

Title: Vaccination and infectious bronchitis virus (IBV) challenge in mature laying hens

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Summary:

All pullets reared for egg production in Australia are currently vaccinated with live attenuated strains of infectious bronchitis virus (IBV). Various vaccines and protocols to control IBV have been developed, although the severity of the disease varies from place to place and flock to flock.

There are two groupings of IBV vaccines commercially available in Australia. Vaccine strain A3 was developed from a field strain isolated in Armidale, New South Wales, in 1962 which was passaged 25 times. The Vic S vaccine was developed after the 20th passage in chicken embryos of a strain isolated in Victoria.

The majority of the work on Australian vaccine strains has been conducted to evaluate efficacy against the nephropathogenicity of IBV. Although IBV has been implicated in deterioration of egg quality and production, limited information is available regarding its interaction with the fully-functional oviduct.

In Australia, it is usual practice to administer vaccine at day-old in the hatchery (usually by coarse aerosol spray) and then one or two additional doses in the rearing phase (by drinking water) before point of lay. In addition, some producers utilise the practice of boosting immunity regularly during the lay cycle. However, questions have been raised about possible negative effects of attenuated vaccines in adult layer birds.

The present study was carried to evaluate the effects of both pathogenic wild/field strains and vaccine strains of IBV on the oviduct and also to assess the protectivity of current vaccine strains. Both Vic S and A3 vaccine strains caused only mild pathology in the oviduct. A3 was more pathogenic for the kidney compared to Vic S. Both vaccinated and unvaccinated hens can shed T strain of IBV in faeces up to 9 weeks p.i. However, vaccination during rearing can markedly reduce the quantity of wild strains of virus shedding in the faeces.

Vaccine strains of virus were detectable up to five weeks p.i. In both the unvaccinated and vaccinated challenge groups, egg shell quality was only affected in terms of shell colour and egg shape index. Australian strains A3, Vic S, T and N1/88 were not responsible for production drops in adult Isa brown hens and none of the strains was responsible for thin, rough corrugated egg shells. Rearing phase vaccination can protect egg internal quality against wild strain IBV challenge. The vaccines A3 and Vic S are not responsible for the deterioration of egg internal quality. The present study showed that application of Vic S vaccine strain can cause paler egg shells in vaccinated and unvaccinated hens.