

Research program IZS VE 16/13

Implementation of molecular diagnostic tests for Marek's Disease (MD) and field investigation on the prevalence of MD in broiler breeders in the Veneto region and factors which can affect MD vaccination efficacy

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Marek's disease (MD) is a worldwide lymphomatous and neuropathic disease of domestic fowl caused by an alphaherpesvirus. MD is economically important in the poultry industry not only due to the increased morbidity and mortality and tumour formation, but also due to the virus immunosuppressive effects, which might affect the severity of various diseases and lower vaccination efficacy. MDV is a well-documented example of how virulence evolves after the introduction of a vaccine and how environmental factor and intercurrent infection can change the incidence and the impact of the disease in the field.

Although MD has been extensively investigated since the early 60's, and although vaccines are available and used in the poultry industry, no uniform and effective solution of the diseases is now available, due to the MD complexity. The main difficulties are multifactorial, and include at least five main drawbacks:

- MD vaccination does not totally inhibit viral shedding, it prevents mortality and tumour formation, but fails to completely eliminate the virus from the environment;
- MDV is a herpesvirus which creates latency and reactivates in response to stressful conditions (physiological and multiple pathogen infections);
- MD vaccination has managed to prevent massive MD outbreaks thanks to periodically changes of the vaccine viruses and to the usage of different virus combinations. However, vaccination has led to the selection of more virulent MDVs, from mild to very virulent plus, giving rise to the development of a new vaccine every 10 years;
- the cell-associated nature of vaccines implies multi-stage delicate and complex procedures to maintain their efficacy;
- MDV is shed, disseminated and infective for long periods. Management factors, such as poultry density, multi-aging and biosecurity may influence the environmental viral load.

The Veneto region is an area with a high poultry density which has lately experienced an increase in MD outbreaks in vaccinated broiler breeds flocks, causing increase of economic losses in this sector. In order to investigate the causes of these MDV outbreaks, the IZSVE intends to adopt adequate and reliable diagnostic tools for MD and to conduct specific field investigations.

The objectives of the present research are:

- to implement and/or develop diagnostic tools for the identification of MD viruses and for the differentiation of the vaccine viruses from the field strains;
- to perform an epidemiological investigation of MD in broiler breeders in a region with high density poultry population (Veneto region) studying the prevalence and load of the field pathogenic MDVs (wild type MDV);
- to perform a study on concurrent immunosuppressing factors in the commercial breeder flocks, in particular the presence of immunosuppressive viruses, which can affect the incidence of MD and vaccine efficacy, Chicken Anaemia Virus (CAV) mainly.