

# RELATIVE CHANGES IN THE WEIGHTS OF GUT PARTS OF SHEEP DURING LIVELWEIGHT STASIS AND LIVELWEIGHT LOSS

N. N. AZIZ and D. M. MURRAY

Dept of Wool and Animal Science, University of New South Wales, Kensington, N.S.W. 2033.

Alimentary tract tissue of sheep is sensitive to level of nutrition as shown by Murray and Slezacek (1980) in their study of different rates of positive growth. This experiment aimed to evaluate the effects on the weight of separate gut parts when sheep either maintained liveweight or suffered liveweight loss. The Merino wethers used in each study were less than 12 months old and were given a pelleted ration composed of lucerne chaff (0.80) and wheat grain (0.20). Of the 21 animals in the weight stasis study, groups of 5 were killed after 0, 25 and 50 days and 6 at 75 days, at 30 kg liveweight. In the weight loss study, 5 animals were killed at a liveweight of 33 kg and 5 each after 25, 50 and 75 days of subsequent liveweight loss at 133 g/day. Full details of feeding, slaughter and dissection are reported by Aziz (1988).

Allometric coefficients relating the separate weight of gut parts to total gut weight (less oesophagus) are presented in Table 1. The coefficients indicate the relative decrease in weight of each part in relation to that of total gut during stasis and loss when total gut decreased at a linear rate of 7 and 10 g/day, respectively ( $P < 0.001$ ). During weight stasis relative rates were similar for the rumen-reticulum, omasum and large intestine although the former decreased at a slower rate than total gut (coefficient  $< 1$ ). The small intestine showed the fastest decrease in weight of all parts during weight stasis and also exceeded that of total gut (coefficient  $> 1$ ).

**Table 1. Allometric regression coefficients ( $\pm$  s.e.) relating the  $\log_{10}$  tissue weight of the separate gut parts to  $\log_{10}$  total gut tissue weight (less oesophagus) during weight stasis and weight loss**

	Rumen-reticulum	Omasum	Abomasum	Small intestine	Large intestine
Stasis	<u>0.835</u> (0.060)	<u>0.929</u> (0.140)	<u>0.187</u> (0.093) n.s.	<u>1.539</u> (0.091)	0.883(0.103)
Loss	1.023(0.046)	1.106(0.137)	0.959(0.092)	<u>1.315</u> (0.070)	<u>0.699</u> (0.060)
Underlined values are significantly ( $P < 0.05$ ) different from 1. n.s. not significant, all other coefficients were significant ( $P < 0.001$ ).					

During weight loss the coefficients for the rumen-reticulum omasum and abomasum were similar to each other and 1. The small intestine again showed the fastest relative rate (coefficient  $> 1$ ) while the large intestine had a slower relative rate than all parts ( $P < 0.05$ ) and less than 1. The results indicate the sensitivity of the small intestine to both treatments, a conservation of abomasum during stasis and a faster rate of rumen-reticulum loss during loss than stasis ( $P < 0.05$ ).

AZIZ, N. N. (1988). Ph.D. Thesis, University of N.S.W.

MURRAY, D. M. and SLEZACEK, OLGA (1980). *J. Agric. Sci. Camb.* 95: 241-50.