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The Relationship Between Face Cover and Reproductive Efficiency in Romney Ewes

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SUMMARY

1. Face cover descriptions have been made on Romney mixed-aged flocks in three environments. In one of these environments, three flocks of different fertility genotypes were studied.
2. In all flocks studied, open-faced ewes produced more lambs (pounds of lamb weaned per ewe mated) than covered faced ewes.
3. The differences in lamb production between face cover classes were due to differences in reproductive efficiency involving both fertility and fecundity.
4. (a) Under conditions of hard hill country, open-faced two-tooths were more fertile than covered faced two-tooths. There were no demonstrable differences in reproductive efficiency between older ewes with different face cover grades. The overall incidence of multiple births was low.
(b) On easy hill country, there were differences both in the fertility of two-tooth ewes and in the fecundity of older ewes in the different face cover classes.
(c) Under a fat lamb environment, there was no association between face cover and fertility, but in older ewes the more open-faced animals were more fecund than the more covered faced ewes.
4. In the flocks of three different fertility genotypes, there was a strong negative correlation between face cover and fecundity within flocks. However, the most covered class of the high fertility flock had a higher twinning incidence than the most open-faced class of the low fertility flock.
5. It was emphasised that while face cover and reproductive efficiency were correlated in all environments, it was not always the same phase of reproduction which was affected.
6. It was suggested that estimates of the effects of face cover on reproductive efficiency must be regarded in the same way as estimates of heritability. They cannot strictly be applied outside the population and environment in which they were derived.
7. An hypothesis was put forward to explain the variations in the expression of the correlation between face cover and reproductive efficiency.
8. Because of the face cover-fertility genotype interaction it was emphasised that the selection of open-faced rams from flocks with low fertility genotypes need not lead to an improvement in flock fertility.

Discussion

MR. MONTGOMERY: Would the speakers care to comment on why there should be a difference in fleece weight between woolly-faced and open-faced sheep?

PROFESSOR COOP: We have suggested some reasons why it is conceivable that a difference might occur but we have no direct evidence.

MR. COCKREM: Where a difference in fleece weight exists, it is in part the result of the higher fertility of the open-faced ewes which produce less wool as a consequence of producing more lambs. So far there do not appear to be consistent differences between the two groups of sheep and until these are established there is little profit in looking for the reasons. The actual weight of wool on the face contributes little to total fleece weight.

MR. INKSTER: The association between face cover and fleece weight is not nearly as clear as that between face cover and reproductive efficiency. In fact, in some of the flocks I have examined, open-faced ewes have produced more wool than covered faced ewes. When analyses are made on a "wet ewe" or a "dry ewe" basis, the position does not become any clearer. In comparing the fleece weights of different face-cover classes, I have not so far tried any technique which would eliminate the effect of body weight on fleece weight. However, there is no reason why it should not be possible in a breeding programme to reduce face cover and yet still increase fleece weight.

DR. McMEEKAN: Have the speakers any explanation for the correlation which has been found between face cover and fertility?

MR. COCKREM: Work is being undertaken to determine the mechanism underlying this relationship.

MR. INKSTER: Without making any attempt to answer Dr. McMeekan's question, I would like to emphasise that while there is a correlation between face cover and reproductive efficiency, there is also an interaction with environment and genotype. Investigations into the physiological mechanism, therefore, can be carried out only on a within-flock basis. For instance, in the data I presented from the three fertility flocks, ewes in the most covered class in the high fertility flock produced more lambs than those in the most open class in the low fertility flock.

Dr. MacDONALD: In the ten tables presented by Mr. Cockrem the averages for lambing percentage were highest for the open-faced group in 30% of the cases, for the intermediate group in 60% of the cases, and in favour of the covered-faced group in 10% of the cases. Therefore, should not Mr. Cockrem be recommending the intermediate rather than the open-faced type of sheep?

MR. COCKREM: By considering all ten tables together, Dr. MacDonald has included the same sheep classified in two ways and also the totals of these classifications. In fact, by the classification by the three years, the intermediate group is the highest once, the open-faced group once and in 1953 the two groups were approximately equal. When classified by age of ewe the open-faced group is highest twice, the intermediate once, and the woolly-faced once. However, the comparisons have been made between woolly-faced sheep and the rest. For this comparison the differences were significant but there were no significant differences between the open-faced and the intermediate group. Moreover, it is possible under the grading system used that some ewes which were essentially open-faced were included in the

intermediate group because they were growing wool on the poll of sufficient length to obscure the eyes. When the intermediate group is sub-divided by use of the face and eye grading system, it will be possible to tell whether the intermediate or open-faced sheep is the more desirable type.

DR. McMEEKAN: I would like to know what Massey and Lincoln propose to do about this. Professor Coop made a gross understatement when he said that open-faced rams are in rather short supply. They do not exist. It is all very well for us to preach the gospel of their adoption, but I think it is a fact that both agricultural colleges make considerable revenue out of selling a number of stud rams and flock rams to farmers. Are the College authorities sufficiently convinced about the value of this work to change over their technique so that farmers can try out in practice open-faced rams to produce more lambs?

PROFESSOR RAE: As Dr. McMeekan is on the Massey Farm Committee he knows that one-quarter of the Massey flock is being bred for open faces.

DR. CARTER: Has Professor Coop any data on the performance within flocks of the different age groups?

PROFESSOR COOP: In our sheep the various face cover effects operate at all ages of the ewes right from two-tooths to the old ewes.

MR. McFARLANE: What advice are we to give farmers when in our district there is an open-faced flock which has consistently low lambing percentages?

PROFESSOR COOP: The comparison should be within flocks rather than between flocks where environment can mask effects. After all, this face cover effect has been shown to operate at different levels, e.g., in the Ashley Dene flock with 110% lambing and in the College stud Romney flock with about 145% lambing.

MR. CLARKE: Is there anything peculiar about the age composition of the Lincoln stud flock? For example, what is the proportion of seven and eight-year-old ewes?

PROFESSOR COOP: The College stud Romney flock is essentially young with approximately one-third as two-tooths. The remainder are mainly four and six-tooth ewes. There are very few more than five years of age.

DR. McMEEKAN: The Lincoln College Romney flock with which I myself was associated at one time could be of very great importance to New Zealand. I would like to see Professor Coop present an analysis of that flock and of the way the changes have been brought about in the last 20 years.

PROFESSOR COOP: The College studs are under the supervision of Mr. P. G. Stevens who, I suggest, would be better qualified to do this.