

IABS Meeting on High Pathogenicity Avian Influenza

Vaccination Strategies to prevent and control HPAI: Removing unnecessary barriers for usage



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“Vaccination to control transboundary animal pathogens and relevance to avian influenza”

BACKGROUND — Since the second half of the 20th century vaccination has been an indispensable tool to improve animal health. Although vaccination was initially developed to prevent disease and mortality, for several transboundary pathogens vaccination has demonstrated to be a useful tool to eliminate pathogens from animal populations.

CHALLENGES — To control transboundary pathogens vaccination induced immunity should sufficiently reduce transmission upon exposure and the aim can be 1) to stop transmission in an infected region, 2) prevent (re)infection in a free region at risk for infection or, 3) stop transmission in a region upon an unexpected reintroduction (emergency vaccination).

RELEVANT APPROACH — Vaccination has been used to eradicate several transboundary pathogens from animal populations in various regions of the world with the worldwide elimination of rinderpest as the most prominent example. Vaccination campaigns have also been successful in the elimination of Foot and Mouth disease (FMD) and Classical Swine Fever (CSF) virus. Of particular relevance to avian influenza is the eradication of Aujeszky's disease (AD) virus, a herpesvirus infection of pigs, which has demonstrated that an imperfect vaccine can be sufficient to eliminate a pathogen, as long as there is good vaccination coverage and accompanying DIVA surveillance. When



an animal population itself is free from infection, but at risk for reintroduction of the pathogen vaccination can be used to prevent outbreaks should the virus reenter. Vaccination against Newcastle Disease (ND) in Europe and other parts of the world is an obvious example in poultry, although ND vaccination does not allow DIVA surveillance. FMD and AD serve as examples in other species. In case of an unexpected introduction in a susceptible population emergency vaccination is an option. Challenges here, besides the effectiveness of the vaccine are the size of the area to be vaccinated and the speed at which vaccination is carried out relative to the transmission rate of the pathogen. Again ND, CSF and FMD serve as examples.

CONCLUSIONS — Vaccination has shown its potential to control various transboundary animal pathogens. To be successful vaccination needs to be applied strictly, with sufficient coverage and accompanied by adequate surveillance. In that case even imperfect vaccines have potential to stop pathogen transmission.

