Does having neighbours reduce dairy calf stress?

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Introduction

Weaning in dairy calves is highly stressful (Phillips,2002
Social isolation in calves increases physiological stress (Boissy and le Neindre, 1997)
Stress in farm animals can be measured using heart rate variability (HRV) using a Polar® heart monitor (von Borell et al., 2007)
Isolated dairy calves were unable to develop social skills required later when they joined a group (Broom, 1997)
Current EU legislation on housing young dairy calves requires contact with at least one other calf at all times (Phillips, 2008)

Aims:

Compare stress levels in calves with different number of neighbours
Measuring stress of social mixing in relation to time in isolation.

Objectives:

Show isolation increases stress levels, so it is better to keep calves in contact with others
Isolation increases stress levels when calves enter a group, so reducing time spent in single pens will reduce stress.

References:

*Broom, D. M. (1997). "Welfare evaluation." Applied Animal Behaviour Science **54**(1): 21-23.*

Phillips, C. (2008). Cattle Behaviour and Welfare, Wiley.

Philips, C. (2002). Cattle Behaviour and Welfare, Wiley

von Borell E, Langbein J, Despres G, Hansen S, Leterrier C, Marchant-Forde J, Marchant-Forde R, Minero M, Mohr E, Prunier A, Valance D, Veissier I. (2007). Heart rate variability as a measure of autonomic regulation of cardiac activity for assessing stress and welfare in farm animals - A review. Physiology and Behavior 92 , 293-316

Comparison	W	P value
Iso : 1N	0.588	0.1219
Iso : 2N	0.634	0.8786

Fig. 1 Mann-Whitney statistical analysis showed no significant difference in heart rate variability between isolation (Iso) and one or two (1N or 2N) neighbours.

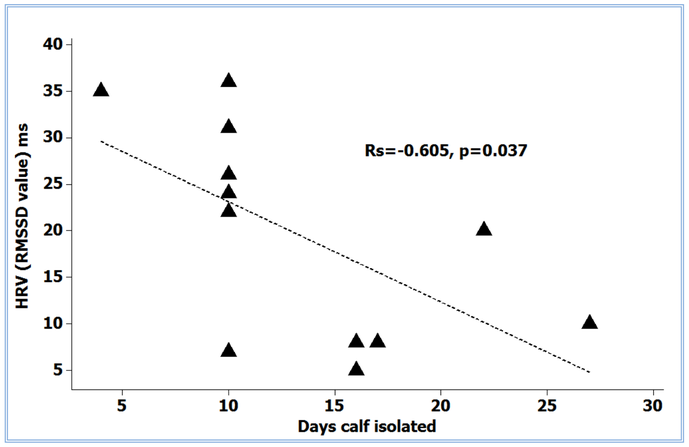

Fig 2. Spearmans rank order correlation for number of days in isolation and HRV on third day after joining a group pen

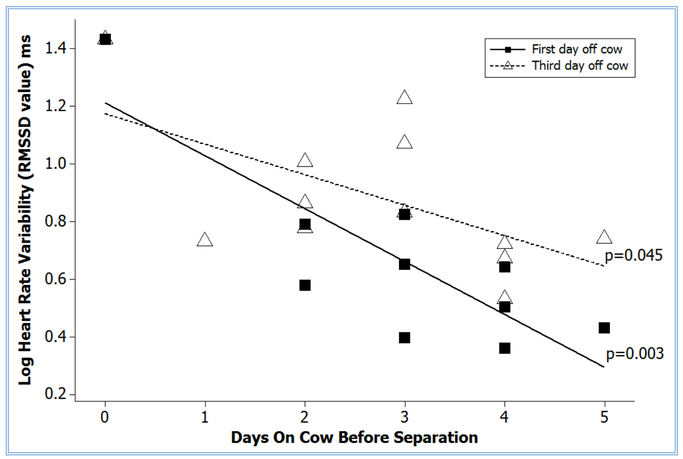

Fig. 3 The number of days with mother pre-weaning and its effect on heart rate variability

Method

17 freshly weaned Friesian dairy calves of mixed sex
Housed in single pens **(Fig. 4)** for a variable amount of time (2 -27 days) then moved into group pens of 4 calves
Split into even numbers for those with none, one or two neighbours
Polar® heart monitor used on calves daily for 20 minutes

Results

No significant difference in HRV between calves in isolation, and calves with one or two neighbours **(Fig 1.)**
The longer the time the calf spends in single pens, the lower their HRV **(Fig 2.)**
Number of days on the cow significantly reduced HRV on the first day of isolation **(Fig 3.)**

Fig. 4 Example of a single calf pen

Conclusion

The number of neighbours had no significant effect on stress levels , this could have been influenced by the weaning age of the calves
The solid sides of each pen seriously reduced contact
The longer the calf was kept in single pens, the more stressed the calf is when put into a group.
To reduce stress, calves should be weaned soon after birth, avoid solid sided pens and moves into group pens as quickly as possible

Acknowledgments:

Newcastle University Funding
Nafferton Dairy calves
Dr James Clapp (Project Supervisor)
Tony and Carol Divers, Nafferton Ecological Farming Group
Charlotte Dolphin and Sinead Coarkin, accompanying researchers