

## SHORT COMMUNICATIONS

### ESTIMATES OF CORTICAL DIFFERENTIATION IN NORMAL AND "DOGGY" MERINO WOOLS\*

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Ahmad and Lang (1957) reported a comparison of ortho- and paracortical proportions in normal and "doggy" Merino wools. The doggy samples had been selected by wool appraisers in several Australian States as characteristic examples of wools regarded in their States as markedly doggy. The normal wools with which they were compared were well-crimped wools of Australian origin, not necessarily from the same source as the doggy wools.

Further work has been conducted at this Institute in attempts to characterize doggy wools (Glynn, Lang, and Wardle 1960) and to discover differences in manufacture of doggy as compared with normal wools (Lang and Sweetten 1960). In these two studies, attention has been confined to normal and doggy wools from single flocks. In these wools the doggy samples may be regarded as intermediate between the normal and those doggy wools studied by Ahmad and Lang.

Glynn, Lang, and Wardle (1960) reported the types of segmentation of the ortho- and paracortices, and that the onset of "dogginess" was accompanied by a tendency to a change of type of segmentation. A preliminary reference to the present author's work on the percentage differentiation on the same wools was made. This work is reported herein.

#### *Experimental*

(i) *Wools Used*.—The samples of normal and doggy wools used were those designated as groups B and C by Glynn, Lang, and Wardle (1960):

Group B: Numbered R49 N and D, R50 N and D, R51 N and D. These were three of the pairs of manufacturing research bulks, each pair being normal and doggy wools from a single flock: R49 and R50 were Merino wool of 64's quality; while R51 was Merino 60's.

Group C: N40–N50 and D40–D52 were normal and doggy staples from the same Western District (Victoria) non-Peppin Merino flock.

(ii) *Staining*.—The staples were tied in the middle of the fibres with a cotton thread to prevent felting. They were then cleaned by first degreasing in hot benzene-methanol azeotropic mixture (approx. 2 : 3 by volume, fractionated, b. p. 59.5°C) in a Soxhlet apparatus for about 12 syphonings. After drying off the solvent, the wool was washed in three 100-ml lots of distilled water at 50°C.

The cleaned wool was then dyed with methylene blue at the boil for 30 min with a liquor : wool ratio of 150 ml to 0.5 g of cleaned wool. The dye-bath consisted

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of Kolthoff buffer at pH 7.4 (82.5 ml of 0.1M  $\text{KH}_2\text{PO}_4$  mixed with 67.5 ml of 0.05M borax), containing also 0.015% w/v methylene blue. The wool was "washed-off" briefly in distilled water.

The dyeing conditions were arrived at after several experiments, and are believed to be an improvement on those of Fraser and Rogers (1955) in that the dyeing, although showing strong differentiation (staining the orthocortex well but not the paracortex), takes place from a weaker solution of the methylene blue and is fast to the washing-off stage.

The methylene blue used was at first a sample kindly supplied by Dr. R. D. B. Fraser, and later one manufactured by I.C.I.A.N.Z. Ltd., grade 2BN150.

TABLE I  
PERCENTAGE OF PARACORTEX IN NORMAL AND "DOGGY" MERINO WOOLS

Sample No.	Mean Percentage Paracortex		Standard Error
	Normal Wools	Doggy Wools	
R49 N	39.3		1.2
R49 D		41.6	1.0
R50 N	40.8		0.8
R50 D		43.8	1.2
R51 N	41.5		0.8
R51 D		40.4	1.1
N40-N50	35.4-43.8, mean 38.4		Mean 0.7
D40-D52		38.3-48.0, mean 43.6	Mean 1.0
Mean of the means	39.3	43.5	

(iii) *Methods of Estimation.*—Cross sections from the dyed wool, selected as of suitable thickness and uniformity, were projected at a magnification of 500 diameters on to millimetre graph paper and the periphery of the fibres and the lines of demarcation between stained and unstained parts were drawn by pencil. The proportion of the asymmetry was estimated in each fibre by counting the squares enclosed and calculating the percentage of paracortex. From 60 to 73 fibres were thus estimated in each sample.

#### *Results and Discussion*

The means of the estimates of the percentage of paracortex in the normal and doggy Merino wools are assembled in Table I. The mean of all the means of the normal wools is 39.3% while that for all the doggy wools is 43.5%. The difference between these overall means, when compared with the standard error of the difference, is found to be statistically highly significant. The overall mean percentage of paracortex in the doggy wools was, however, notably lower than that obtained

by Ahmad and Lang (1957), possibly because of greater admixture of normal fibres in these doggy samples, as was also indicated by the reduction of occurrence of D to H types of segmentation, found by Glynn, Lang, and Wardle (1960).

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