

Effect of season on fertility of dairy cows in four US regions

P. Pinedo¹, J. Santos², G. Schuenemann³, R. Bicalho⁴, R. Chebel², K. Galvao², R. Gilbert^{4,8}, S. Rodriguez-Zas⁵, G. Rosa⁶, C. Seabury⁷, W. Thatcher²

Colorado State University, Fort Collins CO, USA¹, University of Florida, Gainesville, FL, USA², The Ohio State University, Columbus, OH, USA³, Cornell University, Ithaca, NY, USA⁴, University of Illinois, Urbana-Champaign, IL, USA⁵, University of Wisconsin, Madison, WI, USA⁶, Texas A&M University, College Station, TX, USA⁷ Ross University, St. Kitts, West Indies⁸

INTRODUCTION

In dairy cows, severe environmental conditions, such as heat stress during late gestation and early lactation, have been related to reduced subsequent milk yield and reproductive performance.

Although these associations are supported by previous research, studies comparing the effect of season in multiple US regions are scarce.

OVERALL OBJECTIVE

To analyze the association among season of calving and multiple indicators of fertility in multiple farms located in 4 US regions.

MATERIAL & METHODS

Variables in analysis:

- **Resumption of ovarian cyclicity (ROC):** Transrectal ultrasonography at **40±3 and 54±3 DIM**
- **Pregnancy:** Ultrasonography on **d 32±3** after AI and reconfirmed at **d 60±3**
- **Pregnancy loss:** **d 32 vs. d 60** after AI

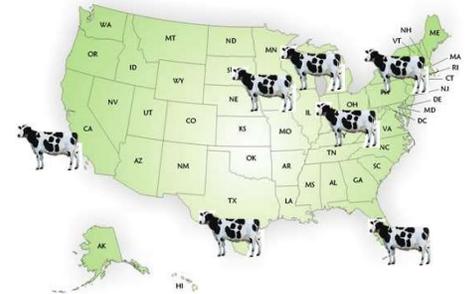
Statistical analysis:

- Multivariate logistic regression was used for testing potential associations between season of calving, region and their interaction with multiple reproductive variables, including ROC, pregnancy and pregnancy loss at first and second AI.
- Parity and season were included as fixed effects, and farm as random effect in the models.

MATERIAL & METHODS

Study Population: A total of 11,733 cows calving in 16 farms located in 4 regions. Northeast [4 herds], Midwest [6 herds], Southeast [1 herd], and the Southwest [5 herds].

Procedures: Cows were enrolled at parturition and monitored weekly for multiple reproductive events, disease occurrence, and survival.



RESULTS

Figure 1: Frequencies (%) of reproductive events by season of calving

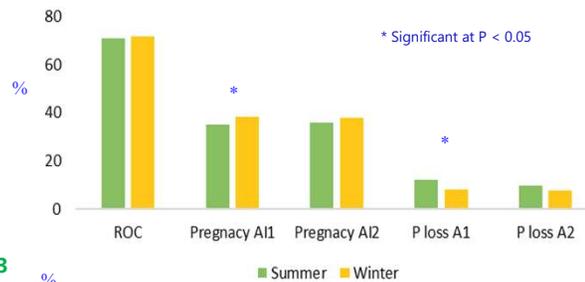


Figure 3: Frequencies (%) of reproductive events by US region and season

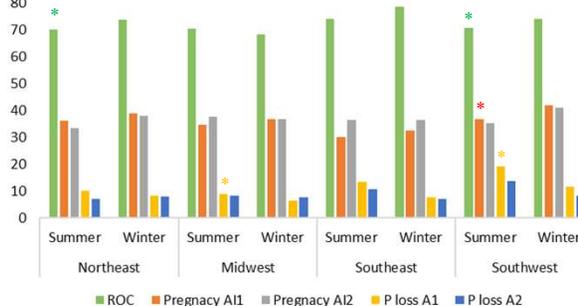
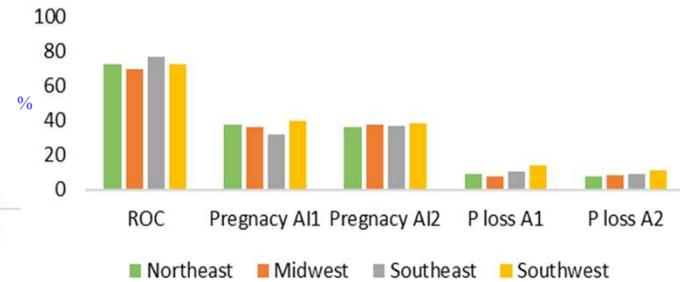


Figure 2: Overall frequencies: ROC 71.5%, PAI1 36.7%, PAI2 37.0%, PLAI1 10.0%, PLAI2 8.7%

Figure 2: Frequencies (%) of reproductive events by US region



CONCLUSIONS

Season of calving had an effect on cyclicity, pregnancy, and pregnancy loss.

This effect depended on the geographic region. In general, the effect of season of calving was more evident in the Southwest.

As manifest in pregnancy and pregnancy loss at second AI, the magnitude of the effect of season of calving decreased as the lactation progressed.

