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Special Issue: Avian Influenza



Avian influenza: the new challenge for family poultry

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Very recently, and specifically last Good Friday, I heard a spokesman of the French chocolate industry earnestly state on a regional French radio programme that he was delighted that avian flu did not appear to have affected the sale of chocolate hens and eggs in his country over the Easter period. This anecdote, surprising as much as amusing, illustrates how a climate of anxiety has, for several months, progressively infiltrated the population with or without the knowing complicity of the media, often fragmentarily informed.

The problem, raised many times, seems clear: once or twice each century, sometimes more often, a widespread pandemic disease arises on the planet, causing the disappearance of millions of individuals. Since 1918, "Spanish" flu caused the deaths of 50 to 100 million people according to estimates. Forty years later, Asian flu in its turn caused numerous loss of human life. For epidemiologists, the situation is therefore clear: another pandemic disease must by necessity hit our populations, and the medium responsible is formally identified: virus H5N1, better known as the highly pathogenic avian flu vector. This latter disease, identified since 1878 as fowl plague (as opposed to the pseudo fowl plague or Newcastle Disease, whose clinical signs are very similar), is caused by a virus commonly found in waterfowl which are generally not affected by the disease but may play a role in spreading these viruses. Since 2003, a number of humans - around a hundred in total or thirty per annum - have died directly of avian flu. These people lived in close contact with their poultry and were generally frail individuals.

In addition, listed cases were more often found in commercial flocks than in family backyards. This has not prevented certain personalities working in prestigious organisations from formulating the assumption that the most favourable place for the mutation of virus H5N1 towards a type much more pathogenic for man, and thus potentially responsible for a possible pandemic, is inevitably the traditional backyard sector associated with free ranging. It is remarkable that the most spectacular case of contamination in Western Europe concerns turkey breeding in complete confinement in the

French département of l'Ain, universally renowned for its famous Bresse chicken reared in the open air! The illogical consequence of the general slaughtering in this centre for turkey rearing in strict confinement has been a dramatic slump in chicken consumption of high quality!

The outcomes of these outrageous declarations are obviously disastrous for traditional family poultry farming, which still represents more than 70% of world poultry production and is an extraordinary development tool for the majority of small farmers in low income food deficit countries. This is particularly true for the most disadvantaged social classes - women, children and the handicapped - who can find in small-scale poultry farming an important means of improvement in their nutritional and social situation. Moreover, family backyard poultry represents an incontestable tool for biodiversity, at a time when the commercial poultry sector uses only hybrid birds whose stock is strictly partitioned by monopolistic multinationals.

Moreover, these adopted positions are diffused at large, high media-profile events intended to mobilise the funding agencies and to sensitise the national governments in favour of policies concocted by brilliant technocrats. The result was immediate and obvious: at the first warning, certain governments did not hesitate to carry out a systematic slaughter of family poultry, ostensibly promising compensation which, even if paid, would never repair the damage suffered. As an example, why, last February, spectacularly destroying in Niger the reproductive guinea fowls which represent the key asset in the Sahelian poultry farming sector of - guinea fowl is known as "grey gold" - when this species is known to resist many viral diseases? What will future rural populations think of the veterinary services whose agents disguised as cosmonauts were prominent in the hunt and slaughter of their animals with the assistance of the security forces, whereas decades of assistance and advice had been necessary to be gradually accepted by the small farmers?

It is to be feared that, in the future, the national authorities - in order to please funding agencies - choose the easiest path, namely the destruction of their traditional poultry-farming sector to the detriment of the small farmers, which could mean an increase in the impoverishment of these already underprivileged social players.

And yet, other solutions exist to stop the progression of avian influenza of which the principal one leads paradoxically to increased support of traditional poultry farming by trying to sensitise the village communities, being generally badly informed, and to provide them with the resources to improve their breeding practices as well as the material, financial and human needs required to attain this objective. This policy is strongly encouraged by the Indonesian government with the assistance of various international donors but especially with the local support of nongovernmental organisations (NGOs).

Among the different problems taken into account, this strategy considers the vaccination and monitoring of family poultry farming. The bodies supporting traditional poultry rearing have already, for several years, advocated the systematic vaccination of family poultry against Newcastle disease, thanks to the strains identified and popularised by Prof. Spradbrow's team from Australia. Operational success has unfortunately been limited because the government authorities have not always paid sufficient care and attention. However, - and by taking into account this time the risks of a pandemic disease - would it not be the appropriate time to seize the opportunity to sensitise the governments, international institutions and NGOs and to recommend major mixed vaccination programmes for family poultry, against both avian flu and Newcastle disease? For their part, the specialised technical organisations only recommend vaccination for animals of value and which are not destined for exportation. For my part, I consider that these two criteria come together in

family poultry farming, not only because poultry represents both an important asset and an essential tool in the domestic economy for the family poultry breeders, but also because, for the whole poultry farming sector, indigenous fowl identified in this breeding system continues to represent the source of unadulterated biodiversity necessary for the survival and sustainability of the planet's poultry farming. In addition, these large vaccination campaigns would allow owner access to all information necessary for improved animal management, housing and feeding. I thus dare to hope that the upholders of family poultry farming will have in mind over the next months to continue to develop the best-suited approaches and strategies, not only for the survival but for the sustainable development of the sector.





R&D REPORT No 1:

Avian influenza and family poultry in Nigeria: potentials for rapid spread and continued presence of disease

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Summary

The emergence of the Highly Pathogenic Avian Influenza (HPAI) is increasingly becoming a global concern especially with the threat of the infection becoming a pandemic. Recently in February 2006, the disease was reported for the first time in Nigeria in a commercial poultry farm, which resulted in the death of over 40,000 birds. The introduction of the disease into the country was associated with many external and internal factors. Prompt actions were taken by all stakeholders including the destruction of the affected and in-contact birds, provision of indemnities, decontamination of the affected farm, quarantine and institution of other biosecurity measures. The disease continues to spread rapidly and has been reported in various locations in Nigeria. The emergence of the disease in the country and its potential socio-economic, veterinary and public health consequences warranted its declaration as a national emergency. The structure of the poultry industry in Nigeria consists predominantly of family poultry, which includes scavenging free-range village poultry with little or no biosecurity and urban commercial poultry production with minimum to moderate biosecurity. The success of this industry continues to be threatened by the emergence and re-emergence of infectious diseases including HPAI. The occurrence of HPAI H5N1 virus in Africa is of major concern, putting at immediate risk the livelihood of millions of people relying on family poultry for income generation and source of protein.

Keywords: avian influenza; family poultry; risk factors; Nigeria

Pre-epizootic situation in Nigeria

Nigeria has the biggest national poultry population in Africa. It is estimated to be 104 million (National Livestock Census, 1992), of which only a 10th is of exotic breeds kept on commercial farms, mostly around cities in the southern parts, and smaller flocks throughout the country. The rest constitutes village chickens of local breeds as free roaming backyard poultry which are of scattered populations and typically are non-descript in type because of indiscriminate interbreeding (Sonaiya *et al.*, 1999), although they are hardy and well adapted to their local environment. To date, the best estimate of the poultry population in Nigeria is the one obtained during the National Livestock Census undertaken in

1992 (Federal Department of Livestock, 1992). *Table 1* summarizes the results of the survey.

Table 1. National poultry population estimates.

Species	Village	Urban	Total
Chickens	68,244,195	4,156,661	72,400,856
Ducks	11,220,461	573,507	11,793,968
Guinea fowls	4,621,670	58,237	4,679,907
Pigeons	13,566,775	1,593,091	15,159,866
Turkeys	207,219	16,144	223,363
All poultry	97,860,320	6,397,640	104,257,960

Source: National Livestock Census (Federal Livestock Department, Nigeria, 1992)

Influenza surveillance activities have been relatively poor in most African countries. There is no reliable data on the epidemiological status of HPAI in Africa and indeed Nigeria. However, previous studies have consistently revealed high seroprevalence of different influenza virus subtypes among human and animal populations in the different vegetational zones of Nigeria (Olaleye *et al.*, 1990; Olaleye *et al.*, 1991; Adeniji *et al.*, 1993; Baba *et al.*, 1997; El-Yuguda and Baba, 1998-1999; El-Yuguda and Baba, 2002; Owoade *et al.*, 2002; Abubakar *et al.*, 2005). However, the contribution of the high virus activities to the overall mortality and morbidity is less well defined. The presence of antibodies to different subtypes of Influenza A indicates the co-circulation of various subtypes that could easily facilitate recombination of strains of influenza virus and consequent emergence of new virus strain which could be highly pathogenic for non-immuned populations. Outbreak of influenza in humans has also been reported in Nigeria (David-West and Cooke, 1974).

In December 2005, before the emergence of HPAI into Nigeria in February 2006, the Federal Livestock Department of Nigeria (FDL) constituted a Technical Committee of Experts on the prevention and control of HPAI in Nigeria. The Committee was mandated to map out strategies for prevention, disease surveillance networking and contingency plan for an HPAI emergency in Nigeria. One of the pertinent recommendations of the Committee was the urgent need for the government to establish a HPAI disease network which would include the setting-up of authorized laboratories for prompt HPAI diagnosis, research on the epidemiology of the disease and extensive national disease surveillance. Collaboration between animal and human diagnostic networks was also emphasized. The Committee also suggested the risk factors that could facilitate the emergence of the disease into the country which included: a) through migratory birds, b) presence of HPAI in South-east Asia and South Africa and increased trade as well as human traffic with Nigeria, c) Nigeria's long porous borders and informal livestock movement/trading across the borders, especially at border markets, d) smuggling/illegal movement of poultry and poultry products into Nigeria from infected countries and e) inadequate veterinary quarantine facilities and manpower. Adequate prevention and control preparation plans were suggested, including the command chain in disease surveillance, reporting, prevention and control networks. Unfortunately before the full implementation of the recommendation of the Committee, the disease was reported for the first time in Nigeria.

Present situation in Nigeria

New outbreaks suggest that the HPAI H5N1 virus is spreading progressively southwestwards and not restricted to the Southeast Asian focus, where the outbreaks of AI started in mid-2003. In Russia and Kazakhstan, outbreaks have been associated with contact between domestic poultry and wild waterfowl at open water reservoirs (especially wetlands and lakes). In Nigeria, such wetlands exist, with free flying wild birds and domestic ducks visiting and resting, and these have been speculated as one of the sources of recent introduction of the disease into the country. Outbreaks of HPAI have been reported only in poultry on commercial farms. It is believed that the lack of disease reporting in family poultry sector could be seen as a result of the lack of HPAI disease recognition capability by the family poultry owners as well as a poor disease-reporting network. With the introduction of the disease into the country, the potentials for its spread and continued presence are high especially among the family poultry populations.

Risk factors abound in Nigeria that could facilitate the spread and continued presence of HPAI in the country. Some of the identified factors are:

- Structure of poultry industry in Nigeria consisting predominantly of family poultry with little or no biosecurity, and peri-urban and urban commercial poultry production with minimum to moderate biosecurity and constant introduction of new birds from relatively unknown and unverifiable sources.
- The rearing together of poultry flocks of different species and different ages.
- Uncontrolled livestock and poultry movement within the country as a result of lack of enforcement of animal disease control laws and regulations in the country.
- Lack of organized poultry marketing and existence of open live poultry markets characterised by interspecies mixing and poor sanitary conditions.
- Lack of registration and licensing of poultry farms/ hatcheries and the related establishments as provided by the law.
- Inadequate early warning and early reaction capabilities including inadequate experience of most animal health workers in the recognition and diagnosis of HPAI.
- Difficulty in the clinical differentiation of HPAI from other endemic poultry diseases like Newcastle disease, fowl cholera, mycoplasmosis, etc.
- Lack of funding for compensation of livestock/flock owners in the event of slaughter of their animals for purpose of disease control.
- Improper disposal facilities for poultry carcasses.
- Sale and consumption of sick and dead birds.
- Presence of wetlands where free flying wild birds and domestic ducks visit and rest, which could be the source of the recent emergence of the disease into the country.
- Nigeria's long porous borders and informal livestock movement/trading across the border especially at border markets.
- Inadequate quarantine facilities and manpower.

The peculiarity of the geographical location of Nigeria calls for concern with respect to the spread of the virus. The country borders five other African countries, namely Benin, Chad, Cameroon, Gabon and Republic of Niger. In addition, major wetlands and Fadama sites exist in the country where free-flying wild birds nest and rest, and live poultry

markets flourish within the country and across the borders. With the emergence of the disease into the country, the government has put in place action plans to facilitate prevention of the spread of the disease to uninfected areas, control in affected areas and elimination of the disease from the country. The present efforts include, but are not limited to, establishment of national disease surveillance and reporting networks, upgrading of diagnostic laboratories, etc. Vaccination of poultry in the country is currently being discouraged for the following reasons:

1. The possibility of mixing vaccine virus strains with any circulating wild strain in the country which could result in the emergence of a new strain which may be pathogenic for a non-immune population of birds.
2. The difficulty of monitoring the emergence of avian influenza virus infection into a previously uninfected zone. Without appropriately developed diagnostic methods, it is often difficult differentiating infected from vaccinated birds using the available serological procedures. This situation could make virus surveillance cumbersome and may seriously compromise control efforts.
3. The peculiarity of the scavenging management system of the scattered village poultry population in this country may render the vaccination of this group of poultry impossible. Traditionally, some logistics problems have been associated with vaccination of this group of birds which include: catching and handling individual birds, using skilled vaccinators and repeating the whole procedure sufficiently often to ensure that every bird receives at least two doses of vaccine at different times. Under the prevailing management system, vaccination would be difficult.
4. There is also much to be said about the difficulty in maintaining a “vaccine cold chain” from the producer to the end users in tropical environments like Nigeria. Vaccination failures continue to be a frequent occurrence, due mainly to rapid vaccine deterioration under the high ambient temperature typical of tropical environments.

Conclusion/Recommendation

Presently, outbreaks of HPAI continue to be reported among commercial and family poultry. The control of the disease among village poultry will require concerted efforts by all stakeholders in developing robust and sustainable biosecurity measures as well as the adoption of semi-extensive management system. These measures will require the availability of basic requirements for productive family poultry including night-housing, demographic data, feeding, vaccination, and quarantine when necessary. Since the control of infectious diseases like HPAI and Newcastle disease are crucial to the development of village-based poultry production, a slow participatory sensitization process of all village members, including village heads, women, children and men, will be an essential starting point. Subsequently, the training aspects of the service delivery will also be important. Since HPAI is not yet endemic to Nigeria, stamping out of birds with indemnities to affected poultry flock owners have been suggested as a way of preventing the spread and continued presence of the disease in the country.

References

- ABUBAKAR, M.B., EL-YUGUDA A.D. and BABA, S.S.** (2005) Seroprevalence of influenza virus infections among domestic animals in Borno state. Paper presented at the 41st Nigerian Veterinary Medical Association (NVMA) Annual conference at Maiduguri, November, 2005.
- ADENIJI, J.A., ADU, F.A., BABA, S.S., OWOADE, A.A. and TOMORI, O.** (1993) Influenza A and B antibodies in pigs and chickens population in Ibadan metropolis, Nigeria. *Trop. Vet.* 11: 39-45.
- BABA, S.S., EL-YUGUDA, A.D. and NGGANJIWA S.P.** (1997) Serological evidence of influenza virus activities in

small ruminant in Borno State, Nigeria: Retrospective and Prospective Studies. *Biosic. Com.* 10: 229-232.

DAVID-WEST, T.S. and COOKE, A.R. (1974) Laboratory and clinical investigations of the 1974 influenza epidemic in Nigeria. *Bull. Wld. Hlth. Org.* 513: 103-105.

EL-YUGUDA, A.D. and BABA, S.S. (1998-99) Preliminary survey of influenza A and B antibodies in Japanese quails (*Coturnix coturnix japonica*) in Maiduguri, Borno State, Nigeria. *Annals of Borno* 15/16: 325-328.

EL-YUGUDA, A.D. and BABA, S.S. (2002) Prevalence of selected viral infections in various age groups of village chickens in Borno state, Nigeria. *Nig. J. Anim. Prod.* 29(2): 245-250.

FEDERAL DEPARTMENT OF LIVESTOCK (2005) Highly pathogenic avian influenza (HPAI) in Nigeria: Strategies for prevention of introduction, disease surveillance networking and contingency plan for disease emergency. Report of the Technical Committee of Experts on the Prevention and Control of HPAI in Nigeria. Federal Department of Livestock & Pest Control Services, Abuja, Nigeria.

FEDERAL DEPARTMENT OF LIVESTOCK (1992) Nigerian Livestock Resources Survey. Resource Inventory and management Limited, Jersey, UK.

OLALEYE, O.D., OMILABU, S.A., BABA, S.S. and FAGBAMI, A.H. (1990) Haemagglutination inhibiting (HI) antibodies against strains of influenza A virus in horse and pig sera in Nigeria. *J. Hyg. Epid. Microbiol. Immun.* 34(4): 395-406.

OLALEYE, O.D., BABA, S.S., OMILABU, S.A. and FAGBAMI, A.H. (1991) Haemagglutination inhibiting antibodies against influenza A and B in human sera from five ecological zones in Nigeria. *J. Hyg. Microbiol. Immun.* 35(4): 395-406.

OWOADE, A.A., ADENIJI, J.A. and OLUTUNJI, M.O. (2002) Serological evidence of influenza A virus serotype (H1N1 and H5N1) in chicken in Nigeria. *Trop. Vet.* 20 (3): 156-161.

SONAIYA, E.B., BRANCKAERT, R.D.S. and GUÈYE, E.F. (1999) Research and Development Options for Family Poultry. Introductory paper to the First INFPD/FAO Electronic Conference on Family Poultry "The Scope and Effect of Family Poultry Research and Development (7 December 1998 - 5 March 1999)".



Avian influenza: the Ghana situation

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Summary

In recent times, the single most important livestock disease, with possible significant implications for animals and humans, is avian influenza (AI). Its occurrence and spread have received the attention of all governments in the world because of its potential to provoke a human pandemic and based on its historical occurrences in the past. Nigeria, the largest populated country in Africa, recorded for the first time an outbreak of AI in February 2006. In Ghana, control measures are being implemented. The country is at risk, since an outbreak of AI has been recorded in Burkina Faso, Niger, Côte d'Ivoire and Nigeria, which are countries in the sub-region with free movement of people. Ghana's surveillance system is on high alert to prevent the disease occurring in the country. Ghana is facing the economic effects, though the disease has not been recorded as at now.

Keywords: control measure; outbreak; pro-poor; rural economy; strategy; surveillance; zoonotic

1. Introduction

In recent times, the world is on edge about the eminent threat of the Highly Pathogenic Avian Influenza (HPAI). The disease is zoonotic, thus affecting animals and humans. The lethal H5N1 virus has finally hit the African continent, with its occurrence in a commercial farm in Nigeria in February 2006, after its wide spread in Southern Eastern Asia countries in 2003, 2004 and in Romania and Turkey in 2005.

Before HPAI was recorded in February 2006 in Nigeria, Africa's largest populated country, there has been anxiety, worry and concerns as to when the disease will hit the continent with its negative consequences. It was unexpected that Nigeria was the first African country that recorded an outbreak of HPAI. Considering the international flyways of migratory birds, it was indeed thought that the disease will first occur in East Africa with its large wild bird population or in Senegal, with its large wild bird exports.

2. Reasons for worry of AI on the poultry industry

With the outbreak of HPAI in Nigeria, it is most likely that it could easily spread rapidly from Nigeria to Ghana because of a number of reasons. These include: the uncontrolled movement of birds for commercial activities, the integrated livestock farming systems, the socio-cultural practices associated with livestock, weak surveillance and quarantine systems, and poultry diseases with similar symptoms of HPAI that could complicate diagnosis, easy movement of people and trade between Nigeria and Ghana. Apart from Nigeria, an outbreak of HPAI has been reported in Burkina Faso and

Côte d'Ivoire, all neighbouring countries of Ghana.

In Ghana, many non-governmental organizations (NGOs) use different strategies in poverty alleviation programmes for the pro-poor. One of such strategies is the development of rural poultry as a tool in reducing poverty. With the outbreak of HPAI, NGOs that use smallholder poultry for pro-poor strategies are unwilling to continue or expand their activities in smallholder poultry. NGOs in Ghana that use poultry as an income-generating activity are indicated in the *Table 1*.

Table 1. Non-governmental organizations in family poultry development.

No	Name of NGO	Operational region	Type of family poultry
1	<i>Ricerca and Cooperazione</i>	Western and Eastern Region	Smallholder commercial layers
2	<i>Heifer Project</i>	Brong Ahafo Volta	Cockerels and layers
3	<i>Opportunities Industrialization Centre (OIC)</i>	Northern Region	Rural Poultry
4	<i>Kindness International</i>	Upper East	Rural Poultry
5	<i>World Vision, Ghana</i>	Eastern and Upper East	Cockerels
6	<i>Sankofa Foundation</i>	Dagme West/East	Layers
7	<i>German Development Service</i>	Eastern Region	Cockerels
8	<i>Ghana Poultry Network</i>	Eastern Region Upper East	Layers/cockerels/rural poultry

Apart from these NGOs, Oxfam had made proposals to implement a billion-cedis rural poultry project in the Northern, Upper East and Upper West Regions. However, with the outbreak of AI, especially in neighbouring countries of Nigeria and Burkina Faso, Oxfam is most likely not to implement this poultry programme.

3. Economics and health impacts of HPAI on family poultry

The reasons for great concerns with an outbreak of HPAI in Africa are the fragile nature of rural economics and public health issues. Family poultry flocks are major sources of daily income to majority of Ghanaian farmers; and with the recent outbreaks of HPAI, the nerve centre of rural livelihoods has been threatened. With the outbreak of HPAI in Burkina Faso, family poultry farmers in the Upper East and Upper West Regions of Ghana no longer bring live fowls to sell in live fowl markets in Kumasi and Accra. This is because these two regions share the same borders with Burkina Faso. Consequently, family poultry farmers no longer earn an income from selling live fowls, until AI has been declared eradicated in Burkina Faso.

Ghana, like any other African country, is facing the challenges of combating HIV/AIDS, malaria and tuberculosis. In the event of an HPAI outbreak in family poultry flocks, the risk of serious complications is of evident public health importance. Ghana is facing the economic effects of HPAI, even though the disease has not yet been recorded. Such economic effects are the falling prices for poultry products and maize, the main feed ingredients of the poultry industry.

4. Strategy for prevention and control

Since the outbreak of HPAI in Asian countries in 2005, the Government of Ghana (GoG) has taken the necessary strategies and control measures to prevent the disease from entering the country. The main strategy of the GoG is a joint AI Working Group (AIWG) of donors/partners and government ministries.

The AIWG consists of the World Bank, the World Health Organization, the Food and Agriculture Organization of United Nations, the United States Agency for International Development, the Ministry of Health, the Ministry of Interior, the Veterinary Services Directorate (VSD) of the Ministry of Food and Agriculture, and the Wildlife Division of the Forestry Commission. The AIWG meets to discuss the control measures to prevent the disease entering Ghana and measures to be taken in case of an outbreak in Ghana. There is the Ghana's Emergency Preparedness Plan for AI Pandemic. Importantly missing from this AIWG in Ghana is representation of civil society, such as NGOs or farmers associations.

5. Implementation of control measures

With the rapid spread of AI in Asian and European countries, the Government of Ghana placed a ban on the imports of live birds and poultry products from infected countries. The VSD of the Ministry of Food and Agriculture is implementing the following control measures:

5.1. Ghana's emergency preparedness plan for AI pandemic

This is set up as a necessary control measure to be implemented in case of an outbreak of HPAI in the country.

5.2. Public awareness campaign

The VSD has launched and continues to create public awareness on the disease throughout the country using local radio and other communication materials. However, there appears to be public concern that some of the local FM stations are giving information that scare the public from eating poultry products. Apart from VSD, other stakeholders in the poultry industry have organized public awareness campaigns. The Ghana Branch of World's Poultry Science Association organized workshop for the public on the theme "The Bird Flu Disease: Questions, Answers and the Way Forward" in April 2006. Also the Ghana Veterinary Medical Association and the Regional Directorate of the Ministry of Food and Agriculture in the Greater Accra Region jointly organized a similar public workshop in March 2006. In April 2006, the Ghana Veterinary Medical Association in celebrating the World Veterinary Day, organized a public workshop. In this workshop, the topics that were discussed included "Avian Influenza and the significance of its transmission" and the "Avian Influenza and the Laboratory Back-up". All these workshops were held in Accra, the national capital of Ghana, which apparently did not focus on the needs and understanding of family poultry producers.

5.3. Production of brochures/posters on AI

The VSD of the Ministry of Food and Agriculture produced and distributed educational posters on HPAI. These posters are placed in all public places, farms, and offices and in rural communities. Apart from posters, colourful brochures are produced and distributed to farmers.

5.4. Surveillance systems

The VSD provides the main framework for the surveillance of HPAI at the international border entry points into the country and at wild bird staging posts. The Ghana Police Service and the Ghana Immigration support the efforts of VSD at these points. Other surveillance systems are complemented by the Ghana Customs Excise and Prevention Services and the Ghana Ports and Harbour Authority, which are positioned at the air and port entries of Ghana.

5.5. Training of VSD staff

VSD of the Ministry of Food and Agriculture has organized a number of training workshops for its personnel on disease recognition and control measures of HPAI. As part of primary animal health care delivery system, VSD has trained Community Animal Health Workers (CAHWs) in many rural communities. However, these CAHWs have not been specially trained and integrated to assist in the prevention and control of HPAI, even though these are in direct contact with family poultry households.

6. Difficulties associated with prevention and control of AI

In Ghana, the main difficulties associated with the prevention and control of HPAI are:

6.1. Live bird market systems

Live bird markets are located in rural communities as well as in urban cities. Family poultry-keeping households bring live birds to these markets on certain days of the week. Spent layers and broilers are sold in the live markets of urban cities, such as those of Accra and Kumasi.

6.2. Socio-cultural practices

Using fowls for cultural and mystical purposes are part of the lives of many Ghanaians. The use of fowls for such purposes can easily be carried out that could escape the most highly sophisticated surveillance and quarantine systems. An instance of this was that one day I was travelling in a public bus from Accra to Obodan, Obodan being located in about 55 km away from Accra. In reaching the next village before Obodan, a fetish priestess came out of the bus and a fowl she was carrying hidden in a polythene bag tried to jump out of the bus at a bus stop. That was the first time that I got to know that she was carrying a fowl, even though we sat next to each other for the whole journey. This case is to point out the difficulties associated in implementing a quarantine zone within an outbreak area of the disease.

6.3. Free-range husbandry

The free-range of village chicken is part of the farming system in Ghana. In rural communities, birds of one household family freely mingle with others from another household or even birds of different communities. This situation creates a problem of disease control measures.

6.4. Newcastle Disease

Newcastle disease (ND) is endemic in family poultry in Ghana. Outbreaks are normally recorded from November to December annually, but could occur at any time. Since the symptoms of ND are similar to those of AI, farmers might not report. This is because many family poultry producers live with ND and will see an HPAI outbreak as common occurrence of ND and will not report an outbreak. It is however imperative that farmers report any case of outbreak of HPAI in family poultry. Government veterinary staff is actively promoting the use of the I-2 thermotolerant ND vaccine for the control of ND as a major policy in family poultry development. Additionally, *Heifer Project International* consistently train farmers to apply I-2 vaccine to protect village poultry against ND.

7. AI surveillance programme in family poultry

A critical control measure for HPAI in family poultry is active, routine and purposeful surveillance. The VSD has trained staff to conduct surveillance in commercial, family poultry systems and wild birds throughout the country.

References

1. **COUNCIL FOR AGRICULTURAL SCIENCE AND TECHNOLOGY (CAST)** (2006) Avian Influenza Human Pandemic Concerns. CAST Commentary, 2006, Ames, Iowa.
2. **DAILY GRAPHIC** (2006) 19th April, 2006, Accra, Ghana.
3. **GHANA VETERINARY MEDICAL ASSOCIATION** (2006) April 2006. Celebrate Our Diversity-Veterinary Medicine and Public Health. Accra, Ghana.
4. **GRAIN** (2006) The top-down global response to bird flu. April 2006: grain.org/articles/?id=12
5. **NEWSWEEK** (2005), The bird flu, the race to prevent a global epidemic, how to protect yourself? October 31, 2005.
6. **VETERINARY SERVICES DIRECTORATE** (2006) Bird flu (avian influenza): what the farmer needs to know and do. Ministry of Food and Agriculture, March 2006, Accra, Ghana.



Avian influenza and chicken health in Morocco

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Summary

Avian influenza (AI) is a respiratory disease of poultry caused by influenza virus A of the Orthomyxoviridae family. The disease is of economic significance to the poultry industry worldwide. Aquatic birds are the reservoirs of all subtypes of Influenza A viruses. Morocco is on the route of migratory wild birds and has local wild and feral birds. However, infection was never detected in Morocco's poultry sector. Effective national immunization program could enable the country to take more active steps towards influenza control.

Keywords: avian influenza; family poultry; migrant birds

Introduction

Poultry production has been constantly increasing over the past decades and a very recent survey conducted by FISA shows that poultry meat production passed from 29,000 metric tons (MT) in 1970 to 230,000 MT in 1997 recording an average annual growth rate of 8%. On the whole, the production of white meat currently contributes to more than 40% in the overall meat consumption (Directorate of Livestock, Ministry of Agriculture, Rural Development and Maritime Fisheries, 2003). In parallel, eggs are also produced.

According to the Food and Agriculture Organisation of the United Nations (FAO, 2004), the poultry sector is divided into four sub-sectors:

- Industrial system with high-level biosecurity and birds/products marketed commercially;
- Commercial poultry production system with moderate to high biosecurity and birds/products usually marketed commercially;
- Commercial poultry production system with low to minimal biosecurity;
- Village or backyard production with minimal biosecurity and birds/products consumed locally.

In Morocco, the poultry farming sector plays a considerable socio-economic role. In rural areas, the poultry reared around the house during daytime to obtain what feed they may be able to get from the environment often as insects and grits. These factors may explain low productivity and high mortality rates. Free-range poultry and their eggs are more likely to be infected by virus and parasites than caged birds and their eggs (Kichou *et al.*, 2001; Hassouni and Belghyti, 2005; 2006).

In recent years, influenza A subtype H5N1 is an emergent and virulent disease that poses a threat to health and safety of the world community. Morocco, from its geographical situation, the importance of its international exchanges, the strong density of its population and their ecological characteristics, presents all factors favourable to the introduction and spread of avian influenza. However, the situation in poultry sector is calm so far (Ministry of Agriculture, 2005).

The current study was undertaken to describe the basic principles of epidemiology, the situation of H5N1 in family poultry in Morocco and the primary prevention. While it is potentially a major threat to human health, it is presently, first and foremost the cause of an animal disease which has already had disastrous social and economic consequences in affected countries, endangering farmers livelihoods, jeopardizing the poultry sector economy, disrupting the national and international trade, weighing heavily on national budgets in order to control the disease.

While it is still unclear whether a pandemic virus would appear in the coming months or years, it is obvious that the animal disease continues to disseminate to new regions and countries causing additional harm. On the other end, controlling the disease at source, i.e. within animals, is considered as the most effective way to prevent a human pandemic. Reducing the overall quantity of virus circulating amongst animals would proportionally reduce the risk of human pandemic.

Epidemiology of avian flu

AI is caused by a range of Type A influenza viruses, influenza viruses belong to the Orthomyxoviridae family and are classified as types A, B, and C, based on antigenic differences in their nucleoprotein (NP) and matrix (M) proteins. The influenza A virus genome comprises eight negative-sense RNA segments. These segments encode ten proteins, two of which are glycoproteins – hemagglutinin (HA) and neuraminidase (NA). Influenza A viruses have been isolated from a variety of animals including humans, pigs, horses, whales, seals and birds.

Avian flu (H5N1) is a serious disease, resulting in severe mortality in chickens and humans. Humans may be infected via close contact with infected birds and by working in an environment that is heavily contaminated with HPAI viruses (WHO, 2005; Alice and Edler, 2006).

Estimates of the impact of HPAI in affected countries vary greatly, depending on the structure of the poultry sector, the speed of outbreak control and the method used to estimate the impact. The impact of HPAI has been distributed within the entire poultry market chain, affecting producers, consumers and employees in the retail industry.

What is the situation in the Gharb region of Morocco?

The Sidi Boughaba Lake, Merja Zerga and Merja of Fouarat, constitute biological reserves, which shelter a significant population of migratory birds. These sites are regarded as the crossing point and the stopover for several species of birds. 87,393 birds will make stopover in Morocco of which some are in the process of disappearance, to thirds of the quotas wintering in North-West area (Harch-Rass, 2004; Harch-Rass *et al.*, 2004). In addition, it is well confirmed that the migratory birds coming from a zone infected by the virus can be contaminated and carrying healthy appearances (Jennifer *et al.*, 2004). Sturm-Ramirez *et al.* (2004) also suggest that, in late 2002, outbreaks of H5N1 HPAI virus

caused deaths in wild migratory birds and resident waterfowl, including ducks.

Over the past few years, it has become increasingly evident that a major reservoir of influenza viruses exists in both domestic and feral avian species, particularly ducks. For example, studies on migratory ducks in Canada in 1978 showed that 50% of these healthy birds were infected with influenza viruses (Hinshaw *et al.*, 1980).

For Africa's land, the following are the entry points for migratory birds:

- The Strait of Gibraltar: through this corridor birds get into Morocco and proceed to West Africa;
- The Sicily and Malta Channels: through this channel birds enter Tunisia and proceed to Algeria, Libya and Chad;
- The Eastern Mediterranean and Bab al Mandab: through this channel birds enter through Djibouti and proceed through Ethiopia to East Africa;
- The Jordan River to Nile Valley corridor: through this corridor birds enter Egypt and then fly to Sudan, Uganda, Kenya, Tanzania, Malawi, Zimbabwe and South Africa.

Farm conditions favour the transmission of infectious disease agents among birds. The probability of infection is higher in commercial production sector than in backyard production sector; infection may have a greater impact due to the concentration of susceptible poultry in these farms (FAO, 2004).

Surveillance of avian flu (H5N1)

The country also appears in the chart where forward the migratory birds. Several species of birds flee the icy cold of the winter period in Northern Europe and Russia and come to find refuge in North Africa. Precaution measures to prevent the introduction of the pandemic into Morocco, given the role of migratory birds in transporting and transmitting the H5N1 virus, and the importation of poultry or their products from infected countries. However, since 2003, Morocco prohibited the importation of poultry and breeding material coming from all the countries that have been declared infected by the H5N1 virus. OIE (2004) recommended that poultry products should not be traded from HPAI infected countries or compartments unless they are treated to inactivate the virus.

Conclusion

Birds represent a zoonotic pool for viruses and their biology. The migrations in particular, have a direct impact on global viral circulation. Among the diversity of avian species which can be naturally infected by influenza viruses, chickens recently became a new contender and transmission link for viruses from wild birds to humans. Only few cases of humans infected in the world and even less who have died. Today the real problem is more to be encountered in the poultry industry and the market shocks, in addition, there is a human treat but the real enemy of human to human transmission is not yet here. This should be clearly expressed. In Morocco, very little is known about avian influenza viruses. However, future research should include further examination of the seasonality as well as health and economic burden of influenza.

References

- ALICE, A. and EDLER, M.D.** (2006) Avian flu (H5N1): its epidemiology, prevention and implications for anesthesiology. *Journal of Clinical Anesthesia* 18(1): 1-4.
- BREEDING DIRECTION, MINISTRY FOR AGRICULTURE, THE RURAL DEVELOPMENT AND MARITIME FISHING'S, RABAT** (2003). Secteur avicole au Maroc: Situation et perspective. N° 161. www.terrevie.ovh.org/a161.htm
- EL AGBANI, M.A.** (1997) L'Hivernage des Anatidés au Maroc: principales espèces, zones humides d'importance majeur et propositions de mesures de protections. *Thèses d'État ès-Sciences Biologiques*.
- FOOD AND AGRICULTURE ORGANISATION** (2004) FAO Recommendations on the Prevention, Control and Eradication of Highly Pathogenic Avian Influenza (HPAI) in Asia. www.fao.org/ag/againfo/subjects/en/health/diseases-cards/27/septrecomm.pdf
- HARCH-RASS, A.** (2004). Etude Ecologique et Ornithologique du Gharb (Kénitra - Maroc): Lac Sidi Boughaba & Estuaire de Sebou: Biodiversité, Migration et Reproduction. *Mémoire de Troisième Cycle, Faculté des Sciences Kénitra, Maroc*.
- HARCH-RASS, A., BELGHYTI, D., EL KHARRIM, K.** (2005) Note sur l'avifaune aquatique du Plage de Mehdiâ & L'Estuaire de l'oued Sebou (Kénitra-Maroc): Biodiversité, Dénombrement et Migration. *Internatiol Marine Biotechnology Conference. St. John's. Newfoundland & Labrador. Canada. June 7-12, 2005*.
- HASSOUNI, T., BELGHYTI, D.** (2005) Sanitary and zootechnical impact of gastro-intestinal helminths of scavenging chickens of Gharb region, Morocco. *INFPD Newsletter* Vol. 15, No. 2: 3-7.
- HASSOUNI, T., BELGHYTI, D.** (2006) Distribution of gastrointestinal helminths in chicken farms in the Gharb region- Morocco. *Parasitology Research*. Online First.
- HINSHAW, V.S., WEBSTER, R.G., BEAN, W.J., SRIRAM, G.** (1980) The ecology of influenza viruses in ducks and analysis of influenza viruses with monoclonal antibodies. *Comparative Immunology, Microbiology and Infectious Diseases Volume 3, Issues 1-2*: 155-164.
- JENNIFER, C., HESS, D.V.M., JEAN, A., PARÉ, D.M.V.** (2004) Viruses of waterfowl. *Seminars in Avian and Exotic Pet Medicine Volume 13. Issue 4*: 176-183.
- KICHOU, F., EL OMARI, N., JAOUZI, T.** (2001) Prévalence de la maladie de Newcastle et la maladie de Gumboro chez le poulet villageois au Maroc. *Livestock Community and Environment. Proceedings of the 10th Conference of the Association of Institutions for Tropical Veterinary Medicine, Copenhagen, Denmark, 2001*
- MOROCCO'S MINISTRY FOR AGRICULTURE, THE RURAL DEVELOPMENT AND MARITIME FISHERIES** (2005): Grippe aviaire: le Maroc prend ses dispositions. www.menara.ma/Infos/includes/detail.asp/article.
- OFFICE INTERNATIONAL DES EPIZOOTIES** (2004) Terrestrial animal health code, 2003. *Paris Office International des Epizooties*, www.oie.int/eng/normes/MCode/A_summry.htm
- WORLD HEALTH ORGANIZATION** (2005) Avian influenza A (H5N1). *Wkly Epidemiol Rev* 2004; 79: 65-70.



Village system analysis to orientate the fight strategy against the avian influenza in rural poultry keeping in Niger

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Introduction

The avian influenza caused by the HPA1 virus was introduced in Africa at the beginning of 2006 in Nigeria, and it continues to spread across the whole of West Africa poultry farming. Different fowl species are affected in the villages of poor regions with peculiar socio-economic and cultural conditions, often lacking of appropriate technical support.

To obtain elements allowing judging about the best intervention line in the local context of rural fowl keeping, an analysis was performed to ascertain:

- a. – the situation on the world wide scale (main features);
- b. – the situation of the disease at the country level;
- c. – the situation at the villages level.

Description of the situation

a. – With reference to the global situation, it was observed that:

1. HPA1 epidemiological situation is very complex, and many factors related to the epidemiology are only partially known;
2. Each country must face its own problems. Many different fowl species are involved and farming systems are various, from a few subjects of different species mixed up and freely scavenging, to monospecific units, industrialized and closed where stamping out is relatively easy. Agro-ecology can influence the behaviour of the virus and the evolution of the disease;
3. The infection continues to spread all over the world and wild migratory birds which may have an important role to play, cannot be stamped out nor vaccinated;
4. Web-footed (domestic and migratory) are frequently responsible for the dissemination of the disease (FAO, 2004; 2006). For instance, it has been observed that Anseriformes are usually healthy carriers. A bird contaminated before its departure on migration can fly during the incubation period to spread the disease upon its arrival. It has also been observed that the virus survives better in water and that water itself can spread the virus;
5. Slaughtering has no impact on the introduction or the re-introduction of the virus while vaccination allows temporal control and/or diminishing of the presence of the virus in the infected zones and prevention of the spreading

from the source of infection;

6. Samples of new mortality cases in domestic and wild birds are continually brought for analysis and confirmation of positive HPA1 virus. This makes the fight and control of the disease extremely difficult;
7. In Africa, mortality rate of poultry are not easily declared. If a bird dies in the bush, rarely it is brought to the Veterinary Services to allow analysis. Anyhow, since the samples must be sent to Europe, epidemiological investigations and laboratory analysis cannot begin at the opportune time. The delay for the diagnosis is long and appropriate intervention can not always be fast enough (FAO, 2006) to prevent the spreading of the disease;
8. Vaccination, the same as stamping out or a combination of both, can be envisaged as a mechanism for prevention and control;
9. Where vaccination is well made, results can be positive, like in Vietnam where HPA1 is well controlled since the introduction of massive vaccination;
10. However, in countries where the strength of veterinary services is limited, both stamping out and vaccination face constraints that can compromise the success of these operations.

b. – In the case of Niger:

1. The virus was identified in two domestic ducks (OIE, 2006) in the Magaria locality, near the Nigerian border where mortality cases were reported;
2. It is possible that the disease came to Niger either by/through migratory birds but also possibly by trade/movement of animals. Indirect contact with vehicles or other contaminated material could equally be incriminated;
3. In the Niger agricultural zone, Niger-River and a lot of humid zones allows migratory birds to stop;
4. The HPA1 virus is impaired by temperatures between 35 to 40 degrees Celsius (as recorded during the period of the report written in April 2006). However, the waters of humid areas and the big Niger River present maximum temperatures between 18 to 21 degrees Celsius;
5. Since the two cases of infected and confirmed HPA1 duck cases on 27th February 2006, all the other analysis were negative up to the timing of writing;
6. To develop an intervention plan, the easiest hypothesis is to consider the avian influenza as present henceforth in the country.

c. – In Niger villages:

1. Four species of poultry are kept: chickens, guinea fowls, pigeons and Muscovy ducks, all susceptible to HPA1 virus;
2. Birds wander freely. They are not locked up during the day and only sometimes during the night. Henhouses are rare and guinea fowls remain frequently in the bush near the dwellings;
3. Fortunately, the villages are far away from one another and direct transmission of the virus between poultry is very unlikely. Nevertheless, one must consider that pigeons, which can fly over long distances in search of food (*Figure 1*) and ducks in the presence of water (Muscovy duck is the only duck species in the rural area which adapts well also in very dry regions) are species at risk in terms of propagation of the disease;
4. However, the risks of indirect contamination is still high since scavenging birds can easily get into contact, either with people, or with means of transport (both vehicles and mammals like donkeys and camels). Migratory birds, even while flying, can spread the virus through their faeces. Hyenas and vultures, which feed on contaminated

dead birds, could also spread the virus. Flowing waters have lower temperatures where the virus survives better and can bring it also far from the place of contamination;

5. These numerous factors could allow the re-contamination relatively little time after stamping out and disinfection (FAO, 2004) and the virus will continue to circulate among domestic or wild birds;
6. Stamping out of contaminated birds brings a lot of problems in the rural areas of Africa where catching the animals is not as easy as in the closed buildings of the industrialized countries. The field analysis shows that killing all birds will not be easily accepted, but the collaboration of people is indispensable. If producers do not collaborate they will disperse the birds in the bush early in the morning to complicate the task of the veterinarians (culling teams). During the discussions the possibility of violent reactions from the people was considered as very probable since poultry keeping represent a mean of food security and is an important sector of the households economy and often a unique source of money;



Figure 1: Pigeons (the white bird on the right, seen here with guinea fowls) can transfer avian influenza to other species because their movement covers long distances.

7. All these factors make stamping out technically and socially very difficult and create a very negative economic impact if a strategy of compensation is not effective (for many economical and technical reasons this is very difficult to be put in place in the rural areas);
8. Sadly, also vaccination brings some constraints linked to technical exigencies and logistics and limited capacities of veterinary services to cover large territories;
9. The distribution of the vaccine in the rural areas and its conservation during the vaccination campaign is not easy enough to guarantee the efficiency of the intervention;
10. All these points were considered and, in the case of Italian decentralized co-operation; GCP/NER/044/ITA, which allows buying a number of fowls in the form of credit, it was envisaged to vaccinate all the birds, in order to protect the investment of producers;
11. It was considered important to obtain a support from local authorities, namely Mayors and/or Chiefs of the villages, to support the sensitizing of the people on the risks and means of fighting HPA1;
12. It is equally convenient to study the socio-cultural factors, which constitute major constraints to put in place activi-

- ties for the project. For example, it was observed that there are difficulties in the choice of beneficiaries in the rural areas. A strategy must guarantee the consensus and collective co-operation;
13. One must also consider the prestige and power of the traditional medicine, which must not oppose the strategy put in place becoming an important risk of failure of the project. One must win their confidence and support, duly respecting the autochthonous culture;
 14. If the vaccination becomes part of the strategy for the fight against avian influenza in Niger, it is important that all the birds in the project area be vaccinated. Vaccination must not be limited to subjects provided by the project but it should be generalized to all the birds in the villages concerned by the project. Public and private veterinarians should be involved in the process of vaccination, and, if possible, employed during the envisaged interventions;
 15. All the domestic avian species must be considered during the planned strategic vaccination (FAO, 2004);
 16. The different bird species are not exposed to contamination in the same way, and each species presents different risks; pigeons can fly very far to search for feed, ducks can be in contact with migratory birds in the ponds and rivers, guinea fowls wander far away from the villages and chickens, though wandering less, can be contaminated by other birds or indirectly by people and vehicles moving in the village;
 17. Psychological impacts must be considered attentively. Protection of birds by vaccination will have a re-assuring effect on consumers and positive for trade, whereas stamping out will produce a probably durable contrary effect;
 18. Certain psychological effects were discussed, the risks of bad interpretation on the part of the villages is great in the rural settings. For example, if, in a village where vaccination has taken place, birds that have not been vaccinated fall sick, it is easy that people think vaccination to be responsible for the introduction of the sickness in the village. But if only non-vaccinated birds in the other villages do fall sick, there will be a proof of the protective effect of the vaccine. This could improve confidence and favour the future action of veterinarians;
 19. It is recommended to organize the vaccination against the avian influenza at the same time as that of the Newcastle Disease. In practice the costs could be similar as to a prophylaxis with a unique vaccine;
 20. It is also recommended the distribution of specific publications as the small practical guide for "Prevention and Control of the Avian Flu in Small Poultry Farms". It is simple and well illustrated; it was prepared to support the fight against HPA1 in Vietnam and is distributed by FAO. It could be adapted to the African context and translated into the local languages;
 21. The choice of the vaccine must respond to recommendations of OIE; it will be of good quality, adapted to field conditions and used rigorously respecting the norms of conservation and treatment. A follow-up strategy must equally be put in place;
 22. It is important to provide information. It is an appropriate way to cut short rumours which maintain the fear of poultry products and have a negative economic, social and cultural impact which is in general more harmful than the sickness itself;
 23. One must encourage local villagers to use other alternatives to diversify their systems of production in relation to potentials, which exist locally. For instance, rabbit rearing could be an interesting alternative in certain zones where forages are available to avoid people remaining without any livelihoods until the problem of avian influenza remains a menace. Proposing alternatives is equally part of programs to fight avian influenza.

Conclusion

The analysis of the production systems in the field allows a better evaluation of the numerous factors which interact both on the probabilities of the HPA1 infection and on the envisaging of the best intervention lines. It is important to consider the different species of birds present in the villages and the socio-economic and cultural factors, which can promote or impair the envisaged prevention and control.

Naturally all these factors undergo an evolution and it is impossible to determine in advance the direction and importance, which they can take. New factors can equally appear, a follow-up is necessary and all the matter should be periodically newly discussed. But it is certain that the analysis of the system is a powerful mean to plan the most efficient action against the spread of the avian influenza in a considered area (FAO, 2003).

References

FAO (2003) Prevention and Control of the Avian Flu in the Small Poultry Farms. Hanoi, 2003.

FAO (2004) Special Issue: Avian Influenza. EMPRES, No. 25, 2004.

FAO (2006) Update on the Avian Influenza situation (as of 23/01/2006). FAOAIDENews, Issue No. 39.

OIE (2006) Website: www.who.int/en (consulted in February 2006).



Economic stakes of the avian influenza on the Senegalese poultry production sector

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Summary

The poultry farming system has been traditionally practised in Senegal for a long time with the rearing of local birds then since close to a half century by the introduction of exotic poultry races. It constitutes today a sector in growth especially in urban and semi-urban areas. Its contribution to nutrition and poverty reduction in rural areas is widely well known. Indeed, the so-called modern poultry farming system in urban areas employs directly more than ten thousands persons and accounts for almost forty billion CFA francs (80 millions US\$) in the national economy as annual turnover sales. The rural poultry sector, with a manpower estimated at more than 15 million birds, constitutes undoubtedly the agricultural activity most widely distributed in the country. The avian influenza which currently represents a world concern appears a major obstacle to the progress of such a dynamic system. The socio-economic consequences of a pandemic of avian influenza in Senegal, would be considerable. Consequently, all actors of the poultry sector should be mobilized to come about the plague or at least to minimize its impact on the national poultry sector.

Key words: poultry farming semi-urban; urban and rural; poverty; malnutrition; avian influenza; socio-economic impact

Introduction

The rearing of hen (*Gallus domesticus*, descending of *G. ferrugineus*), is an usual practice in Senegal, even a way of life, whose socio-economic contribution induced earlier the authorities to take into consideration the sector by according means and policy orientation to drive up the national sector. Therefore, the “*Centre National d’Aviculture*” (CAN, or National Poultry Centre) located in Mbao was created in 1962 to promote and develop poultry farming in all its speculations (extensive or village level production, intensive or semi-intensive production) on a nationwide basis. However, the CNA is almost exclusively interested in urban and semi-urban poultry farming (more or less modern around Dakar and of some other big agglomerations) which exploits exotic stocks, imported primarily from Europe. The rural poultry farming with rustic, locally adapted, but less productive birds, is practically abandoned. However, the authorities decide recently to focus their interests in the development of family or village poultry farming system. Thus, the Senegalese poultry system can be divided into two farming systems or systems of rearing, namely the intensive (or semi-intensive) system and the village (family or rural) system.

The intensive system, which currently represents an annual turnover sale of almost 30 billion FCFA (60 millions US\$), provides more than ten thousands permanent jobs. Village poultry farming system, on the other hand, still remains an effective means of poverty reduction. Due to its importance, any phenomenon that hampers such a dynamic trend will consequently damage deeply and disturb the Senegal's national economy. The policies measurements taken to prevent the sector against the avian influenza induce a national psychosis which can explain the social and economic consequences of such an epizooty in Senegal.

Material and method

The results of this work were obtained in consequence of a permanent follow-up of poultry mortality since 1996. This follow-up was done through advisory in poultry rearing, participation in the training sessions of actors and, participation in various subject-related forum. Secondary information was then obtained from subsequent consultancy missions carried out on the poultry sector since 2001, through various projects financed by FAO (TCP SEN 0065/D and 2904/D), relating to "*Improvement of poultry production in traditional family breeding through a better management of the production and health constraints*", and by the World Bank (PDMAS/Consult SEN-Engineering) on "*the chains of chicken broiler supply*". Then, some primary data were collected through structured investigations and Semi Interview (ISS). ACCESS software is used for data entry and EXCEL for statistical analyses

Results and discussion

Modern poultry farming, a growing sector

This activity which relates to the (intensive or semi-intensive) rearing of exotic breeds under acceptable conditions, records good performances today, in certain stockholders, compared to those obtained from developed countries with moderate climate: (i) an average weight from 1.5 to 2 kg in 45 days of breeding for broiler chickens and (ii) an annual laying varying between 260 and 280 eggs per hen and year. This production of eggs for consumption by modern poultry farming ensures a significant part of the egg consumption in Senegal, which is estimated at approximately 20 to 25 eggs *per capita* and per annum. This is however very far from the level of consumption in developed countries such as Japan where one person daily consumes the equivalent of an egg, or in France where each inhabitant consumes the equivalent of the annual laying of a hen, otherwise, approximately 280 eggs. It is recognized the existence of many amateurs in the rearing activities which do not respect the standard norms or do not even fill the capacity to do so in order to get higher production level, quoted above. The sector uses and valorise agro-industrial by-products, imports certain inputs such as corn, amino acids and the vitaminized mineral supplements. The animal proteins used for the manufacture of feed, come primarily from the fish meal, produced locally. Indeed, there are production facilities and establishments of sale of poultry rearing materials which provide concentrated feed, provide the majority of day-old chicks demand and the sale of materials and products necessary (Diagne, 2004).

The production of day-old chicks increases, reducing the imported share to 5%. According to the CNA, Senegal could be self-sufficient of day-old chicks and even could be in the position of exporting the subjects to the sub-regions in the case of the hatcheries turns to full capacity. However, the majority of eggs to be actually brooded (OAC) is imported. *Figure 1* gives the evolution of the production of day-old chicks to Senegal during the fifteen last years.

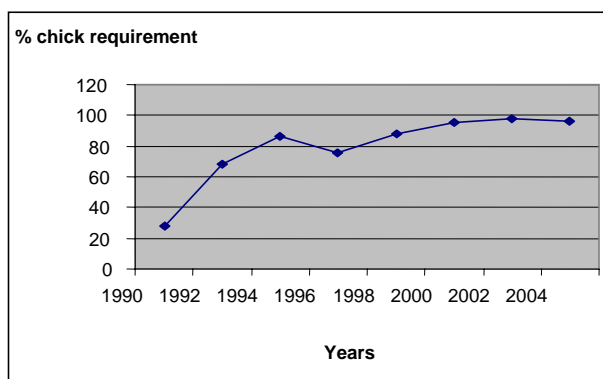


Figure 1: Proportion of national chick requirement produced internally from 1990 to 2004 (CNA/DIREL data).

This rearing system is generally practiced by employees from other sectors, people of the liberal professions or acting in the tertiary sector, which in return engage farmers labour to deal with the farm management. There is however a tendency to professionalization, which means the evolvement of trained people who devote themselves entirely to the intensive poultry farming activities. This urban and semi-urban poultry sector, so-called modern or semi-intensive sector, account nevertheless for only 20% of raised poultry, representing an average of 4,5 to 5 millions annually produced chicken broilers during the last ten years and a comprise herd from 800,000 to 1,200,000 layers. The sub-sector occupies more than ten thousand (10,000) people partially or permanently and involves an own capital investment of more than twenty billion FCFA (40 millions US\$) with net revenue around 30 billion FCFA (Anonymous, 1999) [1 US\$ = 550 FCFA]. In 2005, chicken broiler production was estimated at 5,301,940 and hens started their cycle of laying about 1,605,700. The revenue from the sale of poultry feed almost quadrupled in fifteen years, passing from 4.4 billions in 1992, to 16.78 billions FCFA in 2005 including 7 billions spent for purchase of corn (*Figure 2*). The amount of poultry meat sale rises to 13.8 billions FCFA and that of eggs consumption is around 17.4 billions FCFA (CNA/DIREL, Stat. Avic. Indust., 2004 and 2005).

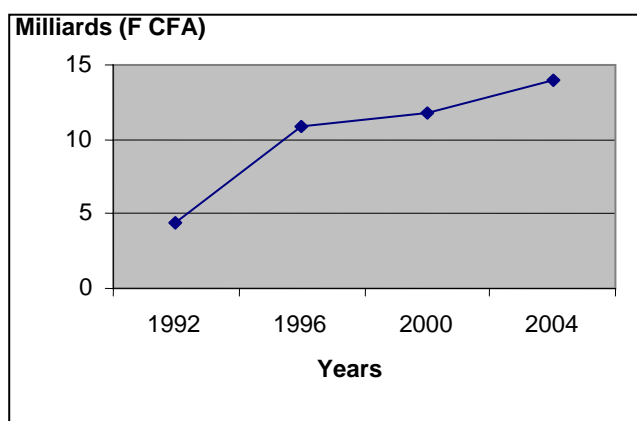


Figure 2: Trend in sale of poultry feeds (CNA/DIREL data).

The activity also benefits from good medical and zootechnical extension services under the CNA and support of private technicians. The veterinarians, animal scientists, engineers in livestock farming, technicians, etc. intervene in an indi-

vidual or group basis such as the COTAVI (“*Collectif des Techniciens de l’Aviculture*”, or Collective of Technicians in Poultry Keeping). Nevertheless, the poultry system is dominated by individual actors (*Figure 3*) more or less isolated, who however always try to get together and mostly during crisis as it is the case with the avian influenza threat.

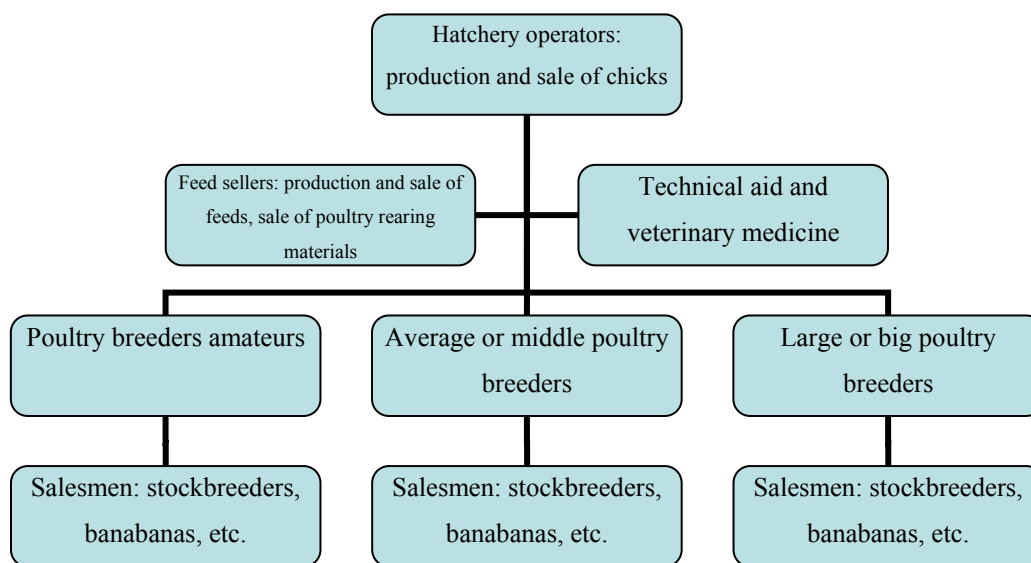


Figure 3: Relation between various stockholders in poultry farming sector.

Village poultry keeping, a socio-economic occupation

Poultry farming in village area is an old and traditional activity practiced by all social ethnic groups around the country (*Table 1*). It requires little means and consists of rearing very rustic local chickens that is a small sized, with the well appreciated fleshy with an adult averaging weight at 6 months close to 1 kg at the female and approximately 1.5 kg in the adult male (Guèye and Bessei, 1995; Zoungrana and Slenders, 1992).

Table 1: Poultry farming ownership.

Areas	Owners			
	Women %	Men %	Association %	From Samples of
Dakar	61	20	19	98
Diourbel	50.5	36	13.5	120
Louga	55	40	5	130
Fatick	50	35	15	180
Kaolack	53	35	12	120
Kolda	50	30	20	80
Saint-Louis*	51	43	8	125
Tamba	57	40	3	97
Thiès	70	10	20	110
Ziguinchor	40	55	5	86
Average	53.30	34.67	12.23	1146

*Saint-Louis included Matam

Source: Traoré (2001).

The indigenous poultry is estimated at approximately 15 million heads, which represents about 80% of the Senegal's poultry livestock (Anonymous, 1995). It accounts for almost 15 billion FCFA from sales turnover. It plays a socio-economic part of foreground in rural medium. Indeed, nearly one third (more than 30%) of the raised poultry, is consumed and thus contributes to malnutrition reduction in rural areas (Traoré, 2001). The sale of birds constitutes mostly women's cash flow, because more than 50% of poultry is sold. The poultry gift share is estimated around 10% and that of sacrificed is also nearly 10% (Table 2). The principal criteria chosen to scarify hen are related to the color (white, black or white mottled of black dress) and the plumage aspect (normal or folded). Finally, there exists "troc" exchange system in the Serer ethnic group areas mainly Fatick and in the Peul ethnic group zones in the Fouladou (Kolda), which consists of exchanging number of hens against a goat or a ewe. Indeed, there is a belief that beginning its herd with hen is desirable for these ethnic groups (Talaky, 2000; Traoré, 2001).

Table 2: Uses of poultry.

Areas	Average percentage of uses of birds			
	Consumption	Sale	Gifts	Sacrifices
Dakar	42	45	10	3
Diourbel	28	57	5	10
Louga	32	58	7	3
Fatick	26	56	6	12
Kaolack	33	52	8	7
Kolda	30	60	7	1
Saint-Louis*	38	52	7	3
Tamba	27	54	9	10
Thiès	32	51	8	9
Ziguinchor	24	52	6	18
Average	32	53	7	8

*Saint-Louis included Matam

Source: Traoré (2001).

Rural poultry production system presents a certain number of deficiencies, among which: i) a rudimentary or non-existent shelter (*Photo 1*): therefore chickens are not well protected from bad weather and other predatory factors and the rub; ii) insufficient food qualitatively as well as quantitatively: poultry in rural areas must feed themselves by scavenging to obtain feeds which covers hardly its maintenance; iii) the presence of avian diseases, mainly the Newcastle disease (ND), which decimates rural poultry and seems to be natural regulator of rural poultry workers. *Figure 4* shows the importance of ND and the parasitic diseases compared to other avian diseases (Arbelot *et al.*, 1996).



Photograph 1: Poultry house in rural area.

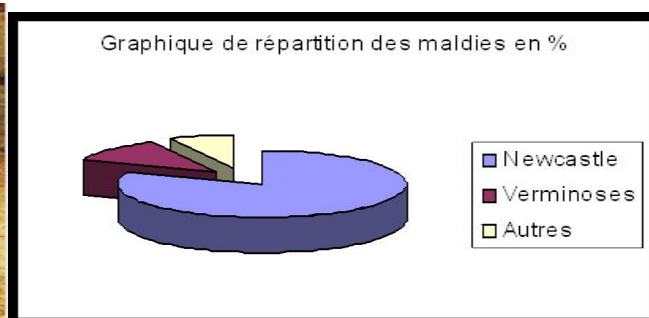


Figure 4: Importance of ND (Traoré and Faye, 2004).

The poultry production system is thus important economically as much as socially, and it deserves to be protected and supported. The current threat that is constituted by the avian influenza must be paid due attention, in order to secure a sector of high potential in national economic progress and growth.

Avian influenza, an obstacle to poultry development

An avian disease that can be dangerous for humans

Avian influenza is a highly contagious disease, whose normal hosts are the calipees which easily transmit them to chickens and very sensitive turkeys. All avian species would be sensitive to the infection at different levels. It is due to a virus of the Orthomyxoviridae family, in the genus of *Influenza A* and B types. The highly pathogenic strains are of A type, pertaining to the H5 and H7 sub-types. This virus is inactivated at 56°C during 3 hours; or at 60°C during 30 minutes. It is also inactivated with the acid pH, by the chemical agents (oxidants and solvents of the lipids), disinfecting them like the iodized formal and compounds. It is however resistant within tissues, faeces and water for long time.

Incubation lasts from 3 to 5 days in the poultry and the disease appears by a severe acute respiratory infection, often fatal evolution (H5N1). One may note a decrease in appetite inducing considerable reduction in egg production, or a decrease in weight. One can observe an oedema encephalic with tumefaction and cyanosis of the peak and the caruncle. Death is sudden and the death rate can reach 100%. In turkeys, one finds the same signs as those indicated in chicken, with less intensity; the duck is an operational carrier.

The human specie expresses fever, an irritation of the throat, accompanied by cough. In certain cases, one notes severe respiratory disorders with viral pulmonary infection leading to death. The major fear of the epidemiologists consists of a possible change in the avian virus contact with the human flu virus, being able to mutate to a new virus type which may also be highly pathogenic for humans, with possibility of inter-human transmission. Pig is an intermediate host who could facilitate and support the mutation (*Photo 2*).



Photograph 2: Cohabitation favourable to the diffusion of the avian influenza virus (Traoré photograph, 2004).

Consequence of an avian influenza outbreak on the poultry production

Currently to protect the country from a possible avian influenza outbreak, a certain number of emergency measures were already taken by the Government, such as, i) information and general sensitizing, especially to the actors of the poultry sector; ii) import ban of poultry, their by-products and rearing materials especially the material of second hand; iii) reinforcement of veterinary control at the borders; iv) constitution of strategic and secured stocks of human vaccines, avian vaccines, antiviral drugs and disinfection products; v) improvement of laboratory standards to ensure correctly diagnostics and correct supply of kits diagnostics tools and vi) supply of additional equipment to technicians. Consequently, these measures bring about a psychosis state to the population and produce counter effects to the poultry sector. For instance, the poultry consumption has dropped, especially in the big cities, principal destination of poultry supply. As an example, there was a decrease in the chicken meat demand during religious events (*El Hachoura, Magal, Maouloud*) which used to be large poultry produce markets in the past. Even if this import ban can be appreciated as local production promotion of chicken broilers, it is not evident that local producers are well prepared to satisfy the national demand. Indeed, the surprise effect will produce consequences which the hen houses are not prepared to receive chicks, the hatcheries are not ready to immediately provide these chicks in a sufficient number (importation of chicks being banned), etc. One can thus fear the disturbance of suitable market and may induce the discredit on the local capacity of the poultry breeders to being able to satisfy the national demand.

An avian influenza outbreak would cause a total stop of all activities of poultry production, accompanied by a stamping out whose consequences would be disastrous:

- a direct loss of more than 10,000 jobs, with socio-economic riot difficult to control;
- an important monetary loss, due to the stop of the poultry meat sale (more than 10 billion FCFA), and to eggs for consumption (20 billion FCFA), etc.;
- a stop of the operating poultry industries (poultry feed manufacturers, hatcheries, etc.) which, in addition to the suppression of direct employment and deterioration of their sales turnover (more than 16 billion for food), will involve a disturbance (even a stop) of the establishments and raw material structures suppliers or related services with poultry industry sectors;
- an increase in impoverishment and a stressing of malnutrition in rural areas, because the elimination of their poultry will deprive the populations of protein sources and easily mobilizable currencies, of an amount estimated at 10 billion FCFA.

Conclusion

The Senegal's poultry sector, in particular in its commercial sub-sector, represents a dynamic economic sector, whose growth rate is one of best primary sector at national level. It occupies a significant number of actors, whose interventions are complementary and interdependent. The traditional poultry farming system, especially practiced in rural areas, plays a social part of foreground. However, its economic importance could be improved, if one reduced the role of a certain number of constraints which slow down its development, in particular by the improvement of the habitat and the feed, such as the fight against certain diseases (e.g. Newcastle disease and the parasitosis). The threat of the avian influenza represents a national plague whose control claims the implication of all, because in addition to the problems of public health involved in this *zoonosis*, it is to be feared a big and deep economic and social crisis, whose consequences

will be difficult to predict and prevent.

References

ANONYMOUS (1995) Rapport annuel Ministère de l'Agriculture, Direction de l'Elevage, Dakar 1995, 64 p.

ANONYMOUS (1999a) Rapport d'évaluation de l'opération coqs raceurs. EISMV, Dakar 1999.

ARBELOT, B., DAYON, J.F., MAMIS, D., GUÈYE, J.C., TALL, F. et SAMB, H. (1996) Enquête sérologique sur la prévalence des principales maladies aviaires au Sénégal: mycoplasmoses, pullorose, thyphose, maladie de Newcastle, maladie de gumboro et bronchite infectieuse. Notes techniques ISRA/PRODEC, 12 p.

CNA/DIREL (2005) Statistiques de la filière avicole moderne de 1992 à 2005. Direl, Ministère de l'Elevage, Dakar, Sénégal.

DIAGNE, B.M. (2004) Etude de l'impact économique des importations de poulets entiers et en morceaux sur le développement de la filière avicole au Sénégal. Rap. de Consultance Oxfam International, Dakar, 65 p.

GUÈYE, E.F. (1998) Village egg and fowl meat production in Africa. *World's Poultry Sci. J.* 54: 73-86.

GUÈYE, E.F. and BESSEI, W. (1995) La poule locale sénégalaise dans le contexte villageois et les possibilités d'amélioration de ses performances. Paper presented at ANRPD workshop and general meeting, 13-16 june Addis Ababa, Ethiopia.

TALAKY, E. (2000) Aviculture traditionnelle dans la région de Kolda (Sénégal) Structure et productivité. Thèse Méd. Vét., Dakar, Sénégal.

TRAORÉ, E.H. et FAYE, P. (2004) Rapport sur les résultats des enquêtes pré vaccination et post vaccination contre la maladie de Newcastle (MN). Programme TCP / SEN / 2904 D FAO "Amélioration de la production avicole en élevage familial traditionnel à travers une meilleure gestion des contraintes de production et de santé animales". Phase II, août 2004.

TRAORÉ, E.H. (2001) « Système de production aviaire » Projet FAO: "Amélioration de la production avicole en élevage familial traditionnel à travers une meilleure gestion des contraintes de production et de Santé animale TCP/SEN 065. " Phase I: 2001-2002. Rapport de mission. 36 p.

ZOUNGRANA, B. and SLENDERS, G. (1992) Burkina Faso poultry in the backyard. *ILEIA Newsletter*: 17.



Avian influenza crisis: small poultry farms are the solution not the problem

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Summary

Backyard or free-range poultry are not fuelling the current wave of avian influenza outbreaks stalking large parts of the world. The deadly H5N1 strain of avian influenza is essentially a problem of industrial poultry practices. Its epicentre is the factory farms of China and Southeast Asia and -- while wild birds can carry the disease, at least for short distances -- its main vector is the highly self-regulated transnational poultry industry, which sends the products and waste of its farms around the world through a multitude of channels. Yet small poultry farmers and the poultry biodiversity and local food security that they sustain are suffering badly from the fall-out. To make matters worse, governments and international agencies, following mistaken assumptions about how the disease spreads and amplifies, are pursuing measures to force poultry indoors and further industrialise the poultry sector. In practice, this means the end of the small-scale poultry farming that provides food and livelihoods to hundreds of millions of families across the world.

Keywords: agribusiness; avian influenza; biodiversity; emerging diseases; factory farming; peasant agriculture; poultry

Introduction

On 17 February 2006, the Egyptian government confirmed that avian influenza had broken out in the nation's poultry. With the international spotlight beaming upon it, the government did not want to look unprepared or, worse, at fault. So it immediately reacted by blaming migratory birds and traditional poultry practices. "The world is moving towards big farms because they can be controlled under veterinarian supervision... The time has come to get rid of the idea of breeding chickens on the roofs of houses," said Egypt's Prime Minister Ahmed Nazif (Nazif, 2006).

Then the Egyptian government swung into action with a military-style cleansing operation. It ordered the culling of all backyard and rooftop poultry and banned live bird markets, where 80% of the nation's poultry is sold. Farmers were promised compensation and vendors were promised refrigerators, so they could switch to selling frozen chicken, but neither materialised (Saber, 2006). Meanwhile, the government banned the transport of live poultry and ordered that all slaughtering must take place in official slaughterhouses, leaving farmers not located near the few official slaughterhouses with no way to slaughter their chickens (Khattab, 2006; Leila, 2006a, 2006b). In less than a month, the Egyptian government effectively destroyed its multi-billion dollar poultry industry, the livelihoods of millions of Egyptians and its ancient poultry practices and biodiversity.

The response from the Egyptian government was not only insensitive to the importance of poultry for its people; it was misinformed. Yes, some backyard and rooftop flocks have been infected, but far more birds are dying from avian influenza in factory farms. Plus, extensive testing of live migratory birds since 2004 has not produced any cases of avian influenza (DoD-GEIS, 2005; Ayyash, 2005; Nassar, 2006). Although official veterinarian reports single out backyard flocks, the website of the Egyptian government lists initial outbreaks at three factory farms where nearly 70,000 birds were culled, followed by further outbreaks on large factory farms in the regions of Ashmoun, Al-Marg, Giza Badrashaan and Damietta, as well as the culling of 77,000 birds at two farms near the desert city of Belbeis and 30,000 birds in nearby New Salhia where one of Egypt's largest poultry companies has its farms (Government of Egypt, 2006). The industry estimates that 50% of the commercial farms in the country have been infected and that over 25 million chickens have been slaughtered (El-Banna Company, 2005).

Backyard chickens: vectors or victims?

The situation in Egypt is not unique. In Turkey, for instance, despite general agreement that the poultry industry had spread avian influenza within the country, Health Minister Recep Akdag assured his people that "the definite and permanent solution would be to slaughter [Turkey's 10 million backyard poultry] and halt such type of breeding for good" (Kathemirini, 2006; Lubroth, 2006; Rosenthal, 2006). The response to avian influenza in Thailand has also focused on the poultry small-scale sector, where surveillance data from January 2004 showed that over 1000 backyard poultry flocks were infected -- 83% of the total number of reported cases of infection. But the same study also identified outbreaks in over 200 broiler and layer farms and concluded that the proportion of infected commercial farms was 5 times higher than for backyard farms (Tiensin *et al.*, 2004).

It was much more difficult to construct an argument against backyard farms in India and Nigeria where avian influenza outbreaks are known to have begun on a few large-scale commercial farms and to have spread from there. India's largest poultry company was slapped with a notice under the Bombay Police Act for "causing public nuisance and threat to health" for its role in the outbreak (Anonymous, 2006). Meanwhile, in Indonesia, the 11 biggest poultry farms have used certain laws to block inspections of their operations. "As long as they followed *our* procedures, we always welcome them," retorted Sudirto Lim, spokesperson for Charoen Pokphand (emphasis added) (CPAS, 2005).

Avian influenza outbreaks on factory farms are nothing new. Highly pathogenic outbreaks of avian influenza have occurred regularly on factory farms in recent decades, such as Australia (1976, 1985, 1992, 1994, 1997), USA (1983, 2002, 2004), Great Britain (1991), Mexico (1993-1995), Hong Kong (1997), Italy (1999), Chile (2002), Netherlands (2003) and Canada (2004) – just to cite some examples outside of the recent avian influenza crisis. Studies indicate that highly pathogenic strains of avian influenza evolve when low pathogenic strains of the virus, which circulate harmlessly among wild bird populations, are introduced into high-density poultry flocks (Suarez, 2000; Ito *et al.*, 2001; Suarez *et al.*, 2004; Timm *et al.*, 2006). Once avian influenza takes hold in a factory farm, the virus amplifies and spreads beyond the farm through a multitude of channels: trade in birds and eggs, people coming in and out, the elimination of waste, the use of litter in feed, etc. (Stegemen *et al.*, 2004; Thomas *et al.*, 2005).

Backyard poultry operations, on the other hand, are characterised by low-density. The experience with H5N1 outbreaks to date suggests that the strain causes only low-mortality in backyard poultry flocks and has a difficult time spreading

within these flocks let alone beyond the farm. According to one veterinarian of the Food and Agriculture Organisation (FAO), the mortality rate among infected backyard flocks in Malaysia in 2004 was only 5% (Sims, 2006). Moreover, the FAO and the World Organisation for Animal Health (OIE) claim that there is "growing evidence that the survival of the virus in smallholder and backyard poultry is dependent on replenishment" from outside sources (FAO/OIE/WHO, 2005).

Poultry diversity may be another factor protecting backyard flocks. While broiler chickens are highly susceptible to avian influenza, the FAO and OIE report that there is evidence that H5N1 virus is adapting to village chickens in the same way that it has adapted to domestic ducks (FAO/OIE/WHO, 2005). A recent study of free-ranging ducks in Thailand found that less than one percent of birds in infected flocks were clinically affected (Songserm *et al.*, 2006). Unfortunately a lack of interest among authorities and the indiscriminate culls triggered by the detection of the virus, even among healthy birds, make it difficult to increase understanding of such dynamics between the virus and native poultry.



AFP/POOL- Robert Ghement

The emerging picture appears to be a context of endemic circulation of avian influenza, causing occasional low mortality in small poultry flocks and large outbreaks in factory farms when biosecurity measures are breached, as is inevitable under endemic conditions. Yet nearly all official farm-level measures and policies for avian influenza are directed at small-scale farmers and free-range practices. They focus on locking poultry indoors, separated from infected wild birds, which are assumed to be the main vector of transmission to poultry, as seen in *Table 1*. By and large, such laws and policies are not only ignorant of disease dynamics within backyard flocks, they are totally impractical for small farmers. In Southeast Asia, governments, with the support of the FAO, are encouraging farmers to set up mesh screens or bamboo enclosures for their poultry. But the costs, estimated at US\$50-70, are out of reach for Asia's small-holders, who typically make less than US\$1 a day, and, in places like Thailand, where such measures have been enacted, it has immediately forced small farmers to abandon poultry (Chanyapate and Delforge, 2004; McLeod *et al.*, 2005).

Table 1. Measures to control avian influenza targeting backyard poultry in selected countries.

Country	Measure
Austria	Ban on outdoor poultry from October to December. Ordinance extended indefinitely around area where H5N1-infected swans were found.
Canada	Ban on outdoor poultry in the Province of Quebec.
China	Anhui provincial government decrees all backyard poultry must be kept in cages. Complete ban on backyard birds in Hong Kong.
Croatia	Ban on outdoor poultry during migration season.
Egypt	Ban on rooftop poultry and ban on live markets.
France	Ban on outdoor poultry, with exceptions.
Germany	Ban on outdoor poultry.
Italy	Free range birds (15-20% of poultry sector) have to be under wire-screens.
Netherlands	Ban on outdoor poultry, with exceptions.
Nigeria	Backyard poultry and birds banned within the Federal Capital Territory, Abuja.
Norway	Ban on outdoor poultry in eight southern counties.
Slovenia	Ban on outdoor poultry.
Sweden	Ban on outdoor poultry.
Switzerland	Poultry must be kept within roofed enclosures.
Thailand	Ban on free-range ducks. Ban on live poultry markets in Bangkok and slaughterhouses moved to outskirts. Forced collectivisation of small poultry flocks in central provinces.
Ukraine	Sale of live poultry and poultry products produced by private village households is prohibited in the Autonomous Region of Crimea.
Viet Nam	Ban on poultry farming in towns and cities.

These measures are also based on scant evidence that wild birds transmit avian influenza to poultry (Melville and Shortridge, 2006). After testing hundreds of thousands of wild birds for the disease, scientists have only rarely identified live birds carrying avian influenza in a highly pathogenic form (FAO/OIE/WHO, 2005; Chen *et al.*, 2006). Nearly all wild birds that have tested positive for the disease were dead and, in most cases, found near to outbreaks in domestic poultry. Plus, the geographical spread of the disease does not match with migratory routes and seasons (BIRDLIFE INTERNATIONAL, 2006). Even with the current cases of H5N1 in wild birds in Europe, experts agree that these birds probably contracted the virus in the Black Sea region, where H5N1 is well-established in poultry, and died while heading westward to escape the unusually cold conditions in the area.

Why is Laos an exception?

If backyard poultry and migratory birds are indeed fuelling the spread of avian influenza then the disease should be raging in Laos. Not only is it surrounded by avian influenza-infested neighbours, Laos is full of free-ranging chickens

mixing with ducks, quail, turkeys and wild birds. These are predominantly native chickens, which account for over 90% of Laos' total poultry production. According to the US Department of Agriculture:

The poultry industry in Laos is predominantly one of smallholders, raising free-range, local chicken breeds nearby their dwellings for meat and eggs, mostly consumed by the household or sold locally for income. ... An average village has around 350 chickens, ducks, turkeys and quails being raised in small flocks interspersed among village homes by about 78 families, with women primarily responsible for the flocks. Ducks, turkey, and quails are also raised, with negligible amounts of geese found scattered around the country. The few commercial operations (less than 100 total, with 89 of these located near Vientiane) in the country supply nearby metropolitan areas (USDA, 2005).

But the country's backyard farms have barely been touched. According to the same USDA report:

A total of 45 outbreaks were confirmed, with 42 of these occurring on commercial enterprises (broiler and layer farms), 38 of these in Vientiane, the capital and primary city of Laos. ... Smallholders who found avian influenza in their flocks were located nearby commercial operations suffering the disease.

The principal reason why Laos has not suffered widespread avian influenza outbreaks like its neighbours is that there is almost no contact between its small-scale poultry farms, which produce nearly all of the domestic poultry supply, and its commercial operations, which are integrated with foreign poultry companies. Laos effectively stamped out the disease by closing the border to poultry from Thailand and culling chickens at the commercial operations. They were less concerned about the disease spreading out from the affected farms because, unlike in Thailand and Viet Nam, small-scale farmers in Laos are not supplied by big companies with day-old chicks or feed and, outside of the capital, poultry is produced and consumed locally. Poultry production is also more spread out in Laos. It is less dense, less integrated and less homogeneous -- all of which keeps avian influenza from spreading and evolving into more pathogenic forms.

The Laos experience suggests that the key to protecting backyard poultry and people from avian influenza is to protect them from industrial poultry and poultry products. It also calls into question the green revolution approach to poultry development, which encourages farmers to sell to more distant markets and to use off-farm inputs, such as feed and day-old-chicks supplied by large operations. Traditional farmer knowledge and biodiversity combined with simple biosecurity measures appropriate to small farms may be all that is required to effectively manage the disease in most rural communities.

Crush and control: the top-down global response to avian influenza

The agencies that preside over the global response to avian influenza, namely the World Health Organisation (WHO) and the FAO, are not interested in such possibilities. Overall, there's hardly been any effort to understand the dynamics of the disease in local contexts or to work with local communities in defining strategies. So what inevitably emerge are big solutions and "global strategies" for wiping out the disease that wipe out the foundations for long term, pro-poor solutions in the process. There's no nuance, no sensitivity to people's needs and, worst of all, no appreciation of the capacity and knowledge that farmers have for managing this virus.

The culling programmes advocated by the WHO and the FAO, for instance, are indiscriminate; all birds are culled in large areas surrounding cases of infection, whether they are healthy or not. In India, the government launched a surveillance campaign in the state of Maharashtra after outbreaks at several factory farms. When a small percentage of samples collected from various villages in one of the poorest districts of the state came back positive, the government imposed complete culls over an area of 1,500 square km, involving more than 300,000 birds and over 300 villages (AFP, 2006a). The state did provide some compensation to the affected farmers, but the US\$0.88 given per bird was far below the value of a village chicken, which typically sells for three times the price of a factory chicken and produces eggs worth four times the price of industrial eggs (Keve, 2006). Needless to say, the government has no plans for replenishing the invaluable poultry biodiversity that it destroyed and there is even talk of new state regulations to ban backyard poultry (Jamwal *et al.*, 2006).

Beyond such immediate measures, the FAO and other agencies are working with governments to map out long-term plans for the "restructuring" of the poultry sector that will eliminate small-scale poultry farming. According to the FAO, a restructured poultry industry of the future in Asia will have:

- more concentrated markets, with fewer, larger producers;
- poultry production zones where infrastructure can be concentrated;
- compartments for exporting countries, arranged in such a way that a minor outbreak of an exporting compartment will hardly affect export;
- live markets moved to the outskirts of cities, with fewer licensed traders, centralised slaughtering and a large number of supermarket outlets in cities;
- fewer small producers;
- requirements to fence and house all poultry (McLeod *et al.*, 2005).

This would be the death of Asia's small poultry farms. In Viet Nam alone, the FAO admits that the implementation of "production zones" would result in the loss of income of potentially one million small commercial producers (McLeod *et al.*, 2005). "There is concern for the future of poor backyard farmers and small commercial farmers," said Fabio Friscia, the FAO's avian influenza programme officer in Vietnam. "A lot of them will have to leave the sector with significant economic losses. The challenge is to provide these people with alternative livelihood opportunities." (AFP, 2006b).

Such thinking goes right to the very top of the organisation. Samuel Jutzi, the FAO's Director of Animal Production and Health, told a Swiss newspaper that small farms are behind the spread of avian influenza, not the large factory farms that he describes as "highly protected". When asked if this meant the end of small-scale poultry farming, Jutzi said, "This type of production will become very marginal. High quality poultry, raised in the open air and grain-fed, will become a niche product." (Kauffman, 2006).

The top-down global response to avian influenza may sit well with governments, many of them neglectful if not hostile towards small farmers and the biodiversity they sustain, but it is a disaster for the poor that these institutions claim to serve. It's an old story being repeated, but this time under the guise of saving the world from a health crisis. The irony is that the solution proposed – a total shift to factory farming – takes us straight back to the source of the problem (GRAIN, 2006).

References

- AFP** (2006a) Indian officials to slaughter more chickens after new bird flu cases. Agence France-Presse (AFP), 28 March 2006: www.todayonline.com/articles/109534.asp
- AFP** (2006b) Bird flu experts in Vietnam to aid long-term control. AFP, April 18, 2006
- ANONYMOUS** (2006) Hatcheries put on notice. The Statesman, Kolkata, 21 February 2006: www.thestatesman.net/page.news.php?clid=2&theme=&usrsess=1&id=107510
- AYYASH, M.** (2005) Bye-Bye Birdie. *Business Today*, December 2005: www.businesstodayegypt.com/article.aspx?ArticleID=6216
- BIRDLIFE INTERNATIONAL** (2006) Are high risk farming practices spreading avian flu? Press Release, Cambridge, 18 January 2006: www.birdlife.org/news/news/2006/01/flu_agriculture.html
- CHANYAPATE, C. and DELFORGE, I.** (2004) The politics of bird flu in Thailand. Focus on the Global South, Bangkok, 20 April 2004: www.focusweb.org/content/view/273/29/
- CHEN, H., SMITH, G.J.D., LI, K.S., WANG, J., FAN, X.H., RAYNER, J.M., VIJAYKRISHNA, D., ZHANG, J.X., ZHANG, L.J., GUO, C.T., CHEUNG, C.L., XU, K.M., DUAN, L., HUANG, K., QIN, K., LEUNG, Y.H.C., WU, W.L., LU, H.R., CHEN, Y., XIA, N.S., NAIPOSSOS, T.S.P., YUEN, K.Y., HASSAN, S.S., BAHRI, S., NGUYEN, T.D., WEBSTER, R.G., PEIRIS, J.S.M. and GUAN, Y.** (2006) Establishment of multiple sublineages of H5N1 influenza virus in Asia: Implications for pandemic control. PNAS early edition, Proceedings of the National Academy of Sciences of the USA, Washington DC, 10 February 2006: www.pnas.org/cgi/doi/10.1073/pnas.0511120103
- CPAS** (2005) Indonesia to revise laws barring access to poultry farms. *AgroIndonesia*, 25 October 2005: www.agroindonesia.com/agnews/eng/2005/October/25%20October%2001.html
- DoD-GEIS** (2005) DoD-GEIS: Influenza Surveillance at NAMRU-3: www.apgea.army.mil/HIOupdate/HIOweeklyUpdate012105.pdf
- EL-BANNA COMPANY** (2005) Personal communication from the El-Banna Company, 26 March 2005.
- FAO/OIE/WHO** (2005) FAO and OIE, in collaboration with WHO, "A Global Strategy for the Progressive Control of Highly Pathogenic Avian Influenza (HPAI)," November 2005, p 17 and p 22: www.fao.org/ag/againfo/resources/documents/empres/AI_globalstrategy.pdf
- GOVERNMENT OF EGYPT** (2006) Bird Flu Statistics: birdflu.sis.gov.eg/html/flu01001.htm
- GRAIN** (2006) Fowl play: The poultry industry's central role in the bird flu crisis. February 2006: www.grain.org/briefings/?id=194
- JAMWAL, N., JAYAN, T.V., GUPTA, R. and GHOSH, P.** (2006) Who flew? *Down to Earth* (14:20), CSE/Down To Earth Feature Service: www.downtoearth.org.in/cover.asp?FolderName=20060315&FileName=news&sid=34&sec_id=9
- ITO, T. et al.** (2001) Generation of a Highly Pathogenic Avian Influenza A Virus from an A-virulent Field Isolate by Passaging in Chickens. *Journal of Virology*, May 2001, 75(9): 4439-4443.
- KATHEMIRINI** (2006) January 21, 2006. ekathimerini.com/4dcgi/_w_articles_world_2862012_21/01/2006_65429
- KAUFFMAN, A.** (2006) Le H5N1 favorisera les usines à poulets? *La Presse*, 13 March 2006: www.lapresse.ch/vqhome/le_journal/economie/usine_poulet_130306.edition=nv.html
- KEVE, J.** (2006) Personal communication with Joseph Keve, a poultry farmer and researcher from Maharashtra, India, 30 March 2006.

- KHATTAB, A.** (2006) A fowl business. Egypt Today, March 2006:
www.egypttoday.com/article.aspx?ArticleID=6448
- LEILA, R.** (2006a) Poultry industry collapses. Al-Ahram Weekly, 23 February 2006:
weekly.ahram.org.eg/2006/783/eg1.htm
- LEILA, R.** (2006b) Here to stay? Al-Ahram Weekly, 6 April 2006: weekly.ahram.org.eg/2006/789/eg3.htm
- LUBROTH, J.** (2006) Senior Officer, FAO, Audio interview: Control campaign in Turkey [Press conference], Rome, January 2006: www.fao.org/ag/againfo/subjects/en/health/diseases-cards/special_avian.html
- McLEOD, A., MORGAN, N., PRAKASH, A. and HINRICHS, J.** (2005) Economic and Social Impacts of Avian Influenza, FAO, Rome, November 2005: www.fao.org/ag/againfo/subjects/en/health/diseases-cards/avian_recomm.html
- MELVILLE, D.S. and SHORTRIDGE, K.F.** (2006) Spread of H5N1 avian influenza virus: an ecological conundrum. *Letters in Applied Microbiology* 42: 435-437.
- NASSAR, G.** (2006) Flu and Mismanagement. Al-Ahram Weekly, 13-19 April, No. 790:
weekly.ahram.org.eg/2006/790/op3.htm
- NAZIF, A.** (2006) Egypt advises people to get rid of dead poultry. Reuters, 18 February 2006:
www.alertnet.org/thenews/newsdesk/L18767812.htm
- ROSENTHAL, E.** (2006) UN Aide urges flu transit checks. *International Herald Tribune*, Paris, January 17, 2006.
- SABER, K.** (2006) Personal communication from Karam Saber, Land Centre for Human Rights, Cairo, 23 March 2006.
- SIMS, L.** (2006) Communication from Dr. Les Sims to Martin Williams, February 26, 2006.
- SONGSERM, T. et al.** (2006) Domestic ducks and H5N1 influenza epidemic, Thailand. *Emerging Infectious Diseases*, April 2006: www.cdc.gov/ncidod/EID/vol12no04/05-1614.htm
- STEGEMEN, A. et al.** (2004) Avian influenza A virus (H7N7) epidemic in the Netherlands in 2003: Course of the epidemic and effectiveness of control measures. *Journal of Infectious Diseases*, 2004, 190: 2088-2095
- SUAREZ, D.L.** (2000) Evolution of avian influenza viruses. *Veterinary Microbiology*, 22 May 2000, 74(1-2):15-27
- SUAREZ, D.L., SENNE, D.A., BANKS, J., BROWN, I.H., ESSEN, S.C., LEE, CHANG-WON, MANVELL, R.J., MATHIEU-BENSON, C., MORENO, V., PEDERSEN, J.C., PANIGRAHY, B., ROJAS, H., SPACKMAN, E. and ALEXANDER, D.J.** (2004) Recombination resulting in virulence shift in avian influenza outbreak, Chile. *Emerging Infectious Diseases*, April 2004: www.cdc.gov/ncidod/EID/vol10no4/03-0396.htm
- TIENSIN, T., CHAITAWEE SUB, P., SONGSERM, T., CHAISINGH, A., HOONSUWAN, W., BURANATHAI, C., PARAKAMAWONGSA, T., PREMASHHIRA, S., AMONSIN, A., GILBERT, M., NIELEN, M. and STEGEMAN, A.** (2004) Highly pathogenic avian influenza H5N1, Thailand, 2004. *Emerging Infectious Diseases*, November 2005: www.cdc.gov/ncidod/EID/vol11no11/05-0608.htm
- THOMAS, M.E. et al.** (2005) Risk factors for the introduction of high pathogenicity Avian Influenza virus into poultry farms during the epidemic in the Netherlands in 2003. *Preventative Veterinary Medicine*, 2005, 69: 1-11
- TIMM, C., HARDER and WERNER, O.** (2006) Avian Influenza. In: *Influenza Report*, eds. B.S. Kamps et al., Flying Publisher, Paris, 2006
- USDA** (2005) Laos: Poultry and Products - Avian Influenza. GAIN Report, US Department of Agriculture, Washington DC, 16 March 2005.



The Danish Easter declaration on the bureaucracy and backyard poultry

62 NGOS/CSOS, JELLING, DENMARK, MARCH 2005

To: The Minister of Family and Consumer Affairs and The Parliamentary Committee of Food, Agriculture and Fisheries

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In this declaration, 62 Danish organisations are protesting against the fact that a valuable public culture is threatened in the same time as biological diversity is disappearing. All is due to the extreme bureaucratic rules. We also point out solutions for disease control, which builds on positive motivations rather than further bureaucratisation and control.

According to the Rio Convention, Denmark is committed to:

- *"protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements"* (Convention on Biological Diversity, article 10 c).
- *"respect, preserve and maintain knowledge, innovations and practices of local communities embodying traditional lifestyles relevant for the conservation of biological diversity"* (Convention on Biological Diversity, article 8 j).
- *"identify processes and categories of activities which have or are likely to have significant adverse impact on the conservation and sustainable use of biological diversity"* (Convention on Biological Diversity, article 7 c).

Bureaucracy and smallholding flocks

This letter should be viewed as a continuation of ours and 8 other associations' statement to the Minister of Food, Agriculture and Fisheries on March 12th 2003 as well as ours and 10 other associations' application to the Minister of Family and Consumer Affairs on September 8th 2004. In all three letters, we are specifically commenting on the rules and regulations for domestic chickens, waterfowls, pigeons and ornamental birds. Additional letters have been sent from other associations, a.o. The Eco Citygarden Network (November 3rd 2003) and The Danish Pigeon Association (September 12th 2004) also concerned about the bureaucratisation of poultry hobbyists and their exchange of birds.

Earlier, the Ministry of Family and Consumer Affairs have promised to modify the rules on trade and vaccination for smallholding poultry in such a way that the easiest possible solutions are chosen. However the new vaccination rules for poultry indicate that the Minister promises one thing while officials do the opposite.

The agreed vaccination method involves a veterinarian and includes needle vaccination of every single bird. In other countries, smallholding poultry owners have a much easier solution, which is a live vaccine added to the drinking water by the owner without involvement of a veterinarian. Our understanding of the note from August 8th by the Directorate of Food and the Minister's note for the co-meeting on November 11th 2004 is as follows: there is no deregulation allowing free trade of pigeons and other poultry and only small adjustments of existing unique Danish rules, which are exceptional in the world, by imposing everyone who sells even one bird to be registered. In other countries, there is free trade

of poultry among smallholding poultry owners.

- *“The international evaluation of the Danish efforts to preserve gene resources of old Danish domestic animal breeds”, May 2002, recommended that Denmark deregulates this kind of bureaucratic overstatement and also work for deregulation at the European Union (EU) level.*
- *“New regulations to control disease outbreaks or even just a rise in the standards of animal health might have a serious effect on the preservation of breeds.” “Furthermore, the aim should be to be exempt of certain veterinary regulations at national as well as EU level, as long as it is safe and appropriate.”*

However, since 2002 there have been no deregulations – on the contrary, there has been further tightenings!

Background

More acceptable regulations must be based on the interests of the broad smallholding culture and not only on the interests of elite exhibitors. That means it includes Little Peter’s chickens and pigeons not only the exhibitors’ fine ringed birds.

Only 5% of all Danish poultry holders are members of an exhibition association. The majority breeds more for preservation purposes and their birds might not be as “noble”. However, this majority makes up the basis of this culture and it is from here the future generations of poultry holders are found. The constraint on the smallholding culture due to regulations and vaccination schemes seriously affect the unorganised beginners – which means that most of these will give up and only the most enthusiastic exhibitionists will persist.

All the regulations and requirements overshoot the mark, and the requirements that mean you have to let a veterinarian vaccinate your poultry and that you have to register trade in order to sell a few birds to a small local market. The end result is that this live cultural heritage will gradually decline and maybe even disappear.

It might be that the officials do not know about this smallholder “society” and do not realize that this bureaucratisation is out of keeping with the reality of smallholders. We are afraid that this is an indirect way to serve the purpose of the commercial sector, which would like to see the end of the smallholding poultry units. It will inevitably be the result of increased bureaucratisation if it is gradually made so difficult to keep 10 chickens in the backyard that people simply give up. Furthermore, it will almost be impossible to recruit new participants in this once recognised healthy hobby.

The interest of poultry breeding is most often established during childhood, therefore it is important that this culture is kept as an informal hobby for children and also for non bureaucratic people.

Regulations that must be changed as soon as possible

The following examples are the most significant rules that will exclude and in the long run wipe out this existing cultural heritage. In the following, we suggest constructive alternatives that will provide loyalty from the small-scale hold-

ers towards the authorities as well as support to protect animal welfare and combat diseases.

1) Regulation of transport of hobby animals

At the moment you have to be registered to bring chickens to an exhibition or to another breeder.

Reasonable alternative

Freedom to transport your own or your fellow hobbyists' birds anywhere, as long as it is a non-commercial transport.

2) Regulation for hobby poultry trade

As it stands now breeders that sell animals must be registered poultry salesmen and list all sale and purchase. The rule is a unique Danish phenomenon. In our neighbouring countries, smallholding poultry breeders are free to trade their poultry. The Danish rule has provoked widespread civil disobedience, because it is not at all common for small-scale holders to register and make sales lists.

Reasonable alternative

Freedom to register as long as you sell less than 50 homebred birds per year. Excepted are those breeds mentioned in the Washington Convention.

3) Animal welfare supervisions during their gatherings

At the moment every small market or gathering of animals of more than one species must be inspected by a veterinarian. This is so costly that these arrangements no longer take place and have been replaced by different undercover arrangements.

Reasonable alternative

Free animal welfare inspection at all one-day-arrangements and all exhibitions arranged by, for example, an association, which looks after the animals during the whole session. Normally, these arrangements have no animal welfare problems.

4) Vaccination

The forced vaccination of all pigeons is a classical example of rules, which may do more damage than good, and they exceed the necessary standards. The Danish demands for vaccination go far beyond standards established in EU, as Danish rules demands vaccination of ordinary pigeons used for household or bred for preservation of pure breed purposes, when the pigeons are exhibited in public. The demands of the EU only cover racing pigeons, which participate in cross border flying for racing purposes.

Vaccination is proved by the reason that pigeon's paramyxovirus PPMV-1 will cross-react with the Newcastle disease PMV-1. However, PPMV-1 infections from pigeons to chickens will only happen under very extreme experimental conditions where the risk of contamination is very high. Similar conditions are required for Newcastle disease in chickens to infect pigeons. Contact between commercial poultry and household pigeons used for exhibitions, and hobby is insignificant or not existent. In the years when compulsory vaccination has been carried out by veterinarians, generation changes among breeders have almost ceased. Pigeons have almost vanished from public exhibitions and fairs, where attention and interest among people could have been developed.

The Danish Veterinary and Food Administration (DVFA) states to the Committee of Gene Resources that this kind of constrained type of vaccination can be considered as being "well-functioning". Though, this is considered some kind of a morbid statement, unless the objective is to eliminate the many kinds of pigeons and the culture that comes along with these pigeons. One could fear the same evolution for other smallholding poultry, if the method of vaccination using a needle, carried out by a veterinarian, is carried out for all chickens. The effect will inevitably be that a harmless and procreative culture will be damaged because smallholding poultry will vanish from public exhibitions and fairs.

A fair and satisfactory solution

A constructive solution for the matter of vaccination, which will take into account the reality for both veterinary theory and the culture and lifestyle of smallholding poultry breeders, should include the following elements for animals exhibited in local fairs, exhibitions and other gatherings of poultry and pigeons:

A) Voluntary behaviour

The risk of diseases amongst smallholding bred poultry and pigeons is far more theoretical than real, and the contact between this type of poultry and commercial poultry is highly unlikely. Therefore, any regulatory rules are considered far more damaging than of potential use.

B) Free vaccine

The purpose of vaccination of smallholding poultry is not to protect these animals as they do not normally have problems with Newcastle disease and paramyxoviruses. The purpose is only to protect the poultry industry against a theoretical risk of standstill. It is therefore only fair that the poultry industry pays for free vaccine of the mentioned types for everyone who will take the inconvenience of vaccinating their hobby animals, as an extra security measure for the poultry industry.

C) Freedom of choice

Vaccine injected using a needle will be very inconvenient for the majority of smallholding poultry breeders; but could be preferable to elite exhibitors. The solution for smallholding poultry breeders should be a free choice of the following available methods:

- 1) Inactive oil-based vaccine injected with a needle. Administered by a veterinarian.
- 2) Live vaccine provided through drinking water. Administered by the breeder. Dosage given according to a

manual in Danish and without consultation of a veterinarian.

3) Live eye drop vaccine. Administered by the breeder. Dosage given according to a manual in Danish and without consultation of a veterinarian.

This model takes into consideration all requirements of the versatile and differentiated culture among smallholding poultry breeders, and will also take into consideration the biological diversity. Further, it is the model that gives the best vaccination coverage, due to its simplicity and positive stimulus, freedom of choice and the breeders' own interest. Using this model, it is likely that documentation of vaccines will be a positive sales argument in legal markets. On contrary, compulsory vaccination as well as other incomprehensive bureaucratic "infringements" reduces ordinary peoples' respect for and inclination to adhere to authority's demands and advices.

5) Contact between vaccinated and unvaccinated poultry

This contact is prohibited according to the new rules, but this is again a good example that the rules are out of line with reality. Such contact will happen without ordinary people being knowledgeable of breaking the rules, i.e. when a family adds a couple of vaccinated birds (bought at the back door) from a commercial flock to their own smallholding flock.

This has already happened often, and several smallholding poultry breeders have heard of incidents where e.g. an unsuspecting German breeder has brought a vaccinated hen to a Danish breeder – and still no one has heard that this should have caused any diseases. DVFA states very logically that live vaccine is a weak infection and that this weak vaccine virus is infectious to other individuals. Thus, they claim that contact between unvaccinated individuals CAN cause outbreak of diseases – but their statement does not contain information on how likely this is. It is our view point that all that happens is that unvaccinated birds, by being in contact with vaccinated birds, are given a weaker form of the virus vaccine and thus in turn are being indirectly vaccinated.

Reasonable solution

This will hardly be a major issue for poultry hobbyists; but instead of imposing a prohibition, which normal breeders can only shake their heads at, DVFA could perhaps give guidance on the best way of introducing vaccinated and unvaccinated birds to each other, so that the theoretical risk of spreading the disease will be further reduced.

A valuable culture is wiped out and biological diversity will decrease

Officials from DVFA consistently take their starting point in a hypothetical worst case scenario as:

- a pigeon can under extreme conditions be infected with Newcastle Disease, which in an unlikely situation could infect other poultry and cause an outbreak;
- contact between a vaccinated bird and an unvaccinated bird could under very exceptional conditions cause the vaccine strain to initiate a mild case of Newcastle Disease -illness in the unvaccinated hen;
- a pure breed hen could infect other birds with Newcastle Disease during an exhibition and thereby causing an illness to spread.

However, experience shows that these things do not happen in practice.

On contrary, the possible damage that such bureaucratic measures have is not considered in proportion to the real risk. If it is not the intention to wipe out a popular culture, rules should be made for smallholding poultry breeders, which as justifiably possible exempts them from control disease programs, similar to the International Evaluation 2002 recommendations. EU's minimum demands should be kept, but Danish poultry hobbyists should never be inflicted any extra difficulties. The International Evaluation 2002 also recommends that Denmark makes an effort to ease restrictions at the EU level. Instead of creating bureaucracy, which causes people to break the rules and increases the level of civil disobedience among smallholding poultry breeders, the authorities could achieve far better prevention by giving information on proper management of hobby poultry, good market practices, exhibitions and so on.

The bureaucratic rules decrease the joy of breeding and selling animals, which means declining numbers of breeders and also fewer breeding animals. Thus, the risk of inbreeding increases, and this goes against the fact that the widest possible population of breeds is needed to secure their future. Another negative result is that fewer people become interested in this living cultural heritage, which smallholding poultry keeping is. A whole culture with centuries of old roots in Denmark is disappearing. It is a culture, which holds potentials for both preserving and creating biological diversity and contemporarily, without any cost for the society, delivers many qualities that the society asks for:

- To create recreational and social networks in the local communities and especially for those groups who do not participate in more intellectual social life;
- To socialize children and cause natural physical outdoor-activities;
- To create a forum where immigrants and Danes from all social classes can meet.

If we do not want this culture to be wiped out within the next 10-20 years, action has to be taken now. The proposed regulations of the rules that we suggest in this declaration will help the smallholding poultry culture to regenerate by itself. However, according to the article 7–10 of Rio Convention concerning the biological diversity, Denmark has an obligation towards this Rio Convention and should identify processes, which have a negative effect on biological diversity, integrate concerns towards biological diversity in laws and regulations as well as protect and promote knowledge and practices found in local communities, who live traditional lives, which have an impact on preservation of biological diversity.

All this means that an elucidation must be initiated in order to identify which conditions constitute a threat against our living cultural heritage and biological diversity by creating hindrances for the smallholding poultry culture. An independent commission, including ethnological expertise, should collaborate with the involved NGOs and elaborate on these problems and draw up solutions, which can generate a flourishing smallholding poultry keeping culture in Denmark.

With regard to diseases, research should be carried out in order to determine the genetic resistant potential of non-commercial breeds and the possibilities to preserve and further develop this resistance through guidance on breeding management.

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Note to the translation from Danish to English of "The Danish Easter Declaration on Bureaucracy and Backyard Poultry"

- All keepers of old poultry breeds in Denmark are people who keep poultry as a hobby and raises poultry as a recreational activity that bears no meaning on the family's economy.
- The national breed: the Danish landrace hen has, for example, not been used in commercial production since 1900; but hobby breeders have preserved the breed for 100 years. Other traditional poultry breeds have for the most been out of production since the 1950's, but many breeds have been preserved for family free-time activities.
- The hobby breeder's motivation is very versatile, for example, the need of meat and eggs from poultry which have had a good and free life, the wish to keep birds as part of the garden eco-system, preservation of breeds and breeding birds for exhibitions.
- The many bureaucratic Danish initiatives have forced out the traditional breeds from the public focus, from public fairs and market days, which means more and more smallholding keepers invest in industrial hybrids because they are more accessible to larger commercial farms. These farms are geared towards bureaucracy and in some cases even favoured by the rules.
- Today, the majority of traditional poultry breeds are sold by breaking the enforced Danish laws on vaccination and sale. Thus, one can say that, in spite of the Danish authorities, the biological diversity in poultry survives as a subculture.

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Highly pathogenic avian influenza H5N1: a global animal health crisis - profound challenges to science and society

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[This contribution was prepared using a major review on "The relationship between avian influenza, different mechanisms of viral spread and persistence, and the structure of the poultry industry" by C. Narrod, L. Sims, A.J. Slingenbergh, A. McLeod (forthcoming).]

Summary

The H5N1 Highly Pathogenic Avian Influenza epizootic is a serious multi-dimensional challenge to agriculture, rural development and public health and requires high multi-sectoral attention for its solution. Many drivers of the crisis are insufficiently known which renders its technically and socially successful containment rather difficult. In this article, some of these elements are highlighted as are the main actions undertaken by the UN's Food and Agriculture Organization (FAO) in support of its member countries.

Introduction

The first Asian H5N1 highly pathogenic avian influenza (HPAI) strain emerged in 1996 when it was identified in geese in Guangdong Province in southern China. Since then the disease spread widely, initially through East and South East Asia in 2003/4, and then into Mongolia, southern Russia, the Middle East and to Europe, Africa and South Asia in 2005/6. Migratory birds appear to have played a role in some of these movements.

During this time avian influenza has attracted very considerable public and media attention because the viruses involved produced fatal zoonotic disease in a small number of humans exposed to the viruses and because of the potential to acquire the capacity to be transmitted from humans to humans, a prerequisite for a human pandemic strain. Although the possibility exists that avian influenza caused by H5N1 viruses leads to a global influenza pandemic, H5N1 has not yet been found to be easily transmissible from birds to humans and even less, if at all, among humans.

The impact of the disease and of its control

With the fear of the spread of avian influenza, many decision makers are asking how to best prevent the introduction of HPAI to their country or if it is already in their country how to prevent further spread and having it become endemic.

Emergency control measures to eliminate new outbreaks of HPAI and to stop the spread of the disease have centred on stamping out which may entail the large-scale culling of infected flocks and contact flocks. The high concentration of poultry in certain areas has led to the culling of millions of animals at great expense (Brahmbhatt, 2005). For low income countries in which poultry is raised primarily by smallholders who can generate important income, such measures may seriously threaten smallholder poultry operations.

For those countries with a large number of backyard producers, poultry production is an important contributor to the livelihood of many poor households. Further, poultry meat and eggs are important sources of essential micronutrients for the poor, children and women, and it is known that in general small animal husbandry is positively associated with intake of animal source foods. The economic and nutritional losses faced by poor producers in these countries, depending on the strategy chosen to control HPAI, could be devastating, as would be the accelerated loss of animal genetic diversity.

Though the viruses have had a significant impact on producers, and in particular on backyard producers, the direct cost of the disease has been dwarfed by the devastating impact on poultry producers globally caused by market shocks driven largely by misplaced public fears regarding safety of poultry products (*Figure 1*). These concerns, fuelled in part by the media, have led to a marked fall in sales and prices for poultry products.



Figure 1: Smallholder backyard poultry systems – under long-term pressure by HPAI? (Photo: G. Bizzarri).

Controversy about origin and spread of the disease

There are a range of unresolved questions regarding the emergence and spread of H5N1 HPAI since 1996. One school of thought suggests that rapidly expanding intensive or industrial farming has played a pivotal role (*Figure 2*) whereas others see this largely as a disease of smallholder poultry, brought about by failure or inability to implement appropriate biosecurity / quality management systems as smallholder flocks expanded. FAO argues that both have played a role, and any attempt to blame a particular practice or sector for emergence of this disease fails to recognise the complexity of the poultry industry and the pitfalls and benefits of the various management systems employed from a veterinary,

social and economic perspective. The crucial role of ducks in open farming systems and of live bird markets as reservoirs of infection also needs to be recognised as well as ways by which these risks are managed or have failed to be managed.



Figure 2: Commercial poultry systems – does HPAI accelerate their growth? (Photo: R. Faidutti).

A worldwide growing and changing poultry sector

Rearing of poultry has long played and continues to play a crucial role in rural development due to the relatively low entry cost and the potentially high returns for smallholders who expand their flocks. Many smallholders have responded to increased market demands created by large urban centres by rearing additional poultry but are now finding that rapid expansion of their flocks without concurrent investments in measures to prevent disease, such as enhancement of biosecurity, has left them vulnerable to disease (*Figure 3*). Even smallholders with uninfected flocks have been affected as a result of market shocks when avian influenza occurred, as the public and authorities demanded infection-free produce grown under ‘safe’ certifiable conditions.



**Figure 3: A worker collects eggs at a well protected chicken farm – how can smallholders keep pace?
(Photo: Saeed Khan).**

FAO argues that the very dynamic growth of the poultry industry world-wide, but particularly in regions which are lacking the scale of veterinary infrastructure needed to monitor and protect animal health has created a ‘time bomb’ that ‘exploded’ when H5N1 HPAI, a highly transmissible disease of public health significance, emerged. All poultry producers were affected by market crashes but those with sub-standard disease prevention programmes, across all production sectors, paid a particularly high price for their failure or inability to implement such measures. Some of these producers will never return to poultry production and those that remain may no longer have access to markets they relied upon before the outbreaks occurred.

Insufficient veterinary support systems

FAO has long noted with concern the rapid expansion of the poultry industry without the required veterinary support systems. This concern also relates to the growth of practices such as free grazing duck production in association with paddy rice systems and to the rearing of domestic birds over ponds in fast expanding aquaculture systems. FAO considers that such practices may be ecologically and economically sound but some of these production systems, in particular free grazing ducks, have now proven to be reservoirs of H5N1 virus (Gilbert *et al.*, 2006). Therefore, additional measures, such as effective duck vaccines and easy-to-apply vaccination technologies, need to be implemented for these important production systems to be safe and sustainable.

It is perhaps too easy to blame veterinary authorities for failing to impose tighter standards on producers when viewing events in retrospect, as the political will to implement necessary actions usually only materializes after major shocks have occurred that convert potential problems to real ones. Similarly, it is rather easy to blame governments and donors for sponsoring programmes in many developing countries to encourage poultry raising as a viable income-earning activity for rural populations. It is certain that such programmes with their direct benefits particularly for women and children in terms of livelihoods and access to micronutrients (The Hunger Project, 2005) need to be associated with the strengthening of disease prevention capabilities.

Although it is recognised that intensively reared poultry can play a role in the emergence of highly pathogenic avian influenza viruses, these farms can also remain largely uninfected in the face of infection in other production sectors through rigorous implementation of biosecurity and other disease prevention measures. This has been demonstrated in Thailand and Hong Kong Special Administrative Region of the People's Republic of China where poultry have been reared successfully in intensive farms despite the presence of virus outside these farms.

Live bird markets, existing in most poultry farming communities, have been blamed for maintaining and spreading infection and there is little doubt that they pose major challenges to veterinary authorities, as seen in experiences from the USA and Hong Kong. It has proven difficult to keep avian influenza viruses out of such markets, reason for which their continued operation is questioned by some experts and policy makers.

Strengthening advice on safe and equitable sector development

Achieving an appropriate balance between the benefits of enhanced biosecurity, the risks associated with creating large susceptible populations of poultry in industrial-scale farms, providing consumers with affordable food, protecting the livelihood of poor smallholders and villagers and conserving valuable poultry genetic diversity are perhaps the greatest challenges facing authorities when making decisions relating to control of H5N1 HPAI. FAO's animal health programme continues to work in order to better understand the global epidemiology of the disease and to define the best strategies for prevention and control. To ensure that these strategies are socially and economically sound, FAO has set up a dedicated group of professionals to carefully analyse socio-economic impacts of the disease and of disease control measures and to advise countries and donors on the management of the challenges associated with control of this disease *vis-à-vis* the current and future structure of the poultry industry (McLeod *et al.*, 2005).

The current HPAI H5N1 crisis poses a possibly unprecedented challenge to the scientific community, both biological and social, to work together to bring the understanding of the socio-economic impacts of efforts to control HPAI to the forefront of the public and private debate. The question is how best to do this so that the risks and pathways of spread, the socio-economic impacts of control measures, and cost-effective control measures can be identified to minimize the negative impact on the poor while successfully containing the HPAI threat. More research has to be done to explain all the determinants of the epidemiology of the disease and to develop better tools, such as vaccines, and strategies to prevent and control avian influenza. Nevertheless, it needs to be recognised that decision makers will have to cope with making decisions under uncertainty for some time to come in that they will not have all the information they need about the disease when implementing control strategies and may need to modify these as new information becomes available.

FAO's response to avian influenza

FAO is committed to continue supporting such complex decision making; the Organisation is, at the request of its member countries, endeavouring to assemble all available and relevant scientific and technical resources so as to contribute to the strengthening of the role of the livestock sector to ensure global food security while enhancing poverty alleviation, public health and the sustainability of the natural resource base, including animal genetic diversity, used in such production.

- Since early 2004, when several Asian countries almost simultaneously reported outbreaks of Highly Pathogenic Avian Influenza (HPAI) H5N1, FAO has worked with affected and at risk countries in Asia, Eastern Europe, Middle East, Caucasus, Africa, Latin America and the Caribbean to facilitate information sharing, networking and capacity building, using FAO's own funds and increasingly supported by extra-budgetary financial contributions from multi- and bilateral donors. The primary objective of these operations was and continues to be the strengthening of disease intelligence and emergency preparedness, the examination of the role of migratory birds in the disease spread, the support of broad awareness creation and of risk communication, the analysis of and advice on social and economic consequences of both the disease and its control, the strengthening of field surveillance and laboratory capabilities, and of global avian influenza surveillance and early warning capabilities. FAO fielded, often together with OIE (Office International des Epizooties / World Organization for Animal Health), WHO (World Health Organization), WB (World Bank) and EC (European Commission), 106 and 166 missions respectively in 2004 and 2005 in support of affected and at-risk countries. In the first six months of 2006, a further 159 missions were carried out to help set up and sustain local, national, regional and global action. By mid 2006, FAO has raised US Dollar 130 million in support of national, regional and global action against this dangerous disease. FAO has so far provided HPAI control and preparedness support in terms of services and/or supplies to 95 countries.
- FAO established, in 2004, the Emergency Centre for Transboundary Animal Disease Operations (ECTAD), a corporate platform for the integrated delivery of FAO's livestock programme related to animal health crises such as avian influenza. This mechanism combines the technical animal health programme design responsibilities of FAO's Animal Production and Health Division under the leadership of FAO's Chief Veterinary Officer with the programme delivery capabilities of FAO's Emergency and Rehabilitation Division with its broad operational experience and expertise.
- FAO has supported countries in designing and implementing emergency and mid- to long-term national control strategies, reviewing human capacity, infrastructure and policies for avian influenza surveillance, detection and control, assessing the socio-economic consequences of the crisis as well as costs and consequences of control measures and various attempts of rehabilitation and long-term restructuring of the poultry sector. FAO also maintains an information service on the evolution of the crisis and of actions undertaken world-wide.
- FAO and OIE have prepared jointly a Global Plan for the Progressive Control of HPAI. They have established the OIE-FAO Avian Influenza Network (OFFLU) designed to coordinate research, provide confirmatory diagnosis, support countries through provision of experts and interface with WHO in the analysis of virus strains.
- The avian influenza early warning activities at the global level are the joint concern of FAO, OIE and WHO, working together in a Global Early Warning (and Response) System (GLEWS), based at FAO Rome, for transboundary animal diseases and emerging zoonoses.
- FAO has assumed, in the UN-wide Avian and Pandemic Influenza Coordination set up by Secretary-General Kofi Annan in September 2005, the leading role as the specialised UN organization in charge of assisting member states in controlling the disease at source in the animal.

References

- BRAHMBHATT, M.** (2005) Avian and Human Pandemic Influenza – Economic and Social Impacts. World Bank, November 2005, www.who.int/mediacentre/events/2005/World_Bank_Milan_Brahmbhattv2.pdf
- GILBERT, M., CHAITAWEE SUB, P., PARAKAMAWONGSA, T., PREMASHHIRA, S., TIENSIN, T., KALPRAVIDH, W., WAGNER, H., SLINGENBERGH, J.** (2006) Free-grazing ducks and highly pathogenic avian influenza, Thailand. *Emerging Infectious Diseases* [serial on the Internet], Vol. 12, No. 2; available from www.cdc.gov/ncidod/EID/vol12no02/05-0640.htm
- THE HUNGER PROJECT** (2005) The African Woman Food Farmer, www.thp.org/awffi/awffi_brochure/bro_contents.html
- McLEOD, A., MORGAN, N., PRAKASH, A., HINRICHS, J.** (2005) Economic and social impacts of avian influenza. FAO (AGAL, ESCB and ECTAD), www.fao.org/ag/againfo/subjects/en/health/diseases-cards/CD/documents/Economic-and-social-impacts-of-avian-influenza-Geneva.pdf



SHORT COMMUNICATION No 1:

Avian influenza an animal health issue: an outline of FAO's approach

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Highly pathogenic avian influenza (HPAI) is a dangerous disease. Since the most recent chain of outbreaks became known in late 2003, it has claimed well over 200 million chickens (through death caused by the disease or through culling) and more than 140 human lives. Behind these stark figures lies a world of facts and hypotheses, where much is known about the nature of the virus that causes the disease but little about its potential to jump to humans and potentially kick off the chain reaction that would qualify the disease as a human pandemic.

The Food and Agriculture Organisation of the United Nations (FAO) is primarily concerned with what is known, namely the structure and epidemiology of the H5N1 virus at the centre of the HPAI debate, its impact on birds, and efforts to prevent and control it – in Asia, Africa, the Near East or Europe, where it has already been identified. At a very broad level, FAO's business is to advise member governments on the best practices to employ in ensuring, among others, that basic food needs are met, that food quality is of the highest level, that an optimum balance is preserved between food production and the necessary level of environmental 'exploitation', and that the livelihoods of those involved in food production are safeguarded and promoted.

Where the food concerned is derived from livestock, in this case poultry, FAO has a special responsibility to protect this livestock from all possible threats, whether natural (through, for example, disease or disaster) or man-made (through, for example, destruction of the environmental resources on which it depends). At the level of protection from disease, FAO's role is to advise member governments on the best available veterinary systems and techniques necessary to maintain and improve the wellbeing of poultry. Further, as the United Nations technical agency responsible for food and agriculture, FAO is concerned with chickens and other poultry as livestock destined for human consumption, whether raised in a single farmer's backyard for home consumption or in a massive commercial production plant oriented towards national, regional and even international markets. In Southeast Asia alone, at the micro level, the HPAI has already hit hard many of those whose livelihoods or food supply depend on poultry (and these run into the hundreds of millions of persons that make up 80% of the population living in rural areas). At the macro level, the HPAI has hit the

economies of affected countries to the tune of tens of billions of dollars. To the already major direct cost of the disease must be added the enormous global impact of the market shocks caused by publics in various parts of the world turning their backs on poultry products through fear that they are unsafe.

It is very difficult, if not impossible, to identify any one culprit, at who or what is responsible for the real damage that avian flu has already wrought, and the potential devastation that it could potentially generate in its wake. There is also a wide array of unanswered questions about the rise and spread of HPAI. Some point the finger at migratory birds, others at the mixing of different species on the ground; some accuse poultry farmers while for others the blame lies with traders, both legitimate and illegitimate. Thus, there are the two opposed camps calling into question the large-scale production systems or the smallholder flocks respectively. The first group argues that the fault lies with rapidly expanding intensive or industrial farming, the second that HPAI is above a disease of smallholder poultry, generated by the lack of appropriate hygienic and regulatory standards and practices.

For FAO, individual family concerns and commercial production systems are equally legitimate forms of livestock production. What is the most relevant depends on a complex mix of environmental, economic, cultural and consumption factors: one system is most appropriate in certain circumstances, the other in different circumstances. Backyard and commercial production systems must co-exist, on condition that both respect the tightest biosecurity practices and procedures. Apportioning the blame to one or the other fails to recognise the role that both systems play or the complexity of the poultry industry and the pitfalls and benefits of different production environments from a veterinary, social and economic perspective.

Whichever system is called into question, it is clear that HPAI remains a potential risk to humans but a real risk to animals. Where animal disease poses a potential threat to human health, FAO's role is to advise on the best methods to contain the disease at the level of animals, prevent its recurrence and undertake research to identify ways of eradicating the disease; however, it must also cooperate with other specialised organisations to define ways of avoiding spill over to humans.

The current state of play is that HPAI is an animal health issue, and the focus must be on attacking the problem at source – in animals. The real and potential transmission of bird flu can be described in three phases, animal-animal, animal-human and human-human. The following scenarios may be associated with each of these phases:

❖ *Animal-animal transmission*

- It is a problem for poultry.
- By extension, it is a problem for those whose living depends on poultry.
- By further extension, it is a problem for consumers when precautionary measures (good husbandry practices) are not applied.

❖ *Animal-human transmission*

- It is a problem of human health for those who handle diseased poultry or are otherwise in direct contact with sick poultry.
- The wider the spread and incidence of HPAI in poultry, the higher the probable number of people whose health will be affected.

❖ *Human-human transmission*

- It could remain localised.
- It could spread rapidly outside originating locations and even cross boundaries to become a pandemic.

FAO's concern is focused on the first phase but also covers much of the second phase in terms of containing the disease and averting human disease. In advising its member governments on how to combat avian flu at source in animals, FAO stresses the primary and fundamental importance of a strong national veterinary service articulated at local level to improve capacity at farm and market level in order to:

- 1) implement biosecurity measures aimed at preventing the disease;
- 2) improve the surveillance and detection of the disease;
- 3) ensure regulatory inspection and proper hygiene, and
- 4) once detected, report, control and limit its spread.

There are proven practices for this, such as isolating poultry, good farm hygiene, use of effective vaccines, close monitoring, and quick culling when necessary. These practices work, and there are success stories in many countries. FAO has been providing advice on how to apply these practices, offering training courses, developing guidelines and manuals, helping equip veterinary laboratories, facilitating access to vaccines, and assisting countries in the design of prevention and control strategies.

It is important that all veterinary activities be effected with the cooperation and understanding of local communities, and that they be defined with an eye to at least maintaining the existing socio-economic conditions of affected individuals/communities, and at best improving these conditions.

Another aspect of FAO's policy is to promote regional networking and information-sharing for improved surveillance and diagnosis of avian flu and for exchanging information on disease incidence and on lessons learned in combating it. It is important that outbreaks be reported in a timely fashion and that epidemiological data and samples are shared.

In this context, FAO cannot give blanket advice – since each individual situation is a case by itself, the control and measures necessary must be assessed on a case-by-case basis. However, numerous expert missions to affected countries have helped create a general rule of thumb which is that hands-on responsibility for surveillance and reporting, and for the application of remedial measures (such as culling or vaccination), must be devolved to local level to protect communities from possible sources of transmission brought in from outside the community and to protect others from disease transported out from the community.

Further, stressing the local-level component does not mean that a global approach makes no sense. On the contrary, the fact that HPAI is a transboundary disease obliges FAO to stress the importance of a coordinated global strategy to fight the disease.

The challenge facing FAO's animal health programme is to better understand the global epidemiology of the disease and design the best prevention and control strategies. This is being done with close attention to the socio-economic consequences of the disease and its management: a small group of experts has been brought together to analyse the

actual and potential impact of the disease and control measures on the socio-economic wellbeing of those populations directly concerned and to provide advice on the current and future structure of the poultry industry.

From FAO's point of view, the HPAI crisis represents an invaluable opportunity to bring together biological and social expertise, sharing the challenge of identifying the risks and proposing those cost-effective measures to combat the disease which carries the lowest possible negative consequences for the rural poor.



Protecting local chicken genetic resources under avian influenza pandemic situation in Egypt

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In mid February 2006, the Highly Pathogenic Avian Influenza (HPAI) H5N1 was detected in more than one governorate in Egypt, first in small and backyard flocks but later in commercial farms as well, and the zoo in Cairo (FAO, 2006). The avian influenza outbreak was officially declared in the country. Although many institutions in the country had been working for three years researching the presence of the virus and developing contingency and emergency scenarios for if and when the pandemic reaches the country, the first few weeks of the disease created some havoc and the priority was given to establishing and implementing biosecurity measures. The indiscriminate stamping-out practices during the early period of the discovery of the disease endangered flocks of valuable chicken local breeds. Egypt has got 11 local and derived breeds which became quite adaptable to local production environments. Among these are the *Fayoumi*, *Dandarawi*, *Montazah*, *Mandara*, *Matrouh*, *Sinai*, *Dokki 4*, *Gimmiza* and *Beheri*. These local genetic resources are important for the backyard production and low-input production systems which still provide some 20% of the total chicken production in the country. There is also a niche demand on products from local breeds where consumers prefer the more intense taste of their meat and eggs. In fact, semi-commercial units were established to meet this demand. Farmers and producers get their chicks from the Ministry of Agriculture farms and other projects. *Fayoumi* breed is an important genetic resource of global interest which has been exported to many countries.

Commercial poultry production is based on exotic stocks where the industry has got parent and grandparent stocks to produce the commercial birds.

Concerned institutions, mainly the Animal Production Research Institute (APRI) of the Ministry of Agriculture and the Integrated Project in Fayoum governorate started taking action to forefend local breeds from a possible loss. APRI redistributed the chicken breeds so as each breed would be present in two different stations of its many stations across the country. In each station a stock of 2500 fertile eggs were kept for regenerating the breed. Each week the oldest one fifth of this egg stock was renewed with the equivalent of fresh fertilized eggs. All birds were housed indoors and all flocks were vaccinated. The Integrated Project in Fayoum followed similar actions.

Indeed, a flock of a chicken breed, *Sinai*, which had been normally kept at one station, Serw, was completely exterminated because a herd of ducks in the same station proved to harbour the virus. The other flock of *Sinai* breed at the other station served well to rescue the breed.

Reference

FAO (2006) www.fao.org/ag/againfo/subjects/documents/ai/AVIbull039.pdf accessed on 13/04/2006.



The control of avian influenza in Indonesia: a community-based approach

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Avian flu first showed up in Java in early October 2003 and then spread across all the major islands throughout the archipelago (Bali, Sumatra and Kalimantan) within just one month due to delays in early diagnosis, reporting and rapid response. By the end of 2005, 25 of Indonesia's 33 provinces and over 150 districts/city districts had become infected. The disease has now become endemic.

The disease has seriously affected the poultry industry, with over 16 million birds killed or culled, and the consumption of poultry products has declined radically since confirmation of the initial human deaths (as of the end of April 2006, 24 people had died out of 32 cases). Direct losses are estimated at over USD 170 million, with the greatest loss registered among an estimated 30 million backyard village farming households raising between 170 and 200 million chickens. An estimated 23 percent of industrial and commercial farm workers have lost their jobs and 40 percent of these have been unable to find alternative employment.

In December 2005, the Ministry of Agriculture endorsed a national Strategic Plan for the Progressive Control of HPAI (highly pathogenic avian influenza – the deadliest form of the disease) with help from FAO, other international institutions like the World Bank, the World Organisation for Animal Health (OIE) and the World Health Organisation (WHO), industry, donors and many more.

The plan aims to implement a programme for the progressive control of H5N1 (the HPAI sub-type responsible for the current fatal outbreaks in Asia, Africa and Europe) and its eventual elimination from the archipelago. The programme covers disease control activities, systematic surveillance and implementation of systematic national poultry vaccination.

However, since Indonesia is a mix of cultural and socio-economic infrastructures, national disease control measures, especially at the sub-district level, can be interpreted and implemented in many different ways. Animal health services are decentralized, so decisions concerning disease control are made primarily at the district level, although there are linkages to provincial livestock services.

Community-level approaches to animal disease control can take many forms, and initiatives have been implemented in more than 40 countries, mostly in Africa. In Indonesia, the key to community-based action lies in the village animal health workers (VAHWs) scattered throughout the country. Also known as 'barefoot vets', 'paravets', 'basic animal veterinary workers' and other names, VAHWs are selected by their communities on the basis of their basic animal

health and husbandry training. These ‘barefoot vets’ are leading players in their communities largely because they are farmers themselves and can disseminate messages and positively influence community behaviour and attitudes toward disease outbreaks.

In December 2005, a FAO mission visited Indonesia to discuss disease control with farmers, village chiefs, NGOs, local veterinary workers, and animal and human health services. As a result of these discussions, FAO has identified four major issues putting the brakes on the development of community-based disease control and has come up with a number of solutions.

The problems

Lack of public awareness and information on avian flu

Small-scale poultry producers have no information on avian flu, which means they are unable to tell the difference between it and Newcastle disease, another fatal disease that affects poultry, and with very similar clinical signs. Only laboratory tests can confirm the presence of avian flu but if the farmers cannot recognise the symptoms in the first place, they will not ask the experts to intervene. Further, lack of knowledge means lack of understanding, and that can lead to wrong attitudes which can have a negative influence on timely reporting to local authorities.

Small-scale poultry producers do not have the resources to change their husbandry practices

Most of these producers have free-ranging poultry, and these scavenging birds play a major role in circulating avian flu. So the way the producers operate increases opportunities for the virus to circulate among birds and to enter commercial farms with a low level of biosecurity. The threat is greatest in peri- and intra-urban areas, where the densities of population and poultry activities are high. The proximity of wet markets to areas of poultry production also increases the possibility of disease transmission.

Lack of financial and human resources

The lack of resources (financial and human) has hampered vaccination of poultry. It has not been possible to reach all smallholders, although medium- and large-scale poultry concerns have been covered better. Compensation remains a sensitive issue and plays a strong role in the way people will report the disease; few producers will accept culling if they are not reimbursed for their financial loss.

Time delays and inappropriate monitoring systems

These are major constraints for effective disease reporting, movement control and surveillance. The existing reporting systems are not efficient enough, and many farms have been infected due to the slow process of reporting. Movement of sick birds contributes to the circulation and spread of HPAI.

The solution

Grassroots involvement of local communities in a comprehensive HPAI prevention and control programme depends on ensuring that these communities understand the disease in all its dimensions. This in turn depends on a clear and targeted public awareness and information campaign which should cover a wide range of issues:

- Compensation;
- Depopulation;
- Control of animal movements;
- Disease eradication;
- Surveillance;
- Reporting;
- Vaccination and post-vaccination monitoring;
- Restocking.

Ensuring the full commitment of farmers in an avian flu crisis should be possible through an efficient awareness campaign, and this will allow better disease reporting and better vaccination coverage. NGOs have a particularly important contribution to make in training and communication, especially for the backyard poultry sector, in support of improved biosecurity, vaccination, destocking, compensation, surveillance/reporting and public awareness programmes.

Financial incentives plus appropriate training and monitoring are necessary if farmers at village level are to be fully involved and committed. Small-scale commercial poultry producers are better able than backyard producers to make their own arrangements for improved biosecurity and vaccination.

Towards community involvement

In many parts of the world, successful community-based approaches have been developed to meet challenges from a range of livestock diseases in the face of increasing constraints on the public sector to deliver adequate animal health services to small-scale livestock producers. However, in Indonesia, the community's limited knowledge of HPAI and the free-ranging nature of smallholder poultry farming have made it difficult to involve them in such disease control programmes.

Future efforts should consider developing locally-adapted, gender-sensitive community-based approaches that actively engage participation of smallholder producers in a range of control measures, e.g. surveillance, early warning, destocking, vaccination and later restocking. The FAO mission has identified two such approaches:

- ❑ A long-term sustainable approach: community-based disease control based on community animal health workers.
- ❑ A short/medium-term approach: emergency community-based disease control involving veterinarian services, NGOs on the ground and ongoing projects, among others. While this may be successful in helping control HPAI, it is not so sustainable in terms of social economic stability and access to veterinary services. This approach requires thorough understanding of the social realities of small-scale farmers (their perceptions and constraints) and the social organisation of poultry production and health maintenance. It also requires social impact assess-

ment of sector and market restructuring for poultry producers and risk perception among a variety of key stakeholders.





The bird flu / avian influenza

A track race is engaged against virus H5N1 by specialists in animal health who try to contain the plague and to prevent its dissemination. In developing countries, the *Centre de Coopération Internationale en Recherche Agronomique pour le Développement* (CIRAD, www.cirad.fr, or Centre of International Cooperation in Agronomic Research for Development) is engaged in this fight. In this regard, it noticed very quickly that scientific knowledge on the virus and the disease was not very accessible to the general public. The CIRAD published a booklet of 60 pages, a true vade-mecum on the avian influenza which gathers, in a very practical format, the main part of current knowledge on this plague. In the form of pocket format, its perusal is facilitated by many titles and subtitles, a detailed contents and didactic links. The main national and international websites put together in a section «*For further reading*». Illustrated with about thirty original photographs resulting from the field missions of CIRAD's veterinarians and ornithologists to developing countries, this booklet provides a progress report on this plague which has initially been striking South-East Asian countries since 1997 before reaching Europe and then Africa at the beginning of 2006.

The publication authors, which are about twenty, are epidemiologists, virologists and ornithologists from the CIRAD's Department of Breeding and Veterinary Medicine (EMVT). They stress that avian influenza is first an animal health problem and that there are the most underprivileged populations in developing countries that pay the heaviest tribute.

The booklet is distributed on request to support educational projects. In order to receive the book, please send your request accompanied by your postal address:

- at E-mail: <dasemvt@cirad.fr>
- by air mail: CIRAD, TA 30/B Campus de Baillarguet, 34398 Montpellier Cedex 5, France

A translation in English, even in other languages, is being studied. Other tools of communication should gradually come in complement: websites, scientific reviews, etc.

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- The World Organization for Animal Health (OIE, www.oie.int)
- The Food and Agriculture Organization of United Nations (FAO, www.fao.org)
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- The Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA, www.cta.int)
- The French Ministry for Foreign Affairs, General Directorate for International Cooperation and Development (DGCID, www.diplomatie.gouv.fr/cooperation/dgcid)
- AGROPOLIS International (www.agropolis.fr)
- The Technical Poultry Institute (ITAVI, www.itavi.asso.fr)
- CEVA Santé Animale (www.ceva.com)



Consultation meeting on “The research community’s response to avian influenza, with special reference to the needs of developing countries” in Nairobi, Kenya [14-16 June 2006]

A Consultation meeting took place at the Windsor Golf & Country Club, Nairobi, Kenya, from 14 to 16 June 2006. It was organized by The International Livestock Research Institute (ILRI, www.ilri.org) and the International Food Policy Research Institute (IFPRI, www.ifpri.org). It gathered interested partners from the international research community to explore how research can support efforts to control highly pathogenic avian influenza, with special reference to the needs of developing countries and the poor. This scientific meeting had four main objectives: (1) to share experiences of those with experience from the avian influenza ‘front-line’ to provide a realistic, objective and up-to-date background for the consultation; (2) to identify and prioritise immediate service needs that research can provide in support of preparedness and emergency responses; (3) to identify and prioritise medium and long-term research needs; and (4) to develop an action plan and consider the way forward, including the possibility of forming an inter-institutional Task Force.

ILRI and IFPRI’s role was to convene, organise, host and fund the initial consultation; provide background materials to stimulate thoughts and discussions; play a facilitatory and catalytic role in implementing the action plan; and to take part as appropriate in service and research initiatives.

Around 70 persons attend the consultation meeting. Participants came from following countries: United States of America, Netherlands, Senegal, India, South Africa, Nigeria, Mozambique, Ghana, Italy, P.R. of China, Egypt, United Kingdom and Kenya. They were invited from a broad range of research and international organisations, the private sector and donors.

Working groups were formed to discuss various topics: research needs, service needs, capacity building, training, planning, collect and dissemination of information, etc. Participants exchanged their views, opinions and experiences in order to make suggestions and recommendations. Recommendations generated by the meeting aimed at responding to several requests ILRI and IFPRI have received from donors on priorities for targeting their research investments for Asia and Africa.

Further details relating to this Consultation meeting can be obtained from:

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2nd Nigeria International Poultry Summit in Abeokuta, Ogun State, Nigeria

[19-22 February 2007]

The 2nd Nigeria International Poultry Summit (NIPS) will be held from 19 to 22 February 2007 in Abeokuta, Ogun State, Nigeria. The general theme of this 2nd NIPS, which has English as official language, is “Consolidating the Poultry Industry in West Africa”. The NIPS is a bi-annual event of Nigeria Branch, World’s Poultry Science Association (WPSA). This event will give an opportunity to local, international experts and other stakeholders in the poultry industry to exchange knowledge on the state of the poultry industry worldwide, with special emphasis on West Africa. After the terrible losses the industry had to bear as a consequence of the dreaded ‘bird flu’, it is time to rebuild and indeed further improve West Africa’s poultry industry.

Scientific and social programme

The scientific sessions have been planned to cover all the areas of poultry science while maintaining relevance to the topic. The technical and business sessions include (1) Poultry Industry Finance and Insurance; (2) Biosecurity; (3) Waste Management and Exploitation; (4) Value-Added Products; (5) Poultry Industry and the New Business Paradigms. Many renowned poultry scientists as well as financial and business gurus have been invited for plenary sessions. The social programme for the NIPS is assuming even greater important. There is an interesting package of cultural programming for all delegates. A truly traditional African cultural evening programme awaits all delegates.

Call for papers

You are encouraged to submit your scientific works and achievements for presentation during the scientific sessions. All scientific papers must be presented as posters for display during the Summit. An abstract of the paper in English must be submitted with the pre-registration or registration form or online from the following address: www.second_nips.com/abstract.

Please note the following important deadlines:

- Submission of abstracts: October 31, 2006
- Submission of invited full papers: December 31, 2006
- Pre-registration for the Summit: December 31, 2006

For further details, please visit the website (www.nipsng.com) or contact:

SUMMIT SECRETARIAT

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8th Asian Pacific Poultry Conference in Bangkok, Thailand [5-6 March 2007]

The Asia Pacific is one of the most important growing markets in animal production. Thailand, in particular, is a prominent agriculture country in this region with a very well integrated, significant poultry industry, which produces poultry products not only for the domestic market, but export to rest of the world. The 8th Asian Pacific Poultry Conference (APPC 2007) will take place in the Swissotel Le Concorde Hotel, Bangkok, Thailand, from 5 to 6 March 2007. The general theme of the APPC 2007, which has English as official language, is “Science to Solutions”. This event will be organized by the Thailand Branch of the World’s Poultry Science Association (WPSA). It will be held right before VIV Asia 2007 also in Bangkok, Thailand. Therefore, participants will be expected from all over the world.

Scientific programme

The Conference will be covering the latest knowledge of all aspects of poultry science and poultry industry, which will include genetics, feed manufacturing technology, nutrition, production, processing, breeding, diseases and health management, environment and management, and food safety. This event will open opportunities to the attendees to enhance their knowledge and to exchange useful information.

Call for papers

The organizing committee would like to welcome all stakeholders to submit scientific papers. Abstracts for technical paper presentation are welcome. Submissions may be sent via E-mail at <info@appc2007.org>.

Please note the following important deadlines:

- Submission of abstracts: October 31, 2006
- Early registration: October 31, 2006

For further details, please visit the website (www.appc2007.org) or contact the organizers at:

The World’s Poultry Science Association - Thailand Branch

Suwanvajokkasikit Animal R&D Institute, Kasetsart University, Bangkok, Thailand

E-mail: <info@appc2007.org>; Tel: +66 2 579 0193; Fax: +66 2 579 0193