animal production in australia

effects of age on wool wax content in merino sheep

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raw wool contains substantial quantities (5% to 30%) of lipid material (wax), the functions of which are obscure. hayman (1953) observed that high wax content of wool is important in preventing fleece rot, a fleece and skin condition in merinos caused by prolonged wetting by rain. considerable variation in wax content occurs both between sheep and sites on sheep but the effects of nutrition and season are not clear (bonsma and starke 1934).

we have studied changes in wool wax content in peppin (three wethers and four ewes) and non-peppin (three wethers and five ewes) merinos maintained indoors in individual pens from birth. lambs were offered a high quality diet before and after weaning. growth rates averaged 0.2 kg/day before weaning and 0.1 kg/day after weaning. at 9 months old the lambs weighed 35 to 43 kg and were offered a maintenance ration for the remaining 18 months of the experiment. wool was clipped at intervals from defined areas on the mid-side and wax content of dry raw wool was estimated by wide-line proton magnetic resonance using a newport analyser mark ii (o’keefe and sharry 1982).

the results (fig. 1) show that wool wax content was:
(1) low during early post natal life compared with adults,
(2) about 8 percentage units lower (p < 0.05) in summer than in winter. this seasonal rhythm in wax content was pronounced in some sheep but non-existent in others. the seasonal rhythm in wax content was not related to wool fibre production which remained approximately constant from 5 months to 2 years of age,
(3) about 7 percentage units lower (p < 0.05) in the peppin than in the non-peppin merinos,
(4) temporarily reduced following docking and castration but lamb growth rate was not noticeably affected,
(5) unaffected by the sex of the animal.

the relationship of the observed changes in the wax content of wool to the susceptibility of sheep to fleece rot is currently being investigated.

fig. 1. changes in wool wax content in merinos from birth to 2 years old. tail docking and castration (t & c), weaning (w), shearing, ration change from production to maintenance (r), and the shortest (june) and longest (dec) days are indicated by arrows. points are means of 8 non-peppins (o-o), 7 peppins (e-e), 6 males (a-a), and 9 females (k-4).


hayman, r.h. (1953). aust. j. agric. res. 4: 430.


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