A Survey of Infectious Bronchitis – Field Traps Confusing a Proper Diagnosis

Wojciech Hodorowicz, Ehud Ashash
Phibro Animal Health
wojciech.hodorowicz@pahc.com

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Introduction

Understanding the Infectious Bronchitis (IB) epidemiology and improving immunity against Infectious Bronchitis Virus (IBV) requires not only knowledge of the regional epizootic situation, but also what is happening on a specific farm. Studies conducted during 2022-2025 in Central and Eastern Europe included 294 samples (dry cloacal swabs or FTA cards), from 96 farms that were analyzed using RT-PCR based on S1 gene and nucleotide sequencing ±330 bp encoding a hypervariable region of S1 protein with phylogenetic analysis. Results from selected, particularly difficult to diagnose farms show that field infection caused by IBV may occur at any age, with more than one genotype of IB field virus with similar clinical signs. In addition, the detection of the virus causing the disease can be challenging because some vaccine strains can mask the presence of some field strains. We also found that it is not enough to collect a sample from one house in the farm to properly understand the epidemiological situation. The generally accepted conclusion shown in this study is that optimum IB protection is best achieved using homologous genotype of viruses, which allows for the elimination of virulent genotype from the farm.
In summary, we demonstrate that the use of well-selected homologous vaccines containing, if needed, more than one IB virus serotype in a vaccination program is justified to create an effective vaccination program. Accurate knowledge of the type and frequency of occurrence of IBV serotypes should enable the creation of the most effective vaccination schedule.

Keywords: *avian infectious bronchitis, IB control, IBV in Europe, IB vaccines, IBV strain differentiation*

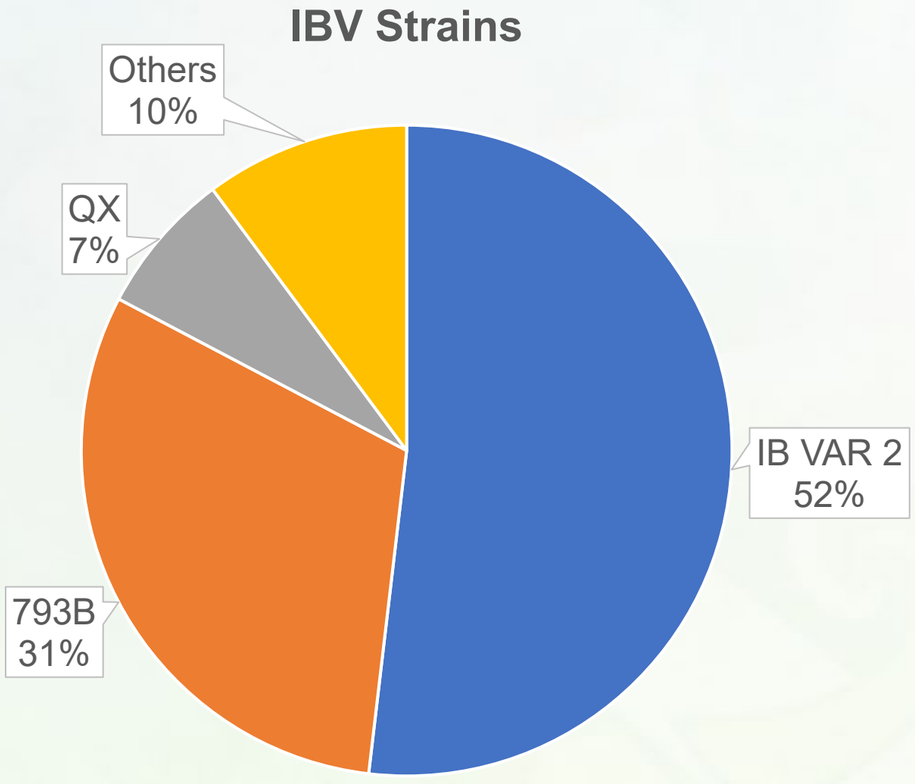
Material and Methods:

Samples: 294 samples collected from 96 farms with respiratory clinical signs or with previous finding of IB located in Poland, Latvia, Ukraine, Romania and Belarus (198 broilers, 54 layers, 42 breeders).
Type of samples: Dry cloacal swabs
Lab test: Conventional PCR or RT-PCR based on S1 gene (±330 bp encoding a hypervariable region of the IB S1gene)

Labs:
Clinic for Poultry and Fish Medicine, University of Veterinary Medicine, Vienna, Austria; Accredited Laboratory PSID No. 0264 according EN ISO/IEC 17025:2005 Notification BMWFW-92.221/0642-I/12/2017 Anicon Lab, Accreditation based on DIN EN ISO/IEC 17025 by DAkkS Deutsche Akkreditierungsstelle GmbH. Accreditation applies to methods listed. D-PL-14290-01-00

Results:

Samples	IB VAR 2	IB 793B	IB QX	Others IBV: D274, Mass, B1648, V1397, Q1, D181, Gua/Xin, Vaccine
294 pcs	153	91	21	30
%	52	31	7	10



Multi-serotype Infection

- Poland, layers farm/same sampling date/same vaccination schedule/same lab
- 3x different ages/3x different houses/3x different results (field viruses):
  - Flock 37w - **Var2** field strain
  - Flock 53w - **B1648** new field strain
  - Flock 69w - **793B** field strain

Recurrent Character of IBV

Multiage broiler farm, Belarus

- **Var2** detection / clinical form / **TAbic® IBVAR206** for 4 cycles then alternate schedule - “protectotype”
- After next 3 cycles problem returned in 1 cycle at whole farm
- Re-introduction of **TAbic IBVAR206** solved the problem

Diagnostics Misleads

- Multiage broiler farm Ukraine
- 793B vaccination stopped, but...
- 793B vaccine strain still detected after nine months!!!
- Final result - infection and clinical disease caused by field strain **Var2**

Multi-serotype Infection

- Broiler farm Ukraine/sampling age 42d /same vaccination schedule
- 2x different houses/ 2x different results (field viruses detected Rt-PCR):
  - House 6 - **Var2** field strain
  - House 3 - **QX** field strain

Conclusions:

- IB Var2 (IS/1494/06 GI-23) field virus infections appear as the dominant IB strain in CEE Region: 52% of all IB clinical cases are caused by IS/1494/06 field virus.
- IS/1494/06 appeared in birds vaccinated with the standard multi-strain programs (Mass+793B+QX) and clearly, this solution is unable to provide sufficient protection.
- IB strains can co-circulate in farms of more than one house so, for a reliable IB strain diagnosis, it is not enough to take only one PCR sample from one house in the farm, even if all the houses present the same clinical signs.
- IBV infection is recurrent - discontinuation of vaccination most often causes the recurrence of field strains and the clinical form of the disease.
- Some vaccine strains (e.g. 793B) can be detected at the farm for several months after stopping use and may therefore mask a true infection with another IBV field strain.
- Effective IB Var2 (IS/1494/06 GI-23) protection should be based on accurate, up to date epidemiology and use of homologous vaccine strains.

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