Selection priorities in high-fertility sheep flocks

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ABSTRACT

The basic aim of selection in flocks in the 150 to 200% lamb drop range remains unchanged, namely to breed sheep of sound physical type and with the genetic potential to give maximum net profits per hectare from sales of meat and wool.

However at these fertility levels the main thrust of selection moves off fertility due to the doubtful benefit of large numbers of triplets under commercial farm conditions. More emphasis can profitably be placed on milking ability as expressed by weaning weight. This has major implications in ensuring quick seasonal disposal of lambs to reduce the pressure on stocking rate brought about by high fertility. Also fleece weight gains in importance as increases in wool production do not involve increased stocking rate.

In high fertility flocks health and behaviour traits such as free lambing, mothering ability and resistance to foot problems are of even greater importance.

Overall, a very important factor to be considered in future selection in high fertility flocks is that per head gains in production be made while holding ewe body weights, i.e., an emphasis on efficiency for best per hectare results.

INTRODUCTION

New Zealand now has a significant number of commercial and ram breeding flocks consistently achieving 150 to 200% lambs born to ewes lambing. It therefore seems timely to explore the question of priorities for futher genetic improvement in such flocks. The suggestions made are based on the author's experience in managing a 900-ewe Coopworth ram breeding flock which has over the past 10 years recorded lamb drops between 170 and 205% with up to 24% of the flock having 3 or more lambs. Also influencing these suggestions are the comments from commercial farmer ram clients, many of whom are also exceeding 150% lamb drops.

Basic Requirement

Clearly the basic aim of selection remains the same for all sheep flocks, namely to produce sheep with the genetic potential to give maximum net profits per hectare from sales of meat and wool. Net profitability per hectare is the product of stocking rate and per head performance after deducting replacement and management costs. Contributing to total per head performance are various possible combinations of the productive traits, fertility, milking ability, growth rate and fleece weight. The challenge facing the farmer and ram breeder is to select animals genetically capable of producing the optimum blend of these traits for his farming environment.

Stocking Rate and Body Weight

To carry the maximum stock units per hectare without unduly depressing per head performance is critical to farm profitability. As breeders we must try to breed efficient sheep with gains in production not simply the result of greater body size. Cockrem (1979) showed that the relative efficiency of 75 kg ewes producing 2.6 lambs is only equal to that of 45 kg ewes producing 2.0 lambs. Large sheep may have other advantages such as better lamb survival, faster lamb growth rate and for marketing as live animals. However, I believe high fertility flocks should put emphasis on achieving higher production levels without associated body weight increases. Should we rate a ewe on the basis of weight of lamb weaned and wool shorn as a percentage of her own live weight? The 60 kg ewe weaning two 30 kg lambs may be more desirable than the 80 kg ewe rearing two 34 kg lambs although under present Sheeplan evaluation the 80 kg ewe and her progeny will be favoured.

Fertility

Of the performance traits, fertility has been acknowledged as having the major influence on net profit and has been the primary selection criteria. While this is still true for most N.Z. flocks, it is our experience is that as lamb drop approaches 200% 20% or more of the ewes will be having 3 or more lambs. The problems associated with triplet rearing along with the pressure on stocking rate generated by high lambing percentages makes further fertility selection less attractive. While most commercial farmers welcome the arrival of a few triplets as a source of spare lambs for mothering, very few are successfully rearing triplets intact.

To make best allocaton of scarce spring feed we shift our triplet rearing ewes into better grassed and sheltered paddocks soon after lambing where they

TABLE 1 Production from single, twin and triplet rearing ewes (lambs with same birth/rear rank only)

Birth/rear rank	1/1	2/2	3/3
Number	127	407	110
Ewe mating weight (kg)	69	69	70
Stocking rate/ha (3 months only—lambing to weaning)	20	15	12.5
Stocking rate/ha (full year average)	16.2	15	14.4
Lamb weaning weight (kg)[1]	34.2	29.4	24.5
Lamb live weight weaned/ewe (kg)	34.2	58.8	73.5
Lamb live weight value/ewe at 70c/kg ($)	23.94	41.16	51.45
Lamb wool kg/head	2.1	1.8	1.5
Ewe wool kg/head	6.1	5.9	5.8
Wool value ewe and progeny at 325c/kg ($)	26.65	30.88	33.48
Meat and wool production/ewe ($)	50.59	72.04	84.93
Meat and wool production/ha at average annual stocking rate ($)	822	1081	1221

1 First cycle lambs only. Average weaning age, 86 days.

are set stocked at 12.5/ha. Ewes with singles are run out to be stocked at 20/ha while those with twins remain at 15/ha. Table 1 shows 1981 production from first cycle ewes lambing and rearing 1, 2 and 3 lambs. This shows that in dollar terms our triplet rearing ewes produce 13% higher returns than per hectare than twin rearing ewes and 49% higher returns than single rearing ewes. Twinning ewes produce 32% higher returns than singles.

On the debit side however, triplet bearing ewes are much more sensitive to deficiencies in feeding and management.

We have noted that compared to other litter sizes triplet-bearing ewes are more susceptible to pregnancy toxaemia, milk fever and bearing trouble before lambing, lose a higher percentage of lambs at birth and suffer more from sore teats and gangrenous mastitis while rearing their lambs.

The fact is that ewes are better equipped for 2 offspring than 3. This leads me to the conclusion that the sort of economic advantage our triplet-rearing ewes show would be difficult to repeat on the average farm. Therefore the farmer getting more triplets than can be conveniently fostered off is likely to switch his selection emphasis to other traits. In theory he may be able to reduce the incidence of triplets in favour of twins by increasing stocking rate and lowering the mating weight. It is still necessary for ram breeders to have fertility levels higher than commercially required to provide rams capable of giving rapid improvement for flocks needing higher fertility.

Milking Ability

Selection for milking ability as expressed by progeny weaning weight must grow in importance with increasing fertility levels. Higher weaning weights assist quick seasonal disposal of surplus lambs to reduce the effects of high fertility on stocking rate. On commercial farms one of the disadvantages of high lambing percentages can be having more lambs to carry later into the season for fattening with a subsequent shortage of feed for tupping or wintering the ewe flock. A 2000 ewe property obtaining a 25% increase in lambing will have at least 500 extra lambs to fatten after weaning.

Milking ability selection must keep pace with increased fertility. This is especially critical in areas subject to summer feed shortages. Ewes expected to rear triplets must have extra milking ability to wean good even lambs.

Our records indicate that the top 10% of ewes rearing twins bring in 8 kg or 12% of adjusted weaning weight more than the average twin-rearing ewes. If the whole flock could be selected to this level it would be worth an extra $84/ha for meat production.

Growth Rate

Lamb growth rate remains an important trait as it complements ewe milking ability especially into the first autumn. However, the emphasis presently given later body weights by Sheeplan may be unnecessary in high-fertility flocks and could in fact compromise selection for efficiency. In our flock for all age groups there is no significant difference in average tupping weight between animals subsequently lambing 1, 2 or 3 lambs. It seem illogical therefore to prefer larger animals with greater feed requirements in the hope that they will be more fertile.

Fleece Weight

In my view fleece weight ranks next to milking ability as the most promising area for further genetic improvement in high fertility flocks. Raising our flock average to the clip of the top 10% would lift wool production 1 kilogram per head worth an extra $49/ha. Additional fleece weight potential does not incur higher stocking levels and is more easily realised as it is available continously and any month of favourable conditions allows its expression.

On the other hand higher fertility potential can be totally negated by adverse weather or feed conditions

at tupping and lambing. In short, extra wool growth potential can be more readily made use of by Mr. Average Farmer.

Carcass Quality

Fat cover and carcass conformation considerations will have to be incorporated into future selection programmes. However, we need to know more about the heritability of the desirable attributes and establish practical and reliable means of identifying live animals of superior quality. Research now under way should provide these answers. If selection pressure is to be directed away from other productive traits towards these attributes there will have to be economic rewards in the market place.

Health and Behaviour Traits

High fertility conditions accentuate the importance of traits such as easy lambing, strong mothering instinct and lamb vigour. In addition there is strong evidence that selection against susceptibility to foot problems, dagginess and early tooth wear could pay dividends.

CONCLUSION

My ideal ewe of the future will: be no bigger than 65 kg body weight; rear twins for 8 or more years; wean her body weight in lean, well-muscled lambs; shear 10 to 12% of her body weight in good quality wool; be a stranger to dagging shears and footbaths; be acceptable to the critics at local saleyards!

REFERENCE

Cockrem, F. R. M., 1979. *Proc. N.Z. Soc. Anim. Prod., 39:* 24.