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# MARKET IMPACTS OF HPAI OUTBREAKS: A RAPID APPRAISAL PROCESS - EGYPT

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## EXECUTIVE SUMMARY

In Egypt the impact of reports of the presence of highly pathogenic avian influenza (HPAI) H5N1 in the region and subsequent outbreaks in the country resulted in significant market shocks for the national poultry sector. The market shock followed a pattern of consumer fears, reduced demand, falling prices and a producer response to reduce supply and a disease impact. Markets subsequently recovered 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 utilisation. 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.

# 1 INTRODUCTION AND BACKGROUND TO THE STUDY

In Egypt the impact of reports of the presence of highly pathogenic avian influenza (HPAI) H5N1 in the region and subsequent outbreaks in the country resulted in significant market shocks for the national poultry sector. The market shock followed a pattern of consumer fears, reduced demand, falling prices and a producer response to reduce supply and a disease impact. Markets subsequently recovered 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 paper described in detail these impacts in Egypt.

## 1.1 EGYPT

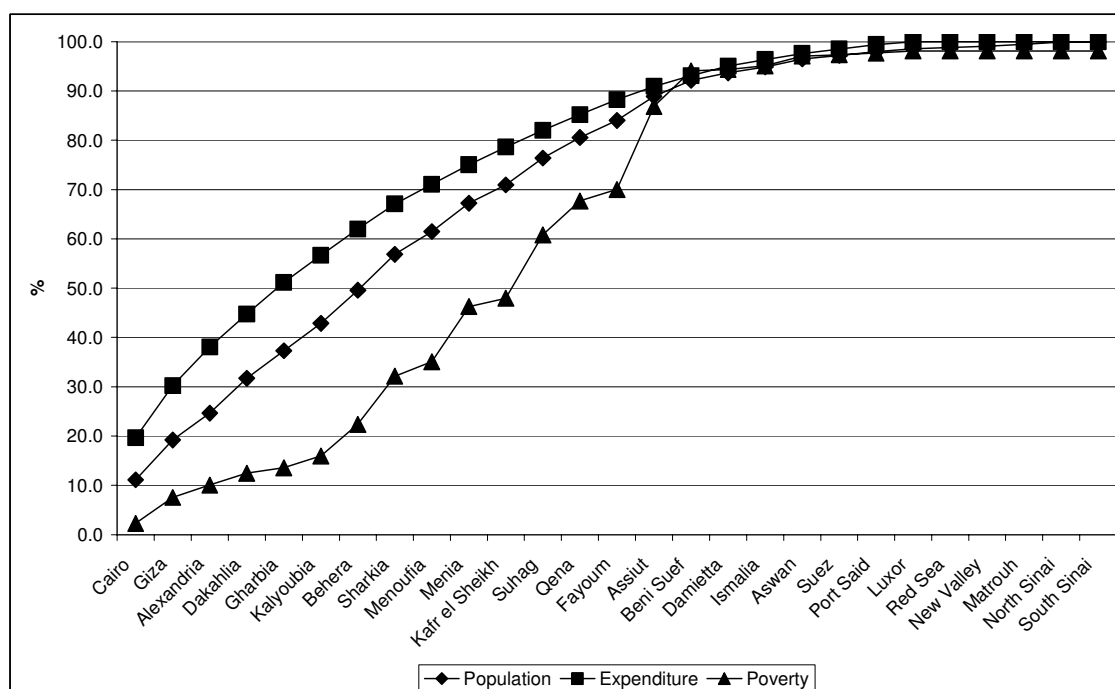
Egypt is a large country both in terms of human population and land area. However, the majority of the population are found on the area surrounding river Nile and its delta. It is estimated that 20% of the total population are either poor or ultra poor and that nearly 60% are found in rural areas. In general more poor people are found in rural areas and in the region of the Upper Nile.

**Table 1. Human population and expenditure data for the main regions of Egypt (data UNDP, 2005 authors analysis)**

	Population		Expenditure		Expenditure	
	000	%	Per person (LE)	% of national average	Total ('000 LE)	%
Urban	12,394	18.1	4,336	159.6	1,978,675	28.8
Rural		0.0			0	0.0
<b>Urban Governorates</b>	<b>12,394</b>	<b>18.1</b>	<b>4,336</b>	<b>159.6</b>	<b>1,978,675</b>	<b>28.8</b>
Urban	8,176	11.9	2,980	109.7	897,030	13.1
Rural	21,554	31.4	2,255	83.0	1,789,544	26.1
<b>Lower Egypt</b>	<b>29,730</b>	<b>43.3</b>	<b>2,461</b>	<b>90.6</b>	<b>2,693,825</b>	<b>39.2</b>
Urban	7,704	11.2	3,040	111.9	862,290	12.6
Rural	17,844	26.0	1,803	66.4	1,184,571	17.3
<b>Upper Egypt</b>	<b>25,548</b>	<b>37.2</b>	<b>2,202</b>	<b>81.1</b>	<b>2,071,307</b>	<b>30.2</b>
Urban	554	0.8	3,468	127.7	70,705	1.0
Rural	423	0.6	3,784	139.3	58,915	0.9
<b>Frontier Governorates</b>	<b>977</b>	<b>1.4</b>	<b>3,599</b>	<b>132.5</b>	<b>129,410</b>	<b>1.9</b>
Urban	28,558	41.6	3,040	111.9	3,196,438	46.6
Rural	40,091	58.4	1,803	66.4	2,661,387	38.8
<b>Egypt</b>	<b>68,648</b>	<b>100.0</b>	<b>2,716</b>	<b>100.0</b>	<b>6,864,820</b>	<b>100.0</b>

The most densely populated region of Egypt is Cairo and its surroundings. This is also the region with the greatest level of urbanisation and the lowest levels of poverty in the country (see Figure 1).

**Figure 1. Percentage of the human population, expenditure and poverty in Egypt by Governorate (UNDP 2005 see Annex 2 Table 6 for the data).**



One aspect that is of surprise in the data gathered on the population is the lack of rural to urban migration. The proportion of people reported to live in rural areas has remained constant over the last 15 years at around 58%. Total population in urban areas is reported to have increased through population growth. As the urban based people are the main consumers of poultry products, they will also be the ones who are of greatest interest in a market impact study.

## 1.2 HPAI IN EGYPT

The first outbreak of Highly Pathogenic Avian Influenza (HPAI) was reported in Egypt on 17<sup>th</sup> February 2006. However, the impact of AI on Egyptian market pre-dates the actual outbreaks. In fact, the media response to the September outbreak in Turkey resulted in Egyptian public reducing poultry consumption; reducing prices and putting pressure on poultry margins and profitability.

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 utilisation<sup>1</sup>. Reports suggest that these shocks may be considerable, particularly in Egypt where poultry consumption as a share of total meat consumption is extremely

<sup>1</sup> This information was interpreted using a Participatory Rapid Appraisal (PRA) and structured questionnaire targeted at broiler and table-egg market chains. The primary data and personal observations used in this study are analysed economically and statistically and presented in an integrated manner. Published and unpublished data about all market chains have been collected from four main sources. The study utilized the livestock budget techniques to calculate the production and economic efficiency measures that used in the market chains analysis.

high. Consequently, it is important that policy makers receive guidance in managing the shocks to the extent possible.

The report is divided into three main sections. The first section presents an overview of the poultry sector and the consumers that are reached by this sector. The second section reviews how the poultry sector and poultry product consumers were affected by HPAI. A final section draws conclusions from the study and makes recommendations on future work and how market impacts may be mitigated in the future.

## **2 POULTRY SECTOR IN EGYPT**

The section on the poultry sector first looks at some important issues with regards policies that have influenced the development of the sector. It then presents an overview of the structure of the poultry sector before the HPAI market shock began with some conclusions on the general trends of the industry. A review of the main poultry markets follows which includes information on the consumers of poultry products. A brief analysis of the trends in poultry product consumption in the 1990s is also presented.

### **2.1 POULTRY TRADE POLICY**

The Egyptian poultry sector is strongly influenced by trade policies for poultry products and inputs and exchange rate controls. The latter reflect the heavy reliance of the poultry sector on imported feed.

Prior to the import bans on poultry products imposed in the late 1980's, poultry imports by Egypt reached nearly 400,000 tonnes. The respective share of these imports came from the USA, Brazil and France, approximately 34%, 8%, and 8% respectively, of the average total quantity imported during 1970-1989. The period of protection for the poultry sector saw an increased investment in the poultry industry and subsequent growth in production. This growth was hampered in 2002 when a devaluation of the Egyptian pound increased feed costs sharply, putting some producers out of business.

In July 2006, the prime minister, in the context of price rises of poultry meat due to supply constraints caused by the culling of birds during the initial HPAI outbreaks, allowed temporary tariff free quantities of imports of chicken, red meat and fish. Imports of up to 150 thousand ton of frozen whole chicken, or 11.3% of domestic consumption in 2004, were expected to lessen the economic impacts of the lack in domestic supply of broiler meat. In addition, in order to reduce the local production costs per ton of poultry, the prime minister in July 2006 allowed temporary tariff free imports of limited quantities poultry feed ingredients.

### **2.2 GENERAL STRUCTURE OF THE POULTRY INDUSTRY**

In order to assess the impact of AI on the Egyptian industry, the structure of the industry needs to be reviewed. The initial study identified four major chains of production:

- Commercial broiler production
- Commercial layer production
- Traditional<sup>2</sup> urban production

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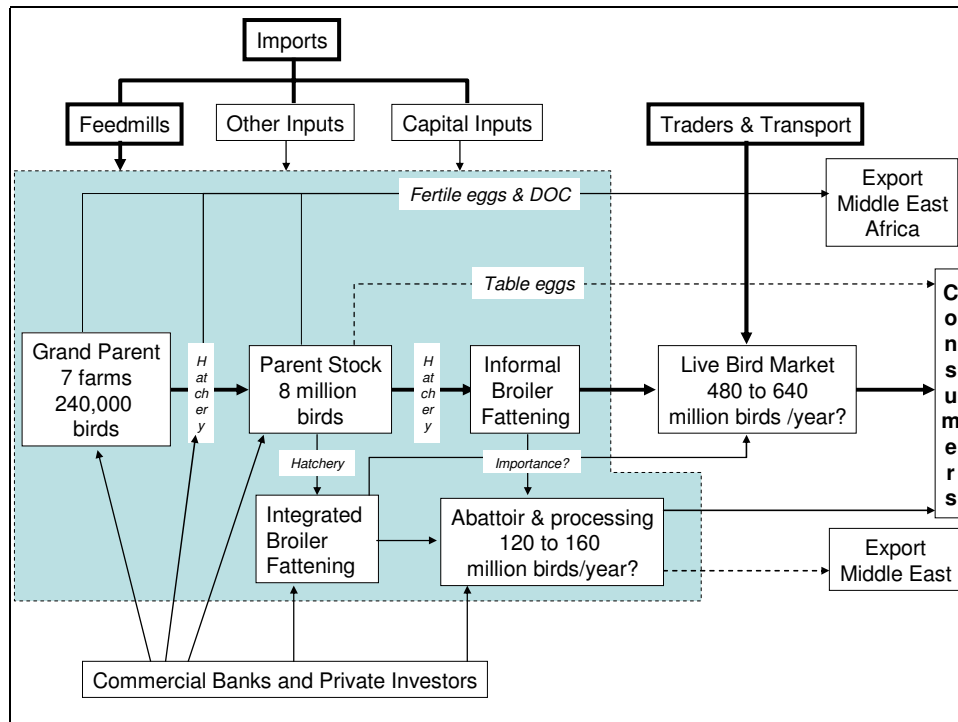
<sup>2</sup> Traditional is used to cover the rooftop production systems found in both urban and rural areas, plus the scavenge based systems in rural areas. It also includes the informal hatcheries and some of the small-scale broiler and layer units.

- Traditional rural production

For each value chain a schematic diagram was produced to identify the movement of the main products.

The commercial poultry industry consists of two main parts; broiler and layer. On the supply side, the commercial broiler industry include six key chains; grand parent farms, parent farms, hatcheries, production farms, feed mills and slaughter houses. The linkage and relationships direction between these chains in 2005 are presented in schematic fashion in Figure 2 and in more detail in Figure 3.

**Figure 2. Value chain for the commercial broiler production system pre market shock – mid 2005 (authors analysis).**



The commercial broiler sector had a large proportion of its output going through live bird markets. There is a limited capacity for slaughtering birds through large scale slaughterhouses and processing facilities. However, the breeding part of the value chain is sophisticated and had been successful in entering into export markets with DOCs and fertile eggs. In addition, the commercial broiler chain exported a limited amount of processed poultry products to the Middle East.

The broiler grand parent stock farms import all their needs of one day old chicks. There are seven grand parent stock farms in Egypt. Their farm production scales are estimated at 220,000 layers per batch in 2005. The batch period in the grand parent stock farms is around 64 - 67 weeks. The total number of commercial parent stock farms is estimated at 954 farms in 2005 (435 farms for standard strains and 519 farms for improved balady Chechen). Their farm production scales are estimated at 11.3 million layers (8.5 millions layers in standard strains farms and 2.8 millions layers in improved balady farms). These parent stock farms produce about 1,413 million of fertile eggs (940 million eggs for standard strains farms and 475 millions eggs for improved balady farms). The grand parent stock farms provide local one-day old chicks for the parent stock farms.

The numbers of commercial broiler production farms are estimated at 19,000 farms (16,289 farms for standard strains and 2,590 farms for improved balady chickens).

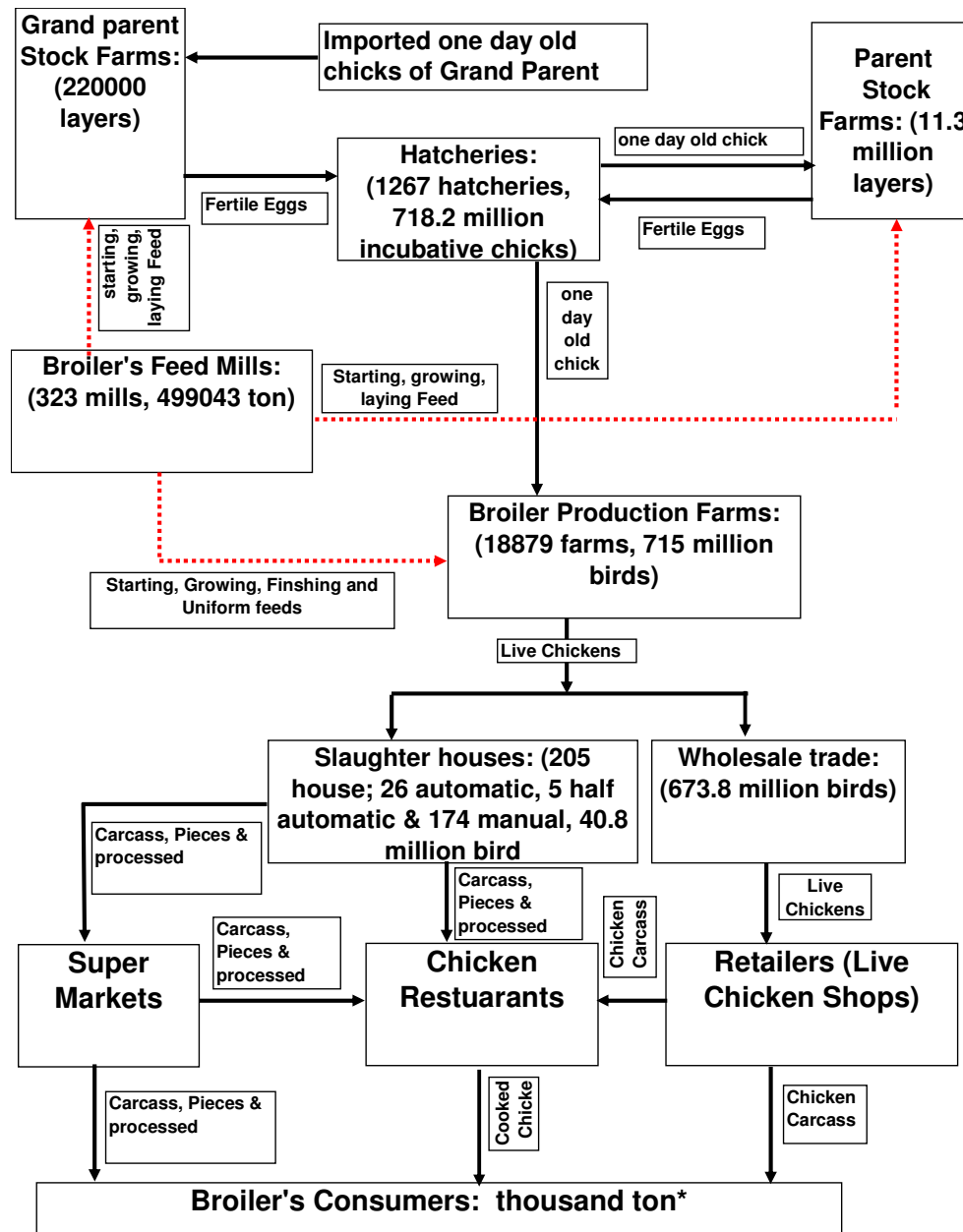


These farms produce about 715 million broiler (415 millions of standard strains and 300 million improved balady chickens).

Poultry feed mills provide four main types of feed for three chains; grand parent, parent stock and commercial broiler production farms. These four types are starting, growing, finishing and laying feeds. Sometimes feed mills provide uniform feed for broiler producers. The published data about feed mills are limited and of poor quality. The total numbers of feed plants are estimated at 323 mills that produce about 499 thousand ton of feeds; 313.2 thousand ton of starting feed, 96.1 thousand ton of finishing feed and 89.9 thousands ton of laying feed.

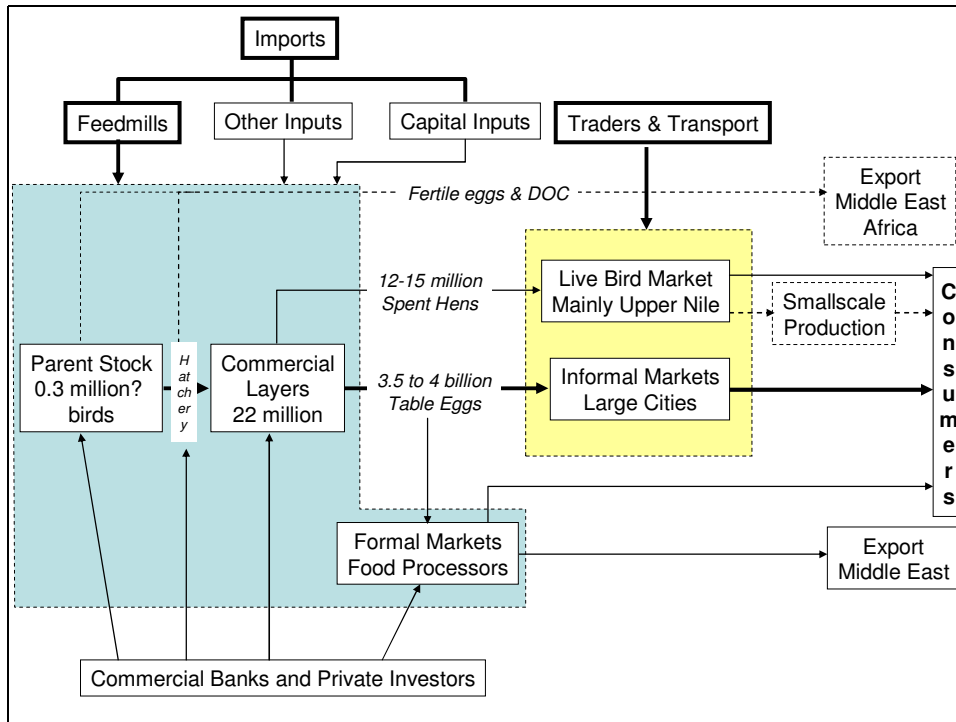
The broiler slaughter houses are very important chain between commercial broiler farms and broiler consumers. The numbers of automatic and half automatic broiler slaughter houses are very limited. Consequently, their production scales are also very limited. The total numbers of slaughter house are estimated at 205 plants; 26 plants are automatic, 5 plants are half automatic and 174 plants are manual. Their average production scales are estimated at 3850 bird/hours. The average production scale of automatic, half automatic and manual is estimated at 2446, 920 and 484 bird/hour, respectively. The total slaughtered birds are very limited (40.8 millions of bird/year) because the poultry consumers prefer live poultry than frozen chickens.

**Figure 3. The Linkage between the Commercial Broiler Industry Chains and their production scales, 2005**



The commercial layer sector was much smaller in terms of bird numbers than the broiler value chain. It also did not have grandparent stock. This value chain also relied heavily on informal markets for its egg sales and the sale of spent hens (see Figure 4).

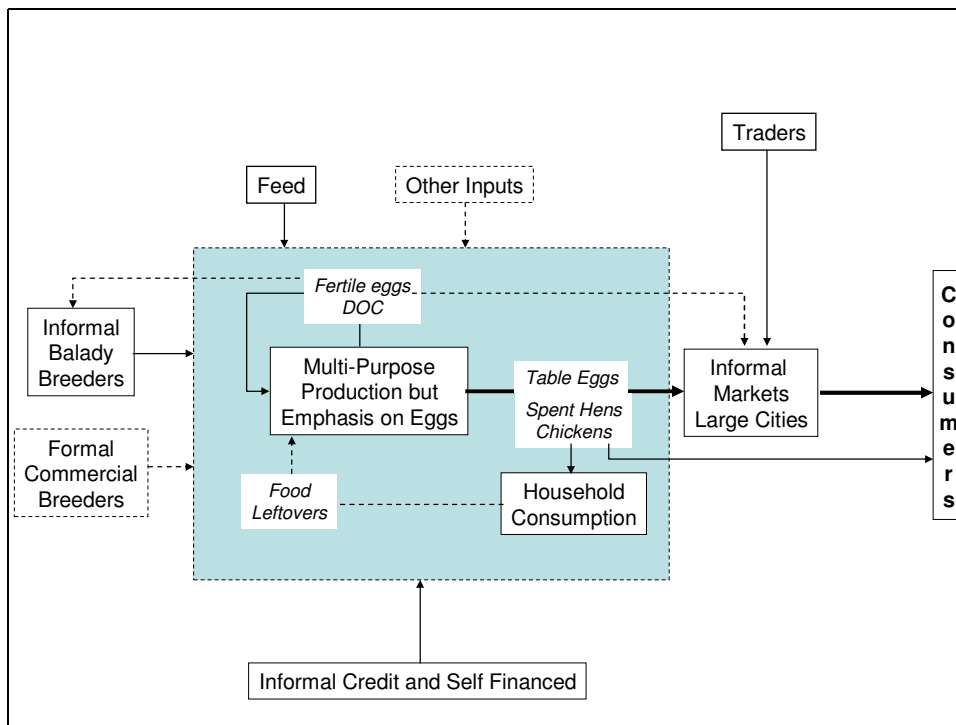
**Figure 4. Commercial layer value chain in Egypt - pre market shock – mid 2005 (authors analysis).**



Accurate information on this value chain is not as readily available as for the commercial broiler chain. Numbers of hatcheries was not available, which given that this chain was the most seriously affected has created a weakness in the current study. What is clearly an important issue is that there is some linkage between the broiler and layer commercial value chains through the feed mills and possible through hatchery facilities.

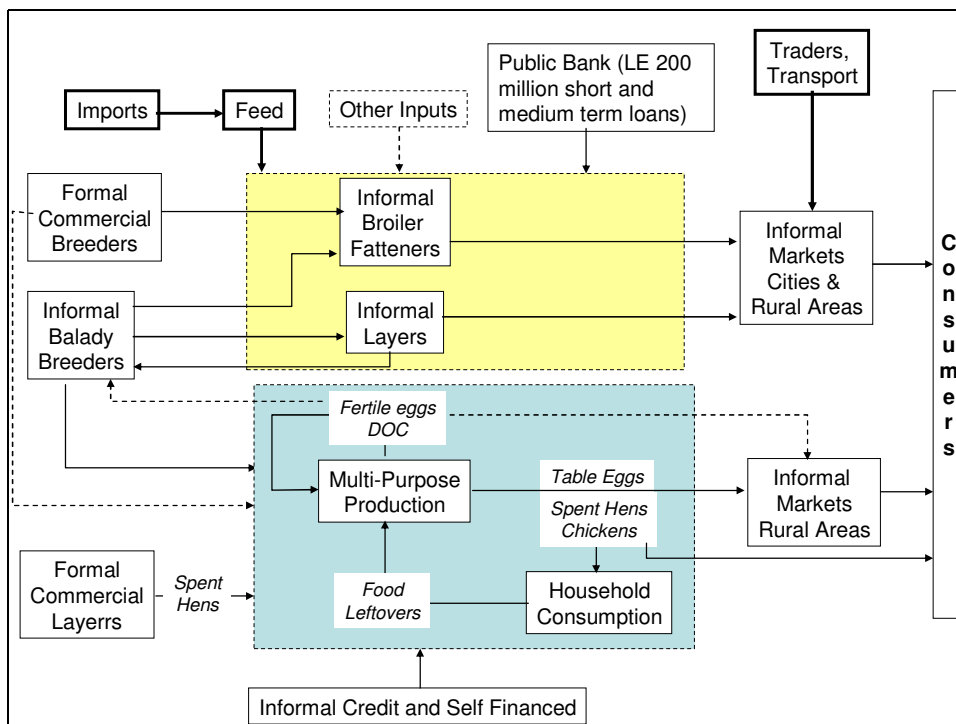
Poultry production in urban areas has been illegal since 1998. However, it still remains an important livelihood component of many families. These traditional rooftop systems are generally focussed on egg production. They provide an important source of regular cash income from egg sales and nutrition for the family. The value chain for these traditional urban poultry systems is presented in Figure 5.

**Figure 5. Traditional urban poultry value chain in Egypt - pre market shock – mid 2005 (authors analysis).**



Finally there are traditional production systems in the rural areas. These cover the scavenge based poultry systems that are mainly for home consumption and sales during times of expected and unexpected cash needs. The chain also includes small scale informal broiler fattening units, layer units and informal hatcheries (see Figure 6).

**Figure 6. Traditional rural poultry value chain in Egypt - pre market shock – mid 2005 (authors analysis).**



As can be seen from Figures 2 to 6 the poultry value chains in Egypt have some important linkages. These are identified as:

- The commercial broiler and layer value chains are linked through feed mills.
- The commercial broiler and layer chains made be linked through hatcheries.
- The commercial breeding units have linkages with the traditional broiler and layer units in both urban and rural areas
- The commercial layer value chain has a linkage through its sale of spent hens with the traditional rural poultry systems in Upper Egypt

Information and data on the commercial value chains is available, particularly for the numbers of birds in each system. However, data and information on the traditional poultry value chains is limited. The authors have made estimates of the poultry populations and numbers of producers that can be split by the identified value chains. The poultry population is dominated by the commercial broiler value chain, but as can be seen most of these birds are in the informal broiler fattening units. The traditional poultry systems are estimated to have around a quarter of the national poultry flock, almost all of the poultry producers (see Table 2).

**Table 2. Estimation of the standing poultry population and the number of producers in the Egyptian poultry sector (authors estimates).**

Species or bird type	Bird Population		Producers	
	No ('000)	%	Number	%
Broiler grandparent	240	0.1	7	0.0
Broiler breeder	8,000	3.7	75	0.0
Fattener commercial*	116,667	53.4	15,556	0.3
Fattener local	3,750	1.7	500	0.0
Layer Breeder	960	0.4	4	0.0
Layer	22,000	10.1	600	0.0
Urban smallscale**	6,720	3.1	672,000	12.9
Rural smallscale***	44,960	20.6	4,496,000	86.6
Ducks	8,000	3.7	300	0.0
Turkeys	3,000	1.4	6,000	0.1
Pigeons	4,000	1.8	2,000	0.0
<b>Total</b>	<b>218,297</b>	<b>100.0</b>	<b>5,193,042</b>	<b>100.0</b>

\* Population was estimated on the basis of the annual production of birds divided by the number of batches per year. For this calculation 6 was used.

\*\* The urban poultry population and number of producers was estimated on the basis that 10% of the households keep poultry and have an average flock size of 10 birds

\*\*\* The rural poultry population and number of producers was estimated on the basis that 60% of the households keep poultry and have an average flock size of 10 birds

It is likely that the output per bird in the traditional sector is much less than in the commercial sector. The authors crude estimates would indicate that commercial poultry production has a 87% share of production of meat and a 77% share of the production of eggs by value. Overall the commercial sector is estimated to cover 83% of the poultry product value (see Tables 7 to 10 in Annex 2). Therefore the importance of the traditional sector in terms of poultry product supply is far less than its importance in terms of the number of producers and probably less than its importance in terms of poultry population. To refine this analysis would require information on the meat and egg production per value chain or bird type to indicate the importance for meat and egg supply. To get a level of economic importance of the different value chains would also

require information on the generation of employment. The availability of data for all these aspects is limited and therefore the current study could not carry out a complete analysis of this nature.

Whilst the authors recognise the importance of the traditional poultry value chains, much of the remainder of the report will focus on the commercial value chains. This is justified for two reasons (1) the collection of data on the traditional poultry production systems was beyond the scope of a six week study and (2) the traditional poultry production systems are not as important in supplying the urban based consumers. It is these consumers who reacted to news of avian influenza, creating a market shock.

## **2.2.1 Main Trends in the Egyptian Poultry Industry**

The main trends of the Egyptian poultry sector are identified as follows:

(1) The average annual percentage change in all items of poultry meat production of all types were positive over the 2000 – 2005 period, with the exception of meat production from spent hens for table-egg. However, the latter is insignificant proportion of poultry meat production.

(2) The average cost structure in the Egyptian poultry industry is relatively high. One explanation of this is the over capacity in infrastructure. It is estimated that 42% of the total existing production capacity lies idle. The reason for the large amount of idle capacity could relate to the market. Egypt has seasonal demands for poultry meat, with the highest demand during Ramadan. In a closed poultry sector with very little capacity to freeze meat, production capacity will be equal to the periods of highest demand. Therefore, the capacity will only be fully utilised during the periods prior to peak demand.

(3) It is estimated that three quarters of the commercial broiler production is produced in small scale fattening farms.

(4) Small commercial farms (less than 20 thousand birds) and improved balady<sup>3</sup> farms are not integrated. They purchase their inputs (especially feed and day-old-chicks) from the large scale farms. The small commercial farms sell their production to local market throughout broiler retailer shops. Most large scale commercial broiler farms are partially integrated. They have small scale feed mills to produce cheaper and balanced starting, growing and finishing feeds. The feeds produced in the farms are mainly for on-farm use only. However, these farms also sell their birds through live bird markets.

Very few large scale broiler farms have feed mills, incubators and slaughterhouses. These farms also sell feed and day old chicks to the small scale farms. Only one large scale farm of broiler is completely integrated. It has large scale farms with grandparent and parent stock, incubators, broiler fattening units, slaughterhouse and broiler. It also provides feed and DOCs to other farms and processes some production from these farms. This company has a line of processed poultry products that are sold in Egypt and exported to Saudi Arabia. It is part of a large regional holding company that has interests in restaurant and food retailing business.

(4) In the poultry meat market from the commercial sector the average share of standard strains and improved Balady breeders is estimated at 83% and 17%, respectively.

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<sup>3</sup> Balady is the term used for local breed birds. This covers a range of breeds from the true local breeds to crossbreds with exotic blood that have red feathering.

(5) According to official estimates, between 2000 and 2005 balady meat production (all poultry species plus rabbits) has increased annually by 3.5% (from 433 to 612 thousand metric tons). However, in the commercial poultry production there is reported to be a sharp increase between 2000 and 2002 from 941 to 1,740 thousand metric tonnes followed by a sharp decrease between 2002 to 2005 dropping back 1092 thousand metric tonnes. Overall there has been an increase in poultry production, but this has not keep pace with human population increases so per capita availability has fallen slightly<sup>4</sup>.

(6) Prices of commercial broilers tended to be 30 – 40 percent lower than the prices of balady chickens. However, prices for the two classes of chickens show the same market variations during the year.

Poultry production in Egypt is considered to be one the important activities within animal production sector. The value of poultry meet and egg in 2003 was estimated to be approximately 8.5 billion LE<sup>5</sup>. This value represents about 24.5% of the animal production value and 8.8% of the agriculture production value.

### **2.3 POULTRY MARKETS AND DEMAND FOR POULTRY PRODUCTS**

Small scale broiler producers sell their output relatively easily in the market. Large-scale producers face greater problems marketing live broilers, because large lots require complex marketing operations. Such operations have been dominated by a few wholesalers, who appear to have wielded oligopsonistic power following the establishment of the modern broiler industry in Egypt. Broilers have to be marketed without delay when they reach a specific age or weight because the production operation ceases to be economical for the following reasons: (1) broilers require increasing quantities of feed, with a decline in output per unit of feed, because of a deteriorating feed conversion rate and decreasing daily growth rate, (2) other broilers may be infected by diseases which result in increasing the mortality rate and decreasing the total live-weight at marketing, (3) broiler houses become overcrowded , (4) the breeding program cycle will be confused because of delays in marketing and (5) the number of annual production lots is reduced. In sum, production costs increase and the consequent annual net farm income decreases with delays in marketing.

Large broiler producers must be committed to a specified annual production schedule. First, at the start of every production year the producers require a supply of baby chicks from the baby chick-producing companies. Hence, broiler producers must sell broilers at specific times in order to receive the next scheduled delivery of baby chicks. Second, most producers fail to take the appropriate production planning methods both at the farm and area level to take into account seasonal fluctuations in demand, caused by festivals and when the demand for broilers is particularly high. Producer's response to such demand shifts tends to be improperly planned, as, most of time; supply seems to have exceeded demand. Poor production planning greatly distorts the upstream operations because slaughter houses capacities are not enough to absorb the surplus in production. Although precise coordination of production operations is rarely found, producers can be expected to consider carefully timing the beginning and the end of fattening lots and any expansion in production capacity in relation to the plans of other

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<sup>4</sup> Imports of poultry products have been minimal in this period, because of the high tariffs on these products. Only the army have imported poultry products.

<sup>5</sup> LE = Egyptian Pounds US\$ = LE 5.68 on 4<sup>th</sup> April 2007

producers in the same area. Producers then plan their own production capacity and timing of production lots accordingly.

Wholesalers, who fully understand the various factors which obligate producers to sell at specific times exploit the situation by offering relatively low prices to producers and by selling to retailers at relatively higher prices. Wholesalers attain high margins and work hard to maintain high fixed margins, even if there is a declining trend in farm-gate prices. A previous study showed that the wholesale marketing margin tended to be a constant percentage of wholesale prices, indicating monopoly power in the wholesale sector.

Market prices for poultry products, eggs and meat, are collected at farm, wholesale and retail levels with distinctions made between products from local (balady) and exotic breed poultry. A presentation of variations in poultry product prices is provided in the following chapter that examines the impact of HPAI.

### 2.3.1 Animal and Poultry Product Consumption

Animal protein food is a small part of the average Egyptian diet. Cereals and legumes are the most common foods. By weight animal protein foods make up about one-tenth of the diet. Animal protein food is red meat, poultry meat, egg, fish and milk. Red meat is commonly used to improve the flavour of the other foods. Flavouring is provided by stock and sauces from meats. Low income families consume about 6 kg of poultry meat per year per person. In contrast, average red meat consumption is around 8 kg per year. For poor people, meat consumption is often animal fat and edible offal used for flavouring and on occasion inexpensive imported livers and frozen meat. Average consumption of the main animal protein products are shown in Table 3.

**Table 3. Per capita consumption of animal protein in Egypt from 1990 to 2004.**

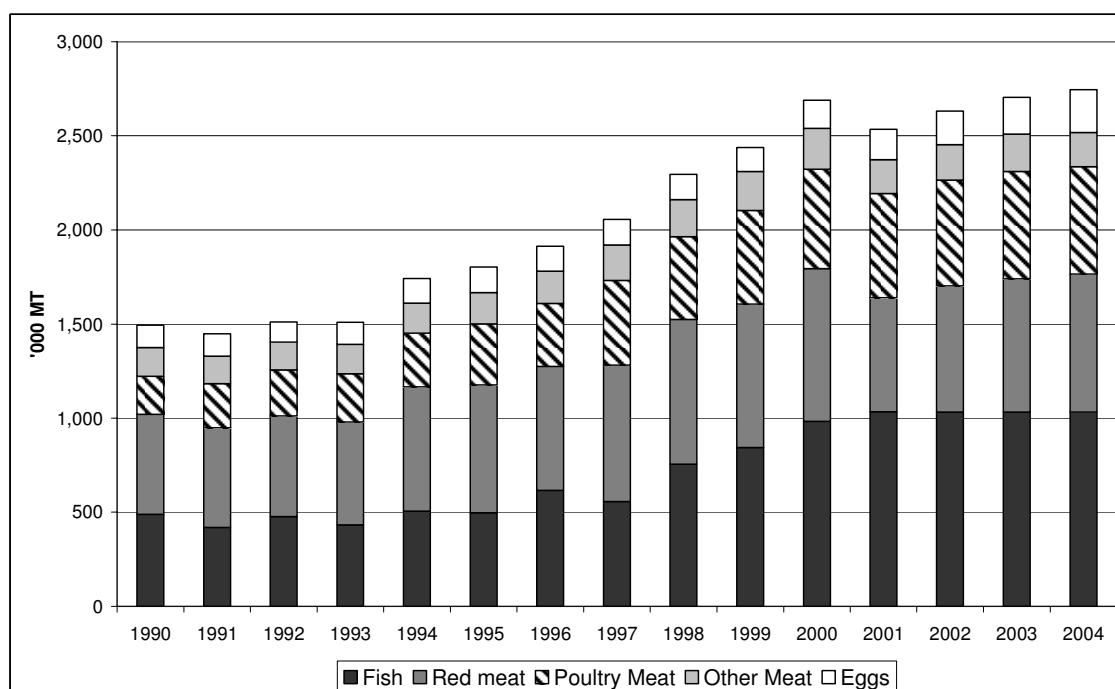
<b>Protein Source</b>	<b>1990</b>	<b>1995</b>	<b>2000</b>	<b>2004</b>
Fish	8.77	8.07	14.50	14.07
Red meat	9.52	11.00	11.96	9.99
Poultry meat	3.63	5.28	7.80	7.76
Other meat	2.72	2.71	3.21	2.48
Milk	45.34	45.50	53.71	61.28
Eggs	2.14	2.18	2.20	3.11
<b>Total in Meat Equivalents</b>	<b>29.61</b>	<b>32.05</b>	<b>43.29</b>	<b>41.06</b>

It is estimated that total demand in terms of physical quantity for meat, fish and eggs has almost doubled between 1990 and 2004 (see Figure 7). Similarly demand for milk has also doubled. Most of the increase in demand for animal proteins can be attributed to population growth, indicating that either income levels have changed little over the last 15 years or that income elasticities for animal protein are low. One other explanation would be that data on income elasticities for animal protein are unknown and have not been used in the estimates for animal protein consumption.

Poultry and eggs contributed around 20% of the total demand in physical quantity in 1990 and this proportion had increased to 30% by 2004. Most of this change was related to increased share of poultry meat.



**Figure 7. Demand for meat, fish and eggs between 1990 and 2004 (data from FAOSTAT, 2006, authors analysis)**



Poultry meat is usually consumed as a whole bird. Chickens are purchased live and slaughtered at the retail point or at the family dwelling. This is convenient because a single bird can be used to serve throughout the day's meals without the necessity of refrigeration. Low income families consume about 6.5 kg of poultry meat per year per person. In contrast, average poultry meat consumption is around 13 kg per year. Meanwhile, eggs are usually consumed as ingredients in other foods with about one third being consumed as whole boiled or fried eggs. Low income household consume less than 90 eggs per year per person. In addition, average egg consumption is around 100 eggs per year. Fish are usually consumed as fried or grilled at the family dwelling after being purchased fresh at retail markets. For low income households, the fish per capita consumption is less than 5 kg compared to egg consumption which averages 7.5 kg per year per person.

One aspect that deserves further attention is the seasonality of demand for poultry products, in particular meat. It commonly quoted that 30% of all meat consumed during the year occurs during the Ramadan festivals. If poultry meat demand follows a similar pattern then there will be poultry population and production peaks prior and during the Ramadan festivals. They will also be associated with greater movements of birds to satisfy demand, here it is important to recognise that the lack of processing, chilling and freezing capacity in the poultry meat value chains limits flexibility. The flexibility is given by having the ability to slaughter the birds when they are needed, i.e. they are stored live rather than frozen.

## 2.4 SUMMARY

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 includes 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 did not become obvious during the study. It is often stated that people continue to demand live birds, in order that they can see the bird slaughtered and dressed. There is also a demand for poultry products, both meat and eggs, from local (balady) breed chickens. This is reflected with 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 is of great relevance as the poultry industry recovers from the HPAI impact. Full details of the impact of HPAI are covered in the following section.

## **3 THE MARKET IMPACT OF HIGHLY PATHOGENIC AVIAN INFLUENZA H5N1**

### **3.1 INTRODUCTION**

The market impact of HPAI H5N1 began well before the announcement of the first outbreak of this disease in Egypt. In September 2005 Turkey announced HPAI H5N1 outbreaks and human deaths. This was picked up by the international and national media as people began to perceive that the disease was spreading rapidly across the world. In Egypt there was media hysteria and a loss of consumer confidence in poultry products. This probably coincided with high levels of poultry stocks as Ramadan was about to begin. Prices for meat and eggs fell and reached their lowest point in February 2006 when it was announced that HPAI H5N1 outbreaks were in Egypt. A further period of panic associated with consumer and producers fears of the disease followed, again this was probably made worse by irresponsible media reporting. Initial control measures were severe, with the culling of an estimated 30 million birds. A majority of these birds were in the commercial layer sector which in turn created supply problems that the country is predicted to recover from in early 2006. In the commercial broiler sector many parent stock farms were affected and hence there were supply problems with day-old-chicks for broiler fattening units. This in turn created poultry meat supply problems which were probably resolved by late 2006. Therefore, there were dramatic impacts of HPAI H5N1 on poultry markets, first through media reporting and the loss of consumer confidence and then through the drastic control actions that have led to severe supply problems through the last three quarters of 2006.

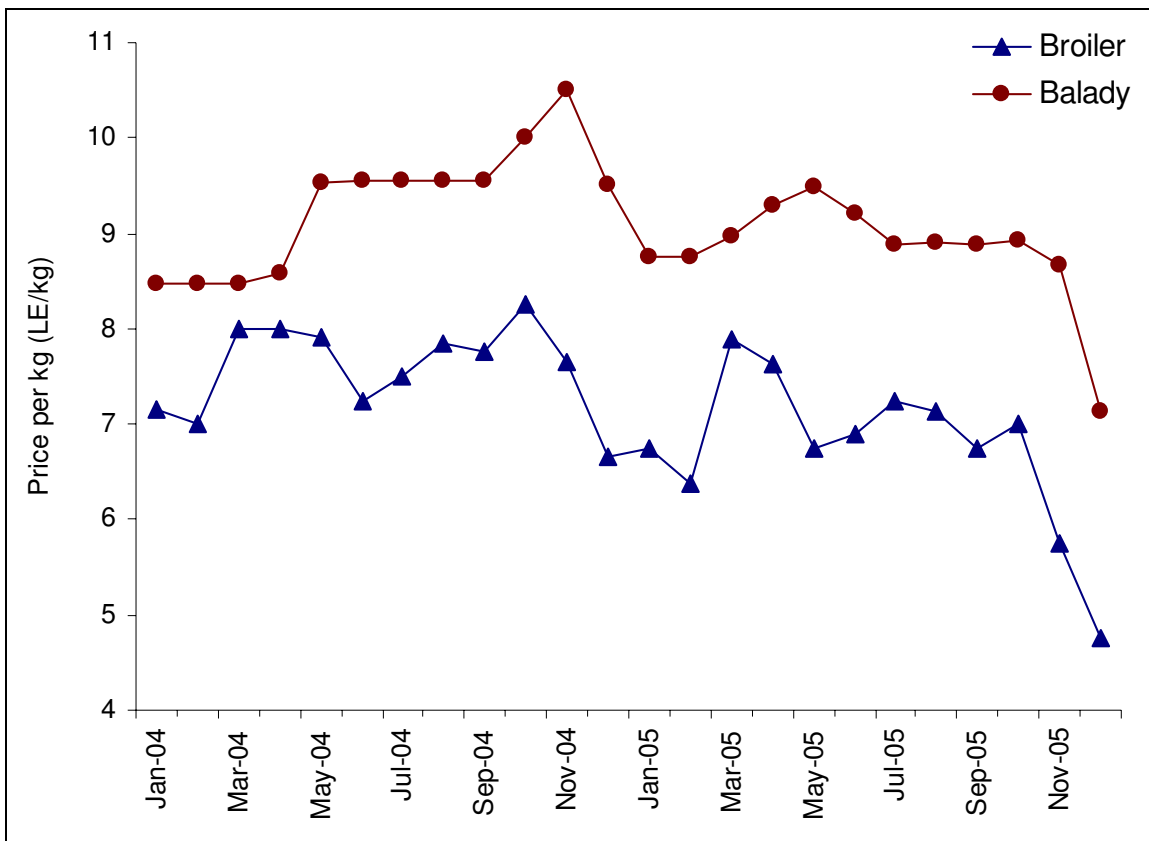
This chapter will provide information on prices through the periods prior, during and after the HPAI crisis. It will then examine in detail the impact on the commercial broiler sector and to some extent the commercial layer sector. As mentioned above data on the traditional poultry systems in both urban and rural areas are not available to make an adequate assessment of the impact in these sectors. It is also beyond the scope of the time and resources of this study to go into detail of the impacts of a loss of confidence in poultry products and subsequent problems of supply on other animal and vegetable protein value chains. What is very likely is that the other protein value chains were positively impacted by the problems in the poultry industry.

### **3.2 POULTRY PRICES**

When interpreting the data on poultry products there are number of important issues that need to be considered. First prices for poultry meat are not stable and trends for the commercial broiler meat would perhaps be downwards prior to the crisis. Prices for local (balady) breed meat would appear to be more stable and in general are 30 to 40% than for the commercial poultry breed meat. The prices of both these types of meat are correlated. What needs to be recognised is that the market for local breed chicken meat is much smaller than for commercial breed chicken meat. The latter is estimated to be around 80% of the total market for poultry meat in terms of volume and value.

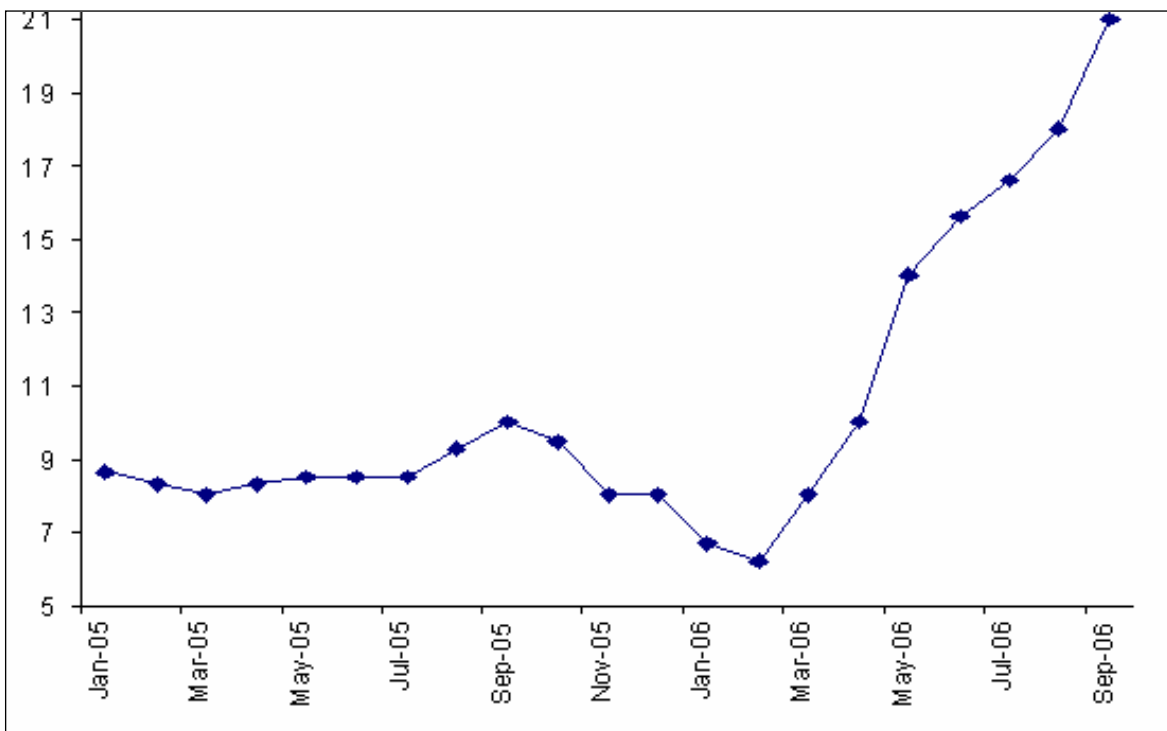
Of great interest in examining the price data is that prices for poultry meat from commercial chicken breed fell dramatically almost as soon as the problems with HPAI H5N1 in Turkey were announced. However, prices for meat from the balady breeds reacted more slowly, crashing in the month of December 2005 (see Figure 8).

**Figure 8. Prices for broiler (commercial poultry breeds) and Balady (local poultry breed) meat from January 2004 to October 2005 (Data from CAPMAS)**



With regards egg prices, there was also a market reaction that occurred in the last quarter of 2005, but this variation was not as severe as for meat prices (see Figure 9).

**Figure 9. Poultry egg prices in Egypt from January 2005 to September 2006 (LE per 30 eggs (Data from CAPMAS)).**

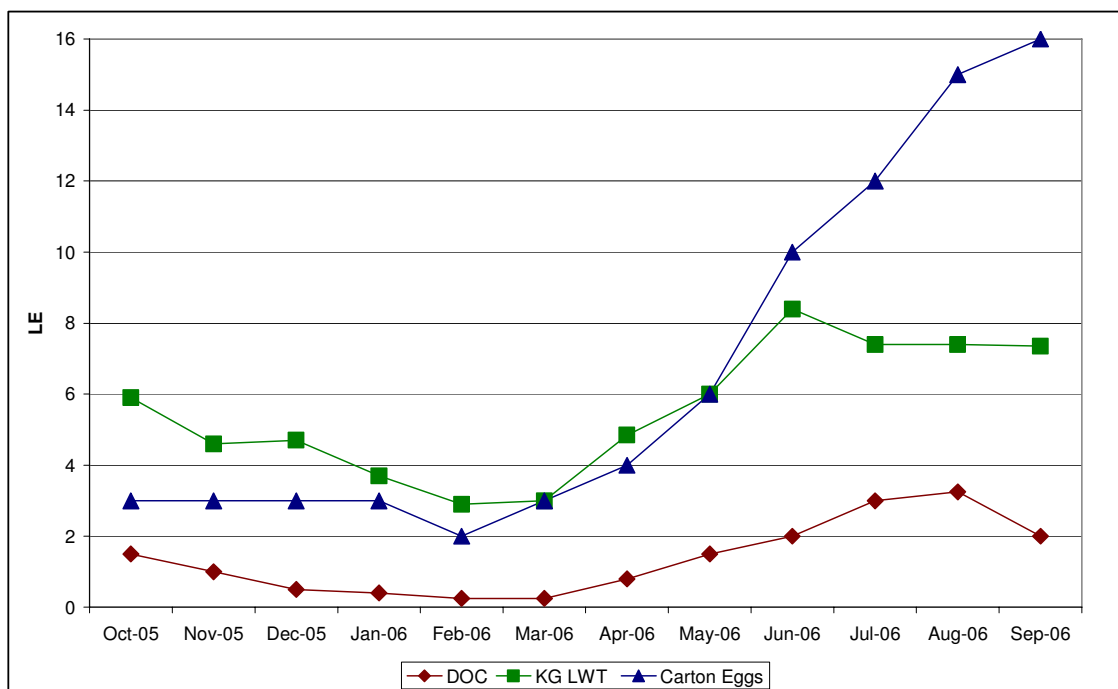


This loss in consumer confidence with a subsequent lowering in demand for poultry products and corresponding fall in market prices had dramatic impacts along the poultry value chains. This is seen clearly with a rapid fall in the price of broiler day-old-chicks as broiler fattener producers stopped production (see Figure 10).

The lowest point for poultry consumer products and products within the value chain were seen in February and March 2006, the period when HPAI H5N1 outbreaks were officially announced in Egypt. The control measures adopted during this period of very weak demand for poultry products involved the culling of a large numbers of birds, but what is significant is the type of birds slaughtered. High proportions of the commercial layer flock and the commercial broiler breeding flock were destroyed during the months of February and March. In addition, disease control policies put severe constraints on the poultry meat value chains. Measures that included the closure of live bird markets, insistence that all birds had to be slaughtered in official slaughterhouses and that live bird movements could only take place from farms to slaughterhouses produced important supply constraints. Here it is important to remember that slaughterhouse capacity is limited to around 300,000 birds per day and demand at peak is estimated to be 2 million birds. These problems at production and processing levels put important constraints on both poultry meat and egg supply in the national Egyptian market. Trade policy on poultry product imports was not relaxed during the initial stages of these supply problems and the national market remained closed due to tariff protection.

Therefore as consumer confidence began to return in the second quarter of 2006 there was insufficient supply to meet demand, hence prices began to rise rapidly (see Figure 10). The most severely affected market was for eggs, where a higher proportion of birds were slaughtered during the initial outbreaks and it is also a sector with a much slower recovery time than the meat sector.

**Figure 10. Prices for day-old-chicks, broiler liveweight and eggs from October 2005 through to September 2006 (data from the Egyptian Poultry Producers Association).**



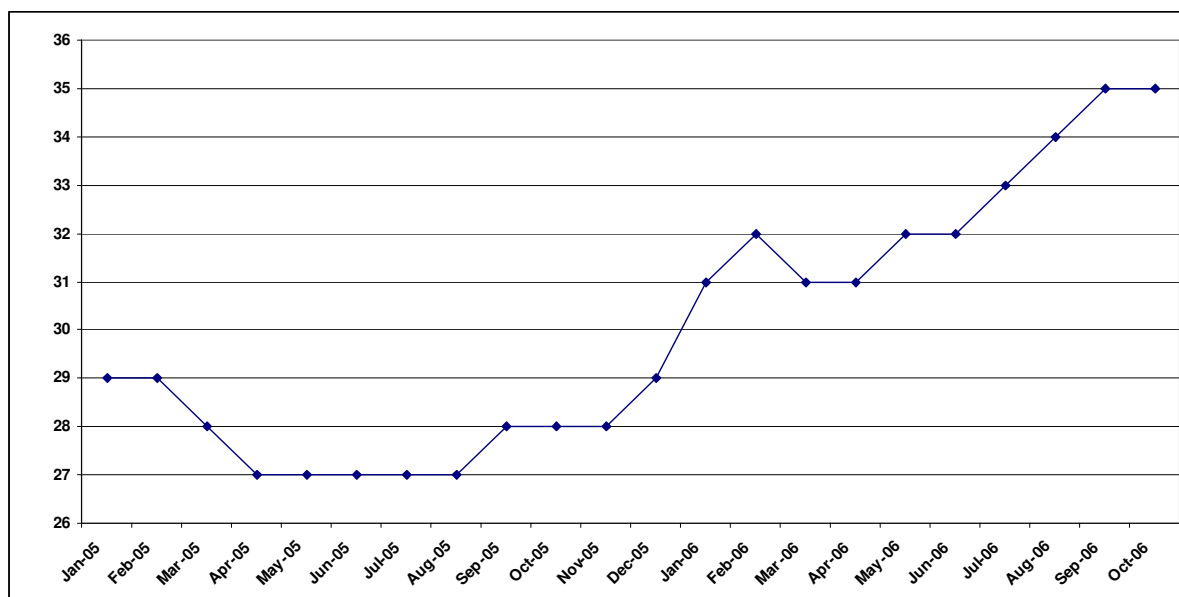
After the initial shock, demand started to recover, particularly in the context of no new disease outbreaks during the summer months. However, as prices surged in response to consumption and short supplies, the government decided to remove the 35 percent

tariffs on poultry meat. This measure, intended to ensure adequate supplies during Ramadan (Sept/October) allow the imports of a set amount of imports through the end of the year.

Despite the announcement in October of two new human fatalities, prices continued to be high and commercial sector poultry operators continued rebuilding their businesses. Indications were that the recovery occurred rapidly in the large commercial operations, but much slower for the sector 3 and 4 operators (small commercial and backyard).

The lack of demand for poultry protein did not mean that demand for animal protein also dropped. Price data for beef showed significant increases from November 2005 that were well above previous trend lines (see Figure 11). This is almost certainly related to a switch to beef from poultry products, but there may be some impact of supply constraints in the beef value chains as foot-and-mouth disease and lumpy skin disease were creating significant production problems during this period.

**Figure 11. Retail prices of beef in Egypt (LE/kg) from Jan 2005 to October 2006 (data source?) (Data from CAPMAS).**



It is recognised that it would also be useful to have data on other protein sources such as fish and vegetable proteins to complete the picture of the impact of switches away from poultry protein. At the time of writing these data were not available. In addition it would be helpful to know the impact of these price changes on the different socio-economic groups. Poultry protein is a relatively cheap animal protein source in Egypt and it is likely that higher prices for poultry consumer products have had a negative social impact. Both these aspects deserve more in depth study.

### **3.3 ECONOMICS OF BROILER MARKET CHAINS DURING HPAI OUTBREAK**

When the AI outbreaks started on 17<sup>th</sup> February 2006, four main precautionary procedures that were taken place by the Egyptian government to prevent and stop the spread of the disease, such as:

- Preventing giving licenses for transporting live birds among the governorates. In some cases, the permission from veterinary authority to transport the live birds is necessary and needed.
- Stop handling poultry in all live markets.

- Close all live poultry retail shops in all villages and cities.
- Kill all the birds in the farm as soon as the disease appeared.

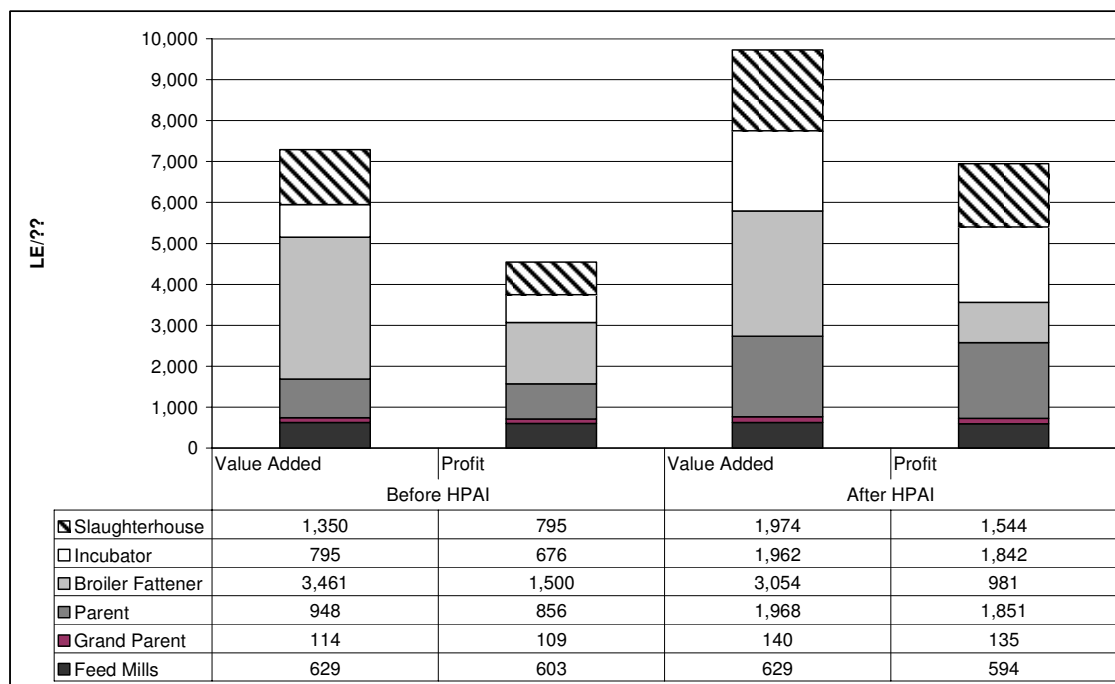
The implementation of these practices was not quick enough to prevent the rapid spread of the disease. The disease spread to 19 Governorates with poultry production. HPAI caused some production, technical and economic impacts on the broiler production chains. During the field study tours, the broiler producers reveal that the main impacts on the technical and economic parameters are as follows;

1. 60% of broiler flock have been died or killed or culled.
2. The average farmgate price of broiler decreased rapidly from LE 6 – LE 6.5 before September 2005 to less than 3 LE/kg of liveweight in February 2006 because most consumers stop eating broiler.
3. The broiler production has been stopped in the infected areas and the surrounded areas because of the great drop in the broiler demand especially after 20<sup>th</sup> march where the human deaths announced.
4. The final liveweight per bird decreased from 1.65 kg to 1 kg where the producers desire to sell their broilers before the crisis destroy the flock completely.
5. Level of labour in broiler production decreased by 40%. There was also a reluctance of workers to return to work in the sector and wage rates were reported to have increased by 15%.
6. To minimize the number of dead birds, the vaccination, chemicals and decontaminant utilization have been increased rapidly. Consequently, the chemicals and vaccination costs per bird have been doubled. The other production and economic parameters are constant.

The value added and the economic efficiency measures of broiler production chain during the shock have been calculated according the previous changes in production, technical and economic parameters. The value added, net loss, farmer (producer) margin and return per one-ton of broiler liveweight is estimated at LE -6980, LE 11925, LE -12225 and LE 3300, respectively.

A summary of the economic impact on the commercial broiler value chain is shown in Figure 12.

**Figure 12. Value added and profit for the different actors along the commercial broiler value chain before and after the HPAI crisis (authors analysis).**



### 3.4 ECONOMIC LOSS IN POULTRY MARKET CHAINS

It is very difficult to estimate precisely the amount of economic losses of AI crisis in the poultry market chains. The study is to estimate the economic losses depending mainly on the following estimated parameters and published data on the crisis:

1. The total number of culled or killed birds from Feb, 17 till 29 April, 2006 (compiled from the General Organization of Veterinary Service) as shown in column 3 in table (4.45).
2. The mortality and killing broiler parent stock layers is estimate by 50% of the total amount of flock of 8 million layers, compiled from the field visits.
3. The unemployment production capacities in feed mills are estimated at 70% of the total production capacities (i.e., 499043 ton) during the studied period.
4. The unemployment production capacities in slaughterhouses are estimated at 102973 ton of meat during the studied period. The production capacities were reduced gradually till they stopped during the crisis.
5. The unemployment production capacities in incubators are estimated at 539967 thousand hatched baby chicks during the studied period. The production capacities were reduced gradually till they stopped during the crisis.
6. The estimated values added of broiler, table-egg layer, table egg parent stock layers, broiler grand parent stock layers, broiler parent stock layers, ton of poultry feed, ton of broiler meat and hatched baby chick are used as opportunity costs of the lost units.

The values added of duck, turkey, balady chicken and other poultry aren't estimated because the time of study was limited. The economic losses caused by the AI crisis according to the chain are presented in table (4.45). The main results are summarized as follows:



1. The total economic losses happened in the all chains are estimated at LE 2.151 billions; LE 653.8 million for Table egg layers chain, LE 463.1 millions for broiler parent stock layers chain, LE 441. 4 millions for incubators, LE 409.4 million for table egg parent stock layer chain, LE 138.6 millions for slaughterhouses chain, LE 130.6 millions for broiler production chain, LE 16.7 millions for broiler parent stock layers chain, LE 15.8 millions for feed mills chain.
2. The worst loss occurred in the table egg layers chain because of the great mortality or culled numbers that happened in this chain, i.e., 17.8 millions birds.
3. The enormous losses in broiler parent stock layers and table egg layers chains are due to the large numbers of culled birds and the high values added per layer in each chain.
4. The huge loss in incubators chain is due to the large unemployment production capacities. Almost all production capacities of incubators have been quite stopped during the crisis. In addition huge numbers of baby chicks killed or sold at minimized levels of prices.
5. The least loss occurred in feed mills chain because the production in this chain depends on imported ingredients (low value added) and the unemployment production capacities are estimated at 87.3 thousand ton.

**Table 4. Economic loss in poultry chains during the AI crisis period, February, 17 – April, 30, 2006**

Poultry market chains:	unit	Culled birds	value added per bird (LE)	Economic Losses (LE)
Broiler	Bird	8,238,718	1.58	13,055,747
table-egg layers	Bird	17,800,695	36.73	653,819,527
table egg parent stock layers	Bird	1,300,002	314.94	409,422,630
Broiler Parent stock layers	Bird	4,000,000	115.79	463,148,000
Broiler grand parent stock layers	Bird	28,000	596.97	16,715,216
Ducks	Bird	421,662	NA	0
Turkey	Bird	108,815	NA	0
Balady chickens	Bird	495,324	NA	0
other poultry	Bird	4,772,939	NA	0
Sub-Total	Bird	37,166,155		1,556,161,120
	unit	unemployment capacities	value added (LE/unit)	Losses (LE)
Feed mills	ton	87,333	181	15,763,957
Slaughter houses	ton	102,973	1346	138,585,380
Incubators	baby chick	539,967,600	0.82	441,399,321
Sub-total				595,748,658
Grand total				2,151,909,778

Sources: (1) General Organization of Veterinary Service, MALR.

### 3.5 SUMMARY

Poultry market after the HPAI crisis, initially starting in October after the announcement of outbreaks and human fatalities in Turkey reveal the following main features;

1. A sudden drop in prices as consumption declined and then a sudden rise in levels of retail and farmgate prices of live poultries and poultry products as consumers confidence recovered and producers struggle to increase supplies.

2. Apparent shortages in meat production and supplies of live poultries.
3. Unemployment production capacities on the commercial poultry farms.
4. A temporary moratorium on investment into the poultry sector
5. High levels of retail prices of poultry substitutes such as fishes and red meat.
6. A quick return to normal poultry consumption levels, with the advent of Ramadan putting additional upward pressure on prices.

Information that is lacking is with regards 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 there 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 impacted positively by the problems in poultry protein chains.

## 4 CONCLUSIONS AND RECOMMENDATIONS

### 4.1 CONCLUSIONS

The market impact of HPAI in Egypt has had ramifications in terms of production, marketing of birds, slaughtering, processing and consumption. It has also influenced some support mechanisms for disease control such as compensation rates. Some disease control policies have had an impact on markets where live bird markets have been banned and formal slaughter systems encouraged. These changes are ongoing as this study was being completed. To simplify what has been presented previously the authors have identified three critical phases with HPAI in Egypt:

- Phase I From market crash to HPAI outbreak announcement (Sept 05 to Feb 06)
- Phase II From HPAI outbreak announcement to market recovery (Feb 06 to May 06)
- Phase III After market recovery

The impacts during these different phases were not equal and the authors have attempted to summarise these in Table 5.

**Table 5. The losers, winners and people neutrally affected by HPAI in Egypt.**

Phase	Losers	Neutral	Winners
I	<ul style="list-style-type: none"> <li>•Commercial broiler and layer producers of breeding and production stock</li> <li>•Hatchery owners</li> <li>•Transporters of poultry products</li> <li>•Market intermediaries</li> <li>•Slaughterhouses and slaughter shops</li> <li>•Feedmill owners</li> </ul>	<ul style="list-style-type: none"> <li>•Urban and rural poultry keepers (assumes that unsold products can be eaten by the household)</li> <li>•Poor urban consumers who may have initially benefited from cheaper poultry products, but later suffered due to less supplies and higher prices for other protein sources</li> </ul>	<ul style="list-style-type: none"> <li>•Cattle, buffalo and small ruminant producers</li> <li>•Fishermen</li> <li>•Importers of alternative sources of protein</li> </ul>
II	<ul style="list-style-type: none"> <li>•Most sectors of the poultry industry, commercial, traditional and associated actors to their value chains.</li> <li>•Poor urban consumers with no access to affordable protein sources</li> </ul>	<ul style="list-style-type: none"> <li>•Possibly early reporters of disease who were eligible to receive compensation</li> </ul>	<ul style="list-style-type: none"> <li>•Cattle, buffalo and small ruminant producers</li> <li>•Fishermen</li> <li>•Importers of alternative sources of protein</li> </ul>
III	<ul style="list-style-type: none"> <li>•Traditional poultry keepers in urban and rural areas due to policies and actions of public sector and the organized commercial sector</li> <li>•Live bird traders</li> <li>•Poultry slaughter shop owners</li> <li>•Poor urban consumers</li> </ul>	<ul style="list-style-type: none"> <li>•Commercial producers who were slow to restock</li> </ul>	<ul style="list-style-type: none"> <li>•Commercial producers who were fast to restock</li> <li>•Importers of alternative sources of protein including chicken</li> </ul>

During Phase I the private sector reaction to market confidence problems resulting in falling demand and hence prices was rapid in terms of production output changes. However, the structure of the industry did not allow much flexibility in this response, particularly the lack of slaughter and freezing capacity. It therefore limited to shutting down or reducing breeding stock output and lowering egg production through delayed replacement and false moulting. The corresponding reaction by the public sector was slow and in some cases non-existent. This created a very vulnerable industry by

February 2006, which probably contained many producers in financial difficulties who would initiate cost cutting measures to remain in business.

During the initial period of Phase II there was media hysteria, unclear strategies for disease control and the extensive spread of HPAI. This combined with a fragile poultry industry created massive supply and demand shocks. Such a rapidly changing market and production environment hampered the initial efforts to control HPAI. Lessons need to be learnt on how to improve media coverage of animal diseases and how to prepare for disease emergencies with clear and well structured control strategies.

In the Phase III, trade and control policies have had negative impacts on two of the most vulnerable sections of the community, small scale poultry productions and poor urban consumers. No open discussion has taken place on these impacts that have become medium term.

In general, lessons need to be learnt on how to improve policies to mitigate market shocks and reduce their impact. Ideally a study like the current one would have benefited from good data on the poultry industry and poultry product consumption. For a large proportion of the poultry industry data are not readily available and where there are data there are doubts about the quality.

The implementation of this study has shown that there are limitations in what can be achieved in a short period of time to assess market impact of a livestock disease such as HPAI H5N1. Data were not available to assess the impacts on the traditional poultry value chains in the rural and urban areas. Whilst these chains have limited economic importance, they do have a high social importance because so many people have poultry in such systems and these people tend to be the less well off in society. In addition, availability of data and time to examine the implications of changes in demand for poultry consumer products on other protein value chains was insufficient. This is a requirement to make estimates of the true impact of HPAI at national level. The impacts as noted above are not even, and in some cases some people will have gained. Of particular concern is the impact on the poor urban consumers who are likely to have suffered and continue to suffer the most from large fluctuations in the price of poultry products. Finally, in a turbulent market for livestock the control of disease, particularly a disease such as HPAI H5N1 spread by market movement, is difficult if not impossible. Maintaining stable markets would appear to be a critical component of a disease control strategy, but the impact and cost of not having stable markets on disease control require more thought on the types of technical and economic tools for further investigation. The strengths the study are equally obvious in that the coverage of the broiler value chain is relatively complete, and to some extent so is the information on the commercial layer chain. As these are the chains that will suffer the greatest economic loss from rapid changes in demand for poultry products, the study has important merits.

## **4.2 RECOMMENDATIONS**

The study has generated a number of recommendations that are list as the following

1. Future studies
  - a. Implications of problems of the poultry value chains on other protein value chains in Egypt
  - b. Social implications of the market shock of HPAI H5N1 in particular the impact on traditional poultry producers in rural and urban areas and poor consumers in urban areas

- c. Responses in trade policy to stabilise poultry product markets in a closed poultry sector
  - d. Understanding the investment patterns in the poultry value chains and their implications on the flexibility of supply and their ability to absorb and recover quickly from market shocks. For Egypt this would need to focus strongly on why slaughterhouse, processing and cold chain investment has been so limited.
  - e. The use of value added methodologies across all protein value chains as a means to determine national economic impact of HPAI.
2. Data concerns and national analytical capacity
- a. Official data on the poultry sector needs to be improved through clear analytical structures and a centralised unit responsible for data storage and analysis
  - b. Ideally such a body would be within the public sector but with private sector board members and influence.
  - c. The output from such a unit should be the identification of poultry research issues, technical, social and economic, impacts of policy and predictions of future market demand..
3. Disease control
- a. The applied compensation programmed should be proportional with and reflect the values added per product units in each chain.
  - b. Strict application of bio-security regulation adapted international regarding the distance of the different farms construction of the houses and bio-safety regulation within the house.

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## 6 ANNEX – DATA TABLES

**Table 6. Population, expenditure and poverty data from Egypt (UNDP, 2005)**

Governorate	Population (2003)			Expenditure				Poverty		
	Total ('000)	%	Cumulative %	Per capita (LE)	Total (LE)	%	Cumulative %	Total (2003)	%	Cumulative %
Cairo	7,629.9	11.1	11.1	4,742.0	36,180,986	19.7	19.7	389.1	2.3	2.3
Giza	5,535.5	8.1	19.2	3,490.0	19,318,895	10.5	30.2	902.3	5.3	7.6
Alexandria	3,755.9	5.5	24.6	3,847.0	14,448,947	7.9	38.1	431.9	2.5	10.1
Dakahlia	4,839.3	7.0	31.7	2,529.0	12,238,590	6.7	44.8	411.3	2.4	12.5
Gharbia	3,859.3	5.6	37.3	3,041.0	11,736,131	6.4	51.1	181.4	1.1	13.5
Kalyoubia	3,804.2	5.5	42.9	2,668.0	10,149,606	5.5	56.7	414.7	2.4	16.0
Behera	4,604.4	6.7	49.6	2,115.0	9,738,306	5.3	62.0	1,095.8	6.4	22.4
Sharkia	5,009.6	7.3	56.9	1,871.0	9,372,962	5.1	67.1	1,668.2	9.8	32.1
Menoufia	3,171.0	4.6	61.5	2,305.0	7,309,155	4.0	71.1	501.0	2.9	35.1
Menia	3,960.6	5.8	67.3	1,845.0	7,307,307	4.0	75.0	1,916.9	11.2	46.3
Kafr el Sheikh	2,541.2	3.7	71.0	2,585.0	6,569,002	3.6	78.6	287.2	1.7	48.0
Suhag	3,730.9	5.4	76.4	1,687.0	6,294,028	3.4	82.0	2,193.8	12.8	60.8
Qena	2,876.8	4.2	80.6	2,019.0	5,808,259	3.2	85.2	1,176.6	6.9	67.7
Fayoum	2,371.8	3.5	84.0	2,346.0	5,564,243	3.0	88.2	400.8	2.3	70.0
Assiut	3,351.0	4.9	88.9	1,489.0	4,989,639	2.7	91.0	2,878.5	16.8	86.9
Beni Suef	2,208.1	3.2	92.1	1,804.0	3,983,412	2.2	93.1	1,236.5	7.2	94.1
Damietta	1,056.4	1.5	93.7	3,337.0	3,525,207	1.9	95.0	46.5	0.3	94.4
Ismalia	844.1	1.2	94.9	2,973.0	2,509,509	1.4	96.4	123.2	0.7	95.1
Aswan	1,098.9	1.6	96.5	2,063.0	2,267,031	1.2	97.6	340.7	2.0	97.1
Suez	478.6	0.7	97.2	3,446.0	1,649,256	0.9	98.5	47.4	0.3	97.4
Port Said	529.7	0.8	98.0	3100	1,642,070	0.9	99.4	58.8	0.3	97.7
Luxor	414.4	0.6	98.6	2,496.0	1,034,342	0.6	100.0	70.9	0.4	98.1
Red Sea	182.5	0.3	98.8		0	0.0	100.0	0.0	0.0	98.1
New Valley	166.2	0.2	99.1		0	0.0	100.0	0.0	0.0	98.1
Matrouh	262.2	0.4	99.5		0	0.0	100.0	0.0	0.0	98.1
North Sinai	302.0	0.4	99.9		0	0.0	100.0	0.0	0.0	98.1
South Sinai	63.7	0.1	100.0		0	0.0	100.0	0.0	0.0	98.1
<b>Egypt</b>	<b>68,648</b>	<b>100.0</b>	<b>200.0</b>		<b>183,636,883</b>	<b>100.0</b>	<b>200.0</b>	<b>17,093.4</b>	<b>100.0</b>	<b>198.1</b>

**Table 7. Estimate of the production of poultry meat by system in Egypt**

	2003		
	Backyard	Commercial Balady	Commercial White
Production (million birds)	51	57	563
Liveweight		1.25	1.65
Dressing out percentage		0.675	0.725
Production (MT)	54,301	48,094	673,489
Proportion of production	7.0	6.2	86.8
Farmgate (LE/kg)	6.68		5.18
Wholesale (LE/kg)	7.03		5.45
Retail (LE/kg)	7.95	7.33	6.43
Value (000 LE)	431,693	352,527	4,330,533
Proportion of value	8.4	6.9	84.7



**Table 8. Estimation of the value of poultry meat and eggs sales in Egypt.**

Product	Traditional		Commercial		Total	
	'000 LE	%	'000 LE		'0000 LE	%
Meat	784,220	15.3	4,330,533	84.7	5,114,753	75.4
Eggs	376,439	22.6	1,290,838	77.4	1,667,277	24.6
Total	1,160,659	17.1	5,621,371	82.9	6,782,030	100.0

**Table 9. Poultry production in terms of bird numbers on farms, 2000 – 2005.**

Year	Balady:						BALADY TOTAL
	Chickens	Ducks	Geese	Pigeons	Rabbits	Turkeys	
	----- (000) -----						
2000	38,842	14,077	4,750	51,036	30,738	652	140,095
2001	43,985	14,508	4,987	54,608	31,873	847	150,808
2002	50,381	16,171	5,236	58,430	33,331	1,070	164,619
2003	51,588	17,003	5,498	62,520	34,170	970	171,749
2004	57,358	18,050	5,741	66,217	35,467	1,179	184,011
2005	61,821	19,094	5,990	70,044	36,642	1,297	194,888
Average Annual Percent Change 2000 - 2005	4.8%	3.1%	2.3%	3.2%	1.8%	7.1%	3.4%

**Table 10. Poultry production in terms of bird numbers on farms, 2000 - 2005**

Year	Commercial:			Broilers	COMMERCIAL TOTAL
	Table- egg	Layers Broiler parent stock	Table egg parent stock		
	----- (000) -----				
2000	15499	6298	279	357318	381394
2001	18957	7232	244	486949	515383
2002	19412	7946	261	664378	693999
2003	18090	7722	277	563683	591775
2004	18529	7966	317	505499	534315
2005	14164	8453	719	415007	440348
Average Annual Percent Change 2000 - 2005	-0.9%	3.0%	9.9%	1.5%	1.4%

**Table 11. Commercial poultry meat production, 2000 - 2005**

Year	Commercial:						COMMERCIAL
	Layers Table- egg	Broiler stock	parent -----	Table stock (000)	egg parent M.Tons	parent -----	Broilers TOTAL
2000	11.62		4.72		0.21	925	941
2001	14.22		5.42		0.18	1260	1280
2002	14.56		5.96		0.20	1720	1740
2003	13.57		5.79		0.21	1459	1479
2004	13.90		5.97		0.24	1308	1329
2005	10.62		6.34		0.54	1074	1092
Average Annual Percent Change 2000 – 2005							
	-0.9%		3.0%		9.9%	1.5%	1.5%

## 7 ABBREVIATIONS AND CONCEPTS

CAPMAS	Central Agency for Public Mobilisation and Statistics
DOC	Day-Old-Chicks
ERSAP	Economic Reform and Structural Adjustment Program
Frontier Governorates	Red Sea, New Valley, Matrouh, North Sinai, South Sinai
Governorates of Lower Egypt	Damietta, Dakahlia, Sharkia, Kalyoubia, Kafr el Sheikh, Gharbia, Menoufia, Behera, Ismalia
Governorates of Upper Egypt	Giza, Beni Suef, Fayoum, Menia, Assiut, Suhag, Qena, Luxor, Aswan
Gross Margin	Income minus variable costs
HPAI	Highly Pathogenic Avian Influenza
MALR	Ministry of Agriculture and Land Reclamation
MSS	Ministry of Social Solidarity
Non-traded inputs	Labour, Management, Rent, Water
PBDAC	Principal Bank of Development and Agricultural Credit
PRA	Participatory Rural Appraisal
Profit	Gross margin minus fixed costs
Urban Governorates	Cairo, Alexandria, Port Said, Suez
Value Added	Profit minus non-traded inputs
WTO	World Trade Organisation