

New Zealand Society of Animal Production online archive

This paper is from the New Zealand Society for Animal Production online archive. NZSAP holds a regular annual conference in June or July each year for the presentation of technical and applied topics in animal production. NZSAP plays an important role as a forum fostering research in all areas of animal production including production systems, nutrition, meat science, animal welfare, wool science, animal breeding and genetics.

An invitation is extended to all those involved in the field of animal production to apply for membership of the New Zealand Society of Animal Production at our website www.nzsap.org.nz

[View All Proceedings](#)

[Next Conference](#)

[Join NZSAP](#)

The New Zealand Society of Animal Production in publishing the conference proceedings is engaged in disseminating information, not rendering professional advice or services. The views expressed herein do not necessarily represent the views of the New Zealand Society of Animal Production and the New Zealand Society of Animal Production expressly disclaims any form of liability with respect to anything done or omitted to be done in reliance upon the contents of these proceedings.

This work is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](http://creativecommons.org/licenses/by-nc-nd/4.0/).



You are free to:

Share— copy and redistribute the material in any medium or format

Under the following terms:

Attribution — You must give [appropriate credit](#), provide a link to the license, and [indicate if changes were made](#). You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

NonCommercial — You may not use the material for [commercial purposes](#).

NoDerivatives — If you [remix, transform, or build upon](#) the material, you may not distribute the modified material.

<http://creativecommons.org.nz/licences/licences-explained/>

SOCIAL INTERACTIONS AMONG DAIRY COWS DURING HERD FORMATION IN SPRING

KATHRYN J. BREMNER

Ruakura Animal Research Station, Hamilton

SUMMARY

Interactions between early calving herd members and late calvers entering the milking herd were recorded. Investigative and mild agonistic behaviour occur irrespective of the length of time cows had been separated, but fighting appeared to be related to the length of separation. On average, 5% of herd members had head-to-head encounters with entering cows from which they had been separated less than six weeks, compared with 18% separated six or more weeks.

Two types of multiple social aggression were observed and defined—group and supportive aggression.

Suggestions are made for minimizing disruptive social effects so that the milking herd stabilizes rapidly in spring. This in turn may facilitate high milk production and normal oestrous cycling in the herd.

INTRODUCTION

The introduction of strange cows into a herd causes some interruptions to the normal behaviour patterns of herd members. Much sniffing, threat activity and sometimes violent fighting have been noted (Schein and Fohrman, 1955; Brantas, 1968). The work of Schein and Fohrman was carried out under field conditions and that of Brantas with a herd of cows being introduced in a cafeteria-type stable. Brantas found that the milk production "considerably declined," but gave no precise figures, when 15 strange cows were herded together in the stable. Schein *et al.* (1955), introducing 35 "semi-strange" heifers and dry cows to a group of 15 milking cows taken from a 70-cow herd, found that over six days the average milk production from the 15 cows dropped 5% in comparison with that from 12 control animals left in the original herd. They attributed this difference to social factors. Brakel and Leis (1974) found only a small, temporary reduction in milk production when transferring low-producing cows one at a time from a high production group to another group. There was no effect on herd production. They did not elaborate on age or dominance status of the cows involved, or indicate if they were strangers.

TABLE 1: SUMMARY TABLE OF HERD NUMBERS AND INTERACTIONS RECORDED WHEN EIGHT NEWLY-CALVED COWS AND ONE NURSE COW ENTERED A MILKING HERD IN SPRING

<i>Cow entering Herd</i>	<i>No. of Cows in Herd</i>	<i>No. of Cows entering Herd</i>	<i>% Interactions initiated by Herd Members</i>	<i>No. of Herd interacting with Cow</i>	<i>Total No. of Observed Interactions</i>	<i>Hours of Observation after Cow Entry (h-min)</i>
1	25	1	25	18	45	2-50
2	22	3	59	12	21	1-39
3 ¹	22	3	67	4	6	1-39
4	22	3	92	7	11	1-39
5	25	1	66	16	32	2-32
6 ²	28	2	39	9	23	3-30
7 ²	28	2	74	16	26	3-30
8	26	1	67	20	48	2-05
nurse cow	28	1	52.5	26	80	3-05

¹Due to mobility of cow 3 some interactions occurred while observer too distant to distinguish interacting cows.

²First few minutes after initial entry not observed.

That the disruption of social stability in a herd can lead to even short-term production losses means that more details should be known of the social effects of mixing cows, an event occurring over many weeks during spring in most New Zealand herds. Generally, replacement stock should be introduced to the herd in the dry season to allow social relationships to stabilize before calving. However, this cannot overcome the effects which separation of calved from dry cows, enforced by the early calving group, will have on a newly-calved cow entering the milking herd later in the season. Under normal calving conditions the building up of the milking herd will extend over the length of at least two mating cycles (40 days). Thus social instability is bound to result when later-calving cows are introduced into the milking herd.

This study was undertaken (a) to attempt to describe the interactions occurring as new cows enter a small milking herd, (b) to seek an understanding of the effects of time away from former herd mates on behaviour after reintroduction, and (c) to suggest what changes in management might ease social adjustment and keep milk production high.

METHOD

Eight cows, which had calved two to four days previously, were introduced into a small milking herd averaging 25 cows in number during or after morning milking. Observations were continued until the cows appeared to have settled in the group, a period of at least 1½ hours. All observations were made late in the calving season as a nucleus herd had to be formed and be stable before commencement. A nurse cow which had suckled three calves for seven weeks was also observed entering a herd.

Records were made of the behaviour of the entering cows; the behaviour of herd members; the type and number of interactions occurring, the number of cows involved, and which cow initiated the interactions.

All cows except two herd members had been wintered as a single group and approximately 80% of the relative dominance relationships of herd cows had been determined during the previous season.

No measure of milk production was possible.

RESULTS

Social behaviour exhibited after a recently-calved cow entered the herd was predominantly investigative or aggressive. Table 1

shows the recorded interactions, the number of cows interacted with, and the length of the observation period for each entering cow. Data for the nurse cow are also presented but are not included in the following averages. The number of cows in the herds averaged 25 at the time of entry. An average of 13 herd members (18 to 77%) interacted with entering cows, and each entering cow was involved on average in 26.5 interactions. Most interactions (average 61%) were initiated by herd members and the dominance status of the entering cow did not appear to be an important factor.

Aggression almost always arose from investigatory behaviour. Threats would be directed by the entering cow to a persistent curious herd member. The cow either tossed her head back towards the offender or turned to face her. If the entering cow was of low dominance status, she avoided the attentions of herd members and this sometimes led to her being chased and thrust at by herd members. Often the entering cow adopted a threat posture, circling side-on to an approaching herd member, but relaxed once the approaching cow sniffed her tail or did not show any sign of aggression. If aggressive intent was shown by both cows, then a head-to-head encounter resulted. This was usually limited to a brief thrust followed by the withdrawal of one cow, but it could lead to longer periods of fighting, varying in length from about 5 seconds to encounters of up to 30 seconds' duration repeated three or four times. If two cows fought they generally did so within minutes of meeting in the milking group.

Two kinds of social aggression involving more than a pair of cows were also observed:

- (1) *Group aggression.* This occurred when a cow entering the milking herd was immediately surrounded by a group of herd cows, several of which directed thrusts at her. This situation resulted in one of the milking group being involved in a head-to-head encounter with the entering cow and occurred twice.
- (2) *Supportive aggression.* This occurred when an entering cow and a herd cow were fighting and another cow interrupted by thrusting at one of the contestants. It was observed on five occasions. Assistance was given irrespective of the relative dominance of either contestants, although all cows assisted a herd mate from the group in which they were most recently a member.

Social dominance relationships within one herd have been observed to be stable over long periods of time (Brantas, 1968; Sambraus, 1970), even from season to season. Cows entering a new herd may (a) still recognize one another but need to reassert relative dominance, or (b) no longer recognize one another and have to establish new dominance relationships. On several occasions social grooming occurred between newly-met cows which would suggest that recognition was possible even after periods of separation up to eleven weeks.

TABLE 2: THE NUMBER OF COWS AVAILABLE FOR SOCIAL INTERACTION, THE INVESTIGATORY RESPONSES, THREATS AND THRUSTS, AND HEAD TO HEAD FIGHTING OCCURRING WITH EACH OF EIGHT ENTERING COWS

	Entering Cow No.								
	1	2	3	4	5	6	7	8	Totals
<i>Separated < 6 weeks:</i>									
N	23	20	20	20	21	20	20	15	159
S	16	12	3	5	20	4	12	18	
T	23	7	2	5	10	3	3	6	
F	0	2	1	1	0	1	0	3	8 (=5%)
<i>Separated 6 to 11 weeks:</i>									
N	2	2	2	2	4	8	8	11	39
S	1	0	0	0	0	6	5	13	
T	3	0	0	0	2	7	3	6	
F	0	0	0	0	0	2	3	2	7 (=18%)

N, No. of cows in the herd. S, No. of investigatory responses. T, No. of threats and thrusts. F, No. of head-to-head fights.

Table 2 sets out the interactions recorded between herd members and entering cows according to the number of weeks participants had been separated. Investigative and mild threat interactions occurred irrespective of length of separation. The ratio of investigatory responses (S) to threats/thrusts (T) and fights (F), changes with the length of separation. For less than six weeks' separation, S:T:F = 10:7:1, and a separation of six to eleven weeks gave a ratio of 4:3:1. The nurse cows interactions were in a ratio of 5:10:2. It can be seen that fighting increases relative to investigation with longer periods of separation between cows. Fighting also occurred much more frequently between cows

which had been separated for six or more weeks. No fights occurred with the two former top dominant cows. Of all cows separated less than six weeks, 5% were involved in fights, whereas 18% of herd members separated for six or more weeks were involved in fighting with entering cows. Because mutually aggressive encounters were more common between cows separated six or more weeks, it appears that the signalling system by which cows reinforce social dominance relationships without using force becomes less effective after approximately six weeks of separation.

The nurse cow exhibited similar trends to the recently-calved cows after being separated for at least seven weeks. She interacted with 26 of the 28 herd members, initiating 47.5% of the interactions herself. Agnostic encounters outnumbered sniffing by 2:1. She fought ten times with five different cows (18% of herd members). Nineteen percent of the time she avoided or was avoided by other cows. Seven out of nine cows avoiding her were younger, and the other two the same age, whereas four of the five cows she avoided were older and the other was the same age. These avoidance responses indicate some sort of recognition, either of the individual cow or of her dominance characteristics.

DISCUSSION AND CONCLUSIONS

The effects on milk production of social instability at the beginning of a cow's lactation are not known, but in view of the effects at a later stage in lactation (Schein *et al.*, 1955; Brantas 1968; Brakel and Leis, 1974) it is reasonable to assume that social stress will mitigate against maximum production.

The effects of social stress on the reproductive performance of cows must also be considered. MacMillan and Watson (1971) consider social stress to be a factor in short-cycling in dairy cows. The problems of metabolic diseases are also aggravated in the spring period.

Avoiding the social instability arising from prolonged separation of early from late calvers is not easy.

- (a) The use of oestrus and mating synchronization followed by calving induction to decrease the period from first to last calving is one method. However, imperfections of technique and the cost must be taken into account.
- (b) The calved and uncalved groups could be herded in adjacent paddocks so that some social contact can be maintained across a fence. This should be effective over short periods of

time. The two herds could be brought together for a short period weekly in order to reinforce dominance relationships.

- (c) It may be possible to maintain one group of cows throughout calving so that all cows go through the milking routine daily.
- (d) Calving the heifers before the older cows would allow them to have established their dominance relationships and to have become familiar with the milking routine before older cows joined the group.

An examination of the literature has failed to locate any studies relating to social stability during herd formation in spring and this is an area worthy of investigation. It is known that the spring period of herd formation is a difficult time for both cows and farm operators, and careful planning to minimize the period of separation of cows in dry and milking herds should facilitate the social integration of cows entering the milking herds and lead rapidly to settled milking conditions.

REFERENCES

- Brakel, W. J.; Leis, R. A., 1974: *Hoard's Dairyman*, 119:1222.
Brantas, G. C., 1968: *Z. Tierzuch. Tierzuchtungsbiol.*, 84: 127.
MacMillan, K. L.; Watson, J. D., 1971: *J. Dairy Sci.*, 54: 1526.
Sambraus, H. H., 1970: *Z. Tierzuch. Tierzuchtungsbiol.*, 86: 240.
Schein, M. W.; Fohrman, M. H., 1955: *Br. J. Anim. Behav.*, 3: 45.
Schein, M. W.; Hyde, C. E.; Fohrman, M. H., 1955: *Proc. Ass. Southern Agric. Workers 52nd Conv., Louisville, Ky.*: 79.