

INFORCE 3[®] AND ONE SHOT[®] BVD: PROTECT CALVES THROUGH THE GRAZING SEASON.

INFORCE 3 & ONE SHOT BVD



VACCINATION TIMING MAKES A DIFFERENCE.

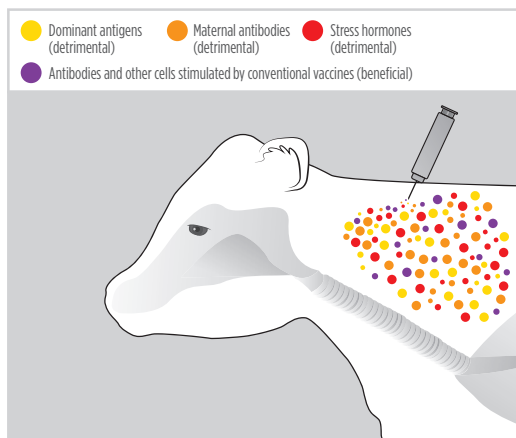
For pre-weaned calves, the stresses of branding and turnout herd work — combined with increased exposure to disease-causing organisms — pose some of the greatest risks for developing bovine respiratory disease (BRD).¹

Mounting a protective immune response in the young calf can be challenging, but research has shed light on vaccination programs that can do just that. When administered during times of stress, INFORCE 3[®] and ONE SHOT[®] BVD can stimulate a robust immune response to help provide rapid respiratory disease protection.²⁻⁶

BRD TAKES A TOLL ON COW/CALF OPERATIONS.

BRD is the No. 1 cause of death in nursing beef calves 3 weeks of age and older.⁷ Of the disease-causing organisms involved:

- Bovine respiratory syncytial virus (BRSV) and bovine viral diarrhea (BVD) virus are leading *viral* causes of summer pneumonia and BRD complex.¹
- *Mannheimia haemolytica* is the most common *bacterial* cause of calf pneumonia and death.¹



Maternal antibodies, dominant antigens and stress hormones can compromise the efficacy of vaccines and suppress the calf's ability to mount an adequate immune response to fight disease.

MATERNAL ANTIBODIES, DOMINANT ANTIGENS AND STRESS CAN INTERFERE WITH SOME VACCINES.

Protecting young calves from BRD can be challenging because unique aspects of the calf's immune system can interfere with the vaccine response:

- Maternal antibodies can bind to and inactivate vaccine antigens, making them less effective.
- Dominant antigens in traditional vaccines like IBR, can suppress the immune response to vaccination in previously unvaccinated calves.⁸
- Stress from handling and herd management procedures can decrease a calf's ability to fully mount an immune response to vaccines or infectious agents.

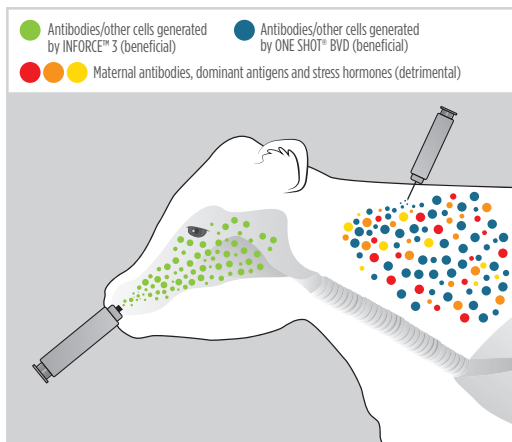
INFORCE 3®

ONE SHOT® BVD

TOGETHER, INFORCE 3® AND ONE SHOT® BVD PROVIDE COMPLETE CALF PROTECTION.

Recent studies show that vaccinating young calves can make a difference:

- Vaccinating with INFORCE 3® and ONE SHOT® BVD can provide rapid, lasting protection against key viral respiratory diseases.^{2-6,9}
- Maternal antibodies against BVD virus do not appear to affect INFORCE 3 and BVD vaccination in young beef calves when vaccination and BVD challenge were separated by only five days.²
- When vaccinated with INFORCE 3, immunosuppressed cattle demonstrated an equivalent or greater innate and adaptive local immune response to infectious bovine rhinotracheitis (IBR) than those vaccinated up to 12 days before stressful events.⁴



Initial vaccination with INFORCE 3 and ONE SHOT BVD helps circumvent dominant antigen interference, maternal antibody interference and stress, stimulating a rapid and complete immune response.

GIVE CALVES A HEALTHY START AND HELP PROTECT THEM THROUGH GRAZING.

The leading vaccine on the market,¹⁰ INFORCE 3:

- Leading respiratory vaccine that prevents BRSV respiratory disease
- Delivers a six-month duration of immunity against IBR
- Can be administered in a single nostril for greater convenience

ONE SHOT BVD, the second-fastest-growing respiratory vaccine on the market,¹⁰ provides the most rapid onset of immunity against *Mannheimia haemolytica* and highest level of protection available against BVD Types 1 and 2 and *M. haemolytica*.^{2,3}

Help protect your cattle from respiratory disease before they head to pasture. Contact your veterinarian or your Zoetis representative, or visit CompleteCalfProtection.com.

¹ Woolums A. Risk factors for BRD on cow-calf operations, in *Proceedings: Am Assoc Bovine Pract* 2015;173-176.

² Data on file, Waltz PH, Riddle KP, Richardson AP, et al. Impact of passive immunity induced by maternal vaccination on subsequent immunization and disease-sparing in early-weaned beef calves challenged with highly virulent BVDV, Zoetis Inc.

³ Data on file, Study Report No. B835R-US-15-419, Zoetis Inc.

⁴ Cortese V, Woolums A, Hurley D, Bernard J, Berghaus R, Short T. Comparison of interferon and BoHV1 IgA levels in nasal secretions of dairy cattle vaccinated with Inforce 3 prior to calving or on day of calving, in *Proceedings: 29th World Buiatrics Congress* 2016;436.

⁵ Mahan SM, Sobocki B, Johnson J, et al. Efficacy of intranasal vaccination with a multivalent vaccine containing temperature-sensitive modified-live bovine herpesvirus type 1 for protection of seronegative and seropositive calves against respiratory disease. *J Am Vet Med Assoc*. 2016;248(11):1280-1286.

⁶ Step DL, Krehbiel CR, Hixon C, et al. Evaluation of Commercially Available Multivalent Modified-Live Viral Vaccines on Health and Performance in Feedlot Cattle. *JJ Vaccine Vaccination*. 2015;3(3):1-8.

⁷ U.S. Department of Agriculture. Cattle and Calves Nonpredator Death Loss in the United States, 2010. https://www.aphis.usda.gov/animal_health/nahms/general/downloads/cattle_calves_nonpred_2010.pdf. Published December 2011. Accessed December 8, 2016.

⁸ Cortese VS, Seeger JT, Stokka GS, et al. Serological response to Mannheimia haemolytica in calves concurrently inoculated with inactivated or modified-live preparations of M. haemolytica and viral combination vaccines containing modified-live bovine herpesvirus type 1. *Am J Vet Res*. 2011;72(11):1541-1549.

⁹ Data on file, Study Report Nos. 3131R-60-08-557, 3131R-60-09-669, Zoetis Inc.

¹⁰ Animalytix® data, January 2019, Zoetis Inc.