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Prebiotic and Probiotic Influence on Beef Calves Immunity

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Prebiotic and Probiotic Influence on Beef Calves Immunity

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Introduction

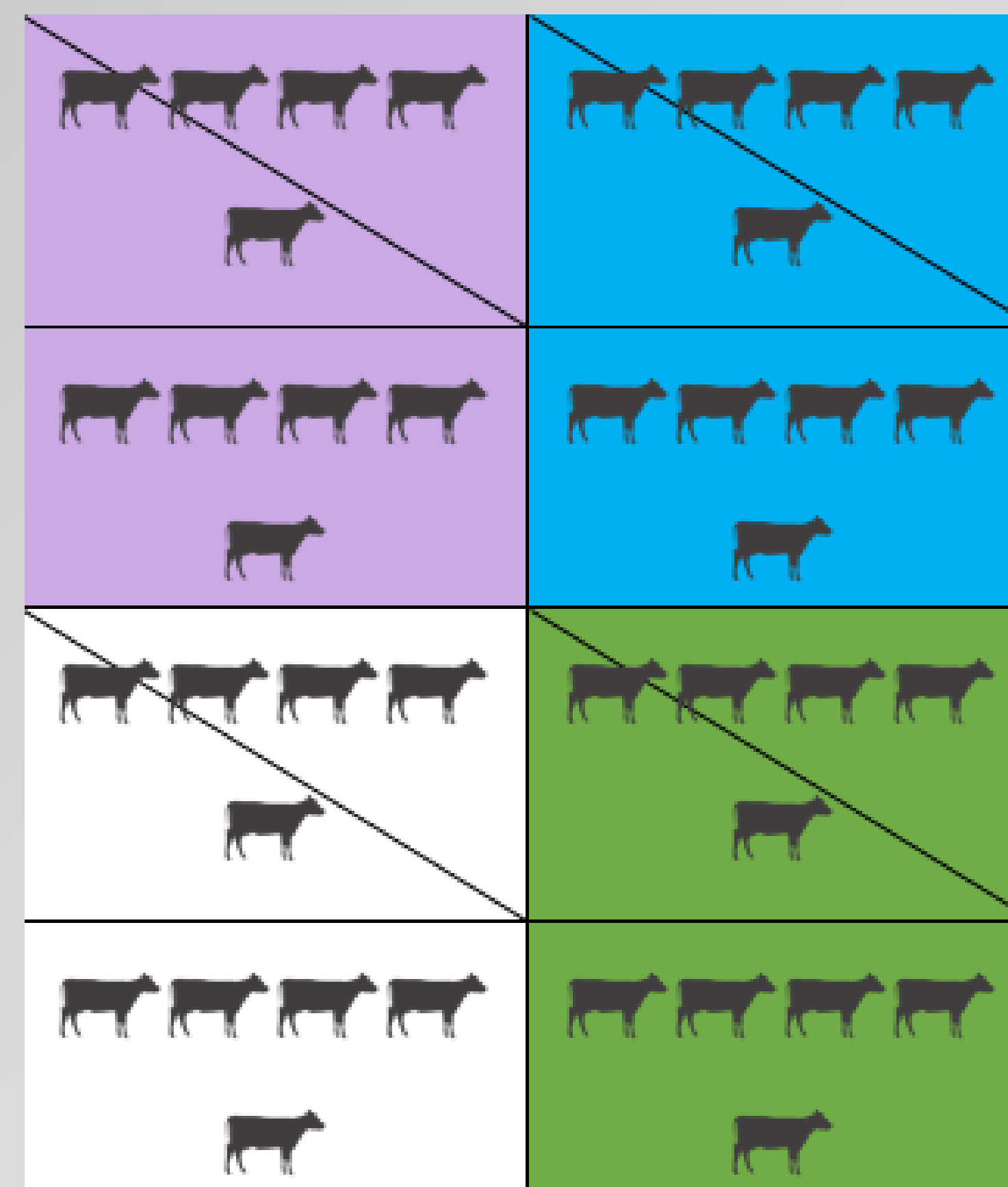
Objective: Evaluate whether prebiotic and probiotic feed additives influenced the immune response during the weaning period in beef calves.

Hypothesis: Addition of both prebiotic and probiotic feed additives provided in a post weaning ration will enhance immune response and minimize morbidity. Furthermore, it is expected this will provide elevated IgG serum concentrations as compared to the control ration.

Methods

- The trial was divided into four groups containing five creep fed and five non-creep fed commercial calves of similar weight and genetics
- All calves were of similar age
- Three groups were fed prebiotic additive, probiotic additive, and a combination of prebiotic and probiotic additives
- The control group was fed a ration devoid of additives
- All four rations throughout the trial were fed free-choice for 28 days
- All four groups were fed an isocaloric ration
- Blood samples were collected each week during the 28 day trial

Data



	C
	PP
	PR
	PE
Solid Color	Creep Fed
Diagonal Line	Non-creep Fed

Figure 1: Calf group separation and feed additives during the trial.

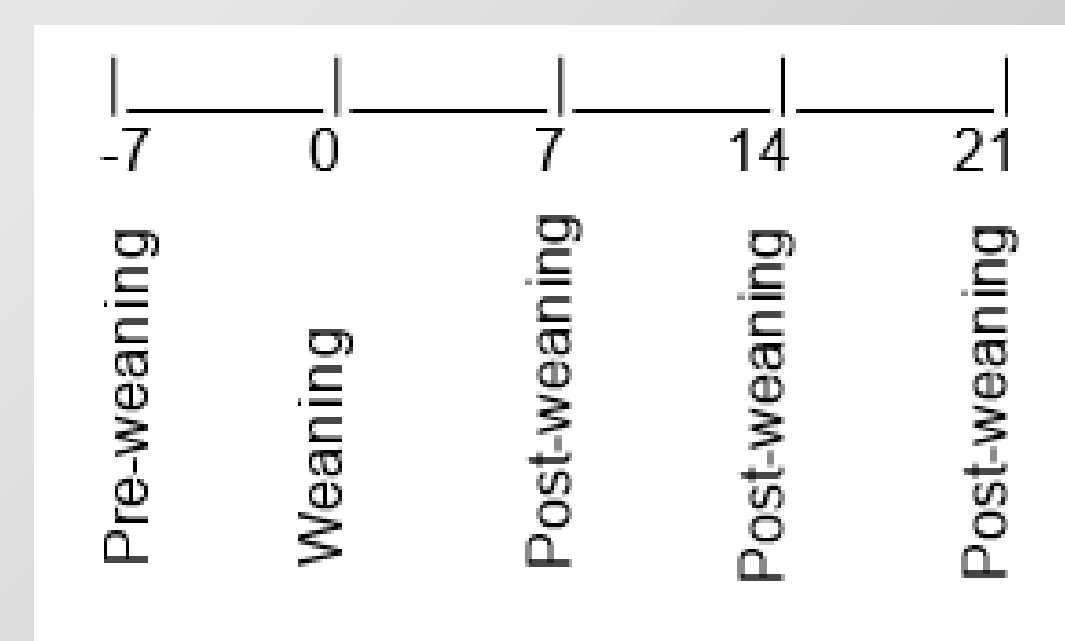


Figure 2: Blood collection timeline.

Results

Days Bled	Supplemental Groups	Control (C) IgG mg/mL	Prebiotic (PE) IgG mg/mL	Probiotic (PR) IgG mg/mL	Prebiotic and Probiotic (PP) IgG mg/mL
Day -7	Creep	41.32	36.31	33.75	36.72
	Non-creep	33.05	38.05	38.38	30.36
Day 21	Creep	44.07	44.19	62.43	46.12
	Non-Creep	63.31	78.35	74.37	56.78

Table 1: IgG least square means from day -7 (pre-weaning) and day 21 (post-weaning).

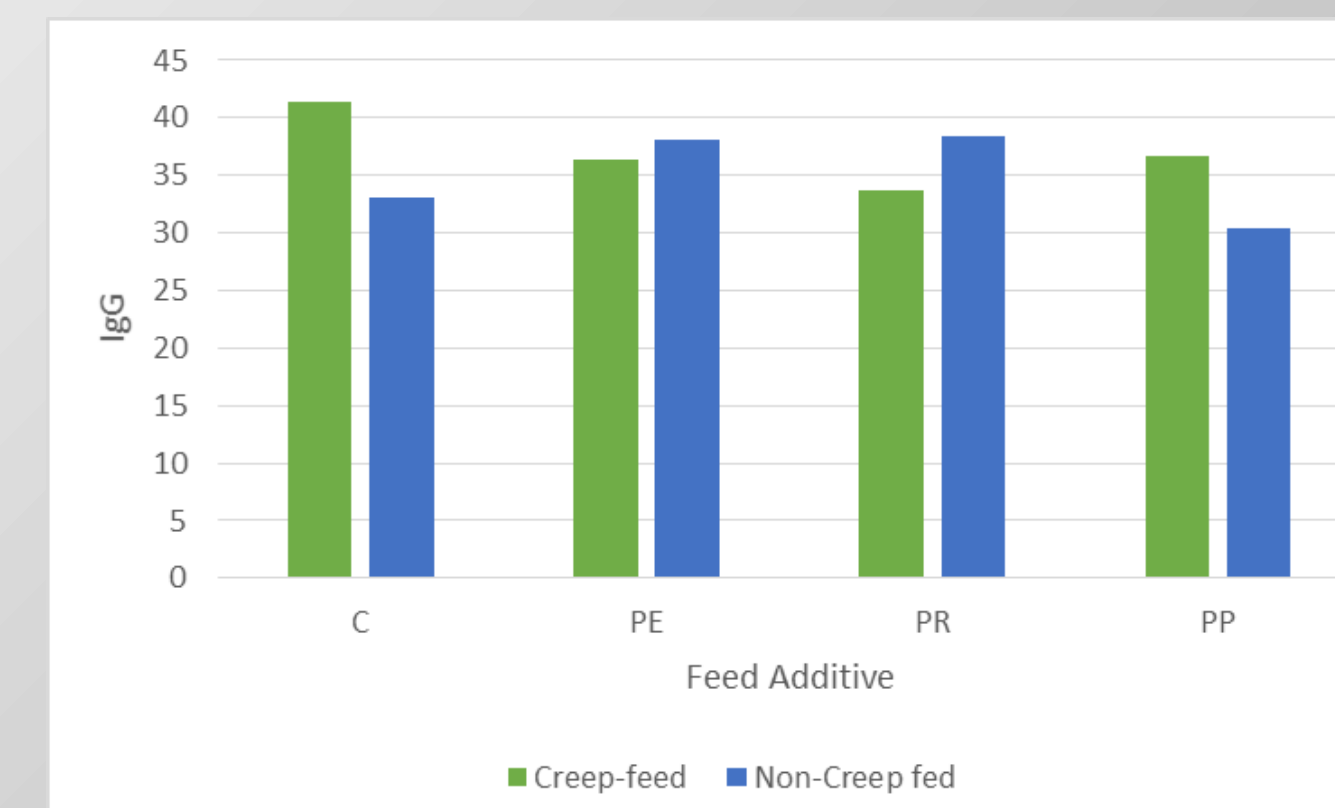


Figure 3: IgG mean levels from day -7 (pre-weaning).

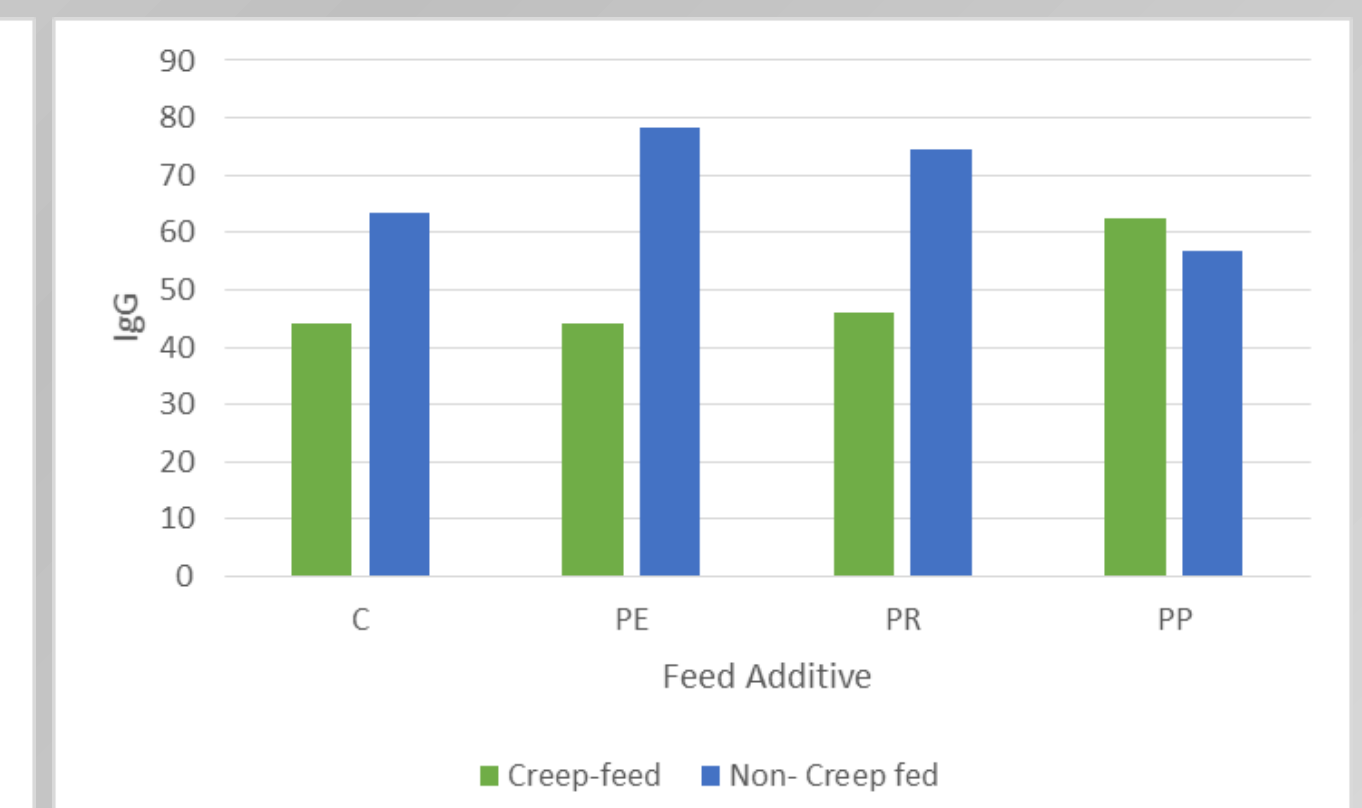


Figure 4: IgG mean levels from day 21 (post-weaning).

Conclusions

The initial hypothesis was proven incorrect. Statistical trends existed for differences in IgG levels between treatment groups. Despite the trends, all IgG were in a physiologically normal range. When comparing the combination of prebiotic and probiotic to the other additives, as seen in Table 1, Figures 3, and 4 the control ration provided a higher IgG concentration. Future experiments should include additional replications. It is possible that the expected outcome was not achieved due to influence affiliated with calf age, vaccination history, and environmental effects.

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