EFFICIENCY OF WOOL PRODUCTION OF FINE WOOL MERINO AND COMEBACK SHEEP

J.M. WILSON* and G.R. SAUL**

A recent review by Butler and Maxwell (1984) concluded that large sheep genotypes with coarse wool are more efficient wool producers than smaller, finer woolled genotypes. This paper reports the results of studies which compared the gross efficiency of wool production of fine wool Merinos, (20 urn, 46 kilograms mean liveweight) with larger framed Comebacks, a stabilized line of medium wool Merino x Polwarth sheep (23 urn, 53 kilograms mean liveweight). The efficiency of wool production of these two genotypes has not previously been compared.

Efficiency of wool production ($ED_1 = g$ clean wool/100 g digestible dry matter (DDM) intake) was determined on 14 individually penned, four year old wethers of each genotype fed two diets; a mixture of oaten grain and chaffed lucerne hay (in vitro DDM 66%, nitrogen 2.0% DM), fed at 1.25 maintenance; and chaffed pasture hay (in vitro DDM 52%, nitrogen 1.7%) fed at maintenance. Efficiency studies were also conducted at pasture with wether weaners, 4-15 month old, using 20 sheep of each of the same genotypes. Total faecal collections and oesophageally fistulated collector animals were used to measure digestible organic matter intake (DOMI). Monthly dyebands were used to measure wool growth.

For the weaners, efficiency of wool production was determined in each season over two successive years.

While eating the grain/lucerne mixture, Comeback wethers produced 46% more wool, 34% more efficiently than the Merinos ($ED_1 = 2.25, 1.67$ for Comebacks and Merinos respectively; $p<0.01$). When fed pasture hay, Comebacks grew 38% more wool 18% more efficiently, but the difference was not significant ($ED_1 = 2.35, 1.99$ for Comebacks and Merino respectively; $P>0.05$). Wool growth rates were 9.1 and 13.3 grams/day for the Merinos and Comebacks respectively when fed the lucerne diet and 10.4 and 13.8 grams/day for Merinos and Comebacks respectively when fed the pasture hay diet.

Comeback weaners had a higher efficiency of wool production ($ED_2 = g$ clean wool/100 g DOMI) than Merinos ($p<0.05$). However the difference in efficiency between the breeds was influenced by the availability of green pasture (GP) and season of measurement. In summer, with 200 kg/ha GP available, Comebacks were only 2% more efficient than Merinos ($ED_2 = 0.92$ and 0.90 respectively). During autumn and winter with 1500 kg/ha GP, the efficiency advantage of Comebacks was 7% ($ED_2 = 1.5$ and 1.41). In spring, when 4500 kg/ha of GP was on offer, Comebacks were 7% more efficient at converting pasture into wool ($ED_2 = 1.70$ and 1.45). Wool growth in summer was 5.7 and 6.8 grams/day and in spring 9.3 and 13.4 grams/day for Merinos and Comebacks respectively.

These results support the conclusion of Butler and Maxwell (1984) that larger framed sheep are more efficient than smaller, finer woolled sheep at converting feed to wool. However, the advantage of the larger genotypes is affected by feed quality and quantity, largest differences occurring when sheep consume ad libitum high quality feed. Given the variation in both seasonal pasture production and quality, it is likely that efficiency differences between sheep genotypes will have only a small influence on wool production per hectare of pasture as has been demonstrated by Obst (1986).


*Department of Agriculture and Rural Affairs, Box 862, Shepparton, Vic., 3630
**Department of Agriculture and Rural Affairs, Pastoral Research Institute, Box 180, Hamilton, Vic., 3300.