

Poultry World

Avishield IB QX: A European success story in IBV vaccine development

Infectious Bronchitis Virus (IBV) remains one of the most economically important viral diseases affecting the global poultry industry. Among the many IBV genotypes that have emerged in recent decades, the QX variant (GI-19 lineage) has become particularly important because of its spread, broad tissue tropism and impact on poultry production.

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Developing an effective vaccine against IBV QX became a priority for poultry health professionals. However, taking a live attenuated IBV vaccine from a field isolate to an authorised veterinary medicinal product in the European Union is a demanding process. The development of [Vaxxinova's Avishield IB QX](#) illustrates how scientific development, extensive testing and regulatory compliance can be translated into a practical tool for IBV control.

The challenge of IBV QX

First reported in China during the late 1990s, IBV QX subsequently spread through Asia, the Middle East and Europe. The virus strain belongs to the GI-19 lineage and has been associated with respiratory disease, nephritis, increased mortality and reduced performance. In layers and breeders, infection may cause reduced egg production, poor egg quality and false-layer syndrome following infection early in life.

Unlike 'classical' respiratory IBV strains, the QX strain can vary in pathogenicity and tissue tropism, which adds complexity to disease control. The emergence and persistence of the QX field strain created a need for the development of homologous vaccination strategies designed to provide targeted protection against this important field genotype.

Developing a live attenuated QX vaccine

Live attenuated IBV vaccines have been used successfully since the 1950s, but developing a new live vaccine remains complex. Attenuation must achieve the right balance between safety and efficacy: excessive attenuation may reduce immune stimulation and protection, whereas insufficient attenuation may compromise safety.

Avishield IB QX was developed from a QX field isolate originating from Germany. The strain, designated QX 1285, was attenuated through serial passage in embryonated specific pathogen-free (SPF) eggs. Multiple passages were required to establish a suitable balance between attenuation and immunogenicity.

Throughout development, the candidate strain was repeatedly assessed to confirm that it retained the ability to stimulate protective immunity while meeting the safety requirements for a live poultry vaccine.



The development of a QX-type IBV vaccine involved laboratory testing, field trials and extensive safety and efficacy assessments.

Meeting Europe's regulatory standards

The European Union applies some of the world's most demanding standards for live veterinary vaccines. Before approval, manufacturers must demonstrate both safety and efficacy according to European Pharmacopoeia requirements.

For a live IBV vaccine, safety studies must assess:

- Administration at the recommended dose and overdose.
- Potential reversion to virulence.
- Spread of the vaccine strain.
- Distribution and persistence of the vaccine virus in vaccinated birds.
- Effects on reproductive performance.

Efficacy studies must demonstrate:

- Onset of immunity.
- Duration of immunity.
- Performance in the presence of maternally derived antibodies (MDA).
- Effectiveness under field conditions.

Demonstrating early protection

One of the first critical efficacy milestones is demonstrating onset of immunity.

In SPF chickens, the vaccine produced 90% protection when administered by spray at one day of age. Administration through drinking water at seven days of age provided a similar level of protection.

Equally important, duration of immunity was demonstrated for up to 10 weeks after vaccination, confirming the vaccine's ability to provide extended protection during the broiler production cycle.

Performance in the presence of maternal antibodies

Maternal antibodies protect young chicks during their first weeks of life but may interfere with the replication of live vaccines, particularly when vaccination is performed at an early age.

Challenge studies in commercial chickens with maternally derived antibodies showed 90% protection after either spray or drinking-water administration of the vaccine. Protection was maintained despite measurable MDA levels at the time of vaccination.

These results indicated that maternal immunity did not prevent vaccine take or compromise protective efficacy. This is relevant for broiler operations in which early vaccination is an important part of the IBV control programme.



Vaccination by spray or drinking water gives poultry producers flexibility when incorporating QX vaccination into their flock health programmes.

Evidence from commercial field trials

Laboratory results must be supported by evidence that a vaccine can be used safely and effectively under commercial conditions.

Two Good Clinical Practice (GCP) field studies were conducted on European broiler farms, with approximately 20,000 birds per house. Mortality, production parameters, serological responses and adverse events were monitored throughout the production cycle. Efficacy was also assessed through controlled challenge of representative birds transferred to experimental facilities.

Production performance, including feed conversion, live weight and overall performance indices, remained within expected commercial ranges and did not differ meaningfully from the comparator groups. Challenge testing of birds from the field trials further supported protection against homologous QX challenge under commercial-use conditions.

A unique feature: Flexible compatibility

A key differentiating feature of the vaccine is its flexibility within vaccination programmes. The vaccine became the first QX-type live vaccine approved in the European Union for

administration by both spray and drinking water. This allows producers and poultry health professionals to adapt vaccination to different management systems and production practices.

It can also be administered by spray at day-old in combination with Avishield IB H120 and Avishield IB GI-13, supporting broader IBV vaccination strategies within a single programme.

Conclusion

The development of Avishield IB QX demonstrates the scientific, technical and regulatory work required to bring a live poultry vaccine to the European market. Starting from a German QX field isolate, the vaccine strain underwent repeated passages, laboratory safety and efficacy evaluations, GCP field studies and regulatory review before EU authorisation.

The vaccine provides protection against homologous IBV QX challenge, maintains efficacy in the presence of maternal antibodies and offers a duration of immunity of up to 10 weeks. Approval for both spray and drinking-water administration, together with compatibility with other Avishield IB vaccines, makes it a flexible option for contemporary IBV control programmes.

References are available on request.