



Effects of unplanned regrouping on activity, feed intake and milk yield of dairy cows

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75th EAAP annual meeting in Florence, Italy
1st – 5th September 2024

Session 45: Indicators, hi-tech solutions, and tools to effectively manage cattle
Abstract number 2215382



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Introduction

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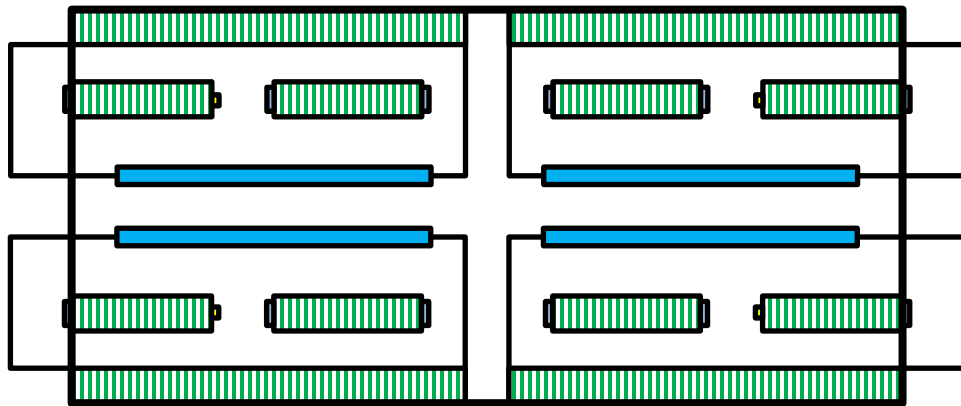
- Project (DigiStable) on cow behaviour, effect of management measures, individual personality
 - Establish indoor positioning system
 - Perform behaviour observation and behavioural tests
-
- Some cows show up in the wrong group for 12h-24h



➡ Do brief group changes effect the behaviour and milk yield?

Material & Methods

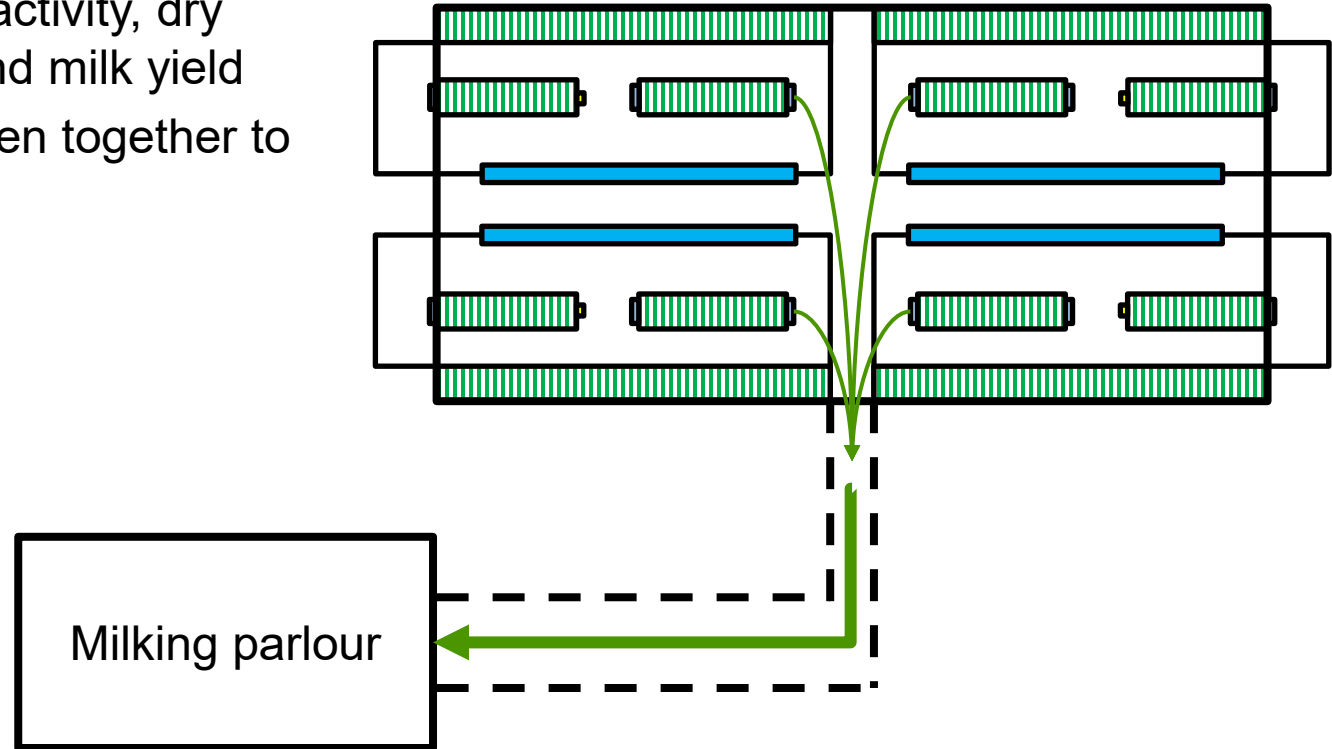
- Daily record of activity, dry matter intake and milk yield





Material & Methods

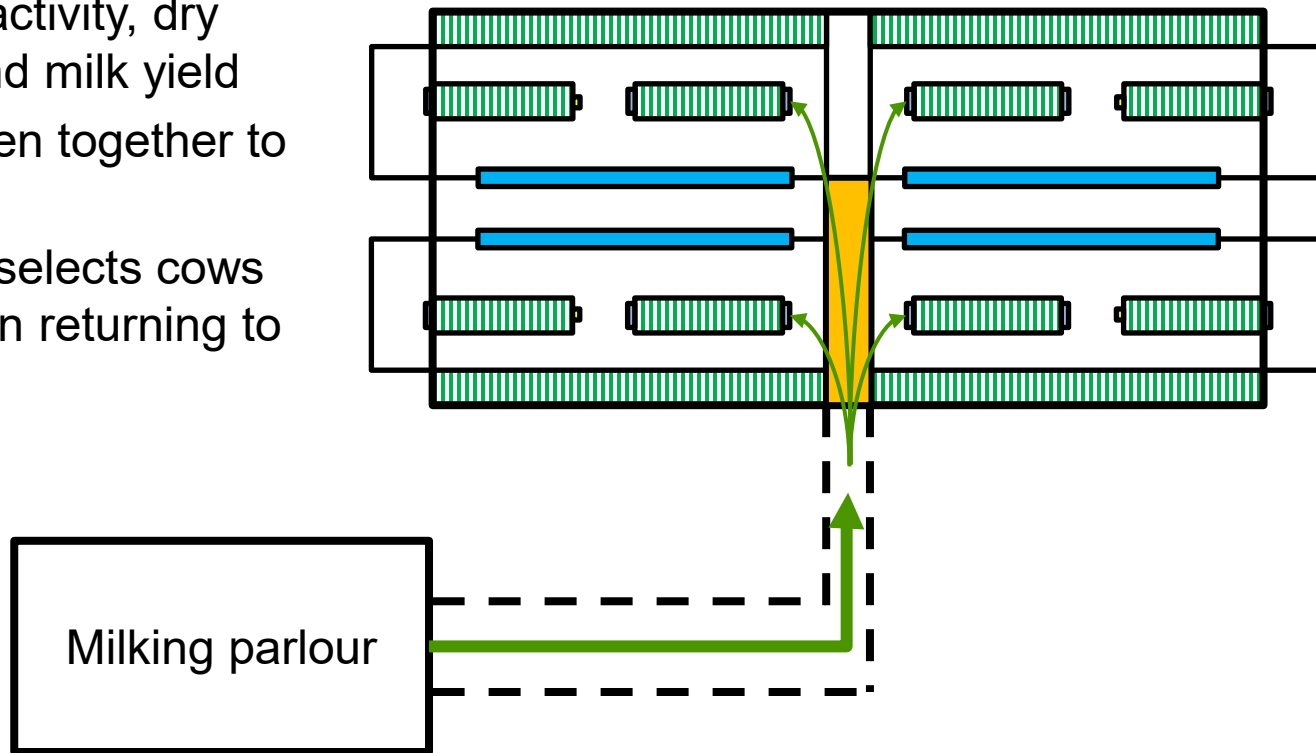
- Daily record of activity, dry matter intake and milk yield
- Groups are driven together to milking parlour





Material & Methods

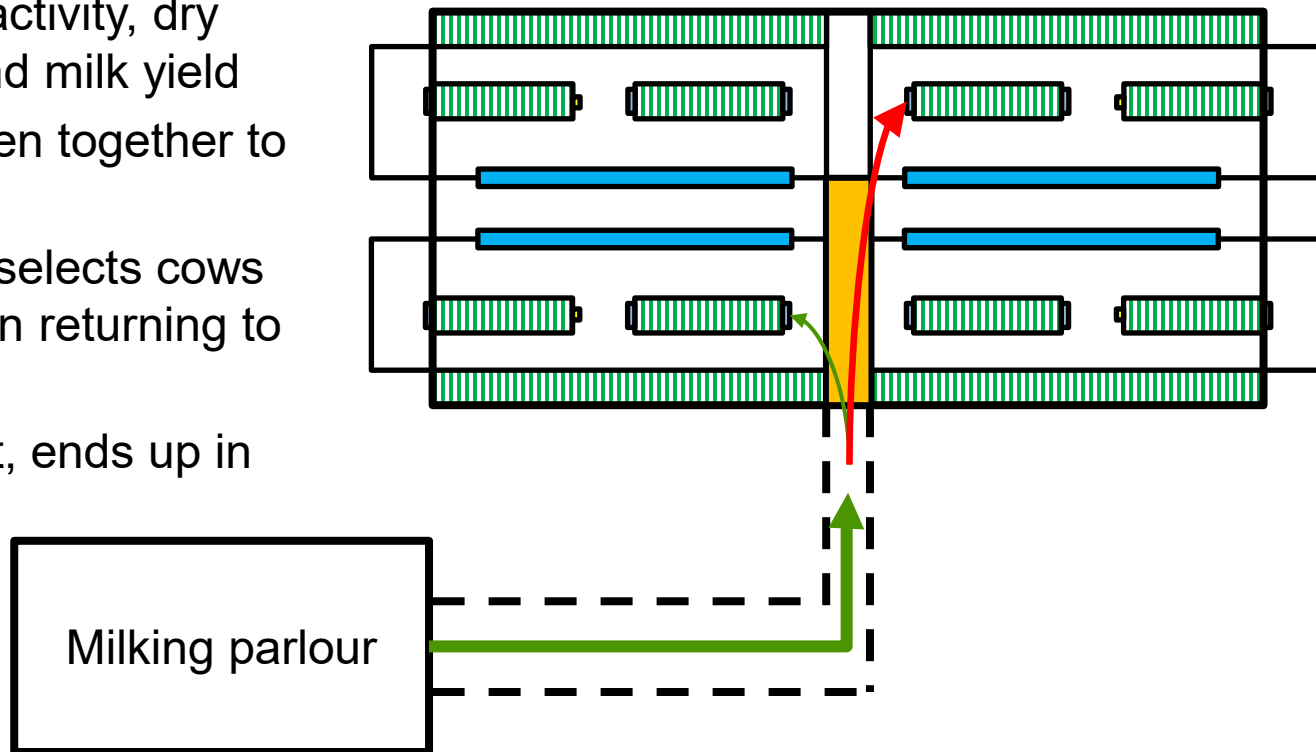
- Daily record of activity, dry matter intake and milk yield
- Groups are driven together to milking parlour
- Automatic gate selects cows into groups when returning to the barn





Material & Methods

- Daily record of activity, dry matter intake and milk yield
- Groups are driven together to milking parlour
- Automatic gate selects cows into groups when returning to the barn
- If cow is too fast, ends up in wrong group

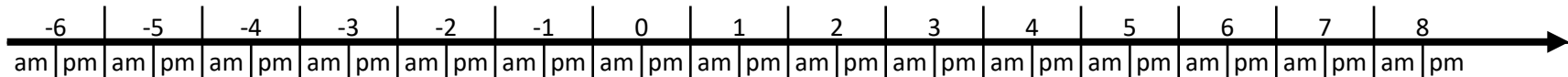




Material & Methods

Definition of regrouping

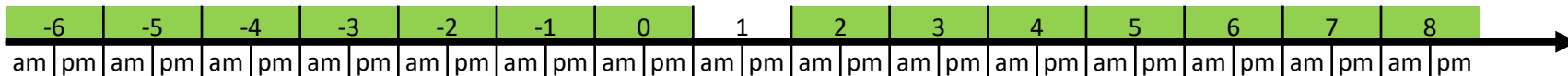
- Times between milking
 - am: 07:00-16:00
 - pm: 18:00-05:00





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- Times between milking
 - am: 07:00-16:00
 - pm: 18:00-05:00
- In correct group for >7d before and after

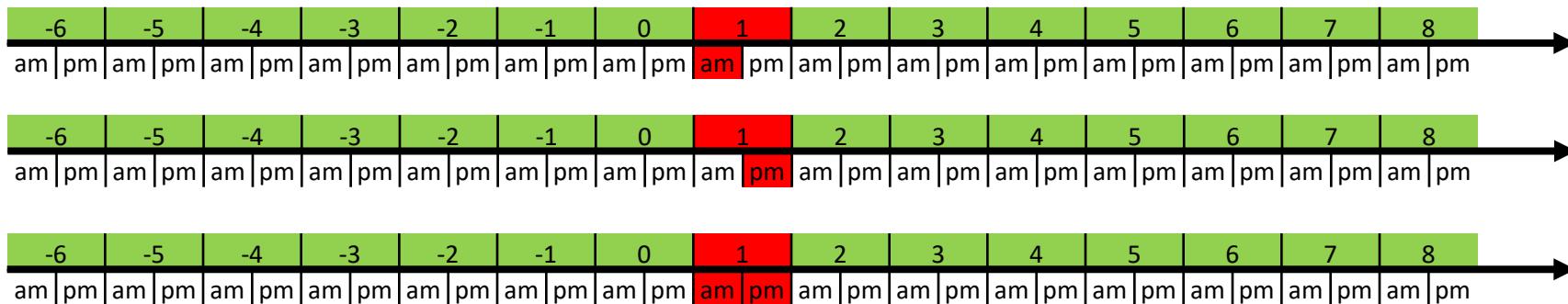




Material & Methods

Definition of regrouping

- Times between milking
 - am: 07:00-16:00
 - pm: 18:00-05:00
- In correct group for >7d before and after
- In wrong group on 1d during am or pm or both





Material & Methods

Comparison of activity, dry matter intake and milk yield

- Activity: day_0 vs day_1
- Dry matter intake: day_0 vs day_1
- Milk yield: day_0 vs day_1





Material & Methods

Comparison of activity, dry matter intake and milk yield

- Activity: day_0 vs day_1
- Dry matter intake: day_0 vs day_1
- Milk yield: day_0 vs day_1
 day_0 vs $\text{day}_1, \text{day}_2, \text{day}_3, \text{day}_4$





Material & Methods

Statistical analysis

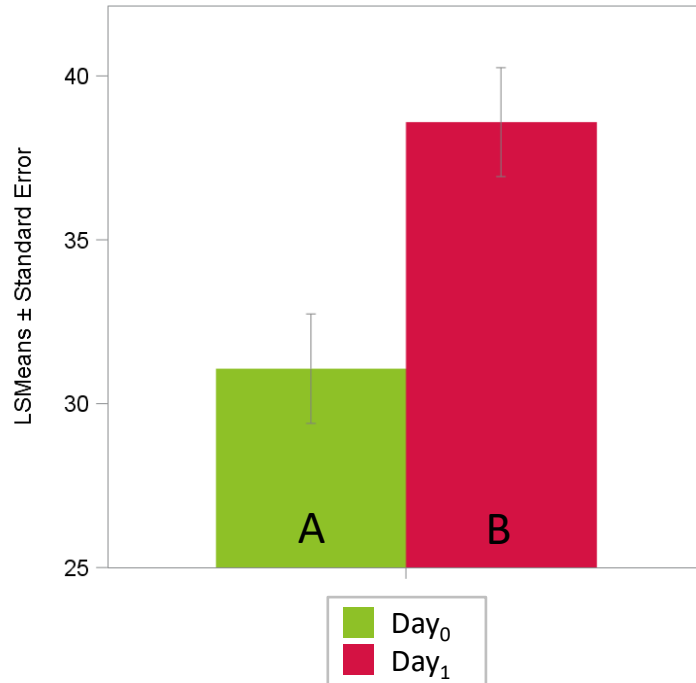
- Linear mixed models (proc mixed, SAS® 9.4)
- Response variable: Activity, dry matter intake or milk yield
- Fixed effects: Regrouping (Day: 0, 1 **or** 0, 1, 2, 3, 4)
Lactation number (LN: 1: 1, 2: 2, 3: ≥ 3)
Lactation day (LD: 1: $<105d$, 2: $105d$ to $210d$, 3: $>210d$)
Body weight (BW: 1: $<\mu-SD$, 2: $\mu-SD$ to $\mu+SD$, 3: $>\mu+SD$)
Dominance index (DI: 1: $<\mu-SD$, 2: $\mu-SD$ to $\mu+SD$, 3: $>\mu+SD$)
- Random effect: Subject, week
- 105 animals, 136 events



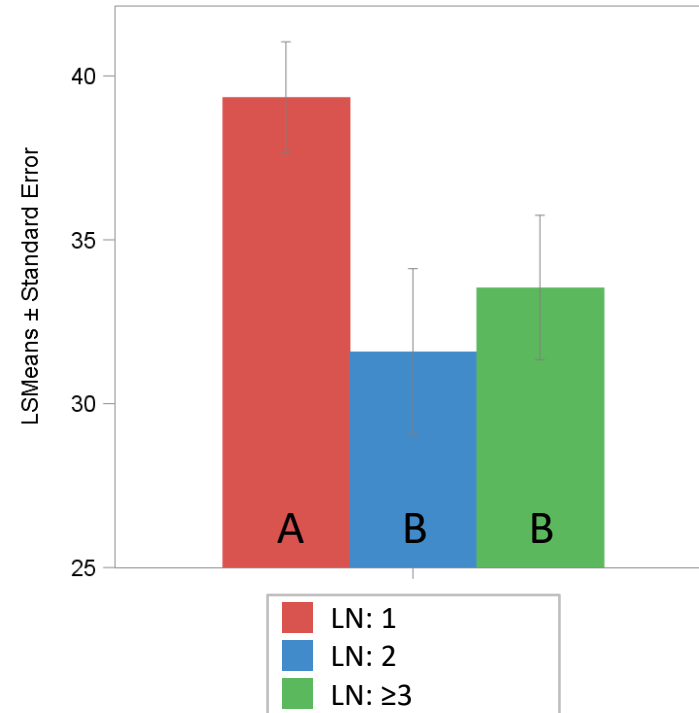
Results

Activity

Regrouping



Lactation number

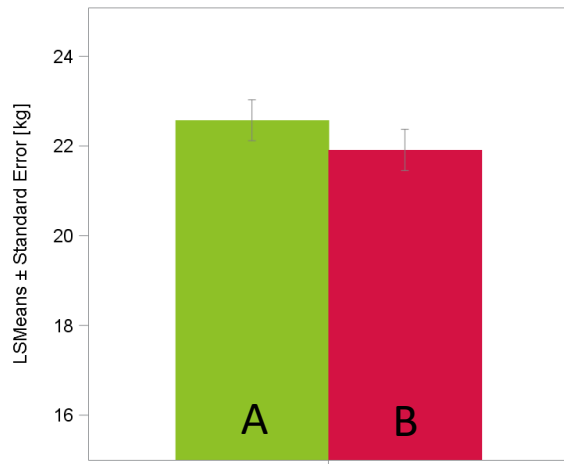


A, B, C: Different letters show significant ($p < 0.05$) differences between groups



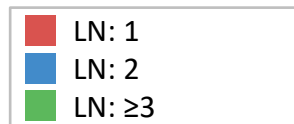
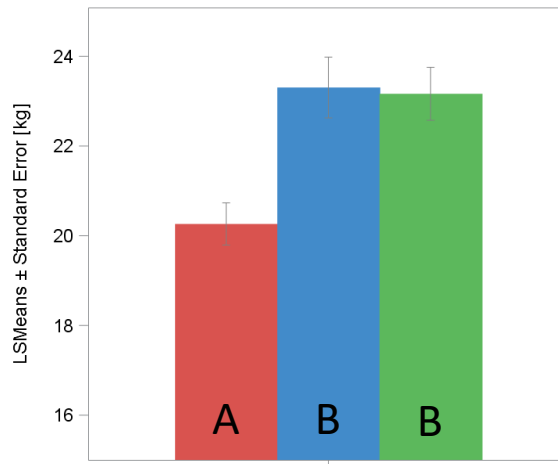
Results

Regrouping

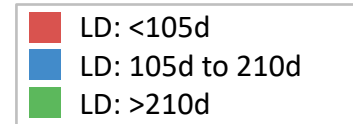
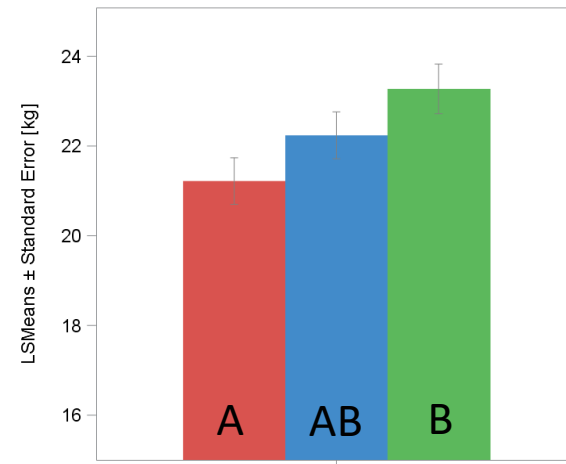


Dry matter intake

Lactation number



Lactation day

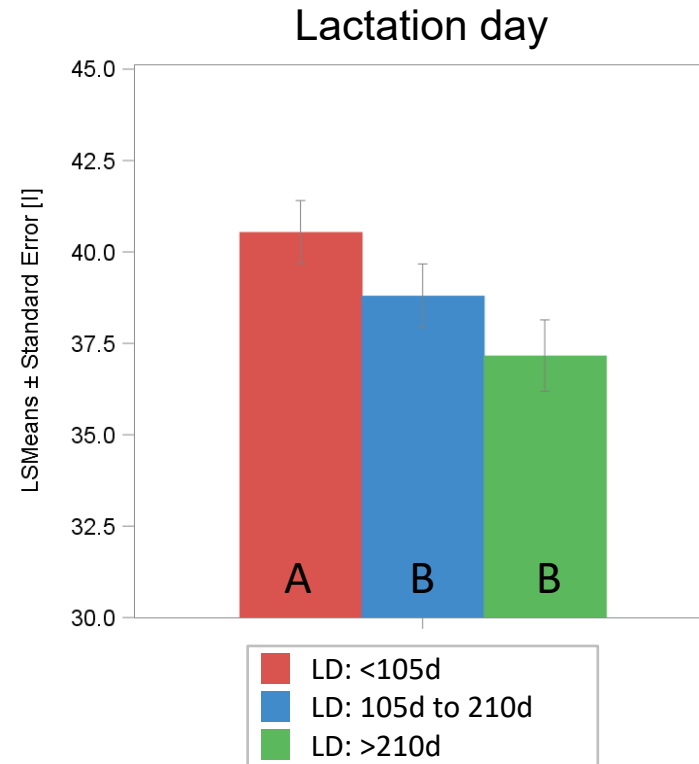
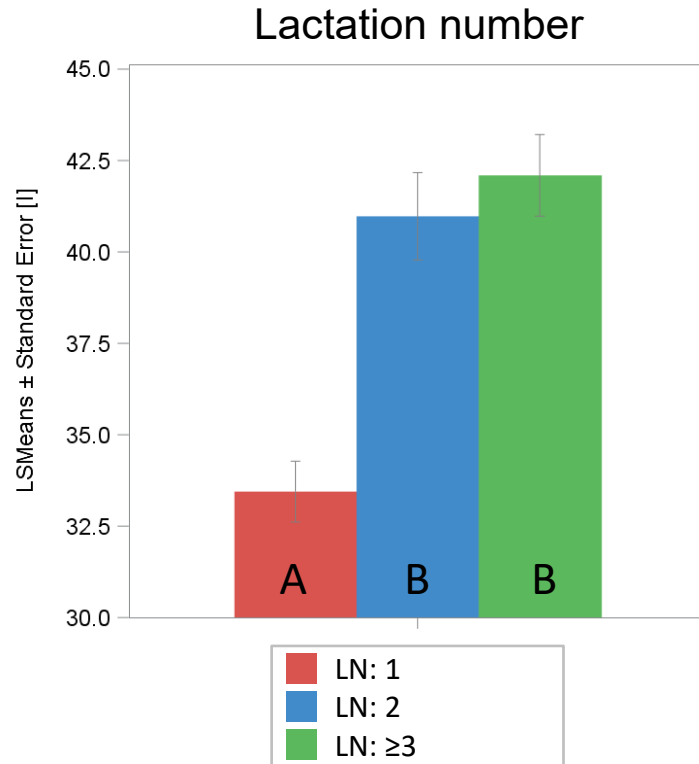


A, B, C: Different letters show significant ($p < 0.05$) differences between groups



Results

Milk yield



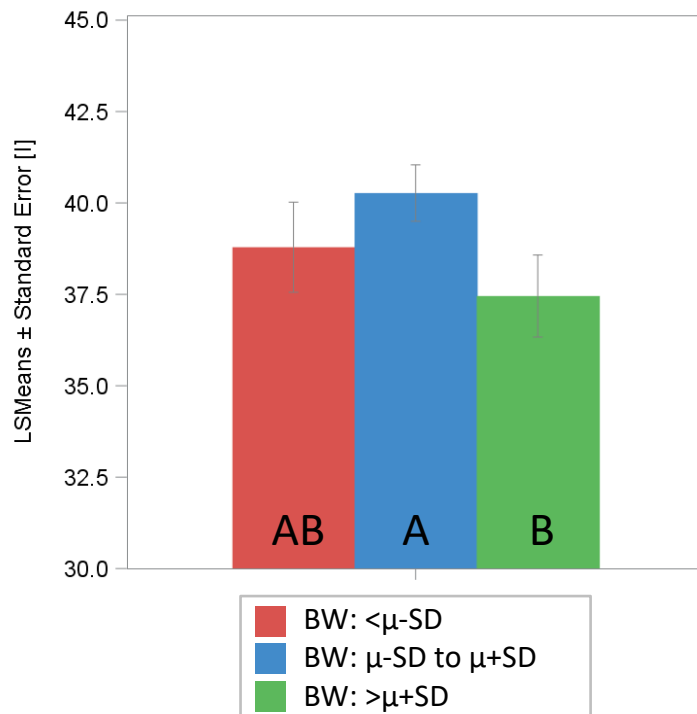
A, B, C: Different letters show significant ($p < 0.05$) differences between groups



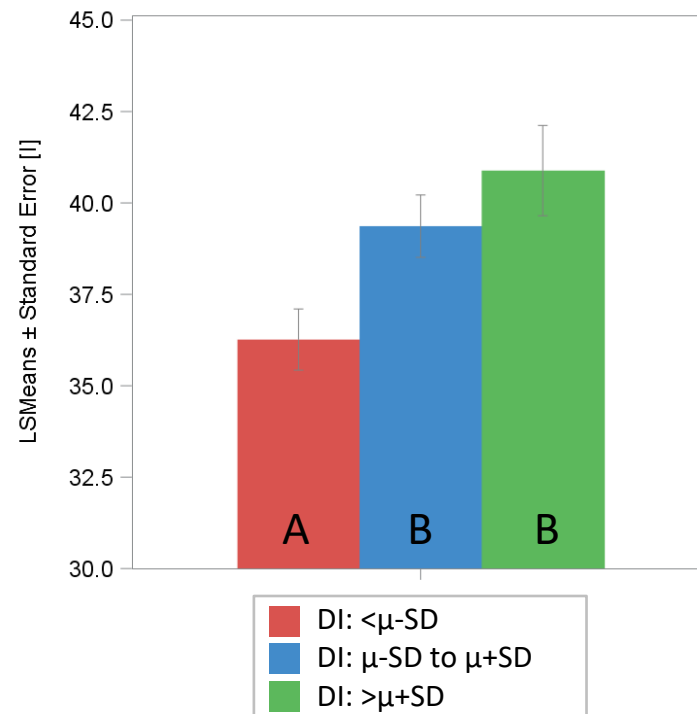
Results

Milk yield

Body weight



Dominance index



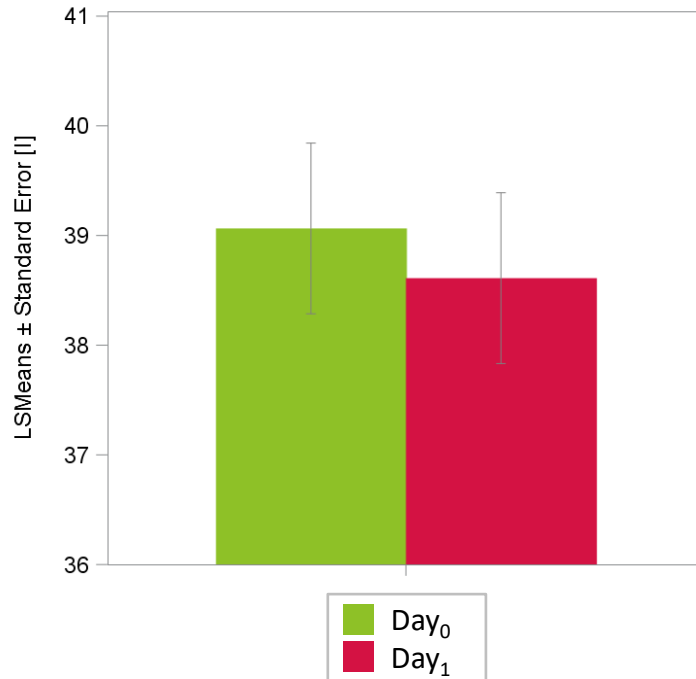
A, B, C: Different letters show significant ($p<0.05$) differences between groups



Results

Milk yield

Regrouping



Comparison Day₀ to:

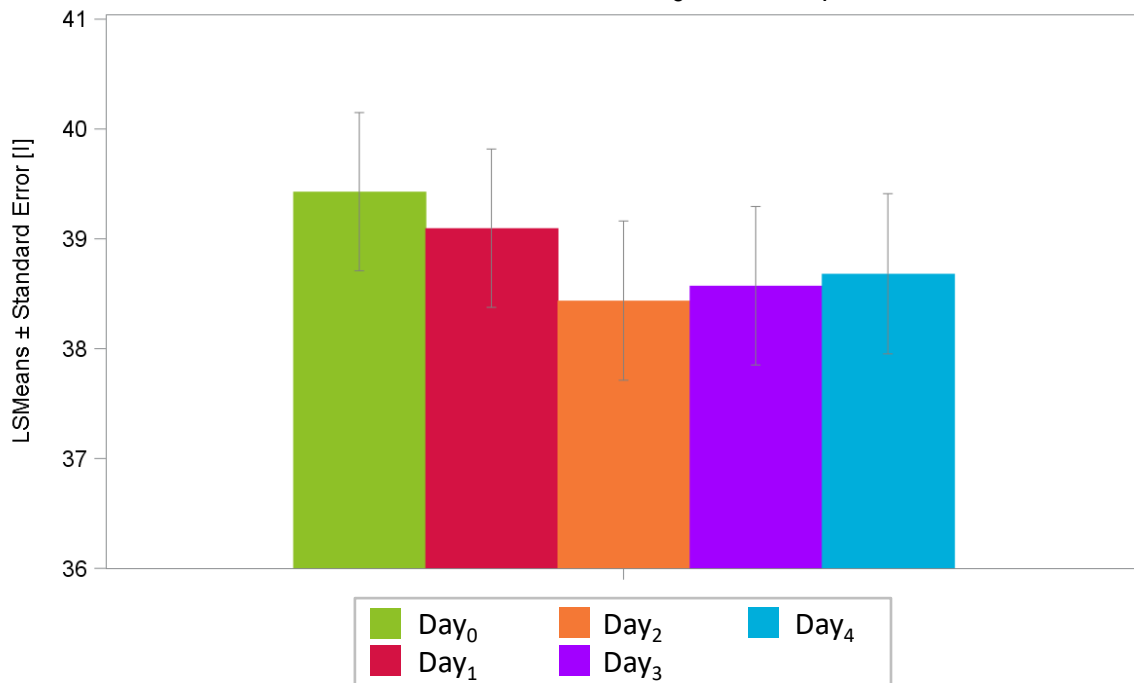
Day₁: -1.0% $p = 0.179$



Results

Milk yield

Regrouping day₀ to day₄



Comparison Day₀ to:

Day₁: -1.0% $p = 1.000$

Day₂: -2.5% $p = 0.009$

Day₃: -2.2% $p = 0.031$

Day₄: -1.9% $p = 0.104$



Conclusion

- ➔ Even short events of regrouping do effect behaviour and milk yield significantly
 - Activity increases by 24%
 - Dry matter intake decreases by 3%
 - Milk yield decreases on day 2 and 3 by 2%

- ➔ Should be taken into account and further analysed in the following analyses

Outlook:

- Detailed behaviour via indoor positioning system
- Information on personality traits via behavioural testing



Thank you for
your attention!

With support from



Federal Ministry
of Food
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Project manager



Federal Office
for Agriculture and Food



by decision of the
German Bundestag