



Dynamics of social relationships in free-ranging cattle across the calving period

Helene Nielsen and Nicoline Dolmer Skov

Supervisor: Elodie Floriane Mandel-Briefer

Extern supervisor: Roi Mandel Briefer

Behavioural Ecology Group, KU SCIENCE

Who are we?

- MSc in Biology
 - Helene: Finished MSc in Ecology 1-2 months ago
 - Nicoline: Finishing MSc in Ecology this year
- Two MSc projects: Same topic and subjects
 - Big project: Crèche behaviour and social bonds
 - What is crèche behaviour?
 - One year: Followed free ranging cattle herd
 - Prior calving
 - During calving
 - After calving
 - Removal of calves
- Presentation: Some aspects



Background

What do we know?

- Natural behaviours:
 - Calves hides (5-10 days), joins herd, form crèches
 - Morning vs later in the day
 - Babysitters: Do not feed calves

Why is it relevant?

- Curiosity:
 - Studying natural behaviours in domesticated animals
- Crèche formation:
 - Reflect on practices in industry vs natural behaviours
 - Foster cows + feeding: Do not occur in crèche behaviour



Aim of study

Focus: Herd of free-ranging cows (adults and calves)

- Social interactions
- Formation of crèche behaviour
 - Lacked ID of calves in the crèches
- What are we interested in?
 - Who are the babysitters? What do they do?
 - How does the herd behave around crèche behaviour? How does it change?
- What can we achieve
 - Insight into natural behaviours



A year in the park

- Hellebæk Kohave
- Free-ranging - Angus, galloway, crossbreeds
- Study 1: 36, study 2: 83 (incl. 36 calves)
- The first calves are born - 36 calves, from April-September
- Introduction of two bulls and 10 new individuals
- Removal of calves in November

- One herd split into two groups

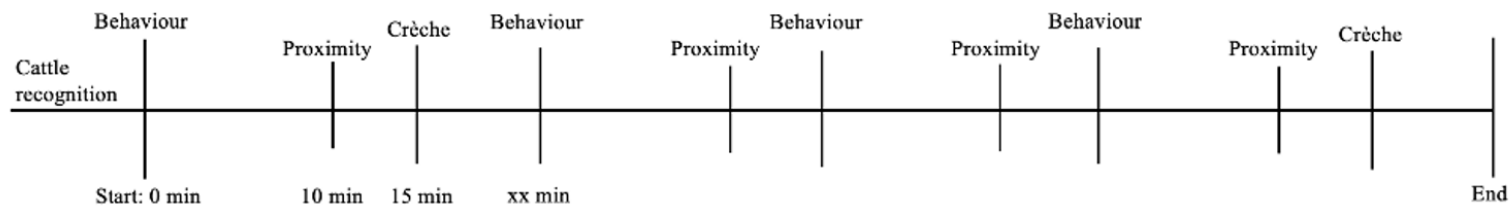


Data collection in the park

- Three different kinds of data
 - Proximity
 - Social interactions (“behaviour”)
 - Crèche
- 3 times a week
- Timeline of data collection



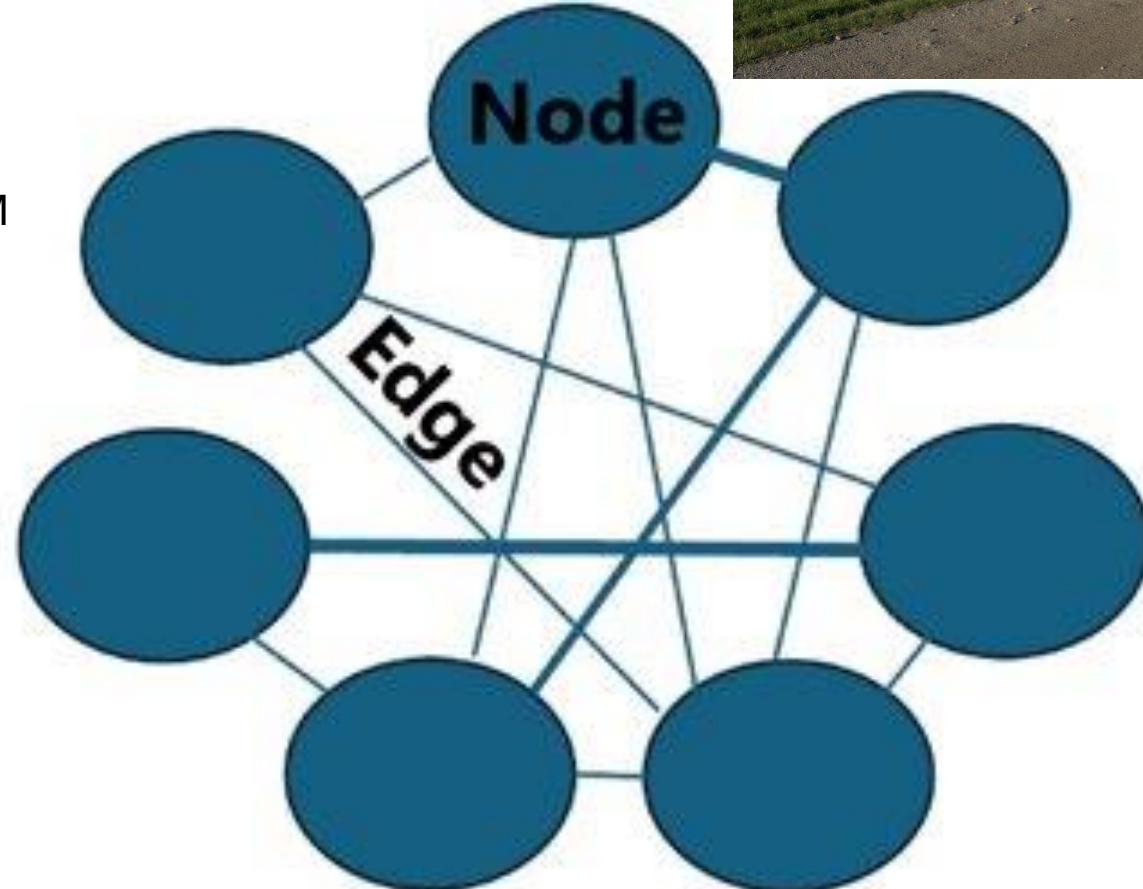
Data sampling including crèche

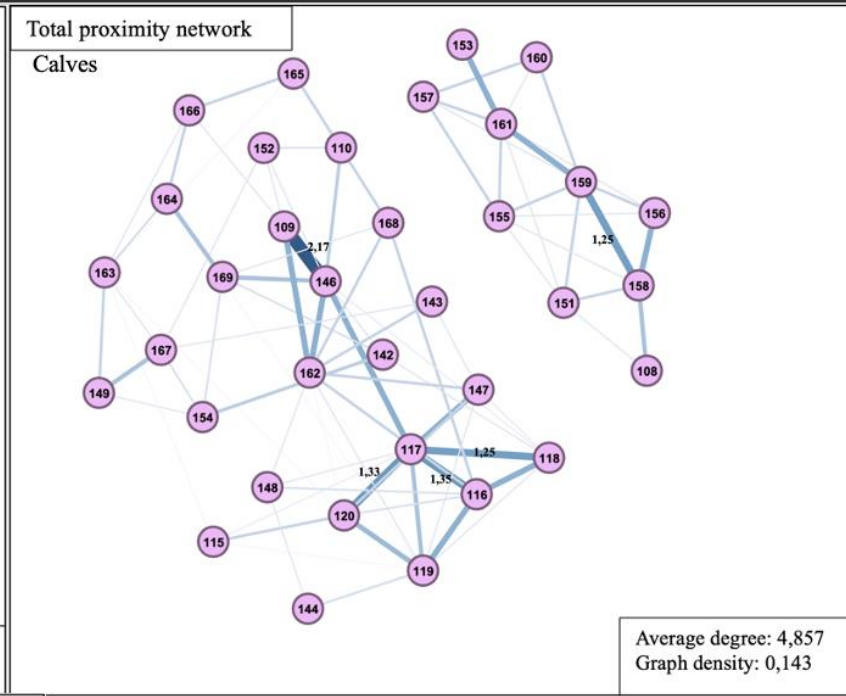
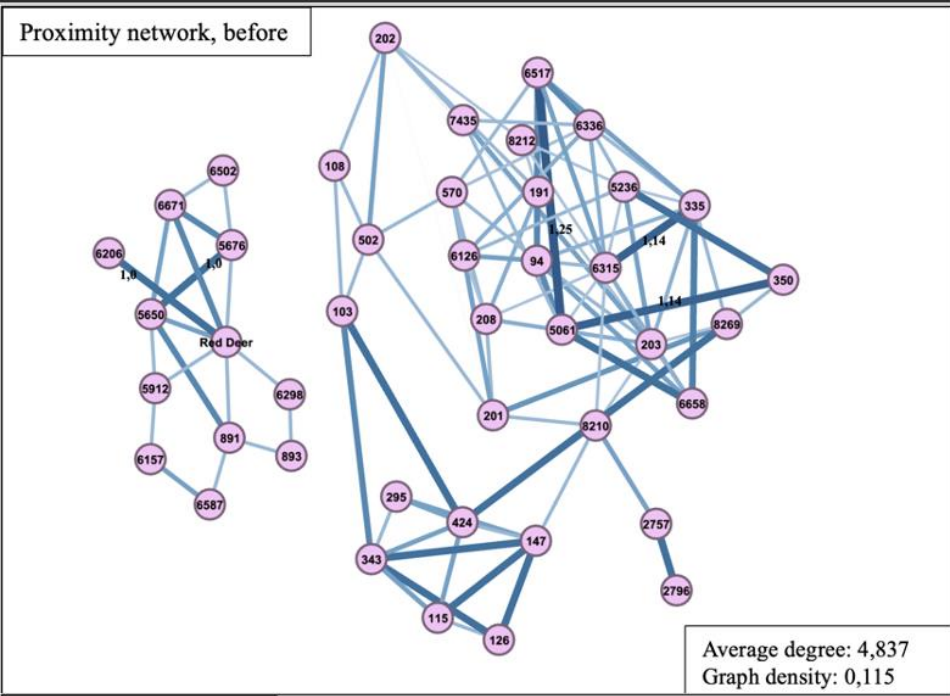


Data processing

Social network

- Node and edge
 - Amount of interactions / proximity events
 - Social bond estimate
- Directional and nondirectional
- Statistical methods: QAP, MRQAP, LMM, GLMM



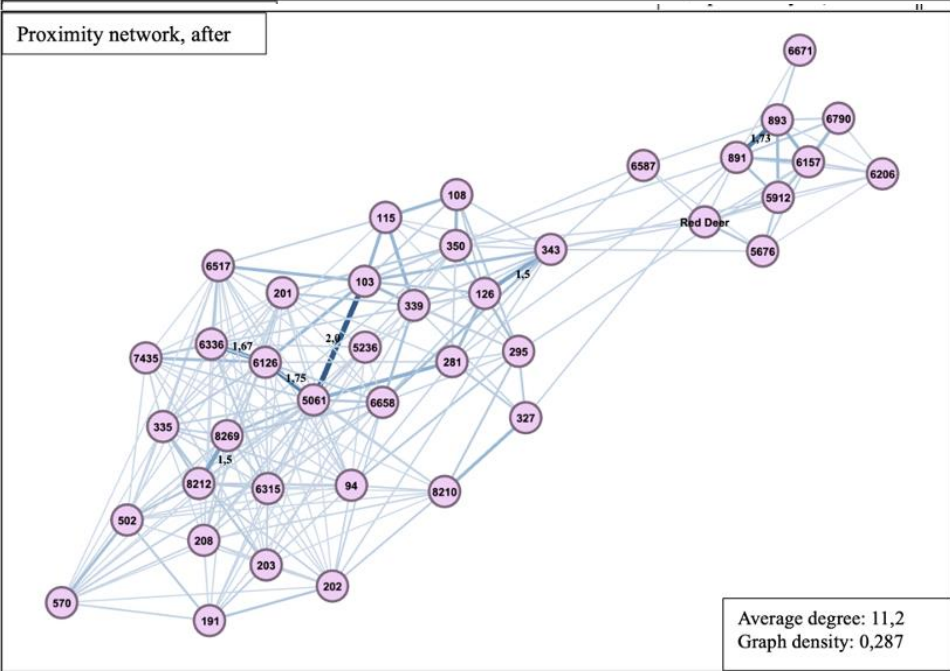


Total herd comparison

Pearson	0.201
P-value	0.002

Group 1 comparison

Pearson	0.192
P-value	0.012

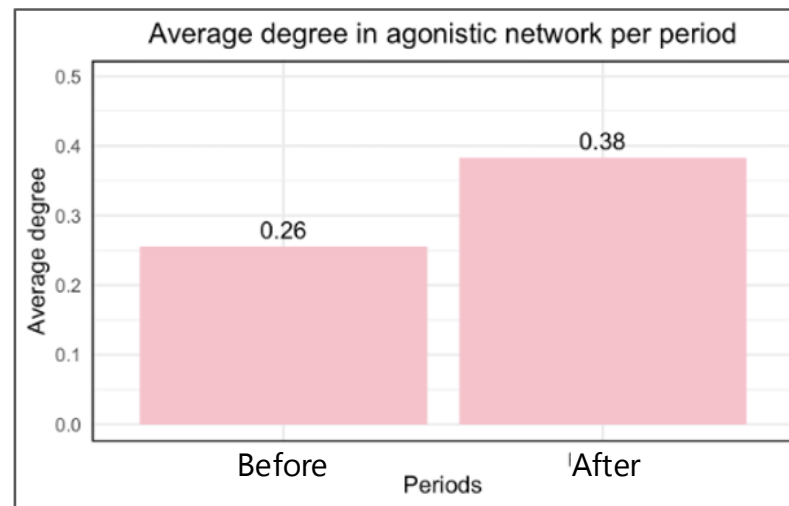
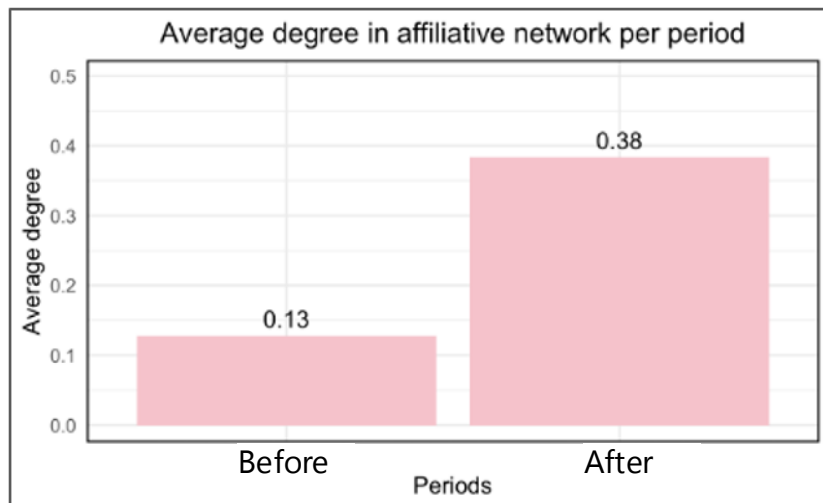


Comparing adult and calf network?

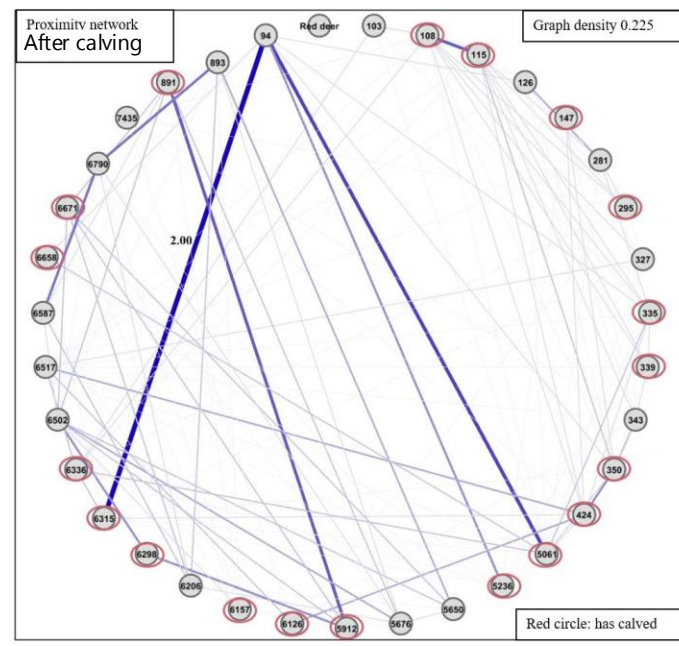
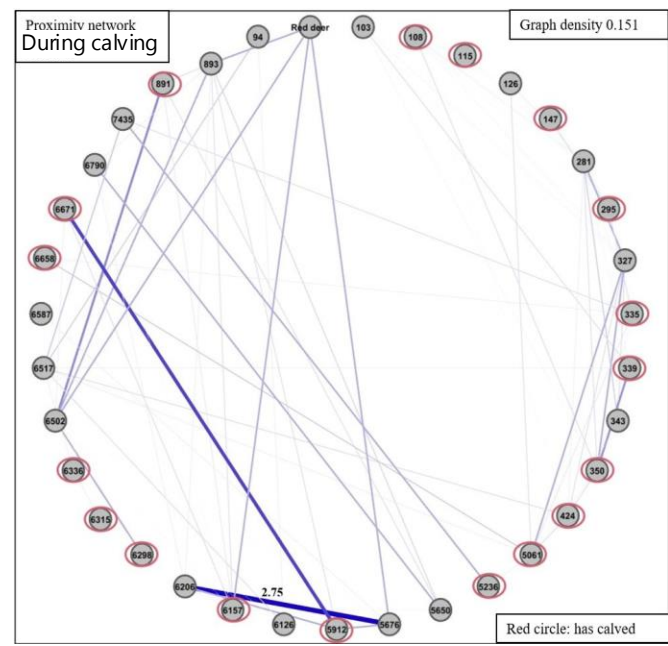
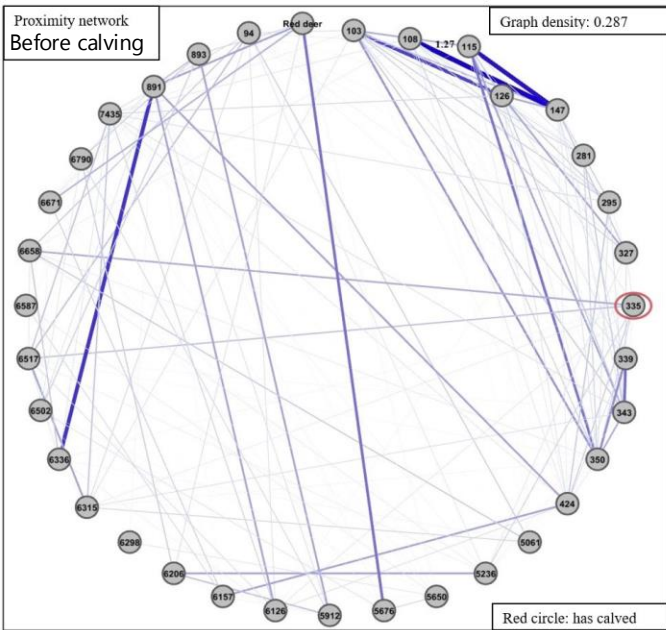
- Calves total network
- Proximity network
 - Before calf removal
 - After calf removal
- Network comparison - two groups

Do the bonds change over time?

- Calves interact more frequently with calves whose mothers associate with each other
- The herd is divided into two groups that only mix once the calves are removed
- Affiliative
- Agonistic



PROXIMITY

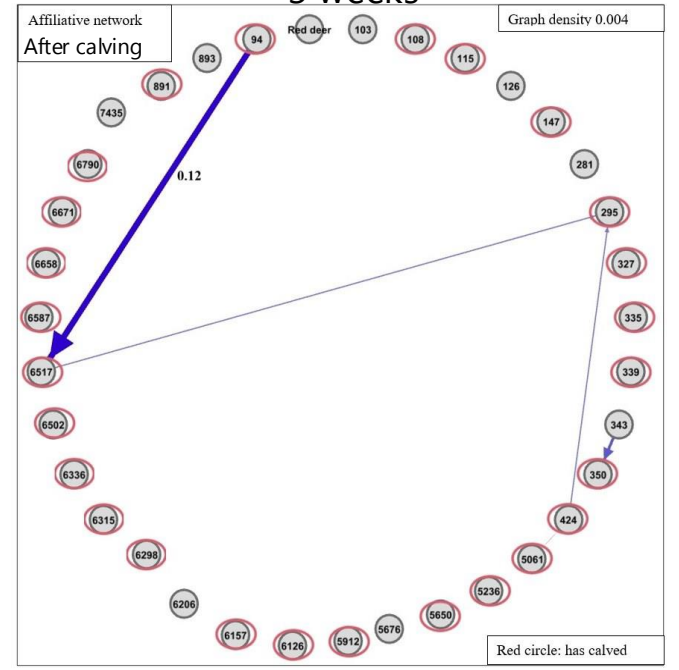
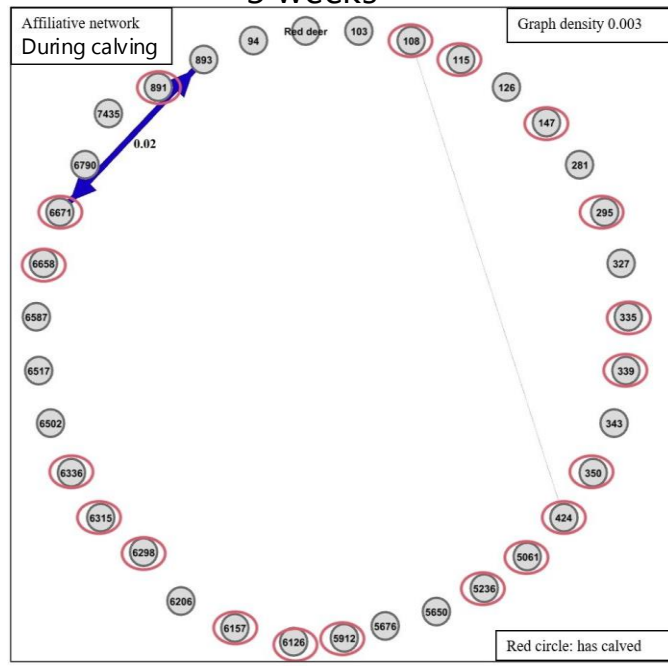
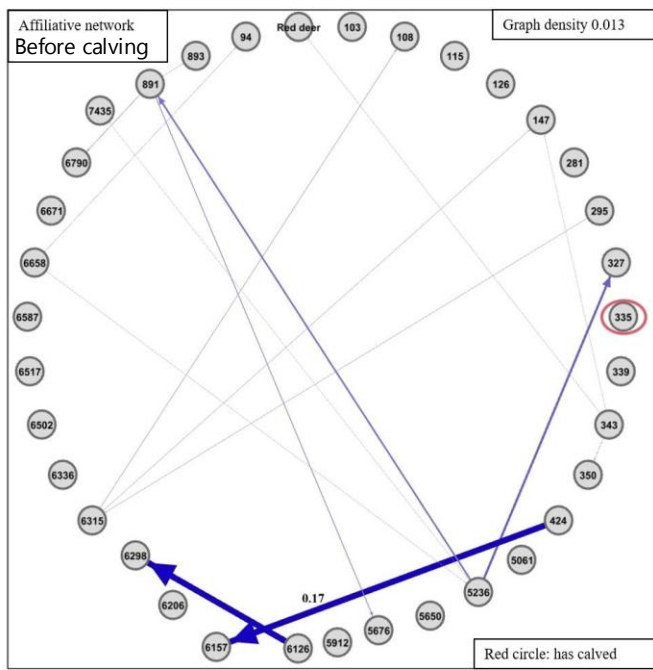


3 weeks

3 weeks

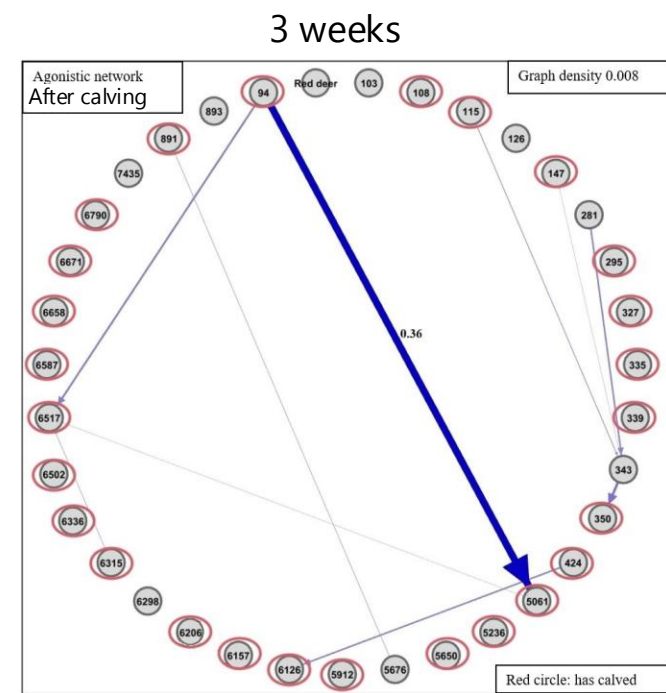
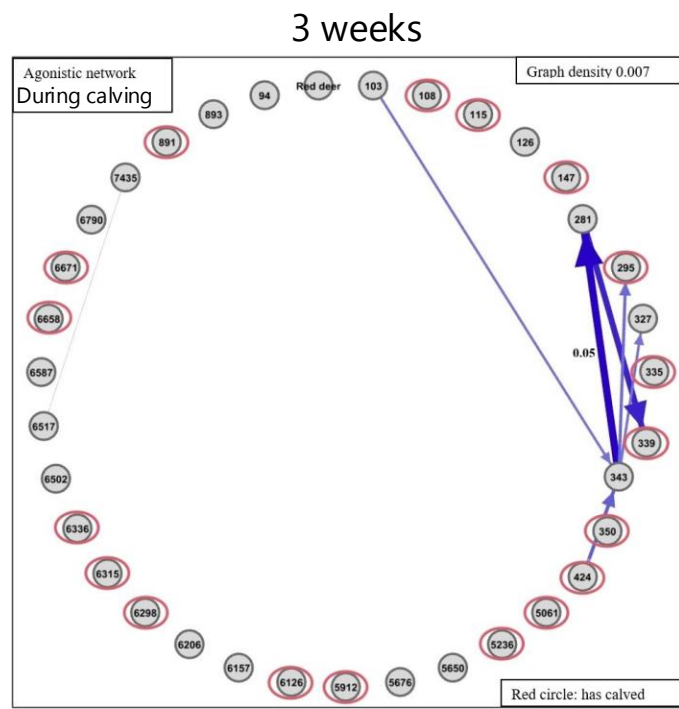
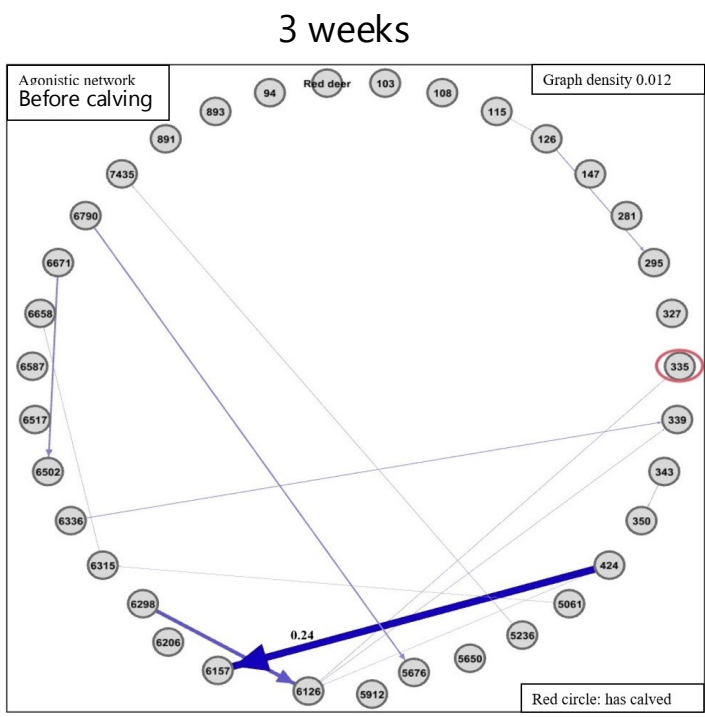
3 weeks

AFFILIATIVE



Changes in social network

AGONISTIC



Changes in social network

Crèche results

- Observed crèche formations
 - Number of calves: +13 calves and crèche
 - Calves behaviour: Resting, foraging and crèche
- Possible babysitters: Ruminating more when crèche present
- Cannot clearly say
 - Lacking ID (crèche presence)



Discussion/conclusion

- Dams' influence on calves' social bonds
- Affiliative -> calves removed -> allogrooming -> social stress buffering
- Agonistic -> unsure -> redirected
- Crèche / no crèche?
 - “babysitters”?
- More studies



Galindo, F., & Broom, D. M. (2002). The Effects of Lameness on Social and Individual Behavior of Dairy Cows [Article]. *Journal of Applied Animal Welfare Science*, 5(3), 193–201.

https://doi.org/10.1207/S15327604JAWS0503_03

Laister, S., Stockinger, B., Regner, A.-M., Zenger, K., Knierim, U., & Winckler, C. (2011). Social licking in dairy cattle—Effects on heart rate in performers and receivers [Article]. *Applied Animal Behaviour Science*, 130(3), 81–90. <https://doi.org/10.1016/j.applanim.2010.12.003>

Thank you for your attention, and to the cows and the red deer as well!

Questions?

