

**Title:** Field application of a Rispens-specific qPCR test

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There is currently adequate control of Marek's disease virus (MDV) in Australia, largely based on the use of the Rispens vaccine in breeders and layers, and high titre cell-associated Herpesvirus of Turkeys (HVT) in broilers. Vaccination against MDV using live vaccines provides protection against clinical Marek's disease but not against co-infection with wild-type pathogenic MDVs, which continue to multiply in the host and be shed in feather dander at very high levels. Thus vaccinated chickens may harbour mixed populations of MDVs. While the Australian broiler industry has access to molecular tests to differentiate between vaccinal (HVT and MDV serotype 2) and pathogenic (MDV serotype 1) serotypes of MDV the layer and breeder industries do not as they rely more on an attenuated serotype 1 vaccine (Rispens CV1988).

This study investigated vaccination responses to Rispens CV1988, experimentally and in the field, to develop effective field measurements of vaccine take. The project commenced in August 2011 and finished in September 2013 and included three experiments:

1. An initial experiment at University of New England (UNE) examined replication, shedding and transmission of Rispens CV1988 in chickens vaccinated with the three commercially available Rispens/CV1988 vaccines available in Australia.
2. A second complex isolator experiment examined the protection provided by Rispens vaccination of ISA Brown chickens against challenge with very virulent MDV (vvMDV) at five different vaccination-challenge intervals (VCI) including challenge before vaccination (VCI of -10, -5, 0, 5 and 10 days respectively). This study also investigated the comparative replication rates and shedding of Rispens and vvMDV in these groups and others where birds were administered only one of the viruses.
3. To evaluate the field application of the quantitative real-time polymerase chain reaction (qPCR) tests field experiments took place on three commercial layer farms in the Tamworth and Port Macquarie area. It is acknowledged that the limited geographic range of the field testing may not encompass the full spectrum of wild-type MDV strains or challenge levels.

The project objectives were achieved successfully and results of this study expands understanding of the interaction between pathogenic and vaccinal viruses following vaccination with imperfect vaccines and provides advice for selection of appropriate samples to test for vaccination success.

The main deliverable is an effective field test for measuring vaccination success following vaccination with Rispens CV1988 and effective methods for detecting MDV breaks in vaccinated flocks. The tests are available on a commercial basis to industry through UNE.

The other main deliverable is useful information on the spread and natural epidemiology of the Rispens MDV strain, and the efficacy of vaccination against challenge at different times post vaccination.

Use of routine vaccine take testing, coupled with other routine tests such as wild-type MDV1 levels in dust will enable industry to closely monitor vaccine performance and quickly detect breakdowns in protection. It will also help maintain ongoing MDV capability.