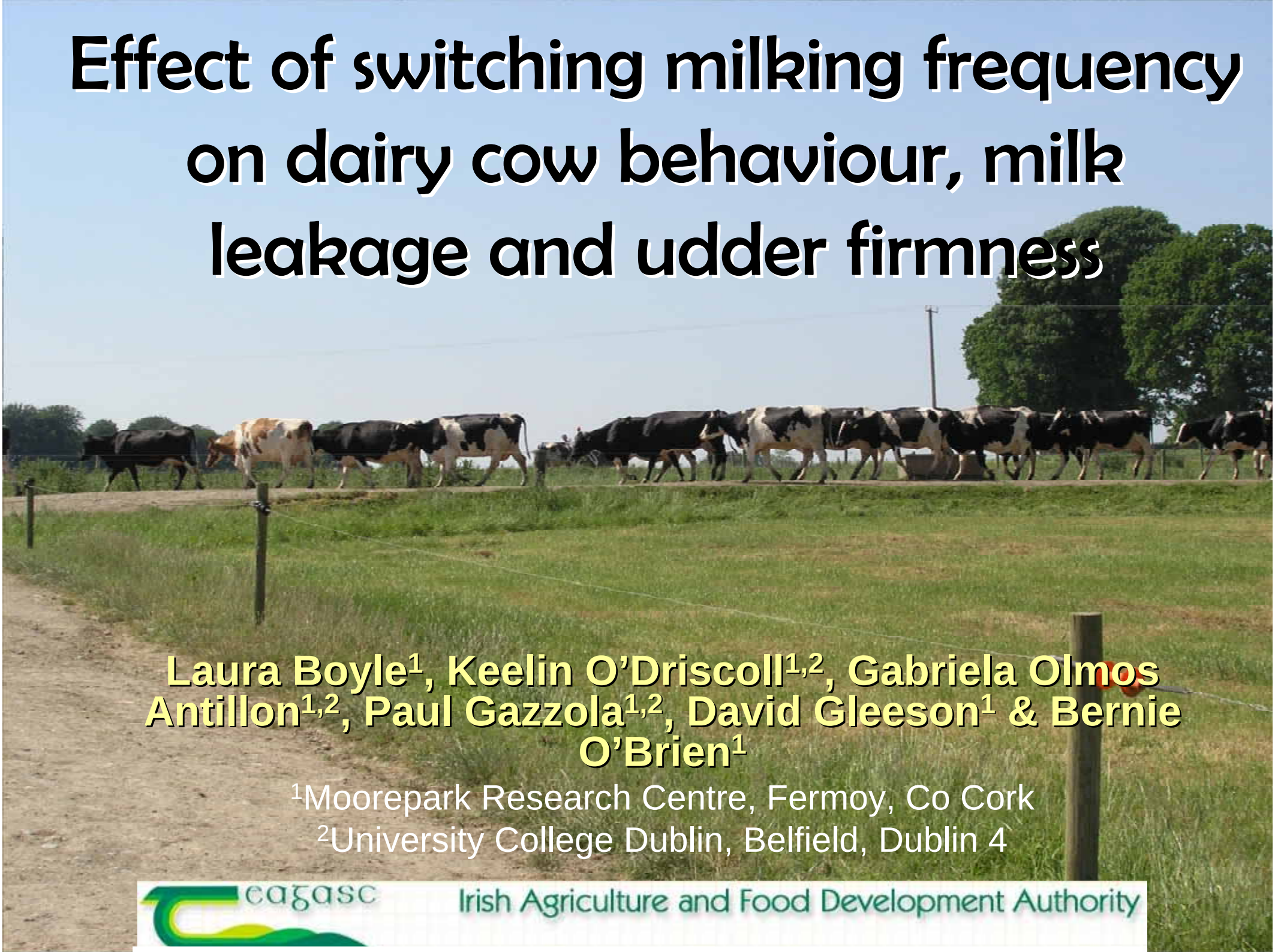
Effect of switching milking frequency on dairy cow behaviour, milk leakage and udder firmness



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Dairy farming in Ireland

- Pasture based milk production system
- Seasonal calving pattern
- Cost and availability of labour
- Lifestyle

Introduction

- Once-a-day (OAD) milking for full lactation
- Twice to OAD milking
- Once to twice-a-day (TAD) milking

Introduction

- Early/peak lactation OAD cows
  - Poorer locomotory ability related to udder distension
  - Milk leakage
  - Higher plasma cortisol concentrations
  - Immunosuppression

(Keane et al., '06; Gleeson et al., '07; Llamas Moya et al., 'submitted)

- Calf suckles dam 4 to 5 times/day

(Odde et al. '85; Hamann and Heerman ' 90; Stewart et al. '93)

- Cows present for milking 2.5 times/day

(Ketelaar et al. '99; Sporndly & Wredle '00)

- Frequent milking improves cow comfort

(Osterman & Redbo '01)

Introduction

- Cows switched from twice to OAD milking at 153 days in milk (DIM)
  - firmer udders
  - no difference in behaviour, faecal cortisol metabolite concentration or milk leakage

(Tucker et al., 2007)

Objective

To evaluate the implications of switching between once and twice a day milking at 110 DIM

- Lying behaviour
- Locomotory ability
- Behaviour at milking
- Milk leakage
- Udder firmness

Hypotheses

1. Cows switched from TAD to OAD milking
   a) higher locomotion scores
   b) reduced lying times
   c) more step/kicking behaviour at milking
   d) udder distension
   e) milk leakage

2. Cows switched from OAD to TAD milking would not differ from cows milked TAD for the entire lactation

Materials and methods

- 42 HF cows blocked on parity, calving date (CD) and previous milk yield
- Av. CD: 28th Feb. ± 20 days
- Av. milk yield: 6300kg (25kg/d)
- 3 treatments from calving
  - Twice daily milking for full lactation (2x)
  - TAD to OAD milking (2x1x)
  - OAD to TAD milking (1x2x)

Materials and methods

- At grass full-time from March 17
- Milking at 0730h & 1530h
- OAD cows - a.m. only
- Switched on 21st June 2006
- 110 ± 19.7 DIM
  - 2x = 25.0kg
  - 2x1x = 25.2kg
  - 1x2x = 20.7kg

Lying/standing behaviour

- 10 cows per treatment
- Automatic behaviour recorders (TinyTag™)

  - 104 to 109 DIM
  - 110 to 112 DIM
  - 115 to 120 DIM

Locomotory ability

- 108, 109, 111, 112 and 117 DIM
- One person scored 5 aspects of locomotory ability from 1 (normal) to 5 (severely abnormal)

(O'Callaghan et al., 2003)

- Milk leakage recorded simultaneously

Step/kick behaviour

- Scored during wash, dry & cluster attachment stages

  0 = No steps or kicks

  1 = ≤ 2 steps

  2 = 2 to 4 steps

  3 = > 4 steps

  4 = < 2 kicks

  5 = > 2 kicks

Statistics

- SAS Version 9.1.3

Locomotion scores and behaviour

- Repeated measures by General Linear Mixed Models (Proc Mixed)

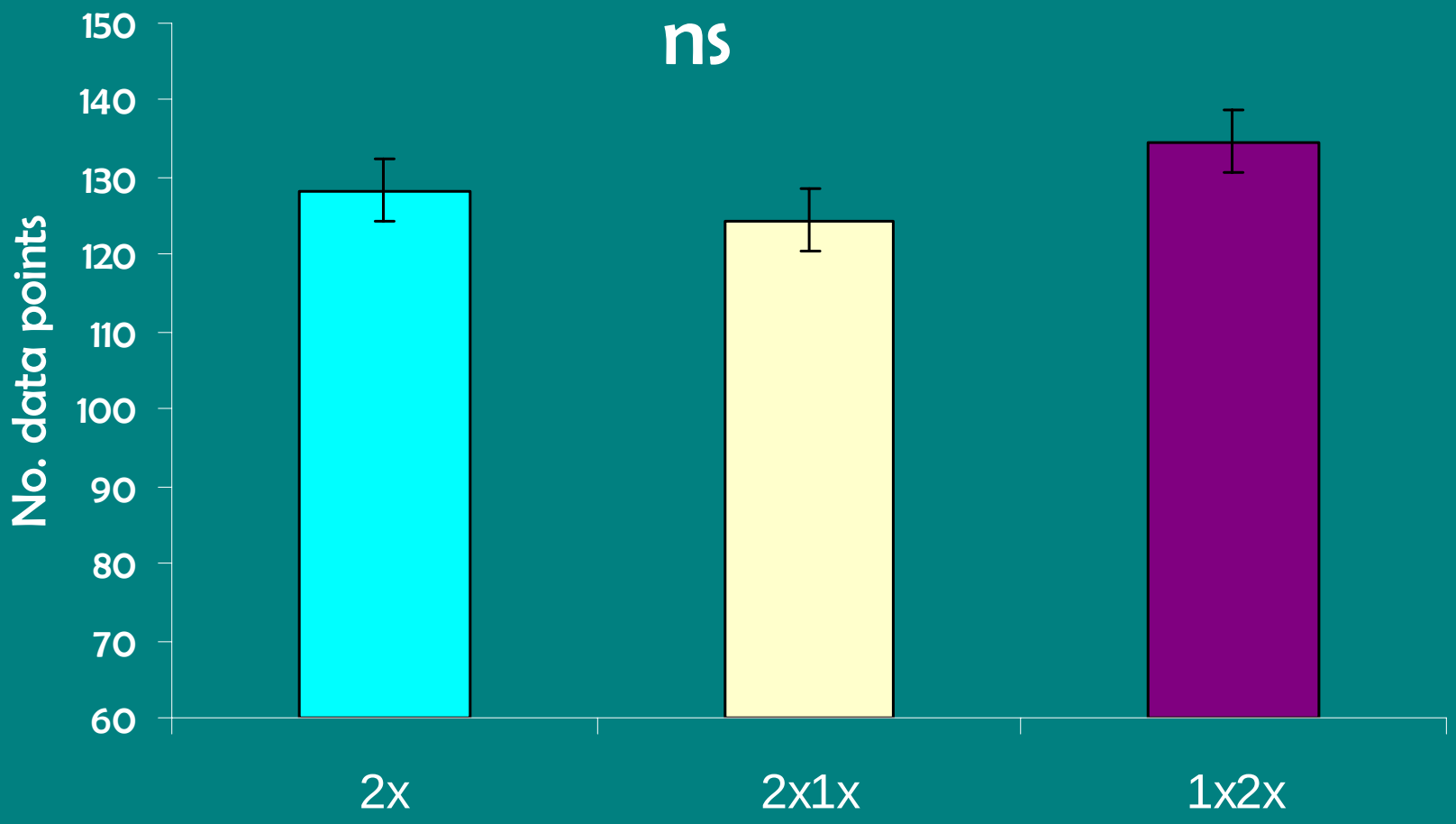
Milk leakage and udder firmness

- Logistic regression for repeated measures (Proc Genmod) and chi-square tests (Proc Freq)

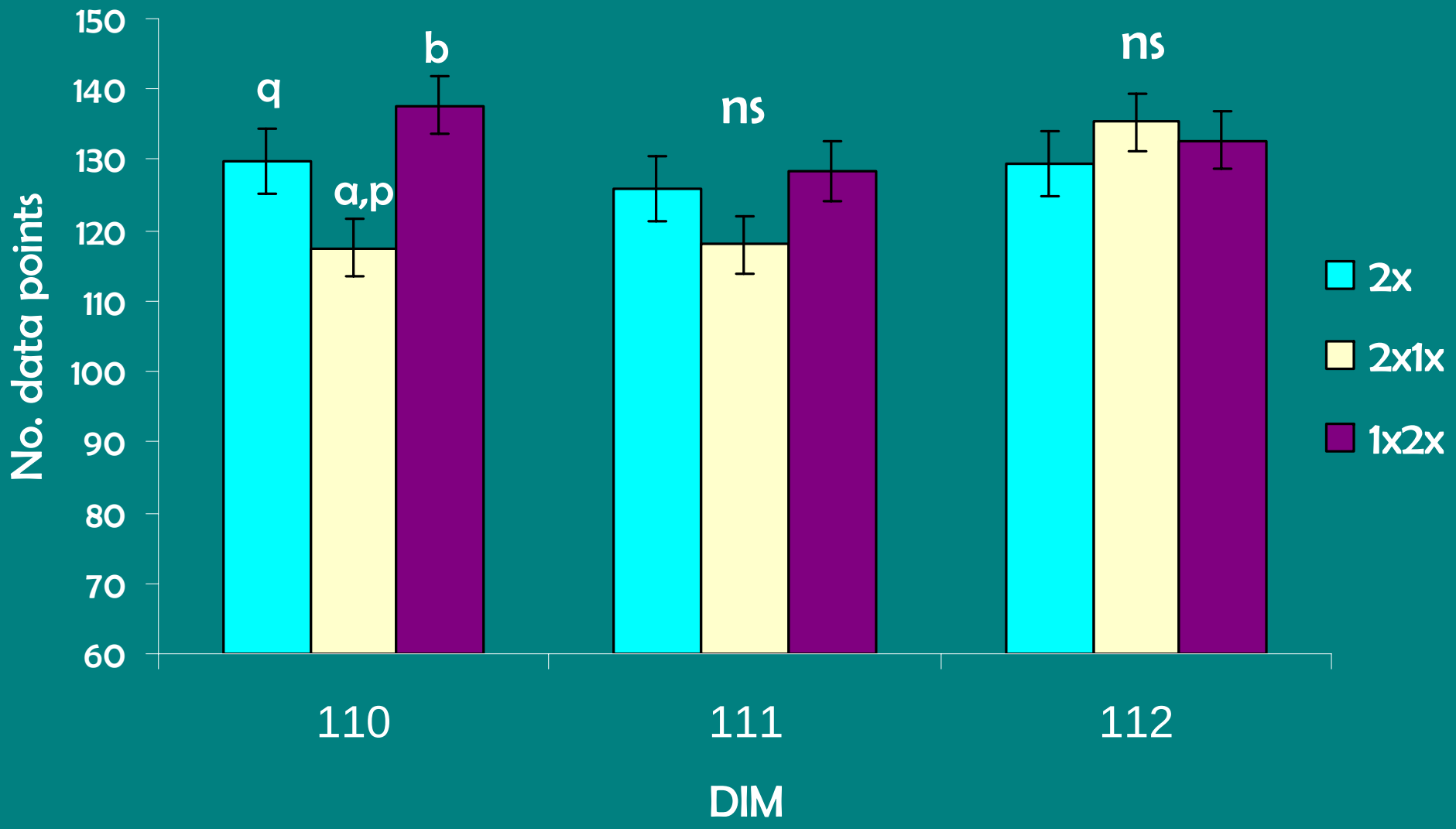
Step/kick behaviour

- Kruskal Wallis test (Proc NPar1Way)

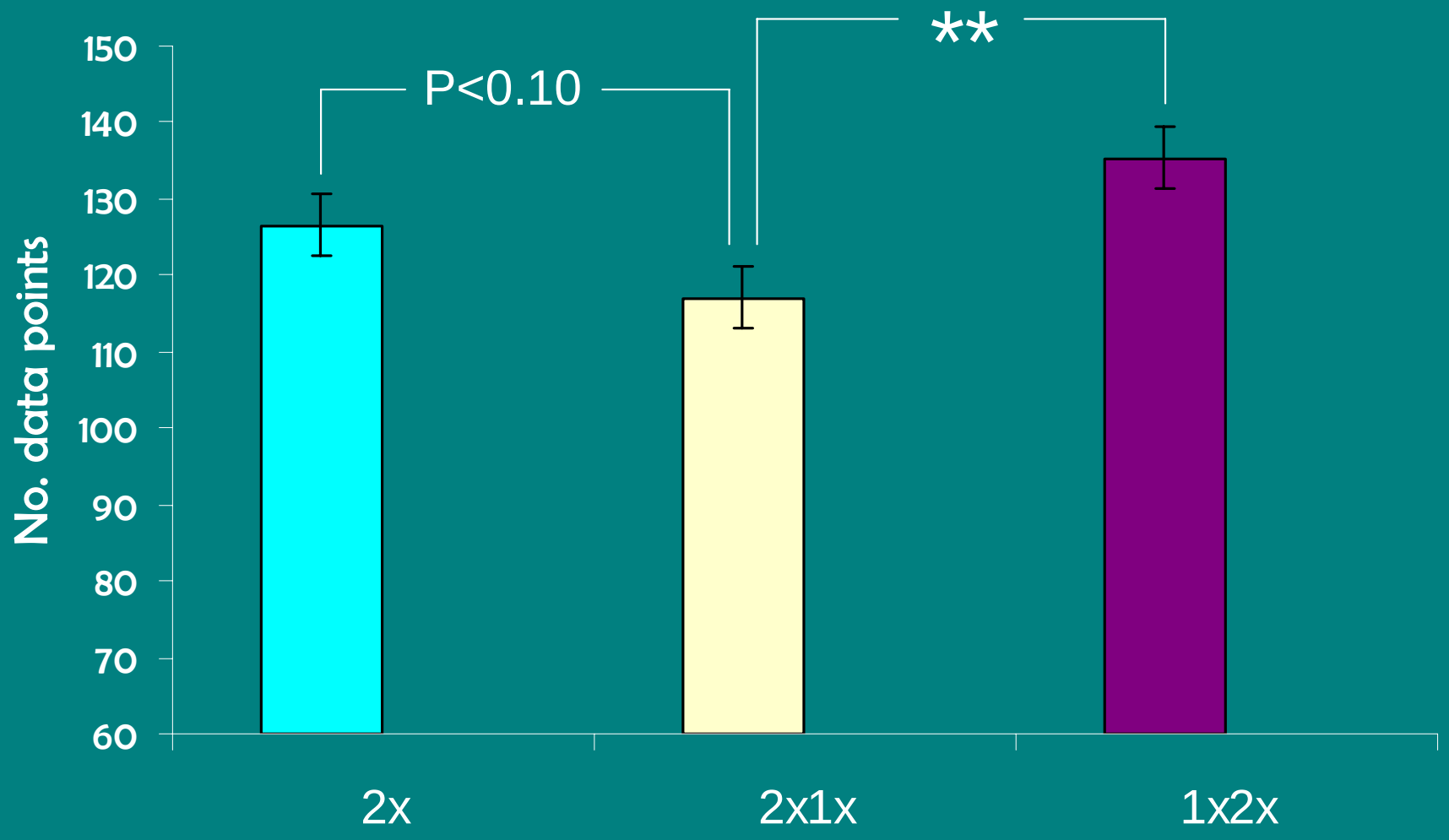
Pre-switch lying duration



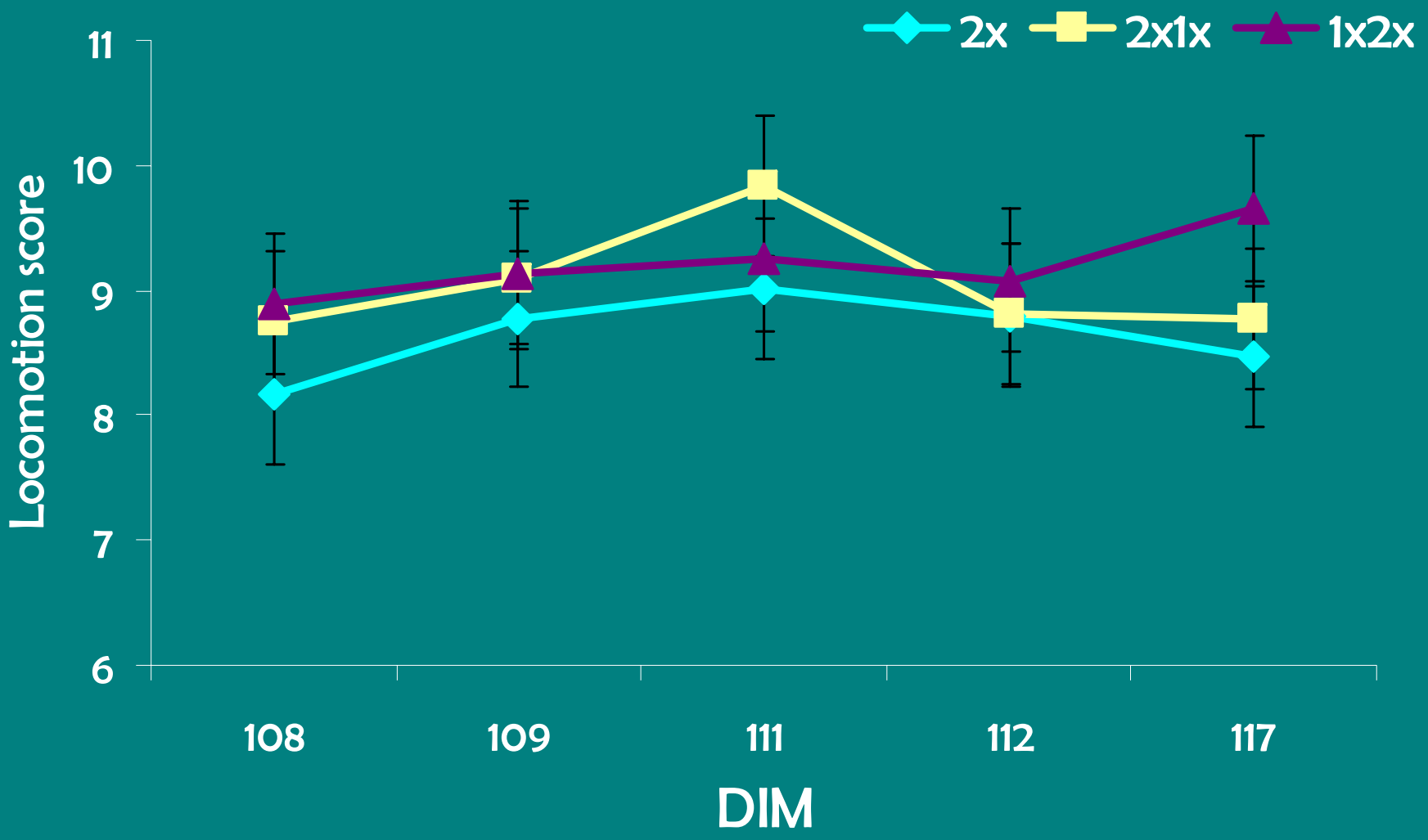
Lying duration on switch days



Lying duration post-switch



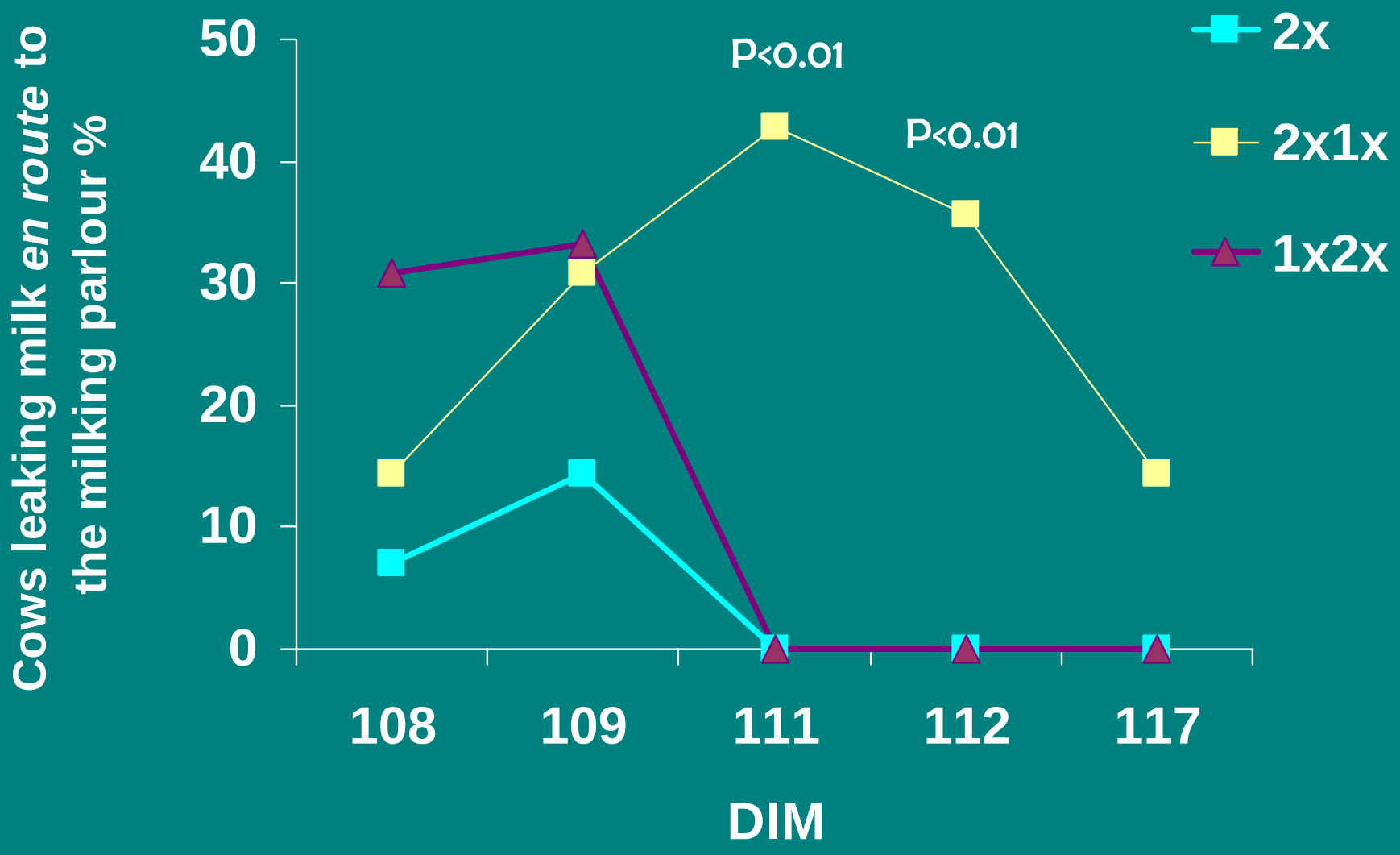
Locomotion score



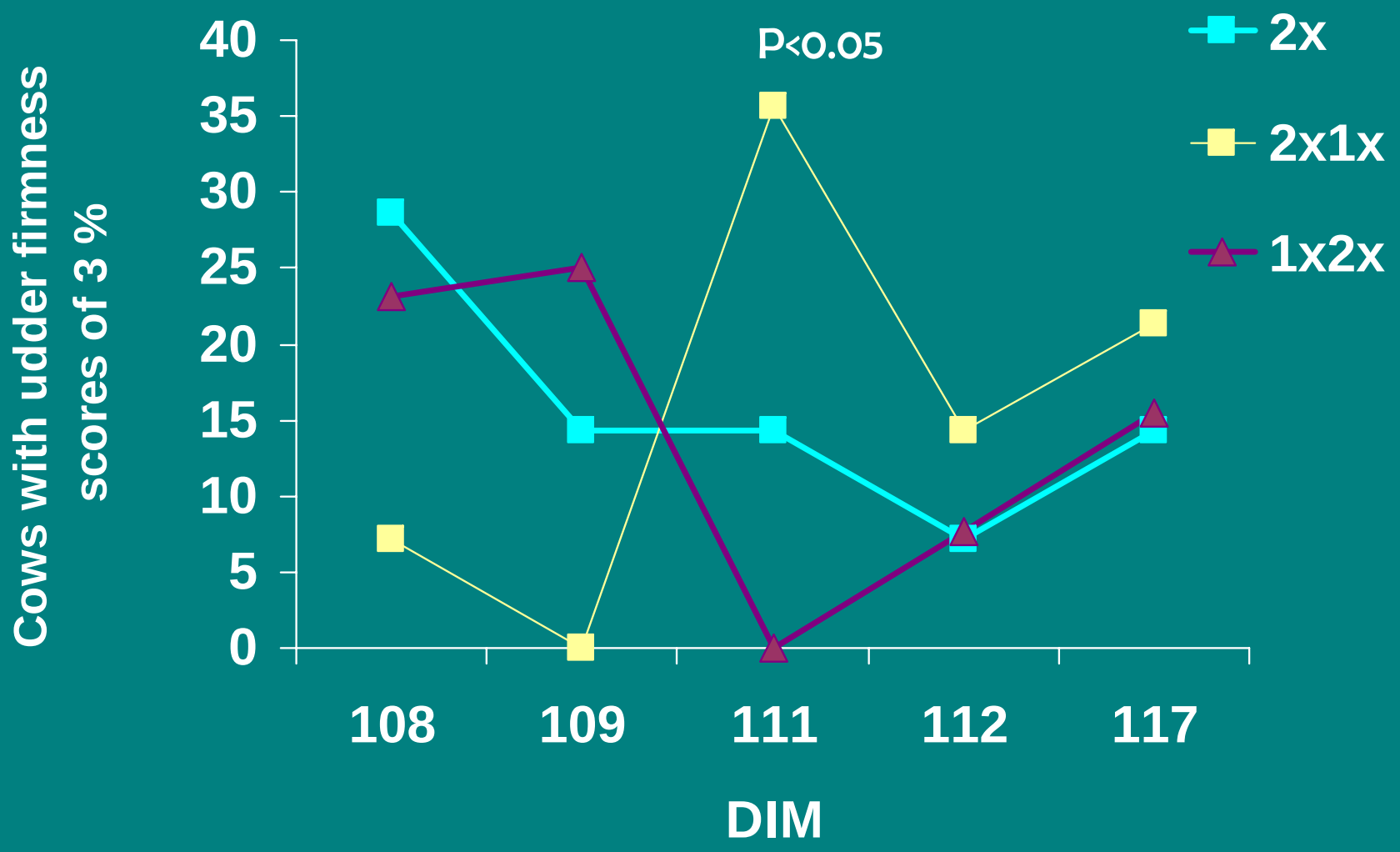
Milk leakage

Treatments	Odds ratio	95% CI	P
2x1x *VS.* 2x	7.5	2.02, 27.49	0.024
1x2x *VS.* 2x	3.3	1.04, 10.71	0.067

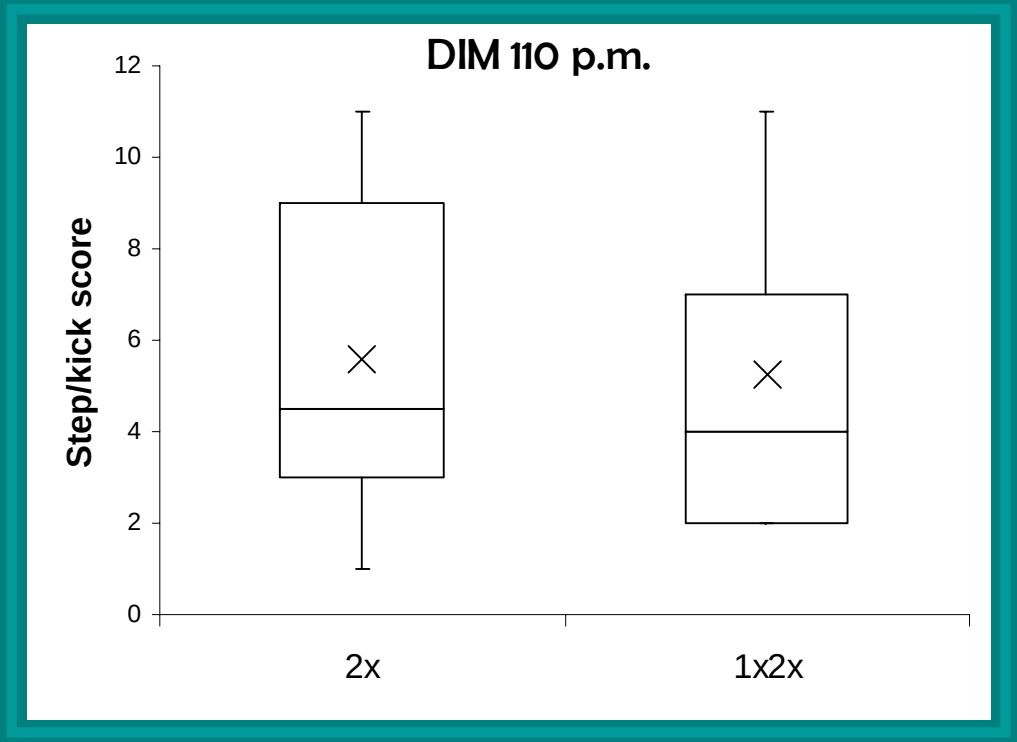
Milk leakage

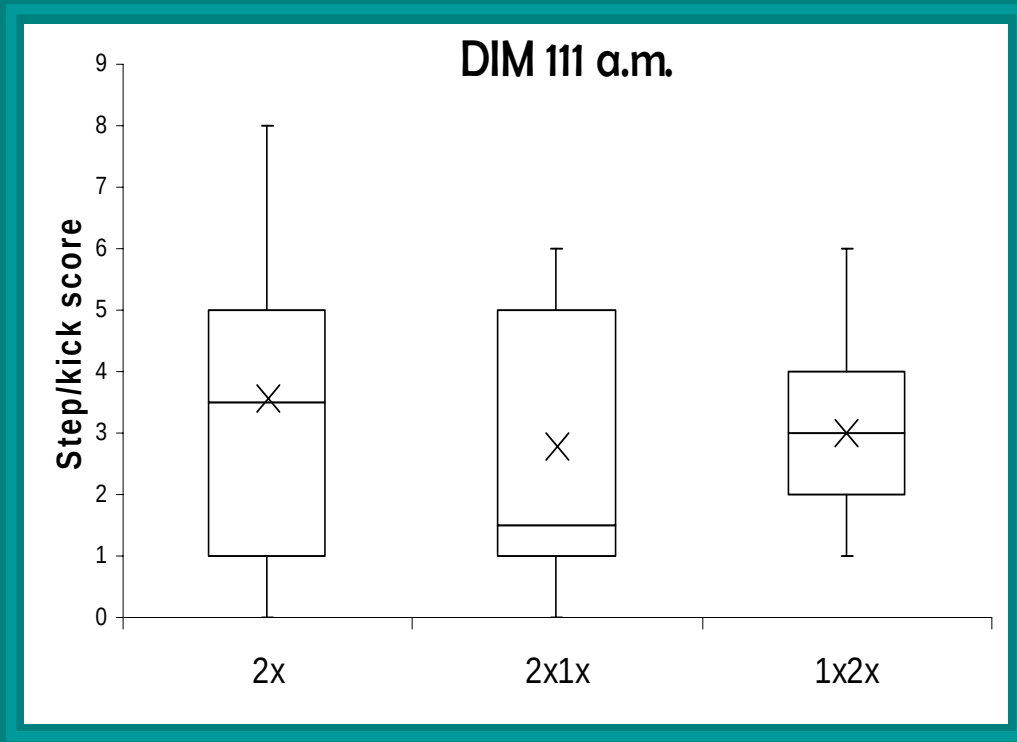


Udder firmness scores



Step/kick behaviour





No effect of switching milking frequency on behaviour in the milking parlour (P>0.05)

Discussion

- 2x1x cows experienced transient udder distension
- Causal factor in the initial reduction in lying time
- However reduction in lying time sustained 1wk later
  - Prolonged discomfort
  - Habituation to TAD milking?
- Cows milked OAD continued to spend longer lying even when switched to TAD milking
- No detrimental effects of switching from once to TAD

Implications of this practice for cow welfare in early lactation must be considered

Conclusions

- Switching from *TAD to OAD* milking at 110 DIM had transient negative welfare implications for dairy cows
- Switching from *OAD to TAD* milking at 110 DIM had no welfare implications for dairy cows