

# science summary



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SCHO1006BLNI-E-P

## Avian influenza reference guide. Version 1.0 - September 2006 Science Summary

A new report published by the Environment Agency summarises published scientific research relevant to our work on avian influenza (avian flu), particularly the H5N1 strain of highly pathogenic avian influenza (HPAI) that has spread westwards from Asia (Asian HPAI H5N1). We will use the report as we work with and support partner organisations to minimise the environmental impact of any outbreak and advise the government and others on issues such as waste management and cleansing and disinfection and as we assess applications for waste disposal activities.

Since 1997, more than 200 million poultry and ducks have been killed by Asian HPAI H5N1 or culled in efforts to control the spread of disease. More than 140 people have died as a result of infection by the virus. There have been no outbreaks in the UK, although a dead whooper swan infected with the H5N1 strain was discovered at Cellardyke in Scotland in April 2006.

In the event of an outbreak of avian flu, bird carcasses and materials such as litter and faeces may present biological and chemical hazards that will need to be managed. In addition to the avian flu virus itself, bacteria such as *Campylobacter* and *Salmonella* may be present in carcasses, litter or faeces. There may also be chemical hazards from substances used to cull birds, decomposition products, cleansing and disinfection chemicals, veterinary medicines and substances arising from disposal processes such as incineration. In order to inform decisions, we have collated data on the influence of pH, temperature and oxygen levels on bacterial growth as well as toxicity and fate data for three disinfectants (Virkon S, FAM 30 and citric acid) and the 15 most commonly used active ingredients of veterinary medicines.

Infectious virus particles can exist in high numbers in the flesh, droppings and other secretions of infected birds. They are released from live birds in respiratory secretions and faecal deposits and from the fluids of decomposing dead birds. Avian flu viruses are not expected to survive for long in air, but they can persist outside their hosts in soil and water and remain infectious for long periods, particularly at low temperature, neutral pH, high levels of moisture or high levels of organic matter. There is little information about the survival of the Asian HPAI H5N1 strain, however unpublished data suggest that this virus can survive for at least four days outside a host bird. As with other viruses, low temperature and the presence of organic matter promote survival. Data for other viral strains (e.g., H4N6) confirm the importance of temperature and demonstrate that survival can be for several months. In the absence of data specific to the Asian HPAI H5N1 strain and the lack of any data specific to UK water bodies we propose that the half-life of this virus should be assumed to be at least 75 days.

Although infectivity data is available for several avian flu viruses, relatively little is known about how infective the Asian HPAI H5N1 strain may be. Using the available data, we tentatively suggest that concentrations between 10 – 1000 viruses per ml of water could cause bird infection. However it is important to note that these numbers are very uncertain, as they are based on very limited data and a number of assumptions. Live infected birds are capable of transporting avian flu viruses, including the Asian HPAI H5N1 strain. There is evidence that some avian flu viruses can be transported on the clothing of poultry workers, on vehicles or anything else that comes into contact with infective secretions. It is therefore important to take precautions

