



## INTRODUCTION

- Infection and inflammation trigger cytokines and chemokines to produce and release leukocytes from bone marrow
- Neutrophils are the first line of defense against invading pathogens and their differentiation is stimulated by granulocyte colony-stimulating factor (G-CSF)
- Injection of pegylated recombinant bovine G-CSF (pegbovigrastim) increases neutrophil count and function and decreases the incidence of clinical mastitis in the first 30 DIM

## MATERIALS AND METHODS

- 34 Holstein cows were administered 2.7 mL of either physiological saline (n=16) or pegbovigrastim (Imrestor, Elanco; n=18) according to its label, 7 d before anticipated calving date and again within 24 h after calving
- Complete blood count was assessed in samples throughout the study period (**Figure 1**)
- Neutrophil counts were  $\log_{10}$  transformed and compared using mixed linear regression

## RESULTS

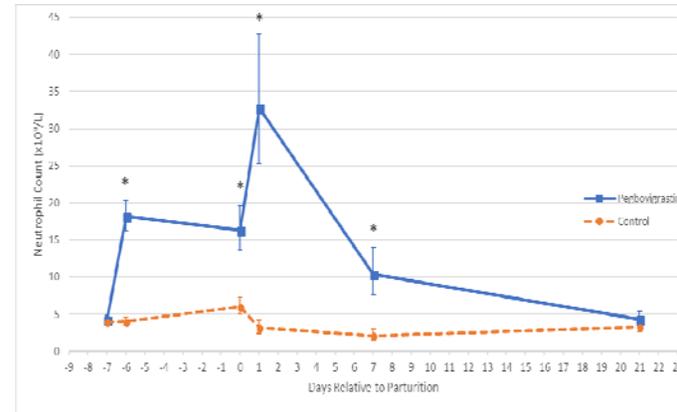
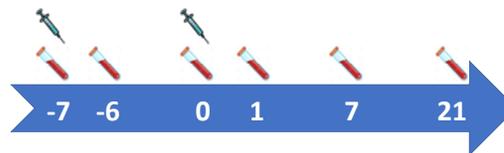


Figure 2: Back-transformed estimates and 95% confidence intervals of circulating neutrophil count for cows treated with pegbovigrastim (n=18) (solid line) or saline (n=16) (dashed line) at d -7 and d 0. \* indicate significant differences (P < 0.05) between groups

- Neutrophil count was affected by treatment\*time and different (P < 0.05) at d -6, 0, 1, and 7 (**Figure 2**)
- Control cows had 100% segmented neutrophils; whereas treated cows had an average of 5% (range of 1.3 – 9.6%) band cells

## OBJECTIVE

To characterize the response of each treatment of pegbovigrastim on neutrophil counts in peripheral circulation, when administered 7 days before anticipated calving and within 24 hours after calving



injection of physiological saline or pegbovigrastim

collection of blood sample from coccygeal vessels for complete blood count differential

Figure 1: Timeline representing blood sample collection and injections of pegbovigrastim (n=18) or physiological saline (n=16) relative to calving

## SUMMARY

- Injection of pegbovigrastim one week prior to, and soon after, calving triggers a rapid increase in circulating neutrophil count
- An additive increase follows the second injection at the time of calving
- Most (~95%) additional neutrophils in circulation after treatment were mature segmented cells, indicating that the storage pool of neutrophils is not depleted by the effect of the first injection of pegbovigrastim

## CONCLUSIONS

- Injection of pegbovigrastim substantially increases the number of mature neutrophils available for immune response in dairy cattle during the transition period
  - Additional trials are required to confirm its effects on the risk of reproductive and infectious disease