

# SKIN PRODUCTS AND FLEECE ROT RESISTANCE IN MERINO-TYPE SHEEP

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## Summary

Eighty **wethers** representative of 16 flocks and six strains - predominantly Merino - were grazed together in East Gippsland, a district where sheep are prone to fleece rot, for four years; 1971 to 1974.

Fleece rot occurred in the two wettest years in South Australian **Peppin** Merinos, comeback, and some Victorian **Peppin** Merinos but not in Merryville, Victorian Strain Merino, and New South Wales Peppins.

The value (\$) of fleeces of some genotypes resistant to fleece rot was greater than those of some susceptible genotypes.

## I. INTRODUCTION

While selection of sheep resistant to fleece rot has been reasonably successful in the higher rainfall areas of Australia (Merriman 1956), the basic factors involved in fleece rot resistance or susceptibility have not been defined. In particular, Jackson (1973) reported the lack of objective data on fleece rot.

## II. MATERIALS AND METHODS

From the age of one-year, a group of 80 **wethers** (5 each from 16 **sheep** breeders) were grazed together on the property of Mr. James Stewart, near Stratford, in East Gippsland, Victoria. The observations were made for four years (1971-74).

The **wethers** were selected, as representative of the breeders' objectives, for highest fleece return (\$), the sheep being of good conformation and apparent resistance to fleece rot.

The Stratford district is typical of much 'of the East Gippsland grazing environment, being subject to heavy persistent easterly rains of predominantly summer-autumn incidence, in addition to the influence of westerly rain of winter spring dominance.

The fleeces were shorn, appraised and valued in late June each year. Midside samples were taken before shearing, and a range of objective fleece measurements were made at the laboratories of Sir James Hill and Sons Ltd., Keighley, Yorkshire, England (Table 1). The method of Daly and Carter (1954) was used to determine wax and suint.

The flocks, represented in the Stratford Trial, (Table 2) were allocated into six categories based on established strains, according to the predominant bloodline present.

**STRAIN 1.** Merryville (MV) - from Gippsland Studs based on Merryville strain.

**STRAIN 2,** Victorian (VS) - from other Gippsland Studs and Western District (Victoria) strain.

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STRAIN 3, Victorian Peppin (VP) - from Victorian Studs of predominantly Peppin strain.  
 STRAIN 4. N.S.W. Peppin (NP) - from N.S.W. studs of Peppin strain.  
 STRAIN 5. South Australian x Peppin (SP) - from Bungaree (S.A.) strain by N.S.W. Peppin strain.  
 STRAIN 6. Comeback (CBK) - from Corriedale x Merino cross.

Gippsland sheep breeders' objectives, in breeding for fleece rot resistance, have been to select for -

- (i) bright-pearly wool in preference to fleeces with coloured yolk.
- (ii) moderate wax content to confer a soft handle, avoiding harsh fleeces usually low in wax, and fleeces high in wax having a sticky yolk.
- (iii) well defined regular crimp and staple formation, presenting a close even tip to the elements, yet opening freely from tip to butt, without coting or excessive crossfibres.
- (iv) long stapled fleeces.

### III. RESULTS

Despite marked differences between years in rainfall and hence sheep nutrition there were only small changes in the percentages of wax and suint in the dry skin product (Table 1). The percentage of wax was reduced and the percentage of suint was increased in years of poor nutrition.

TABLE 1  
Skin products of Merino-type strains (means for all sheep)

	Greasy fleece wt. (kg)	Washing yield (%)	Wax (%)	Suint (%)	Wax Suint Ratio	Fibre diameter ( $\mu$ m)	Rainfall mm
1971	5.6	73.5	20.9	3.4	6.2	21.2	720.3
1972	4.3	75.3	17.5	4.1	4.3	18.5	408.9
1973	4.8	72.4	21.9	4.0	5.5	19.1	543.6
1974	6.1	73.2	21.9	2.9	7.6	21.1	656.3

Fleece rot and/or bacterial discoloration of wool was confined to four of the 16 strains (Table 2) and occurred only in 1971 and 1974, years of higher rainfall. Within strains, sheep which were affected by fleece rot had the same range of wax and suint values as unaffected sheep; wax 13.4 to 23.4% and suint 2.4 to 6.0% of dry skin product. Greasy fleece weights for sheep affected by fleece rot averaged 5.7 kg compared with 5.6 kg for unaffected sheep. Washing yields were high in all strains.

TABLE 2  
Skin products of Merino-type strains (1971 data)

Strain <sup>†</sup>	Greasy fleece wt (kg)	Washing yield (%)	Wax <sup>#</sup> (%)	Suint <sup>#</sup> (%)	Wax Suint Ratio	Fibre Diameter ( $\mu$ m)	Fleece value (\$/hd)	Fleece rot*
MV	6.1	75.5	22.9	1.4	16.8	20.2	6.24	
MV	5.3	70.3	24.7	2.2	11.0	19.9	5.30	
MV	5.2	69.9	25.3	2.9	8.7	19.2	4.83	
VS	5.8	70.6	23.2	2.5	9.3	20.7	5.28	
VS	5.6	70.9	25.7	2.1	12.4	21.3	5.34	
VS	4.7	70.6	23.1	3.6	6.4	19.2	4.62	
VP	6.2	76.9	17.5	3.3	5.3	21.6	5.49	
VP	4.7	76.1	19.9	3.2	6.1	22.0	4.07	
VP	6.3	74.7	17.7	3.8	4.6	19.5	5.35	
VP	5.0	76.5	17.9	4.5	3.9	22.5	4.32	
NP	6.0	74.3	20.9	3.4	6.1	22.9	5.18	
NP	5.3	74.5	19.1	3.3	5.9	20.3	4.85	
NP	6.2	74.9	17.6	4.6	3.8	21.7	5.29	
SP	6.7	74.2	19.3	3.6	5.3	23.3	5.49	
SP	5.7	69.7	21.8	5.5	4.0	22.5	4.68	
CBK	4.8	75.8	17.0	4.0	4.3	22.9	3.71	

<sup>†</sup> Strains are described in section on methods

<sup>#</sup> Wax and suint expressed as per cent clean dry skin product.

\* Number of fleeces in each group with fleece rot and/or discoloration in 1971; 1974 figures shown in parentheses; same sheep affected in both years except in case indicated.+

#### IV. DISCUSSION

Sheep may become susceptible to fleece rot after prolonged wetting of the skin (Hayman 1953). Such conditions occur frequently in East Gippsland but the incidence of fleece rot is likely to be low in strains other than South Australian x Peppin (SP), Comeback (CBK), and possibly Victorian Peppin (VP) Merinos. While particular strains of sheep were shown to be more susceptible to fleece rot, there is no indication in this experiment that these genotypes have fleeces of higher value (\$) than non-susceptible genotypes.

It would appear that the Gippsland sheep-breeders have selected sheep highly resistant to fleece rot with fleece properties characterised by high washing yield, low suint and moderate wax content. To the processor, fleeces with these yolk characters have the maximum appeal, since they are of excellent colour and staple and have a minimum tip wastage, giving a high top to noil ratio in processing. The fleece tip is characteristically dark, sealing the staple to prevent degradation, of the tip by weathering.

Whereas there were differences between strains in incidence' of fleece rot which were accompanied by differences of wax/suint ratio, the data within strains did not differ in wax/suint ratio for susceptible and non-susceptible sheep. Paynter (1961) also has observed the absence of difference in wax/suint ratio of sheep fleeces either unaffected or

extensively affected by fleece rot. In the family comparisons of Hayman (1953) Camden Park x Peppin merinos were shown to have higher wax and suint contents and were more resistant to fleece rot than four families of Peppin Merinos.

In selection studies of Turner Brooker and Dolling (1970), cited by Jackson (1973), there were two groups, one selected for high clean scoured yield (i.e. low wax + suint + dirt) and the other selected for low clean scoured yield. Nearly all of the response to selection, at least at Cunnamulla (up to 1966) has been in wax production per unit area of skin. Selection for low wax production (yield + group) has led to a higher incidence of fleece rot, a whiter yolk colour, and a more yellow scoured wool colour.

Hayman (1953) found that within one strain of Peppin Merinos, sheep affected by fleece rot had a much lower wax percentage than sheep unaffected, but found no difference in suint percentage.

In practice it would seem that the high wax to suint ratios found in many of the Merino strains, which are resistant to fleece rot are incidental rather than a basic explanation for fleece rot resistance, though it would seem that within susceptible strains, sheep with fleeces of higher wax content tend to be more resistant.

Gippsland sheep breeders have tended to select for moderate wax and low suint contents, at least by visual means, and this has led to increased resistance to fleece rot in these sheep.

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