EMPRES WATCH
Highly Pathogenic Avian influenza spread into Nigeria

Situation update
(10 February 2006)

Summary findings

This first occurrence of the already too famous H5N1 virus into the African continent is of major concern, putting at immediate risk the livelihood of millions of people relying on poultry production for income generation and sources of protein. If this situation gets out of control, it will have a devastating impact on the poultry population in the region and will increase the exposure of humans to the virus.

On the 6th of February 2006, an outbreak of Highly Pathogenic Avian Influenza, H5N1 virus was reported for the first time in Nigeria. The outbreak was notified in a poultry layer commercial farm where ostriches and geese were also kept in the state of Kaduna. A second outbreak has been tentatively diagnosed in Sovet Farms, in Kano State where samples have been collected and sent to the laboratory for confirmation. The first reported case in Kaduna state was initially suspected on the 10th of January while the laboratory confirmation came almost a month later with the identification of the virus strain H5N1 (genetic sequencing confirmed an Asian lineage origin of the virus).
The site of H5N1 occurrence in Kaduna State appears to be located in the Guinea Savannah ecological zone. This area of Nigeria has a large human population and a large proportion of land is used for agriculture. In the dry season, farmers grow their crop at the receding water edge at reservoirs, rivers or lakes allowing domestic poultry to roam freely around field crops, houses and the surrounding vegetation.

People in these regions are poor and are unlikely to dispose of animals even if they are diseased, as it is both an income and source of protein. With Immuno-suppressed people because of HIV infection, tuberculosis or malaria, it is not known how HPAI will affect human health as well. A significant effort will have to be placed in order to gain the support of local population to control the disease through education, awareness campaigns and incentives to report the disease.

Understanding the magnitude and true extent of the infection is still lacking and field assessment teams are being deployed in the country to carry out thorough investigations. Uncertainties also remain on the conditions of introduction of the disease and subsequent exposure of poultry. Although wild bird migration would seem a likely source of introduction, the role of trade (legal and illegal) of poultry and poultry products, movements of people and animals must be carefully assessed before drawing any final conclusions. Furthermore, Nigeria's poultry commercial sector is more developed than in any other West African countries. This probably relates to the fact that Nigeria has a comparatively good infrastructure when it comes to roads, facilitating transports within the country. As observed in Asia, poultry trade has played and continue to play a major role in the secondary spread of the disease and strict movement controls will be instrumental to stop the spread of the disease, if not already the case.

In favour of the wild bird introduction hypothesis, it is noteworthy that the outbreak site in Nigeria is located at southern edge of the major Chad basin including the Hadejija-Nguru wetland area, both considered as major wintering areas in the region for long-distance migrant species coming from Europe and Russia, including palearctic ducks. Two migrant species coming from Europe and Russia: Pintails (Anas acuta) and Garganeys (Anas querquedula), are known to overwinter in considerable numbers in Northern Nigeria in the Hadejija-Nguru and Chad basin Wetlands.

If the hypothesis of a wild bird introduction is confirmed, it would be expected that the infection has been brought into other key migrating sites. This needs to be elucidated as soon as possible and targeted surveillance in neighbouring countries should be immediately implemented. It is also important to recall that considerable intra-African migrations of African birds are taking place within the continent. In Africa, the seasonality of dry and wet seasons work in a similar fashion on bird migration than the summer and winter cycle under temperate regions. This phenomenon could contribute to the further spread the disease within Africa.

Testing results of wild birds recently sampled in Mali, Chad and Ethiopia, through the regional FAO technical cooperation projects, in collaboration with CIRAD and Wetlands International, will be extremely valuable to throw light on this hypothesis. More samples are currently being collected in additional key sites in Africa and elsewhere.

The introduction of the disease through illegal trade cannot be excluded. The introduction could have happened through illegal importations of poultry or more likely poultry products. No data are available at the moment to confirm or rule out this possibility.

The countries at immediate risk of infection are the one sharing borders with Nigeria, namely Niger, Benin, Chad, and Cameroon. Unfortunately, the delay between the first suspicion in January and the recent confirmation (mortalities were reported as early as beginning of January), left ample opportunities for the virus to colonize free areas if control measures were not swiftly implemented. In return, it is not yet known if the disease has been first introduced into Nigeria or into another country from where it could have spread without being reported.
With migratory birds going back to their breeding areas in the North, European countries are facing a greater risk of disease introduction. This risk is currently being assessed by a group of wildlife experts set up by the European Food Safety Agency of the European Commission.

**Poultry production sector in Nigeria**

The poultry population in Nigeria is estimated at 140 million birds. Unlike typical African poultry production systems (with an estimated 80% of backyard poultry) the structure of the poultry industry in Nigeria is represented by approximately 40% of commercial operations (15% semi-commercial and 25% commercial) and 60% of backyard poultry farms.

Nigeria’s poultry sector grew rapidly from 1999 to 2002 after more than a decade of decline. The growth is attributed to the government of Nigeria’s decision to liberalize the imports of vital inputs such as, day-old chicks, parent breeding stock, barley and malted barley since 1998 and corn in 2000. Between 1960 and the early 1980’s, Nigeria’s poultry sector grew rapidly, supported by significant foreign and domestic investment. The period, 1986 to the late 1990’s witnessed a dramatic decline in poultry production, with the population of commercially reared birds falling from a peak of 40 million in 1982 to a mere 10 million in 1997.

Demand for poultry products has increased markedly over the past years, thanks to the rapid growth in the number of fast food restaurants featuring a chicken menu in major urban areas and growth in sales through institutional catering facilities serving foreign companies operating in the petroleum sector. This growth trend is expected to continue as the Nigerian economy continues on its recovery path. A characteristic of the poultry meat market is that low-income Nigerians prefer the tougher spent hens from laying operations, while the higher income and the expatriate community favour the tender broiler meat. This preference in taste results in relatively high prices being paid for the spent layers. Most locally-produced broilers are marketed to higher income groups in the major cities of Port Harcourt, Lagos and Abuja. This market segment takes frozen, whole birds produced locally. In contrast, imported chicken consists almost entirely of frozen leg quarters. As much as two-thirds of all imported leg quarters are derived from spent hens. Following the import ban on frozen poultry, most supermarket outlets have stopped carrying imported frozen poultry to avoid becoming targets of the regulatory authorities.

**Commercial relationships with neighbouring countries**

As shown in the map below, the outbreak area is located along a primary road of a communication network that extends its ramifications into Niger, Chad, Cameroon, Mali and Benin. This road network runs along Wetlands in the North of the country to finally join the complex Chad basin.
Commercial relationships are known to occur between Nigeria and the neighbouring Niger. Poultry and poultry products from Northern Nigeria, where the disease has been notified, can be commercialised in markets of Southern Niger.

**Ecological Conditions Specific to West Africa**

West Africa lies on the southern part of the Black Sea/Mediterranean Flyway, which crosses from Southern Europe across southern Spain and the Mediterranean. It then skirts the West African coastline, from Morocco south to Mauritania. From there a broad sub-Saharan belt stretches from across Mali and Niger, covering most coastal countries south of it. Migratory routes from West and Central Europe and Central Asia where HPAI in wild birds has been diagnosed have been identified recognised to increase the chances that birds over wintering in West Africa’s wetlands, rivers, and shorelines may transmit the disease to local wild birds, and from there to domestic poultry. This transmission pattern has been identified in other regions and could have taken place in Nigeria where the disease has now been detected.

Inland valleys near wetlands represent approximately 50 percent of the agriculturally available wetland area in West Africa and contain dense human populations. Many of the region’s river courses contain catchments and dams to form reservoirs, such as the Senegal basin, the Niger basin, the Volta basin, and the Chad basin. These basins form ideal nesting and rest areas for migratory birds and it is believed that these basins could represent the areas of first introduction of the virus into the African continent. This assumption was made to define a selection of key sampling sites in Africa for wild bird monitoring in the framework of the technical cooperation projects set up by FAO, in collaboration with CIRAD and Wetlands International. Capture activities have already been completed in few countries (Mali, Chad, and Ethiopia) and samples were sent to selected OIE/FAO reference laboratories.
West Africa, particularly the dry savannah zones, represents wintering areas for many long-distance migrants from Europe, particularly for passerines (song birds). However, West Africa is also a major wintering area for many non-passerines, including considerable numbers of some Palearctic duck species, several species of shorebirds and some birds of prey.

In Nigeria there are two major areas where long-distance waterfowl and shorebirds are present: the Hadejjia-Nguru wetlands and the Lake Chad. These areas are located in the north of the country, in the Sahel and Sudan Savannahs ecozones. Both areas hold waterfowl, particularly Northern Pintails (*Anas acuta*) and Garganeys (*Anas querquedula*), considered as migrant species coming from Europe and Russia. The population of Garganeys in West Africa is estimated to 2 000 000 birds, distributed mainly within the Sahel zone. Also Northern Pintails are numerous in the West African Sahel zone, with an estimated winter population of < 500 000 birds.
The overlay of wintering areas of the four main species (in absolute number): *A. querquedula*, *A. Penelope*, *A. acuta* & *A. clypeata* is shown below:


The Garganey *Anas querquedula*

Migrant Palearctic ducks are usually confined to the best inland wetland areas in the North of Nigeria. These wetlands also receive a large numbers of shorebirds - for instance Ruffs (*Philomachus pugnax*), Little Stints (*Calidris minuta*) and Curlew Sandpipers (*Calidris ferruginea*)

In the south of the country, along the coast, Palearctic species of shorebirds and terns are present. Raptors occur in open areas all over the country, for instance Marsh Harrier (*Circus aeruginosus*), Montague's Harrier (*Circus pygargus*), Pallid Harrier (*Circus macrourus*) and Ospreys (*Pandion haliaetus*), but never in any large concentrations.

The site of H5N1 occurrence in Kaduna State appears to be located in the Guinea Savannah zone. This area of Nigeria has a large human population and a large proportion of land is used for agriculture. In the dry season, farmers grow their crop at the receding water edge at reservoirs, rivers or lakes allowing domestic poultry to roam freely around field crops, houses and the surrounding vegetation.

People in these regions are poor and are unlikely to dispose of animals even if they are diseased, as it is both an income and source of protein. With Immuno-suppressed people because of HIV infection, tuberculosis or malaria, it is not known how HPAI will affect human health as well. A significant effort will have to be placed in order to gain the support of local population to control the disease through education, awareness campaigns and incentives to report the disease.

**Measures taken by the Livestock and Pest Control Services of Nigeria**

- Restriction of movement of birds and other domestic animals in and out of Kaduna and Kano States.
- Restriction on the movements of personnel working in poultry farms in Kaduna and Kano States.
- Depopulation of the birds in the affected farms by slaughtering and incinerating the birds. The task will be completed today, 9th February 2006.
- Quarantine the farms and surroundings, which is a standard procedure.
• Sensitization and awareness campaign on safety measures to the farmers and the populace in the affected areas and other States within the country.
• The Nigerian Government has set up Eight Team Monitoring Committees located in different parts of the country to monitor the situation. The team is made up of Virologists, Epidemiologists and Veterinary Doctors to monitor the situation.
• The Nigerian Government has approved to compensate farmers that are affected with two hundred and fifty Naira (N250=) per bird.

EMPRES follow-up and response

• FAO and OIE are taking immediate action and coordinating common response to the situation.
• EMPRES mapping and analysis of known outbreak.
• Dr. Seck, Coordinator of Avian Influenza, from FAO Regional Office and Dr. William Amanfu, Animal Health Officer from the Animal Production and Health Division, FAO-Rome are expected to arrive in Abuja over the week-end to lead the FAO/OIE investigation into the Avian Influenza outbreak in Nigeria. South Africa will send two experts to join the FAO/OIE mission: Dr James Kitching and Dr Marna Sinclair.
• The FAO/OIE team will work in close collaboration with the Livestock and Pest Control Services of the Federal Ministry of Agriculture and Rural Development, and the Nigerian Committee of Experts on the Prevention and Control of the Highly Pathogenic Avian Influenza.
• FAO will provide field investigations and logistics, including protective clothing (PPE) through available stock in Dakar, Senegal.
• Urgent need for effective coordination with WHO and the Ministry of Health
• Areas of investigation: Farm history and husbandry practices, bird population at outbreaks, epidemiology of the outbreaks, ecology of the outbreak areas, possible spread to other States and neighboring countries, etc.
References

3. Personal communication from wildlife experts (Jonas Waldenström, University of Lund, Sweden)
4. Bulletin électronique SANI (Niger)