Nobilis® IB 4/91

Widening the range of IB protection

Broad Protection

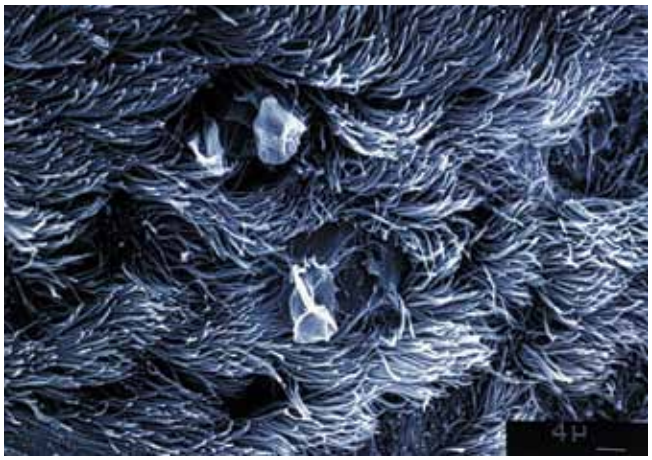
MSD Animal Health

Infectious Bronchitis

IB continues to be a cause of major economic losses in the poultry industry

Disease caused by IB virus

Infectious Bronchitis is a highly contagious disease, causing tracheal rales, coughing and sneezing. In broilers economic losses occur through poor performance (decreased weight gain and increased feed conversion). An increased susceptibility to secondary infections increases the mortality rate and the cost of antibiotic therapy. Nephropathogenic strains of IB cause kidney failure and an increased mortality rate. In laying flocks IB causes a drop in egg production and changes in egg quality. If infection occurs at an early age there may be permanent damage to the oviduct.



The normal surface of the trachea is covered mostly by cilia. The cilia protect the lower respiratory tract by trapping and removing pathogens and small particles

Following IB infection, the cilia on the epithelial cell surfaces are destroyed. The protective effect is thus lost, allowing the invasion of secondary pathogens.
This effect can be quantified using the ciliostasis test.

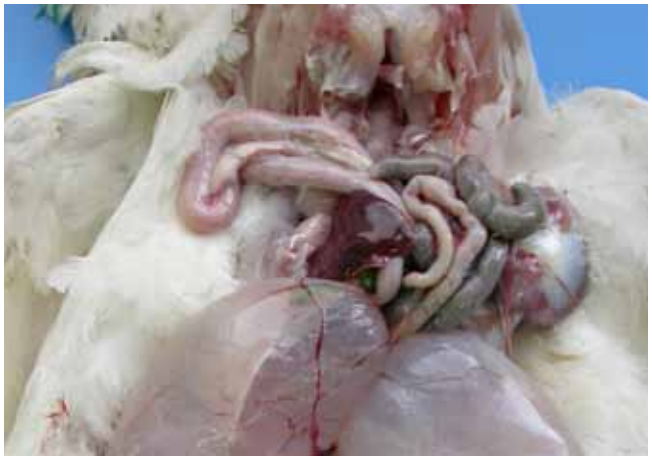
Infectious Bronchitis

Clinical signs

Birds of all ages are susceptible to infection but the clinical signs may vary. The first recognized and most conspicuous signs are the respiratory signs, hence the name Infectious Bronchitis. However, the pathogenicity of the virus for the oviduct in very young chicks or birds in production is often more important. The kidneys may also be affected.

The following may be seen:

Young chickens are depressed and huddle under the heat source.
Respiratory signs - gasping, coughing, tracheal rales and nasal discharge.
Birds in lay have a marked drop in egg production and an increased number of poor quality eggs may be produced.
The external and internal quality of the eggs may be affected, resulting in misshapen or soft-shelled eggs with watery content.
The hatchability rate of the eggs can be severely affected.
When the kidneys are affected, increased water intake, depression, scouring and wet litter.



Post mortem examinations of birds infected with the QX virus frequently show either cystic oviducts with watery contents that could exceed one litre or (partially) atrophic oviducts with large cystic dilatations. The walls of the oviduct are thin and transparent in the cystic areas. The ovaries in the birds are functional and look normal.

Distended oviduct of a hen infected with IB variant QX virus. Notice the large amount of transparent fluid and the functional, normal looking ovary.

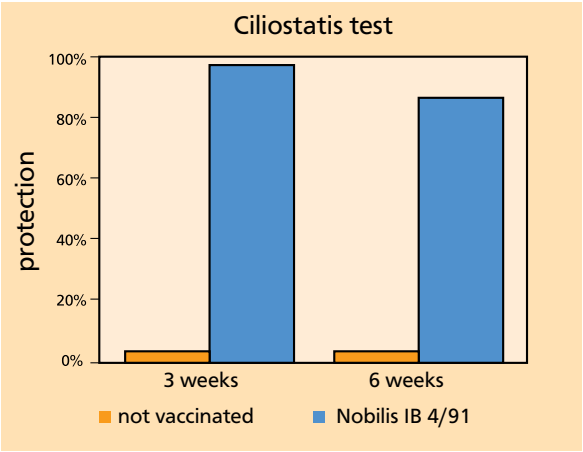
Nobilis® IB 4/91

Innovative vaccine improves performance

Proven immunity against 4/91 challenge

Experiment with layers vaccinated at day-old with Nobilis IB 4/91.

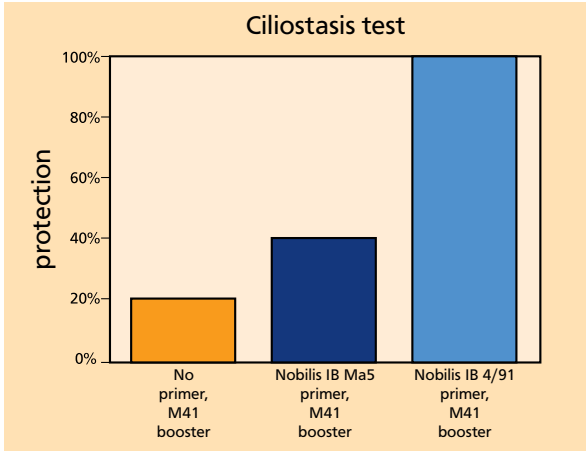
IBV 4/91 challenge, 3 or 6 weeks after vaccination.



Conclusion: Nobilis IB 4/91

is capable of inducing high and sustained levels of protection against IBV 4/91 challenge.

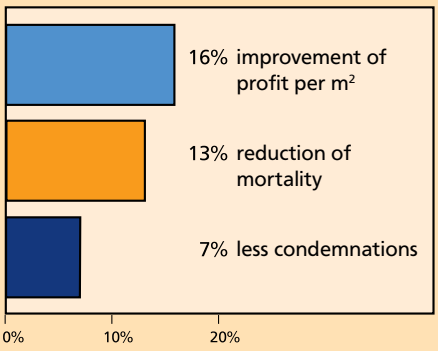
Experiment with layers primed with Nobilis IB 4/91 or Nobilis IB Ma5 and boosted with an inactivated IB M41(Massachusetts) vaccine.
IBV 4/91 challenge, 4 weeks after booster vaccination.



Conclusion: Nobilis IB 4/91

is an effective primer for inactivated M41 to induce protection against IBV 4/91 challenge.

Higher profit per m^2 in broilers



25 broiler problem sites with over 2.5 million broilers had evidence of IBV 4/91 field infections.

Two subsequent production cycles were compared.

Birds in the first cycle were vaccinated with 2 doses of IB H120 (at day 1 and 10); the second cycle used IB H120 (day 1), followed by Nobilis IB 4/91 (day 10).

The second cycle showed a significant reduction in mortality and condemnation rate and an increase in profit per m2.

Nobilis® IB 4/91

Protectotype™

and Serotypes

"From a practical point of view it may be more relevant to think in terms of protectotypes rather than serotypes"

(Dr. J. Cook, 1998)

New serotypes of IBV can emerge as a result of a few aminoacid changes in the genome of the virus. As most of the virus genome remains unchanged there is a level of cross protection between different strains. With the continuous emergence of new IB strains, the level of cross protection induced by currently available vaccines needs to be evaluated. For practical purposes, IBV strains can be grouped into protectotypes, according to the protection achieved by vaccine strains.

Ciliostasis test

The ciliostasis test measures the effect of a virus on the tracheal mucosa. The test is also used to evaluate protection after vaccination. Level of protection is expressed as a percentage; values of 50% or above imply an active cilia layer with good protection. Values below 50% imply poor protection. A vaccinated bird that is subsequently challenged will have an active cilia layer if adequately protected.

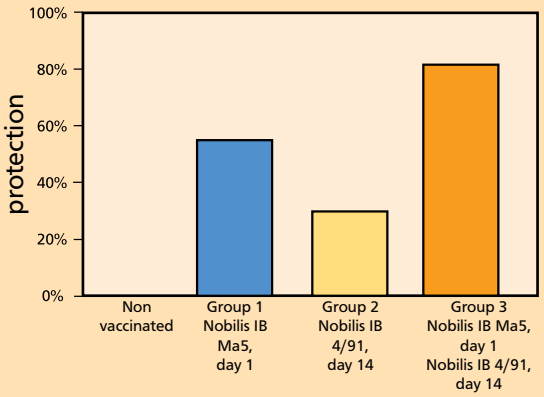
Evaluation of Cross Protection

Four groups each of 10 SPF birds
Vaccinated with Nobilis IB Ma5 at day
Vaccinated with Nobilis IB 4/91 at 14 days
Nobilis IB Ma5 at day 1 and Nobilis IB 4/91 at day 14
Non vaccinated
Challenged with different field isolates at 5 weeks of age.
Ciliostasis test 5-7 days post challenge.

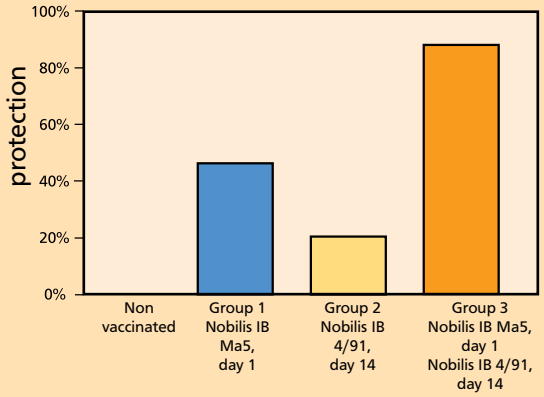
CONCLUSION

Broad protection is achieved through the use of Nobilis IB Ma5 at day1 and Nobilis IB 4/91 at day 14.

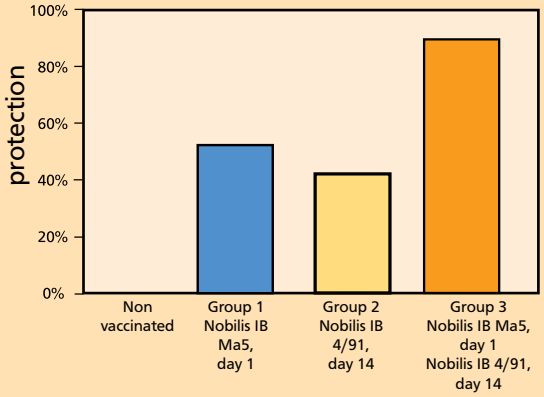
Protection against: South American IBV isolate
Ciliostasis test



Protection against: African IBV isolate
Ciliostasis test



Protection against: Asian IBV isolate
Ciliostasis test



Nobilis® IB 4/91

Protectotype™ and IB variants

Infectious bronchitis virus variant D388 (QX)

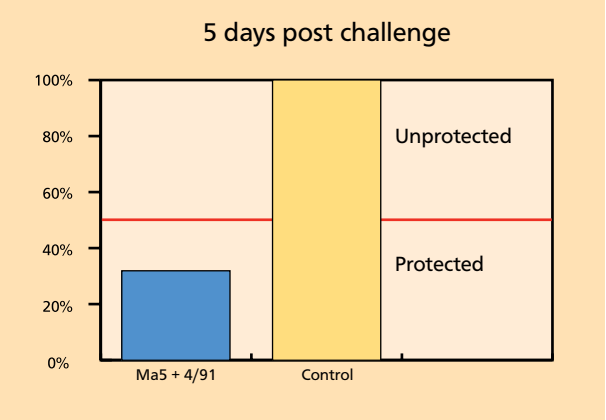
Since 2004, severe egg production problems have been reported in The Netherlands. Also respiratory signs have been reported in broilers older than 4 weeks of age. In birds in production the problems are characterized by a low production rate with peak levels reaching only between 30% to 55% in apparently healthy flocks*. These cases were associated to earlier outbreaks of nephropathogenic infectious bronchitis that had occurred in 2003 in broilers and pullets from which an unidentified variant IB virus was isolated. This original isolate was similar to a Chinese isolate known as QX. The Dutch isolate was later named D388 by the Animal Health Service at Deventer in the Netherlands.

Similar findings have later on been reported in other countries in Europe and other parts of the world.

* Immature, atrophic or thin walled and cystic oviducts were a common finding in necropsied birds in the affected flocks.

Protection when using Nobilis 4/91 against D388 (QX) challenge

Initial experiments carried showed that a single application of a live vaccine of the Massachusetts serotype does not confer sufficient protection against challenge with the D388 isolate. Better protection is achieved when vaccines of other serotypes are included in the vaccination program. For example, giving an initial vaccination at 1 day of age with a live Massachusetts type of vaccine (for example Nobilis® IB Ma5) followed by revaccination at 14 days of age with a live vaccine of the 4/91 type. This reinforces the importance of the concept of Protectotypes™ (for more information see Serotypes and Protectotypes)



Nobilis® IB 4/91

Widening the range of IB Protection

Nobilis IB 4/91:

A live attenuated IB vaccine effective against IB virus strain 4/91.
Broad protection against many other IB variants in combination with Nobilis IB Ma5.
Proven safety.
Can be applied via spray, eye drop or drinking water.
Does not interfere with existing vaccination programmes.
Nobilis IB 4/91 is an effective primer for inactivated IB Massachusetts booster before lay.

Broad Protection against Infectious Bronchitis

Nobilis IB 4/91

Can be used as a single component vaccine, or it may be used in the same vaccination program with Nobilis IB Ma5, as suggested below.

Suggested vaccination schedule

Vaccination age	Day 1	Day 14	8 Weeks	12 - 14 Weeks	16 - 18 Weeks
Layers and breeders	Nobilis IB Ma5*	Nobilis IB 4/91	Nobilis IB Ma5	Nobilis IB 4/91	Nobilis IB multi**
Broilers	Nobilis IB Ma5*	Nobilis IB 4/91	a	a	a

*Nobilis IB Ma5 may be administered in combination with ND vaccine Nobilis Clone 30 (Nobilis Ma5 + Clone 30)
** In countries where Nobilis IB multi is not available, single inactivated Massassuchets type IB vaccine can be used

Description

Nobilis IB 4/91 is a live, freeze-dried vaccine against Infectious Bronchitis serotype 4/91. Each dose contains at least 3.6 log10 EID_{50} of the IB virus strain 4/91.

Indication

Active immunisation of chickens against disease caused by Infectious Bronchitis virus serotype 4/91 or serologically related types.

Malo, A., Orbell, S.J., di Fabio, J., Huggins, M.B., Woods, M.A. & Cook, J.K.A.(1998). Cross protection studies after the use of live-attenuated IBV 4/91 and Massachusetts vaccines. In: Proceedings of the Forty-Seventh Western Poultry Disease Conference, Sacramento, California, pp 62-64.

Administration

The vaccine can be administered by spray, eyedrop or in the drinking water.

Presentation

Nobilis IB 4/91 is available in sphereon containing 1000, 2500 or 5000 doses.

Visit www.infectious-bronchitis.com

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