB) is made by combining urea, molasses and minerals in a form that can be used for feeding of animals and it has been used successfully in cattle and small ruminants (Forsberg et al., 2002). Mineral deficiency in grazing ruminants has been reported by several authors (Gowda et al., 2004 and Khan et al., 2007) and supplementation is one way of tackling this problem. In India, studies on supplementation of UMMB for small ruminants and its effect on blood biochemical parameters are limited. Hence, the present study was conducted to find out the effect of concentrate and UMMB supplementation on the blood biochemical parameters of off season Mecheri lambs.

Twenty four numbers of weaned off season Mecheri ram lambs (aged 3-4 months) born between June and August were randomly divided into three groups of eight animals each. Lambs were reared under grazing for a period of 180 days. The study was undertaken from December 2008 to June 2009. Average body weight of animals was 10.5 kg. The groups were assigned to treatment as T1 - Grazing alone, T2 - Grazing + concentrate supplementation and T3 - Grazing + UMMB supplementation. Animals were allowed for grazing in the from 9:00 a.m. to 4:30 p.m (7.5 hours). Three groups were grazed together in the farm pasture land area and separated in their pens in the evening. Grazing area mainly consisted of Cenchrus pasture with admixture of other local grasses. Concentrate feed was offered to the animals according to their body weight. The allowance was increased based on the body weight and age of the animals. UMMB of 3 kg size was offered to the animals on a plastic container. UMMB (made by cold process) was procured from Karnataka Milk Federation and the composition of UMMB was, molasses - 45 %, urea – 3 %, bran - 13.25 %, rice polish - 14 %, calcite – 6 %, calcium oxide - 4 %, magnesium oxide - 4 %, diammonium phosphate - 10 % and trace minerals - 0.75 %. Lambs were provided free access to the blocks. Proximate composition of concentrate feed and UMMB is moisture 7.12 and 15.37 %, crude protein 16.38 and 17.93 %, ether extract 2.62 and 1.16 %, crude fibre 5.67 and 1.98 %, total ash 8.93 and 26.39 % respectively.

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### TABLE 1: Mean (±SE) blood biochemical profile of off season mecheri ram lambs

<table>
<thead>
<tr>
<th>Period</th>
<th>Serum total protein</th>
<th>Serum albumin</th>
<th>Serum calcium</th>
<th>Serum phosphorus</th>
<th>Serum total cholesterol</th>
<th>Blood urea nitrogen</th>
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<tbody>
<tr>
<td></td>
<td># T1</td>
<td>T2</td>
<td>T3</td>
<td># T1</td>
<td>T2</td>
<td>T3</td>
</tr>
<tr>
<td>Initial</td>
<td>5.50</td>
<td>5.53</td>
<td>5.57</td>
<td>2.87</td>
<td>2.83</td>
<td>2.79</td>
</tr>
<tr>
<td>30 days</td>
<td>0.32</td>
<td>0.31</td>
<td>0.31</td>
<td>0.16</td>
<td>0.07</td>
<td>0.10</td>
</tr>
<tr>
<td>NS</td>
<td>0.31</td>
<td>0.42</td>
<td>0.27</td>
<td>0.17</td>
<td>0.11</td>
<td>0.15</td>
</tr>
<tr>
<td>60 days</td>
<td>5.63</td>
<td>5.76</td>
<td>5.63</td>
<td>2.74</td>
<td>2.87</td>
<td>2.77</td>
</tr>
<tr>
<td>NS</td>
<td>0.29</td>
<td>0.21</td>
<td>0.17</td>
<td>0.06</td>
<td>0.10</td>
<td>0.08</td>
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<tr>
<td>90 days</td>
<td>5.26</td>
<td>5.80</td>
<td>5.61</td>
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<td>2.74</td>
<td>2.62</td>
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<tr>
<td>NS</td>
<td>0.31</td>
<td>0.27</td>
<td>0.37</td>
<td>0.11</td>
<td>0.09</td>
<td>0.09</td>
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<tr>
<td>120 days</td>
<td>5.20</td>
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<td>5.68</td>
<td>2.50</td>
<td>2.83</td>
<td>2.62</td>
</tr>
<tr>
<td>NS</td>
<td>0.37</td>
<td>0.52</td>
<td>0.13</td>
<td>0.13</td>
<td>0.06</td>
<td>0.04</td>
</tr>
<tr>
<td>150 days</td>
<td>5.18</td>
<td>5.76</td>
<td>5.68</td>
<td>2.52</td>
<td>2.79</td>
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<tr>
<td>180 days</td>
<td>5.24</td>
<td>5.86</td>
<td>5.75</td>
<td>2.51</td>
<td>2.86</td>
<td>2.75</td>
</tr>
</tbody>
</table>

Means bearing the same superscript within a row do not differ significantly.

# Level of significance
* Significant (P < 0.05).
** Highly significant (P < 0.01).
NS Non-significant.
Blood samples were collected from all the animals at monthly interval in each group by jugular vein puncture with proper antiseptic precautions. Serum was harvested and stored at – 20 °C until use. Serum total protein, albumin, calcium, phosphorus, total cholesterol and blood urea nitrogen were estimated spectrophotometrically (Systronics, India, Model 2202) using standard commercial diagnostic kits. (Span diagnostics Ltd, Surat, India). The data recorded were analysed statistically by completely randomized design (Snedecor and Cochran, 1996).

**Total protein:** Total protein levels differed in supplemented groups in final month of the experiment (Table 1). At 180 days, supplemented groups had significantly (P < 0.05) higher total protein than the control (T1) group. Animals fed with more proteins in the diet through concentrate feed and UMMB had higher total protein levels. This is in agreement with Dhore et al. (2005). In T3 group, the values decreased during later months, which caused the difference at 180 days rather than the increase in total protein values as a result of supplementation. This might be due to deficit nutrition received through grazing in unsupplemented group during summer.

**Albumin:** Serum albumin levels differed significantly (P < 0.05) as a result of supplementation from 120 days of the experiment onwards (Table 1). T3 group was having significantly higher values than T1 group and T3 group was having intermediate values. Supplementation of protein has helped the animals to maintain the albumin levels. Similar to total protein, the difference was due to depression in serum albumin levels in T3 group than due to increase in supplemented groups. However, Raghuvansi et al. (2007) could not find any difference in serum albumin levels due to supplementation.

**Calcium:** Calcium values differed between the groups from 60 days to the end of the experiment (Table 1). Supplemented groups had higher calcium values and the difference was because of the reduction in serum calcium in the unsupplemented group. This might be due to supplemental calcium in the concentrate and UMMB. Poor availability of calcium through grazing during summer months might be the reason for this reduction. Srikandakumar et al., (2003) also reported that heat stress reduces the serum calcium levels and animals needed some form of calcium supplementation during dry seasons.

**Phosphorus:** Serum phosphorus levels did not differ significantly in lambs between the groups except at 180 days of the experiment (Table 1). At 180 days, supplemented groups (T2 and T3) were having higher (P < 0.01) phosphorus values than T1 group. In general, T3 group had the highest value followed by T2 and then T1. The higher phosphorus in the supplemented groups is due to the rice bran included in the concentrate feed and diammonium phosphate included in UMMB. These findings concur with the results reported by Debasis and Singh (2003).

**Total cholesterol:** Serum cholesterol levels were not significantly different for the treatment groups until 120 days of the experiment. Cholesterol differed (P < 0.05) between the groups at 150 and 180 days of the experiment (Table 1). Concentrate supplemented group had higher cholesterol values than the unsupplemented group. Better plane of nutrition of supplemented groups might have resulted in more cholesterol levels in these groups.

**Blood urea nitrogen:** BUN values were significantly different (P < 0.05) at 60 days and 90 days and thereafter it became highly significant (P < 0.01). Supplemented groups had higher BUN value than the control group (Table 1). UMMB supplemented group (T3) had higher value than other groups (T1 and T2) up to 150 days of the experiment. But in the final month, no significant difference was noticed among the supplemented groups. This might be due to addition of urea as NPN source in UMMB. Higher level of BUN in buffaloes and cattle (Currier et al., 2004) were recorded while feeding supplemental urea products. Compared to the initial values, increase was observed in supplemented groups (T2 and T3) with highest increase in T3.

Urea toxicity in kids as a result of feeding UMMB manifested by increased BUN value was reported by Angan Roy et al. (2008). But in the present experiment BUN values were within the normal physiological range indicating that UMMB supplementation did not cause toxicity.

It was concluded that, supplementation with concentrate feed and UMMB had positive influence on the blood biochemical parameters of off season Mecheri lambs and it is recommended to provide some form of protein and mineral supplementation to the lambs in summer.

**REFERENCES**


