



AGENDA & SUMMARY CONTRIBUTIONS

Symposium on

The Market and Trade Dimensions of Avian Influenza



**Rome, Italy,
14 November 2006**

in conjunction with
the 21st Session of the Inter-Governmental Group on Meat and Dairy Products

EXECUTIVE SUMMARY AND RECOMMENDATIONS

Shaping the landscape of global livestock industry are the escalating and pervasive outbreaks of animal diseases. In a context of steadily rising demand for locally produced and imported livestock products, these outbreaks are posing considerable challenges and imposing costs on livestock producers, industries, and economies around the globe. While the short term costs of animal disease outbreaks are shown to be considerable, they also hold long term implications for trading patterns, policy formulation, industry investment and sector development.

This is particularly true of avian influenza which over the past three years has moved across the globe via transmission of the virus through wild bird migrations or movement of birds, people, or contaminated inputs. Spreading from Asia into Europe, the Mid-East and Africa, this disease has resulted in the culling/death of more than 300 million birds, the death of more than 160 people, trade disruptions, shifting consumption patterns and most likely billions dollars of damage in terms of lost incomes for industries and households. The potential for avian influenza to give rise to a global human influenza pandemic means that controlling the disease in poultry continues to be a top priority objective of governments, international organization, such as FAO as well as standard setting bodies, such as the World Organization for Animal Health (OIE).

Disease control and the market impact of disease are increasingly linked to the choices of policy intervention and control measures which have differential impacts on markets, trade, and different sub-groups of the sector. Increasingly, and very acutely in the case of avian influenza, given the human health implications, policy makers are forced to address difficult questions of how the livestock sector should be structured and how market arrangements should be managed to limit the damaging impact of animal disease outbreaks.

Objectives of the Symposium

Held in conjunction with the FAO's 21st Session of the Inter-Government Group on Meat and Dairy Products¹, this technical symposium was held to generate a broad understanding of the role of markets in transmitting the impact of AI and to assist policy-makers to understand:

- A The role of markets and trade in determining the direct and indirect costs of outbreaks of avian influenza;
- A The economic and social implications of various policy responses in the context of production systems, linkages to markets, and magnitude of disease outbreaks;
- A Appropriate policy and institutional measures to put in place which minimize the economic costs of animal disease;
- A The role of public/private sector linkages in mitigating AI-induced market shocks;
- A Lessons learned from different country specific control mechanisms;
- A Appropriate international standards and their role in limiting damage to economies and maintaining market opportunities in the context of AI outbreaks.

Recommendations

Over the course of the day, approximately 100 participants, including representatives of governments, private sector, industry groups, and international organizations 1) reviewed the impact of AI on international and domestic markets; and, 2) acknowledged, both conceptually and empirically (through case studies) that the prevention and control of AI outbreaks require country specific measures which need to be considered in the context of the structure of production/markets in individual countries as well as their linkages to international markets. In addition, the Group discussed the importance of linking public policies with private industry strategies (both in terms of roles and financing of AI prevention/response and recovery activities).

¹ The IGG on meat and dairy products is a forum for discussion by all FAO delegates and official observers, to review commodity problems related to meat and dairy products. These Sessions are held every two years and in order to better inform FAO delegates of critical issues affecting markets, technical symposia are organized with representatives from expert bodies and private sector. These fora have as an objective not only to inform delegates of issues but to serve as a means for developing a consensus plan of action.

Consequently, when considering the market and trade dimensions of avian influenza, the Group stressed the importance of strong linkages and collaboration with the private sector, both in terms of sharing experiences and expertise among developed/developing countries and ensuring linkages between developing countries. They emphasized that FAO's initiative to generate lessons learned and to identify and manage the market impact of interventions related to the prevention and control of AI could be considerably enhanced through such collaboration. At the same time, it was acknowledged that compliance with OIE standards for international trade should be encouraged to help limit the damage to markets.

It was agreed that attention was needed to take account of economic, epidemiological and human health factors when considering AI risk reduction. It stressed the need for regional capacity building particularly in the context of harmonizing transboundary policies and practices. FAO's on-going cross-divisional work on the socio-economic impact of avian influenza was supported and endorsed the following recommendations:

- Enhance North-South linkages between private sectors, building on and sharing the lessons learned on how to respond to AI outbreaks effectively, in particular the identification of economic incentives that can encourage enhanced risk mitigation measures by the private sector, thus reducing the potential spread of disease.
- Continue work on analysing compensation mechanisms, ensuring that they translate into capacity building and policy change, as well as investigating the possibility of assisting developing countries (specifically working with the private sector) to use risk assurance schemes as a means to provide compensation.
- Recognise, within the context of AI, the need for a balance between veterinary interventions and market realities, prioritizing the importance of food safety and human health. Analysis should be undertaken on appropriate approaches to disease control in poultry, balancing epidemiological risk reduction and distribution of economic effects.
- In the context of the transboundary nature of AI and other animal diseases, regional capacity building should be initiated to understand how to reduce collective costs of control arising from market impacts. Activities should focus on harmonizing policy interventions cross-borders, looking at the risk of transboundary trade in poultry and products, and strengthening links between private sector and governments.
- Recognize the importance of developing strategies that minimize adverse consumer reaction through the provision of clear and responsible information.

AGENDA

Tuesday, 14 November 2006

- 08:00 - 09:00 Registration
- 09:00 - 09:15 Opening by Chairperson, Samuel Jutzi, Director of FAO's Animal Health and Production Division, Review of the Objectives of the Symposium
- 09:15 - 11:00 **Market Impact of Avian Influenza: Theory and Practice**
- Impact of AI on global markets: an overview. *Nancy Morgan, FAO*
 - A framework for identifying market and trade impacts of HPAI and its control: theory and empirical findings. *Martin Upton, Reading University*
 - How do markets respond to disease outbreaks? The differential impact on market participants. Case study presentations (Egypt, Turkey)
 - The hidden costs: impact on livelihoods and households. *John Curry, FAO*
 - Aspects of marketing and communication relative to poultry in the case of AI. *Frans Dolburg*
- 11:00 - 11:30 Break
- 11:30 - 11:45 **Technical Challenges in AI Prevention and Control: A review of FAO activities.** *Joseph Domenech, Chief, Animal Health Service*
- 11:45 - 12:45 **Policy Responses**
- Public/Private Sector Linkages: Issues in maintaining markets for large and small poultry operations. What are the trade -offs? *Robert Burden, Serecon Management Consulting Inc., Canada*
 - Policy choices and institutional options: how do they affect disease costs. *Jonathan Rushton, FAO*
- 12:45 - 14:15 Lunch Break
- 14:15 - 15:15 **International Trade Dimensions of Animal Disease Control**
- Impact of animal disease on international markets. *Merritt Cluff, FAO*
 - The risk of AI transmission through breeding stock. *Alan Emsley, USA*
 - What are the policies needed to minimize market disruption? *Sarah Kahn, Head of International Trade Department, OIE*
- Discussion
- 15:15 - 15:45 **Effective Communication: A tool for minimizing disruptive market impacts.** *Satya Sarkar and Katinka De Balough, FAO*
- 15:45 - 17:30 "Best Market Practices in Mitigating Market and Trade Impacts of Animal Disease"
Panel of Experts
Discussion
Summary and Recommendations

MARKET IMPACT OF AVIAN INFLUENZA: THEORY AND PRACTICE

GLOBAL MARKET IMPACTS OF AVIAN INFLUENZA

Nancy Morgan, Livestock Trade Analyst, FAO

Global meat market developments in 2006 were set against a backdrop of animal disease-induced market instability in recent years characterized by consumption shocks, variability of export supplies, and price volatility. The onset of avian influenza (AI) in Asia (outbreaks in late 2003 and early 2004) coincided with the discovery of bovine spongiform encephalopathy (BSE) in North America, a region which supplies nearly one-quarter of global meat exports. Exacerbating market instability were the foot-and-mouth disease (FMD) outbreaks in Brazil and Argentina in late 2005.

New AI detections in the major consumption areas of importing nations in Western Europe, the Near East, and Africa in late 2005/early 2006 led to major consumption shocks and translated into shifting trade flows, dramatic price declines, and supply responses in both infected and non-infected countries. Market shocks can be reviewed in the context of changing international poultry prices which, after rising more than 30 percent in the context of avian influenza (AI)-reduced export supplies since 2003, plummeted nearly 20 percent since mid-2005 as AI was reported in over 40 previously unaffected countries in Europe, Middle East and Africa. In Europe where AI was reported in domestic poultry operations in 11 countries (out of 25 countries confirming HPAI outbreaks), prices in some markets dropped nearly 40 percent. Meanwhile, in uninfected markets, such as the United States and Brazil, the suppliers of 70 percent of global trade, prices dropped 40 and 25 percent respectively between mid to late 2005 and April 2006.

These price declines were the barometer for an unprecedented AI-induced 2 percent drop in poultry trade in 2006 as consumption dropped. This could potentially translate into potential trade losses of up to \$2 billion in 2006, as the potential gains of unaffected AI trade (estimated in 2004 at \$14 billion) drops in the context of consumption reduced trade gains and lower international prices. In the European region, AI outbreaks were confirmed in 25 countries, with trade bans put in place for those 9 countries where AI was identified in domestic poultry operations. Approximately 69 countries put bans on poultry products from the various affected Member countries within the EU-25. Eleven of those did not adopt a regional approach and imposed bans on all EU products. In addition to bans related to H5N1, trade restrictions were also put in place on product from the Netherlands which in August identified a low pathogenic bird flu strain on one farm. With short term consumption shocks in the EU-25 ranging between 70 percent in Italy, 40 percent in France, and 0-10 percent in other member countries, EU aggregate chicken prices declined by 15 percent in late 2005. Some recovery in consumer confidence in 2007 is allowing export prices to recover but not yet to pre-AI levels.

Circulation of HPAI N5N1 in poultry is undoubtedly caused by trade in affected birds, both birds for slaughter and genetic inputs into the industry such as day old chicks and hatching eggs. The economic impact of these outbreaks and the economic implications for industries and economies transcend the actual costs of controlling the disease. A previous review undertaken by FAO² documents the enormous financial and economic losses that can accrue to both developed and developing nations following the outbreak of a transboundary animal disease. In most cases, the indirect costs of animal disease exceed that of the direct costs to control the disease and, certainly in all cases, the costs of animal diseases to the livelihoods of households and industries linked to the livestock sector are underestimated. One of the long-term consequences of the costs imposed by animal diseases is that longer-term investment in the sector may be compromised and that industries forced to restructure with implications for rural livelihoods.

² Animal Diseases: Implication for International Meat Trade: <http://www.fao.org/unfao/bodies/ccp/me/02/default.htm>

POTENTIAL COSTS AND IMPACTS OF MORE OUTBREAKS

Merritt Cluff, Senior Commodity Analyst, FAO

While it is recognized that animal disease may have a significant local impact, the growing interdependence of livestock markets is creating awareness of the broader costs on livestock industries around the globe. Certainly, escalating outbreaks of animal diseases have increased market instabilities, most recently with a recurrence of foot-and-mouth disease (FMD) in South America, the identification of bovine spongiform encephalopathy (BSE) in various major exporting countries and, most specifically, the ever widening and troublesome spread of avian influenza (AI), especially its H5N1 variety, around the world. These outbreaks have tested the resilience of global livestock markets that have recently exhibited the slowest growth in trade over the past decade. The notification of trade bans for meat has never been higher and, increasingly, consumers' concerns about meat safety are leading them to shift consumption to other animal proteins. As governments express rising concern about the socio-economic impact of animal disease prevention and control, the zoonotic nature of H5N1 is raising the costs of prevention and disease control, prompted by the possibility of a disease pandemic affecting the human population

In the context of considerable policy challenges posed by animal disease to livestock producers, meat processing industries and policy-makers around the globe, FAO has undertaken an analysis which reviews the status of the major animal diseases currently affecting markets and assesses some preliminary scenario results of three broad animal disease scenarios involving AI, FMD and BSE outbreaks. The examination of alternative model simulations helps identify and assess critical aspects of the impacts of animal diseases on markets. In particular, it provides general benchmark estimates on the market and trade costs of these diseases under different scenarios while providing a framework to assess some of the factors and policies that can influence the market impact of different types of animal diseases.

Animal Disease Outbreaks

This FAO study³ provides some preliminary estimates of producer market losses that arise from disease outbreaks, in particular those resulting from shocks to production and consumption which result in shifting trade and price impacts. The factors which are of clear importance in terms of determining the direction and magnitude of these shock are: 1) the role that market characteristics play in determining individual country market losses; 2) the impact that regionalization policies have on disease costs; 3) the nature of consumer responses in influencing market losses; and, 4) the characteristics of the specific animal disease. This brief overview presents the results of the AI scenarios undertaken in the study which can be found at the following site: http://www.fao.org/unfao/bodies/ccp/me/2006/index_en.htm

Various AI scenarios were evaluated, including:

- Global AI consumption shift/shock of 10 percent away from poultry to other meats
- AI outbreak in the EU: Two scenarios with loss in exports for 6 months: first, with no consumption shock, second, with a 10 percent consumption shock in the EU.
- AI outbreak in Brazil: loss in exports for 6 months, no consumption shock.
- AI outbreak in the United States: loss in exports for 6 months, no consumption shock.

These results were examined relative to the baseline projection for 2006, shown in Tables 1-4 in document:

<ftp://ftp.fao.org/docrep/fao/meeting/011/j8387e.pdf>

Global consumption shock due to AI

The impact on global markets and trade of shifting consumer preferences in all countries away from poultry meat is demonstrated in the first scenario which simulates the effect of a global 10 percent shift away from poultry toward the other meats in 2006. In the first year, trade in poultry products falls by 13 percent and traded prices by almost 7 percent. World production and consumption of poultry meat decline by nearly 6 percent. Given the lag in supply response of other meats, prices increase considerably, with beef and pigmeat prices up from 10 to 20 percent in the Atlantic and Pacific markets⁴. Feed prices fall as poultry production contracts and other meat production remains largely

³ "Impacts of animal disease outbreaks on livestock markets", IGG document, November 2006.

<ftp://ftp.fao.org/docrep/fao/meeting/011/j8387e.pdf>

⁴ Definitions of these prices are available in the original report.

unchanged in the first year. However, the model, when carried into future years, illustrates the global market's ability to respond to market shocks with feed demand recovering in subsequent years as production of other meats rises. Clearly, sharp meat consumption shifts, as currently witnessed in global poultry markets, have large ripple effects throughout the broader agricultural economy.

In a second scenario, a simulated reduction in EU poultry exports, channeled into the domestic market in the short term, reduces EU chicken prices by almost 4 percent. In response to a 7 percent decline in production, a shortage of white poultry meat results in increased imports. As competitors move to fill the global supply shortages, international poultry prices increase by almost 2 percent, while substitution effects increase the prices of beef and pigmeat. Scenario 2b is identical to 2a, except that a 10 percent EU consumption shock (i.e. a shift left in the demand schedule), which is allocated proportionally to other meats, has been assumed. In this scenario, chicken prices decline by over 6 percent, poultry output by almost 12 percent and consumption by almost 7 percent. The consumption shift affects the domestic pigmeat sector and, given the biological lag that limits the supply response for the first year, prices rise by almost 12 percent. Pigmeat prices in the Pacific market, which is the highest value destination for EU pigmeat, rise only 1 percent, as EU supplies to that market are reduced. In the beef sector, increased beef consumption attracts imports from the Atlantic market, causing beef prices in that market to rise 3.5 percent. The price and trade impacts of a significant shift in European meat consumption patterns stimulates higher Brazil and US poultry exports. Finally, while under the first scenario producer market revenues (as measured by the sum of the price and output changes) fall by about 11 percent (or about €1.2 billion), they fall almost 18 percent (or about € 2.1 billion) under a consumption preference shift away from poultry meat.

AI hypothetical outbreaks in Brazil and the United States

The final two scenarios evaluate hypothetical AI breakouts in Brazil and the United States. Not surprisingly, given their large share of world trade, these scenarios hold broader implications for international poultry markets than that of the EU, which only accounts for 10 percent of global trade. These two examples show how market shocks differ for countries depending on their relative linkages to international markets. A 50 percent export shock in Brazil, which exports about 30 percent of its production, leads to a 10 percent reduction in domestic poultry prices. Meanwhile, given the lower export dependence of the industry in the United States, where exports (almost exclusively lower priced dark meat) account for only 15 percent of domestic output, the same proportionate loss of export markets is estimated to reduce production and prices by some 7 percent. The obvious lesson demonstrated by these scenarios is that greater involvement in international markets exposes a country to proportional greater "market access risk"; e.g. the price/sales risk that is associated with higher export dependence. In these two scenarios, market revenue losses, as exports are banned for the duration of six months, are 20 percent in Brazil compared to about 14 percent in the United States. Effects on international markets obviously depend on relative market shares, the importance of trade to the overall industry, and the destination of trade flows

Some of the preliminary conclusions of the study, which include an examination of the relative impact of different outbreaks of animal disease, including AI, FMD, and BSE are that:

- International market responses to animal disease outbreaks depend critically on the type of disease, the nature of consumer responses, the size of the market affected and trade linkages. Obviously, the impact of animal disease outbreaks, in the form of market losses, is highest for countries where the outbreak occurs and is in proportion to the country's export dependence. The prevalence of disease-related market segmentation, such as those existing for beef and pigmeat, create higher international impacts for those market segments.
- Consumer reactions play an important role in determining the size of market losses associated with animal diseases, with non-disease infected exporters significantly and adversely affected. Government policies which seek to sustain consumer confidence could mitigate market losses, thus minimizing markets impacts, both in-country and globally.
- Regionalization is a very effective instrument to limit market losses to countries that are experiencing an animal disease outbreak and to stabilize international markets. This has proved to be the case for Brazil and Argentina, where the potential market impacts of FMD outbreaks could have been extremely severe in the absence of importer recognition of in-country zones.
- A return to market equilibrium following a significant disease outbreak varies by disease and meat product. Poultry markets rebound very quickly, given the rapid supply responses of the industry, in contrast to beef markets which may take a decade to return to equilibrium.

A FRAMEWORK FOR IDENTIFYING MARKET AND TRADE IMPACTS OF HPAI AND ITS CONTROL

Martin Upton, Professor Emeritus, Redding University

Market impacts of HPAI, on national and global markets, result from production losses that reduce supplies, together with human food safety fears that reduce demand. The overall impacts depend upon the time profiles of shifts and recovery of supply and demand.

Established conceptual frameworks which are useful for analyzing the global cost of animal diseases are difficult to identify. This paper tries to fill that gap by provides a general framework for reviewing the potential impact of an AI outbreak on a country, recognising that the market impacts of HPAI differs between countries depending upon their per capita income levels, whether or not they are net exporters of poultry products, and the location, frequency of outbreaks and type of disease control measures imposed.

In particular the report provides some guidelines on predicting the impact of an outbreak in different markets with diverse characteristics, speculates on the factors which transmits the market impact to disease-free countries, discusses the role of the structure of the poultry sector and market chains, and investigates the public/private role in controlling disease and the impacts of preventive and precautionary measures.

The report concludes that export trade in poultry meat is concentrated in the industrial and commercial sub-sector of a few high- or middle-income countries. Although four different poultry production systems have been identified by FAO, a key distinction exists between industrial and commercial systems, with low disease risk and intensive production, and smallholder and 'backyard' systems with high disease risk and low productivity levels.

These two systems are associated with separate semi-independent market chains. The industrial/commercial system, responsible for most of the product output in high and middle income countries, generally includes large-scale processing and retailing companies. They have the resource capacity to survive the impact of HPAI outbreaks, although exporters faced with export bans may have problems.

Given the existing financial and veterinary resource constraints, collaboration is needed between governments and the commercial poultry sub-sector, in controlling the spread and limiting the adverse market impacts, of HPAI.

Suppliers of chicks and poultry feeds may face damaging reductions in demand, when poultry production and consumption are reduced by disease outbreaks.

Smallholder and backyard systems generally involve many more producers than do commercial systems. In low income developing countries, they may account for most of the total domestic poultry production. The risks to this sub-sector can be high because the probability of infection is greater than in commercial systems, while the costs of an outbreak are much higher in relation to household incomes.

Private markets fail to deliver adequate levels of disease control in livestock, so public sector intervention is needed, though subject to financial and human resource constraints. Interventions include direct action, dissemination of information and regulation. Alternative control measures differ in their requirements of veterinary and other resources and in their impacts on the structure of the industry. Some measures impose greater costs on the smallholder sub-sector.

In the absence of special support measures for smallholder producers and traders, the incidence of HPAI outbreaks and measures for their prevention and control may hasten the growth of commercial systems and the decline of smallholder poultry production.

IMPACT OF AI OUTBREAKS: AN EXAMINATION OF COUNTRY CASE STUDIES

It was previously highlighted that prevention and control of AI outbreaks requires country specific measures which reflect their marketing and trade position. The price to producers and consumers is dependant on relative shifts in demand and supply which in turn reflect market structures caused in part by their net trade position. The impacts of disease outbreaks in a closed market economy differ from those in net importing or exporting countries. Production

systems and marketing chains as well as preventive and control measures all affect costs and, unless addressed in a comprehensive framework with collaboration from all stakeholders, disease control will be less efficient. Case studies of the impact of AI on markets in Egypt and Turkey were presented which highlighted, in the context of AI disease control and prevention, the differential impacts on markets. Certainly it was clear the important role played by effective communication in addressing the impact of AI on markets.

The Turkish Situation

Prof. Dr. Cengiz Yalcin, Ankara University Veterinary Faculty

Turkey has a well-developed commercial poultry sector as well as widespread backyard industry in rural areas. Turkey declared highly pathogenic avian influenza outbreaks first on 07th October 2005 and then on 25th of December of the same year. The first outbreak was quickly eradicated. However, the impact of the latter which resulted in human deaths caused panics among consumers, the impact of which lingered until Mid-February 2006. Due to the panic, poultry meat markets collapsed, and sales dropped 1-4% below pre-AI level, with prices dropping to a level much lower than the cost of production in the early days of January 2006. Besides putting the surplus production in cold storage, reducing production capacities, most of the firms had to 1) destroy chicks up to 15-day-old; 2) delay age of slaughter (from 42 days to 54-55 days); and, 3) sell the breeding eggs as table eggs.

The government had to depopulate all the birds in each of 230 outbreaks and surveillance zones (2.5 million birds). Then, 13.5 million spent hens, generally sold in the rural market, were culled through the last outbreak in 31st of March 2006. The culling, compensation and the expenditures on the disease control and prevention cost the government around 32 millions YTL (US\$23 million).

While some sector participants, including backyard producers, were compensated, the rehabilitation programs were not based on any type of analysis which evaluated the differential impact of disease interventions. Furthermore, no further assessment has been made of the scale and duration of market shocks that 1) result from consumer fears about eating poultry products and 2) recognize market losses for producer and other market participants. Yet reports suggest that these shocks may be considerable and it is important that policy makers receive guidance in understanding and managing the shocks.

This study aimed at carrying out a rapid market assessment to examine the impact of market shocks caused by the HPAI outbreak and immediate control measures, and indications of long term change in the structure of poultry markets. It is intended that the study proposed here will provide a case study detailing the market events around the HPAI outbreak(s) in Turkey in 2006, and the methodological framework developed during this study be used to derive similar information from other countries facing AI outbreaks.

The study concludes that in spite of the short duration of consumer panic resulting from disease outbreaks and human mortalities in Turkey, the poultry sector and its related industries (both upstream and downstream industries) were severely affected. Such events demonstrated that longer AI outbreaks resulting in more AI-related human deaths would cause devastating effects not only on the sector itself, but also on the national economy.

Differential market assessment illustrated that:

- The integrated firms have been negatively affected during the outbreak periods. The AI induced losses due to decreases in production levels and market prices of broilers are estimated to be 27,6 millions YTL and 101,9 millions YTL respectively.
- The industry has been recovering, but several medium scale semi-integrated and integrated firms have gone bankrupt. Further bankruptcies are expected in the near future. However, survivors, particularly those invested in brand development, are likely to be better off in the future. Previously, consumption of commercial poultry meat and eggs by the rural families were negligible. However, as a result of bans on spent hen sales in local market, and de-population of backyard poultry, the industry has been increasing their sales volumes in the rural markets.
- The AI crises increased collaboration among integrated firms. The "Healthy Chicken Meat Platform" established by the largest 19 integrated broiler firms conducted very successful campaigns to re-gain consumers' confidence in a short period of time.

- However, poultry contractors seemed to be disproportionately affected by the outbreaks. These broiler and turkey producers lost on average 1 cycle of production due to the AI. Most of them are operating now. However, their future is very dependent upon the future of the integrated firms. Negative impacts on integrated firms are directly transferred to contract producers. The nation-wide losses at the contracted broiler farms were estimated to be 77,6 millions YTL of which 51,3 millions YTL was due to decrease in the production and 26,6 millions YTL was due to unpaid management fees. The production losses in the contracted farms are likely to be significantly higher than those in the integrated firms. However, the government did not have any compensation programme for the contracted broiler and turkey producers.
- The integrated firms are able to negotiate with Ministry relative to the problems/losses they faced due to the AI outbreaks, consequently influencing government decisions on compensation payments. However, they did not represent the problems faced by contracted farms due to the AI outbreaks. Since the contracted farmers are not organized under producers associations and unions, they have limited political voice and their problems aren't sufficiently addressed. The government tends to neglect them when supporting the industry.
- Most of the table-egg producers have not re-stocked after culling of 13,5 million spent hens (31% of the national layer population) due to the unclear picture in the market. In particular, some of the farmers are in very bad financial crisis. They cannot restart operations due to the lack of finance, and they tend to rent their business. Those capable of re-entering the market are producing eggs, expanding their sales in the rural areas and enjoying high egg prices recently.
- The psychology, nutrition and income of rural families have been severely affected due to delayed restocking (due to the ban of the spent hens in rural market, most villagers can not find hens to purchase). They did not perceive as sufficient the compensation paid by the government since they not only lost income from poultry, but they become dependent on purchased poultry products in the market (indirect income loss). It is recommended that the government consider all these losses when considering compensation.
- During the crisis, the consumers, significantly lowered their protein intake and paid higher prices for substitute protein sources (red meat and fish). However, most resumed poultry consumption by June 2006.
- The government spent 31,7 millions YTL for combating the disease and compensating the sector participants. As a result of AI induced losses in production the sector and its related sectors, tax revenue losses were also occurred. Calculation of the economic/socio-economic cost of the AI nationwide is difficult to estimate. But it has far reaching indirect impact from tourism to the environment.
- The government gained valuable experience on how to manage contagious zoonotic animal diseases. Both the government and industry realised that media communication/management is the most important area in the management of contagious animal diseases. The government is regarded as successful in combating and controlling the disease in spite of the fact that the methods of depopulating the birds, organization efficiency in deployment of resources, and communications with the public have been under criticism.
- Initially the government focused on combating and controlling possible future outbreaks, neglecting rehabilitation programmes/initiatives for those suffering from the outbreaks. The decision to and how to compensate was not based on the scientific socio-economic impact analyses of different segments of the industry. The rapid market analyses and differential impact analyses outlined in this research depicted that the impacts of the disease appeared to be very damaging to the sector and its negative impacts are far reaching. The findings suggest more elaborative compensation programmes for the future outbreaks.

The Egyptian Situation

Lise Albrechtesen, Policy Assistance Branch, Cairo; Dr. Ahmed Ibrahim, Prof. Agricultural Economics, Zagazig University, Egypt; Dr. Jonathan Rushton, FAO/Rome

In Egypt, as in other countries, the impact of AI outbreaks has resulted in significant market shocks for both commercial and backyard poultry operations. The market impact followed a sequential pattern. During and immediately after an outbreak: demand falters, prices drop, and then supplies decline as producers reduce output (birds are culled, mortality rates increase, or producers respond to reduced consumption and lower prices), and industry returns decline. Markets subsequently recover but the ability of producers to re-enter the market in a timely fashion may be compromised by various factors with implications for the long term structure of the sector.

The report provides a rapid assessment of the scale and duration of market shocks in Egypt that result from consumer fears about eating poultry products, producer concerns about loss of markets, and potential implications of increased market access for imported products. These changes are reviewed before, during and immediately after the outbreaks of 2006 in the context of the evolving nature of market chains and the changes in market participation by economic agenda, changes in capacity utilization. Reports suggest that these shocks may be considerable, particularly in Egypt

where poultry consumption as a share of total meat consumption is extremely high. Consequently, it is important that policy makers receive guidance in managing the shocks to the extent possible.

Prior to the market shock of HPAI, the poultry industry and its associated value chains were increasing in complexity and sophistication in order to supply a growing demand for poultry products in the national market. The industry was also becoming increasingly aggressive in the export of poultry products. The majority of the export products were from the breeding component of the broiler value chain and the sale of eggs from the layer value chain. However, there were some exports of processed chicken products mainly to Saudi Arabia. The general development of the sector has been promoted through protectionist policies and favourable exchange rates that made imported feed inputs relatively cheap. Changes in exchange rate policy created difficulties for many poultry producers and the poultry industry was probably still in the process of recovery when HPAI problems began.

The investments across the value chains were not even. Heavy investments had been made in breeding stock, management and building and equipment infrastructure. These investments in production facilities have not been matched by investments in slaughterhouses, processing and retailing of poultry products. The lopsided nature of investment is not easily explained and would require a more holistic analysis that included business and investment regulations and policies. There may also have been an intentional lack of investment in processing and cold storage facilities for poultry products to provide a degree of protection to the industry if poultry product tariffs were lifted.

A clear understanding of the consumers of poultry products was not available nor became obvious during the study. It is often stated that people continue to demand live birds in order to see them slaughtered and dressed. There is also a demand for poultry products, both meat and eggs, from local (balady) breed chickens. This is reflected in a premium for these products, but the size of the market for such products is much smaller than for poultry products from standard commercial breeds. How consumers would react to a change in availability of chilled poultry meat pieces and processed poultry products is difficult to predict. Again such an analysis was outside the scope of the present study, but would be of great relevance as the poultry industry recovers from the HPAI impact.

The main features of the poultry market after the HPAI crisis, starting in October with the announcement of outbreaks and human fatalities in Turkey are as follows:

1. A sudden drop in prices as consumption declined and then a sudden rise in levels of retail and farm-gate prices of live poultry and poultry products as consumers' confidence recovered and producers struggled to increase supplies.
2. Apparent shortages in meat production and supplies of live poultry.
3. Unemployed production capacity on commercial poultry farms.
4. A temporary moratorium on investment in the poultry sector
5. High levels of retail prices of poultry substitutes such as fish and red meat.
6. A quick return to normal poultry consumption levels, with the advent of Ramadan putting additional upward pressure on prices.

Information is lacking with regard to the social impacts of the market shock on rural and urban poultry producers and on poor urban consumers. Data were not available to cover these aspects of the impact assessment nor were the resources to carry out data collection. There was also insufficient time and data available to examine the implications for other protein value chains that were probably affected positively by the problems in poultry markets.

MARKET IMPACTS AS HIDDEN COSTS OF AVIAN INFLUENZA ON RURAL LIVELIHOODS AND HOUSEHOLDS

John Curry, Gender Research Officer, FAO, Rome

While there is a growing understanding of factors that contribute to many of the direct costs of an outbreak, the hidden costs including the impact on livelihoods and households, particularly of the millions of small rural village or backyard producers poor, is less well known. Poultry derived income, even if small, is crucial for some household strategies and the many women who are mainly responsible for production. In particular, the culling and high mortality of birds certainly has had an impact on the livelihoods of poultry-dependent households in many of the least developed countries. In addition, the unproductive “downtime” forced on affected poultry farms has had a negative effect on industry profitability and market stability while there have been broader ripple effects through global markets as consumption and trade shocks have affected prices for meats and industry inputs around the globe.

Market shocks from HPAI affect a wide range of actors/stakeholders along value/market chains. Such actors include: sellers, intermediaries, transporters, processors and commercial (esp. large-scale) producers (and their workers) and consumers. Of these, those most integrated into/dependent upon formal marketing chains—be they international, national, sub-national—can be expected to be the ones most directly affected by these market shocks. However, others less integrated into formal value chains can also be affected both directly and indirectly by market shocks in a number of ways that are economic or social. These include smaller-scale commercial producers, subsistence-oriented producers who interact with market chains as informal sellers, intermediaries or buyers and consumers who rely on local markets. Such people and their households depend to varying degrees upon their interactions with poultry value chains (formal and informal) and are therefore susceptible to market shocks to their livelihood strategies. Consequently, market shocks resulting from HPAI and its control can be seen as ‘hidden costs’ to people’s continued use of poultry production, processing, marketing and consumption in their livelihood portfolios.

The symposium was informed of the Livelihood Analyses Framework approach which is an analytical tool providing a multi-dimensional approach to the understanding of livelihoods and the understanding of required linkages within this framework. Using this livelihoods analysis framework, this presentation explored the effects of market shocks, particularly those related to HPAI and its control, on small-scale poultry producers and other actors in the value/market chain, drawing upon experiences from selected affected countries in Asia and Africa which HPAI impacted has been assessed. HPAI and its control pose series of shocks, particularly economic, that affect not only individual, households and community livelihoods assets in various ways, but also the capacity of individuals, households and communities to fashion coping strategies to mitigate the effects of such shocks.

Particular attention has been devoted to market-related economic shocks that HPAI and its control may precipitate or exacerbate. These shocks can result from closures of markets and movement restrictions on poultry to limit the spread of the H5N1 virus, fluctuations in poultry prices in response to changes in both supply of and demand for poultry, and restructuring plans/regulations/policies to improve market efficiency and upgrade biosecurity on farm and in markets. For small-scale producers and traders who are integrated into poultry marketing chains of various lengths, this can mean the loss of income from poultry, possibly representing an appreciable proportion of family income, loss of value of certain capital assets and the need to alter either livelihood strategies or incur additional costs to remain in the poultry sector (e.g., the cost of upgrading biosecurity to obtain certification in a restructured marketing system. Even for those not well integrated into large-scale formal market chains and for those where poultry production is small-scale and subsistence-oriented, market shocks associated with HPAI and its control may disrupt household livelihood strategies, challenge the ability to meet social obligations and maintain social networks (i.e., diminution of social capital), further inhibiting access to productive resources or alternatives to poultry, intensify general threats to livelihoods or inhibit recovery, thereby affecting the livelihood resiliency of particularly vulnerable individuals and households (e.g., women, the elderly, the rural poor).

Further research needs to be done on: livelihood aspects/threats, etc. to Sector 3 households that are more likely to feel these market-associated shocks more directly and may end up losing poultry production a significant component of their livelihoods portfolio. An important question to explore would be the ways different sorts of Sector 3 and 4 households cope with market shocks and for how long they can persist. Market and poultry sector policy formulation will require better insights to these and other questions in order to understand the consequences of HPAI-related impacts (including market shocks) on the livelihoods of small-scale for formulating shock mitigation and/or livelihood support strategies as part of market and sector restructuring plans in future.

POLICY CHOICES AND INSTITUTIONAL OPTIONS: HOW DO THEY AFFECT DISEASE COSTS

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Highly pathogenic avian influenza (HPAI) has so far caused losses that can be linked to: direct disease impact; implementation of control measures; market shocks caused by media and consumer reactions; and human deaths. Within this context, trade has been important in disease spread⁵, and has also been affected due to control actions and market shocks. These impacts have highlighted and magnified the need for clear and well implemented animal health policies that include:

- Disease control measures, implemented in recognition of their differential impact on sector wide stakeholders;
- International coordination of donor agencies;
- Coordination of the Ministry of Agriculture with other Ministries such as Health, Finance, Education and with NGOs, CSOs and donors;
- Coordination between public and private sector organisations; and
- The need for better risk communication.
- Mechanisms for private sector engagement in the animal disease control process.

The paper will attempt to examine the role of policies, review the requirements for successful implementation, and identify roles that public and private organisations, through policies and strategies, need to play to mitigate the impact of avian influenza and other transboundary diseases.

Taking a step back: understanding policies

The first challenge is to clarify what we mean by policies and strategies and distinguish between the intent and the implementation process.. The authors identify an environment where government policies are made and are implemented through laws, programmes and projects (see Figure 1). Policies at government level or strategies within the private sector are simply statements of intent and to have impact they require implementation tools. The impact of policies can take place across the food chain. Examples of policies (and their coresponding implementation measures) would be:

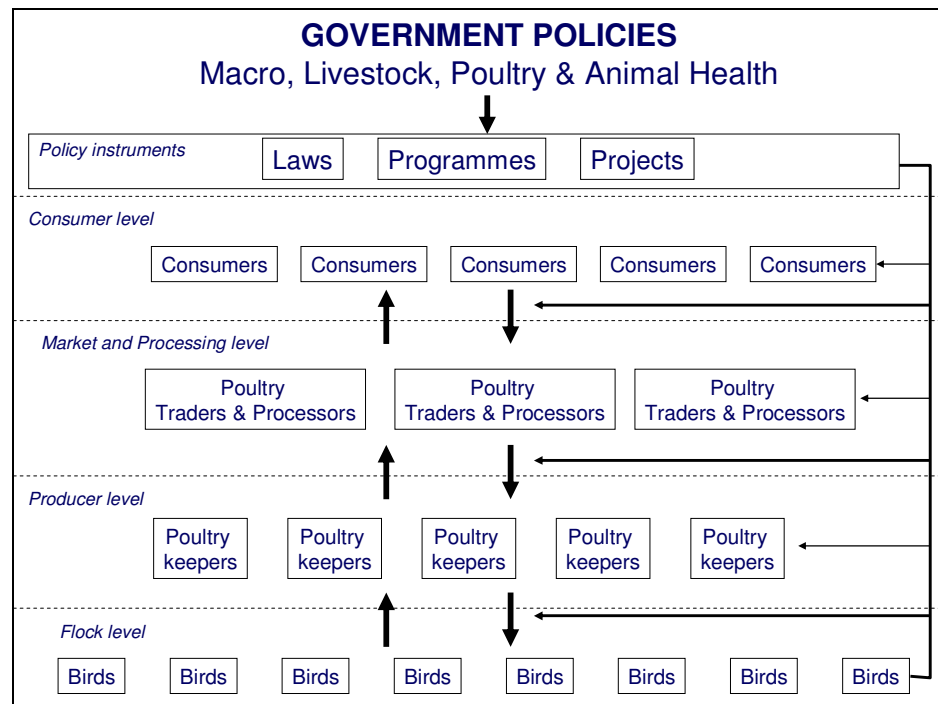
1. A policy to increase government revenues could be implemented through **laws** that put value added tax on livestock and livestock products. Similarly, a policy to improve the nutrition of urban consumers could be implemented through **laws** introducing subsidies on domestically produced livestock products, or conversely lowering tariffs on imported products. This would influence the economic relationship between livestock product traders, processors, producers and consumers.
2. A policy to empower women may be implemented by **extension programmes** which target women with messages on training and information. This would influence the intra-household dynamics of the livestock keepers. A national compensation **programme** for HPAI would outline the principles underlying funds distribution to producers whose birds are culled as a animal disease control measure.
3. A policy to increase livestock production may be implemented through a **project** that introduces high yielding breeds of animals that directly affects the herd or flock level. Similarly, a policy to control HPAI could be a project that reinforces the national laboratory system.
4. A policy to increase the efficiency of feed resource use could be implemented by **projects focused on** improving herd or flock fertility management in order to generate more young stock per breeding female. This would influence the relationship between the herd or flock and the livestock keepers.

The landscape within which people, governments, private sector, and other organisations interact, called the "institutional environment" which establishes the rules of the game, is set within a framework of public regulations, culture and private regulations. A priority focus, particularly with animal health, is placed on the importance of public regulation. In more developed countries, whilst public regulations are very important, increasingly, private regulation

⁵ Although this is not entirely understood, the role of trade in disease spread is linked to the structure of livestock markets, the nature of trade linkages and product movement (both national and cross-border), as well as the institutional relationships between various actors in the chain.

has a powerful effect on private organisations, the institutional environment, and the behaviour of individuals. Certainly in the case of animal health, private implementation of control strategies can be an effective way of creating cost and risk sharing mechanisms. Good examples would be the Canadian Structured Risk Management Approach (SRMA) and the Brazilian FMD vaccination campaign. In less industrialised countries, private regulation may be operating in a weak policy environment characterized by lack of implementation mechanisms for animal disease control. Figure 1 provides a framework outlining the policy environment as set by a government and its influence across the food chain.

Figure 1. The levels of analysis to generate evidence based approach for policy analysis and decision making (modified from Rushton et al, 2005).



Within the public sector, organisations influence animal health policy at different levels. At international level, the WTO, through the OIE and *Codex Alimentarius*, play a critical role in setting international animal health policies. International discussions and dispute arbitration mechanisms on animal disease control measures, particularly those linked to trade-affecting outcomes, are available through the WTO's Sanitary and Phytosanitary Committee (SPS).

At national level, animal health policies are influenced by:

- Veterinary services which are usually an integral part of the Ministry of Agriculture or Livestock.
- Food hygiene standards will involve a crossover of responsibilities with the Ministry of Health. There is often confusion of roles which, in some countries, leads to duplication and conflict.
- Compensation schemes and financial requirements for rehabilitation initiatives require input and consultation with the Ministry of Finance and possibly the Ministry of Social Security
- Communication on animal health measures may be influenced by the Ministry of Information
- Policies and legislation from the Ministry of Trade underpin market access for livestock products.

Moving beyond government policies to practices, involving the private sector .

Animal health measures are also influenced by private strategies for the poultry sector which are set at farm level by individual producers, at the company level by vertically integrated operations, or nationally by industry associations. Their collective decisions to participate in measures such as movement controls and vaccination are often the key to success. Producer or sector level associations have influence based on shared vision and formal agreements or peer pressure within looser groups. The aim in such associations is to improve operations and stabilise market

environment. Across the value chain, dominant actors may set strategies that essentially govern how these chains operate. Such a situation is found in strongly integrated companies and where dominant market actors such as large supermarkets are aiming for market share and sustainable growth. Important cross-border private sector coordination is also provided by regional or international industry affiliations, such as the ASEAN Federation of Poultry Producers or the recently conceived International Poultry Council.

Understanding the importance and potential linkages between public policies and private strategies in animal health control is a good starting point when addressing a crisis such as the control of HPAI. The following table presents a general comparison of public policies and private strategies.

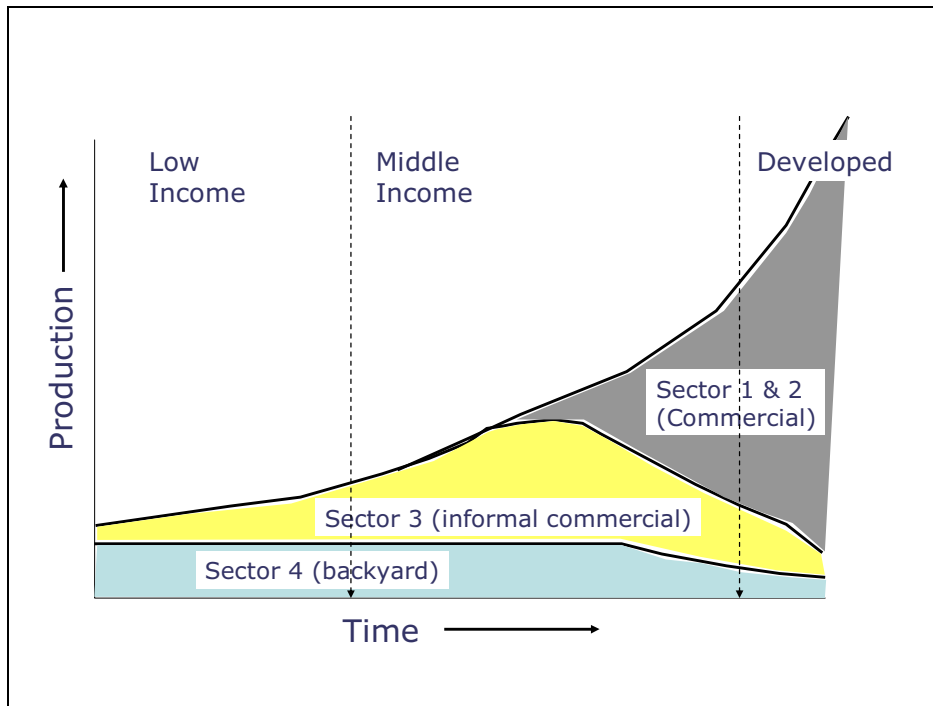
Characteristic	Public		Private		
	International	National	Farm	Association	Value Chain
Orientation	Protection of free areas, expansion of animal health standards	What should be done (ideal world)	Private interest	Group Interest	Market (consumers)
Enforcement	Trade restrictions	Obligation (penalty and reward)	Profit and risk minimisation	Peer pressure	Market incentives
Prerequisites for successful implementation	Export orientation	Strong and respected veterinary services	Access to affordable technologies and services	Strong code of conduct	Attractive markets that pay for quality (hygiene, presentation)
	Strong national veterinary services	Effective and respected government	Educated producers	Ability to punish members who break the rules	Business management
	Strong national private sector	Strong legal system	Access to financing	Strong legal system	Internal enforcement processes
	Well trained and informed producers	Market & Private incentives closely match policies			

The above framework highlights, in the context of public policy making, the potential and influential role that private strategies hold for effectively realising the results of an animal health policy. Consequently, influencing and directing private strategy is an innovative means of assisting the implementation of public animal health policies, and is an effective means of cost and risk sharing within society.

... requires an good knowledge of the poultry sector

In order to effectively mobilise the private sector in animal disease control, public organisations need to understand the dynamics of the poultry sector. Rapid changes of the poultry sector at national and international level in the last 20 years have created very complex poultry value chains. The world has seen the rapid development of poultry sectors, and associated large increases in the poultry populations mainly kept in industrial poultry systems. The traditional or backyard systems have continued, but their share of poultry markets and poultry numbers has reduced. Problematic in the development is the growth in a middle sector that is described by FAO as sector 3 which has rustic and less bio-secure conditions of production, particularly in layer and broiler fattening units. The authors' hypothesis is that as countries develop, more and more birds and production are incorporated into the integrated industrial poultry sector (see figure below.)

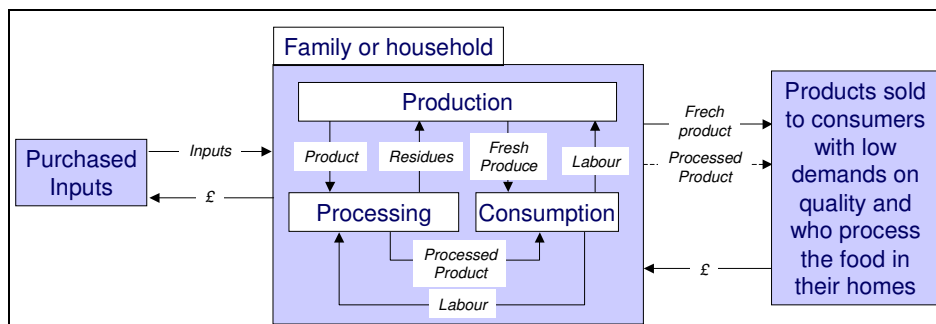
Poultry sector development



Linking knowledge to policy formulation

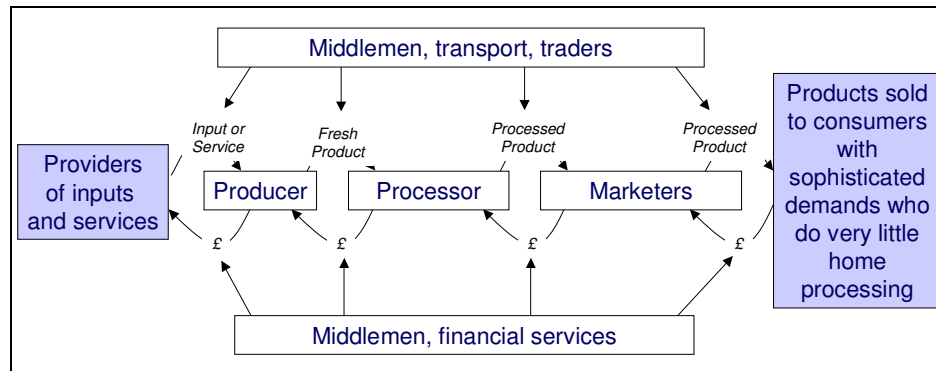
However, the evolution of the poultry sectors in many countries has not been matched by knowledge in policy formulation on animal disease control and an understanding of the implications for public interventions. In a simple food chain (see Figure below) there a relatively limited number of interventions and a relatively clear role for public organisations. Therefore, the impact of production management changes to reduce parasite burdens have an impact on availability of food at household level.

Simple food value chains (from Rushton & Viscarra, 2006)



However in the complex food value chains, now prevalent in many parts of the world, primary production has complex relationships with consumers through processing and marketing channels. The links in the chain are maintained by middle men, transport companies and finance groups. Where the value chains become integrated, i.e. owned and controlled by one company, the middlemen disappear. In addition, the consumer demands have become more sophisticated for processed food and food with zero risk of food-borne diseases (see the next figure).

A schematic diagram of the dominant complex food value chains (Rushton & Viscarra, 2006)



In the complex food chains, there are a large number of potential interventions and the role of public organisations and the effectiveness of public policy is less clear. It is increasingly evident from an evaluation of the impact of animal disease controls that no one policy mix will suit all countries because the poultry sectors will be in different stages of development.

In *developed countries* the majority of production will come from a commercial sector and the largest interest group will be CONSUMERS who demand reasonably priced protein sources that is well presented and produced in ways that are hygienic and increasingly in welfare friendly ways. In *middle income countries*, an increasing proportion of the population are found in urban areas. This population demand cheap protein sources, which is satisfied by a rapidly developing informal commercial sector. In *low income countries*, the rural population continues to be important and backyard systems are important in providing protein and regular cash needs. However, it should not be forgotten that even in countries with predominant backyard operations, most of urban supplies come predominantly from industrial poultry systems located in peri-urban settings.

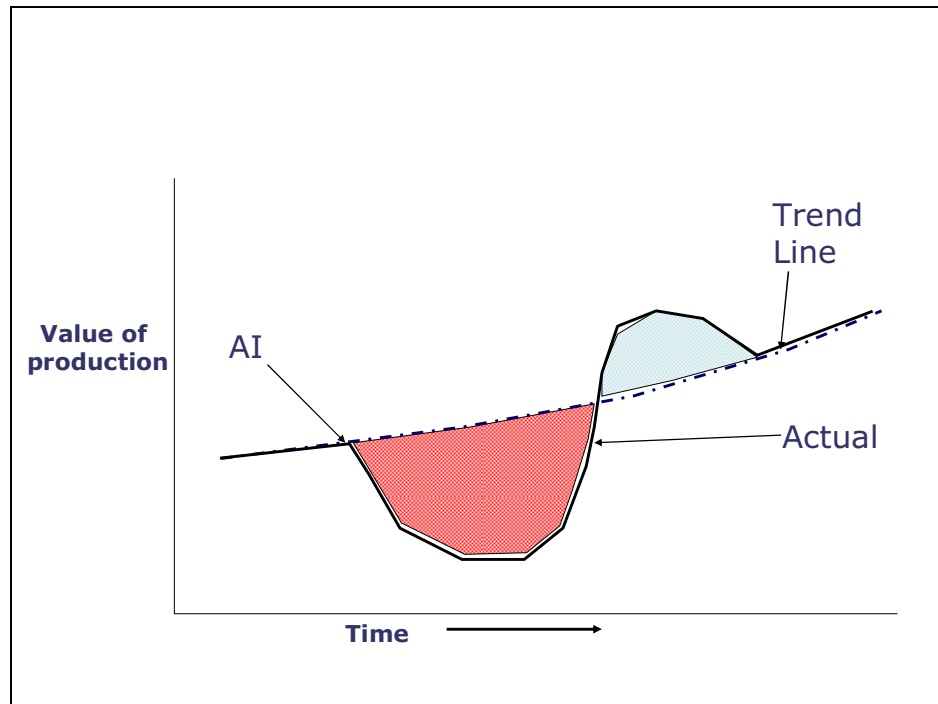
In an emergency disease situation such as HPAI control, matching public animal health policies to the poultry sector and its stage of development will be important in achieving successful control. Therefore policy makers need to review animal health policies within the context of their own country's stage of development and the development of their poultry sector. In general these policy makers need to be wary of general recommendations.

The policy challenges related to AI disease control

With a context of various typologies of poultry sectors, it is important to review and link the policies for animal disease control, their market impact shocks and mitigation measures that arise from a highly pathogenic avian influenza. This assessment requires a review of the experiences of market shocks due to HPAI around the world. In general, the countries badly affected have experienced initial periods during which urban consumer lose confidence in buying and eating poultry products. This leads to a sharp fall in poultry product prices and the quantity of these products purchased. Where the disease has also been present, there has also been a sharp decrease in supply due to the high bird mortality caused by HPAI and also the control responses which includes culling diseased and at risk birds, and movement restrictions in and around affected areas.

As consumer confidence returns, there is often a problem with satisfying growing demand with local production. In countries with protected poultry sectors, such as Egypt, this has led to large increases in price for poultry products as the poultry sector recovers. Producers who recover quickly from the disease are well positioned to benefit from these changes in the market price. However, if the breeding sector is affected, either through disease or cut backs in laying activities, the only short term solution is the import of meat products, or, more problematically, by illegal cross-border trade of potentially infected birds and breeding stock. A schematic representation of an AI market shock, induced by a disease outbreak or by consumer resistance to eating poultry, is shown in the following diagram.

Market impact shock



It is clear from experience that preventing and controlling disease where trade and markets are heavily disrupted is very difficult. Consequently the challenge for both policy makers and industry participants is how to **reduce the peaks and troughs around an avian influenza announcement and/or outbreak?**

The first step is to understand:

1. Who loses during the initial market shock and subsequent disruptions due to HPAI and its control?
2. Who is best placed to recover?
3. Who requires assistance in the recovery period, what type of assistance is needed, does the provision of this assistance have to originate from government, what support can be mobilised by private sector.

Within a broader context, the following policy issues need to be reviewed when dealing with an highly pathogenic avian influenza market shock:

1. Is the communication policy adequate for both risk communication and control measures?
2. Will control measures create medium to long term supply problems, disrupt markets, and lead to long term restructuring of the industry?
3. Are there policies and lack of supportive institutional capacity (such as credit availability), that will hinder recovery?
4. Do the market impacts generated by AI have differential impact on different market participants within the sector?
5. Are there policies adopted during the HPAI epidemic that will have negative impacts on the poultry sector?
 - a. who are the losers and why?
 - b. what are political, social (poverty, gender & nutrition), cultural, environmental and biodiversity impacts?
6. In attempt to examine these questions, the following core public policies and roles have been identified:
7. Surveillance (disease and the sector)
 - a. rapid response, minimise breadth/length of outbreak and reduce culling
8. Border and movement control
 - a. prevention measure at the border
 - b. understand movements within sector to apply most cost-effective movement control before and during outbreak

9. Coordination and direction of field disease control operations
 - a. compensation mitigates some effects of culling but not all
 - b. vaccination preserves birds but does not take away all market shock
10. Monitoring of disease control measures
 - a. monitor progress in real time to decide when to modify field actions
 - b. zoning and compartments require a demonstrable capability to monitor
11. Rehabilitation measures
 - a. large depopulation and movement control affect restocking
 - b. movement control affects market access
 - c. other actors besides producers are affected (but not compensated)
12. Communication
 - a. balance risk for public health against producing a market shock
 - b. clear messages on effective and achievable disease control measures by sector

As outlined above governments are not the only actors in animal disease control; private sector are normally the implementers, beneficiaries, and risk takers in control measures and have core strategies and roles in effective HPAI control measures. These roles are identified as the following:

- Coordination, communication and cooperation with the public sector, critical within this are activities that correspond to surveillance. It is often forgotten that the frontline of the surveillance system are the producer who see and monitor their birds every day.
- Promote farm and local level biosecurity measures within the industry – effective self-policing
- Procurement and distribution of vaccines
- Transparency and honesty in disbursement of compensation funds

In conclusion, setting public policy requires an understanding of the poultry sector, the dynamics of change within this sector and the private strategies that govern the sector. Preparedness plans for possible outbreaks (control and communication strategies) need to include policies, strategies and implementation of actions that will mitigate the impact of an announcement on HPAI and/or its presence. This is in recognition of the fact that if markets are badly disrupted, control of HPAI will be difficult if not impossible. To achieve effective market mitigation, there needs to be a matching of veterinary actions with market realities and incentives. Finally successful and cost-effective implementation requires coordination between public and private sector organisations.

PUBLIC/PRIVATE SECTOR LINKAGES: CONSIDERATIONS IN MAINTAINING MARKETS FOR LARGE AND SMALL POULTRY OPERATION

Bob Burden, Serecon Management Consulting Inc.

An issue which arose throughout the symposium was the need for clearly understanding public policies and private strategies, in particular the roles which public and private organizations, both national and international, should assume to mitigate the AI impact on stakeholders. Poultry markets continue to evolve and AI prevention, response and recovery activities must be seen as part of this evolution. This motivation for change is directly related to the producers need to protect their assets, but there is also a significant public benefit creating difficulty in determining how to deal with the issue and who should pay for it.

The marketing chains, if well understood, serve as a useful mechanism to facilitate the potential targeting of intervention to different market participants. Attention must be given to disease prevention in the context of the role played by markets, price and economic incentives which motivate human behaviour, as well as the trade issues which motivate policy orientation. It was clearly emphasized that communication channels and messages in many cases do not adequately cover risk issues. This paper took the position that the current approach taken by many countries to address avian influenza (AI) is neither the most efficient nor effective method of dealing with the disease. It tends to be reactive in nature and does not use available market systems to motivate desired behaviour on the part of farmers, who in fact are the first responders to a disease.

This issue is of relevance to all regions of the world as an outbreak of avian influenza (AI) results in a serious disruption of the operating reality in any poultry production system. The nature, magnitude, and distribution of impacts vary, and are directly related to a number of factors:

- the structure of the poultry production system prior to the outbreak
- control measures implemented
- the ultimate pathogenicity of the virus

There is no doubt that all poultry producers (and other direct stakeholders) benefit from disease control. However, disease control activities also provide a significant benefit to the general public at large both in terms of the provision of food, the general state of the economy and the potential relation to public health concerns. Many of these benefits are at the expense of those producers who sacrifice uninfected flocks in the stamping out process.

Public good associated with the control of AI control is not limited to a specific geographic region. In fact, there is a strong argument to be made that support of prevention and response infrastructure in smallholder/backyard (typically identified as Group 4 producers by the FAO) flocks in developing nations may provide significant marginal returns to developed countries due to the extent of migratory flyways and the involvement of wild birds as a potential vector.

These factors emphasize the need for all public and private stakeholders in the poultry industry to focus on a more strategic approach to disease prevention, response and recovery. This approach obviously needs to be macro in nature, reflecting the scope of the benefits, it must be micro in its application to be of use to those directly affected.

This paper strongly recommends a "Structured Risk Management Approach" (SRMA) that extends the traditional role of compensation from its role in recovery to the areas of disease prevention, response and recovery process. This allows for a more natural evolution of market solutions and a more systematic way of identifying roles and responsibilities. It also allows markets to evolve in a way that increases stakeholder responsibility, while still ensuring that public benefits are paid for by the public.

The first step in designing any coverage option, regardless of who is paying for the ultimate program, is work closely with stakeholders to determine what the perils are and how they can be mitigated. Once this is done, there is a significant diversity of options available to address the problem.

A SRMA provides public and private stakeholders a way of leveraging market tools to enable other forms of producer/stakeholder indemnification including but not limited to:

- Farmer levy funding
- Bank guarantee funding
- Retrospective payment
- Reciprocal insurance
- Re-insurance options

The extent of public involvement in designing and implementing a SRMA in developing countries would have to be higher than that provided for producers in the developed world. Fortunately, this in no way limits the use of available insurance and re-insurance markets once the policy and protocols are designed. Cost sharing can be arranged based on need and social objectives. This does not limit the ability for the process to initiate market evolution to a desired end.

In addition to helping ensure the survival of affected producers, the process has the added benefit of developing a means of cross compliance to desired actions that help to reduce the potential of an outbreak in the first place.

Finally, while the options selected/used and the funding necessary may vary, the SRMA provides a consistent approach of developing the options and the resulting business cases. If the business case development can become more consistent, it will ultimately facilitate funding decisions which will have to be made on them.

Rather than a reactive approach to address AI, which typically focus on disease control and eradication, a "Structured Risk Management Approach" (SRMA), currently utilised in Canada, was presented. This approach has the purpose of motivating desired behaviour in areas of surveillance, compliance, biosecurity and emergency response through a system of compensation throughout the entire AI chain from prevention to recovery. By engaging all stakeholders in identification of needs and costs, agreements could be reached on cost sharing between public and private players, possibly with help from the international community. Both implicit and explicit forms of cross-compliance between indemnification and desired behaviour are needed. There are options to financing the SMRA and it was suggested that this approach could be implemented even in developing countries.

THE RISK OF AI TRANSMISSION THROUGH BREEDING STOCK

Alan Emsley

The poultry breeding industry is a segment of the poultry sector in which production systems 1 and 2 practise a high level of biosecurity as infection could have huge implications for the financing and reputation of major companies. While it is possible to control security in vertically integrated and many firms in system 3, there are always risks caused by transportation systems, movement of product and contamination of facilities. Risk of disease is higher in systems 2 and 3 and more assessment of risk is needed in these areas.

Trade in genetic stock refers primarily to a carefully-structured model of day-old chick transport from a small number of geographic locations to multiplication operations in more than 100 countries around the world on a regular schedule. Ultimately, this breeding stock supply chain's final hybrid products (egg layers, broilers, turkeys and ducks), after several rounds of carefully scripted reproduction, reaches the commercial producers of eggs and meat as day-old chicks. By virtue of its geographic reach and significant contribution to the supply of commercial chicks globally, this distribution process has attracted attention from those seeking to identify points of potential risk of disease spread, particularly of highly pathogenic avian influenza (AI) which has animal and human health implications. While the focus is understandably on the trade process, it is also important to recognize that policies aimed at regulating the process must be carefully prepared to avoid unintended consequences, including exacerbation of the disease situations that they are intended to control. Guided by the knowledge of how products move through these trade routes and how biosecurity, including health monitoring of flocks, is employed, policy makers may more effectively put in place regulations and practices which strengthen health security while minimizing the economic and social cost that a less-enlightened program can engender.

An overview of the topic by the presenter revealed that:

1. The global trade network in day-old poultry breeders delivers millions of chicks to more than 100 countries with extremely low risk of transmitting disease because of health practices and risk awareness throughout the network.
2. In fact, trade in genetic stock plays a demonstrably favorable role in *preventing* the spread of avian influenza by implementing procedures, honed over decades of experience, which are designed to protect breeders' investments and, in so doing, protect the industry from disease of many kinds.
3. Breeding stock are under continuing threat of contamination from birds under extensive management, including commercials who are exposed to bird and human traffic without the protection that intensive management can provide.
4. Breeding stock are under continuing threat of contamination from animals in contact with disease-carrying birds.
5. Only with the aid of programs such as NPIP and the internal biosecurity procedures of primary breeders is the threat of contamination kept to a minimum.
6. The risk of AI transmission by genetic stock exists to the extent that well-understood and thoroughly tested health procedures are not followed. That risk is negligible at the higher levels of flock multiplication (PL to GP). The risk at PS level varies with geographic location but is difficult to quantify accurately with the current state of knowledge. Factors which can increase this risk include:
 - a. Lack of uniform standards for health practices within and between countries.
 - b. Failure by breeding stock owners to implement procedures which combat the dangers that exist in their immediate vicinity (e.g. neighboring flocks, traffic patterns of transport vehicles, staff requirements). Low profit margins can exacerbate these dangers if breeder operations are unable to support the investment needed for effective biosecurity.
 - c. Inadequate insurance against catastrophe tends to delay reporting or motivates illegal sale and movement of condemned flocks.
 - d. Prospects of delays in restocking can lead to less safe restocking methods and sources. This may be the result of well-intended, but ill-conceived efforts by regulatory authorities to block shipments without health-justified cause. It is important to remember that birds do not stop producing eggs or needing food day after day if trade intervention blocks the flow of day old chicks to markets. The life cycle of chickens, from egg to hatched chick through the end of productive life, needs to be considered when planning regulatory action. Industry representatives have an obligation to educate

policymakers about their industry.

The recommendations presented by the speaker included:

1. Create more uniformity and transparency in poultry health standards.
 - a. Convene a meeting of officials who administer national poultry health programs (e.g. NPIP) and those from developing countries charged with creating national standards.
 - b. Convene a meeting of willing participants from breeding companies, OIE and policymakers from certain key countries importing breeding stock in order to gain consensus on acceptable criteria for compartmentalization.
 - c. Promote, at the state level, wider acceptance and strict implementation of OIE guidelines and acceptance of OIE independent arbitration in case of conflict.
 - d. Enforce existing regulations more uniformly
2. Improve awareness of the number and location of breeder operations
 - a. Build and maintain a database of global breeder/hatchery operations using current import/export information, including number and type (GP, PS) of breeder operation.
 - b. Develop an understanding of the chick traffic patterns at the lowest end of the supply chain and how well and how rapidly that flow may be managed in a disease outbreak.
 - c. Reward flock registration and health certification. The right to trade is the key reward.
3. Educate
 - a. Through political networks, educate policy makers about the real economic consequences of trade interruption and about serious efforts already in place in major parts of the breeding sector. Build relationships with those in a position to develop international consensus.
 - b. Through agricultural extension, ensure that extensively-managed poultry are aware of the risks posed to their own poultry and to breeder operations from direct contact between confined breeding stock and unconfined birds (see Appendix 2 and multiple references on biosecurity on the web). Recognize that adding more than 1% of production costs to improve health will be met by resistance from producers who already budget 6-8% of their production costs for medication and vaccination.
 - c. Promote 'good neighbor' policies between intensively managed operations and surrounding communities.
 - d. Promote and motivate use of procedures which isolate subsets of poultry from one another and separate caretaking personnel with whom these subsets have contact. Appeal to the alignment of sound health policies and self-interest.

INTERNATIONAL STANDARDS: AVIAN INFLUENZA AND THE OIE PERSPECTIVE

Sarah Kahn, Head of International Trade Department, OIE

The OIE informed the Group of the ongoing work on training, support to the development of new scientific information, and work associated with WTO compliance and with mediation of disputes. The organization actively collaborates with FAO, WHO and regional organizations on animal health issues. AI is receiving considerable attention following the outbreaks although work in this area has been ongoing for some time. Of particular concern is the lack of understanding in some countries of what OIE can offer relating to AI. Hence, priority attention is being given to training. In addition, the presentation emphasized that:

1. The behaviour of consumers has an important influence on the market and trade impact of diseases that, like AI, affect human health. Consumer behaviour is influenced by perceptions of risk and this in turn is dependant upon social and cultural context. This must be recognised in order to implement effective strategies, including those focused on reassuring consumers. This is a role for national governments (veterinary services and public health agencies), which should work in partnership with international standard setting agencies (especially the OIE in regard to international trade standards for avian influenza and other transboundary animal diseases and zoonoses) and the private sector. It is important to have credible spokes people. Regional organisations working in collaboration with international standard setting organisations can make useful contributions. Preparedness and contingency planning arrangements should be developed consistent with international standards and should incorporate risk communication with consumers as part of the strategy to manage domestic and international market impacts.

2. Compensation/indemnification of producers is an important mechanism to ensure compliance with reporting requirements and transparency. This is a challenging task, with many practical problems (e.g. animals infected with disease may become more 'valuable' than those that are disease free in an epidemic situation where markets have collapsed). Even if the compensation mechanism is well designed and implemented, it is still necessary to consider contingent costs, which are not covered by classical compensation models. There is a role for private sector insurance models to cover this gap.

3. The trans-boundary nature of epizootic animal diseases like AI and FMD needs to be taken into account in planning disease interventions. It is important to translate key communication tools, so that they are meaningful for people in villages (as opposed to those in central/HQ positions, who can understand English or French). For people in border villages, control measures and communications products must bridge international boundaries in order to be effective.

4. Official veterinary services are key players in developing and applying standards and measures and the OIE has taken a leadership role, working in partnership with FAO, to strengthen these services. It is also important to take account of industry structures and needs if these measures are to be effective and practical. The government/industry partnership is important in addressing the economic realities of the different production sectors.

COMMUNICATION

A final technical session of symposium provided examples of the efforts by WHO, FAO and UNICEF to support actions by governments and the private sector through communication campaigns to extend PR through various media which counteracts some of the negative concerns and fears of consumers. Examples were provided of how such activities can have a very positive impact on restoring consumption.

A SUMMARY OF THE PANEL DISCUSSION AND THE EMERGENCE OF CERTAIN THEMES

The symposium concluded by brief presentations by a panel of experts who summarised the discussions, pulled together a list of relevant issues of concerns, and provided suggestions on further action needed to be taken by governments, industries, and international organisations, such as FAO.

- It is clear that HPNAI outbreaks (the ones that cause major market effects) are occurring in the context of an already volatile poultry market. International effects have been quite substantial in terms of prices, volumes and shifts in location. At national level there are different impacts in different types of markets (as described in Prof Upton's framework and illustrated by country case studies, examples highlighted from interventions from the floor) depending on the extent to which a country is closed, importing or exporting and has or has not experienced an HPNAI outbreak.
- It was agreed that within countries there are differences in impact according to the production sector (1-4) and at different points in market chains. These impacts are directly linked to the chronology of disease effects, in particular:
 - the initial market shock (mainly driven by consumer fears);
 - the effect of control measures imposed by governments (market restrictions, movement control, depopulation);
 - the recovery process (which may take place at different speeds in different parts of the poultry sector).

Consequently, losses and benefits may be differently distributed. Both of these points make the case for disease control strategies that are fine-tuned to knowledge of the poultry sector. For example:

- In sectors 1-2, the primary concern is for rapid recovery of lost markets which may hinge on international trade agreements. With sufficient information and renewed market access these sectors can be very resilient. However, they are not immune to shock - several quite large producers in the case study countries have gone bankrupt;
- Sector 3 is dependent on markets that may be subject to shocks and closure. It is also, as we reviewed in the breeding stock discussion, a sector which poses considerable risk for both disease transmission and market impact shocks.
- Poultry has multiple uses in Sector 4. This sector has lack of access to information, is vulnerable to loss of assets and income for even short periods, and tends to recover slowly. Although not connected as strongly to formal markets as sector 3, severe depopulation, combined with movement controls, affect restocking.

All elements of disease control process determine, to varying degree, the market effect – culling, compensation, movement control, market closures and progressive withdrawal of measures. It is clear also that these control measures have differential impacts on the different market participants.

There has been a strong private sector effort to coordinate activities with government as HPNAI control is widely agreed to be an international public good, largely because of its actual and potential impact on human health. It was suggested that international agencies do more to assist the private sectors in different countries to learn from each others experience.

There is a need to continue work with governments and their private sectors to fine-tune disease control strategies and promote forward planning. Targeted interventions should take account of market impacts in different types of national market and different sectors. The existence of regulations for zones and compartments offers the possibility to be creative, although in practice it has been hard to establish free compartments in countries that already have NAI (discussion of the OIE paper highlights some steps being taken to address this). The compensation process still needs more attention and the Symposium participants indicated that FAO should continue to work on this kind of analysis. Considerable attention was focused on the topic of compensation and private indemnity. However, it was recognised that compensation does not compensate for all economic losses.

There continues to be a need to learn about the interactions between the biology of virus and the actions of people. Different sectors contribute in different ways to introduction and spread of virus but there are still gaps in knowledge of the causes and effects. A targeted approach to disease control would look jointly at epidemiological risk reduction and distribution of economic effects. It was recognized that FAO has the unique capability positioned to exploit multidisciplinary capability in this analysis. However, it is critical that any analysis undertaken by international organisations translates into policy and strategy changes in animal health control.

There is value in examining all points on a market chain that constitute a potential risk – but this may require various organisations to be forthcoming with information ; the case of obtaining breeding stock trade information is an interesting example. Linkages with other organisations to share information and data would an important element in this type of analysis.

More understanding is needed to identify how access to information and types of information “motivate desired behaviour” It was recognised that sectors 1-2, 3 and 4 may need different media and approaches – and in some cases information dissemination in local languages. It appears that appropriate information delivered through a trusted medium can reduce market impacts (probably not the initial shock), with the question of trust very different in different cultures, countries and sectors. Enhancing communications processes was recognized as important, particularly in collaboration with private sector. It was emphasized that rapid response and control provides a strong signal to restore consumer confidence.

Regional linkages and the need for cross-border collaboration on disease control/policy harmonisation were mentioned . Regional markets are interdependent in both formal and informal elements: it is clear that informal movement of birds cross borders is not only very hard to monitor but holds huge risks of disease transmission. What is needed individually and collectively is to strengthen the activities in regional economic groupings to reduce their collective market impacts and their costs of control. It was recognized that more regional meetings are needed, well co-ordinated, and preceded by regional market analysis.

When devising control strategies it is important to think forward beyond the outbreak to restoration of markets and rehabilitation of the sector – how will the benefits be distributed? International dialogue and collaboration is needed to collectively address the challenges posed by AI. A UN Knowledge network has just been initiated on socio-economic impacts of HPAI control, hosted by FAO. A wide membership would be welcome; delegates are requested to indicate interest to the Secretariat and subscribe to the network located at: <http://groups.google.com/group/KN-Soceco-AI/topics?hl=en>. In particular, delegates and participants in the Symposium are encouraged to provide input into action on the collective recommendations of the Group which include:

1. enhancing North-South linkages between private sectors, building on and sharing the lessons learned on how to effectively respond to AI outbreaks, in particular with mechanisms to strengthen private sector regulations which mitigate against disease spread;
2. continuing work on compensation, ensuring that analysis translates into capacity building and policy change. Within this regard, investigate the possibility of assisting developing countries (specifically working with the private sector) to use risk assurance schemes as a means to provide compensation;
3. recognising, within the context of AI, the need for a balance between veterinary interventions with market realities. Analysis should be undertaken on appropriate approaches to disease control, balancing epidemiological risk reduction and distribution of economic effects;
4. regional capacity building, in the context of the transboundary nature of AI, should be initiated to understand how to reduce the collective impact market in the context of the costs and management of disease control. Activities should focus on harmonising policy interventions, looking the risk of transboundary trade in poultry and products, and strengthening links between private sector and governments.