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A PROGRESS REPORT ON RESEARCH ON FACE COVER

F. COCKREM*

A REVIEW OF RESEARCH on face cover in the Romney sheep at Massey College over the past five years was given, together with an account of work in progress.

The following were the main aspects covered in the review :

- (1) Woolly-faced sheep showed poorer body growth as lambs after weaning than did open-faced sheep and this may be the cause of their observed lower fertility.
- (2) The differences mentioned in (1) above were not the result of wool blindness.
- (3) Open-faced sheep have follicles containing wool fibres on their faces and appear to differ from woolly-faced sheep in the rate of growth of these fibres.
- (4) A method of measurement of face cover was described and it was shown that this measurement was related to the body weight of the two-tooth ewe.
- (5) Wool growth on the fleece areas was only indirectly related to face cover through body weight and fertility. The important aspect was that woolly-faced sheep show a greater rate of wool growth on the face and head *relative* to the rate of growth on the main fleece areas.
- (6) A theory, now under investigation, was put forward. This suggests that the greater wool growth on the face and head of the woolly-faced sheep is the result of a greater blood supply to the skin of the head than to that of the open-faced sheep. If this is so, then it could be part of a syndrome of a failure of a woolly-faced sheep to respond adequately to stress situations. Such a syndrome could explain the observed results on body growth and fertility but considerable further investigation is required.

*Sheep Husbandry Department, Massey Agricultural College, Palmerston North.

DISCUSSION

Q.: What was the origin of the ewes and did they come from a flock of low fertility?

A.: I have no information on the fertility of the privately-owned flock from which the experimental ewes were selected. The selected animals were cull two-tooth ewes from a Taihape station flock in which rams from a well-known breeder had been used for a considerable number of years. One characteristic of the two-tooths was their low body weight (70 to 100 lb) at the time of selection compared with their offspring reared at Massey College.

Q.: If the face cover groups had been selected so that the average body weights of the groups were the same, would there have been a difference in fertility?

A.: I do not know. If it had been possible to find sufficient animals of extreme face cover in the overlapping range of body weights (80 to 90 lb), there may still have been fertility differences associated with hogget growth and birth rank on which I have no information for these sheep. An additional experiment would be required to answer this question satisfactorily.

Q.: What may be the basis of the possible genetic mechanism?

A.: The high heritability of face cover and the low heritability of the associated factors, together with the fact that the associations occur in the College random-bred flock, suggest that pleiotropy rather than linkage is of importance. The blood supply and stress theory would be a description of pleiotropic effects.

Q.: It is suggested that face cover affects body growth. Would it not be simpler to examine the hypothesis that body growth affects face cover?

A.: I do not suggest that face cover affects body growth but that they are both affected by a common underlying factor. To put forward the view that body growth affects face cover is to suggest a different physiological mechanism. The idea has been rejected on two counts. First, there is a high heritability of face cover compared with a low heritability of body growth. In the matings of, for example, open ram \times open ewes, if body growth was the determining factor then, with its low heritability, a high variance of body weight, and hence face cover, would be expected. In fact, all the offspring were open-faced with a low variance of body weight. Secondly, in the adult sheep where face cover does change slightly from year to year, lower body weight changes are associated with decreased face cover—*i.e.*, a secondary environmental effect in an opposite direction from the genetic effects on lamb growth.

Q.: Has consideration been given to the results of published work on the effects of light acting through the pituitary?

A.: The possibility of wool blindness acting in this way has been rejected for the following reasons: (a) Lack of effects following wiggling, (b) because of the time of the year that sheep were wool blind, and (c) particularly because marked body growth differences in lambs showing differences in face cover but not wool blind have been demonstrated.