

# Infectious bursal disease: How a surveillance program helps set up successful vaccination programs.

Infectious bursal disease (IBD) is one of the most prevalent disease challenges in chicken production. By conducting surveillance, producers can understand which IBD types are present in their flocks and when the virus is likely to infect birds. This information can then be used to help develop effective IBD vaccination programs.

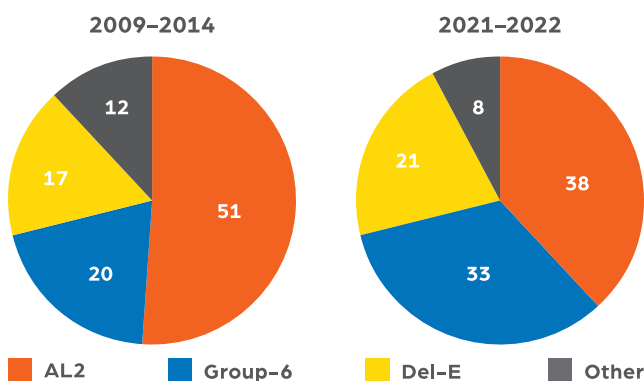
## About infectious bursal disease virus

Infectious bursal disease virus (IBDV) is a highly infectious viral disease that infects young chickens and can cause permanent immune suppression in birds 3 weeks of age or younger.<sup>1</sup>

Immune-suppressed birds are more likely to be infected by secondary bacteria such as *Escherichia coli*.<sup>2,3</sup> Facing a weakened immune system due to IBD, the secondary pathogens are more likely to cause further health challenges and performance losses.

Another challenge with IBDV is that the virus frequently mutates, leading to a wide range of antigenic variation in the field, both over time and across locations (see pie charts below).<sup>1</sup> AL2 is the predominant variant type in the broiler industry, recovered from nearly half of all sampled flocks during the 2009-2014 period, although Group-6 type viruses have increased in prevalence more recently.<sup>1</sup>

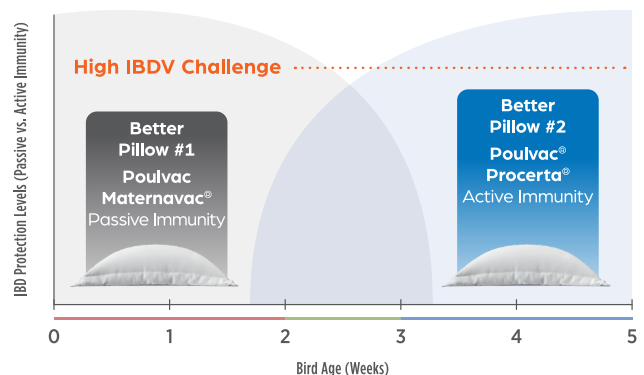
Percent Prevalence of IBDV Types Over Time



With multiple types of IBDV, it is important to choose a vaccine that provides protection against the predominant variants. The best way to know which viral challenges a flock is facing is to participate in a bursal surveillance program.

## Only Strong Breeder and Progeny Programs Can Cushion Against Early and Late IBDV Challenges

Both immunity pillows cushion birds from IBD-related immune suppression.



Breeding chickens are vaccinated against IBDV, providing newly hatched chicks with maternal antibodies, which help protect their chicks during the first two to three weeks of life (the first “pillow of protection”). Chicks can also be vaccinated — usually in the hatchery — to set up the chick’s immune system to provide active immunity (the second pillow of protection).

As maternal antibodies start to wane around 14 days of age, hatchery vaccinations can help transition chicks to active immunity, ensuring there are no gaps in coverage, especially when chickens are raised in high-challenge environments.<sup>4</sup>

## Establishing and conducting IBD surveillance.

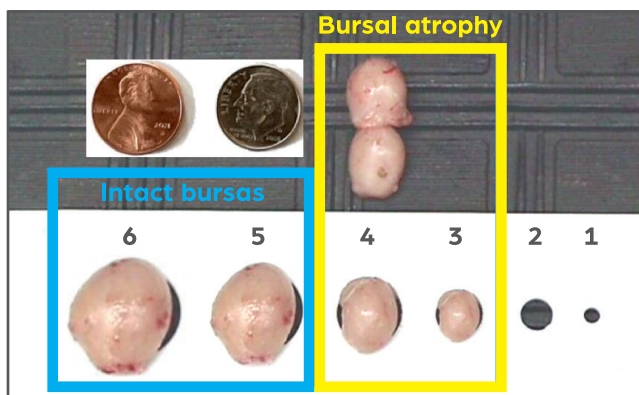
In order to counter active IBDV challenges and develop appropriate vaccination programs, it is important to routinely assess bursal health in young chickens. Surveillance could be conducted proactively to determine which virus types are infecting at what age in a complex in order to gauge immune suppression potential and develop an IBD vaccination program, while others may conduct surveillance on vaccinated broilers to document its cushioning or “Pillow 2” effect.

Since Zoetis conducts the surveillance programs in-house, reports offer more granularity to the PCR sequencing results so customers can see exactly which virus types they are dealing with, how they may be changing over time and can fine-tune their vaccination programs to align with their field challenge.

When samples are shipped to the diagnostic laboratory, additional information such as vaccine and clinical history are important to include as they provide relevant information needed to develop subsequent recommendations.

Zoetis recommends sampling chickens when they are 18-32 days of age to best determine the window of field challenge and sequence virus types. We don’t usually sample before 17-18 days because percent yield of active infections/damage usually goes way down and we can still estimate infections by 2 weeks of age based on the 18 to 22-day results.

At collection, bursas should also be measured and scored with a bursameter (example shown). This gives valuable information regarding the window of infection and the level of cushioning provided by vaccination.



Bursameter scores in 3-week-old broilers, showing relative bursal sizes.

Figure 1. Example of a bursameter and recording sheet used to assess bursal atrophy caused by IBDV.

### Collecting Bursa Samples

- ✓ Collect from about a dozen farms in a chicken complex
- ✓ Collect five to six bursas per flock from normal healthy birds
- ✓ Measure bursas using bursameter
- ✓ Place bursas on ice during collection; cool as soon as possible
- ✓ Freeze bursas for PCR testing on the same day as collection
- ✓ Ship hard/frozen bursas on ice (dry ice in summer) to diagnostic lab; include completed sample submission form

## Interpreting IBDV surveillance results

When the laboratory completes its testing, customers/clients receive a report\* summarizing results for bursameter scores, PCR results and genetic analysis of detected viruses (if sequenced; see examples). Kalen Cookson, DVM, MAM, DACPV director of clinical research, Zoetis, also provides comments on the results, which customers can evaluate with their own veterinarians.

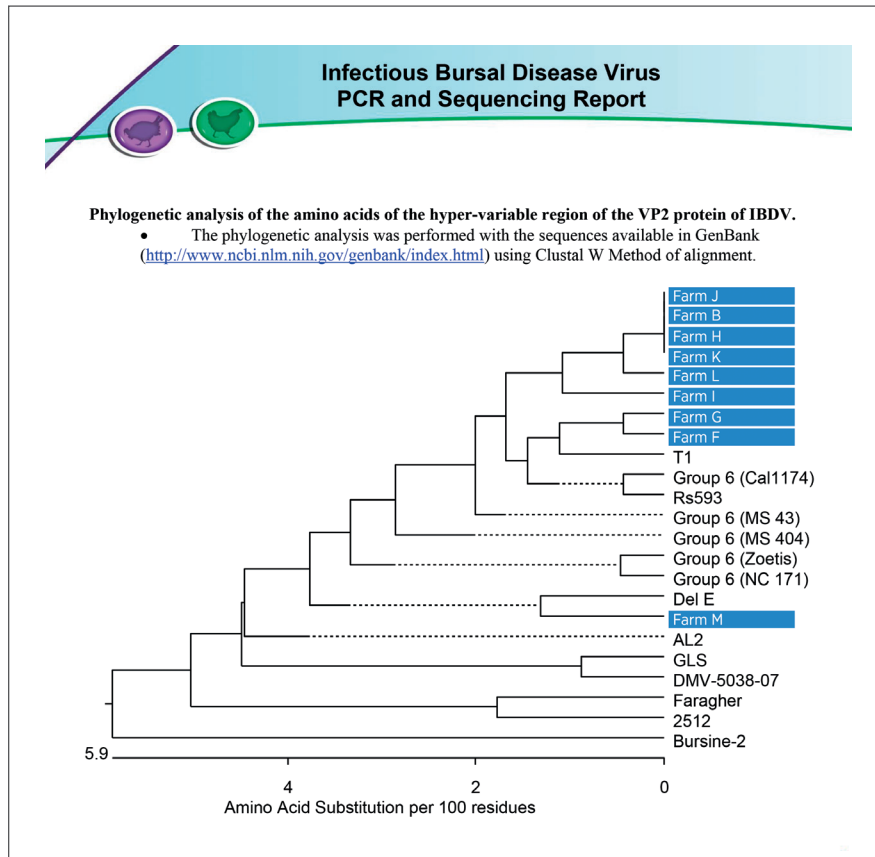
With these results, users can determine which IBD types are present in a flock and when birds are becoming infected, so vaccination programs can be developed to target those challenges.

### Results Summary

Sample	Farm	Age	Bursameter Scores	PCR Result/CT	% Homology
622-0043-1	Farm A	23	5,5,5,5,6	39.545	N/A
622-0042-1	Farm B	26	4,4,5,5,5	26.544	Group 6 (MS 43) (99.1%)
622-0043-2	Farm C	26	5,5,5,5,7	39.501	N/A
622-0043-3	Farm D	26	4,4,5,5,6	39.712	N/A
622-0043-4	Farm E	27	4,5,5,5,5	39.410	N/A
622-0043-5	Farm F	27	4,4,4,4,4	30.179	Rs593, T1 (98.2%)
622-0042-2	Farm G	29	4,4,4,4,4	31.654	Rs593, T1 (97.4%)
622-0042-3	Farm H	30	5,6,6,6,6	27.647	Group 6 (MS 43) (99.1%)
622-0042-4	Farm I	30	5,5,5,5,5	26.964	Group 6 (Cal 1174) (98.2%)
622-0042-5	Farm J	33	3,4,4,4,5	30.285	Group 6 (MS 43) (99.1)
622-0042-6	Farm K	34	4,5,5,5,5	30.191	Group 6 (MS 43) (99.1)
622-0042-7	Farm L	38	4,4,5,5,5	35.220	Group 6 (MS 43) (98.2)
622-0043-6	Farm M	44	6,6,6,6,6	28.974	Del-E (97.4)

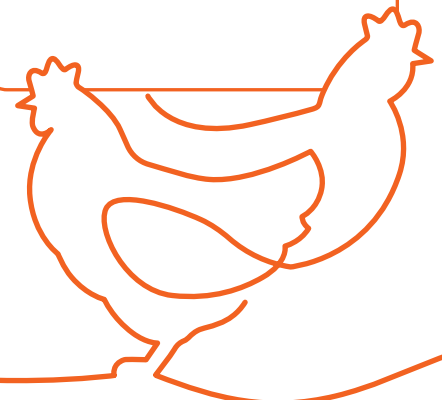
Negative: Ct>40    Suspect Positive: 35-39.9    Positive: <35  
 \*\*N/A=Unable to sequence

**Figure 2.** Sample summary report table showing surveillance results from a broiler complex. In this case, most positive flocks are facing a Group-6 variant IBD challenge starting between 3 to 3-1/2 weeks of age.



**Figure 3.** Additional results page showing a phylogenetic tree of the samples. Blue bars show how individual farms within this broiler complex are related to common IBD variant types.

Contact your Zoetis representative to discuss current IBD challenges and enroll in an annual IBD surveillance program.



\*Zoetis may provide a summary or report for informational purposes only. Such information is not intended to be a specific recommendation or advice. At all times, customer agrees to consult with its own veterinarian of choice.

<sup>1</sup> Anderson T, Barker A, Strickland J, Cookson K, Da Costa M, Schaeffer J. An update of wild type IBDV from diagnostic bursal surveys of broiler flocks in the United States since 2009, in *Proceedings*. International Poultry Science Forum, Atlanta, Georgia. 2023.

<sup>2</sup> Cookson K, Macklin K, Giambone J, Toro H. The influence of *E. coli* inoculum titer and virally induced immune suppression on the incidence of cellulitis in a broiler skin challenge model, in *Proceedings*. Western Poultry Disease Conference. 2007.

<sup>3</sup> Dey S, Pathak DC, Ramamurthy N, Maity HK, Cellappa MM. Infectious bursal disease virus in chickens: prevalence, impact, and management strategies. *Vet Med* 2019;(10):85-97.

<sup>4</sup> Cookson K, Da Costa M, Dickson J, Schaeffer J. Broiler protection and performance trials of the newest HVT-IBD recombinant vaccine against AL2 and Group-6 IBDV challenges, in *Proceedings*. AAAP Meeting. 2022.