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INTRODUCTION

- Almost half of Holstein cows experience at least one health disorder early postpartum, which can be a risk factor for infertility as evidenced in cows subjected to synchronization protocols¹
- Detecting cows in estrus is a challenge², and the adoption of automated activity monitors (AAM) for estrus detection is increasing³. Quantifying the impacts of health disorders on expression and detection of estrus will allow refinement of reproductive management

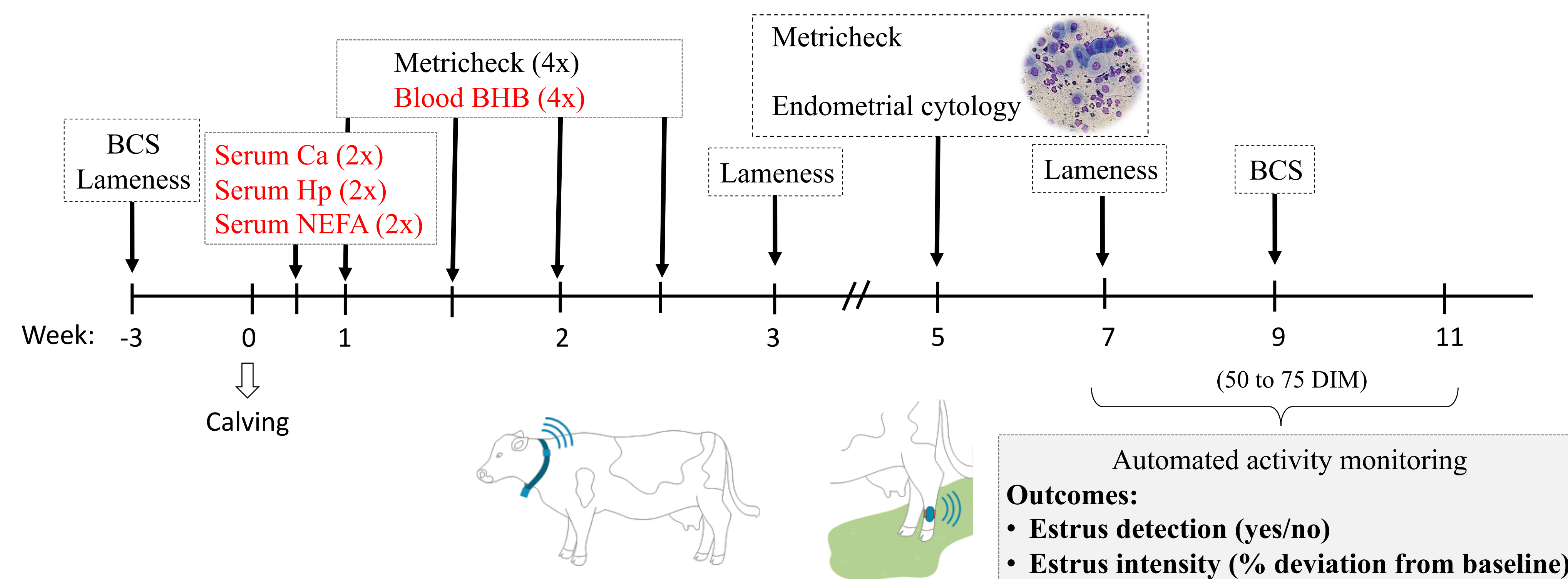
OBJECTIVE

To investigate associations between postpartum health and detection of spontaneous estrus between 50 and 75 d in milk by AAM in dairy cows

MATERIALS AND METHODS

- Ongoing prospective observational study in 2 commercial dairy herds in Ontario
- Holstein cows (n = 876) were examined between May 2019 and Oct 2020, as part of a larger study that will enroll 1,300 cows
- Breeding program based on estrus detection by activity monitors [AfiAct (Afimilk, Kibbutz Afikim, Israel) or Lely (SCR Engineers Ltd., Netanya, Israel)] with no hormonal interventions until ~75 DIM

Summary of data collection



- Metabolites were categorized based on ROC curve cutpoints associated with purulent vaginal discharge at wk 5 (Ca: 2.1 mmol/L; Haptoglobin: 1.0 g/L; NEFA: 0.7 mmol/L; BHB: 1.3 mmol/L)
- Metritis was defined as brown, watery, foul-smelling discharge with or without fever, and cytological endometritis as $\geq 6\%$ polymorphonuclear cells in cytology
- Detection of estrus was analyzed with multivariable logistic regression including variables previously tested in univariable models with $P \leq 0.15$ and herd as a random effect
- Estrus intensity data from one herd (n = 211 events) were similarly analyzed with linear regression

RESULTS

- 72% of cows were detected in estrus by 75 DIM
- 63% of cows (77% primi and 54% multiparous; $P = 0.01$) were detected in estrus between 50 and 75 DIM

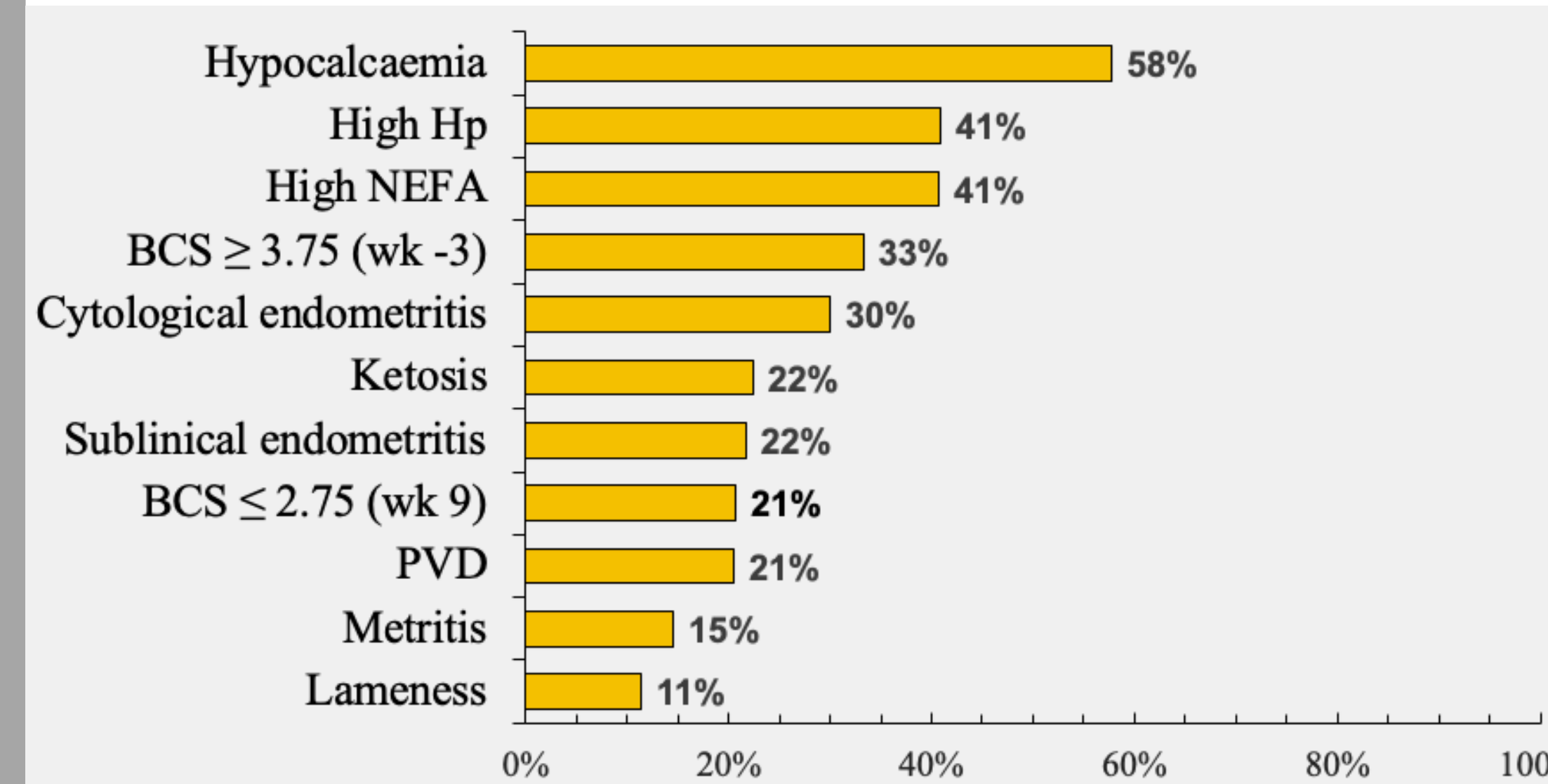


Figure 1. Incidence (%) of postpartum health disorders observed

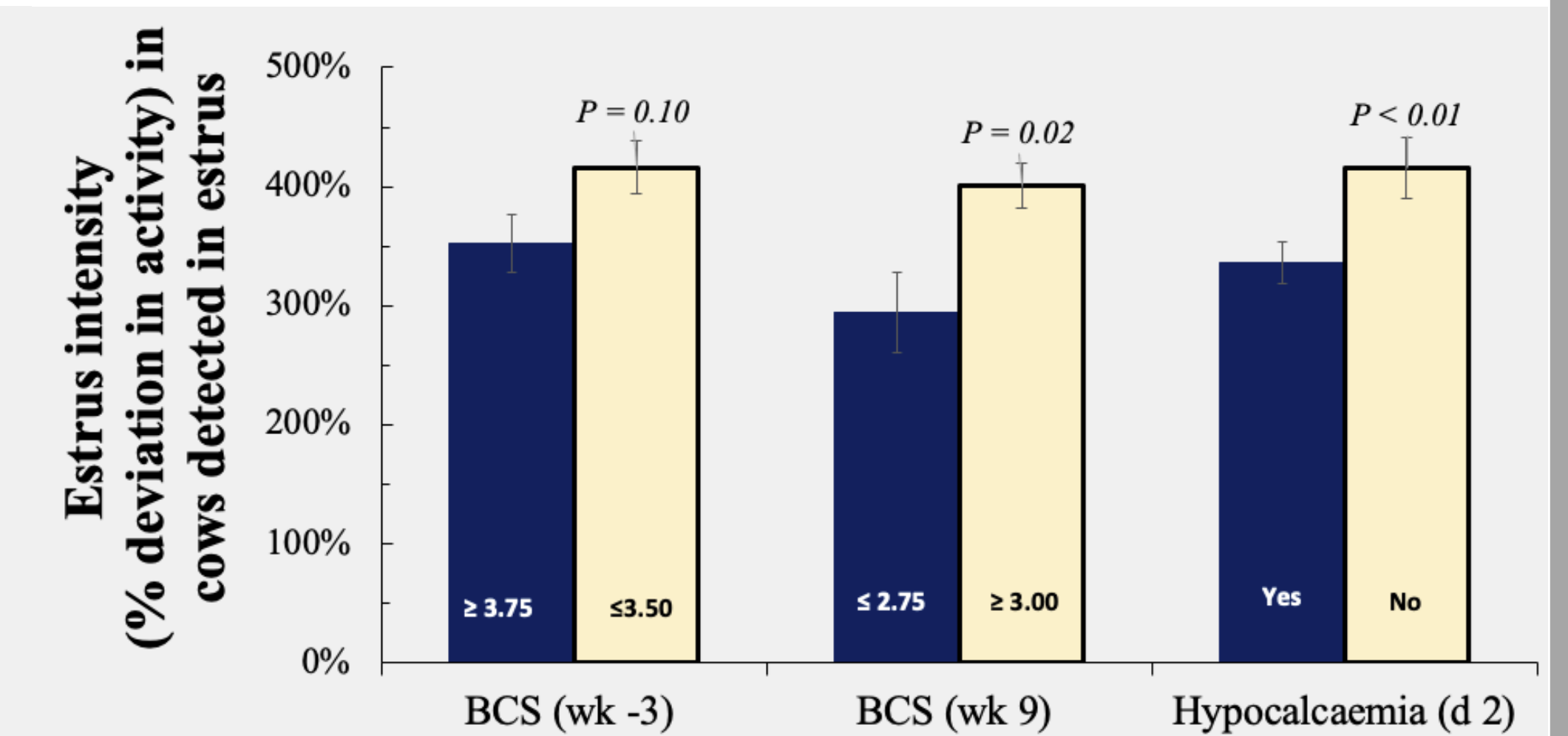


Figure 2. Estrus intensity (% deviation of activity) in cows detected in estrus in 1 herd (n = 211)

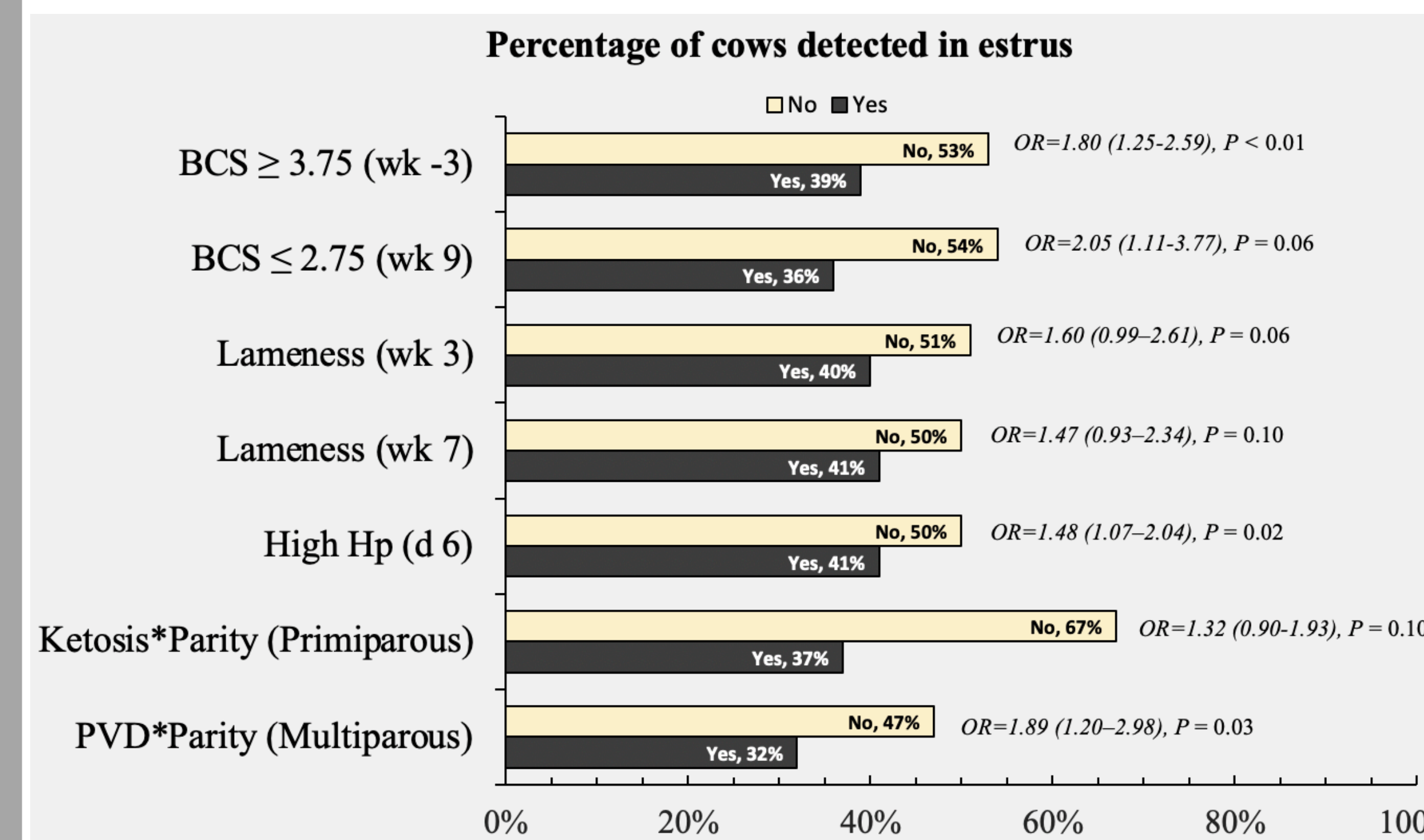


Figure 3. Odds ratio of estrus detection in cows with (yes) vs. without (no) risk factors (n = 823)

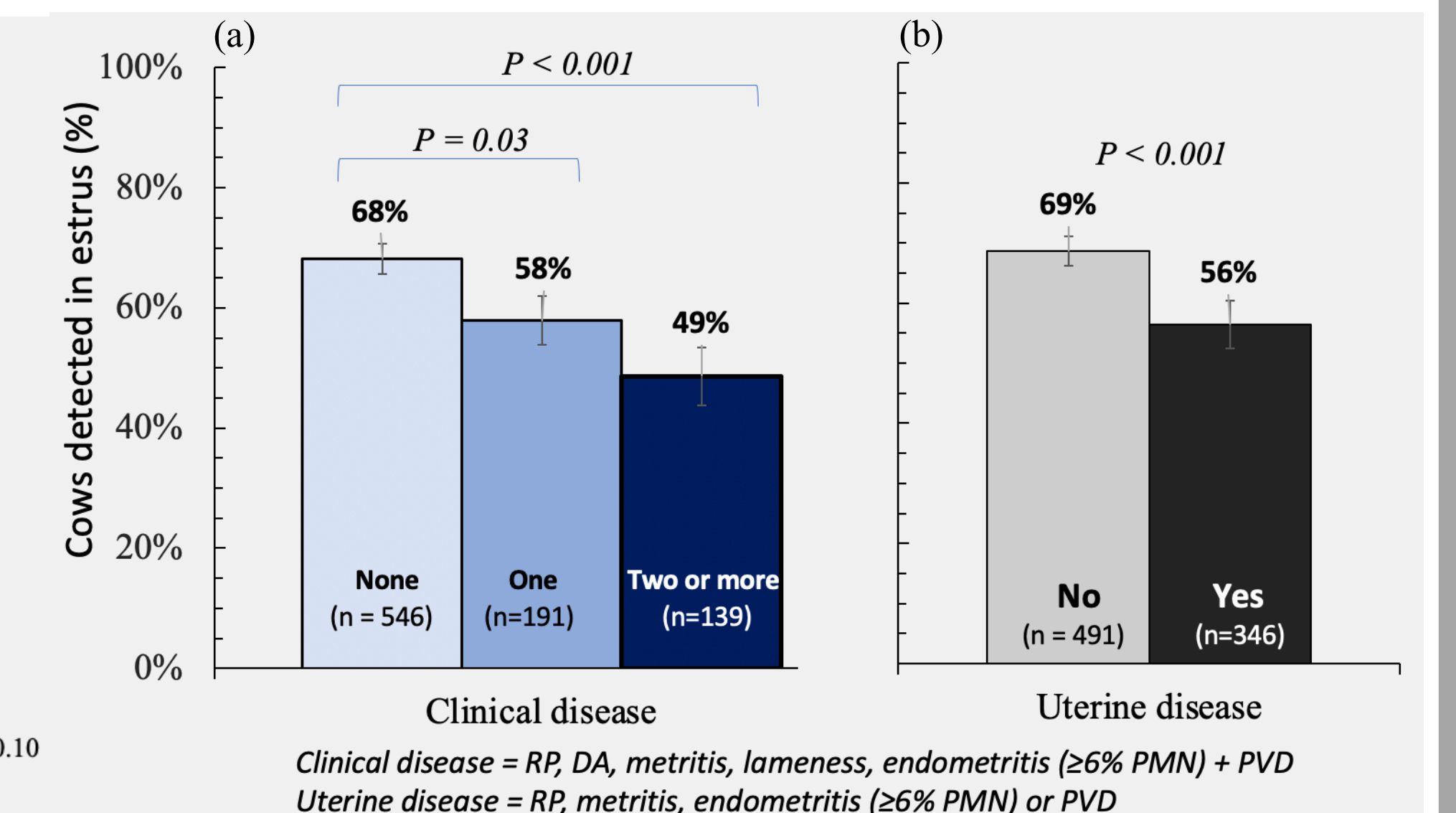


Figure 4. Percentage of cows detected in estrus according to the occurrence of clinical (panel a) or uterine (panel b) disease

CONCLUSIONS

- Risk factors associated with reduced odds of estrus detection were **systemic inflammation** (high Hp), **ketosis** (for primiparous cows), **purulent vaginal discharge** at wk 5 (for multiparous cows), **lameness**, **high BCS prepartum** and **low BCS** during the breeding period
- Among cows detected in estrus, **estrus intensity** was reduced in those that experienced **hypocalcaemia** and those with **high BCS prepartum** and **low BCS** during the breeding period
- Identifying cows that are more or less likely to be detected in estrus will allow refinement of reproductive management decisions**

References:

- ¹Santos et al., 2010 Soc. Reprod. Fertil. Suppl. 67:387-403
²Lopez et al., 2004 Anim. Reprod. Sci. 81:209-223; ³Denis-Robichaud et al., 2016 JDS 99:9339-51