BLOOD FLOW TO THE MAMMARY GLAND, FEED INTAKE, AND MILK YIELD OF SHEEP OFFERED TWO DIETS

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Previous studies with dairy cattle indicate that maize silage increases milk yield when added as a supplement to pasture, particularly legumes (Stockdale and Beavis 1988). The effect of diet on mammary blood flow, feed intake and milk yield of sheep offered either 100% white clover or 50% white clover and 50% maize silage was studied as part of a larger investigation into mechanisms responsible for dietary induced differences in milk production.

Five days after parturition, a 4 mm ultrasonic blood flow probe (Transonic Systems Inc., Cornell, New York) was placed around the left pudic artery of each of six pregnant Merino-Border Leicester cross ewes. Polyvinyl catheters were placed in the subcutaneous mammary vein and saphenous artery during surgery under epidural anaesthesia. The animals were housed in metabolism crates and were offered either the clover (n=3) or mixed diet (n=3) ad libitum from 5 days post-surgery . Eleven days subsequently, (period 1) blood flow (BF) to the left side of the mammary gland was recorded at intervals of 1 hour (0900-1700h) and milk yield (MY) to the same side was determined at 0800 and 1700h by machine-milking after administration of oxytocin (1 I.U.). Mean voluntary feed intake (VFI) was recorded for two consecutive days, commencing on the day preceding the measurements. The diets were then interchanged between the two groups of ewes and the measurements repeated after a further 11 days (period 2).

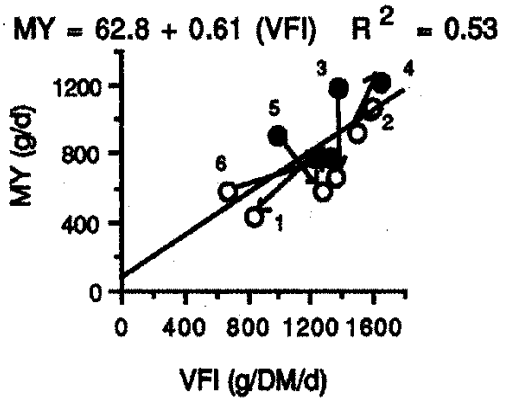

Fig.1. MY vs BF for 6 ewes (1-6) fed silage-clover mix (o) and clover (●) for period 1 ⇒ period 2.

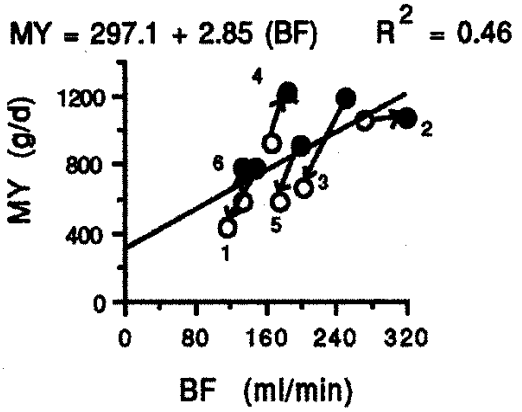

Fig.2. BF vs VFI for 6 ewes (1-6) fed silage-clover mix (o) and clover (●) for period 1 ⇒ period 2.

There was a strong positive relationship between VFI and MY, but at the same VFI clover resulted in a higher MY than the mixed diet for four of the six sheep (Fig. 1). There was a positive overall relationship between VFI and BF (BF = 35.2 + 0.123 VFI; $P<0.03$, $r^2=0.37$), but no difference between the diets. However, Fig. 2 indicates that MY for any given BF was higher for the sheep offered clover than the mixed diet. These results indicate that the increased milk yield observed with the clover diet is due a more efficient conversion of pudic artery blood to milk.

STOCKDALE, C.R. and BEAVIS, G.W. (1988). Proc. Aust. Soc. Anim. Prod. 17: 472.

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