

THE EFFECT OF ANIMAL PHYSIOLOGICAL STATE ON SITE AND EXTENT OF DIGESTION IN SHEEP

C. LEMERLE,* A.R. EGAN** AND T.E. TRIGG*

Digestibility depression at increased feed intake (Tyrrell and Moe 1972) is the result of an increased **digesta** rate of passage (Grofum and Williams 1977) which reduces the time available for digestion in the **rumen**. With increased intake the changing relationship between digestion rate and passage rate can also cause shifts in site as well as extent of **digestion**, thus affecting nutrient supply to the animal.

An experiment was carried out to investigate the changes in **digesta** pool size, flow rates and rate and site of digestion which accompany the differences in forage intake due to different physiological demands. **Six** ewes were offered either chaffed **ryegrass** (3 sheep) or chaffed **paspalum** (3 sheep) ad-libitum in two physiological states (lactating, then dry). Each ewe was fistulated at the **rumen** and the duodenum. Mean values for voluntary feed intake (VFI), dry matter digestibility (DMD), proportion digestion **occurring** in the **rumen** (DMDR), **rumen** liquor mean retention time (MRT), and **rumen** liquid volume (**V**) are presented in the table.

The effect of physiological status on intake and digestion in ewes

	Dry sheep		Lactating sheep	
	Ryegrass	Paspalum	Ryegrass	Paspalum
VFI (g DM/d)	958 (74) ^a	975 (147)	1448 (58)	921 (128)
DMD (%)	69.6 (1.2)	55.2 (1.2)	66.7 (0.6)	54.3 (0.9)
DMDR (%)	66.9 (3.5)	65.1 (5.5)	55.7 (0.8)	37.5 (7.6)
MRT (h)	6.8 (0.6)	8.3 (1.0)	5.1 (0.6)	8.6 (1.3)
V (l)	2.75 (0.25)	3.18 (0.63)	3.75 (0.29)	4.50 (0.55)
	^a (S.E.M.) n = 3			

The results demonstrate a shift in digestion towards the **hindgut** when roughage fed sheep are lactating, the effect being more pronounced on the lower quality paspalum diet. Although liquid MRT only decreased in the lactating sheep fed ryegrass, there was an increase in **rumen** volume in all lactating ewes regardless of diet.

There are implications in this **for** both patterns of nutrient yield (eg. protein : energy ratio) and interactions between fibre components and energy concentrates (eg. microbial population changes) in the **rumen**. The influence of this on intake and substitution rates in sheep receiving supplements requires further attention.

GROVUM, W.L. and WILLIAMS, V.J. (1977). Br. J. Nutr. **38** : 425
 TYRRELL, H.F. and MOE, P.W. (1972). J. Dairy Sci. **55** : 1106

* Kyabram Research Institute, Kyabram, Victoria, 3620
 ** School Agriculture & Forestry, University of Melbourne, Parkville, Victoria, 3052