Replication of HVT-Al(HA) vector vaccine in different species of waterfowl

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Waterfowl plays a key role in the epidemiology of H5N1 HPAI, therefore efficient immunization of ducks and geese is of great importance. Previous studies have shown that herpesvirus of turkey (HVT) is able to replicate in certain species of waterfowl. A HVT-Al vector vaccine, expressing HA gene of a H5N1 HPAIV strain (rHVT-HA) has proven to be efficacious in inducing good immunity in chickens against infection with different clades of H5N1 HPAIV. A single vaccination at day-old with rHVT vaccines expressing the protective antigen of certain pathogens can provide long-term immunity against the relevant pathogen.

Since species and genetic differences of target animals may influence the replication of the rHVT, we tested the replication of a rHVT-HA vaccine in different species and cross-breeds of ducks and in geese to collect data on the possible application of rHVT-HA vaccine in waterfowl. In the studies conducted we investigated the possible differences among the waterfowl species, i.e. geese, Muscovy duck, Pekin duck and mule duck. Vaccine virus replication was followed by real-time PCR from spleen, bursa and feather tip samples. Humoral immune response to vaccination was tested by HI test and H5-specific commercial ELISA.

We found remarkable differences between the different species of ducks in the rate of rHVT-HA replication and as a consequence in the immune response to the HA insert of the rHVT-HA vaccine. It replicated well in Muscovy duck, to a lesser extent in mule and in Pekin duck, while replication in geese was very good.