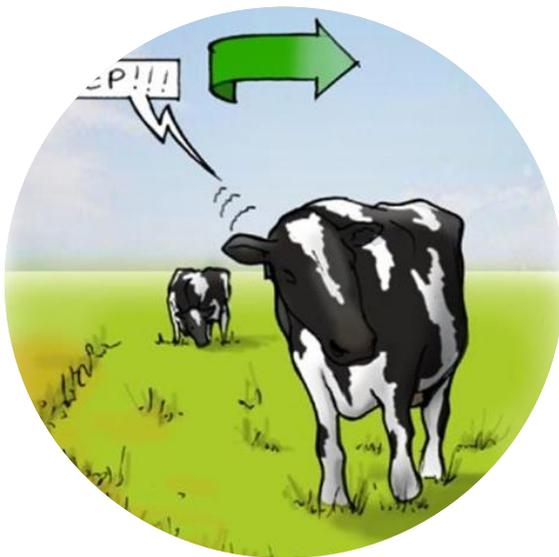


Changes in the Social Network when Separating High- and Low-productive Dairy Cows



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Current: Production ~ Social network data

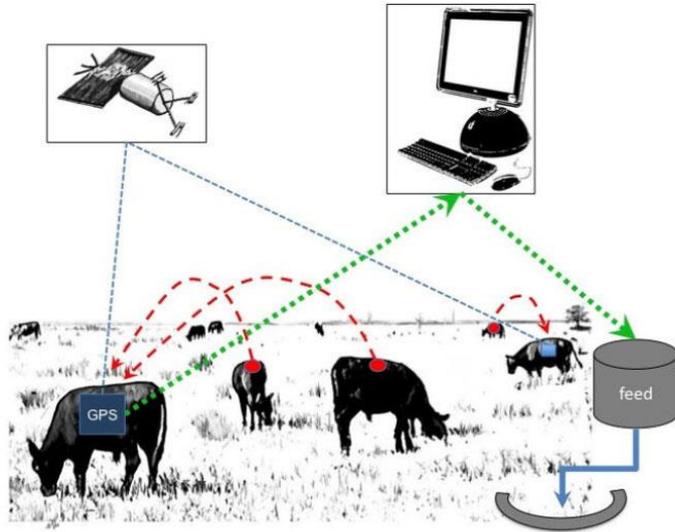


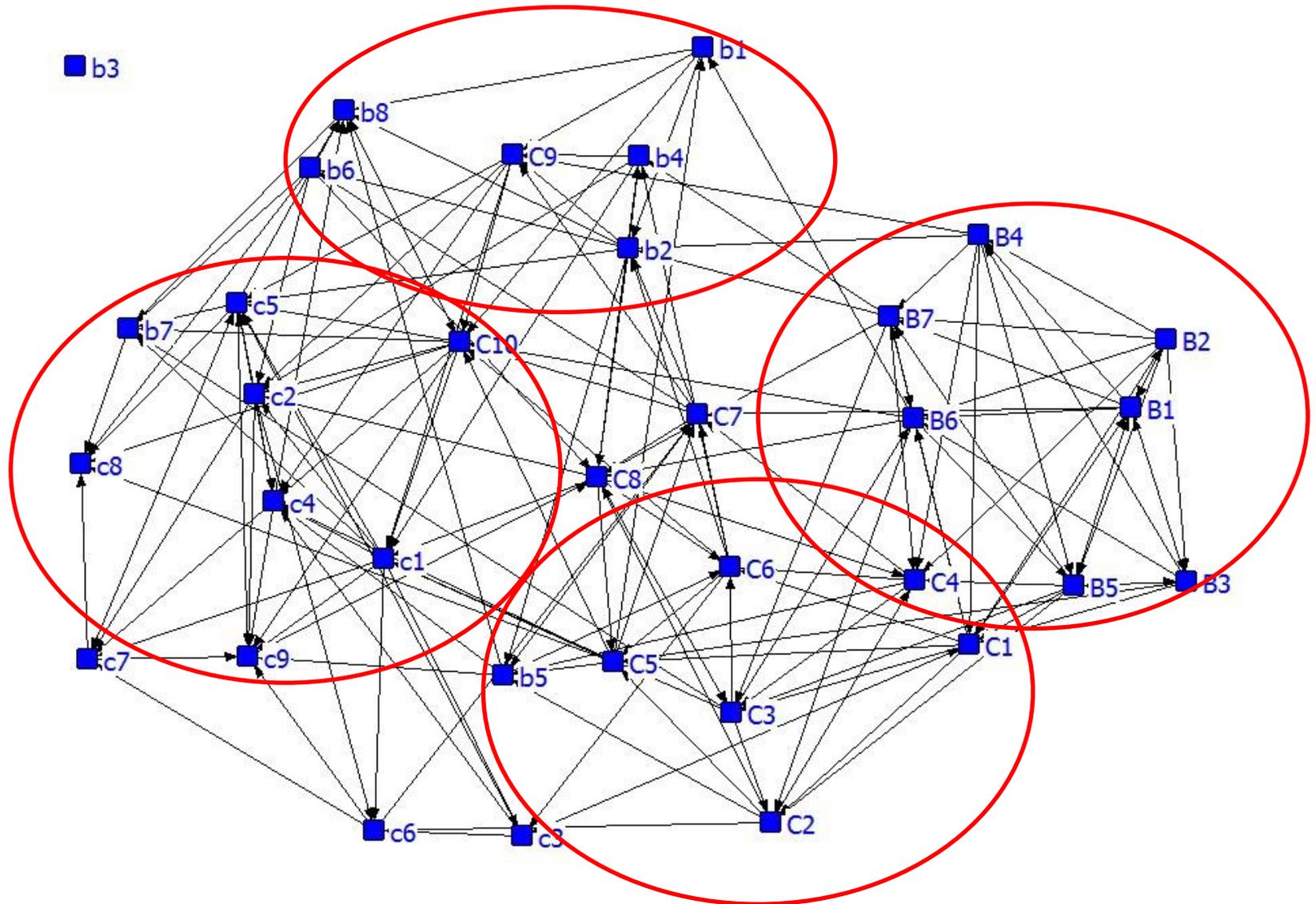
Figure 1 - Schematic of a precision grazing system. Master collars with GPS and behavior or physiology sensors on certain individuals (box) receive information from nearby animals fitted with short-distance "slave" transmitters (circles). Master collars send all information in real time to computational and decision-support centers (large dotted arrow), which in turn send control signals to operate a series of feeders, gates, and audiovisual stimuli to direct animal movement.



Questions that need answers:

- Is the individual dairy cow producer?
Or scrounger?
- Has it a positive effect on production?
Or negative?
- Is its welfare OK? What is its influence
on others?

Old: Social Network Heck Cattle



Cow-Calf relations

Experience

- Scottish Highland, Galloway, Heck cattle
- Hider and follower diversity (more hidiers)
- Creches (first month after 4 days)
- Cow calves and bull calves
- Flexible organisation (Fusion-fission, family bond?)

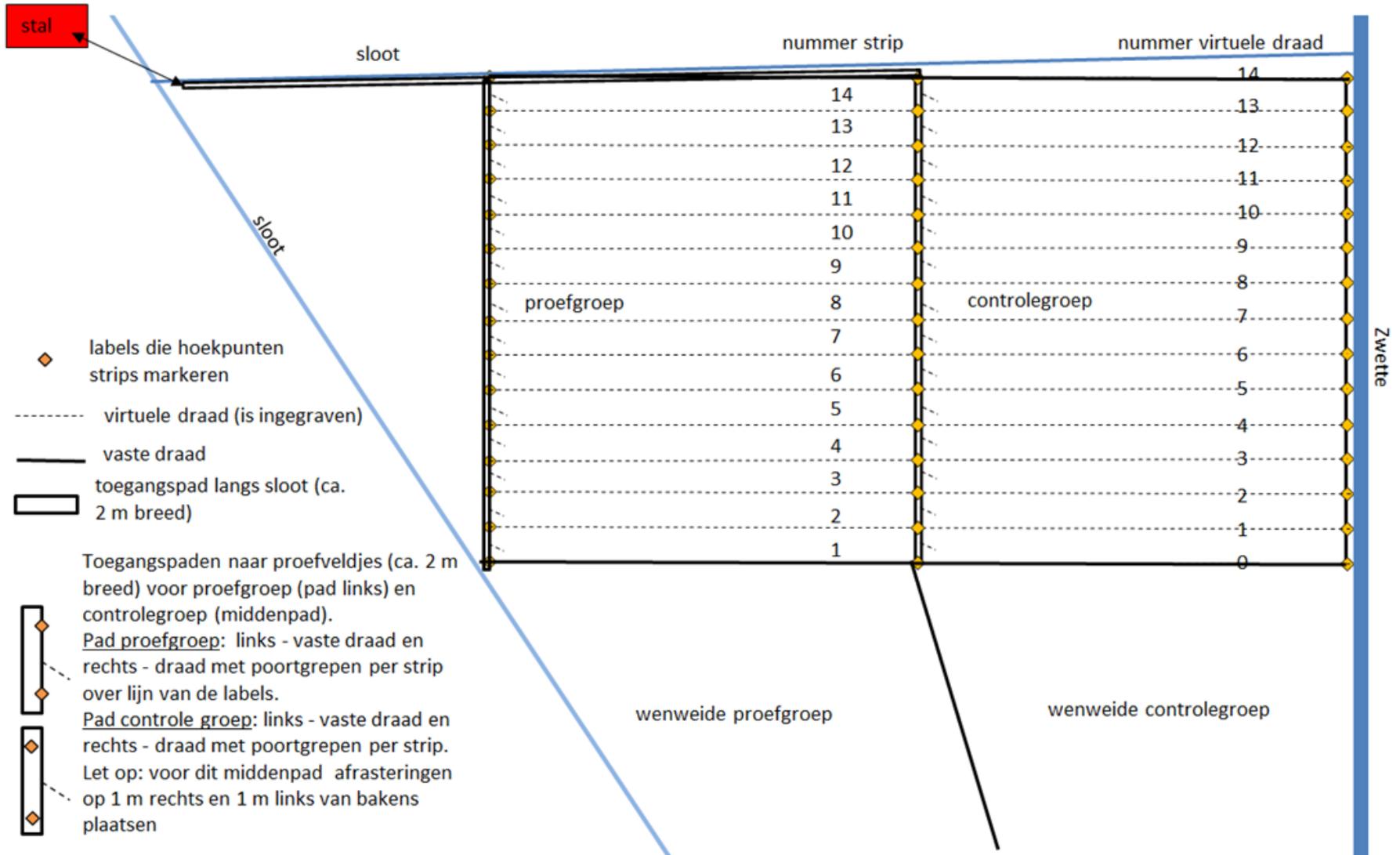
My aim to promote and analyse

- Approach-Avoidance behaviour not Bonding
- Social Network that monitors Natural Behaviour
- Management Systems that follows the Social Network

But now for the Introduction

- Dairy cows may graze more efficiently when allowed grazing in predefined areas with predictable sward height and grass quality.
- According to literature separating High- and Low yielding (HY and LY) dairy cows may have advantages for efficient grassland use, by allowing HY-animals to graze on a new grass strip first

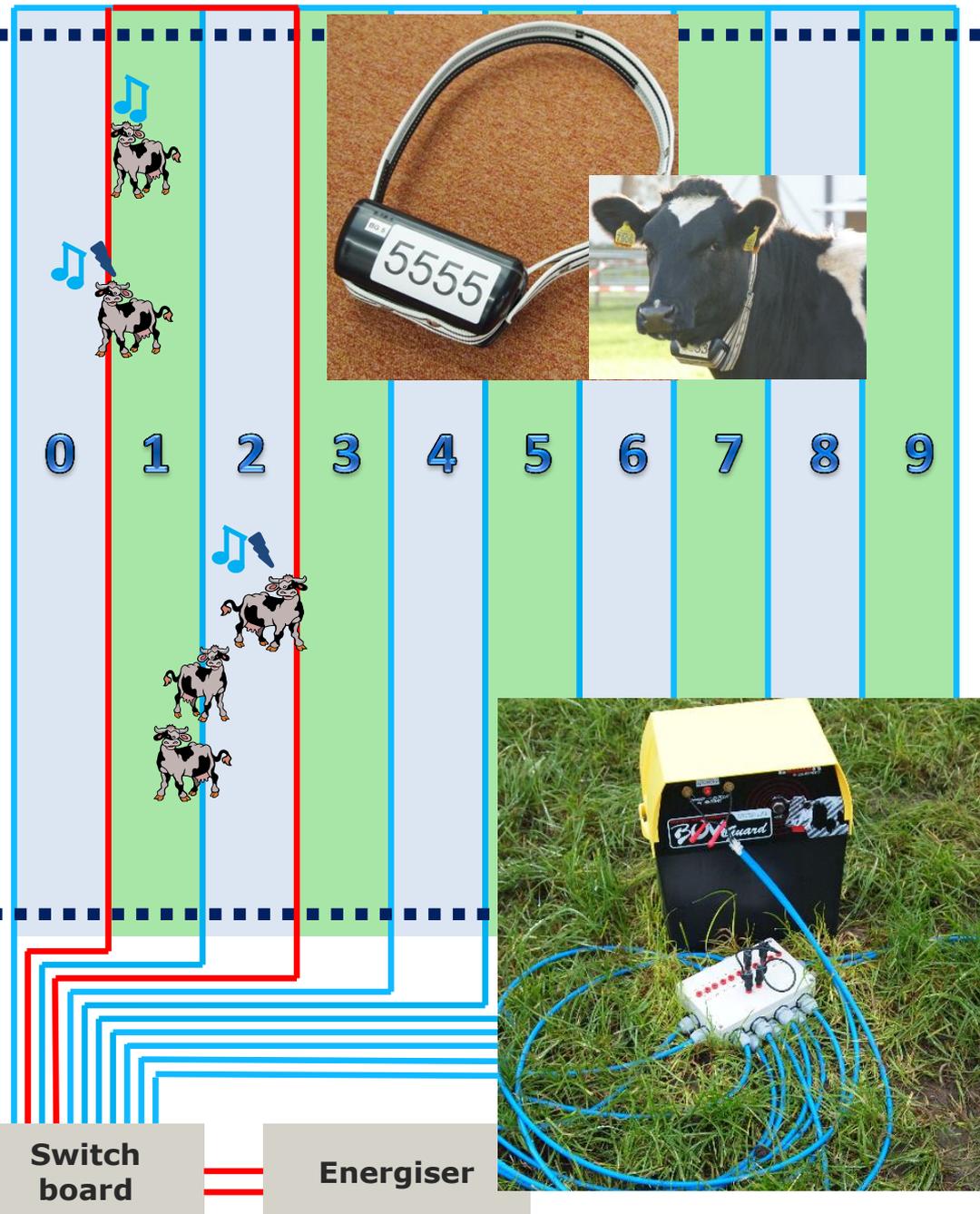
October 2016 at Dairy Campus



BoviGuard

■ BoviGuard actuator

- Warning (sound)
- Correction (shock)



Group reaction on signal



Individual reaction on signal



Methods

- GPS and NN and NND
- Milk production was recorded (liter per day)

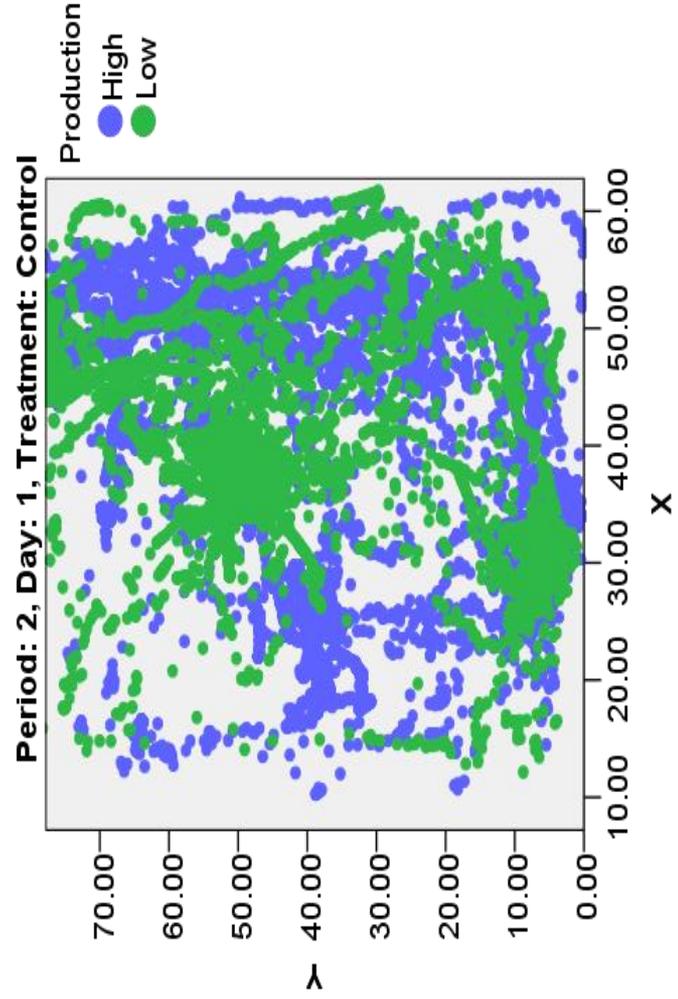
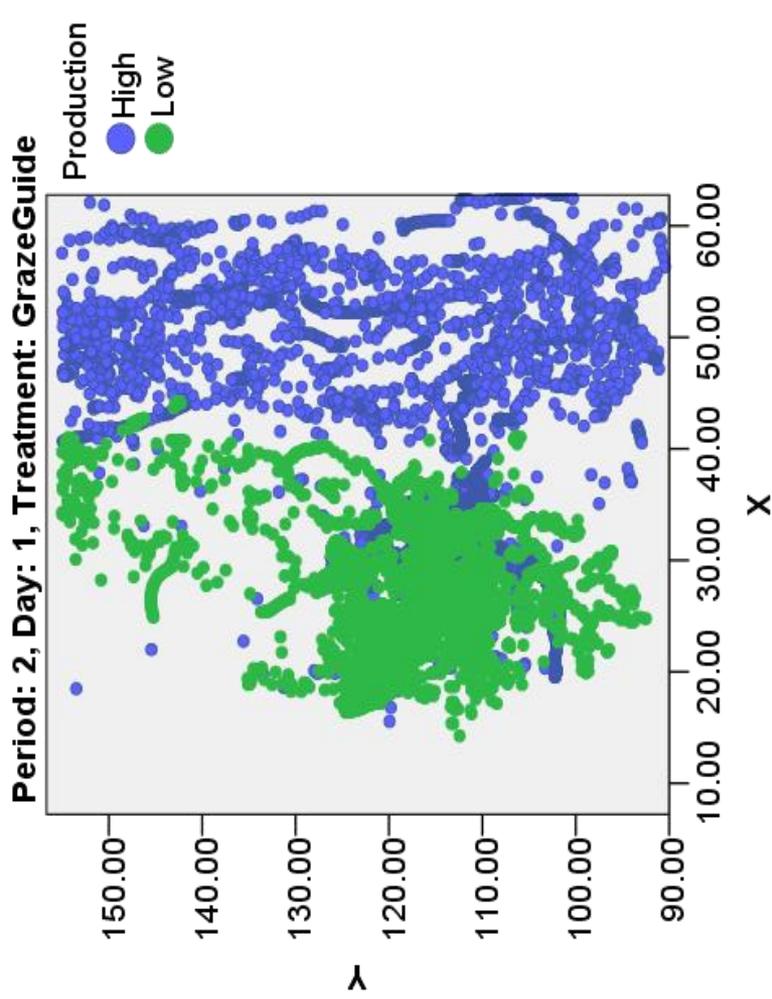
- Data were recorded in three periods, i.e.
 - P1 (learning),
 - P2 (basis) and
 - P3 (cross-over, i.e. experimental and control group were switched).

Methods

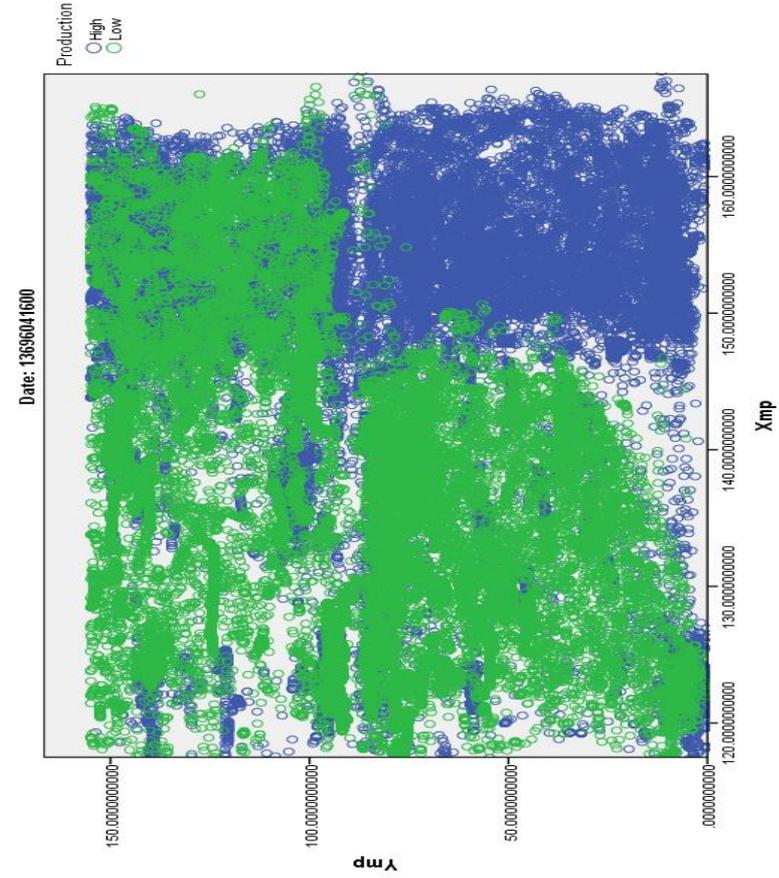
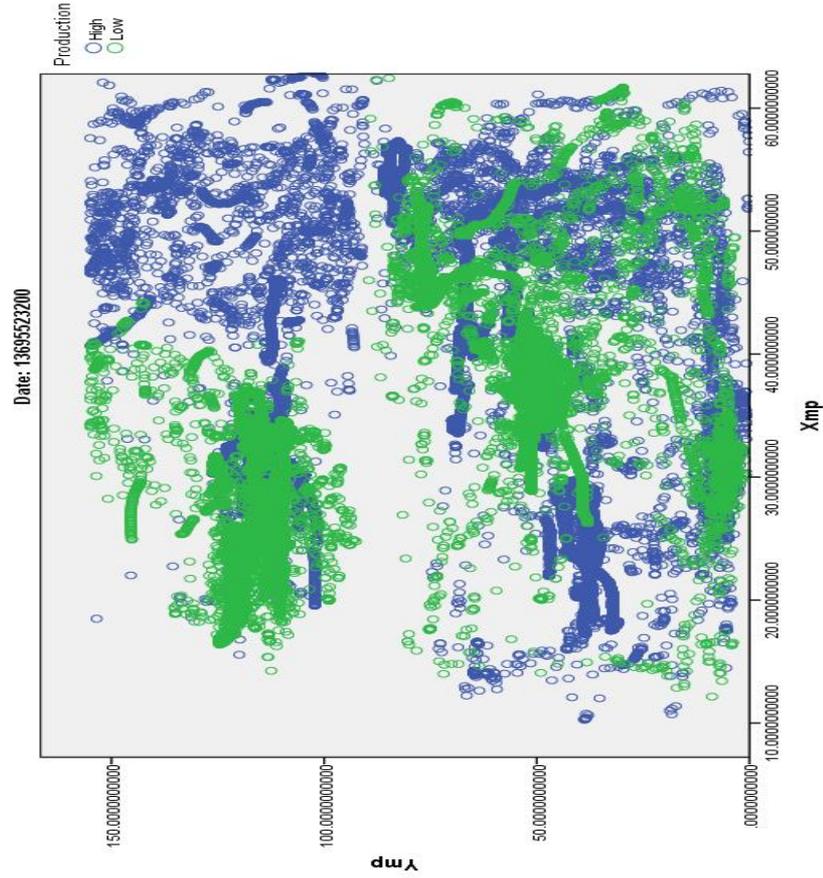
- In the control group 8 cHY and 8 cLY cows were grazing on a fixed area with every day a new strip of grass.
- In the experimental group 8 eHY-cows (matched with cHY) were also free to graze in the same fixed area, but
- **8 eLY cows (matched with cLY) were potentially stopped at a virtual fence that reduced the grazing area with**
- Possible social, welfare and production consequences.



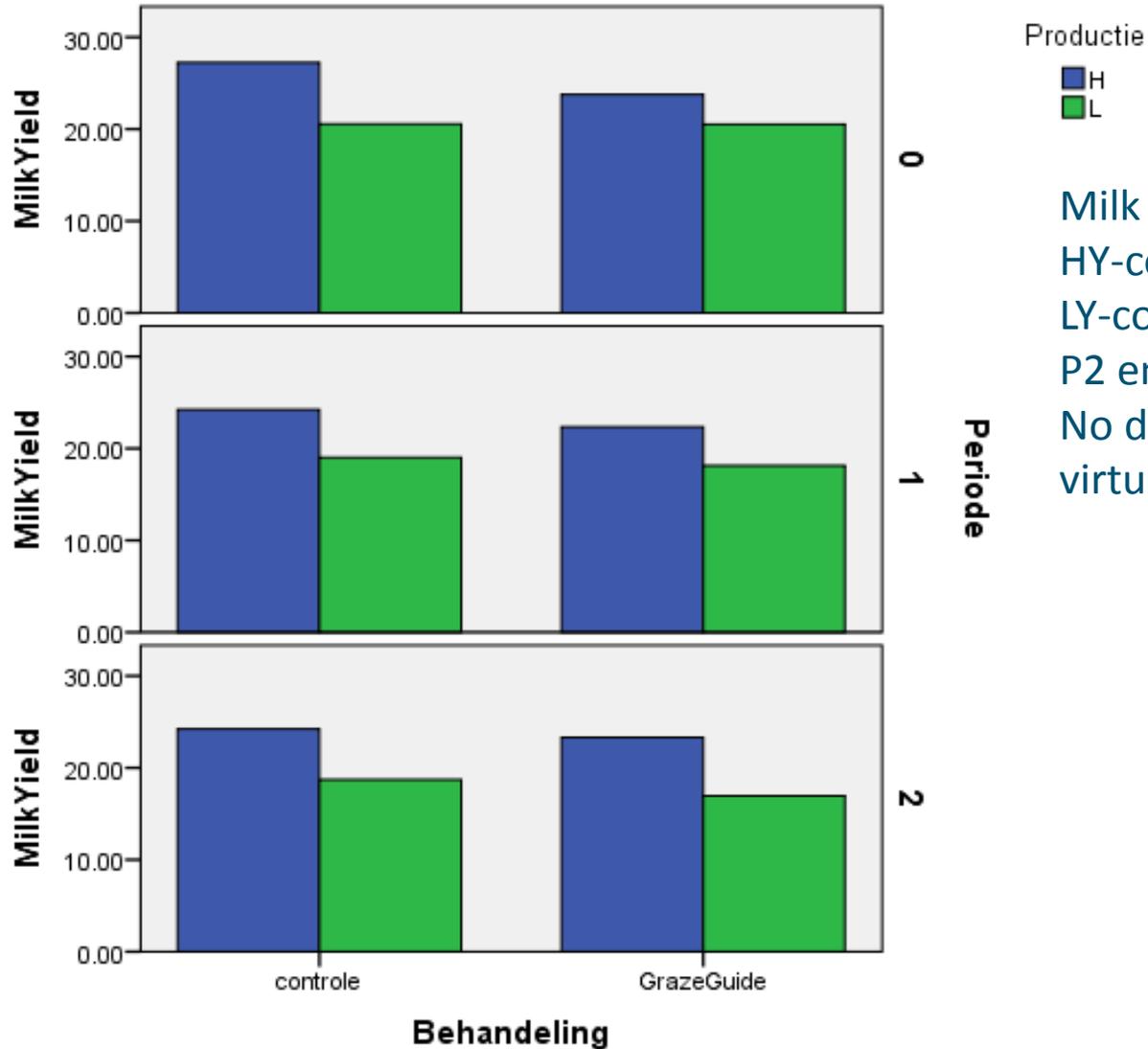
Period 2 Day 1



Exp and Control switched



Milk yield



Milk Yield
HY-cows (23.5 l/day) and
LY-cows (19 l/day) in P1,
P2 en P3 (all $P=0.000$).
No difference between
virtual fence and control.

Results

- The virtual fence was successful in preventing eLY-cows to reach the fresh grass.
- A reduction in their locomotion was found that might be related to a reduced welfare.
- However, no effect of the virtual fence and the restriction of the LY experimental group on milk production was found,
- Preliminary analysis of the Social Network showed a strong separation between eHY- and eLY-cows induced by the virtual fence.
- In the cross-over this separation initially remained, but extinguished in 3 days.

Conclusion

- Low and high yielding dairy cows are easily separated by a virtual fence.



Thanks!



Questions?

