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Heifer Disposition and Bonding of Lambs to Heifers

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ABSTRACT

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Abusive and non-abusive (tolerant) heifers were individually identified during pen confinement with young sheep. Physical aggression by abusive heifers toward lambs included butting and kicking. Two groups of three 75-day-old lambs confined with tolerant heifers developed a bond after 20 days and a strong bond after 55 days. However, three lambs confined with abusive heifers were not bonded at 20 days, but formed a satisfactory bond with the cattle after 55 days as the cattle became more tolerant of the lambs. During pen confinement, lambs with abusive heifers spent 41% of the time in a creep area away from heifers. In contrast, lambs in two tolerant lamb–heifer groups spent only 15% of their time in the creep area. Heifers which are abusive to lambs should be identified and removed from lamb–heifer groups if bonding is to be accomplished consistently and efficiently.

INTRODUCTION

Anderson et al. (1987) showed that bonding of sheep to cattle can be accomplished by penning 45–90-day-old sheep with heifers for a period as short as 30 days. Failure of 62-day-old lambs to bond to heifers was attributed to physical aggression displayed by two of the six heifers in this group toward the lambs during the pen confinement. Heifer aggression was characterized by butting and kicking the lambs. The objective of this study was to determine the effect of confining 75-day-old lambs with abusive or tolerant heifers on the occurrence of lamb to cattle bonding.

METHODS

The study was conducted on the Jornada Experimental Range, located in southcentral New Mexico, between 17 March and 12 May 1986. Nine crossbred Rambouillet × Polypay lambs averaging 75 days of age, with no previous contact with cattle, and weaned at 62 days of age, were randomly assigned to each of three pairs of Hereford × Angus and Brangus heifers selected from a previous study (Anderson et al., 1987). The three groups were shielded from each other in separate pens averaging 139 m^2 in size. Two of the six heifers, from one of three earlier experimental groups, had previously been identified as abusive and were penned together with three of the lambs (Treatment 1). Each of the remaining two pens of lambs had a pair of heifers judged to be tolerant (Treatments 2 and 3).

Water was provided ad libitum in each pen. Alfalfa hay was available to the animals each evening. A 20% protein supplement was provided for the lambs in a creep not accessible to the heifers.

Bonding following pen confinement of each lamb–heifer group was evaluated on 7 and 8 April and 12 May in a pasture. Intraspecific and interspecific distances were estimated. If interspecific distances were $\leqslant 16$ m the lambs were classified as bonded. These tests followed approximately 20 and 55 days of penning. The data consisted of the minimum diameter of a circle required to enclose each animal species, and the shortest distance between the perimeters of the sheep and cattle circles. Data collection took place at 15-min intervals for five consecutive hours during the two field tests. A wet- and dry-bulb ambient air temperature reading, along with wind speed and direction, was recorded at the beginning and end of each field test.

Mean diameters and mean distances of separation along with appropriate standard deviations were calculated for each treatment. In addition, data on the spatial location of the lambs and heifers within each of the three pens during confinement were summarized between 18 March and 7 May.

RESULTS

No precipitation was recorded during the field testing on 7 and 8 April or 12 May. Intermittent light winds and warm temperatures between 22 and 32°C characterized the 3 days.

Observations during pen confinement indicated that $>50\%$ of the time all six heifers were found in the area in which hay was fed. In contrast, the lambs in all three treatments were observed more frequently at or near the water (Table I). Table I also reveals that during 14 of the 34 observations (41%) the lambs in Treatment 1 (abusive heifers) were found in the creep area, while the lambs in Treatments 2 and 3 were in the creep area $\leqslant 15\%$ of the time.

TABLE I

Location of lambs and heifers (%) during pen confinement between 18 March and 7 May 1986 ($n=34$)

Animal group	Location					Total (%)
	Water	Hay	Lamb creep	Water/hay[1]	Hay/lamb creep[1]	
Treatment 1						
Heifers (abusive)	23	62		15		100
Lambs	44	15	41			100
Treatment 2						
Heifers (tolerant)	33	58		9		100
Lambs	64	21	6		9	100
Treatment 3						
Heifers (tolerant)	27	58		15		100
Lambs	52	33	15			100
Means						
Heifers	28	59		13		
Lambs	53	23	21		3	100

[1]Animals in two locations.

Treatment 1

In the initial field trial, the abusive pair of heifers and three lambs had a mean minimum separation of 219 ± 2 m. Twice the lambs did not follow the heifers. Based on the initial test there appeared to be minimal bonding. During the second field test, the mean minimum diameter of the lamb–heifer group was 8 ± 7 m. Several times the lambs were observed to run toward the fast-walking heifers. Trailing rather than active grazing was the predominant activity in the second trial. Lamb vocalizations were heard during the final trial but not during the initial trial. Bonding was not apparent in the initial trial. However, a relatively strong bond appeared to be present on 12 May.

Treatment 2

In the initial field trial the three lambs showed bonding to the two tolerant heifers. The mean minimum diameter of the lamb–heifer group was 24 ± 36 m. The distance between the lambs and heifers ranged between 6 and 130 m with the maximum separation occurring while the lambs were standing and the heifers were grazing away from the lambs. During the final field trial, the mean diameter of the lamb–heifer group was 10 ± 6 m. Only once during active grazing did the lambs become separated from the heifers by more than 46 m.

Treatment 3

The initial field test gave mean minimum diameters of 12 ± 8 m for the

lamb–heifer group. However, for approximately 45 min the lambs became separated from the heifers by approximately 130 m. This was possibly caused by a relatively dense stand of soaptree yucca (*Yucca elata*) and ungrazed dropseeds (*Sporobolus* spp.), which approached 0.6 m in height. The lambs stopped grazing and stood looking away from the heifers with their heads down. The heifers continued to graze away from the lambs. When the lambs finally began to move they vocalized but the heifers did not vocalize in response. To facilitate the group getting back together, the lambs were moved towards the heifers. Once visual contact was re-established the lambs and heifers remained together for the remainder of the field test.

Twice during the second field-testing the heifers and lambs returned to the corral, but were immediately returned to the field. The mean minimum distance between the lambs and heifers was 8 ± 4 m, except for one time in which the animals were separated by approximately 91 m prior to the animals returning to the corral for the second time.

DISCUSSION

Following 55 days of pen confinement the lambs in all three treatments had bonded with their respective heifers. Bonding appeared to have taken place in Treatments 2 and 3 following 20 days of penning, but not until the final test (55 days) did a strong bond take place with the abusive heifers (Treatment 1).

The bonding of lambs to heifers which was observed during the final trial of Treatment 1 may be explained in several ways, none of which were tested experimentally. (1) The heifers were older than during the study by Anderson et al. (1987) in which these same heifers were found to be abusive. Their aggressive behavior may have lessened because of increasing age and more extended exposure to sheep, which may have led to a greater tolerance of lambs. (2) The group size, both intraspecific and interspecific, was smaller in this study than in the one by Anderson et al. Agonistic intra-heifer associations may have precipitated aggression among the six heifers in the study by Anderson et al., while in this study there were only two heifers. (3) The lambs used in this study averaged 15 days older when placed with the heifers than the study by Anderson et al. These and other factors might have influenced the susceptibility of the lambs to abuse.

Apparently, abusive behavior is not a static trait but is dependent upon many factors. Regardless of what reason(s) are responsible for establishing a strong bond, it appears that abusive heifers can be recognized and should be removed if the formation of a bond is to be done successfully and efficiently.

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