



EFFECTS OF MATERNAL BOVINE APPEASING SUBSTANCE AT THE TIME OF INSEMINATION ON PREGNANCY OUTCOMES AND ASSOCIATIONS WITH GENOMIC PREDICTION OF DAUGHTER PREGNANCY RATE IN HOLSTEIN COWS RECEIVING DOUBLE-OVSYNCH



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INTRODUCTION

- Maternal bovine appealing substance (mBAS) is a stress-reducing pheromone.
- Previous work reported that an mBAS analog (FerAppease®) improved pregnancy per AI (P/AI) after use at insemination in cows with an estradiol-based protocol, with potential trends related to estrus expression and parity¹.
- Effects in GnRH- and PGF_{2α}-based Double-Ovsynch (DO)² protocols used in the U.S., and interactions with genomic prediction of daughter pregnancy rate (GDPR)³, a major predictor of pregnancy outcomes, remain uncertain.

HYPOTHESIS

mBAS would increase P/AI in DO synchronized dairy cows, with greatest benefits in primiparous cows, estrus-expressing cows, and high-GDPR cows.

OBJECTIVES

Determine the effect of mBAS on P/AI and whether parity, estrus expression, or GDPR modifies the response.

MATERIALS AND METHODS

- Product applied to nuchal region (5ml) and muzzle (5ml) at the time of AI
- Parity, estrus, genomic prediction of daughter pregnancy rate (GDPR), and P/AI recorded
- Blood samples, hair samples, and ultrasonography data were collected from a subset of cows (n=93) at the time of AI and 7 days post-AI in order to assess acute hormonal changes
- Statistical analysis performed on JMP using logistic regression

MATERIALS AND METHODS

TIMELINE FOR ESTROUS SYNCHRONIZATION AND SAMPLING

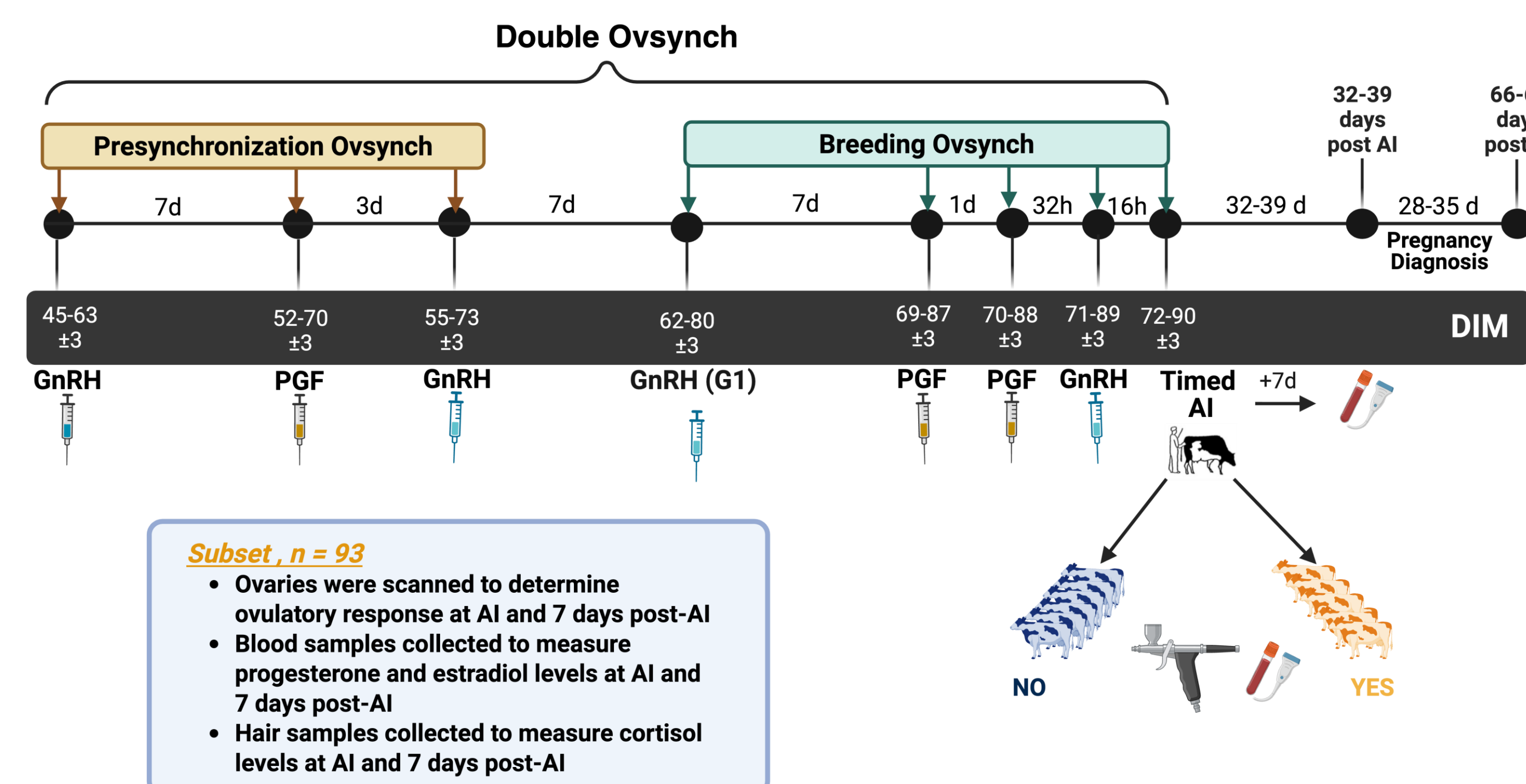


Figure 1. Depiction of Double-OvSynch Synchronization Protocol. Cows were synchronized using this protocol in order to administer timed AI.

	Q1	Q2	Q3	Q4
GDPR (min)	-4.5	-1	0	0.7

Figure 2. GDPR Quartile Minimum Values. Cows were divided into quartiles based on their GDPR value provided by participating farms.

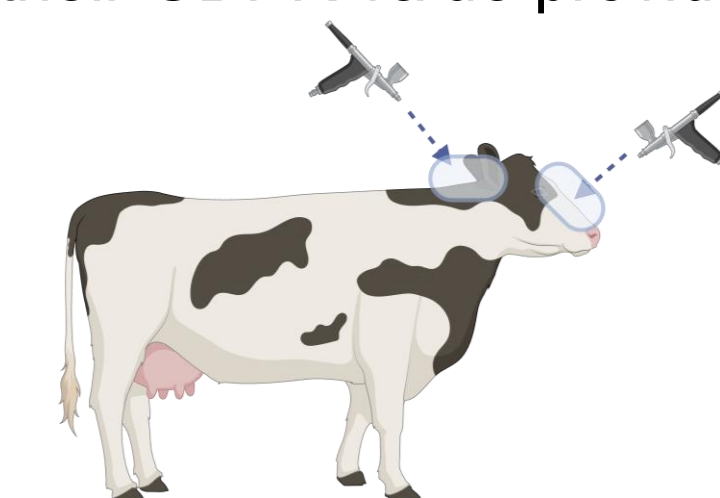
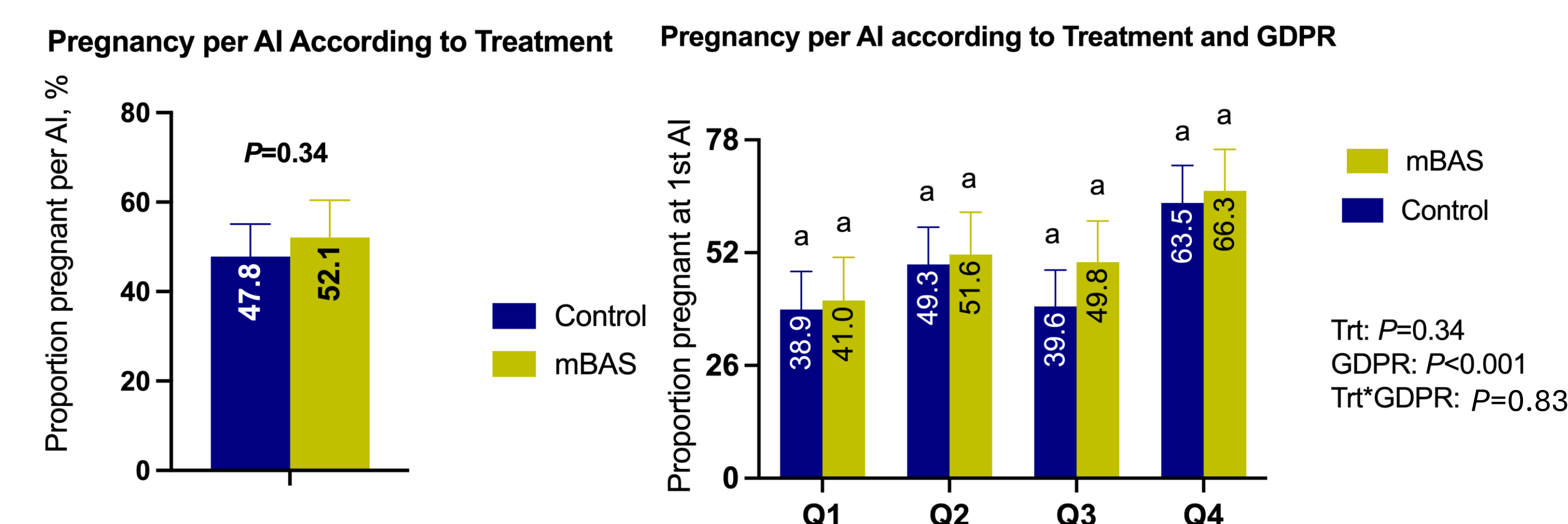


Figure 3. Application Locations for mBAS Product. Cows received FerAppease® at the nuchal region and the top of the muzzle, each in 5ml quantities.

Subset Methodology (n=93):

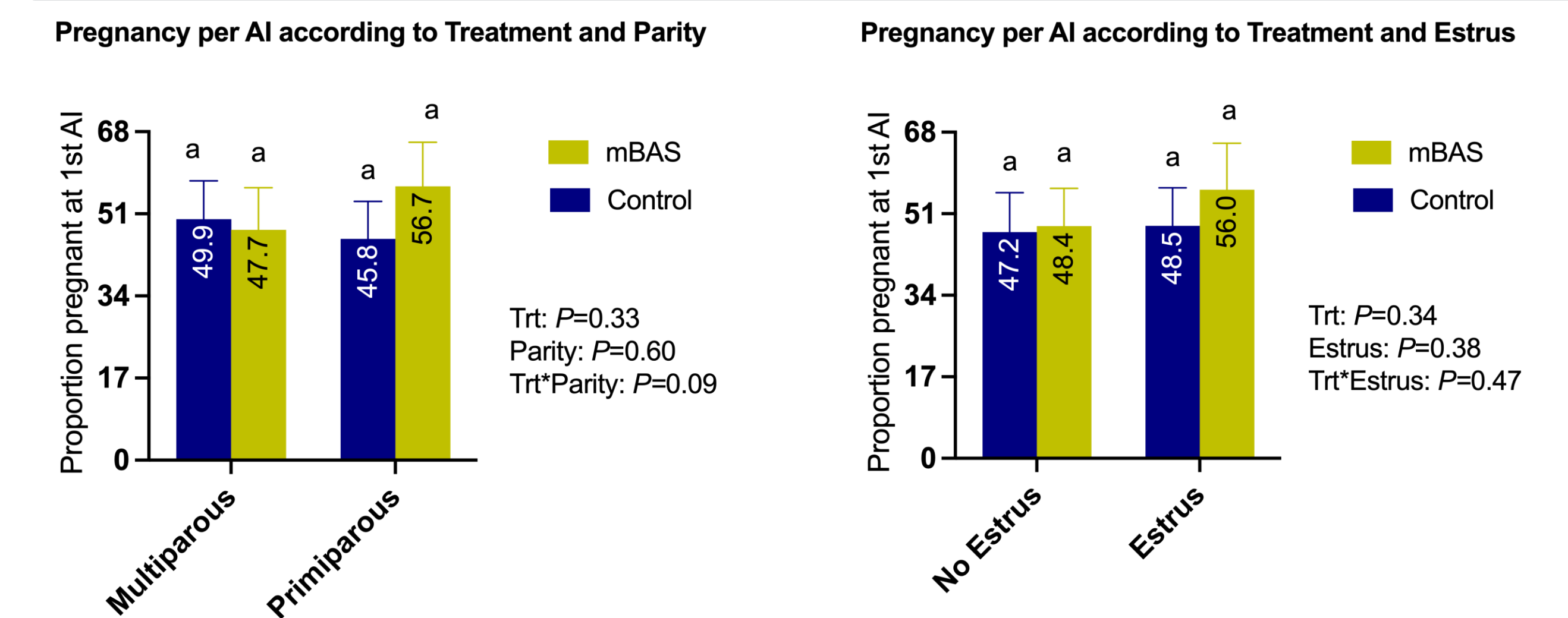
- Sample collections performed at AI and 7 days post-AI
- Blood samples collected from coccygeal vein and centrifuged for plasma
- Hair samples collected from the distal tail
- Trans-rectal ultrasonography used to assess follicle and corpus luteum presence and size to determine ovulation rate.

RESULTS



Figures 4-5. Pregnancy per AI According to Treatment (4) and GDPR (5). Preliminary results indicate that mBAS does not significantly increase P/AI in DO synchronized dairy cows, nor are these results impacted by GDPR quartile. Values shown represent least square mean and associated standard error bars.

RESULTS



Figures 6-7. Pregnancy per AI According to Treatment and Parity (6) or Estrus (7). Preliminary results indicate a tendency for mBAS to have a more significant impact on primiparous cows than multiparous cow, however state of estrus shows little significance. Values shown represent least square mean and associated standard error bars.

CONCLUSIONS

Preliminary results suggest that mBAS use in DO synchronized dairy cows may be most effective in improving P/AI in primiparous cows, allowing for a more targeted and efficient application strategy.

FUTURE WORK

Laboratory analysis of collected blood samples will assess changes in progesterone and estradiol levels at AI and 7 days later. Cortisol levels will be similarly assessed using hair samples. This information will be combined with ultrasonography results to better understand hormonal interactions with mBAS.

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