VAXXITEK®
HVT+IBD+ND

FROM THE TRUSTED LEADER IN
IBD VECTOR VACCINE TECHNOLOGY

DESIGNED FOR YOU

Strong immune foundation and
optimized protection against Marek's,
Infectious Bursal, and Newcastle diseases

PREVENTION WORKS
Shaping the future of poultry health

Boehringer Ingelheim

INTRODUCING VAXXITEK® HVT+IBD+ND

Developed by the trusted leader in IBD vector vaccine technology.

HISTORY OF LEADERSHIP: Boehringer Ingelheim introduced herpesvirus of turkeys (HVT) vector vaccines using **one virus to control multiple diseases,** providing game-changing solutions for the poultry industry.

TRUSTED PROTECTION: Launched in 2006, **VAXXITEK® HVT+IBD was the first HVT+IBD vector vaccine** on the market, making it the historic leader in Infectious Bursal disease (IBD) vaccination. Today it has **protected more than 100 billion birds** and is **available in more than 75 countries** around the world.

STRONG SCIENTIFIC BACKING: More than **90 publications** report the benefits of using VAXXITEK® HVT+IBD.

An all-in-one hatchery solution to protect flocks against three diseases.

Building on the **trusted vaccination platform used to develop VAXXITEK® HVT+IBD,** our research and manufacturing experts successfully designed a **3-in-1 vaccine** that provides a strong immune foundation and optimized protection against **Marek's disease (MD), IBD—and Newcastle disease (ND).**

All the benefits of VAXXITEK® HVT+IBD, now designed with ND protection.

3in1

Strong immune foundation and optimized protection against MD, IBD, and ND, for a simplified vaccination protocol in 1 shot[1]

Early onset and long duration of immunity, for protection throughout susceptible periods[1]

Demonstrated safety through the absence of death or severe respiratory clinical signs[1]

VII

Genotype VII ND insert, for broad protection

XXI

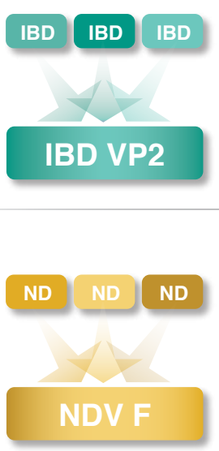
Powered by the manufacturer of VAXXITEK® HVT+IBD, for field-tested know-how

Reference: 1. Data on file. Boehringer Ingelheim Animal Health.

Constructed using the same backbone as VAXXITEK® HVT+IBD.

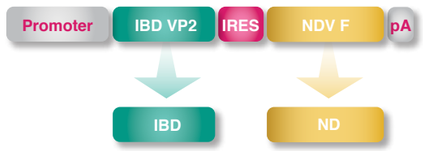
VAXXITEK® HVT+IBD

1 / It all starts with the proven platform of the trusted HVT+IBD market leader.



2 / The selected IBD genetic sequence provides efficient, broad protection against IBD classic, very virulent, and variant viruses.

3 / A genetic sequence was selected from prevalent and virulent ND virus (NDV) to form an NDV fusion (NDV F) insert.[2] This optimized genotype VII sequence enables broad and up-to-date protection against ND viruses.[3]



4 / The insertion site of the NDV F sequence is the same as the infectious bursal disease virus (IBDV) insert coding for the VP2 protein: Faragher strain.

Furthermore, use of only one promoter allows proper gene expression of both viral genes, resulting in a field-proven mechanism of protection.

VAXXITEK® HVT+IBD+ND

5 / The result is the newest addition to the VAXXITEK® family of vaccines. Designed for you.

References: 2. Miller PJ, Haddas R, Simanov L. Identification of new sub-genotypes of virulent Newcastle disease virus with potential panzootic features. *Infect Genet Evol.* 2015;29:216–229. **3.** Alexander DJ. Newcastle disease and other avian paramyxoviruses. *Rev Sci Tech.* 2000;19:443–462.

EFFICIENT PROTECTION AGAINST A VARIETY OF IBDV STRAINS

VAXXITEK® HVT+IBD+ND is approved to provide IBD protection from day 28.

STC classic IBDV challenge[4]:

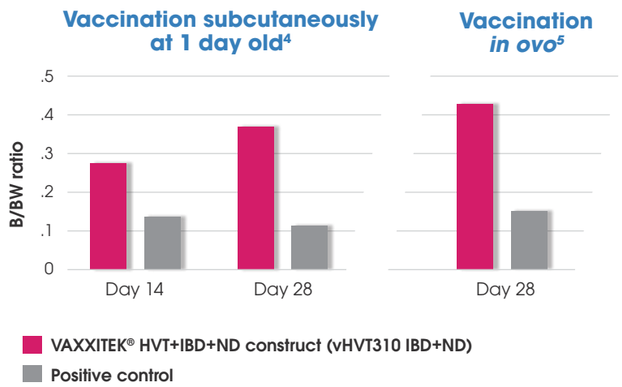
- VAXXITEK® HVT+IBD+ND construct (vHVT310 IBD+ND) was administered subcutaneously to specific-pathogen-free (SPF) chickens that were then challenged at day 28 post-vaccination.
- **100% protection** was demonstrated at day 28.

Level of protection against STC classic IBDV following subcutaneous route at 1 day old

Vaccine	Administration	Challenge	Level of protection (Day 28)
VAXXITEK® HVT+IBD+ND	Subcutaneous (1 day old)	STC classic	100%

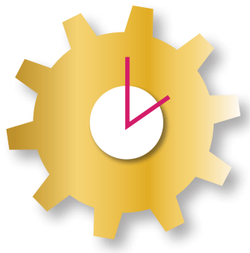
IBDV VAR-E challenge[4,5]:

- VAXXITEK® HVT+IBD+ND construct (vHVT310 IBD+ND) was administered subcutaneously or *in ovo* to SPF chickens that were then challenged at 14 or 28 days of age.
- Vaccinated chickens showed **significant differences in bursa-to-body weight (B/BW) ratio** compared to positive control.
- Immunity was demonstrated from **14 days** of age following subcutaneous administration. Additionally, protection was shown at **28 days** of age following *in ovo* administration.



Faragher classic IBDV challenge[6]:

- A European study was performed where day-old SPF chickens were vaccinated subcutaneously with VAXXITEK® HVT+IBD+ND construct (vHVT310 IBD+ND) and challenged at day 21 post-vaccination.
- **100% protection** was demonstrated at day 21.



IMMUNITY STARTS TO DEVELOP EARLY AND IS DEMONSTRATED AGAINST CLASSIC **IBDV**

VAXXITEK® HVT+IBD+ND protects efficiently against both classic and variant E IBDV throughout the IBD susceptibility period and acts as the cornerstone of your hatchery vaccination program.

References: 4. Merial Select, Inc., 2016, Report number 16-083. **5.** Merial Select, Inc., 2017, Report number 16-194.
6. Boehringer Ingelheim R&D, 2018, Report number 16-0325.

PROVEN PROTECTION AGAINST VELOGENIC NDV

VAXXITEK® HVT+IBD+ND

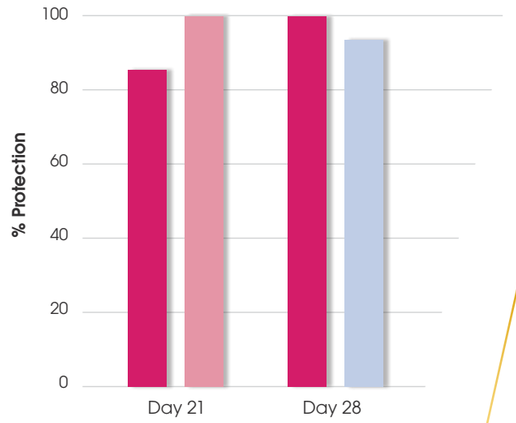
Designed to provide rapid and long-lasting protection.[7–9]

SPF chickens were vaccinated with VAXXITEK® HVT+IBD+ND construct (vHVT310 IBD+ND) subcutaneously at day 1 and then challenged with a velogenic GB Texas ND virus at 21, 28, and 84 days post-vaccination, or Herts 33 at day 21 post-vaccination. SPF chickens vaccinated *in ovo* were challenged at day 28 with velogenic GB Texas ND virus.

- Chickens vaccinated subcutaneously at 1 day of age showed clinical protection against velogenic ND virus from **day 21**: 85% of birds are protected against NDV GB Texas. In Europe, birds showed 100% protection against NDV Herts 33.
- *In ovo* and subcutaneous administration demonstrated protection against velogenic NDV GB Texas at day 28 post-vaccination.
- No level of protection was demonstrated in negative controls.

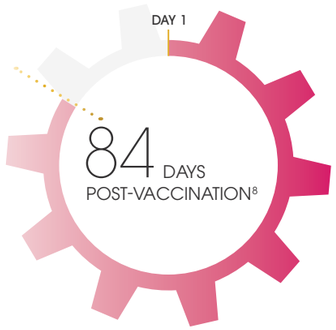
VAXXITEK® HVT+IBD+ND is approved to provide early onset of immunity against NDV from day 28.

Onset of immunity against ND[7–10]



Duration of immunity[11]

Protection against velogenic ND virus demonstrated at day **84 post-vaccination**



Subcutaneous or *in ovo* administration of VAXXITEK® HVT+IBD+ND provides early onset and long duration of immunity against a NDV velogenic challenge.

References: 7. Merial Select, Inc., 2017, Report number 16–191. **8.** Merial Select, Inc., 2018, Report number 16–190.
9. Merial Select, Inc., 2017, Report number 16–0499. **10.** Merial Select, Inc., 2016, Report number 16–084.
11. Boehringer Ingelheim Merial Select, Inc., 2017, Report number 16–171.

PROVEN PROTECTION AGAINST MD

Demonstrated onset of immunity to MD.

Label indication confirms that MD immunity has been demonstrated from **5 days of age** by both *in ovo* and subcutaneous administration.

Level of MD protection through *in ovo* and subcutaneous administration[12,13]

Vaccination	Challenge	% Protection *in ovo*	% Protection subcutaneous
VAXXITEK® HVT+IBD+ND	vMDV* GA22	85.7%	82.9%
Negative control		3.0%	2.9%

* Virulent Marek's disease virus.

Safety comparable to existing HVT vector vaccines.[14]

SPF chickens were vaccinated *in ovo* with a high dose of the VAXXITEK® HVT+IBD+ND.

- Vaccinated chickens showed no clinical signs throughout observation period.
- No significant difference in body weight was observed compared with negative controls.

VAXXITEK® HVT+IBD+ND has been proven to remain safe and stable, and to not revert to virulence after five passages in SPF chickens.[15]

References: 12. Merial Select, Inc., 2018, Report number 16-189. **13.** Merial Select, Inc., 2018, Report number 17-111. **14.** Merial Select, Inc., 2017, Report number 16-187. **15.** Boehringer Ingelheim R&D, 2017, Report number 17.0107.R.

ONE INJECTION. MULTIPLE BENEFITS. IMMEASURABLE PEACE OF MIND.

References: 16. Morton DB. Vaccines and animal welfare. *Rev Sci Tech.* 2007;26(1):157–163. **17.** Lemiere S, Rojo F, Fernandez R, et al. Benefits of the herpesvirus of turkey vector vaccine of infectious bursal disease in control of immune-depression in broilers and decrease of use of antibiotic medication. In: Proceedings from the XVIIIth Congress of the World Veterinary Poultry Association Congress; August 19–23, 2013; Nantes, France. Abstract. **18.** Hoelzer K, Bielke L, Blake DP, et al. Vaccines as alternatives to antibiotics for food producing animals. Part 2: new approaches and potential solutions. *Vet Res.* 2018;49:70. **19.** Atienza JC, Nagera AJ, Martinez PO, et al. Evaluation of a herpesvirus of turkey vector vaccine inducing protection against infectious bursal and Marek's diseases (VAXXITEK® HVT + IBD) under Philippines field conditions. In: Proceedings from the XXIII World's Poultry Congress; 29 June 29–July 4, 2008; Queensland, Australia. **20.** Rautenschlein S, Lemiere S, Simon B, Prandini F. A comparison of the effects of the humoral and cell-mediated immunity between an HVT-IBD vector vaccine and an IBDV-immune complex vaccine after in ovo vaccination of commercial broilers. In: Proceedings from the XVIIth Congress of the World Veterinary Poultry Association Congress; August 14–August 18, 2011; Cancun, Mexico:830–843. **21.** Tang SF, He SJ, Li WM, Lemiere S. Field experience of vaccination in day-old broiler chickens with a herpesvirus turkey-infectious bursal disease (HVT-IBD) vector vaccine in different systems of chicken production across China. Poster presentation. In: Proceedings from the XVIIth Congress of the World Veterinary Poultry Association Congress; August 14–August 18, 2011; Cancun, Mexico: 920–926. **22**. Zhou X, Wang D, Xiong J, Zhang P, Li Y, She R. Protection of chickens, with or without maternal antibodies, against IBDV infection by a recombinant IBDV-VP2 protein. *Vaccine.* 2010;28:3990–3996.

To learn more about VAXXITEK® HVT+IBD+ND, contact your Boehringer Ingelheim representative.

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