IS THERE A NUTRITIONAL BASIS TO SHEEP ILL-THRIFT ON THE TRAPROCK?


The Traprock landform is characterised by generally shallow, low-fertility soils. Sheep grazing native pastures on these soils typically have low growth rates, poor wool production and reduced reproductive efficiency. During winter, young stock do not grow; a break occurs in the wool of all classes of sheep; introduced adult sheep lose condition rapidly and may die, yet "adapted" ewes sustain pregnancy and lactation during this same period.

Pasture management can improve animal performance but the topography and shallow soils exclude this option for approximately 80% of the landform. Protein and energy supplements have also improved performance but at an uneconomic cost/benefit ratio.

This study aimed to define, under normal farm management, the physiological and nutritional changes in weaner ewes during the critical period (March - November). Liveweight was recorded monthly for 180 ewe lambs from weaning. Samples were collected from an identified monitor group of 20 animals at each weighing to assess health and nutrition.

Although the season was atypically mild and wet, sheep grew poorly from April (19.4 kg) to mid-September (20.5 kg) with no growth from June to September. Serum albumin concentrations paralleled growth rate, declining from weaning (25 g/l) to September (20.7 g/l). There was no obvious change in climate or pasture associated with the resumption of 'normal' growth.

Two animals necropsied in September when performance was worst were in fair condition with moderate depot fat. Both were osteoporotic and had inactive growth plates. Serum alkaline phosphatase activity was low for age throughout but rose over the study period.

The reduced protein synthesis and bone activity were consistent with the reduced thyroid activity demonstrated by low serum triiodothyronine and free thyroxine concentrations. Both thyroid and pituitary glands were histologically normal.

Rumen ammonia, faecal protein, serum urea and pasture protein were all greater than the critical levels associated with inadequate protein nutrition. Pasture phosphate content was low but this was not reflected in faecal or plasma phosphate concentrations, presumably reflecting selective grazing and low metabolic requirement.

Rumen VFA concentrations were low in samples collected 1/9 and 4/11. These low concentrations were not reconciled with in vitro digestibility measurements made on the pasture samples collected 1/9 and the obvious growth in November. Plasma hydroxybutyrate concentrations (assumed at this low metabolic rate to reflect rumen butyrate production) were low until growth resumed. There was a coarse association between hydroxybutyrate concentration and weight gain in the subsequent sampling interval.

Energy appears to be the primary limiting nutrient possibly the result of reduced rumen function caused by an inhibitor of plant or fungal origin.

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