

The Determination of Relative Efficiencies of Wool Production by Merino Strains in the Field

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DATA from sheep grazing at Cunnamulla, Armidale and Deniliquin, show that clean wool production per unit of bodyweight differs in three strains of Merino. The absolute levels of clean wool per unit of bodyweight for each strain show some variation with location and year, but the overall ratios are close to 90: 100: 110 for the fine, medium and strong woolled strains respectively. The differences between strains may be the result of variable levels of fodder consumption per unit of bodyweight, variations in the efficiency of converting fodder into wool or a combination of both. These differences are being studied on a relative basis, the aim being to estimate relative food intakes, measure relative wool productions and from these calculate the relative efficiencies (wool production per unit of feed intake). Relative outputs of faecal organic matter will give an estimate of relative intakes of fodder provided that the strains have similar efficiencies of digestion and select food of the same chemical composition.

A preliminary experiment has been carried out at Prospect, where eleven strong woolled non-Peppin (S.N.P.) and seven fine woolled non-Peppin (F.N.P.) wethers were grazed on native pasture (containing some subterranean clover) over a period of thirty weeks. The sheep were harnessed for the entire period and total collections of faeces were made on four consecutive days each week. Wool samples were taken from delineated areas on each midside at intervals of four weeks, and the total production of clean wool was measured by scouring entire fleeces at the end of the experiment.

The mean contents of nitrogen and crude fibre in faecal organic matter and of "silica free" ash and silica in faecal dry matter for the S.N.P. strain were 2.54%, 28.8%, 7.57% and 18.4%, respectively. The corresponding figures for the F.N.P. strain were 2.43%, 29.8%, 7.04% and 17.4%. These figures suggest that there was a difference, in favour of the S.N.P. strain, in the nutritive values of the feed selected by sheep of each strain.

The production of clean wool and the output of organic matter by the S.N.P. strain were respectively 137 per cent. and 113 per cent. of the corresponding values for the F.N.P. strain. Assuming the ratios of feed intakes and faecal outputs to be the same, the efficiency of wool production in the S.N.P. strain was 121 per cent. of that in the F.N.P. strain. However, if the small differences in faecal nitrogen content indicate differences in digestibilities of feeds consumed and if intakes are assessed on the basis of a constant amount of nitrogen being excreted per unit intake of organic matter, then the ratio of feed intakes becomes 119 : 100 (S.N.P. : F.N.P.). The corresponding values of wool produced per unit of feed intake are in the proportions 116 : 100.

Pooled data from all sheep show that wool growth per unit of organic matter output and wool growth per unit of nitrogen output are each significantly correlated with wool production ($P < .001$). These relationships indicate that the conversion of feed into wool is more efficient in higher producing animals.

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