Many factors affect the preference of high-yielding dairy cows for pasture *vs* cubicle housing

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Domestication history

- Since their domestication, cattle have usually spent at least part of the year at **pasture**
- Increasing numbers now being **continuously housed**…
- …although some Scandinavian countries now require cows to spend part of the year at pasture

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But what do the cows prefer?

- But do the cows **prefer** to be at pasture?
- And what **factors** influence their preference?
- A series of experiments have been conducted at Harper Adams over the last 7 years
- This presentation will summarize the results

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1. Preference: indoors *vs* pasture

Indoors ⟵ 48 m Choice point ⟶ 48 m Pasture

Ad libitum

Total Mixed Ration (TMR)

Grass Pasture

1800-3000 kg DM/ha

- Recorded their **initial choice**
- Cows then had **free access** between the two

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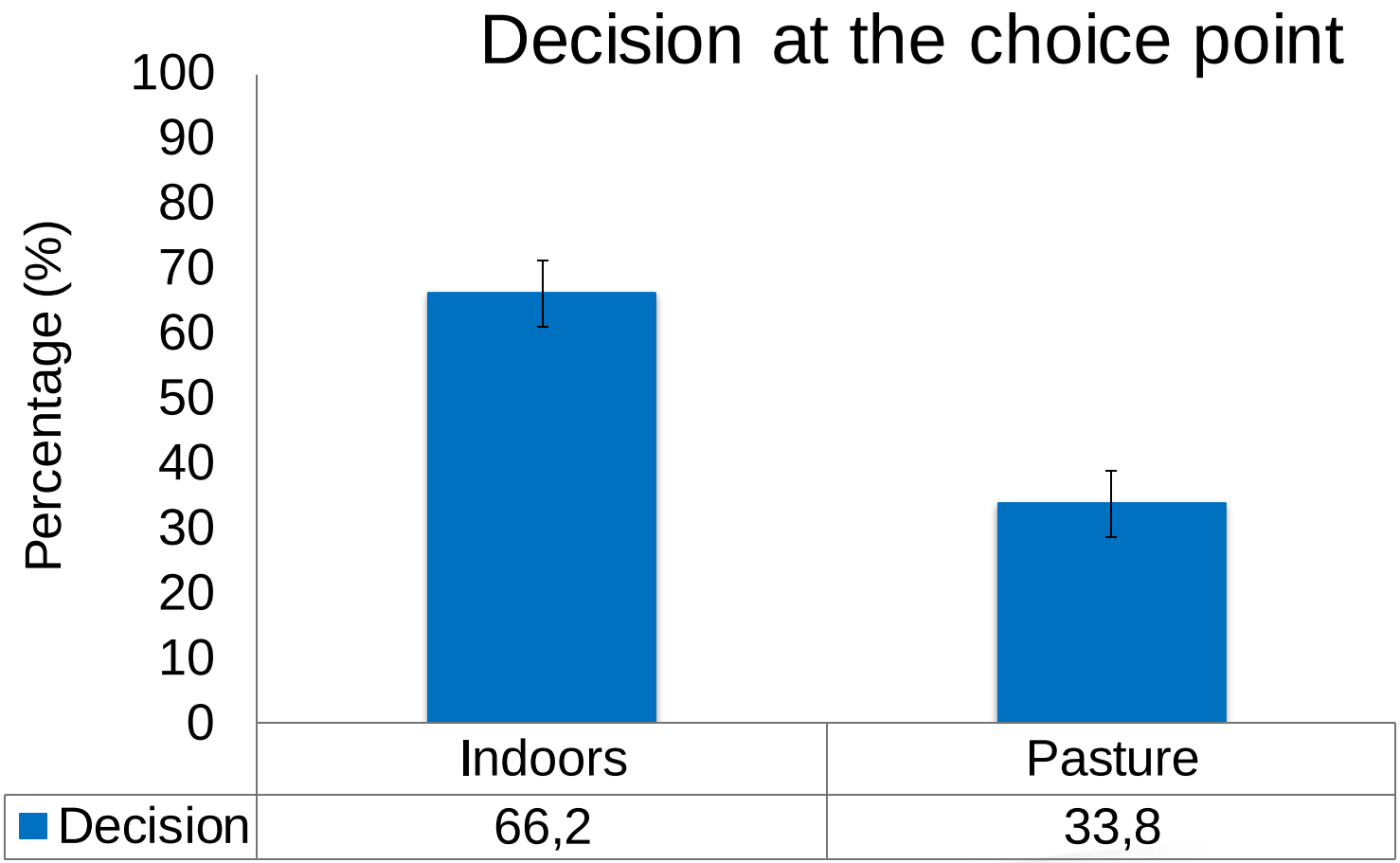
1. Preference: indoors *vs* pasture



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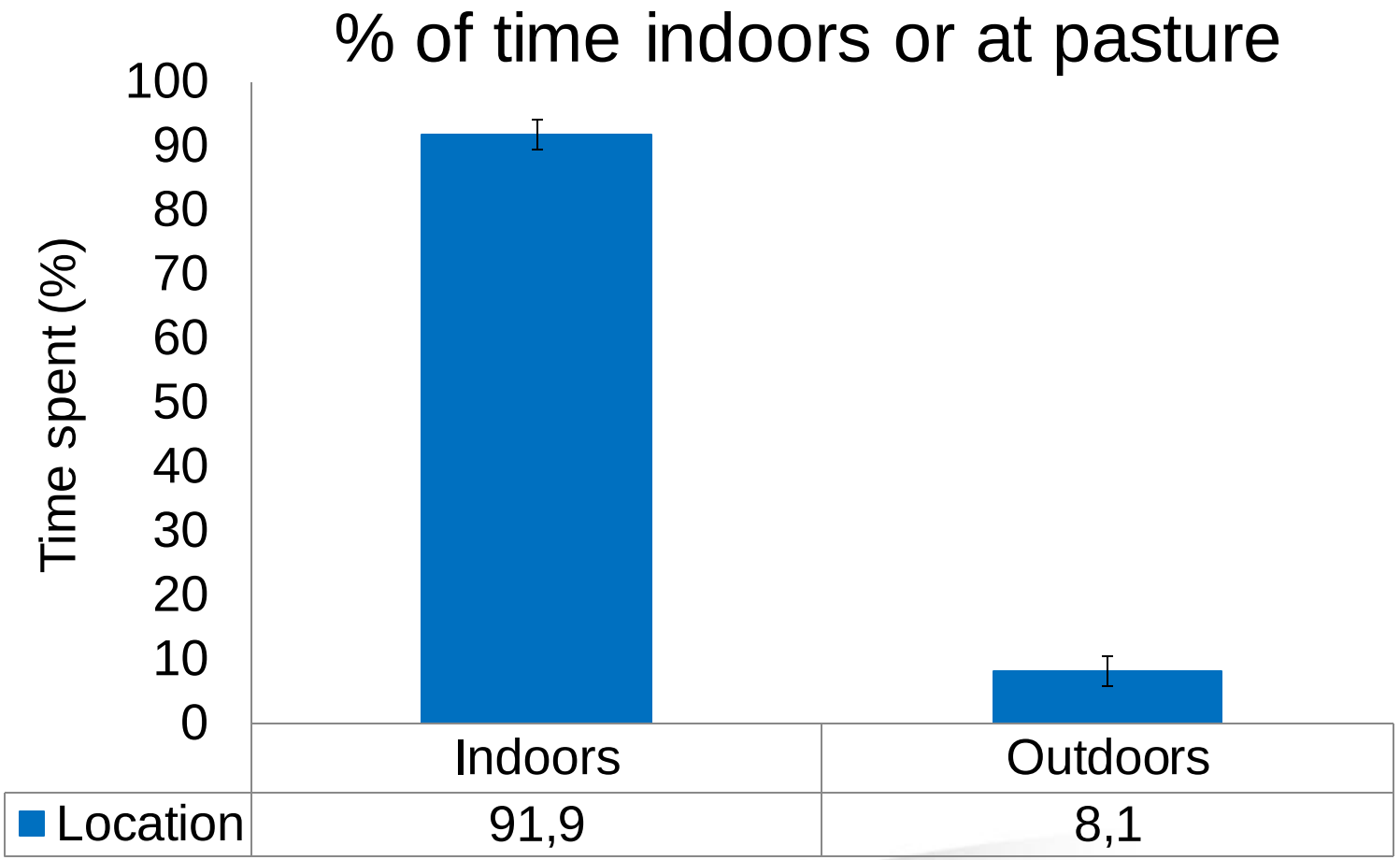
1. Preference: indoors *vs* pasture



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1. Preference: indoors *vs* pasture

- Factors affecting preference:
  - Rainfall - cows spent more time indoors on days when it rained (P=0.015)
  - Milk yield - high yielding cows (>26.9 kg/d) spent more time indoors (P=0.005)
- To our surprise, cows spent the majority of their time **indoors**. Why?

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2. Effects of TMR at pasture

- Does offering **TMR at pasture** affect dairy cow preference for indoors *vs* pasture?

Pasture ← 20 m → 20 m → Indoors

6 cows had TMR
6 cows did not

All cows have TMR

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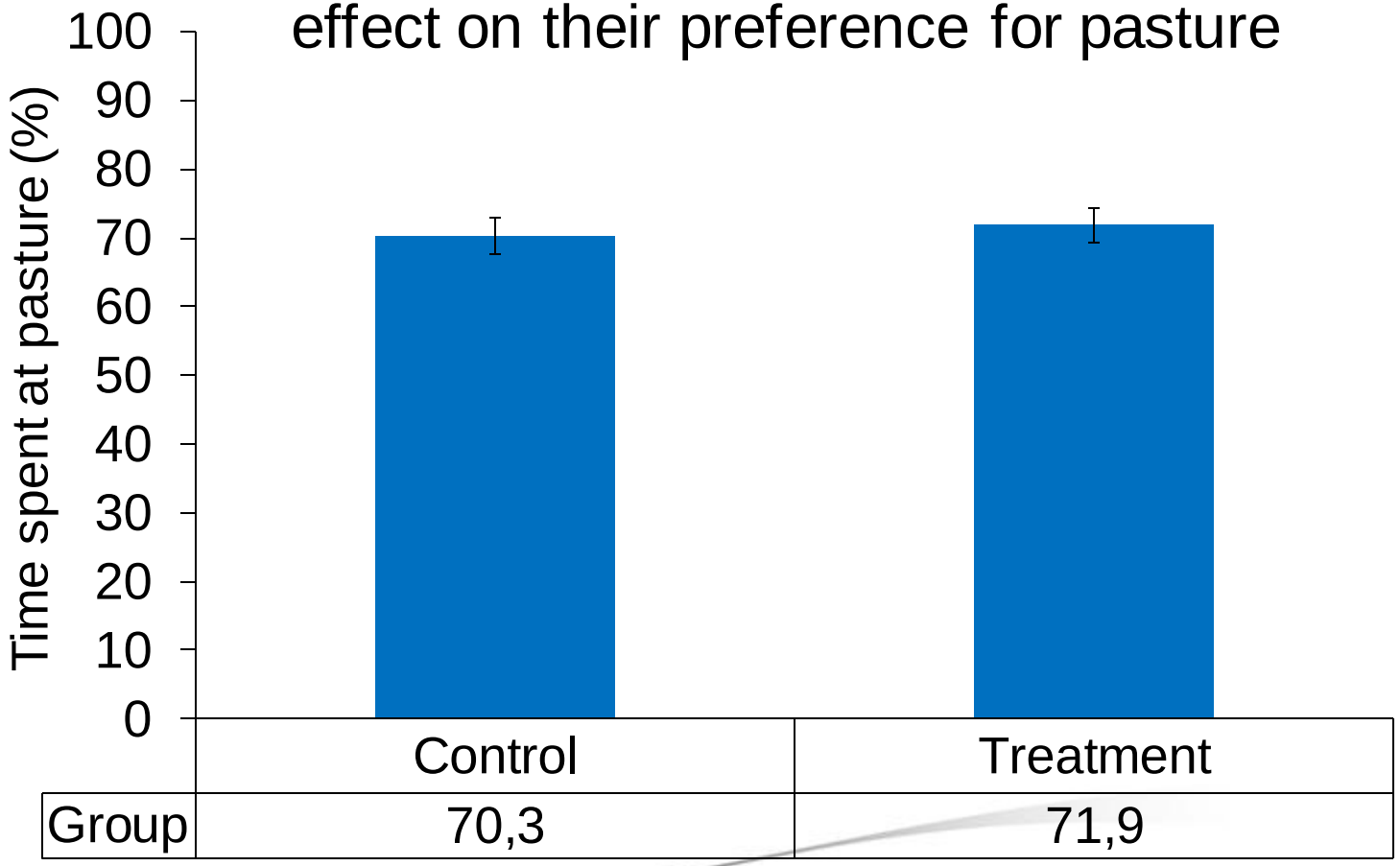
2. Effects of TMR at pasture

Offering TMR at pasture (treatment) had no effect on their preference for pasture



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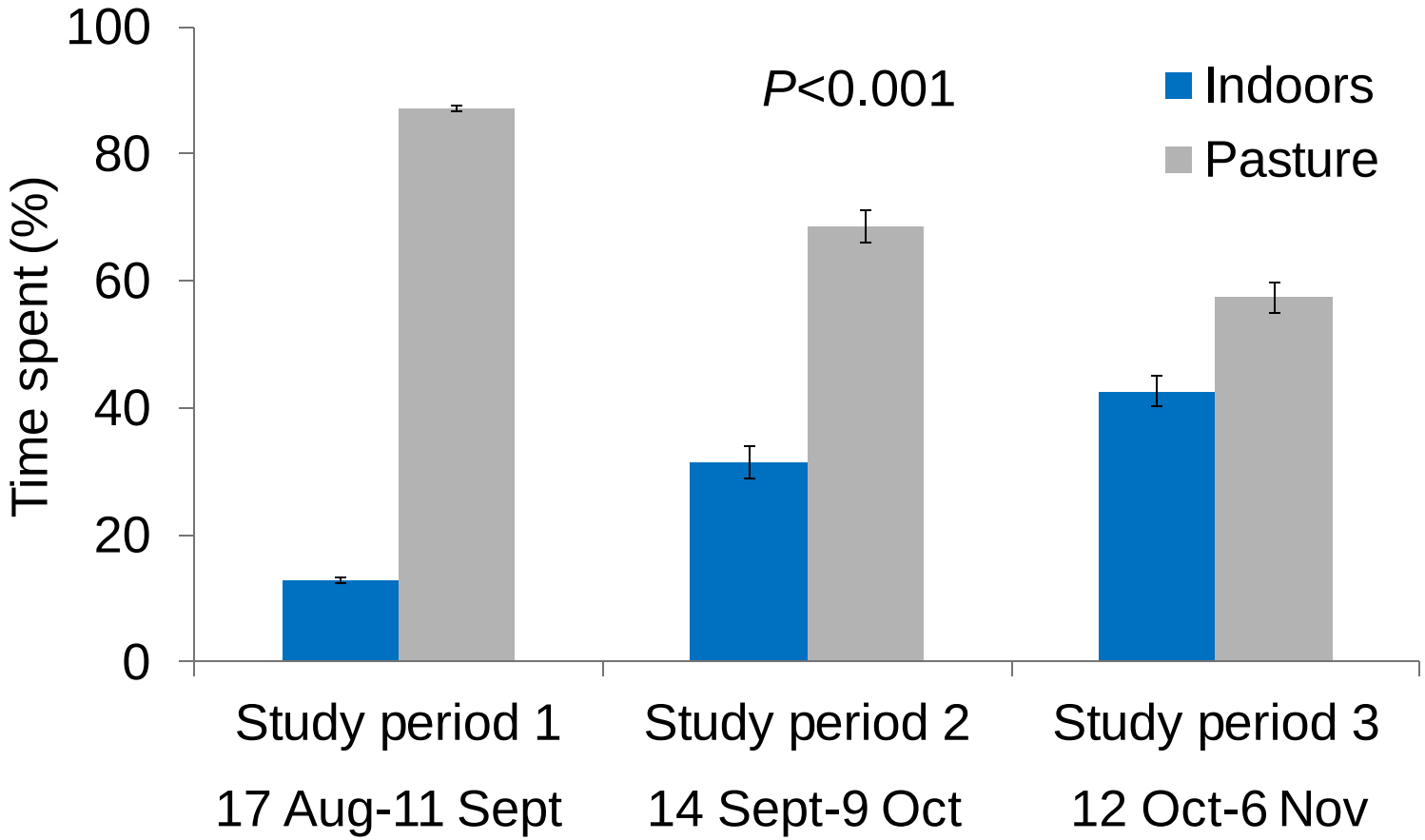
2. Effects of TMR at pasture



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3. Effects of distance to pasture

- How does increasing the **distance** between pasture and indoors affect preference?
- Cows had to walk 60m, 140m or 260m to get to pasture
- This approach also allows us to establish the **motivation** of cows for pasture
- i.e. how hard are they prepared to work

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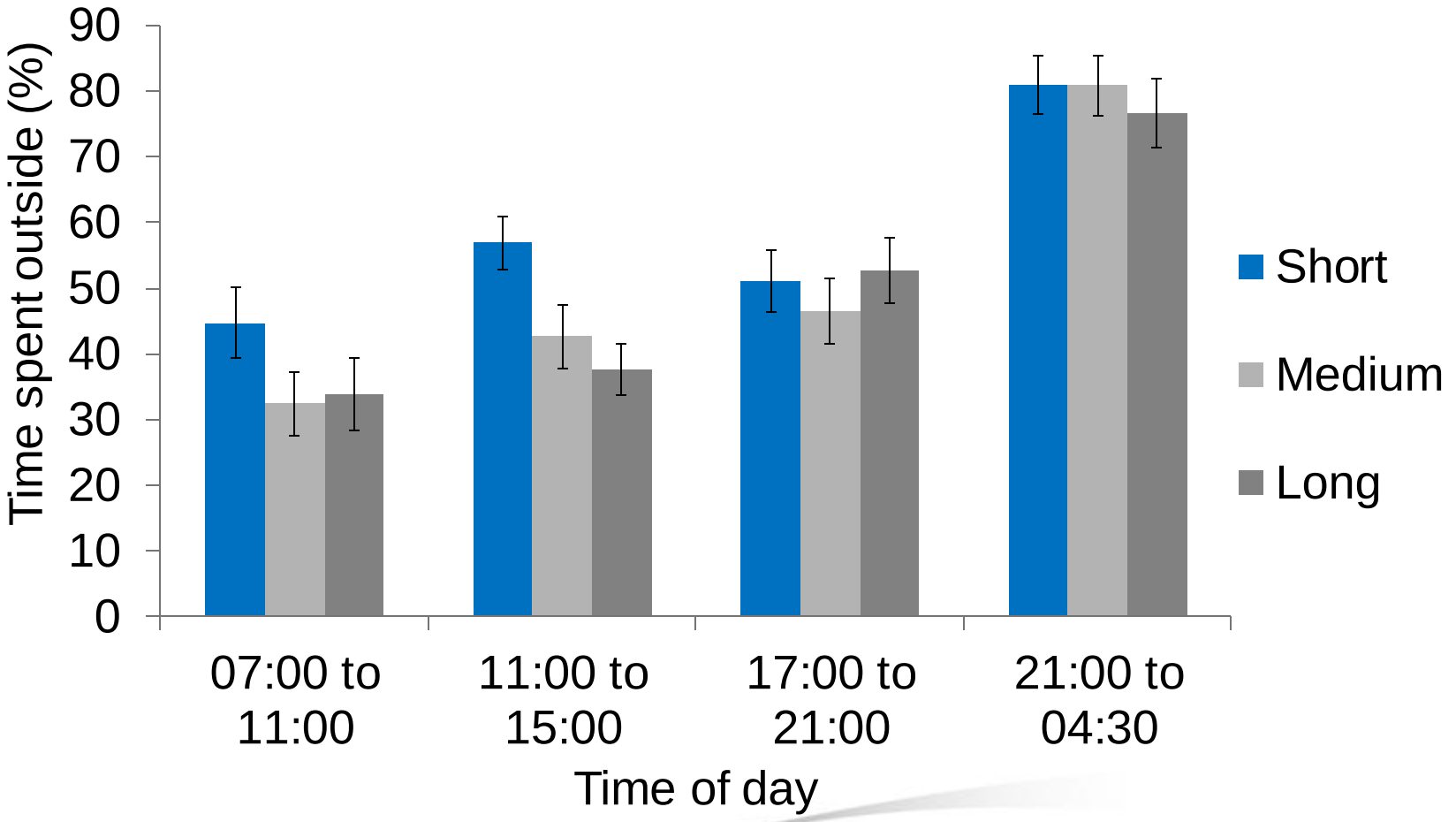
3. Effects of distance to pasture



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4. Effects of herbage availability

- How important is **grazing** to these high-yielding cows?
- The study had two herbage availability levels:
  - High: 3000 ±200 kg DM Ha^{-1}
  - Low: 1800 ±200 kg DM Ha^{-1}
- This study included a continuously-housed control group

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4. Effects of herbage availability

- No effect (P > 0.05) of herbage allowance on time spent at **pasture** or on **TMR consumption**
- Compared to continuously housed cows, those with pasture access:
  - Spent more time **lying** and less time **standing**
  - Ate the same amount of TMR, but ate it more quickly
  - Produced more milk

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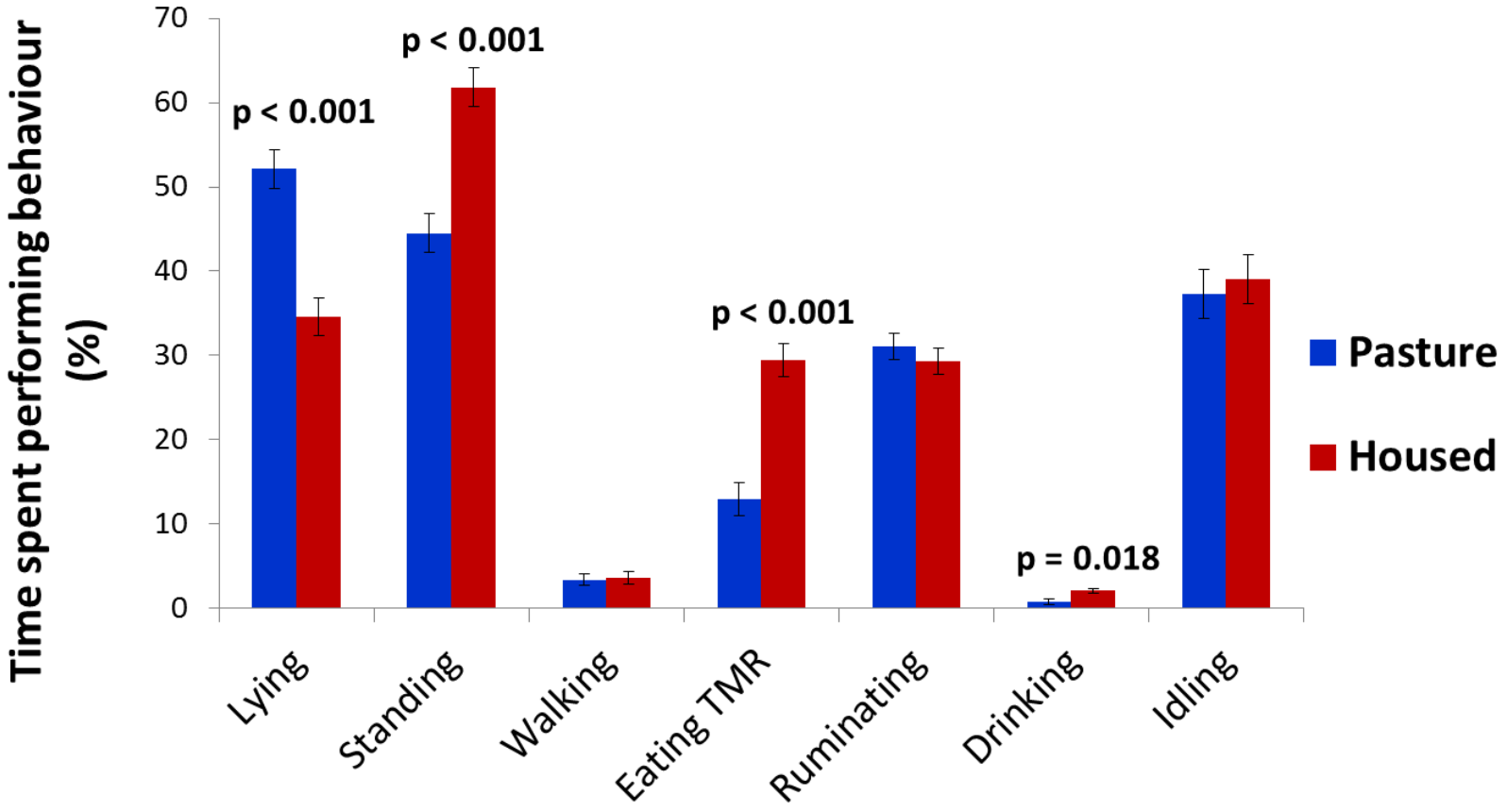
4. Effects of herbage availability



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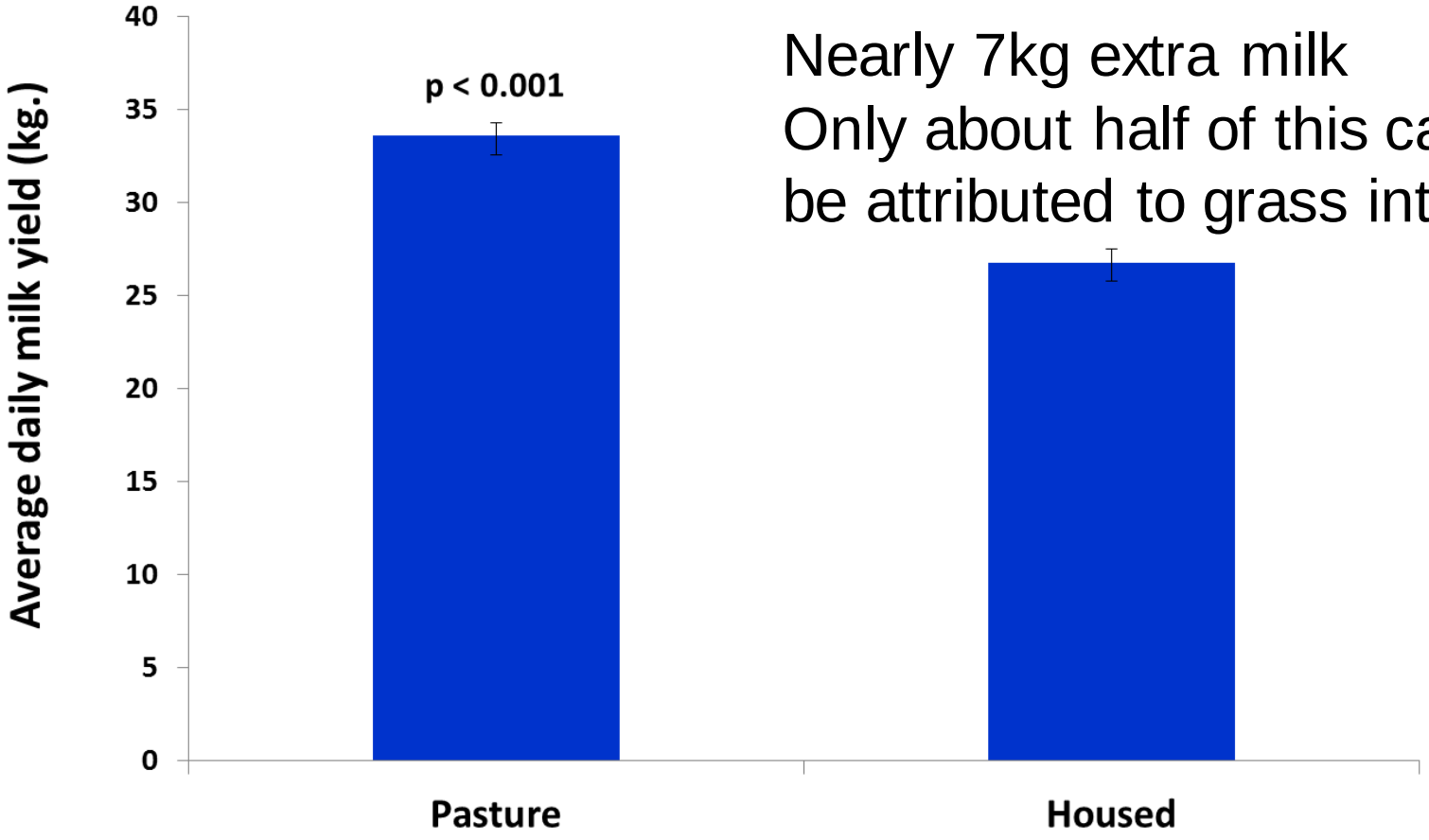
4. Effects of herbage availability



Nearly 7kg extra milk
Only about half of this can be attributed to grass intake

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5. Effects of previous experience

- Holstein Friesian heifers reared in two groups, either:
  - **P**: with **maximum** exposure to pasture
  - **Z**: with **no** exposure to pasture
- Tested their preference (n=24) for pasture at approx. 16 months

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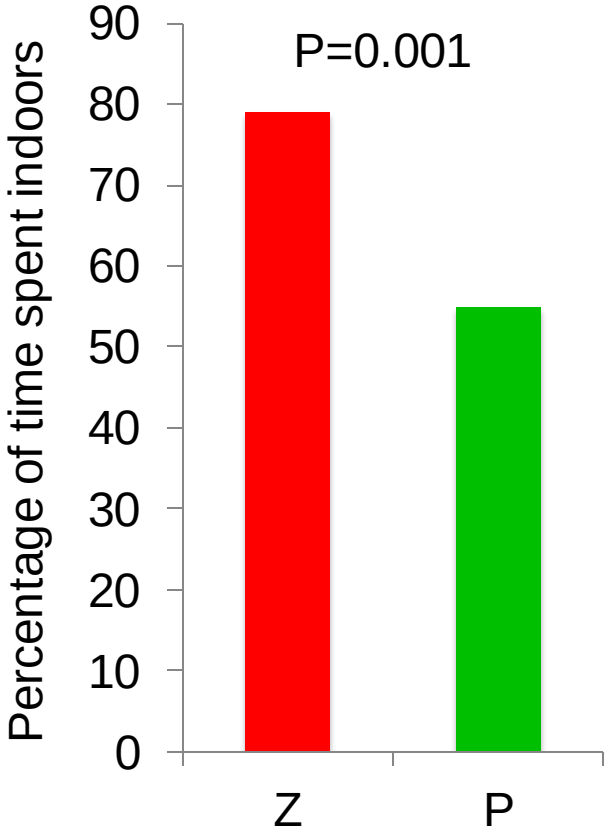
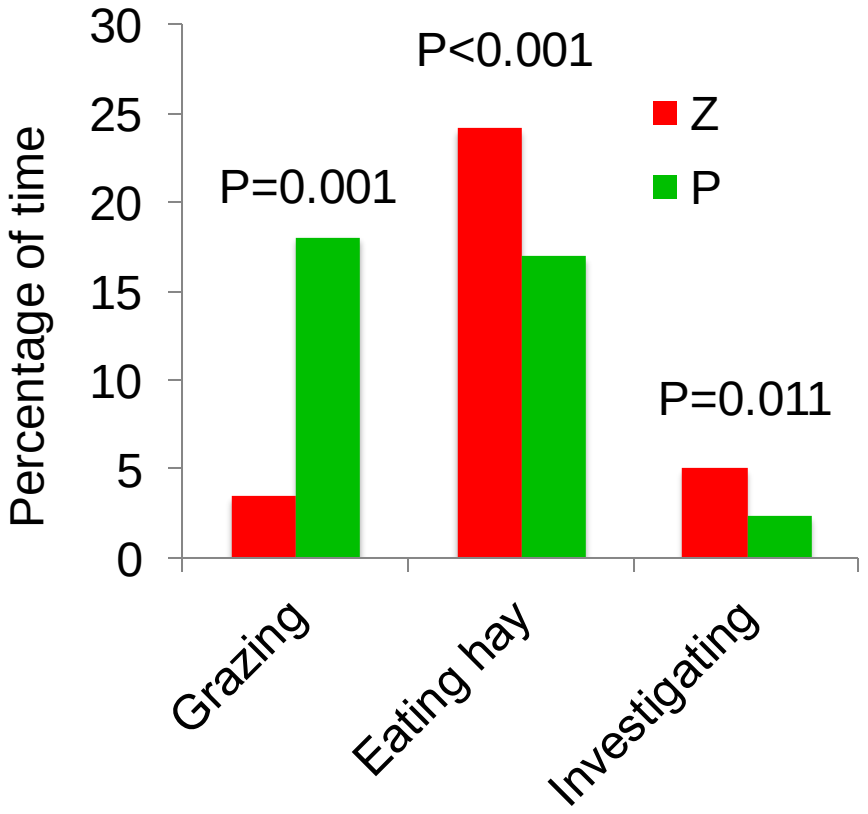
5. Effects of previous experience





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5. Effects of previous experience

- All heifers spent >50% time inside, probably due to wet summer and muddy, uncomfortable field
- Compared with P heifers, Z heifers spent:
  - More time inside
  - Less time grazing
  - More time eating hay
  - More time investigating

} Is grazing innate? Appears to be a learned component

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5b. More previous experience

- The Z heifers then joined the P group
- Meanwhile, a **third group** of heifers continued to be reared without pasture access
- This gave three treatment groups:
  - **P1** first exposed to pasture in their **first** year (P)
  - **P2** first exposed to pasture in their **second** year (Z)
  - **P3** first exposed to pasture in their **third** year *(new!)*
- Tested their preference and observed their behaviour in summer 2013

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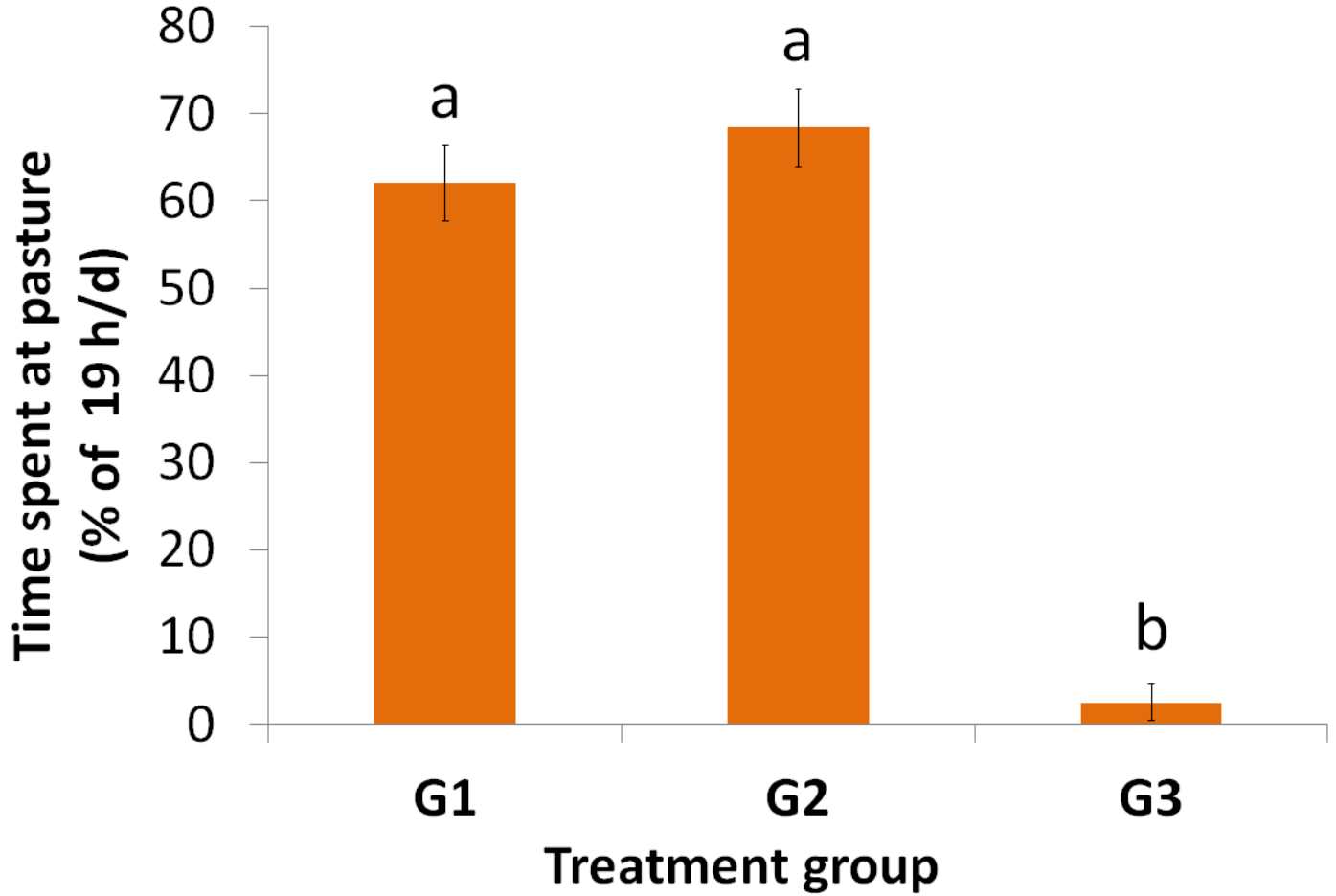
5b. More previous experience



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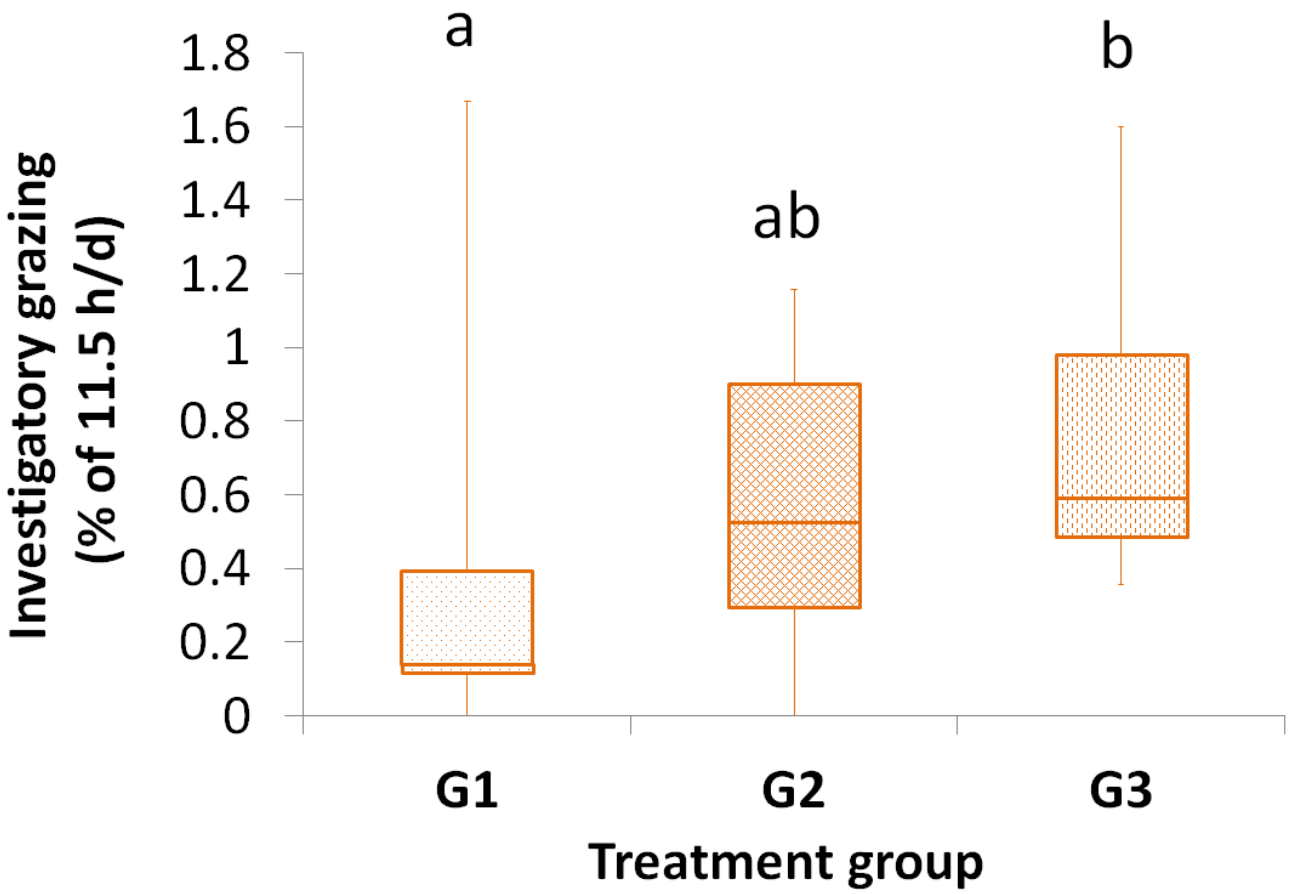

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General conclusions

- **Many factors** affect cow preference for pasture:
  - Cows prefer indoors when it is **wet** and/or **cold**
  - Cows are more motivated for pasture at **night**
  - **Grazing** does not appear to be a major factor influencing the preference of high-yielding cows for pasture
  - Pasture access increases **lying times**, as pasture may be more comfortable than cubicles
  - Pasture access gives **higher milk yields**, possibly due to **increased comfort**
  - **Previous experience** has a big effect on preference for pasture, and grazing appears to be **learned** and not innate

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Towards a Welfare ‘Gold standard’?

- Cows show a **partial preference** for pasture, which means there are times when they prefer to be indoors
- Giving dairy cows **continuous free access** between pasture and housing, although difficult to manage in practice, is likely to give the best welfare outcome

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Funding acknowledgements

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REASEHEATH COLLEGE			DairyCo	
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Thank you and any questions?

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