

## PROTEIN DEFICIENCY IN YOUNG LAMBS GRAZING IRRIGATED SUMMER PASTURE

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The growth rate of lambs grazing irrigated summer pastures at Leeton, New South Wales, is lower than that of similar animals grazing annual pastures in spring. The feed intake and performance of lambs grazing an irrigated summer pasture containing about 20% crude protein has been investigated (S.T. Dawe, unpublished). When this experiment was simulated using a computer model of protein and energy utilization in sheep (Graham *et al.* 1976), it was predicted that, for lambs with an empty body weight of less than 20 kg, the extent of microbial degradation of dietary protein was such that the lambs were absorbing insufficient amino acids to promote the body and wool growth rates expected for the particular energy intakes. The experiment reported here was conducted to test the validity of this prediction.

Abomasal catheters were inserted into 18 Dorset Horn x Merino-Border Leicester lambs when weaned in November at 5 weeks of age. The lambs were grazed together at a rate of 50/ha on an irrigated pasture consisting of 76% paspalum (*Paspalum dilatatum*), 8% white clover (*Trifolium repens*) and 16% other species, mainly *Juncus*. The pasture initially contained 15% crude protein and the mean availability of dry matter was 1.52 tonne/ha. When the lambs weighed  $10.0 \pm 0.3$  kg, 10 days after insertion of the catheters, they were divided into 3 groups and each received one of the following treatments: (i) continuous abomasal infusion of a 10% sodium caseinate solution which provided  $32.1 \pm 0.9$  g/day of protein; (ii) continuous abomasal infusion of a 12% glucose solution which provided  $40.2 \pm 1.6$  g/day of glucose; and (iii) a control group which carried packs of similar mass to the other animals. Portable pumps were used for the infusions. An estimated 590 and 622 kJ/day of net energy for maintenance was provided from the casein and glucose infusions, respectively. The lambs were weighed every second day for 8 weeks and a midside patch of wool approximately 100 cm<sup>2</sup> was clipped at 2 or 4 week intervals.

Results presented in the Table confirm the computer predictions by showing that lambs given the infusion of casein grew significantly faster and produced more wool than those given a similar amount of energy as glucose or than those in the control group. Although performance of the lambs was improved by the protein supplement, it was still well below that achieved in spring, suggesting that feed intake remained inadequate for lambs to achieve their growth potential. The experiment reported suggests that computer models are a valuable aid for assessing the nutritional status of sheep in a particular situation.

Treatment	Liveweight gain (g/day)	Growth of clean wool (g/day)
Casein infusion	$93 \pm 10^a$	$4.2 \pm 0.4^a$
Glucose infusion	$53 \pm 6^b$	$2.2 \pm 0.2^b$
Control	$59 \pm 6^b$	$2.3 \pm 0.3^b$

a,b Values within columns with different superscripts are significantly different ( $P < 0.05$ ).

GRAHAM, N.McC., BLACK, J.L., FAICHNEY, G.J. and ARNOLD, G.W. (1976).  
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