

PAIR-ASSOCIATION IN TWIN LAMBS BEFORE AND AFTER WEANING

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ABSTRACT

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Association between twin lambs before and after weaning and their association with their dam before weaning was observed in Dalesbred, Jacob, Border Leicester and Border Leicester × Jacob Lambs. There was no significant difference between breeds, but the females spent more time close to the ewe than the males. The proportion of close associations was less and intermediate associations were higher in twins of mixed sex. The major effect of weaning was an increase in pair-association for 2 days; by the third day, pair-association had returned to pre-weaning levels. It is interesting that pair-association with non-castrated males increased after weaning.

INTRODUCTION

Young lambs closely associate with their mothers in preference to other ewes. Twin lambs also show a preference for each other's company rather than that of an alien (Arnold and Pahl, 1974; Shillito Walser et al., 1983). However, there is little published data of a quantitative nature on intra-family association, especially when twin lambs are involved. Arnold and Pahl (1974) observed undisturbed flocks of ewes and lambs of four different breeds. They found that the ewe–lamb bond appeared to be stronger when resting or sleeping than when grazing. Lambs showed a preference for grazing with their dams at 8 weeks of age and with the ewes of their own breed at 18 weeks, and it was not until the lambs were 7 months old that any detectable preference had disappeared. They concluded that these changes in associative behaviour demonstrated the gradual breakdown of the ewe–lamb bond and the development of association with other individuals. Shillito Walser et al. (1981) observed twin lambs at 6 and 7 weeks and 10–14 weeks, but all the male lambs had been castrated. Arnold and Pahl (1974) did not consider differences between sexes. The observations reported in this paper were made on twin lambs, including uncastrated male lambs.

METHOD AND ANIMALS

Nine pairs of twin Dalesbred, 11 pairs of twin Jacob, and 6 pairs of twin Border Leicester and Border Leicester \times Jacob/Border Leicester lambs with their ewes were run together in a single flock. The Border Leicester/Border Leicester \times Jacob lambs looked and behaved like Border Leicester lambs. The Dalesbred and Jacob ewes were identified by means of coloured tape on their horns. The Border Leicesters and Border crosses wore plastic collars of different colours. The lambs in all cases were marked with the same colour tape or collar as their dam.

The sheep grazed in an area 92 m \times 64 m before weaning and in an adjacent field 100 m \times 50 m after weaning. The lambs were weaned on 1 day, when they were 13–18 weeks old, by moving the ewes to a field 600 m away. The lambs were first observed with their dams when they were 76–90 days old. Each family was observed as a unit on two consecutive days. The distance between the twin lambs, before and after weaning, and the distance of each lamb from its ewe was recorded every 15 min. Distances were estimated by eye using the spacing of fence posts as a standard, or "ewe-lengths" when ewes were present, and were divided into three categories: close (0–4 m); intermediate (5–20 m); distant ($>$ 20 m). The length of observations varied from 2 h per family before and on the day of weaning, to 6–7 h on the 1st, 2nd and 5th day after weaning. The numerical results were expressed as percentages of total observations and were tested for significance using paired or grouped Student *t*-tests.

RESULTS

Before weaning

There was no statistically significant difference between breeds in the amount of time the lambs spent close to, intermediate or distant from the ewe (Table I). The Border Leicester lambs tended to spend more time over 20 m away from their dam than other breeds.

It was often noted that lambs were fairly consistent in the degree of association with their dam; if they stayed close to the ewe on one day they showed a similar association on the next day.

In every breed, the males spent less time close to the ewe than the females. Consequently, the number of intermediate and long-distance observations for the males was greater than those for the females. However, this sex difference was only statistically significant in the Jacobs, where a grouped *t*-test confirmed that the percentage of close associations for males was less than for females (males, 37.8; females, 63.4; $P < 5\%$).

Only two pairs of twin lambs (one Border/Jacob and one Jacob) were both males and they were added to the nine pairs of females to compare mixed-sex twins with same-sex twins. Dalesbred and Jacob mixed-sex twins

TABLE I

The proportion of close, intermediate and distant associations between ewes and their lambs and between twin lambs, expressed as a percentage of the total observations. (Numbers in parentheses indicate number of lambs (L) or pairs (p) observed in each breed)

| Group associations | Border Leicester | | | Dalesbred | | | Jacob | | |
|--------------------|------------------|--------|-----------|-----------|--------|------------|-------|--------|------------|
| | 0-4 m | 5-20 m | > 20 m | 0-4 m | 5-20 m | > 20 m | 0-4 m | 5-20 m | > 20 m |
| Ewe-male lamb | 35.6 | 30.8 | 33.6 (6L) | 34.2 | 44.6 | 21.2 (5L) | 37.8 | 37.7 | 24.5 (8L) |
| Mixed-sex twins | 55.4 | 25.4 | 19.2 (4p) | 37.6 | 40.8 | 21.6 (5p) | 43.6 | 28.0 | 28.4 (6p) |
| Ewe-female lamb | 57.2 | 20.3 | 22.5 (6L) | 47.0 | 33.2 | 16.8 (13L) | 63.5 | 23.8 | 12.7 (14L) |
| Same-sex twins | 60.0 | 17.0 | 23.0 (2p) | 51.0 | 39.5 | 9.5 (4p) | 55.4 | 24.2 | 20.4 (5p) |

TABLE II

The effect of weaning on the proportion of close, intermediate and distant associations between twin lambs, expressed as a percentage of total observations, divided for breed

| Day observed | Border Leicester/Border Jacob | | | Dalesbred | | | Jacob | | |
|------------------|-------------------------------|--------|--------|-----------|--------|--------|-------|--------|--------|
| | 0-4 m | 5-20 m | > 20 m | 0-4 m | 5-20 m | > 20 m | 0-4 m | 5-20 m | > 20 m |
| Before weaning | 56.7 | 24.5 | 18.8 | 43.5 | 40.3 | 16.2 | 49.4 | 26.1 | 24.5 |
| Day of weaning | 66.7 | 31.1 | 2.2 | 67.1 | 28.0 | 4.9 | 80.6 | 12.5 | 6.9 |
| Day 1 of weaning | 45.8 | 35.7 | 18.5 | 67.4 | 26.3 | 6.3 | 75.0 | 21.0 | 4.0 |
| Day 2 of weaning | 36.1 | 32.6 | 31.3 | 52.6 | 19.3 | 28.1 | 55.1 | 28.7 | 16.2 |
| Day 5 of weaning | 14.8 | 48.8 | 36.4 | 21.5 | 35.7 | 42.8 | 37.7 | 27.3 | 35.0 |

spent a larger proportion of time over 20 m away from each other compared with the Border Leicester breed ($D=21.6$; $J=28.4$; $BL=19.2$). In mixed-sex twins of every breed, the proportion of close associations was less and intermediate associations were higher than in same-sex twins.

After weaning

The major effect of weaning was the temporary but marked increase in the close association of twin lambs (Table II). The mean number of close associations increased from approximately 50% before weaning to 70% after weaning. Paired *t*-tests showed that this was significant in Dalesbreds ($P=5\%$) and Jacobs ($P<1\%$). Jacob close associations increased by the greatest degree, and remained higher than either of the other breeds for the 6 days of the study.

The increase in the number of close associations on the day of weaning was correlated with a distinct reduction in the number of distant associations of over 20 m. This was seen in all breeds where the number of observations of associations at less than 20 m distance averaged 93–98%.

As the lambs became accustomed to the absence of the ewe, the number of close associations fell rapidly. On the 2nd day after weaning, the number of associations observed at each distance had almost returned to pre-weaning levels (Table II). There was little difference between same-sex and mixed-sex twins except that on the day of weaning, close association was higher in same-sex twins (82%) compared with mixed-sex twins (66%).

DISCUSSION

The association between twin lambs with each other and with their dam was much the same in all the breeds studied. The results for Jacob twin-lamb associations were very similar to the findings of Shillito Walser et al. (1981) in which twin lambs were observed with their dam on 51% of occasions. Castrated male Jacobs were seen with their dam in 44% of observations and female Jacobs in 61% of observations. This compares favourably with 38% for the Jacob male and 64% for the female in this study.

The difference between male and female associations may be the result of the female lambs staying close to the ewe and the male lambs going further away to form all-male groups. The two all-male pairs observed in this study associated together, and may both have been leaving the ewe and joining male groups. This matrilinear succession and male dissociation has often been observed in flocks containing older lambs (Grubb and Jewell, 1966; Arnold and Pahl, 1974; Hunter and Milner, 1983).

Shillito Walser et al. (1981) worked with twin lambs, but all the males they used had been castrated within 24 h of birth. They found that twins increased their association after weaning, and this agrees with the results of this study. It is interesting to note that this increase occurred with un-

castrated male lambs which were showing less close association with the dam than were the female lambs. According to Orgeur and Signoret (1984), male lambs of this age have low plasma testosterone and LH levels. It is not possible, however, to tell whether the increase in lamb association after weaning was the result of the female lamb staying with the male or whether the association was mutual.

The decrease in lamb association was shown by Shillito Walser et al. (1981) to occur within 1 week of weaning. The results of this study suggest the association was more transient, returning to pre-weaning levels within 3 days of weaning.

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