

LINCOLN UNIVERSITY WOOL MEASUREMENT SERVICE

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INTRODUCTION

The Lincoln University Wool Measurement Service (LUWMS) is a raw textile fibre testing and advisory service administered by the Wool Science Department of Lincoln University. It has evolved from the Department's ad hoc extension activities with New Zealand woolgrowers into a semi-commercial wool testing and advisory service.

AIMS AND OBJECTIVES

1. To introduce and encourage ram breeders to become more objective in assessing economically important wool characteristics by providing a wool measurement service and supporting advice.
2. To help breeders identify genetically superior rams by providing within-flock rankings for individual wool traits and a breeding index combining fleece measurements.

DEVELOPMENT OF THE SERVICE

The LUWMS was officially established in 1974 when 29 woolgrowers, mainly Corriedale and Merino breeders, commenced testing ram hogget mid-side wool samples. Estimations for quality number and grade were also given. By 1983 sixty breeders, including Mohair and Cashmere breeders were using the Service.

160 breeders will use the LUWMS in the current season. This includes approximately 90% of the registered Merino and Corriedale stud breeders, who mainly test ram hoggets. Currently 75% of the work is for these breeders, but many other raw textile fibres from Fitch fur to Deerdawn have been measured. Subjective assessments of quality number and grade have been discontinued in favour of measurement.

The Service is currently staffed by 8 permanent part-time technicians plus a supervisor and operates within the industry as a Test House. It also has a measurement and extension input into various Breed Societies' activities involving measurement.

Testing is also done for various research projects from within and outside the University.

TESTS AVAILABLE

Tests offered include washing yield, average fibre diameter (FD) (airflow method), loose wool bulk, predictive test for susceptibility to yellow discolouration, clean scoured colour, staple strength, staple length, FD and variability by projection microscope, fibre length and medullation score.

Measurement of yield (for clean fleece weight estimation) and FD make up 75% of all the testing work. The susceptibility to yellowing test (Wilkinson 1981) is the next most requested measurement.

OPERATION

Standard wool test methods are used where applicable with some adaptations made for preparation of the full staple mid-side samples which are used instead of core samples.

An initial visual appraisal of all samples is made to detect poor sampling, tender and/or discoloured wool and general comments are noted, along with the standard test result printout. Test results from the LUWMS can only be used for flock selection and not as a basis for wool selling.

BREEDERS' REPORTS

Following the measurement of submitted samples, breeders can receive a number of reports:

1. Wool tests with sheep listed in tag order.
2. Wool tests with sheep listed in clean fleece weight order.
3. Wool tests with sheep listed in estimated breeding value order.
4. Sire summaries.

The wool test data are corrected for environmental factors by the LUWMS computer program when they are recorded, eg. twins vs. singles. The mean difference between classes is used to adjust data to a common basis. The estimated breeding values are derived from linear selection indices combining CFW and FD. The genetic parameters used in the construction of the index are:

$$h^2_{CFW} = 0.35, h^2_{FD} = 0.5, V_{CFW} = 0.4 \text{ kg}^2, V_{FD} = 3 \text{ } \mu\text{m}^2,$$

$$r_p = 0.25 \text{ (non-Romcross), } 0.45 \text{ (Romcross),}$$

$$r_G = 0.3 \text{ (non-Romcross), } 0.5 \text{ (Romcross).}$$

The relative economic values are derived from extrapolating one year into the future based on a regression of the last 10 years wool prices (Cottle et al. 1988). The indices used in 1988/89 are shown in Table 1. Breeders may request a particular index, otherwise it is selected automatically. The index values can be used to price the rams (Cottle 1986).

Table 1: Selection indices - 1988/89

Sheep/wool type	Average hogget fibre diameter (mm)	Index	Predicted response to ram selection (/10 years)*	
			CFW (kg)	FD (mm)
Fine Merino	< 19.1	6.4 x CFW - 10.0 x FD	-0.09	-2.64
Medium Merino	19.1 - 21.5	3.9 x CFW - 4.8 x FD	-0.04	-2.61
Strong Merino	21.5 - 24.5	3.0 x CFW - 2.2 x FD	0.10	-2.39
Halfbred	24.5 - 27.0	2.2 x CFW - 0.8 x FD	0.38	-1.67
Corriedale	27.0 - 30.0	2.1 x CFW - 0.4 x FD	0.57	-0.66
Romcross	> 30.0	1.7 x CFW - 0.03 x FD	0.69	+1.26

* Assuming generation interval = 3.5 years,
Standardised selection differential of rams for stud use = 2.2

If other wool tests are done, eg. bulk or predictive test for fleece yellowing, the results can be used to calculate independent cull levels. The sire summaries at present do not correct for numbers of offspring per sire or for selection of offspring.

Breeders receive hardcopies of these reports but the facility exists for returning data as ASCII files or in a dBaseIII program for use on an IBM-PC.

REFERENCES

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 WILKINSON, B.R. (1981). Wool Tech. Sheep Breed. 29:169.