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Avian influenza V

Epidemiology in farmed poultry

If an avian influenza virus is permitted to circulate it becomes, for example, a chicken-adapted strain and this creates a new phylogenetic lineage. This new virus is then less able to replicate in its original strain.

Influenza viruses, having entered a new host, change at a higher rate and for species under immune pressure from natural infection and/or vaccination, the rates of change in the HA and NA genes are even quicker.

Certain influenza viruses have become endemic in man, swine, horses and poultry and, with time, such viruses become more and more specific to the species they have infected. However, there are exceptions to this, for example classical swine H1N1 influenza in North America has crossed over into turkeys and caused serious disease outbreaks.

Sporadic infections of humans with poultry strains, such as H5N1, H7N7, H7N3, H7N9 and H9N2, have occurred so avian influenza does pose a threat to man as a zoonotic pathogen. However, this is considered to be a low risk.

Avian influenza viruses do move from wild birds to poultry. Direct exposure is the most likely route to establish infection in a flock. In the 1960s and 70s this was a frequent occurrence in the Minnesotan turkey industry when outdoor paddocks and access to outdoor water sources were common. By the 1990s, when all these flocks had been housed, the incidence of influenza outbreaks had been dramatically reduced.

The mixing of different types of poultry in live bird markets favours the spread of influenza from ducks to chickens. The probability of this occurring and an avian influenza virus becoming adapted to its new chicken host is greatly enhanced by the regular/daily introduction of new naïve birds into the market. In fact, this is the perfect environment for influenza viruses to cross between species and create new species-adapted strains. Once avian influenza has become entrenched in the live bird market it becomes a real risk to poultry in the area, for example the farmer who takes his birds to market and then returns home or, worse still, returns home with his unsold birds and returns them to their flock of origin.

Another dangerous scenario, which still occurs in Asia, is the pond rearing of ducks, as in this system, wild ducks can visit and comingle with their domesticated counterparts.

Avian influenza can infect poultry via their drinking water, especially if that water has been sourced from a local pond, lake or river. Outbreaks of influenza have also been associated with wild birds entering poultry houses and drinking from uncovered header tanks.

Turkeys are susceptible to swine flu (classical H1N1 and reassortment strains such as H1N2 and H3N2). For this reason the siting of turkey units near pig farms should be avoided. Interestingly, it is thought that some swine influenza viruses originally had a wild bird origin.