

# ASSESSMENT OF MINERAL STATUS OF TWICE-YEARLY LAMBING YANKASA EWES

## (2) SODIUM AND POTASSIUM CONCENTRATIONS IN THE SALIVA OF TWICE-YEARLY LAMBING YANKASA EWES

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### ABSTRACT

Changes in the concentrations of sodium (Na) and potassium (K) in saliva were monitored in order to assess the status of these cations in twice-yearly lambing ewes.

Five pregnant ewes in late gestation were sampled once per week for 8 weeks before lambing and 8 weeks post partum. Values (meq/litre) obtained (187.4-190.5 and 8.7-9.3) for Na and K respectively in the saliva of both pregnant and lactating Yankasa ewes did not show any evidence of deficiency for the two cations.

**Key Words:** Yankasa ewes, Sodium, Potassium, Saliva.

### INTRODUCTION

A craving for salt is the earliest and most obvious criterion of sodium deficiency in the animal. However, it is difficult to distinguish this behaviour from other forms arising from other deficiencies as some animals will eat salt even when they are not suffering from sodium deficiency.

Lack of the element also lowers utilization of digested protein and energy, and prevents conception (Maynard, Loosli, Hintz and Warners, 1975).

Distribution of Potassium (K) in the body, is similar to Na but it exists primarily as a cellular constituent. K plays a vital role in muscle, where its content is six-times that of Na. Both cations are readily absorbed and

excess of body needs, is immediately excreted in urine.

Sodium in urine and the Na:K ratio in the saliva, are of nutritional interest (Underwood, 1981). Changes in the concentrations of these cations in saliva, were therefore monitored, in order to assess their status in twice-yearly lambing Yankasa ewes.

### MATERIALS AND METHODS:

Animals and their feeding with management have been described (Fajemisin *et al.* 1988). Saliva from five pregnant ewes in late gestation, averaging 34k liveweight, were taken once a week for eight weeks, before lambing, and eight weeks post partum by the method of Murphy and Connel (1970). Each

sample was centrifuged at 2000 rpm for 10 minutes and an aliquot was kept in deep freezer, until required for analysis.

Accurately pipetted 2 mls of a saliva sample, was digested with a mixture of nitric and perchloric acid (5:1). Na and K contents in the digests were determined with Atomic absorption spectrophotometer, model 290.

Analysis of variance was used to test differences between means.

### RESULTS

The concentrations of Na and K in the saliva of twice-yearly lambing Yankasa ewes obtained in this study compared with normal values from literature, are shown in Table 1. During gestation, observed values were  $187.45 \pm 6.2$ ;  $9.29 \pm 1.1$  MEq/L for Na and K respectively with Na:K ratio of 21.85 for both cations. The effect of gestation and lactation on the variations observed were not significant, giving overall values of  $189.1 \pm 5.9$  and  $8.96 \pm 1.2$  MEq/L for Na and K respectively with Na:K ratio of 21.1.

### DISCUSSION

Bott, *et al* (1964) quoted 160-175 and 4-6 MEq/L as the normal for Na and K respectively, in parotid saliva of cattle and sheep. Observed values, 187-190.5 and 8.7-9.3 MEq/L for Na and K respectively, in the saliva of both pregnant and lactating Yankasa ewes, were higher in the present study. Results (Bott *et al*, 1964; Jones, Miles and Sinclair, 1967; Sinclair and Jones 1968), indicated an inadequate Na status in cattle and sheep, when salivary Na concentration was lower than 110 to 120 MEq/L and the Na:K ratio was less than 5.

Replacement of Na by K in the volume of saliva secreted by ruminants, is caused by increased aldosterone secretion of adrenal gland, together with an increase in the sensitivity of the parotid gland to the effect of the

hormone during sodium deficiency (Blair-West, *et al*, 1963). The decline in the salivary Na:K ratio is evident from the work of Murphy and Plasto (1972). Normal values are given in MEq/L as Na 145 and K 7 respectively, a Na:K ratio of 20. The comparative values for the deficient animal were, 40 and 90, giving a Na:K ratio of 0.45. Since this adaptive change in Na:K ratio of parotid saliva is sufficiently sensitive for use in estimating sodium requirements of lactating ewes (Morris and Paterson, 1975), the values so obtained in this study are quite meaningful as there were no visible sign of sodium and potassium deficiency.

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