

USE OF TEXTILE COATS TO FACILITATE FOSTERING IN SHEEP

G. ALEXANDER, D. STEVENS and L.R. BRADLEY

SUMMARY

When a simple rectangular textile coat that had been worn by a potential foster mother's own lamb was transferred to an alien lamb, about 50% of Dorset ewes accepted the foster lamb immediately, and a higher proportion of primiparous than multiparous Dorsets accepted foster lambs. The procedure was less successful with cross-bred ewes (Border Leicester x Merino), but confinement for up to 2 days resulted in a high acceptance rate in both types of sheep. The method appears to function both by masking the alien lamb's odour and by transference of the odour of the ewe's own lamb to the foster lamb.

The method may be useful in experimental studies on lamb growth and in practice for fostering stray lambs onto ewes with single lambs.

INTRODUCTION

During the first few hours after parturition ewes learn to distinguish their own lamb(s) from other ewes' lambs (aliens). Their own offspring are suckled exclusively, while aliens are rejected and even attacked (Alexander 1960). This specific recognition is based on olfaction as shown by experiments in which various recognition cues were modified or eliminated (Poindron et al. 1980). Fostering is therefore difficult, unless it is done within a few hours of birth, before the ewe has learned the odour of her own lamb. In practice, fostering is usually done when lambs are a day or two old, and farmers hope to facilitate acceptance of foster lambs by attempting to disguise their odour. However, there has been no systematic study of fostering methods, and their outcome is uncertain and undocumented (Lamond 1949).

Fostering is important both for experimental studies on lamb growth, and for saving abandoned lambs or lambs from large litters, and its importance is likely to increase if current interest in methods of increasing fecundity in sheep gains momentum. This paper reports part of an investigation into the effectiveness of a simple fostering method using cheap textile coats to transfer lamb odour from the foster mother's own lamb to the foster lamb. In a previous study, the ewe's own lamb's wool fastened near the base of the foster lamb's tail proved ineffective (Alexander et al. 1983).

METHODS

Animals

The main study involved 66 Dorset ewes of mixed parity, and their Dorset lambs, and 44 Border Leicester x Merino ewes and their Dorset-sired offspring. A small, supplementary study involved 6 Dorsets and 9 cross-breds. The ewes and lambs were transferred from the lambing paddocks to covered outdoor pens (1 m x 1.5 m) for fostering.

Procedure

Ewes were tested in pairs and were used twice in the main study, once when lambs were 1-2 d old and again on the following day when 2-3 d old. Simple

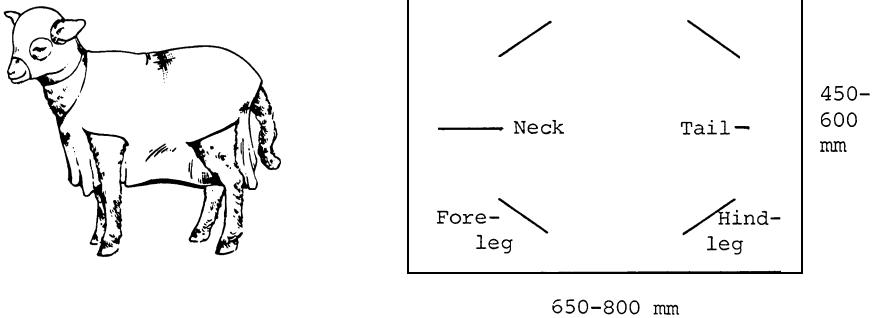


Fig. 1. Left: Artist's impression of lamb wearing coat plus hood. Right: Details of coat design. Basic coats were of heavy-weight hessian costing approximately 20 cents per coat. Edges were not hemmed. Slits for the neck, fore- and hindlegs were all 100-120 mm, and the tail slit was 30 mm. The design aimed for coats to remain in place without the need for ties, and to cover the anal region which ewes sniff to aid in identifying their lambs.

often butting. On some occasions the lamb wearing the transferred coat was tested before the control test in which lambs wore their own coats.

Following these tests lambs were returned to their mothers, and the ewes were re-allocated to another treatment group (Table 1) for a second trial; the new coats were placed on the lambs 1-3 h after the first test. Coats were discarded after one use, but hoods were reused after washing.

In the supplementary trial ewes were used once, and only two treatments, hessian coats plus hood from rump, and hessian coats impregnated with wool fat, were employed. Lambs were left with the foster mothers for 2 days and observed daily for acceptance. with four twin-bearing ewes, two Dorsets and two cross-breds, an own lamb was returned 18 h after introduction of the foster lamb.

Statistical comparisons

All comparisons were made using Fisher's exact test.

RESULTS

The wearing of all nine types of attire appeared to facilitate acceptance of alien lambs by Dorset ewes, either before or after the transfer of coats or coats plus hoods. In the control tests done with the test groups, several types of attire resulted in a significantly higher proportion of alien lambs accepted ($P < 0.06$) than in the two control groups (Table 1). Transfer of attire resulted in small nonsignificant increases in acceptances in 7 of the 9 test groups, but when these were pooled the increase was significant (from 24 to 53%, $P = 4 \times 10^{-6}$). In all test groups, acceptances after transfer were higher ($P < 0.06$) than in the two control groups in which there was no transfer. More primiparous than multiparous Dorsets accepted the 'foster' lambs both in the control tests (20/36 versus 17/69, $P = 0.0025$) and tests after exchange of attire (26/36 versus 30/69, $P = 0.005$).

Table 1 - Ewes' acceptance of alien lambs wearing attire of different types, before and after exchange of attire with that of the ewe's lamb

| Type of attire | Proportion of alien lambs accepted by ewes* | | | |
|----------------------------------------|---------------------------------------------|------------------------------------------|---------------------------------------|------------------------------------------|
| | Dorset ewes | | BL x Merino ewes | |
| | Control (lambs wearing own attire) | Test (lambs wearing exchanged attire) | Control (lambs wearing own attire) | Test (lambs wearing exchanged attire) |
| <u>Control groups</u> | | | | |
| No attire | 1/20 | - | 0/13 | |
| Hessian coat but no transfer | 1/19 | - | 0/9 | |
| <u>Test groups</u> | | | | |
| Hessian coat | 3/11 | 7/12 (3)† | 1/8 | 1/8 (1) |
| Hessian coat plus hood from head | 3/12 | 6/12 (2) | 0/6 | 2/8 |
| Hessian coat plus hood from rump‡ | 6/12 | 10/12 (6) | 2/8 | 2/8 (2) |
| Hessian with poly-ethylene backing# | 4/12 | 4/12 (4) | 0/8 | 0/8 |
| Hessian coat impregnated with wool fat | 7/12 | 9/12 (7) | 1/8 | 1/8 (1) |
| Wool coat | 6/12 | 7/12 (6) | 0/8 | 2/8 |
| Cotton coat | 4/12 | 5/12 (4) | 0/8 | 0/8 |
| Nylon coat | 5/11 | 5/12 (5) | 0/8 | 2/8 |
| Polyethylene coat | 0/12 | 4/12 | 0/6 | 1/8 |
| TOTALS excluding control groups | 38/106 | 57/108 (37) | 4/68 | 12/72 (4) |

* The same ewes were used in the test and control situation. Control lambs were either the same aliens as the test lambs or twins to the same aliens.

† Figures in brackets indicate the number of ewes accepting the alien in both control and test situation.

‡ "Hood" worn on rump by ewe's own lamb was transferred to head of test alien lamb. Treatment introduced because ewes sniff closely at rump region of lambs.

Polyethylene sheet outside when worn by ewe's own lamb - inside when transferred to alien.

rectangular coats (Fig. 1) of various textiles, or textile coats plus hoods of a tubular elasticised cotton bandage (Table 1) were placed on each ewe's own lamb(s) for a nominal 24 h (23-51 h in practice). Lambs were separated from ewes after about 20 h, to increase motivation to suckle, and approximately four hours later each ewe within the pair was tested for acceptance of the alien lamb belonging to the other ewe. Coats, or coats plus hoods, were then exchanged between lambs from the two ewes and the test was repeated. The lambs' tails were not drawn through the tail slits of the exchanged coats.

Acceptance of alien lambs was assessed from behaviour over 5 min. The ewe was judged to have accepted the lamb if suckling, and/or grooming and soft maternal bleating occurred. Rejection was indicated by loud bleating, circling and

Few cross-bred ewes accepted aliens, either before or after transfer of attire, but in the pooled data the increase following transfer was significant (from 6 to 17%, $P = 0.062$).

The use of hoods was introduced following observations of ewes initially accepting alien lambs wearing hessian coats, but then rejecting them after sniffing the head.

In the supplementary study with mixed groups of Dorset and cross-breds, transfer of hessian coats impregnated with wool fat, increased acceptance from 2/7 to 5/7 (NS) and transfer of hessian coats, plus hoods from the rump, increased acceptance from 1/8 to 7/8 ($P = 0.01$). All foster lambs, including the four in which an "own" lamb was also present, were eventually accepted during the two days of confinement.

DISCUSSION

The mechanism whereby the use of attire facilitates fostering is obviously an olfactory one. However, facilitation appears to be only partly due to transfer of odour from the ewe's own lamb to the foster lamb; significant facilitation also appears to result from the mere wearing of some types of attire. Perhaps the ewe recognizes an odour of the coat material itself, or perhaps the alien lamb's odour is masked, in a situation similar to that in which a proportion of ewes accept young alien lambs with their odour removed by washing (Alexander et al. 1983).

The trend for primiparas to accept foster lambs more readily than multiparas was unexpected in view of the reputation for poor maternal behaviour in ewes lambing for the first time (Alexander 1960). Apparently the ability of ewes to discriminate between lambs improves with parity.

The results indicate that the use of cheap textile coats coupled with confinement is an effective, practical means of facilitating permanent exchange of lambs between ewes, at least in some breeds. The effectiveness of different types of attire will be studied further. The method will also be further studied in its use for fostering an additional lamb onto a ewe already rearing its own lamb. In practice, the maintenance of a small flock of recently lambed single-bearing ewes of suitable breed with their lambs wearing coats, could provide a reservoir of potential foster mothers.

ACKNOWLEDGEMENTS

The use of hessian coats was suggested by Mr Bob Elwin, CSIRO Armidale, on the basis of experience on a cattle property near Tamworth, N.S.W. The authors are also grateful to Mr Bill Dwyer, CSIRO St Marys for management of the sheep.

REFERENCES

- ALEXANDER, G. (1960). Proc. Aust. Soc. Anim. Prod. 3:105.
ALEXANDER, G., STEVENS, D. and BRADLEY, L.R. (1983). Appl. Anim. Ethol. 10: 215.
POINDRON, P., Le NEINDRE, P., RAKSANYI, I., TRILLAT, G. and ORGEUR, P. (1980).
Reprod. Nutr. Develop. 20(38): 817.
LAMOND, H. (1949). Sheep and Goat Raiser, San Angelo, Texas, 29(9): 36.