World Journal of Agricultural Sciences 5 (3): 264-269, 2009
ISSN 1817-3047

An Economic Evaluation for the Impacts of Spreading of Bird Flu on Poultry Sector in Egypt

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Abstract: Poultry sector in Egypt is among main sources of animal protein supply. Investment injected into this sector was estimated at over L.E. 20 billions and it accommodates 2.5 million workers (casual and permanent jobs). Value of poultry meat and table eggs is around L.E. 9967.5 millions at prices of 2005/2006. This research was designed to throw light on poultry industry crisis, due to spreading of bird flu during the recent years (from 2005). Two million workers in this industry lost their jobs with heavy losses in investment poured in this industry due to this disease. Total losses of chickens and eggs producers between 17/2/2006 through 6/4/2006 is estimated at L.E. 257.5 millions representing about 0.32% of total animal production value and about 0.19% of total agricultural income 2005/2006 at current prices. Operating rate in artificial hatcheries reached 45.1% prior the disease emergence and about 33.2% post disease emergence. Marketing margin per kg. of various kinds of living poultry has risen significantly due to restriction imposed on poultry movement among governorates and closure of living poultry shops. Share of producer in each consumer's L.E. has been decreased significantly, as slaughter houses capacity was less than demanded. Share of wholesaler and retailer in each consumer's L.E. has risen significantly post disease. About 30% of workers in poultry sector that equal 750 thousand equal 750 thousand workers have lost their jobs. Traditional poultry production sector was accused as the source of flu. So, most of this sector has been deliberately destroyed. Restructure of the traditional sector is a must to revive it on proper basis.

Key words: Poultry Sector · Chickens · Eggs · Bird Flu disease · Animal Production · Environmentally · Marketing

INTRODUCTION

Poultry sector in Egypt is one of the major sources of animal protein supply. Poultry industry is regarded as one of the main agricultural industries, as its investment reached over L.E. 20 billions and absorbs around one million of permanent jobs plus one million casual workers. Value of poultry meat and eggs valued about L.E. 9967.5 millions at prices of 2005, representing around 20.1% of total value of animal production and around 7.3% of total value of agricultural production.

Poultry industry in Egypt is manifested in various forms and activities [1]. It accommodates 3.77 millions domestic farms owned by rural families. Egypt is about 12 millions out of which 10% produce their needs of poultry products. Spreading of bird flu will cause loss in the income of those families.

Commercial poultry sector [2] includes about 14.7 thousand broilers projects accommodating about 25.14 thousand broiler houses producing about 776.3 million bird per year. It also includes broiler parent stocks and egg production projects with the capacity of 32.7 million laying birds producing around 7.9 billion table eggs per year. It moreover includes projects of table egg parent stocks plus and slaughter houses which absorb around 20% of the produced broilers. The commercial sector also include feed mill plants that produce about 29.9% of total poultry feeds. Poultry meat processing plants are of great importance in Egyptian markets. It exports processed poultry meat valued around US$ 12.2 millions in 2003. Confectionary & bakery industries are highly related to poultry business as their plants reached 800 plants. Labour power in confectionary and bakery industries is estimated at 15% of labour power of food industries.

Emergence bird flu disease in Feb. 2006 was a big strike to poultry business and caused critical damages to the whole poultry business. Losses of the poultry business are valued at L.E. 863.1 millions up to Feb. 2008.

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The disease infected about 50 persons out of them 22 persons lost their lives. Cost of anti-bird flu drugs reached L.E. 228 millions during 2006 and 2007, out of which L.E. 164.9 millions was spent in 2007.

Problem and Objective of the Research: Spreading of bird-flu as from 2006 has caused and still causes tremendous losses in poultry industry. Around 2 million workers lost their jobs plus losses in investments allocated for this industry. Imports of poultry meat have risen drastically to cover the domestic demand and hard currencies were adversely affected. The objective of this research revolves around the changes in poultry sector resulting from spreading of the bird flu in Egypt since the early 2006. It also investigates points of weakness in the poultry business that obstacles the fulfillment of food protein gap. It also looks for solutions for healing.

Research Methodology and Sources of Data: Methodology depends mainly on descriptive and quantitative analysis of secondary data obtained from Agricultural Economics Affairs Sector, Ministry of Agriculture Plus data obtained from case studies.

RESULTS

Average of total designed production capacity for broiler projects (2006-2007) reached about 990.2 million birds. Subsequently, operating capacity reached about 40.5% which explains the reduction of production in the second period compared with the first period by around 27.8%.

Analysis of variance showed a significant difference between actual production prior and post flu emergence. Value of f was calculated as 15.5.

Variance analysis results showed significant statistical difference between pultry production prior and post flu emergence.

Average of actual production of slaughter houses during 2003-2005 reached about 129 million birds. Actual production of such abattoirs during the same period was 33.4 million birds with operation rate of 25.9%. In the meantime, average of total capacity of poultry slaughter houses during 2006-2007 (post disease) reached 1423.2 million birds with a rise of about 1003.3% this tremendous increase in slaughter houses was due to the support given by the state to set up new abattoirs to stop spreading of the disease by the end of 2009.

Table 1: Impact of bird flu on production of chicken meat and table eggs during 2003-2007

	Operation capacity by 1000 chicken			Operation capacity by 1000 eggs		
Year	Total capacity	Actual Production	Operation %	Total capacity	Actual Production	Operation %
2003	892717	563683	63.1	7652660	483487	63.2
2004	922924	505499	54.8	8920252	4015516	45.0
2005	976720	497154	50.9	6595612	3004605	45.6
Period's average	930787	522112	56.1	7722841	3951603	51.2
2006	972041	362335	37.3	9406334	2761464	29.4
2007	1008431	440145	43.6	8005117	3685636	46.0
Period's average	990236	401240	40.5	8705726	3223550	37.0
Changes in two periods %	6.4	(23.2)	27.8	12.7	(18.4)	(27.7)

1.* ( ) values between brackets are negative

2.Source: collected & calculated upon data of Ministry of Agriculture, Animal & Poultry Wealth Sector, published by Agric. Economics Affairs Sector.

Table 2: Impact of bird flu on production Efficiency of egg layers in commercial sector during 2003-2007

	Operation capacity by 1000 chicken			Operation capacity by 1000 eggs		
Year	Chicken	Egg	Productivity	Chicken	Egg	Productivity
2003	24285	7652660	315	18090	4834687	367
2004	28256	8920252	316	18529	4015516	217
2005	21364	6595612	309	14164	3004605	212
Period's average	24635	7722841	313	16928	3951603	233
2006	30953	9406334	304	19522	2761464	142
2007	32300	8005117	248	23331	3685636	158
Period's average	31627	8705726	275	214227	3223550	150
Changes in two periods %	28.4	12.7	(12.1)	26.6	(18.4)	(35.6)

* ( ) values between brackets are negative

Source: collected & calculated upon data of Ministry of Agriculture, Animal & Poultry Wealth Sector, published by Agric. Economics Affairs sector.

Table 3: Variance analysis of productivity of egg layers In total capacity prior & post flu emergence

Source of variance	Total Squares	Degree of freedom	Average squares	(f) Value
Productivity in total capacity	2128	1	2128	(5.3)*
Error	1598	4	399	
Total squares	3725	5		
Source of variance	Total Squares	Degree of freedom	Average squares	(f) Value
Productivity actual capacity	10086	1	10086	(20.2)**
Error	1978	4	495	
Total squares	12064	5		

(*) Significant at 0.05 (**) Significant at 0.01

Source: Table (2)

Table 4: Impact of bird flu on production of artificial hatcheries and feed factories during 2003-2007

	Production of artificial hatcheries per million baby chicken			Poultry fodder production per 1000 tons		
Year	Total capacity	Actual Production	Operation %	Total capacity	Actual Production	Operation %
2003	985.5	485.7	49.3	49.3	585.7	20.7
2004	1207.4	737.0	61.0	61.0	699.7	21.5
2005	1815.8	599.9	32.4	32.4	1394.2	19.6
Period's average	1348.2	607.5	45.1	45.1	893.2	20.3
2006	1380.5	516.5	34.4	34.4	464.9	13.4
2007	1434.4	417.5	37.4	37.4	717.3	12.8
Period's average	1407	467.0	33.2	33.2	591.1	13.0
Changes in two periods %	4.4	(23.1)	(26.4)	(26.4)	(33.8)	(36.0)

* ( ) values between brackets are negative

Source: collected & calculated upon data of Ministry of Agriculture, Animal & Poultry Wealth Sector, published by Agric. Economics Affairs sector.

Table 5: Impact of bird flu on operation capacity of poultryslaughter houses 2003-2007 Per Million Birds

	Year							
	Operation Capacity prior disease				Operation Capacity post disease			Change between
Item	2003	2004	2005	Period's average	2006	2007	Period's average	two periods
Total capacity	109.8	109.3	167.8	129.0	226.3	2620.0	1423.2	1003.3
Actual capacity	29.2	31.5	39.5	33.4	47.4	818.2	432.8	1195.8
Operation %	26.2	28.8	23.5	25.9	20.9	31.2	30.4	17.4

Source: collected & calculated upon data of Ministry of Agriculture, Animal & Poultry Wealth Sector, published by Agric. Economics Affairs sector.

Table 6: Impact of bird flu on living chickens marketing efficiency (2203-2005) – (2006-2007)

	Item								
	Price per living kg			Marketing margin L.E.			Consumer's distribution of L.E. %		
Species	Farm	Wholesale	Retail	Wholesale	Retail	Total	Producer	Wholesaler	Retailer
Marketing efficiency prior disease 2003-2005									
Indigenous chickens	8.03	8.72	9.38	.069	0.66	1.35	85.6	7.4	7.0
Specialized chickens	6.15	7.29	8.06	1.14	0.77	1.91	76.3	14.1	9.6
Indigenous ducks	10.50	11.50	12.61	1.0	1.11	2.11	83.3	7.9	8.8
Bickini ducks	8.10	8.82	10.47	0.72	1.65	2.37	77.3	6.9	15.8
Indigenous turkey	12.05	13.15	14.06	1.1	0.91	2.01	85.7	7.8	6.5
Specialized turkey	10.5	11.13	12.95	0.63	1.77	2.40	81.4	4.9	13.7
Specialized rabbit	11.56	11.50	12.96	0.54	1.46	2.00	84.6	4.2	11.2

Table 6: Continued

Marketing efficiency post disease 2006-2007									
Indigenous chickens	8.15	9.66	12.89	1.51	3.23	4.74	63.2	11.7	25.1
Specialized chickens	6.25	8.27	10.58	2.02	2.31	4.33	59.1	19.1	21.8
Indigenous ducks	13.0	215.72	18.0	2.72	2.28	5.0	72.2	15.1	12.7
Bickini ducks	10.5	12.96	16.1	2.46	3.14	5.60	65.2	15.3	19.5
Indigenous turkey	14.2	16.66	19.1	2.46	2.44	4.90	74.3	12.9	12.8
Specialized turkey	12.11	13.0	17.97	0.89	4.97	5.87	67.4	5.0	27.6
Specialized rabbit	11.95	14.5	17.94	2.55	3.44	5.99	66.6	14.2	19.2
Indigenous chickens	11.63	13.9	16.90	2.27	3.0	5.27	68.6	13.4	17.8

(*) Indigenous: Based on local strains and produced in traditional sector.

(**) Based on foreign strains and produced in modern or commercial sector.

Table 7: Variance analysis for living chickens marketing efficiency prior and post disease emergence 2003-2007

Source of variance	Total squares	Degrees of freedom	Average squares	(f) value
Marketing cost	40.7	1	40.7	(203.5)**
Error	3.1	14	0.2	
total squares	43.8	15		
Source of variance	Total squares	Degrees of freedom	Average squares	(f) value
Share of producer in each consumer's	937.9	1	937.9	(50.1)**
Error	262.2	14	18.7	
Total squares	1200.1	15		
Source of variance	Total squares	Degrees of freedom	Average squares	(f) value
Share of wholesaler in each consumer's L.E.	160.7	1	160.7	(11.4)*
Error	197.2	14	14.1	
Total squares	357.9	15		
Source of variance	Total squares	Degrees of freedom	Average squares	(f) value
Share of retailer in each consumer's L.E.	321.3	1	321.3	(16.7)**
Error	269.0	14	19.2	
Total squares	590.3	15		

(*) Significant at 0.05 (**) Significant at 0.01

Source: collected and calculated from table (6)

The Significant Difference Between Average Marketing Margin of Poultry in the Two Periods: The share of retailer in each consumer's L.E. for indigenous chickens, specialized ducks, indigenous ducks, Bickini ducks, indigenous turkey, specialized turkey, indigenous rabbits and specialized rabbits, post disease spreading increased to about 258.6, 127.1 44.3, 23.4, 96.9, 101.5, 52.4 and 58.9%, respectively. Variable significance was proved at all levels of as shown in table (7),

According to FAO reports, about 20% of permanent workers in poultry commercial sector lost their jobs.

Actual table egg production in traditional sector reached about 1.2 billion eggs, representing about 28.6% of egg production at national level. Rabbit production reached about 1.8 million rabbits representing about 54.5% at national level. Pigeons, ducks, geese and turkey production lacks statistics and data base.

DISCUSSION

Poultry industry is a source of income for a broad sector of citizens as a result of job opportunities created. This industry is based mainly on some complementary industries as fodder Making (3). Table (1) shows that operating percentage of poultry fattening farms has declined from 56.1% to 40.5%, because of the bird flu. Variance analysis estimation between the two periods reveals a significant statistically difference between the operating percentage prior and post flu emergence. Total losses of broilers and egg producers just after 2 months of flue emergences is estimated at about L.E. 257.5 millions.

The related activities can be simply manifested[4] in things as artificial hatcheries, poultry feed factories and slaughter houses which receive less than 20% of

broiler production. The rest 80% of broiler production is marketed as living birds because of the shortage of slaughter houses.

Concerning table eggs production, operating percentage decreased from 51.2% to 37% because of the flu in 2006. Subsequently, operating efficiency of table egg producing farms declined too. Likewise, production efficiency of egg layers decreased from 74.4% to 54.5% as a result of bird flu too.

Variance analysis results of production efficiency for egg layers prior and post flu revealed a significant statistical difference.

Results also say that poultry fattening and egg production farms were exposed to a big decline in the operating percentage which led to high percentage of job loss and low demand for inputs of production as a result of mass execution of baby chickens and some fodder factories went out of business.

Operating efficiency of artificial hatcheries decreased from 45.1% to 33.2% because of the flu. Demand for baby chickens was also declining and a big number of workers were fired [5].

Operating efficiency percentage of fodder production decreased from 20.3% to 13% putting fodder factories in harder position after the emergence of flu.

Concerning mechanized abattoirs of poultry, operating efficiency percentage rose from 25.9% to 30.4% as q result of establishing more abattoirs and prohibiting living birds marketing as well.

Marketing is composed of a number of economic activities[6], the function of which is to bring products at the right time and place of consumers. Owing to the modest capacity of slaughter houses which ranges from 15% to 20% of broiler supplied, most of production is handled alive. This mechanism [7] has its bad impact economically and environmentally. The next part of this research will focus on impacts of the disease spreading on marketing efficiency of the living birds.

Studying of marketing efficiency of poultry revealed that marketing margins increased, as a result of the flu, to 251%, 127%, 137%, 136%, 144%, 145%, 195 and 164% for indigenous chickens, specialized chickens, indigenous ducks, Bickini ducks, indigenous turkey, specialized turkey, indigenous rabbits and specialized rabbits respectively.

This deterioration is mainly attributed to non-studied decrees that prohibit poultry transport between governorates and prohibit marketing of living birds, though lack of abattoirs. Thus, share of profit margin of producer has been declining.

Based on the previous presentation[8], it seems clear that the decline of marketing efficiency of living birds, post disease, is attributed mainly to a number of procedures. Those procedures are manifested in prohibition of living birds movement among governorates and closure of chicken shops without supplying sufficient slaughter houses. By the end of 2009, it is planned to set up the sufficient number of slaughter houses.

Losses of broiler and eggs producers[9], per day during the two months before the emergence of bird flu were estimated by about L.E. 3.94 millions as a result of the low demand for such products. In the meantime [10], middlemen's losses were estimated by about L.E. 1.2 millions per day.

Before the emergence of the disease[11], number of workers in the poultry sector estimated by 2.5 millions. Owing to bird flu a number of workers will lose their jobs. Average of operating capacity of broiler decreased from 56.1% during 2003-2005 to around 40.5% during 2006-2007. likewise, average of operating capacity of table egg production farms decreased from about 51.2% during 2003-2005 to about 37% during 2006-2007. similarly, operation capacity of artificial hatcheries and fodder factories decreased by 26.4% and 36% respectively, which drove 30% of workers out of employment (around 760 thousand jobs). According to FAO reports, about 20% of permanent workers in poultry commercial sector lost their jobs.

Domestic (home) poultry[12] raising unit is defined by floks less than a hundred bird each. Those units are managed by the family for a couple of purposes. Firstly to supply protein for the family. Secondly to get additional income as well.

RECOMMENDATIONS

- Inject more investment into poultry sector to set up new and sufficient number of slaughter houses, cooling tunnels and mega refrigerators,
- Establishment of marketing companies to handle frozen chickens;
- Supply soft credit facilities to producers;
- Strengthen control on table egg and broiler production with providing vet. services;
- Set up fire places for dead chickens;
- Establishment of cooperation societies to supply inputs of production at reasonable price;
- Provide extension services through vet. units and proper extension workers.

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