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# RELATIONSHIP OF PARTURIENT BEHAVIOUR TO REPRODUCTIVE EFFICIENCY OF FINNSHEEP

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## SUMMARY

Finnsheep will readily produce litters of light lambs but few will survive without optimum physical and social conditions. It is recommended that surveillance be continuous, lambing ewes be isolated to indoor pens, and primipara be supervised. The maternal drive and repertoire of the Finns were less than the Clun Forest ewes studied. The greater degree of Finnish husbandry is suggested as a possible cause of the decline of these traits.

## INTRODUCTION

THE NUMBER of lambs reared per ewe per year is one of the two most important factors in efficiency of lamb production (Large, 1974). The Finnsheep has been recorded in Finland as producing an average litter size (ALS) of 2.48, when the offspring of the 67% of yearlings which lambled were included (Maijala, 1967). However, an increase in ALS above 4 at birth did not result in greater ALS at 2 weeks. Melrose (1974) noted that considerable improvements in husbandry, particularly skilled attention at lambing, were required to reduce perinatal mortality in the more intensive sheep systems. The problems specifically related with prolific sheep have not been extensively studied (Anon., 1973) and their parturient behaviour has only recently been described (Holmes, 1975a). Holmes (1975b) has related the role of maternal behaviour of prolific ewes to neonatal loss. Sheep behaviour has most recently been reviewed by Hulet *et al.* (1975). The present investigations were made into behavioural activities of the Finnsheep which might reduce the success in rearing maximum of lambs from each litter. Comparisons were made in the same environments with the Clun Forest breed which has an ALS of about 1.70 (David, 1969).

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## MATERIALS AND METHODS

Preparturient behaviour of Finnsheep and Clun Forest pure-mated ewes (1 to 7 years old) of mixed experience was recorded intermittently by direct television and time-lapse cine observation. Continuous records over three years totalling 234 h were made on 19 different ewes of each breed. Records started from observed commencement of straining and continued for periods up to 6 h after completion of the last foetal delivery. Ewes were left to lamb in their group enclosures either at grass or housed, or were moved within the building to individual pens at the first observed strain. Interference was restricted to the minimum considered essential for lambing or identification reasons.

## RESULTS AND DISCUSSION

Recording of earliest onset of the 7 physical and 25 behavioural signs considered to be characteristic of preparturient ewes showed considerable variation, ranging from 15 days (hind-leg stamping) to 4 h (back-arching). The median times of onset ranged from 3 days (ragged lower abdominal outline) to 42 min (made "nest") before completion of first foetal delivery. The median time of onset of the physical signs tended to be earlier than the behavioural signs (Mann-Whitney), not significant. Multiple-bearers showed slightly increased warning of parturition. Generally, Finns appeared to show more signs of pain, to which almost half the behavioural signs could be ascribed. No one sign could be used to predict lambing more than 4 h *prepartum*. As individuals seldom showed more than a few signs it would appear that prediction of the prolific sheep's parturition is no more satisfactory than that previously reported for single-bearers (Wallace, 1949; Fraser, 1968). Hence 24 h surveillance becomes essential to prevent possible losses.

Premature maternal interest was a minor problem. Adoption occurred in only one group-lambled indoor Finn, which was initially approached by 3 lambs less than 1 h old. Two lambs survived the 2 days to her own delivery of triplets. Her own lambs died within 4 days but the adopted pair suckled to 12 weeks.

Mean duration of regular straining for the first-born of Finn litters was significantly (Mann-Whitney,  $P < 0.05$ ) shorter than those of Cluns. There was progressive reduction in mean

duration with successive deliveries within litters of both breeds. Of the 51 unassisted deliveries subsequent to the first-born, 11 (all Finn and either last or penultimate births) were expelled without any apparent straining and 10/11 were from standing ewes. Such ewes did not show immediate awareness of lamb presence and the lambs were neglected for some time by the dam. Duration of passage through the birth canal, the total foetal expulsion phase and posture of ewe at delivery might all affect neonatal viability. Absence of straining and the possibility of secondary uterine inertia produce a dilemma as to when to examine for further foetuses. Ewes eating, drinking or ruminating should be examined as evidence suggests they have either completed the foetal expulsion phase or are in dystokia.

The duration of the first intense licking of each lamb declined progressively with successive deliveries within the litter. The licking rate (mean total licking per min) of ewes with 3 and 4 lambs declined more rapidly after completion of foetal expulsion phase than those with fewer lambs. The later the lamb in the birth-order the greater it is disadvantaged in reduction of licking attention. There were no apparent breed differences in reduction of licking attention. There were no apparent breed differences in licking behaviour. The Finn lambs had low birth weights (mean  $\pm$  S.E. =  $1.91 \pm 0.06$  kg v  $3.34 \pm 0.10$  kg for Cluns) and were prone to hypothermia, even indoors. Although initially highly active and successful at getting to the teat, they were generally ineffective at sucking.

Dysepimeles, which describes lack of care-giving (epimeletic) behaviour or activities detrimental to the survival and growth of offspring, was a feature of primiparous Finns. This took the form of failure to stand immediately on delivery, failure to lick, unco-operative responses to teat-seeking and sucking attempts, and agonism. There was no apparent relationship with the dam's own rearing experience but there was marked similarity between dam and daughter in dysepimeles.

There were 5 lamb deaths directly attributable to dam behaviour — *i.e.*, agonism, PMI and failure to rupture the amnion. This was equivalent to 4% of all lambs delivered alive and 12% of the lambs dying between birth and weaning. However, there was interference by the observer in rupturing sacs and additional care was given to many lambs.

Finns were more interactive in frequency and variety of encounters in group lambing and did almost all the licking of alien lambs less than 5 h old. The most common form was the

ewe to advance and nose a freshly dropped litter member. There was no consistency between the behaviour of a ewe before or after parturition. Ewes of both breeds showed significantly ( $\chi^2 = 4.47$   $P < 0.05$ ) greater tendency to interact after parturition than before. Few ewes prevented access to their neonates by investigating ewes but the many Finn lambs were repelled, often vigorously. Removal of colostrum from alien ewes immediately *post partum* was done by some Finn lambs.

Following early and complete loss of offspring (5 lambs within 8 h) one Finn ewe caused considerable disturbance in attempts to mother neonates and agonism towards the dams. Rapid identification and separation of such ewes is imperative.

There were significantly ( $\chi^2 = 8.67$ ,  $P < 0.01$ ) more lambings between 0100-0700 and 1300-1900 h than the remaining 12 h. In agreement with Lindahl (1964) and Handscombe (1974) there was a peak incidence associated with feeding. The possibility of being able to predict and manipulate time of lambing ought to be investigated.

The experienced Finn showed absence or lower incidence of minor behavioural patterns which could be regarded as maternal deficiencies. They were: foot-stamping; nest-making; post-parturient pawing of ground and lamb, preparturient tongue-flicking and rumble-calling; favouritism; placentophagia; absence of agonism towards their own offspring but more active rejection of aliens of the other breed. It is suggested that loss of maternal drive could have arisen through lack of selection pressure associated with selection for prolificacy and high degree of human interference.

#### CONCLUSION

Considerably greater attention than other breeds at lambing is required to achieve the potential in the Finn's prolificacy.

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