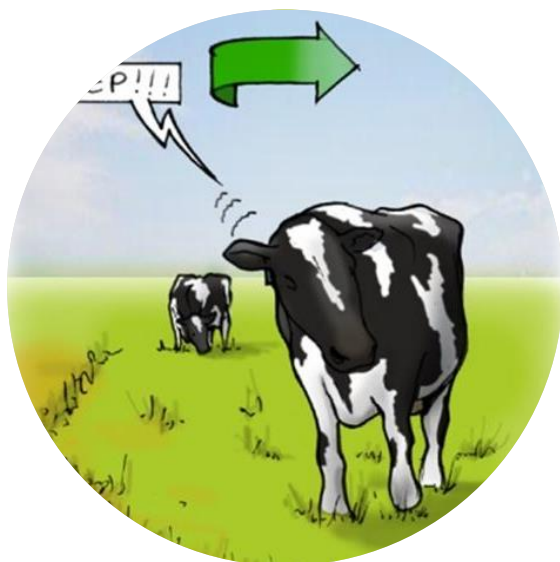


Using GrazeGuide (virtual fencing) separation for grazing in production groups

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Courage, Dairy Campus innovatie fonds & Melkveefonds



LIVESTOCK RESEARCH
WAGENINGEN UR

ICAR&IDF/ISO
CONFERENCE ANALYTICAL WEEK
2019 PRAGUE
CZECH REPUBLIC

ICAR 2019 17 – 21 June
IDF/ISO 2019 21 – 25 June

NGO's: Cows shall be part of the Landscape!!



Stalmelk in Chocomel en Fristi



Pas op: kaas zonder weidemelk!

NGO informs consumers:
Products manufactured from
NON grazing milk!!!



LIVESTOCK RESEARCH
WAGENINGEN UR

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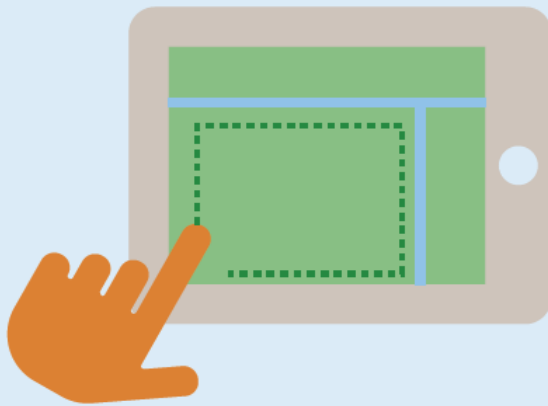
Motivation

- Efficient use of grassland \Leftrightarrow labour intensive
- Guiding cows with sensors:
 - Adaptive grazing area
 - Position information individual cows (GPS)
 - Lead cows with sound signals (warning)
 - Correct cows with electric signals
- First questions:
 - Can cows be guided with signals
 - Effect of signal guiding on behaviour

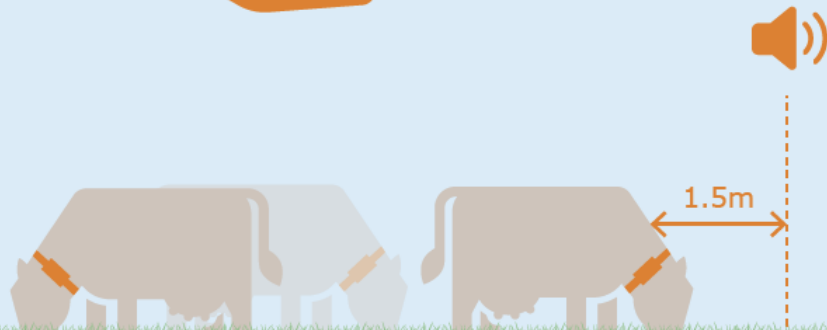
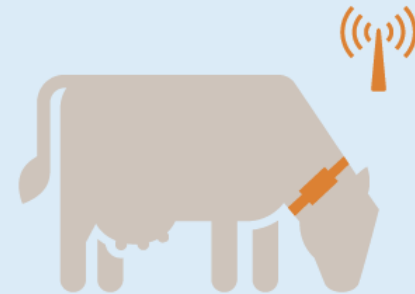


Virtual fencing

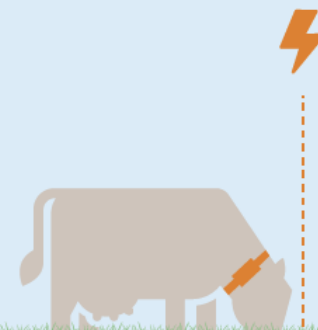
Farmer draws virtual fence with app on tablet or smartphone



A GPS-collar gives cow signals and communicates data to the farmers-app



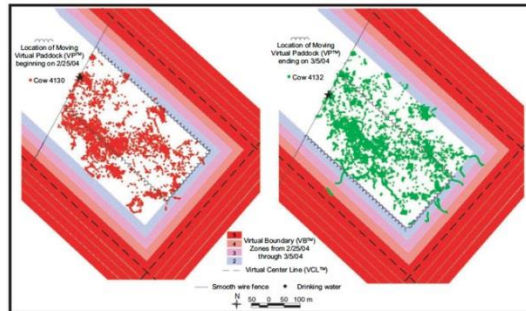
At a distance of 1.5m of the virtual fence cows receive a sound signal



When continuing walking in same direction the cow runs against virtual electric fence

Other initiatives

Anderson, US 2007



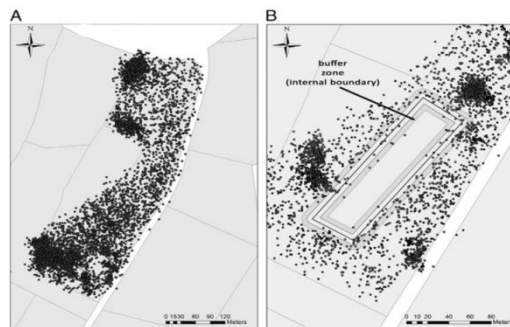
CSIRO, Australia 2016



Nofence, Norway 2018



Umstätter et al, Scotland 2015

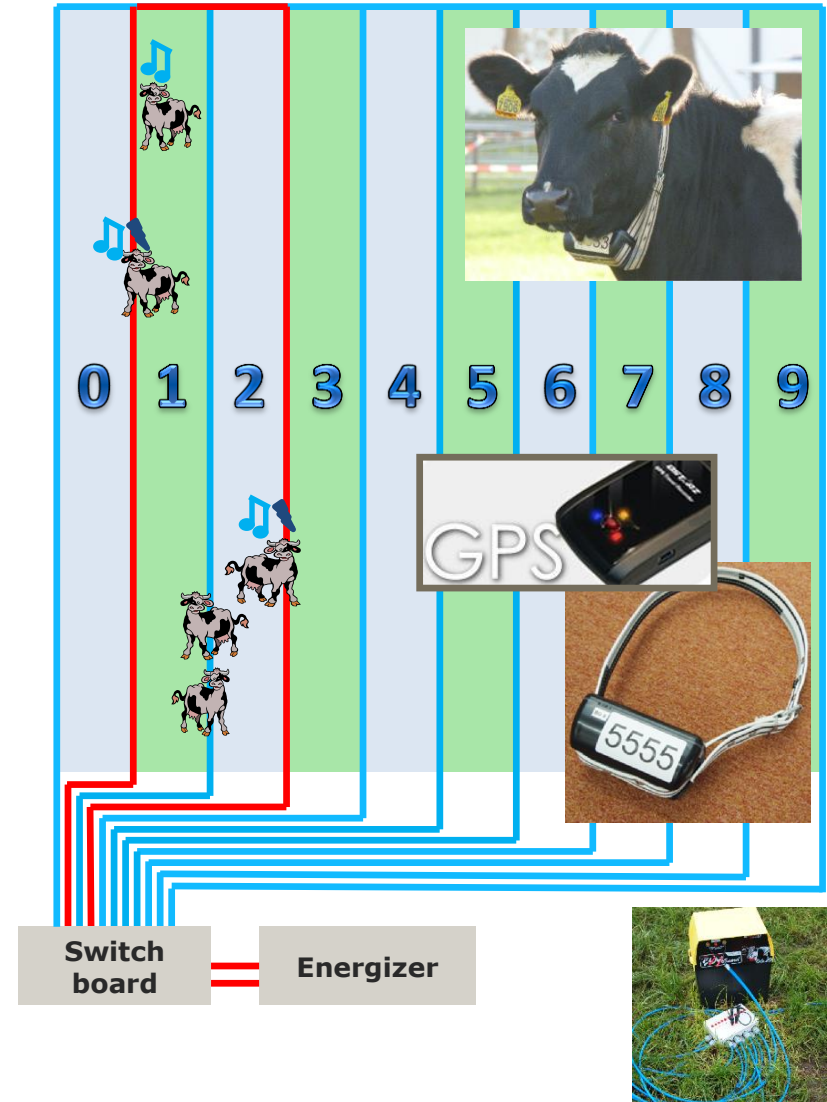


Piggott, New Zealand 2017



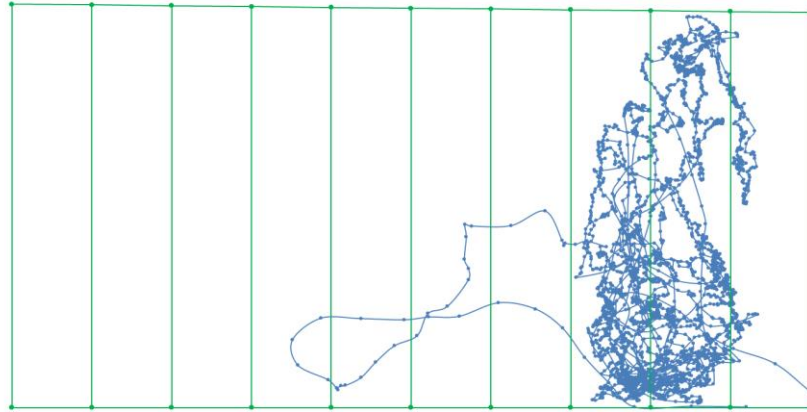
2015 (Carus) BoviGuard + GPS

- Approval animal welfare commission
- Inductive loop
- Strips (10x ~80mx10m)
- BoviGuard actuator
 - Warning (sound) / Correction (shock)
- Heifers (4x4)

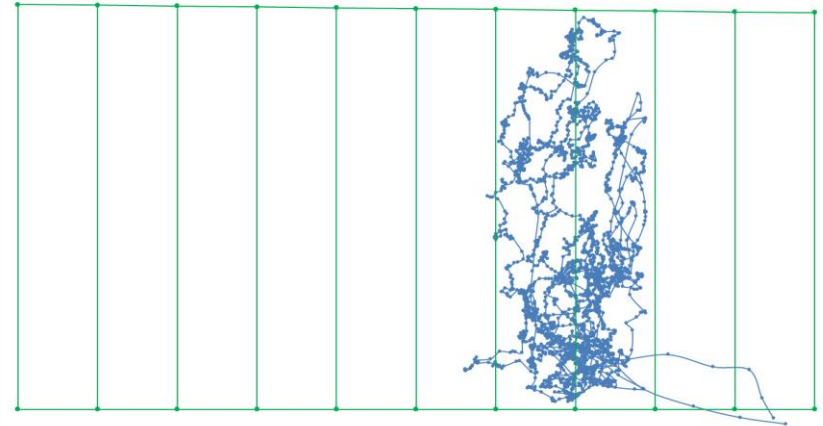


Carus 2015

koe 1 - veldjes 2&3 op 21/10



koe 1 - veldjes 3&4 op 22/10



Conclusions:

- Cows learn quickly
- Herd behaviour beats virtual fence
- Some escapes recorded
 - Mostly the same cows
- Virtual fence can have impact behaviour
 - Especially with small strips (10 m)



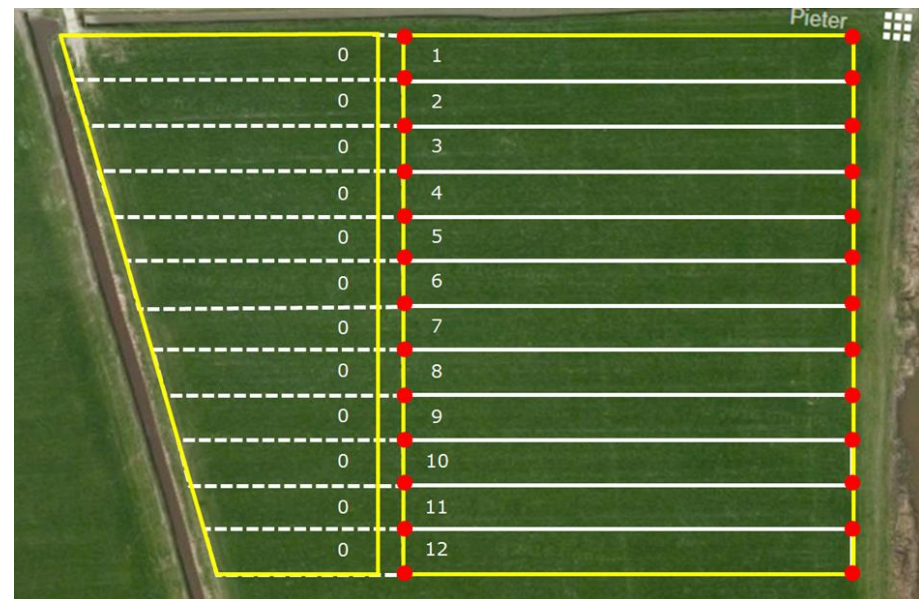
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Research spring 2016 on Dairy Campus

Questions

- Works Graze Guide also for dairy cows
 - Is a short training period possible
 - What happens if fence is moved during day
 - What happens if cows are in heath
 - Impact on behavior
-
- Cows (15) early lactation
 - Strips 12x ~160mx15m



Conclusion research spring 2016

- Works the system for group dairy cows?
 - 15-20 per group? No problem
 - Training of the cows? Within 4 hours
 - Problems with cows in heath? No problem
 - Adjustment of fence during day? No problem
 - Effect on behaviour and production? No issues??



Research October 2016 on Dairy Campus

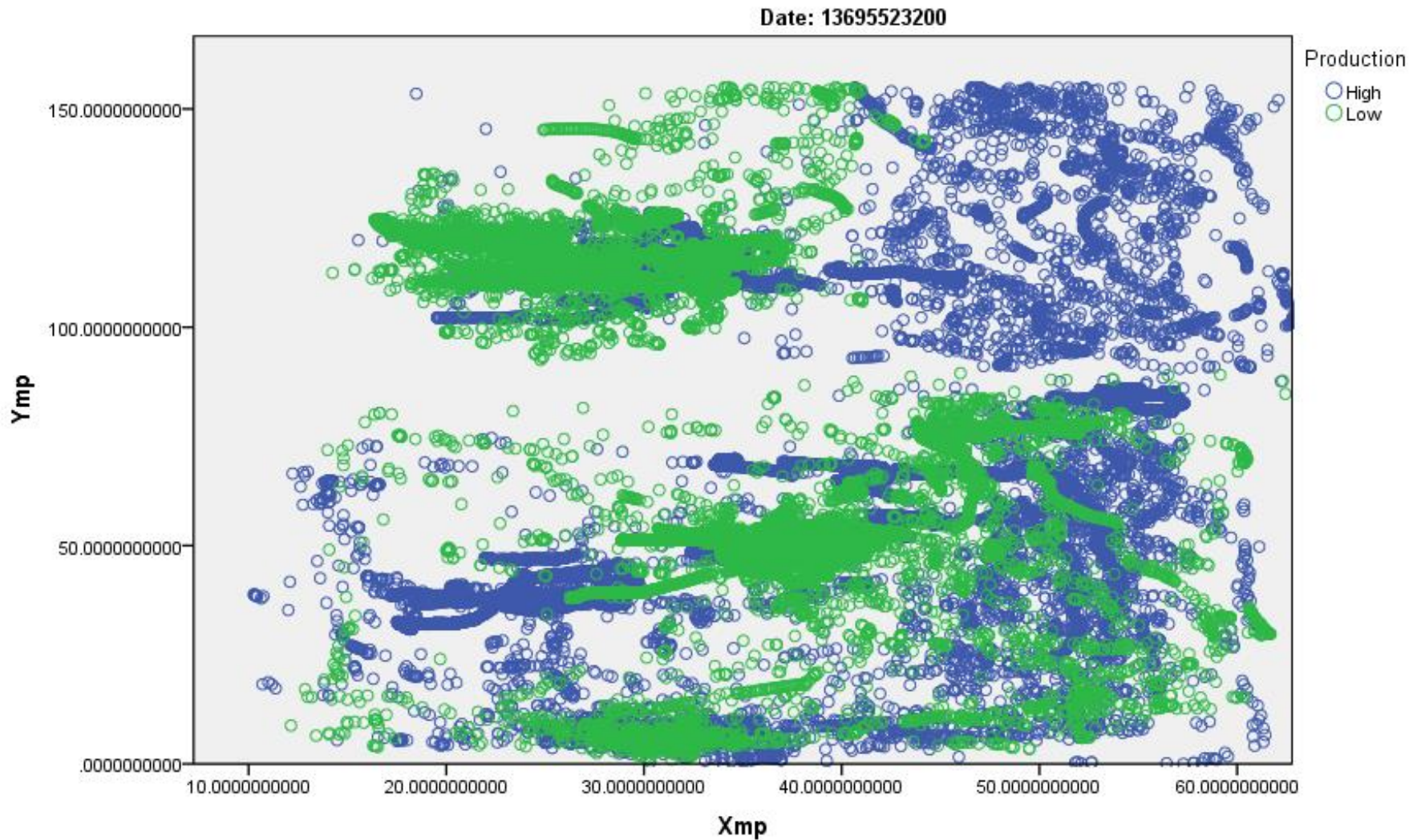
Strips 2x 12x ~80mx15m

Question (with 2x2x8 cows, experimental & control group):

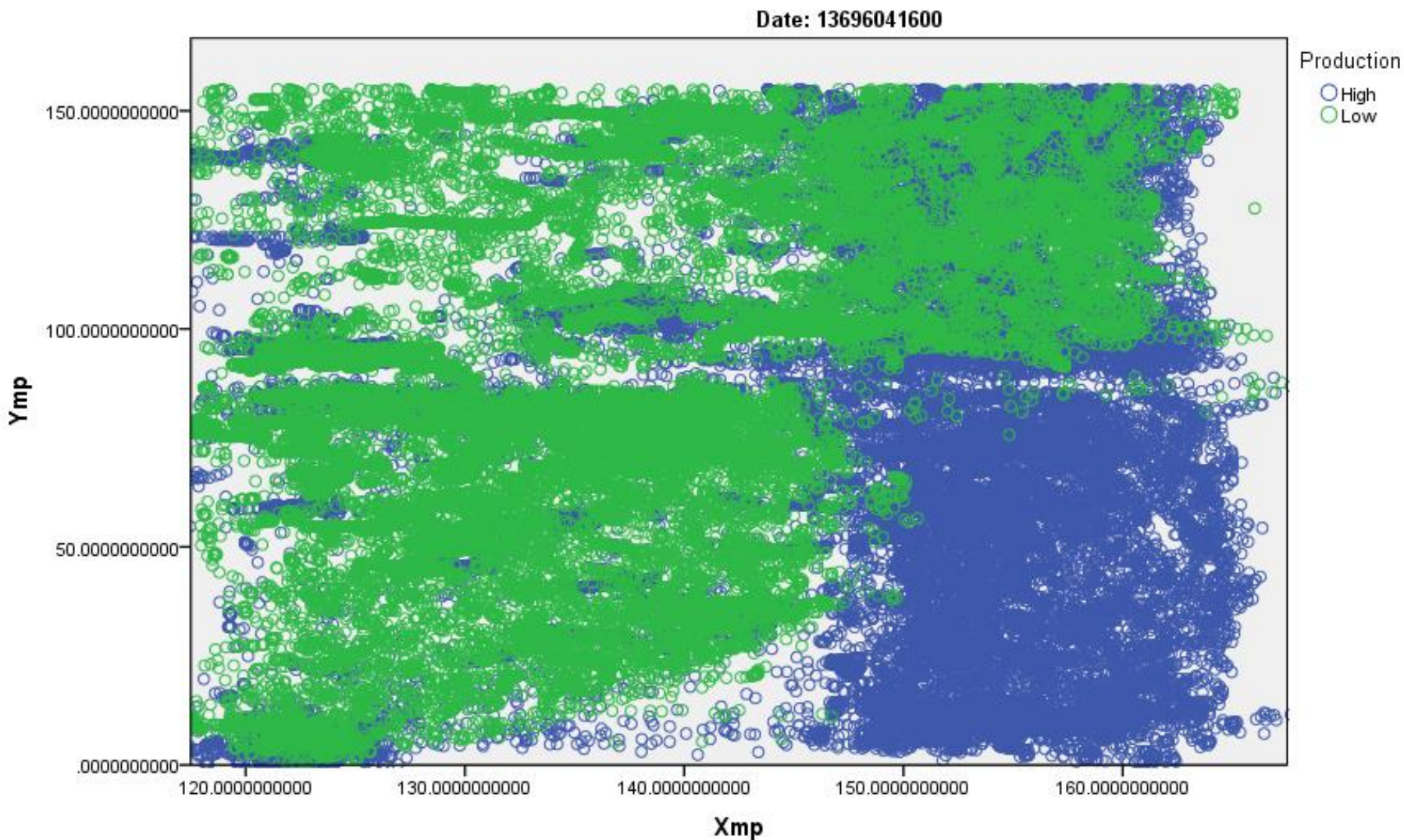
- Separating High Yielding (HY) and Low Yielding (LY)
 - LY: 2 strips where cows grazed previous days
 - HY: 2 strips where cows grazed previous days
1 additional strip with fresh grass
- What is impact on production, behaviour
- Phases:
 - P1 (leaning)
 - P2 (basis)
 - P3 (cross-over, i.e.
experimental & control
group switched)



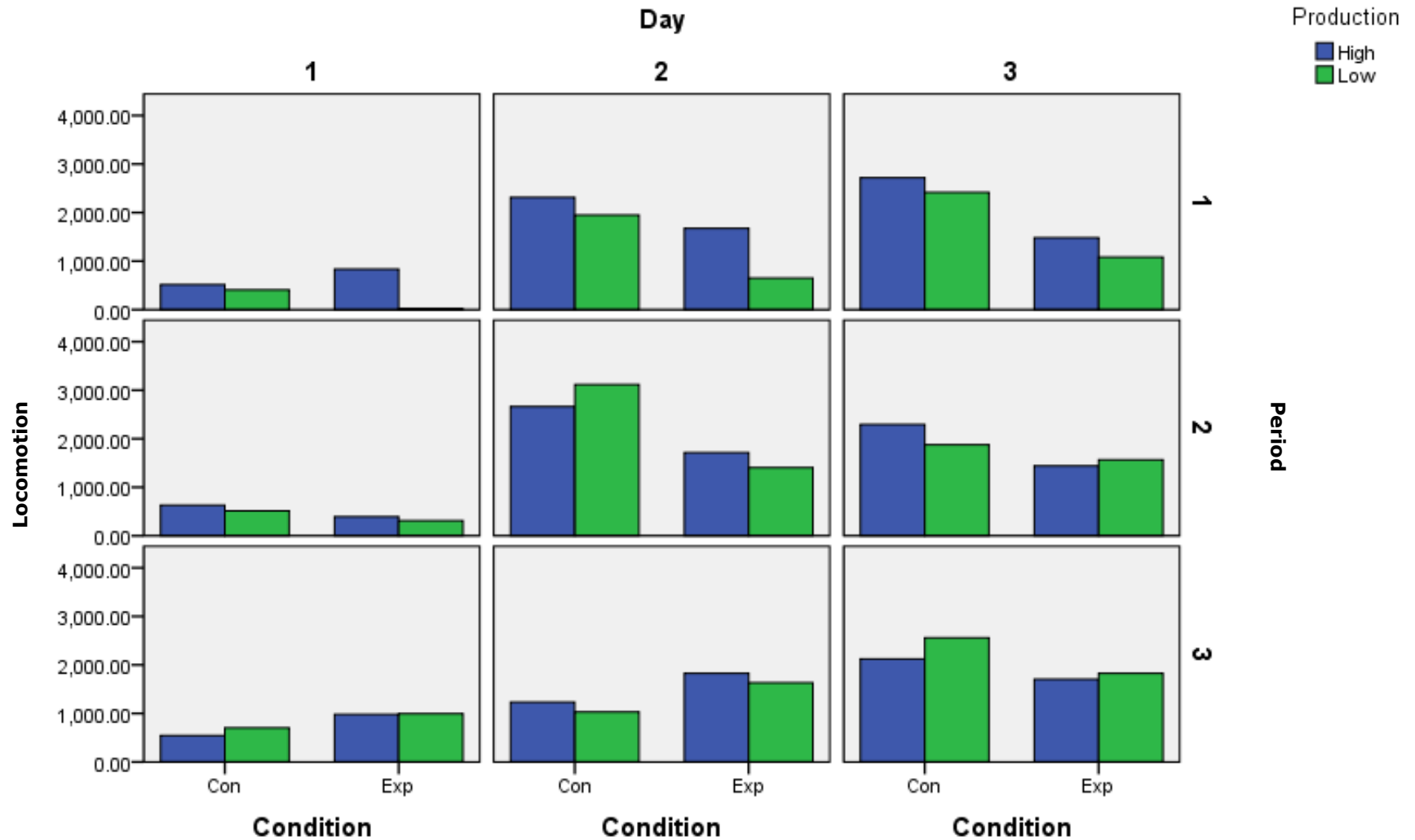
High and Low productive



Experimental & Control group switched



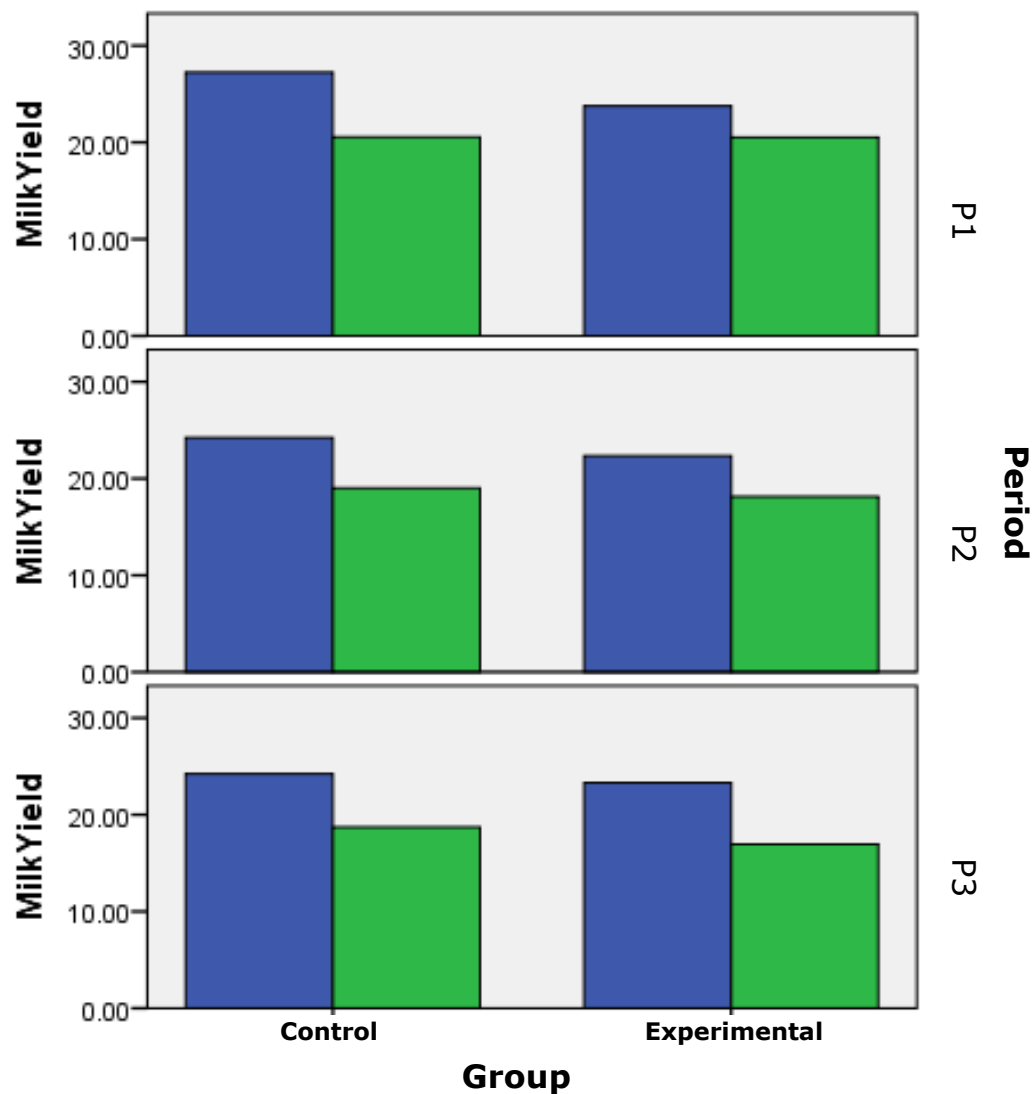
Distance walked / day



Locomotion activity (LA)

- P1: HY-koeien (1585 m/day) LA higher than
LY-koeien (1049 m/day; LMM $P < 0.001$)
Control group (1719 m/day) LA higher than
experimental group (1050 m/day; $P < 0.001$)
Experimental LY lowest LA (771 m/day; int.act. $P = 0.028$)
- P2: Control group (1850 m/day) LA higher than
experimental group (1130 m/day; $P = 0.002$)
- P3: Cross-over no significant difference in LA

Milk production



Production



Milk yield:

- HY-cows (23.5 l/day) higher than LY-koeien (19 l/day) during P1, P2 & P3 (all $P=0.000$)
- No effect virtual fence on yield LY-cows

Conclusion October 2016

- GrazeGuide can be used for separating groups
- Impact on production and behaviour:
 - Remarkable: in cross-over separation remained 2 days
 - Behaviour: Impact on locomotion activity
 - Production: no effect recorded



General conclusions

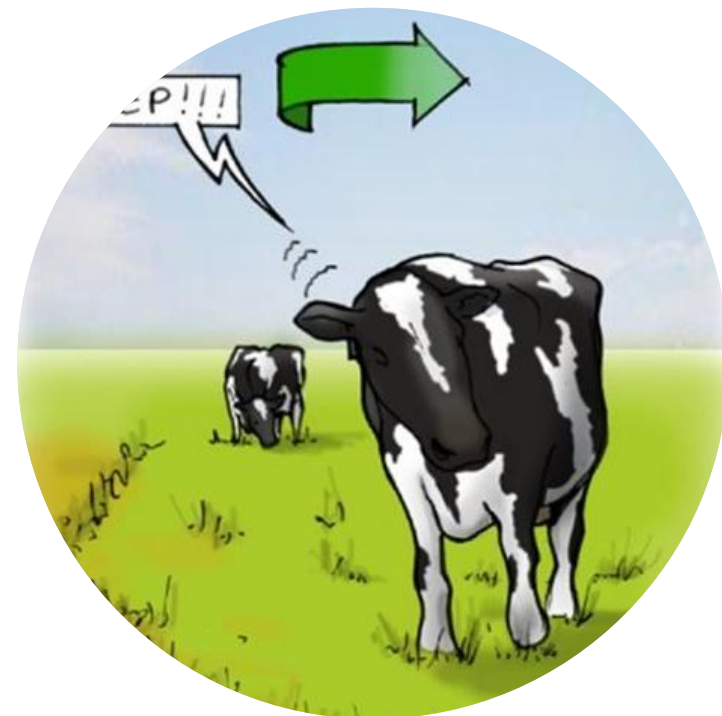
- Sensor-controlled grazing of cows is possible
- Preconditions to dimensions of the grazing area
- System consistency is crucial
- GrazeGuide offers new grazing possibilities
- Areas of interest in development
 - Public opinion
 - Animal welfare



Next step!



- Commercial GPS based system
- Technical & economic feasibility
- Integration in farm management
 - Secure grazing (time a day & days a year)



Questions!