Naturally weaned beef cattle preferentially associate with related rather than unrelated animals

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Introduction

Researchers and farmers alike are motivated to optimise social conditions for extensively grazed cattle to promote welfare and productivity. Therefore, questions relating to social dynamics and resulting preferences in beef cattle are important to answer, such as if social relationships change over time or in relation to life-history events (e.g., weaning), how long the mother-offspring bond persists beyond weaning, or how social associations form within groups, to be able to accurately inform industry regarding optimal social conditions in beef cattle. Increasing current understanding of social patterns and preferences of a species allows us to manage them in a way more suited to their optimal social conditions. Few studies have explored the social dynamics of beef cattle groups as part of a network and/or with a focus on cow-calf dynamics. Here we present an investigation of the social dynamics in a naturally weaning beef herd using social network analysis (SNA).

Research aims:

- Compare & contrast association patterns of related and unrelated cattle managed together in a natural weaning herd
- Investigate whether suckler beef cattle have preferred social partners
- Determine whether the social network structure of a related group of cattle changes as the calves in the group approach weaning

Methodology

Cows were managed in sub-herds of 250-300 animals on an extensive pasture system in Wiltshire, UK. Yearling calves were retained in the herd to be weaned naturally by their mothers and heifer calves stayed in their natal sub-herd for their entire productive lives.

The focal herd consisted of 269 animals (106 cows, 70 yearlings, 93 calves), 15 related cows were selected along with 15 unrelated paired controls of the same age and gender.

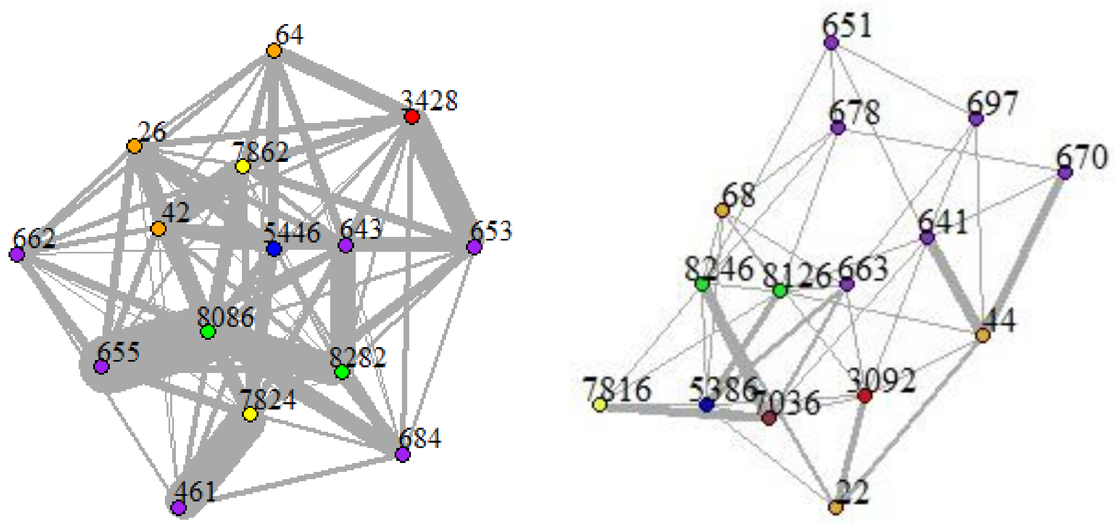
Nearest-neighbour (NN) data were collected by direct observations on the 30 focal cows for 2 days per week for 13 weeks in November 2019 – March 2020.

Asymmetrical social networks were created for each group (related & unrelated) along with a network for the entire herd. These networks were compared between groups and across time.

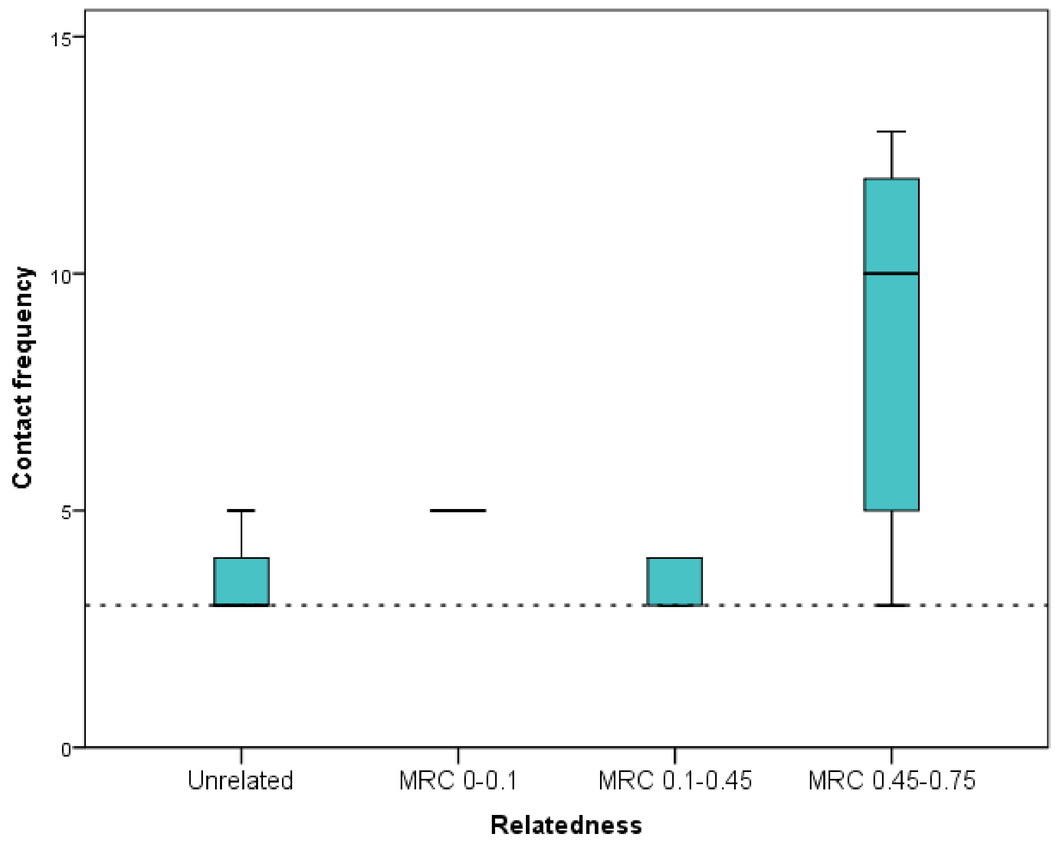
Results

SNA revealed that study cows had stronger social connections with other related cattle than unrelated cattle had to other unrelated cattle and they preferred related nearest-neighbours over unrelated nearest-neighbours.

The social networks remained stable over time as the weaning period approached and no differences were found between the cow-calf associations before and after weaning.



Social networks of the Related group (left) and the control group (right) using data from the entire 13-week period. Colours represent cow age.



NN frequency of the 30 focal cows with herd members of different relatedness (MRC= Matrilineal relatedness coefficient).

Conclusion

The results suggest that beef cattle preferentially associate with related animals over unrelated animals when allowed free access to both, that they form consistent social attachments, and that calves born into the group are important for its social structure.

References

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