

BREED-BACK™ FP Vaccine Studies

Key Points

Challenge Studies Show Greater than 90% Protection Against Fetal Persistent Infection Due to BVD Type 1 and BVD Type 2 Following Vaccination with BREED-BACK™ FP 10 Viral Vaccine

- Study demonstrated high efficacy for fetal protection in preventing persistent infections (PI) due to BVD virus Type 1 and Type 2.
- After direct challenge with virulent heterologous strain of BVD Type 1 virus during gestation, 91% of vaccinates were protected.
- After direct challenge with virulent heterologous strain of BVD Type 2 virus during gestation, 91% of vaccinates were protected.
- 100% of non-vaccinated control cattle had BVD persistently infected fetuses.
- 0% of vaccinates aborted, although one vaccinate had no fetus at harvest.
- 43% of Type 2 challenge controls aborted.

Study Design

BVD Type 1 Challenge & BVD Type 2 Challenge Trials

Study animals	37 heifers serologically naïve for BVD antibody; all heifers housed separately
Procedure	Vaccination at 4-8 weeks prior to insemination At ~75 days gestation given direct intranasal challenge At ~60 days post-challenge fetuses harvested and tested for presence of BVD challenge virus to determine persistent infection Peyers Patches (lymph tissue), cerebellum, spleen, thymus, abdominal fluid, liver, femur, placenta, and uterine fluid from each fetus Each heifer monitored for clinical signs, viremia, leukopenia, and pyrexia following challenge BVD antibody checked in all heifer during trials
Direct challenge strains	Heterologous, non-cytopathic BVD Type 1 and BVD Type 2 virulent strains known to cause BVD persistent infection

**Treatment Groups
BVD Type 1 Challenge Trials**

	Number	Vaccination Timing	Vaccine
Group 1	11 heifers	4-8 weeks prior to breeding	BREED-BACK™ FP 10
Group 2	8 heifers	No vaccination	Non-vaccinated controls

**Treatment Groups
BVD Type 2 Challenge Trials**

	Number	Vaccination Timing	Vaccine
Group 1	11 heifers	4-8 weeks prior to breeding	BREED-BACK™ FP 10
Group 2	7 heifers	No vaccination	Non-vaccinated controls

**Study Results Trial 1
Following BVD Type 1 Virulent Challenge**

	Clinical Signs	Leukopenia	Viremia	Fetus Positive PI	% Abortion	% Death of Heifers	% Efficacy in Vaccinates
Vaccinates	46%(5) ¹	0%	0%	9%(1)	0%	0%	91%
Controls	100%	38% (3)	100%	100%	0%	0%	NA

1- Mild symptoms.

**Study Results Trial 2
Following BVD Type 2 Virulent Challenge**

	Clinical Signs	Leukopenia	Viremia	Fetus Positive PI	Abortion	Death of Heifers	% Efficacy in Vaccinates
Vaccinates	27%(3) ¹	0%	0%	0%	0% ^{2,3}	0%	91% ²
Controls	100%	86% (6)	100%	100%	43%(3)	43%(3)	NA

1- Mild symptoms.

2- One vaccinate had no fetus at harvest, unknown cause; if one assumed BVD, % efficacy is 91% instead of 100%.

3- One vaccinate aborted due to Actinomyces; no BVD virus isolated.

The Bottom Line

- **BREED-BACK FP 10** modified live viral vaccine, in these studies, showed 91% protection against BVD persistently infected fetuses.
- BVD Type 2 challenge resulted in **no deaths** and **no abortions** in vaccinates.
- Three of seven controls died and three others aborted following BVD Type 2 challenge. All control heifers and fetuses were positive for BVD virus, indicating an extremely strong challenge.
- The complete study is published in *Veterinary Microbiology*, volume 96, issue 2, 17 October 2003, pp. 117-131.