CLASSER GRADINGS -AND MEASURED FLEECE PRODUCTION IN YOUNG MERINO AND CORRIEDALE EWES

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Summary

The association between subjective classer gradings taken at 15 to 16 months of age and objective fleece measurements at shearing at 18 months was measured for ewes on one Merino and two Corriedale properties in Western Victoria.

Simple correlation coefficients between classer grades and measurements were generally small in the range 0.28 to 0.51. Selection for fleece weight by visual appraisal was about 35 per cent as efficient as selection by measurement.

I. INTRODUCTION

Wool production may be increased by selecting either ewes or rams for greasy or clean wool weight (Turner 1958). Classing entirely by hand or eye judgment has been the traditional method of selecting sheep, but visual appraisal has been found to be less efficient than measurement in selection for wool production (Riches and Turner 1955; Morley 1955). Many studs and flocks have not yet incorporated fleece measurement into selection programmes and rely mainly on classing standards. Since the rate of genetic progress is largely determined by the intensity of selection (Lush 1948), the increase in wool production in those flocks not using measurement techniques will depend largely on the accuracy of the classer in selecting for particular wool traits.

This paper describes the association between subjective classer gradings taken on 15 to 16 months old Corriedale and Merino ewes and objective fleece measurements taken later at shearing at 18 months of age.

II. MATERIALS AND METHODS

Observations were carried out on one Merino and two Corriedale flocks which were part of a larger experiment, conducted in Western Victoria; the type and strain of sheep and the environment were previously described by Mullaney and Hyland (1967). Ewes, born in 1958, were run together on each property from birth, and subjectively classed by a professional sheep classer for various traits at about 15 to 16 months of age. Scores were given (1 = poor, 5 = good) for the following traits: point, belly and back cover, wool colour, handle, character and

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condition, greasy fleece weight and density. The classer was consistent in his appraisal of all traits, with 72 to 83% of animals receiving the same score at two appraisals, taken one day apart.

The ewe groups remained intact after classing except for deaths, until shearing at about 18 months of age. Fleeces were then weighed (G) and a mid side! sample of each fleece was taken. Each sample was objectively measured for the following characteristics: percentage clean scoured yield (Y) , clean wool weight (W), mean fibre diameter (D) , stample length (L), crimps per inch (Cr) and quality number (Q). The definition and measurement techniques of each trait has been previously described by Turner *et al.* (1953) and Mullaney *et al.* (1969).

Multiple regression and correlation statistics in which the classer scores were the dependent variables and the objective measurements the independent variables, were calculated for each property. A stepwise computer programme was used to fit the regression equations, only those variables significant at the 5 per cent level being fitted.

III. RESULTS AND DISCUSSION

The mean classer scores and fleece measurements for ewes on each property are given in Table 1. For most traits, the Merino flock had mean scores, which were higher than the Corriedale flocks, but the differences were generally small. The greatest discrepancy occurred in the scores for character, where the definition and evenness of crimp was apparently more evident in Merinos than Corriedales. The measured fleece production varied considerably between breeds, and between the two Corriedale properties.

Since the mean scores given by the classer were much the same in the three flocks, classer standards appear to be largely determined for within flock comparisons, and not for between flock comparisons. This, of course, is as expected; in selecting young ewes as breeding flock replacements, interest is centred on increasing the mean production of the existing flock and between flock comparisons are of little value.

Simple correlation coefficients between pairs of classer traits and between classer and measured traits are given in Tables 2 and 3 respectively. In general, the majority of the correlations in both tables were low (<0.30) and similar between breeds. and properties. The association between the classer scores for point and belly cover were in the medium to high range (0.57 to 0.63) ; these traits, together with back cover, had medium positive correlations with the classer score for greasy fleece weight, suggesting that each of these traits was, considered about equally by the classer when visually assessing greasy fleece weight.

Correlations between grades for wool cover on points, belly and back and measured greasy and clean wool weight were in the range 0.28 to 0.5 1, and were similar between properties. Hence, the view held by many sheep breeders that these traits are good indicators of wool production was not supported by this study. The association between scored and measured fleece weight on all properties was about 0.50, indicating that classer selection for the single trait, greasy fleece weight, is less efficient than selection by measurement. The correlation between density

TABLE 1

Average classer scores and measured fleece production of young Merino and Corriedale ewes

Trait	Breed					
	Merino (M)		Corriedale			
			Property 1 (C1)		Property 2 (C2)	
Classer Scores *						
Point cover	3.5	(0.8)†	3.4	(0.7)	3.5	(0.7)
Belly cover	3.5	(0.8)	3.6	(0.8)	3.7	(0.8)
Back cover	3.7	(0.7)	3.4	(0.8)	3.4	(0.7)
Colour	3.6	(0.7)	3.5	(0.7)	3.2	(0.7)
Character	3.1	(0.8)	2.4	(0.6)	2.6	(0.6)
Handle	3.6	(0.7)	3.5	(0.6)	3.1	(0.6)
Condition	3.5	(0.6)	3.4	(0.6)	3.3	(0.6)
Greasy fleece weight	3.6	(0.6)	3.4	(0.7)	3.5	(0.6)
Density	3.8	(0.6)	3.5	(0.6)	3.6	(0.5)
Measurements						
Greasy fleece weight (G) (kg)	4.00	(0.25)	3.90	(0.29)	4.72	(0.33)
Percent clean scoured yield (Y)	69.3	(4.7)	65.8	(6.9)	68.8	(5.1)
Clean wool weight (W) (kg)	2.77	(0.21)	2.59	(0.22)	3.25	(0.31)
Mean fibre diameter (D) (microns)	23.0	(1.8)	28.7	(2.9)	31.1	(2.2)
Staple length (L) (cm)	9.1	(0.9)	10.6	(1.3)	11.9	(1.4)
Crimps/in. (Cr)	17.1	(4.6)	5.8	(2.4)	6.4	(2.7)
Quality number (Q)	64's		56's		56's	
Number of ewes	294		265		321	

* All scores measured as 1 = poor, 5 = best.

† Standard deviation given in parenthesis.

score and measured wool weight (both G and W) was in the range 0.21 to 0.46; Brown and Turner (1968) reported a phenotypic correlation between fibre density and clean wool weight of 0.16.

The significant ($P<0.05$) partial regression coefficients of measured traits on classer traits are given in Table 4. The contribution of the various traits to the variation in the classer traits, calculated from the square of the multiple correlation coefficient, indicate the efficiency of the classer in terms of measurements. In general, the association of the combined wool traits with classer grade for any trait was small, between 6 and 49 per cent (average 28.7 per cent) of the variation in classer score being due to variation in measured traits. Clean wool weight, but not greasy fleece weight, was associated with scores for wool cover on points, back and belly. An explanation of such an effect is not apparent. Measured greasy fleece weight contributed to about 35 per cent of the variation in score for this trait. This

TABLE 2

Simple correlation coefficients between classer scores for various traits

Classer trait	Property	Belly cover	Back cover	Colour	Character	Handle	Condition	Greasy fleece weight	Density
Point cover	M	0.57	0.33	0.05	—0.04	0.03	0.10	0.30	0.23
	C1	0.57	0.44	0.11	—0.02	0.04	0.11	0.32	0.29
	C2	0.63	0.30	0.03	0.11	0.04	0.04	0.37	0.18
Belly cover	M		0.24	0.03	—0.16	—0.11	0.01	0.23	0.24
	C1		0.25	—0.16	—0.04	—0.12	—0.19	0.37	0.30
	C2		0.28	—0.02	0.19	0.13	—0.07	0.40	0.14
Back cover	M			0.35	0.38	0.25	0.30	0.42	0.25
	C1			0.23	0.13	0.28	0.20	0.41	0.39
	C2			0.22	0.17	0.04	0.24	0.23	0.22
Colour	M				0.40	0.37	0.51	0.06	0.25
	C1				0.19	0.47	0.68	—0.15	—0.06
	C2				0.20	0.37	0.62	—0.13	—0.06
Character	M					0.41	0.26	0.20	0.07
	C1					0.27	0.08	0.11	0.07
	C2					0.35	0.25	0.14	—0.07
Handle	M						0.58	0.01	—0.18
	C1						0.45	—0.11	—0.09
	C2						0.29	0.08	—0.22
Condition	M							—0.02	—0.18
	C1							—0.22	—0.15
	C2							—0.19	—0.16
Greasy fleece weight	M								0.59
	C1								0.61
	C2								0.21

TABLE 3

Simple correlation coefficients between classer scores and measured production

Classer Trait	Property	G*	Y	W	D	L	Cr	Q
Point cover	M	0.38	0.18	0.41	0.29	0.20	—0.09	—0.17
	C1	0.29	0.16	0.37	0.28	0.14	—0.15	—0.14
	C2	0.42	0.19	0.45	0.29	0.29	—0.22	—0.27
Belly cover	M	0.33	0.18	0.37	0.28	0.06	—0.25	—0.31
	C1	0.31	0.09	0.34	0.36	0.11	—0.22	—0.38
	C2	0.47	0.22	0.51	0.30	0.29	—0.36	—0.40
Back Cover	M	0.29	0.28	0.38	0.04	0.33	0.20	0.14
	C1	0.33	0.21	0.44	0.21	0.14	—0.10	—0.10
	C2	0.33	0.33	0.45	0.16	0.21	0.08	—0.07
Colour	M	—0.14	0.37	0.04	—0.20	—0.08	0.16	0.24
	C1	—0.12	0.22	0.02	—0.11	—0.03	0.10	0.25
	C2	—0.28	0.37	0.03	—0.26	0.12	0.16	0.19
Character	M	0.33	0.18	0.11	—0.31	0.24	0.44	0.46
	C1	0.17	0.08	0.14	—0.10	0.03	0.29	0.22
	C2	0.20	0.37	0.35	0.09	0.26	0.59	—0.08
Handle	M	—0.14	0.46	0.09	—0.34	0.24	0.20	0.22
	C1	—0.08	0.14	—0.03	—0.06	—0.03	0.10	0.14
	C2	—0.15	0.23	0.10	—0.13	0.29	0.11	0.02
Condition	M	—0.23	0.52	0.03	—0.12	0.22	0.16	0.17
	C1	—0.19	0.28	—0.01	—0.07	0.01	0.08	0.26
	C2	—0.17	0.40	0.04	—0.19	0.18	0.19	0.21
Greasy fleece weight	M	0.56	0.09	0.52	0.25	0.18	—0.12	—0.16
	C1	0.51	0.01	0.46	0.25	0.20	—0.23	—0.34
	C2	0.56	0.12	0.54	0.45	0.34	—0.42	—0.47
Density	M	0.46	—0.01	0.39	0.29	—0.01	—0.06	—0.09
	C1	0.38	0.05	0.37	0.20	—0.01	—0.08	0.17
	C2	0.25	0.01	0.21	0.10	—0.16	—0.03	—0.04

* See footnote Table 1.

TABLE 4

Standard partial regression coefficients for classer traits and measured production in Merino and Corriedale ewes

Classer Trait	Property	G	Y	W	D	L	Cr	Q	Percent Variation in Classer Trait Accounted for by Measured Traits
	M		—0.18	0.39	0.18				22.5
Point cover	C1	—0.78	—0.58	1.21	0.36				26.2
	C2			0.40	0.13				22.1
	M			0.37					17.5
Belly cover	C1			0.24	0.30	—0.19		—0.34	30.7
	C2			0.42				—0.22	30.5
	M			0.44		0.16	0.16	0.24	34.5
Back cover	C1	—0.63	—0.46	1.14	0.21				29.7
	C2			0.47	0.14			0.20	31.3
	M		0.25					0.28	29.5
Colour	C1							0.16	22.0
	C2		0.12		0.19				35.5
	M			0.30	—0.11	0.12	0.22	0.25	48.9
Character	C1	0.22					0.24		19.3
	C2		0.18	0.18					33.0
	M		0.31		—0.40	0.12			43.9
Handle	C1		0.18						6.6
	C2				—0.17	0.26			17.6
	M		0.45	—0.24		0.11		0.22	46.5
Condition	C1	—0.17	0.25					0.22	28.4
	C2		0.22				0.19		34.0
	M	0.60							33.5
Greasy fleece weight	C1	0.49						—0.34	38.2
	C2	0.38			0.16	0.14		—0.16	41.1
	M	0.50			0.21	—0.12		0.22	27.5
Density	C1	0.52				—0.27		—0.15	24.4
	C2	0.33				—0.26			12.2

indicates that visual appraisal for fleece weight is only about 35 per cent as efficient as measurement; similar results have been given by Riches and Turner (1955). Visual appraisal for other fleece traits would generally be even less efficient than for fleece weight.

It is apparent that in this study there is little evidence that classer gradings are determined by specific measurable fleece traits or by any combination of these, and selection programmes for any wool trait based solely on such gradings would have been about 30 to 40 per cent as efficient as selection based on measurement. The results, however, do not take account of classing skill in appraisal of sheep with body and wool faults; these skills are essential to stud and, to a lesser extent, flock classing. It is emphasised that a sheep classer does not normally score individual traits; he usually subdivides a flock into a number of classes on the basis of appraisal of traits in combination. The greatest genetic gain is likely to be made by the incorporation of selection indices into breeding programmes; however, the "half classing" method, combining classer skills and fleece measurement (**Dunlop** and Young 1960), is likely to be a compromise acceptable to most stud breeders.

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