International Poultry Production

Poultryhealth BYTES

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Number: 188

Avian influenza VI

Pathogenicity – host and viral strain factors

HPAI virus causes high mortality in 4-6 week old specific pathogen free chickens, otherwise, by definition, it would not be HPAI. Just by being HPAI does not mean it will cause disease in other species. This needs to be defined by experimentally challenging those species with the HPAI virus.

One of the most extensive series of such studies has been with the H5N1 HPAI 1997 chicken isolate from Hong Kong.

The Hong Kong 97 strain caused high mortality in all the gallinaceous species it was tested on, including chickens, turkeys, pheasants and quail. In other species tested the picture was less severe or, in some instances, there was no clinical disease.

When some were challenged they showed neurological signs that correlated with virus replication sites in the brain. Ducks, on the other hand, showed limited respiratory tract lesions and did not show any evidence of disease.

Using a two week old duck model H5N1 viruses isolated between 1997 and 2001 could infect but did not cause any morbidity or mortality. Starting with some 2002 isolates mortality was observed, with the most recent isolates having a 100% mortality.

For mammalian species, including man and pigs, natural infection with H5N1 HPAI is associated with severe atypical pneumonia, which reflects a respiratory tract infection. Other mammalian species, including ferrets, cats and dogs, may have systemic spread of the virus which contributes to mortality.

The pathogenicity of HPAI is difficult to characterise for all species and as the virus changes, so does the clinical manifestation of the disease it causes.