

Bird flu – is the world at risk?

Bird flu has raged in South-East Asia since late 2003, spreading westwards since 2005. In the summer of 2005 it reached the European region of Russia, and in February 2006 it was confirmed for the first time in Africa. The spectre with the mysterious code name HPAI H5N1, that is not only wiping out poultry throughout the world, but also has the potential to trigger a pandemic akin to Spanish flu in 1918, has dominated the media for months on end. What does it all mean and what impact is it having on rural areas?

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The agent responsible for bird flu is the highly contagious «avian influenza (AI)», an epizootic disease caused by a highly virulent influenza A virus, subtype H5 or H7, which can affect all species of poultry. The species most affected are chickens and turkeys. Alongside the highly contagious influenza A virus subtypes H5 and H7, other less contagious and virulent influenza A viruses are found particularly among waterfowl. For this reason, a distinction is drawn between highly pathogenic avian influenza viruses (HPAI-V) and low-pathogenic avian influenza viruses (LPAI-V); bird flu is caused by an HPAI virus.

Incidence of avian influenza prior to late 2003

Epizootic «fowl plague», first described in Italy in 1878, spread to other countries primarily via trade in infected animals. Until the second half of the 20th century, such epizootic outbreaks of the disease were rare. Drastic methods were successfully applied to stamp out the disease (slaughter of infected stock, establishment of poultry-free buffer zones, and systematic prohibition of any movements of livestock, materials or humans) and, as a result, both the spread of the disease and livestock losses were minimized. This approach no longer proved effective, however, when the disease emerged in poultry-dense regions such as Pennsylvania, USA (1983, affecting around 17 million animals on 452 farms), northern Italy (1999/2000, approx. 14 million animals affected), or the Netherlands, Belgium and Germany (2003, around 33 million animals). During the epidemic in the Netherlands in spring 2003, there were already calls for alternatives to the «stamping-out strategy». The issue of vaccination played a key part in this debate.

Bird flu from South-East Asia – current events

Since late 2003/early 2004, avian influenza subtype H5N1 has spread with unprecedented speed, initially in Southeast Asia,



Photo: Bilderbox

and subsequently, since 2005 also in Europe (Russia, Ukraine, Romania, Turkey, Croatia). It reached Africa in early 2006. Some 50 countries worldwide are currently affected by avian influenza subtype H5N1. The virus has been confirmed both in domesticated poultry stocks and wild birds. Around 200 million poultry birds (including chickens, turkeys, quails, ducks and geese) have so far fallen victim to the virus, either by contracting the disease or because of culling in an effort to combat its spread.

As in the past, trade and other movements of animals continue to play a crucial role in the spread of the disease. A new and particularly problematic feature of the current epizootic is the fact that migratory bird species are being infected with the HPAI virus and are clearly able to transport the virus over great distances – which could explain how the disease has spread rapidly to wild bird populations along the flyways of migratory birds to Europe. Wild birds have hitherto been carriers of the LPAI virus, which can mutate to HPAI in domesticated poultry. Experience teaches that the likelihood of this happening is fairly slight. Moreover, the devastating consequences of the disease only become manifest after a certain time lag. Wild birds infected with HPAI, on the other hand, pose a direct threat to poultry stocks.

As well as being a particularly virulent pathogen for birds of all species, the worrying thing about H5N1 is its high zoonotic potential: 291 people have so far con-



With the emergence of bird flu in regions with large poultry stocks and practicing intensive husbandry methods—such as the USA, Italy, Netherlands, Belgium and Germany—measures previously used to combat the disease quickly proved inadequate. Livestock losses were too great, and it proved too difficult to contain the epizootic.

tracted HPAI H5N1 virus, 172 of whom have died. It is this feature of the present virus that raises fears of a strain emerging that can be transmitted from one human to another. Only subtypes H1, H2 and H3 of the influenza A virus have hitherto occurred among humans; hence a subtype H5 virus would encounter a population that is largely unprotected in immunological terms and could thus spread unhindered.

How can the spread of the disease be halted?

Veterinary medicine has effective disease control instruments at its disposal, aimed at rapid eradication of the disease and control of the pathogen. Classic instruments include rapid diagnosis, slaughter and destruction of sick and infected animals; prohibition of contact with animals and imposition of restrictions on the movement of animals, products and people; use of hygiene barriers; regionalization and vaccination.

Nevertheless, every disease outbreak must be assessed on a case-by-case basis in order to select the most appropriate instrument to deal with it. In addition to the actual disease, this evaluation process also focuses on other important factors such as stocking density, production method (indoor or free range), and mode of sale (local markets or centralized marketing; significance of export market). These factors determine which control

strategy is to be adopted. This is why there is no single strategy for combating outbreaks of bird flu. Even the Global Strategy drawn up by the Food and Agriculture Organization (FAO) of the United Nations and the World Organisation for Animal Health (OIE), which sets out short, medium and long-term goals for combating the disease, lists a variety of options for tackling it. While most western, industrialized countries currently advocate the «stamping-out strategy» rather than vaccination, countries where extensive small-holder poultry-keeping predominates tend to recommend comprehensive vaccination with proven vaccines in addition to slaughtering and destroying sick animals. The Global Strategy is continually being adapted to the circumstances of the affected countries and is updated at country level as new knowledge emerges.

For any strategy to be successful, however, the chosen instruments must be rigorously applied. This also requires political will in the countries affected. The latter is ultimately also vital for selecting the instruments, since efforts to combat the disease can also be a means of carrying out structural policy in rural areas!

What impact is the current epidemic having? The impact of bird flu varies widely depending on the production methods involved. There are nevertheless some common features:

- This disease poses a risk to humans. A major objective of everyone engaged in combating the disease is therefore to push for long-term changes to prac-

tices that increase the risk of infection in humans (e.g. living at very close quarters with poultry, poor slaughter hygiene, consumption of fresh blood).

- Bird flu causes significant production losses. As a result, market shortages occur, leading to higher prices for consumers. Simultaneously, however, the general undermining of consumer confidence can also result in marketing difficulties at global level, leading to income losses for producers everywhere, irrespective of where the disease has broken out.
- In many of the affected countries, destruction of poultry stocks due to the disease itself or to control measures threatens the food security of the local population and endangers valuable animal genetic resources.

HPAI-V H5N1 – what does it mean?

Further distinctions can be drawn between influenza-A viruses by examining the membrane proteins H (haemagglutinin) and N (neuraminidase). So far, 16 different types of haemagglutinin (H1 to H16) have been identified; of these, only H5 and H7 have hitherto been identified as bird flu triggers. Nine different types of neuraminidase (N1 to N9) have been confirmed to date. The mysterious code number HPAI-V H5N1 therefore stands for a highly pathogenic avian influenza A virus of the subtype haemagglutinin 5 with type 1 neuraminidase.

Photo: DW/HH



In industrialized countries and some emerging economies (Thailand, Brazil), international trade in poultry and poultry products plays a significant role in the national economy. In these countries, the outbreak of bird flu and consequent lengthy trade embargo can have major consequences for the economy as a whole. For this reason, producers will have little inclination to report the outbreak immediately (so as to delay the onset of the trade embargo) on the one hand, while on the other it is they who have most to gain by bringing the disease under control (and thus taking all the more radical action).

The «stamping-out strategy» implemented in such cases to eliminate the disease rapidly (with a view to restoring participation in international trade as soon as possible) hits subsistence farmers in affected regions especially hard, since their animals are slaughtered and destroyed even if they are not diseased. At the same time, they are excluded from international trade anyway. In order to protect subsistence farmers' livelihoods and genetic resources in countries with a high ratio of very small subsistence holdings, slaughter and destruction of sick and infected poultry should therefore be combined with vaccination of the remaining stocks using proven vaccines. The Global Strategy devised by FAO and OIE contains concrete recommendations in this regard to ensure effective control of the disease.

The epizootic currently under way worldwide could nevertheless bring about a dramatic change in the way poultry production is organized. Large industrial production operations that are able to invest significantly in biosecurity measures stand to gain an even greater share of the market in the process, while extensive, small-holder production methods will be put under pressure. This could have fatal con-

sequences for many families' ability to subsist, and for genetic resources, as well as consequences (that are impossible to estimate as yet) for the ecosystem in rice-growing areas such as Vietnam, where extensively farmed ducks use the irrigated rice paddies as their main source of food.

Role of international organizations

The current worldwide epizootic cannot be brought under control by individual countries or regions acting alone without international coordination and support. Moreover, an interdisciplinary approach is required to combat this disease. This is why the international organizations FAO, OIE and WHO responded immediately at the start of the outbreak in South-East Asia in early 2004. A Global Early Warning

Characteristic features of the current HPAI virus

- The virus is particularly virulent and gives rise to clinical signs in all species of birds (poultry and wild-fowl).
- The virus spreads extremely quickly. It is transmitted primarily by trade and movements of poultry and poultry products, and by infected wildfowl and migratory birds.
- The disease results in severe economic losses in the affected countries and threatens the livelihoods of large numbers of affected poultry farmers.
- Humans infected by the disease following direct contact with infected animals or products (notably blood) develop severe clinical signs. Mortality among patients admitted to hospital stands at around 57 %.

This last point in particular gives grounds for urgent action to stem the disease.

Due to the bird flu the prices for poultry have slumped. A chance for the poor to buy cheap food, as they are not aware of the risk.

and Response System (GLEWS) was introduced in 2004 as a joint structure for the use of all three organizations. The common Global Strategy of WHO/FAO and OIE has been available since 2005. Within the central and regional offices of FAO, an Emergency Centre for Transboundary Animal Diseases (ECTAD) has been established, complemented by a Crisis Management Centre since mid-2006. An important role is also being played by the OIE/FAO network of reference laboratories for avian influenza (OFFLU), established in 2005 to support these organizations and the affected countries. The United Nations has also assumed responsibility in the fight against the disease, and has appointed a coordinator for avian influenza at its headquarters in New York.

In January 2006, the pledging conference jointly convened by China, the USA and European Commission issued the so-called Beijing Declaration, acknowledging the role of WHO, FAO and OIE in coordinating support measures. At the same time, funds totalling 1.9 billion USD were approved by the donor community for the purpose of combating avian influenza. These funds were topped up again at the first follow-up conference in Vienna in June 2006, although at the same time it was lamented that too little of the money had so far been disbursed.

Summary

The highly pathogenic avian influenza H5N1, which started in South-East Asia in late 2003, continues to threaten many countries around the world. The virus is particularly virulent and shows high zoonotic potential. This presents a threat not only to human and animal health, but also to the livelihood and food security of many people living in regions with a large number of poultry-keeping smallholders. Furthermore, valuable genetic resources are being destroyed both by the disease itself and – depending on the strategy adopted – by the disease control measures. The international community is therefore being called upon urgently to provide support and advice to the countries affected in their fight against the disease. It must be borne in mind, however, that prevention and control of the disease remain the responsibility of the countries concerned.