



Poulvac[®] Bursa Plus

*It's Potent Protection
Against vvIBDV*

Leading the Way in IBD Protection

FORT DODGE ANIMAL HEALTH



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A Very Virulent Virus (vvIBDV) Demands a Very Effective Vaccine

As early as 1987, reports of very virulent infectious bursal disease virus (vvIBDV) came from broiler and layer flocks in many European countries, Africa, China, Japan and Southeast Asia. It soon became evident that mild or intermediate IBD vaccines did not adequately protect against vvIBDV. Consequently, costly mortality and production losses continued.

vvIBDV Symptoms are Devastating

- Mortality up to 70%
- Watery diarrhea
- Poor feed efficiency
- Complete bursal depletion
- Poor response to vaccination programs

Poulvac Bursa Plus—Effective! That's Why It's the Chosen Product Against vvIBDV

- Consistently immunizes in the face of maternal antibodies
- Spreads efficiently and protects well with a single dose
- Reduces mortality and improves performance

Preserving Immunizing Potential

- A vaccine's activity level determines its ability to establish itself in the bursa and quickly replicate and immunize in the presence of maternal antibodies
- Poulvac Bursa Plus retains the activity level of the parent strain (V877) by avoiding cell culture adaptation
- Poulvac Bursa Plus shares critical amino acids in common with all wild-type viruses (253 and 284, see chart below)

	Position 253	Position 284
Classic Field Strains	✓	✓
vvIBD Strains	✓	✓
Poulvac Bursa Plus	✓	✓
Tissue Culture Adapted Vaccines	◆	◆

✓ = Most efficient bursal activity level
◆ = Less efficient bursal activity level

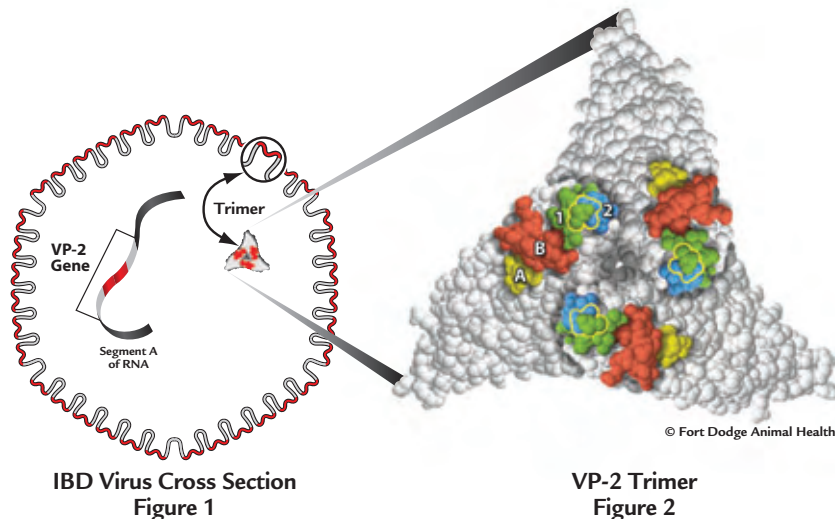


- VP-2 gene codes for an amino acid chain, which folds to create three-dimensional structures (**VP-2 proteins**) that cover IBD virus (**Figure 1**)

- Three interlocking VP-2 proteins form a VP-2 trimer (**Figure 2**)

- Central cup-shaped region of trimer functions as a single attachment site (**center of Figure 2**)

- Amino acids 253 and 284 (**outlined in yellow**) form a structure that is critical to cell attachment and infection



- The four colored structures (**A, B, 1 and 2**) on each VP-2 molecule represent clusters of amino acids

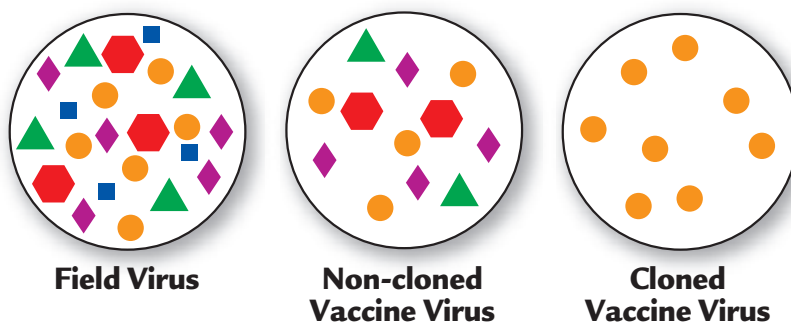
- These clusters form the 3 peaks of each attachment site (**red surfaces of the IBD virus in Figure 1**)

- These peaks contain epitopes that make IBDVs antigenically distinct from one another

- Neutralizing antibodies from vaccination bind to these peaks and interfere with infection by field virus

The Choice for vvIBDV Protection Is the Vaccine With the Right Balance of Efficacy and Safety

- Poulvac Bursa Plus master seed is derived from a unique classic strain (V877) that causes no clinical mortality or significant immune suppression
- “Hot” vaccines are derived from pathogenic field isolates that may retain more residual pathogenicity
- Fort Dodge Animal Health considers Poulvac Bursa Plus a “strong” vaccine based on its safety profile as demonstrated by more rapid bursal regeneration and lower immunosuppressive potential. It’s a classic choice that sets a very high standard.
- Poulvac Bursa Plus is a non-cloned vaccine and is produced in chicken embryos



- A field virus theoretically contains a variety of sub-populations that may differ antigenically
- A non-cloned vaccine virus maintains as many of the sub-populations as possible
- A cloned vaccine is developed with the intention of maintaining a primary sub-population



Responds Fast & Spreads Efficiently— Why Settle for Weaker Performance?

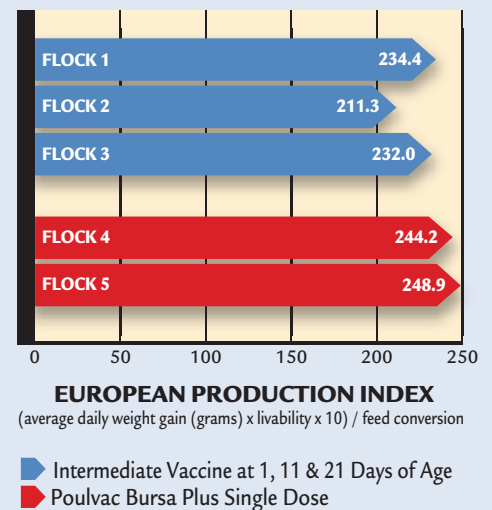
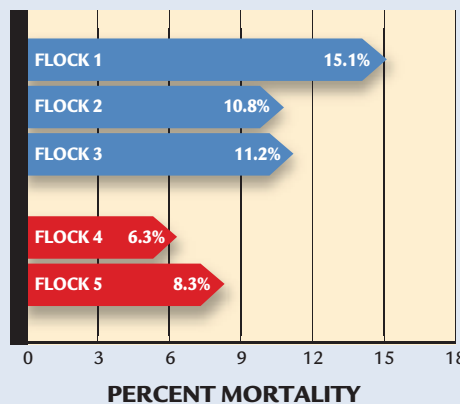
- Poulvac Bursa Plus spreads efficiently to ensure immunization of birds missed during vaccination
- Poulvac Bursa Plus was given to 100 14-day-old broiler breeder chicks
- Vaccinates were then placed with 100 non-vaccinated controls
- Both groups were sampled at 14 and 28 days for serology

		AGAR GEL IMMUNODIFFUSION TEST	
Days Post Vaccination	Treatment	Percent Positive	Geometric Mean Titer (log ₂)
1	Vaccinated	0%	0
1	Contact	0%	0
14	Vaccinated	100%	5.0
14	Contact	90%	4.5

- All Poulvac Bursa Plus vaccinated birds showed protective immunity as quickly as 14 days post-vaccination
- 90% of the contact birds were positive, demonstrating fast spread and immune response

Single Dose Protection Against vvIBD Saves Time and Prevents Losses

- On a commercial broiler farm, sequential flocks were vaccinated with one dose of Poulvac Bursa Plus compared to three doses of an intermediate vaccine
- Mortality and the European Production Index (EPI) were used to evaluate vaccine performance
- Higher EPI numbers indicate improved productivity



- One dose of Poulvac Bursa Plus was more effective than three doses of intermediate vaccine against vvIBD
- Poulvac Bursa Plus helped decrease overall mortality and improve performance

Poulvac Bursa Plus Also Protects Against Subclinical IBD—Trial #1

- A field trial was conducted to assess the benefit of Poulvac Bursa Plus vaccination in the face of a subclinical IBD challenge
- One dose was given between 16 & 20 days of age to almost 1,000,000 broilers

	Number	Average Age at Processing	Average Weight	Mortality	Feed Conversion
Poulvac Bursa Plus	946,618	46.860 days	2.2305 kg.	3.87%	2.03
No Vaccine	981,283	47.065 days	2.2222 kg.	5.47%	2.06
Poulvac Bursa Plus Advantage		.205 days	0.0083 kg.	1.60%	.03

- These production improvements represented an advantage of US\$18,850 per million broilers

Poulvac Bursa Plus Also Protects Against Subclinical IBD —Trial #2

In a broiler operation, Poulvac Bursa Plus was used in combination with Bursine®-2 (*in ovo*) or as a sole vaccination (14-18 days-of-age) and compared to a competitor’s “hot” vaccine.

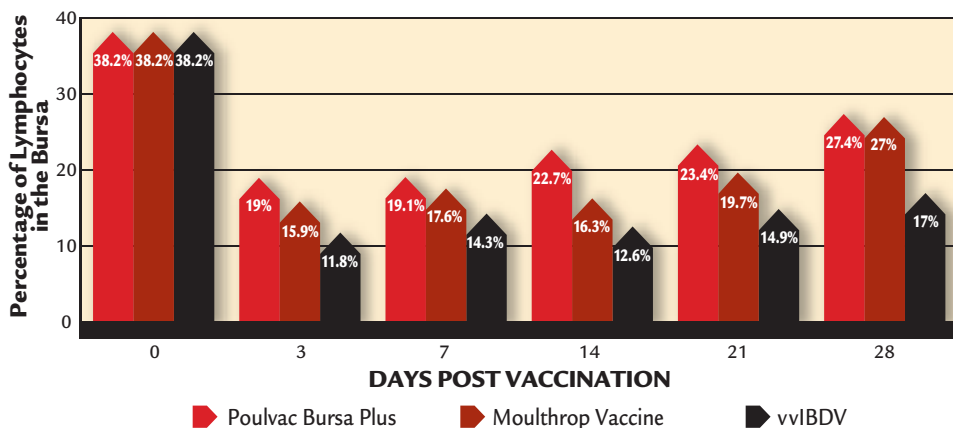
	Age	Body Weight	Daily Weight Gain	Condemnations
Competitor’s “Hot” Vaccine	50.32 days	2908 g	56.42 g	1.28
Poulvac Bursa Plus	50.73 days	2949 g	57.70 g	1.03
Bursine-2 (<i>in ovo</i>) & Poulvac Bursa Plus	50.67 days	3034 g	59.93 g	0.64

- In this trial, Poulvac Bursa Plus alone outperformed the competitor’s “hot” vaccine
- Bursine-2 & Poulvac Bursa Plus combined for excellent protection and improved performance results
- Bursine-2 *in ovo* did not decrease hatchability or increase early mortality



Poulvac Bursa Plus— Rapid Bursal Regeneration

- A trial was conducted comparing Poulvac Bursa Plus, a competitor’s “hot” vaccine and a vvIBDV isolate in SPF pullets
- After a 14-day exposure, bursas were submitted for computer imaging analysis to estimate the percentage of lymphocytes in the bursa

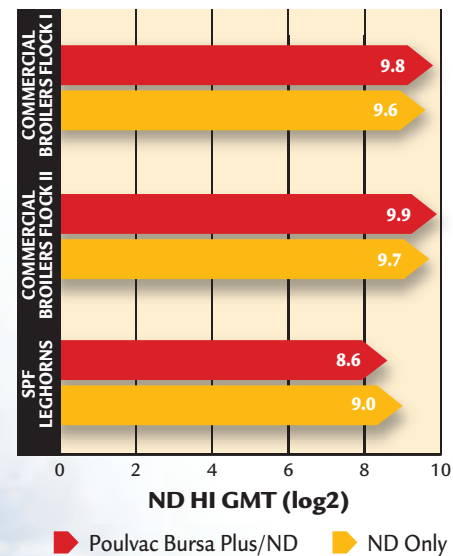


- Poulvac Bursa Plus quickly infected the bursa and regeneration started a week faster than the “hot” vaccine

Poulvac Bursa Plus— No Newcastle Titer Suppression in Broilers & SPF Leghorns

- Two flocks of commercial broilers and one flock of SPF leghorns were divided and half of each was vaccinated at 7 days-of-age with Poulvac Bursa Plus
- All birds received Newcastle disease (ND) vaccine at 21 days-of-age

ND HI titers (GMT log₂) at 49 days-of-age



- Poulvac Bursa Plus did not compromise the Newcastle vaccine response
- Optimum immune response is important to achieve desired performance parameters



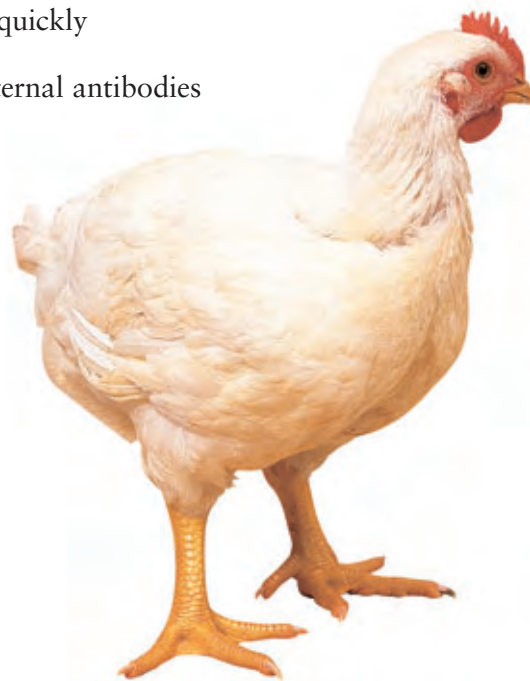
Poulvac Bursa Plus— An Extremely Stable Virus

- Poulvac Bursa Plus was given at a 10x dose and serially backpassaged 10 times in two-week-old SPF leghorns
- The 10th backpassage showed no evidence of reversion to virulence
- No clinical disease and no increase in gross or histological bursal lesions were seen

Protecting Against vvIBDV With Poulvac Bursa Plus— Naturally, the Chosen Product is the Effective Product

When threatened by vvIBDV, effective protection is a requirement, not an option. That's why Poulvac Bursa Plus is the product of choice when a broiler or layer operation is facing challenge from vvIBD. Also, Poulvac Bursa Plus can be used when mild and intermediate IBD vaccines are not sufficiently protecting against subclinical IBD.

- Poulvac Bursa Plus immunizes quickly
- Effective in the presence of maternal antibodies
- Efficient spreadability for complete flock coverage
- Rapid bursa regeneration ensures minimal immune suppression



Leading the Way...

The leader is the one customers prefer by choice. They prefer quality, achievement, innovation and performance. They prefer the one they can trust. This is why Fort Dodge Animal Health has become one of the leading manufacturers of veterinary vaccines in the world—and a leading vaccine producer for the poultry industry.

Leading the Way Requires Technical Support to Provide Local Solutions to a Global Problem

- **Disease Expertise.** Poultry producers have a scientific partner to research and understand how IBD reduces performance.
- **Virus Knowledge.** Fort Dodge Animal Health's know-how and expertise helps provide local solutions to prevent potential IBD losses.
- **Educational Support.** Producers have always been able to rely on Fort Dodge Animal Health for the latest scientific information on IBD.

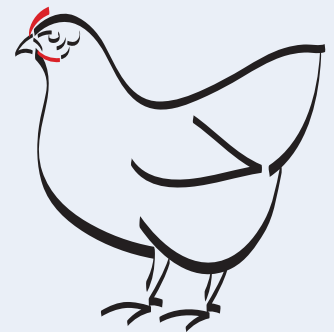
Leading the Way Requires Precise Diagnostic Support

- **Start with the Bursameter.** This simple, effective tool allows for quick, accurate and objective evaluation of bursal health.
- **Add Computer Imaging Analysis.** For many years, Fort Dodge Animal Health has used this innovative technology to quantify bursal damage and estimate time of infection.
- **Complement with Molecular Diagnostics.** Polymerase Chain Reaction (PCR) is followed by either Restriction Fragment Length Polymorphism (RFLP) or sequencing analysis. These state-of-the-art tools identify and characterize IBD strains around the world.

Leading the Way Requires a Solid Reputation

- **Quality, Time-tested Products.** Bursine®-2, Bursine® Plus and Poulvac® Bursa Plus vaccines provide maximum flexibility in vaccination programming... whatever the local IBD challenge. All products are tested and meet global guidelines for purity, potency, safety and efficacy.
- **People and Service.** Experts in IBD around the world ensure the right IBD program provides a local solution to allow customers to maximize profits. And our IBD experts are backed by professionals ensuring timely delivery and product support.
- **Dedication to the Industry.** Few companies can compare to our nearly 100-year dedication to the global animal health industry. Over those years, Fort Dodge Animal Health's commitment to the global poultry industry has helped producers worldwide to maximize profits through improved disease control.
- **Constant Innovation.** Fort Dodge Animal Health uses the latest scientific information and technology to develop the products and applications required to control the evolving IBD challenge around the world.

Fort Dodge Animal Health... A Company that Leads the Way—Isn't that What You'd Prefer?



Protection for Productivity

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