Exposure to bacterial toxin in utero alters pre-weaning growth performance, and metabolic and immune response of calves

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Introduction

- In other species (rats, birds), immune challenge of the dam during gestation improves immune response in offspring
  - No data in livestock species

Methods

- Pregnant crossbred cows (n = 50) were randomly assigned to 1 of 2 treatments based on expected calving date
  - Saline administered subcutaneously (**CONTROL**)
  - 0.1 µg/kg BW of bacterial toxin administered subcutaneously (**Bacteria**)
- Cows were administered Bacteria or saline in late gestation
- Cows were managed as a single herd on bahiagrass pasture until weaning

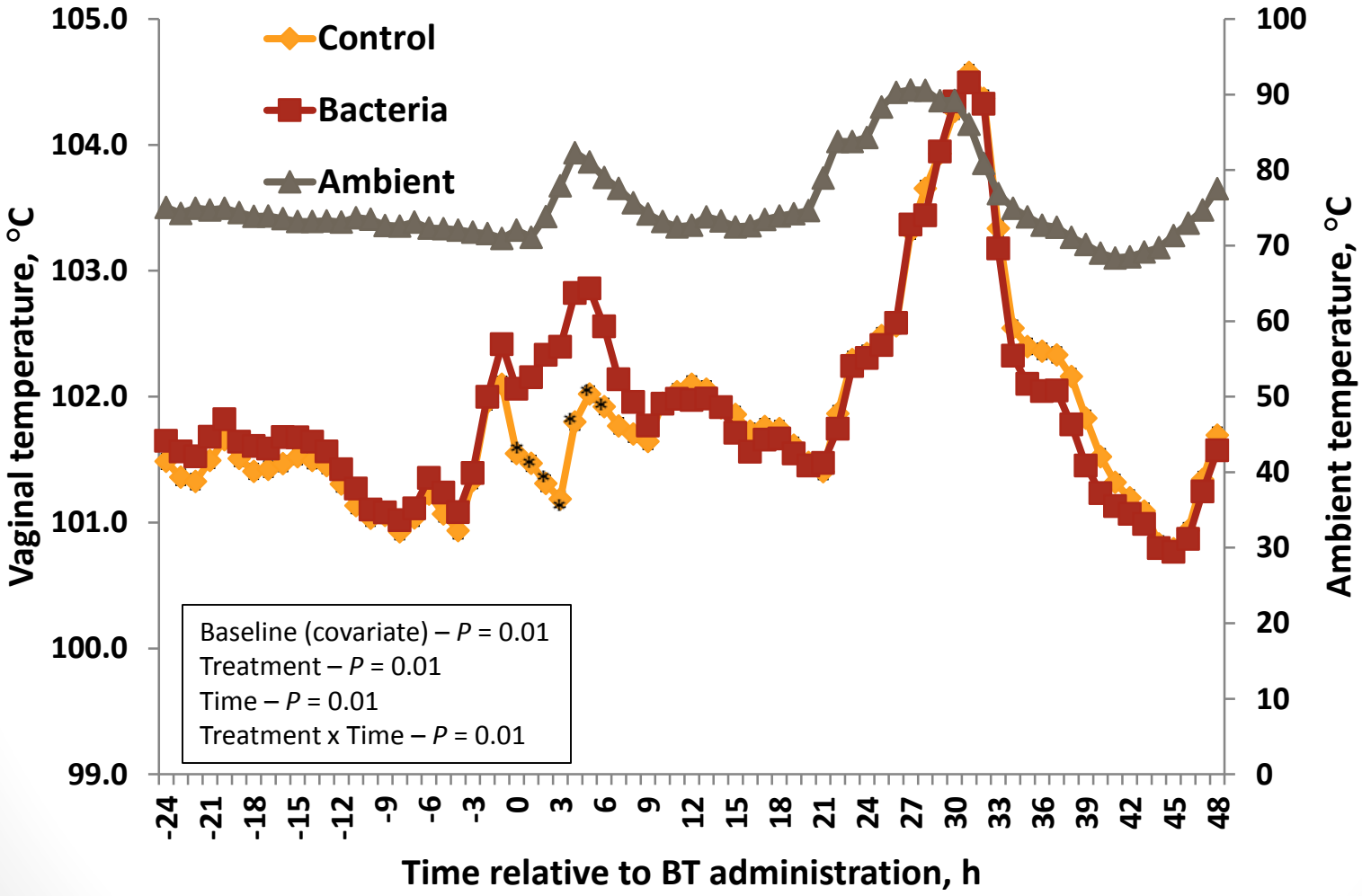
Methods

- 12 heifer calves from each treatment were challenged with same bacterial toxin following weaning

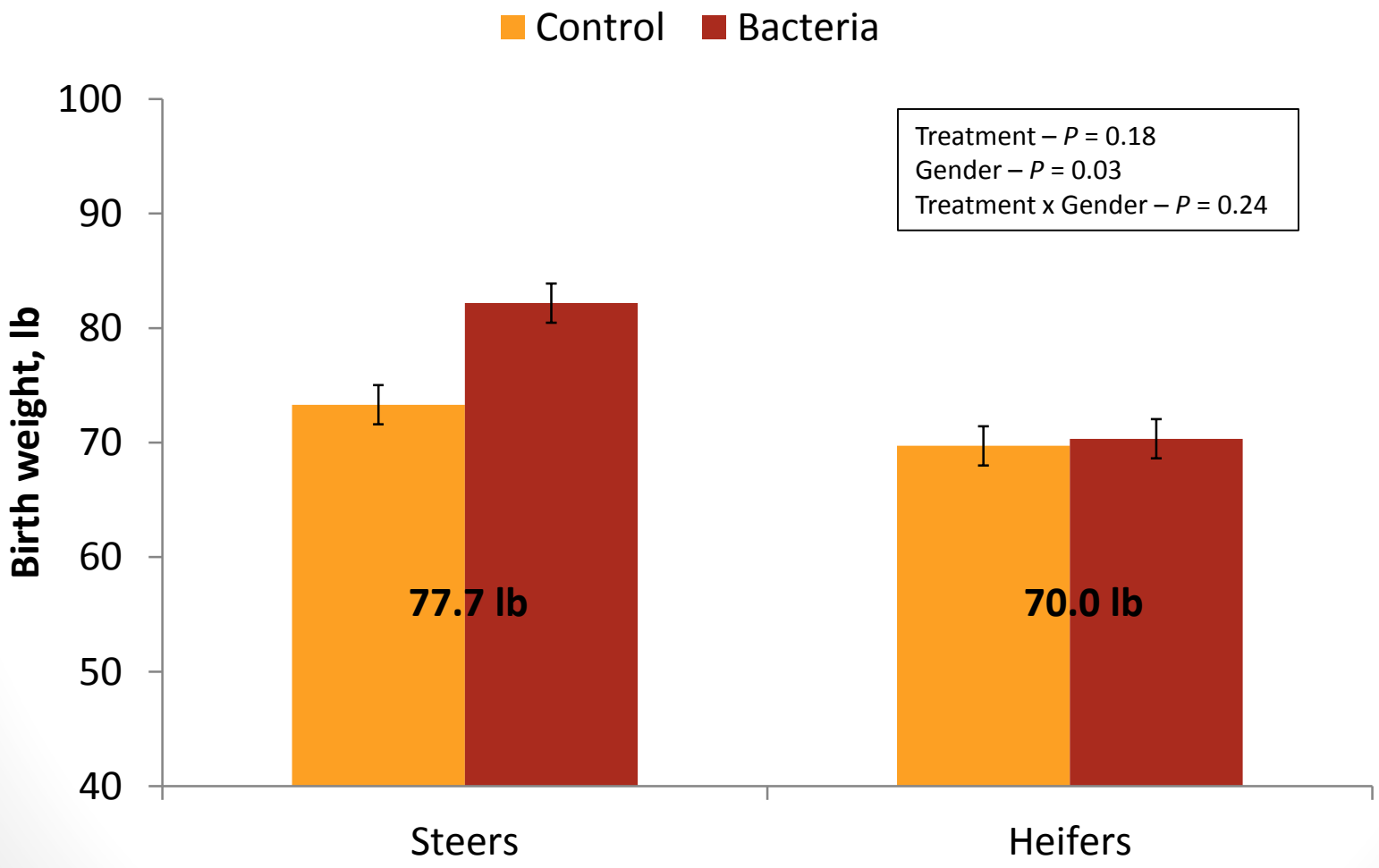
- Blood samples were collected to determine changes in metabolic and immune parameters

Results

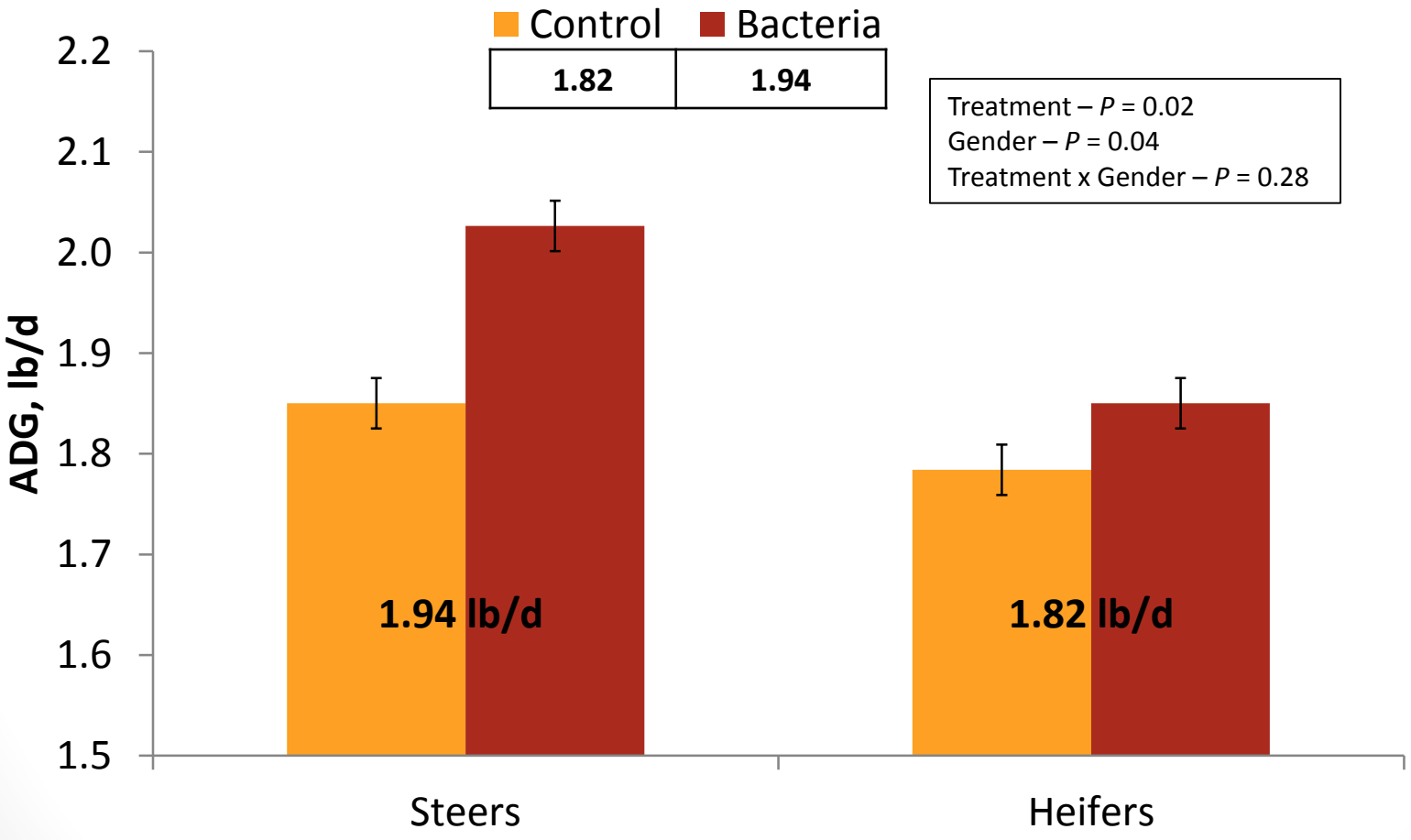
Cow Vaginal Temperature



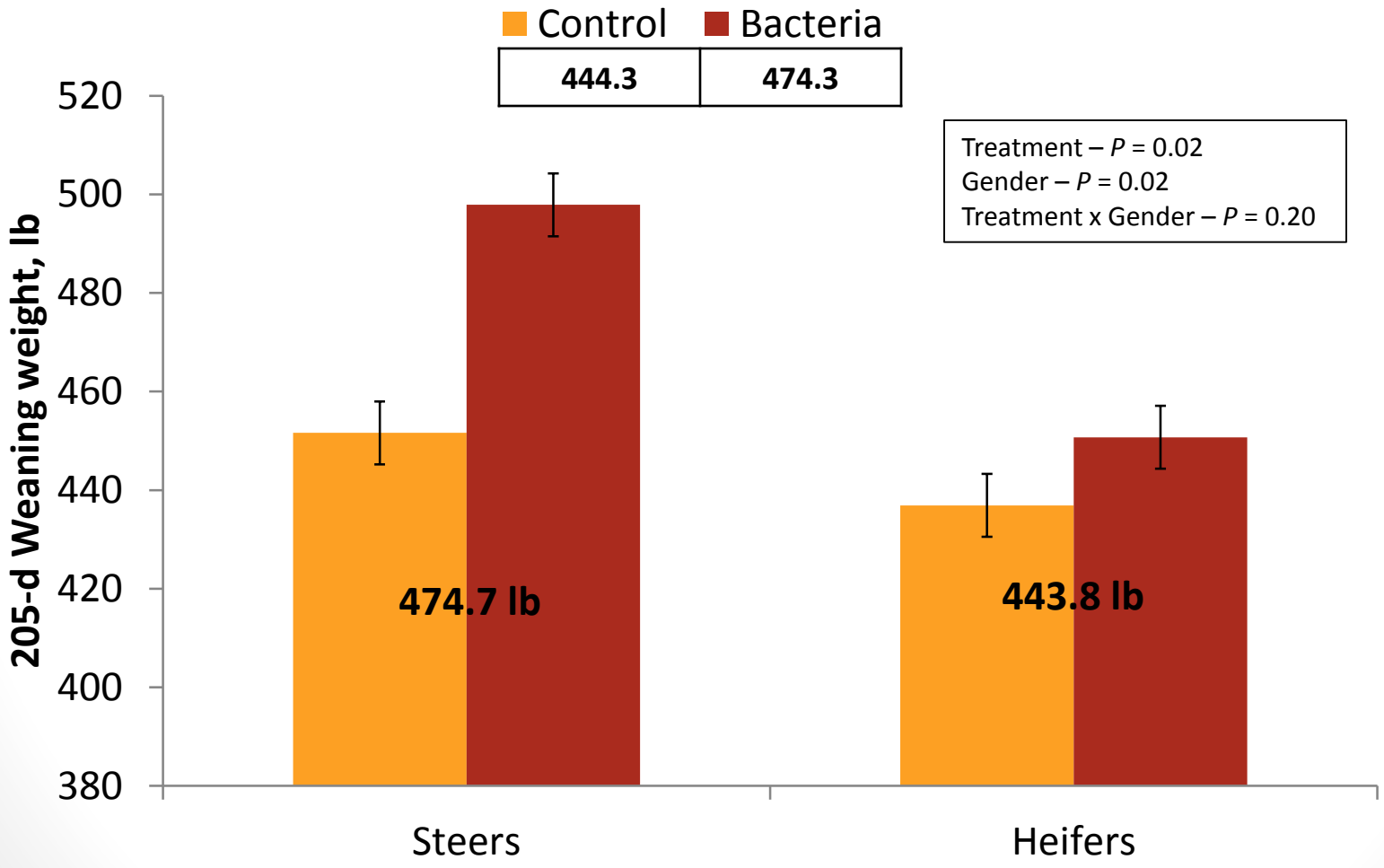
Calf Birth Weight



Calf Average Daily Gain

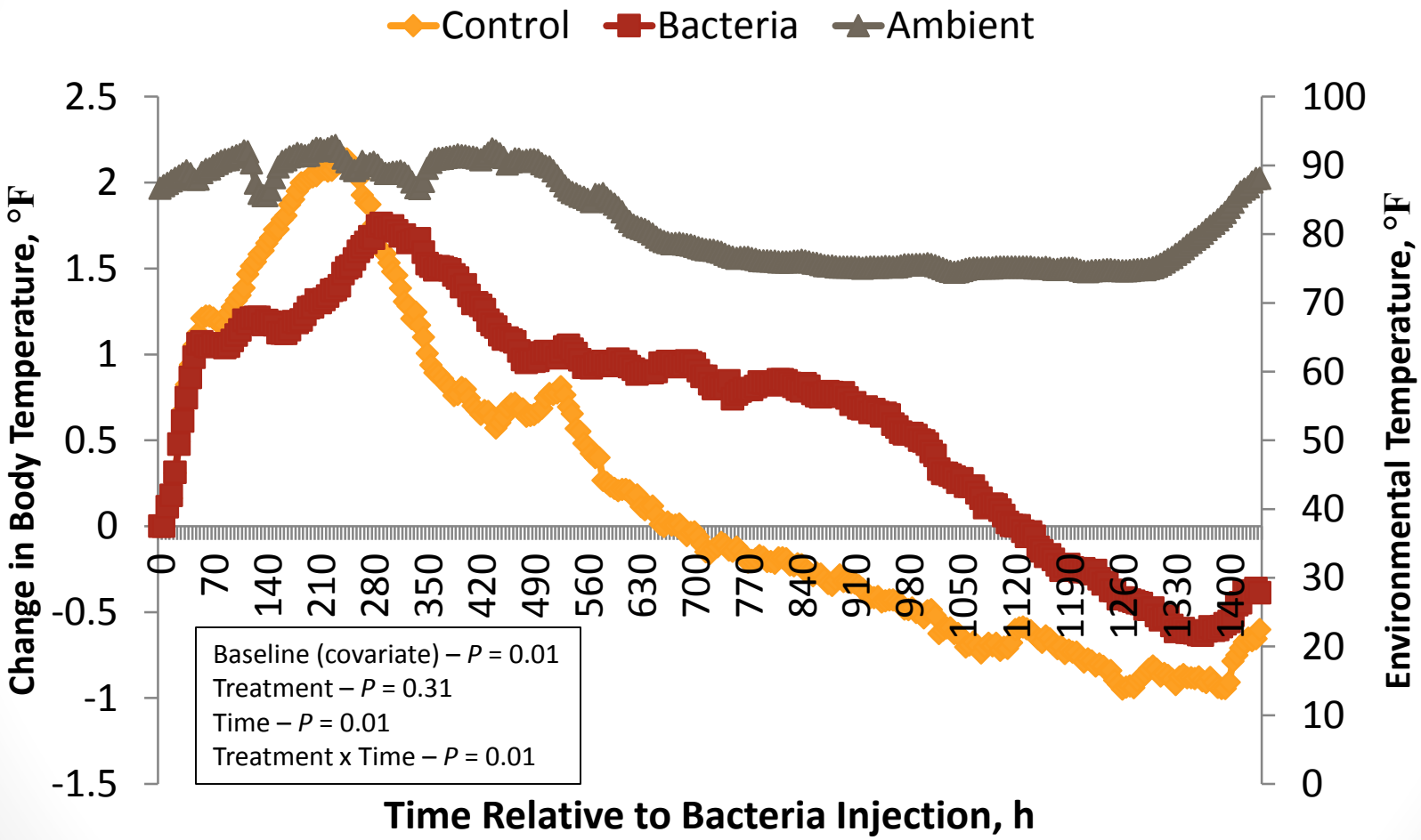


205-d Weaning Weight



BACTERIAL TOXIN CHALLENGE OF HEIFER CALVES

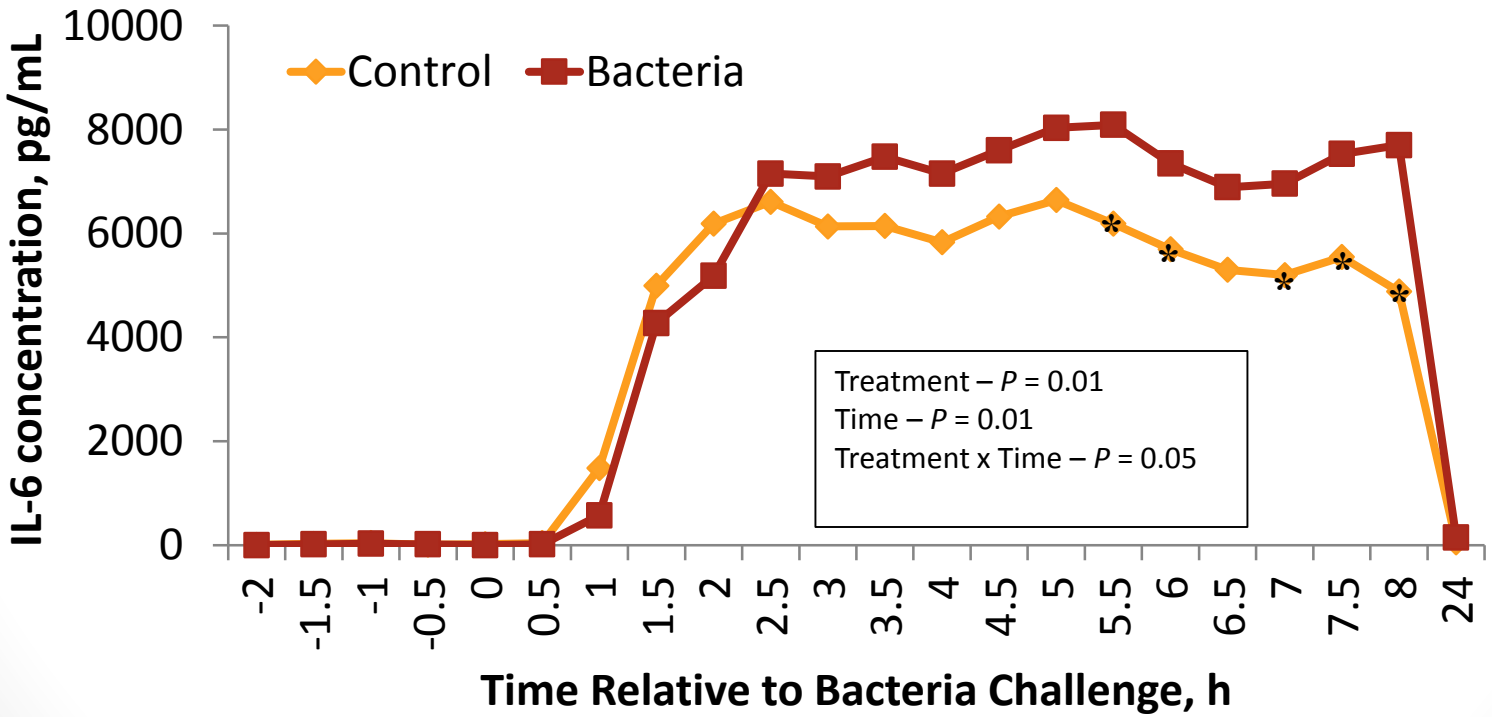
Heifer Vaginal Temperature



Lancaster et al., 2014

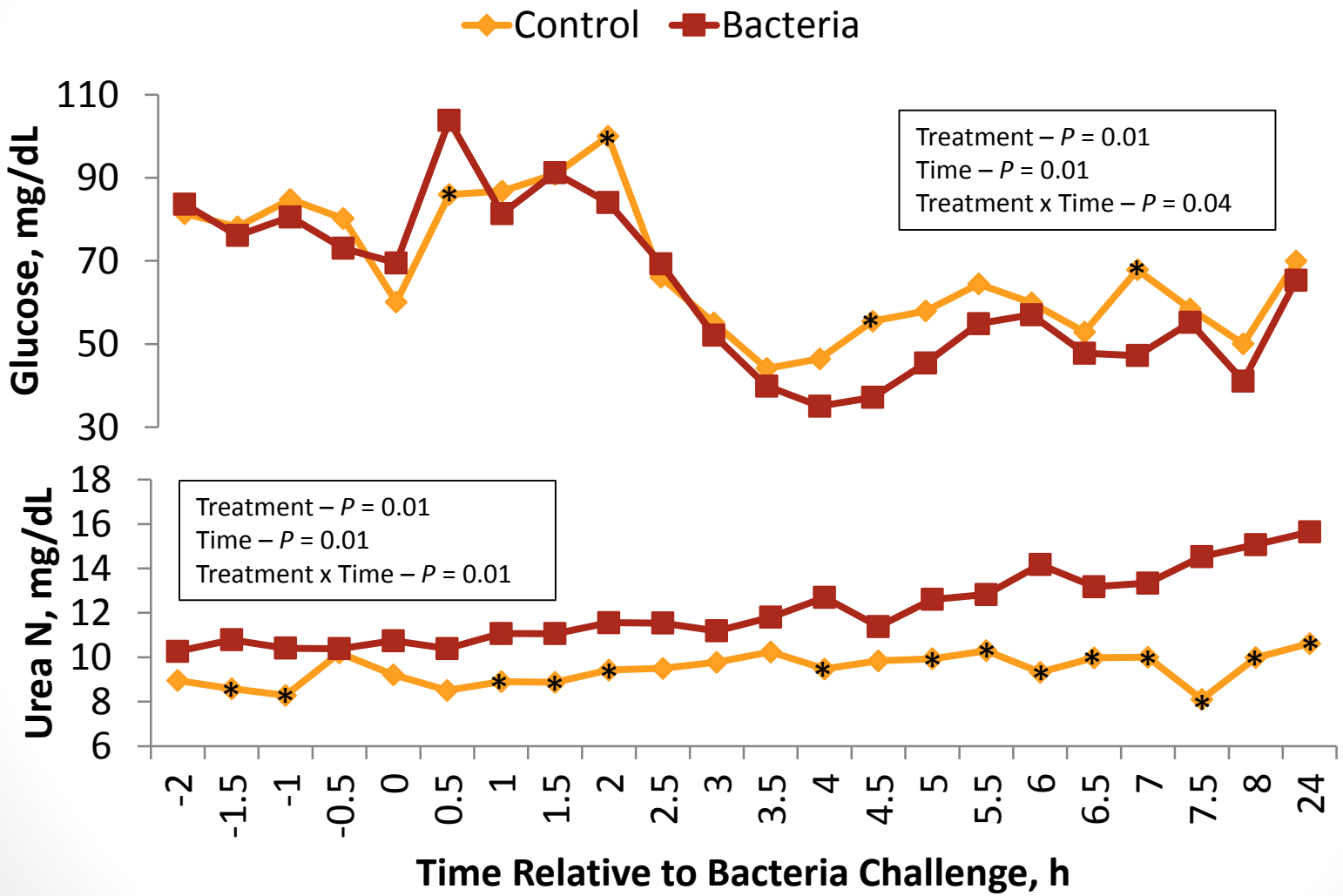
Immune Response

- Blood parameters related to inflammatory response were not different between treatments



*$P < 0.05$ at that time point

Metabolic Response



*$P < 0.05$ at that time point

Summary

- Birth weight was not affect, but administration of bacteria toxin during late gestation increased weaning weight 30 lb
- Immune response of heifers was altered by prenatal exposure to bacteria toxin such that heifers may develop acquired immunity more effectively
- Metabolic response of heifers was altered by prenatal exposure to bacteria toxin such that heifers mobilized more nutrients to fight the pathogen

Disclaimer

- Bacteria injection of pregnant cows can cause abortion
- Much more needs to be learned before this can be utilized in the beef industry
- It is not recommended that producers administered bacteria toxins to pregnant cows at this time

Questions