

PYRAMID
+ PRESPONSE[®] SQ

PYRAMID[®] 5 + PRESPONSE[®] SQ VACCINE PROVEN SUPERIOR TO INFORCE 3[®] + ONE SHOT[®] BVD IN DUAL CHALLENGE STUDY

As protection from antibody-rich colostrum wanes, calves need vaccines to stimulate their immune system. Historically, it was thought that maternal antibodies found in colostrum would interfere with a vaccine's efficacy when administered to a calf at too young of an age. That's why some producers have turned to intranasal vaccines for young calves.

Researchers set out to determine whether PYRAMID 5 + PRESPONSE SQ, and its unique MetaStim[®] adjuvant, could overcome maternal antibodies in calves as young as 30 days old.

Researchers evaluated a control saline solution, PYRAMID 5 + PRESPONSE SQ and an intranasal + injectable vaccine protocol and their ability to overcome maternal antibody and protect against disease. They vaccinated 60 calves at 30 days of age with either saline, PYRAMID 5 + PRESPONSE SQ [injectable] or INFORCE 3 + ONE SHOT BVD [intranasal + injectable], and then challenged them five months later with bovine viral diarrhea virus (BVDV) Type 1b and *Mannheimia haemolytica*. All calves received colostrum with a known amount of BVDV antibodies prior to vaccination.

 Type 1b is the most prevalent BVDV strain in the U.S.¹

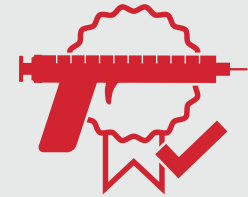
THE FINDINGS

WHEN CHALLENGED WITH BVDV TYPE 1B
AND *M. HAEMOLYTICA* FIVE MONTHS
AFTER VACCINATION:



Calves vaccinated with PYRAMID 5 + PRESPONSE SQ produced an immune response that **reduced disease severity**.

The **injectable vaccine** protocol provided a **stronger immune response** than the intranasal + injectable vaccine protocol.



KEY TAKEAWAY

EVEN IN THE FACE OF MATERNAL ANTIBODIES, **PYRAMID[®] 5 + PRESPONSE[®] SQ VACCINES PROVIDE PREMIER PROTECTION FOR YOUNG CALVES.**²

PYRAMID[®] 5 + PRESPONSE[®] SQ CALVES HAD THE ADVANTAGE:²



Lower rectal temperatures on multiple days



Higher concentration of BVDV Types 1 and 2 antibodies (titers), indicating a higher level of protection against disease



Stronger memory response to BVDV, to help fight off the virus in the future



Less nasal shedding of BVDV, to reduce spread to healthy herd mates

MATERNAL ANTIBODIES ARE NO MATCH FOR METASTIM[®] ADJUVANT

Previous studies found that the PYRAMID 5 vaccine provides protection against diseases like BVDV Type 2 and BRSV, even in the face of maternal antibodies.^{3,4,5} This dual-challenge study presents even more evidence that the PYRAMID vaccines with the **METASTIM adjuvant can stimulate robust immunity — even when maternal antibodies are present.**



Disease risk on a cattle operation is everywhere. The vaccine that you choose matters. Work with your veterinarian to determine the best protocol for your operation.

LEARN ABOUT RELENTLESS PROTECTION AT PYRAMIDVACCINES.COM

¹ Fulton RW, Cook BJ, Payton ME, et al. Immune response to bovine viral diarrhea virus (BVDV) vaccines detecting antibodies to BVDV subtypes 1a, 1b, 2a and 2c. *Vaccine* 2020;38(24):4032–4037.

² Perkins–Dines S, Dias N, Krafusur G, et al. The effect of neonatal vaccination for bovine respiratory disease in the face of a dual challenge with bovine viral diarrhea virus and *Mannheimia haemolytica*. *Vaccine*. 2023;41(19):3080–3091.

³ Zimmerman AD, Boots RE, Valli JL, Chase CCL. Evaluation of protection against virulent bovine viral diarrhea virus Type 2 in calves that had maternal antibodies and were vaccinated with a modified-live vaccine. *JAVMA* 2006;228(11):1757–1761.

⁴ Zimmerman AD, Buterbaugh RE, Schnackel JA, Chase CCL. Efficacy of a modified-live virus vaccine administered to calves with maternal antibodies and challenged seven months later with a virulent bovine viral diarrhea Type 2 virus. *Bov Pract* 2009;43(1):35–43.

⁵ Kolb EA, Buterbaugh RE, Rinehart CL, et al. Protection against bovine respiratory syncytial virus in calves vaccinated with adjuvanted modified-live virus vaccine administered in the face of maternal antibody. *Vaccine* 2020;38(2):298–308.