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Avian influenza I

The importance of avian influenza has increased significantly in the poultry industry recently. Accordingly, we have decided to dedicate forthcoming issues of Poultryhealth BYTES to giving you a comprehensive insight into this important viral disease of poultry.

General introduction

Influenza A viruses not only infect birds, they are also important global human and veterinary pathogens. These viruses have a complex ecology and epidemiology involving various wild, captive and domesticated avian hosts plus various wild and domesticated mammalian hosts including man, pigs, horses and dogs.

Influenza A viruses cause a range of clinical disease pictures. These are related to viral pathogenicity and whether infection is restricted to one mucosal surface or is capable of creating systemic infection.

The influenza A virus has genetic and antigenic variation arising through a high rate of mutation and a segmented genome that enables this virus to rapidly change and adapt to new hosts. In fact, this can occur to such an extent that the 'new virus' can rapidly become endemic in a new host species. This process also adapts the virus to its new host so that it gains a degree of host specificity.

In avian species this barrier is often less clear as, for example, chicken adapted viruses also usually infect other gallinaceous birds as well as birds such as ducks and waterfowl.

Control of influenza utilises tools such as culling, quarantine and vaccination.

The influenza virus

Influenza viruses belong to the Orthomyxoviridae family of segmented RNA viruses, of which one genus is the influenza A viruses. Other genera include influenza types B and C which are human species of the flu virus that tend to be confined to man.

All influenza A viruses have eight different gene sections that encode for at least 10 different viral proteins. Two of these – haemagglutinin (HA) and neuramidase (NA) – are used in the classification of influenza viruses and are the origin of the H and N in names like H5N1. So far we know of 18 HA proteins, hence the influenza virus currently has 18 subtypes designated H1 to H18.

Viral morphology

The morphology of the influenza viruses is very variable ranging from spheres to long filamentous forms, with the latter being most common in clinical isolates of the virus.