Veterinary Research Scholars Program
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Impact of vaccination route on mucosal and serum antibody production in branding-age beef calves

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Introduction

- Bovine viral diarrhea virus (BVDV) is a significant cause of economic loss for cattle producers and vaccination protocols are commonly used to mitigate the impact of BVDV
- Mucosal immunity is an important defense against respiratory disease in cattle and intranasal vaccination against respiratory pathogens is becoming increasingly popular in herd health protocols
- Little is known regarding mucosal antibody responses to BVDV
- Our goal is to describe the effect of vaccination route on mucosal antibody responses in branding-age beef calves
- The proposed research is significant to the cattle industry because it provides relevant information regarding mucosal vaccination strategies
- Successful completion of our research objective will further characterize mucosal immune responses to respiratory viruses and provide valuable information that will shape vaccination strategies aimed at preventing respiratory disease

Hypothesis

Branding-age beef calves vaccinated initially with intranasal modified live (MLV) BVDV vaccine will develop strong, long-lasting nasal and serum antibody levels following subcutaneous re-vaccination as compared to calves vaccinated initially via the subcutaneous route and then re-vaccinated via the intranasal route.

Materials and Methods

- The cow herd was previously demonstrated to be BVDV persistently infected (PI) negative
- Refer to **Table 1.1** for treatments
- Treatment groups were separated after initial vaccination until PCR confirmed that BVDV was no longer being shed in nasal secretions
- Calves were re-vaccinated at week 5
- Nasal and serum samples were collected every 7 days for a total of 5 weeks
- Antibody levels in these samples will be measured using an ELISA (SVANOVIR BVDV-Ab)
- We will follow these calves until weaning, taking monthly measurements of serum and nasal BVDV-specific antibodies

Group	Initial IN Vaccine	First Treatment	Second Treatment
1	IN BHV/PI3/BRSV	SQ MLV BVDV	IN MLV BVDV
2	SQ MLV BHV/PI3/ BRSV	SQ MLV BVDV	IN MLV BVDV
3	IN BHV/PI3/BRSV	Control (No BVDV)	Control (No BVDV)
4	IN BHV/PI3/BRSV	IN MLV BVDV	SQ MLV BVDV

Table 1.1

Future Outlook

This work may lead to an innovative BVDV surveillance method. We expect calves exposed to intranasal BVDV MLV vaccine will develop nasal antibodies specific to it, whereas calves exposed parenterally will not. Detection of herds harboring PI cattle may be possible based on detection of BVDV specific nasal antibodies using nasal swabs **(Figure 1.1)**.

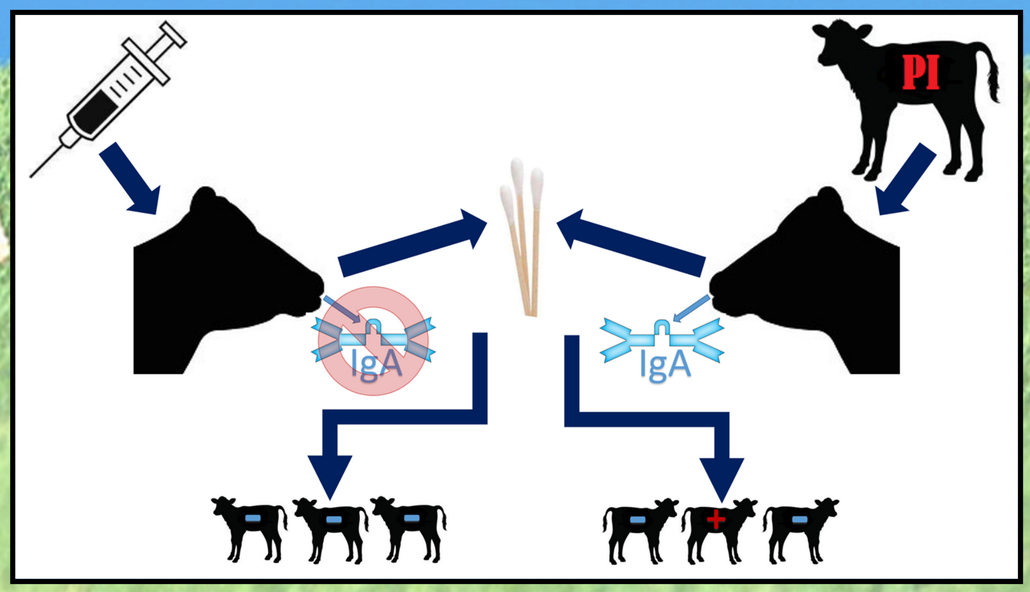

Figure 1.1

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