

## Evaluating Effect of Mineral Supplementation on Health Status of Pregnant Ramnad white ewes

B. Puvarajan<sup>1</sup> and S. Senthil Kumar<sup>2</sup>

Department of Veterinary Microbiology  
Veterinary College and Research Institute (VCRI)  
Tamil Nadu Veterinary and Animal Sciences University (TANUVAS)  
Orathanadu - 614625 (Tamil Nadu)

### Abstract

The study was conducted to evaluate the effect of mineral supplementation on lambs growth of nomadic grazing pregnant ewes of Ramnad white breed along with hematological alterations. The lambs born during two seasons viz. February-March and September-October, 2019 were recorded and were divided into two groups. Mineral supplementation to one group revealed increase in survival percentage of lambs compared to un-supplemented ones. The serum mineral concentration also increased and hematology revealed decrease on neutrophil lymphocyte ratio and decrease in total plasma proteins and remained so till end of puerperal period.

**Keywords:** Ewe; lamb; mineral; supplementation; ramnad white

### Introduction

The sub-optimal levels of lamb survival is a hindrance/ determining factor in sheep reproduction esp. in grazing sheep in India. The nomadic shepherds purely depend on grazing in our Cauvery Delta region as this agrarian zone comprises of paddy cultivation round the year and sheep manure being the main source for paddy farmers and in turn the shepherds are mutually benefitted by grazing their sheep in paddy fields. Moreover in India, land fragmentation, reduction in grazing area have contributed more to mineral imbalance and limit the sheep in attaining true growth and production potential (Mohanta and Garg, 2014). Mineral deficiencies or imbalance in soil or forages are responsible for poor reproductive performance (Bhattacharya *et al.*, 1994; Sejjian *et al.*, 2014). The hot and humid climate prevailing in our area reduce the internal growth of pregnant ewes and only scanty reports are available on nutritional aspects of grazing sheep in this geographical area and hence alongwith lamb's body weight gain, hematological parameters in pregnant ewes and its effects were recorded in our study.

### Materials and Methods

The research on area specific mineral supplementation (as per Table 1) in pregnant ewes

1. Associate Professor and Head and Corresponding author. E-mail: vetpuva@gmail.com
2. Associate Professor and Head, Teaching Veterinary Clinical Complex

was conducted between February, 2019 to December, 2019 at Ulur, Pudur and Vannipattu regions of Cauvery Delta zone of Orathanadu block, Tamil Nadu. Forty pluriparous sheep (aged above two and half years), 20 Ramnad white breed sheep of each were divided with first group T<sub>1</sub> kept as untreated control fed with grazing alone without mineral supplementation and second group (T<sub>2</sub>) given 15 grams of area specific mineral mixture daily per oral for ninety days. All pregnant ewes were subjected to macro and micro mineral profile in serum before and after mineral mixture supplementation. About 5 ml of anti-coagulated blood was collected and subjected for estimation of leukocytes as leukogram and hemogram alongwith Calcium, magnesium, copper, zinc, manganese and iron in serum by Auto analyser. The data collected from the study were analyzed as per the method described by Snedecor and Cochran (1994) for mean, standard error and analysis of variance (ANOVA).

The serum mineral level in pregnant and non-pregnant sheep of treated and untreated groups of Ramnad white sheep fed with area specific mineral mixture and hematological parameters in pregnant ewes was recorded (Table 2).

### Results and Discussion

The average hematological parameters estimated from blood of affected animals are as follows: Calcium (Ca) 10.33± 2.41; Magnesium (Mg) - 6.55±1.86 and Phosphorus (P) 3.33±0.54; leukocyte count - 6580 with neutrophils, eosinophils and lymphocytes (Table 2).

**Table 1: Composition of mineral mixture supplement [kg/qt.] (NRC, 2007)**

| Components                     | Percentage (%) |
|--------------------------------|----------------|
| Di-calcium phosphate           | 62             |
| Calcium carbonate              | 30             |
| Zinc sulphate (monohydrate)    | 0.55           |
| Ferrous sulphate (monohydrate) | 1.8            |
| Potassium iodate               | 0.6            |
| Cupric sulphate                | 0.08           |
| Manganese dioxide              | 0.13           |
| Cobalt chloride (pentahydrate) | 0.013          |
| Magnesium carbonate            | -              |
| AIA                            | 4.81           |

group during lambing were 9, 6 and 32 percent and 12, 58 percent respectively (Not shown in table as calculated from recorded findings of farmers field). The higher lamb survival percentage (58%) was recorded in mineral supplemented group as compared to non-supplemented group (32%) which was compared with findings of Mude *et al.* (2010). Since this type of research study carried out in nomadic sheep for the first time in this region, the research findings are compared with earlier workers *on par* with goats. These results can be attributed to mineral supplementation during late pregnancy and explains that without supplementation in pregnant ewes of control group during late pregnancy might have resulted in ill development of lambs. The results obtained in our study were compared with that of Bhoshale (2005), who reported higher kid survival percentage in goats (50%) in mineral supplemented does as compared with non-mineral supplemented

**Table 2: Mineral level, hematology and erythrogram in pregnant ewes**

| Groups                   | Macro mineral estimation |                         |                    | Micro mineral estimation |                        |                         |              |
|--------------------------|--------------------------|-------------------------|--------------------|--------------------------|------------------------|-------------------------|--------------|
|                          | Ca                       | Mg                      | P                  | Co                       | Fe                     | Zn                      | Co           |
| T <sub>1</sub>           | 8.66± 2.22 <sup>a</sup>  | 5.77±1.39 <sup>a</sup>  | 2.75±0.35          | 0.72±0.48 <sup>a</sup>   | 1.39±0.87 <sup>a</sup> | 0.63±0.33 <sup>a</sup>  | 00.024±0.001 |
| T <sub>2</sub>           | 10.33± 2.41 <sup>a</sup> | 6.55± 1.86 <sup>a</sup> | 3.33±0.54          | 0.84±0.55 <sup>b</sup>   | 1.78±1.09 <sup>b</sup> | 0.76±0.28 <sup>b</sup>  | 0.027±0.002  |
| Hematology (cells/ µl-1) | Leukocytes               | Neutrophil              | Eosinophils        | Monocytes                | Lymphocytes            | Basophils               | Neutrophils  |
| T <sub>1</sub>           | 8655                     | 4875                    | 450                | 211                      | 2560                   | 17                      | 1.9          |
| T <sub>2</sub>           | 6580 <sup>b</sup>        | 4568 <sup>a</sup>       | 488                | 235                      | 1665 <sup>b</sup>      | 12.0                    | 3.7          |
| Erythrogram              | Erythrocyte (x106/ µL)   | Hemoglobin (g dL-1)     | Packed cell volume | MCV                      | MCHC                   | TPP (x106/ µL) (g dL-1) |              |
| T <sub>1</sub>           | 9.55                     | 8.98                    | 30.11              | 26.58                    | 42.25                  | 7.15                    |              |
| T <sub>2</sub>           | 10.67 <sup>a</sup>       | 10.24 <sup>a</sup>      | 30.18 <sup>a</sup> | 28.28 <sup>bc</sup>      | 43.18 <sup>a</sup>     | 7.76 <sup>a</sup>       |              |

Values within the column differ significantly (P<0.05) (Radostits *et al.*, 2007).

Means followed by different letters differ statistically (P<0.05) by the Student-Newman-Keuls test.

In our study, the status of serum macro and micro mineral profile was carried out in pregnant ewes during last two months of pregnancy. The findings of the serum micro-macro mineral profile investigation showed deficiency of Ca, Zn, Fe and Cu in pregnant ewes (T<sub>2</sub>) grazing on pasture. It is evident from study that number of lambs born, total mortality observed and percent of lamb survival in control and treatment

does (16.67%). Yatoi *et al.* (2017) and Yildiz *et al.* (2005) reported that mineral serum variations in different seasons also influenced the health status of pregnant and non pregnant sheep and hence its reiterated that pregnant ewes are predisposed to mineral deficiency and this predisposition increased during winter when the fodders become scarce and recommended mineral supplementation based on

physiological requirements of animals. Such deficiencies in feed are likely to accentuate many problems related to animal reproduction.

The post parturient complications observed simultaneously were predominantly abortion (22%), retention of placenta (7.5%) and still birth (5%) in control group and abortion (24%) and RFM (10%) in treatment group of pregnant ewes after lambing seasons. Kumar *et al.* (2011) reported reduced post-parturient complications by mineral supplementation mixture in late pregnancy goats and Erdogan *et al.* (2017) observed and reported the effect of organic selenium in feeding of ewes in late pregnancy which can be transferred to progeny in sheep which supports our documentation of mineral supplementation to pregnant ewes kept in pasture. In conclusion, our study showed that macromineral levels in maternal blood decreased in control group because of demand of the fetal growth in later pregnancy. Hence we suggest to provide the area specific mineral mixture incorporated with major and minor minerals such as Ca, P and Mg to rations of grazing sheep to avoid the post-partum complications esp. in nomadic sheep.

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### Chhattisgarh launches Godhan Nyay Yojana

The Chhattisgarh Chief Minister, Shri Bhupesh Baghel in June' 2020 launched 'Godhan Nyay Yojana'. The scheme is to make animal husbandry commercially profitable. The Godhan Nyay Yojana is the first of its kind that will procure cow dung from cattle owners. The scheme will also prevent open grazing of cattle and will solve the problem of roadside stray animals. A five-member sub-committee has been constituted to determine procurement rate of cow dung. The procured cow dung under the scheme will be used for vermicompost production. They will then be sold to cooperative societies to meet the fertilizer requirement of the farmers.