Bangladesh J. Agric. Econs XXVI, 1& 2(2003) 97-109

Research Note

IMPACT OF BIRD FLU RUMOUR ON PRODUCTION, MARKETING AND CONSUMPTION OF BROILER IN SELECTED AREAS OF BANGLADESH

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ABSTRACT

The paper compares the profitability, price, marketing and consumption of broiler in bird flu rumour period with that in normal period. Savar upazila and Dhaka city were selected as producing and consuming areas respectively. Twenty farm owners, 25 intermediaries and 40 consumers were interviewed. Farmers earned only Tk 61 in bird *flu* period compared with Tk 112 in normal period by investing Tk 100 in poultry production. Marketing chain became shorter and marketing cost increased in abnormal period. Marketing margin and profit of traders decreased significantly due to *low* volume of trade. Consumers did not respond instantaneously to the rumour and average fall in price in bird *flu* period was three times as much as price fall in normal period. Over one-half of consumers totally stopped consuming broiler due to rumour of bird flu.

I. INTRODUCTION

Poultry industry as an emerging agribusiness started practically during eighties in Bangladesh. It is now in a transitional stage of production. With the beginning of small scale layer and broiler farming in the early 1990's the production stage has taken up the shape of an industry.

With the expansion of commercial poultry farming throughout the country, the demand for poultry inputs like day-old-chick, feed, medicine etc. is increasing day by day. To meet up the demand for these inputs, entrepreneurs from private sector are coming forward to establish hatchery, feed mill and pharmaceutical company for poultry. At present a total of 0.15 million commercial farms have been established throughout the country. About 6 million of people are engaged directly and indirectly in poultry industry. About 3500 million of eggs, 250 million of broiler day-old chick, 25 million of layer day-old chick, more than 200 million tonnes of poultry feed are being produced per year in the country (Rahman, 2004). A number of mills have started producing poultry feed by this time and more entrepreneurs are coming forward to establish feed mill and poultry processing plants.

The bird flu is an animal disease spreading like a wild fire of jungle in many countries of the world. The virus had spread at an incredible rate over the course of the months of January and February 2004 hitting about ten countries in South-East Asia and in USA. Numerous other countries in the area were at risk and were taking aggressive precautions. The poultry

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and food industry of Asia faced a tremendous financial loss due to spread of bird flu. It was estimated that about 20 percent of the total number of the poultry farmers had partially closed down their businesses and the industry had lost about $ 3.5 billion (Lister, 2004).

Although the poultry birds of Bangladesh were not infected by bird flu or avian influenza, the people of Bangladesh were in suspicion during the bird flu period. The death of 20 people at that time by unknown disease in different places of Bangladesh made this suspicion more strong. Later it was proved that the unknown disease did not occur for avian influenza but it occurred for the virus of NIPAH and HENDRA. But the poultry industry of Bangladesh faced a terrific financial loss for the rumour of bird flu. The price of broiler decreased fifty percent in wholesale and retail market. The poultry farm owners of Bangladesh especially broiler farm owners faced a huge amount of financial losses. Many farm owners were bound to stop poultry raising as they lost their capital. Thus, the present study is an attempt to find out the impact of bird flu rumour on production, marketing and consumption of broiler in Bangladesh.

II. METHODOLOGY

Savar upazila under Dhaka district, an area of higher concentration of broiler farming, was selected for this study. Dhaka Metropolitan City is considered as the largest consuming areas of broilers in the country. So, for having maximum potentiality in broiler marketing, Dhaka city markets as well as Savar market were selected for the present study.

The commercial broiler farm owners, intermediaries and consumers were considered as the population of this study. The selected samples consisted of 20 broiler farm owners, 25 intermediaries and 40 consumers. The total sample size of the present study was thus 85. Eight wholesaler-cum-retailers, 6 wholesalers and 11 retailers from different markets of Dhaka city and Savar were selected. Of the 40 consumers, 10 each were farmers, religious leaders, service holders and businessmen. Keeping in view the objectives of the study, three different types of interview schedules were prepared to collect the information from broiler farm owners, intermediaries and consumers. Data were collected both from primary and secondary sources. Primary data were collected during the period from January 2004 to June 2004. (The details of sampling procedure and selected markets are presented in Rahman, 2004)

In this study the marketing efficiency of broiler marketing system has been measured by the following three different methods:

i) Ratio of output to input or conventional method:

Conceptually, efficiency of any activity or process is defined as the ratio of output to input. If 'O' and 'I' are respectively output and input of the marketing system and 'E' is the index of marketing efficiency; then

$$E = \frac{O}{I} x 100$$

A higher value of E denotes higher level of efficiency and vice versa. When applied in the area of marketing, output is the 'value added' by marketing system and 'input is the real cost of marketing (including some fair margins of intermediaries)'. The difference in the price at farm level (price received by farmer) and that at the retail level (price paid by the consumers) may be used to measure the 'value added' but it has limitations mainly because of market imperfections (Acharya and Agarwal, 1999).

ii) Shepherd's method:

Shepherd (1965) has suggested that the ratio of the total value of goods marketed to the marketing cost may be used as a measure of efficiency which is given below:

$$ME = \frac{V}{C}$$

Where,

ME = Marketing efficiency in Shepherd's method

V = Total value of goods marketed or consumer's purchase price per unit.

C = Total marketing cost per unit.

Same as conventional method a higher value of ME denotes higher level of efficiency and vice versa. The limitation of this method is that it does not take into consideration the price received by the farmer.

iii) Acharya's method

The limitation of both two methods stated above are taken care by the method suggested by Acharya. The following modified measure is therefore, being suggested by Acharya:

$$MME = FP \div (MC+MM)$$

Where,

MME = Modified measure of marketing efficiency.

FP = Net price received by farmers

MC = Total marketing costs

MM = Total net margin of intermediaries.

A higher value of MME denotes higher level of efficiency and vice versa (Acharya and Agarwal, 1999).

III. COST AND RETURN OF RAISING BROILER

It is seen from table 1 that the cost incurred for raising broilers in two situations (normal and bird flu) were more or less same but the returns varied significantly between two situations. The 't' values of paired test showed that the differences between gross as well as net returns of two situations were significant at 1% level. Although the farm owners earned

profit of Tk. 8700 in normal situation, but they incurred loss of about Tk. 29,000 per 1000 birds in bird flu situation. Negative gross margin in bird flu situation indicated that farm's return did not cover even the variable cost. That means farms could avoid loss to a great extent by stopping production. As a result, many farm owners found no other ways but to shut down the farms temporarily.

Table 1. Cost and return of raising broiler in two different situations.

Cost & Returns	Tk./1000 birds		Change from normal situation (%)	t-values (Paired sample test)
	Normal situation	Bird Flu situation		
A. Gross return	83701.16	45556.79	-45.57	14.93***
B. Total variable cost	73112.80	72567.21	-0.75	0.43
C. Total cost	74964.10	74453.41	-0.68	0.41
D. Gross margin (A-B)	10588.36	-27010.42	-355.01	15.64***
E. Net margin (A-C)	8737.06	-28896.62	-430.74	15.70***
F. Return per Taka invested (variable cost basis) (A÷B)	1.14	0.63	-44.74	14.96***
G. Return per Taka invested (Total cost basis) (A÷C)	1.12	0.61	-45.54	14.87***

*** Significant at 1% level

It is not so difficult to imagine the situation of the farm owners after carrying a vast amount of losses due to rûmour of bird flu. Most of the farm owners in the study areas had lost their capital, which broke down their backbone. The economic condition of most of the farm owners was not so good to recover these losses. It was informed that out of 176 farms in Savar upazila, 27 farms were closed permanently and another 11 farms were closed temporarily for the loss of bird flu rumour, although the actual number of closing farms might be more. Among the closed farms, most of the farms were new in broiler farming and small or medium in size.

Most of the farm owners who continued to raise broiler after the bird flu period, had to purchase inputs like day-old-chick, feed, medicine, etc. on credit with the agreement of paying the money after selling the broiler birds. The sellers of the inputs found no other way but to sell their products on credit as most of the farm owners were victimized. Some farm owners continued their production activities of broiler by borrowing money from non-institutional sources.

IV. MARKETING SYSTEM

Marketing Chain

Marketing chain of broiler as found in the study area in normal and bird flu situations are presented in figure 1 and figure 2 respectively. Although in normal situation the broilers produced in Savar were sold both in Savar and Dhaka city markets but in bird flu situation those were sold only in Savar market. Moreover, the amount of sale by farm owners to different intermediaries was different in different situations. In normal situation, farm owners sold most of live broiler (90%) to wholesaler-cum-retailers and wholesalers. But in bird flu situation, a significant amount (36%) was sold by farm owners directly to the consumers.

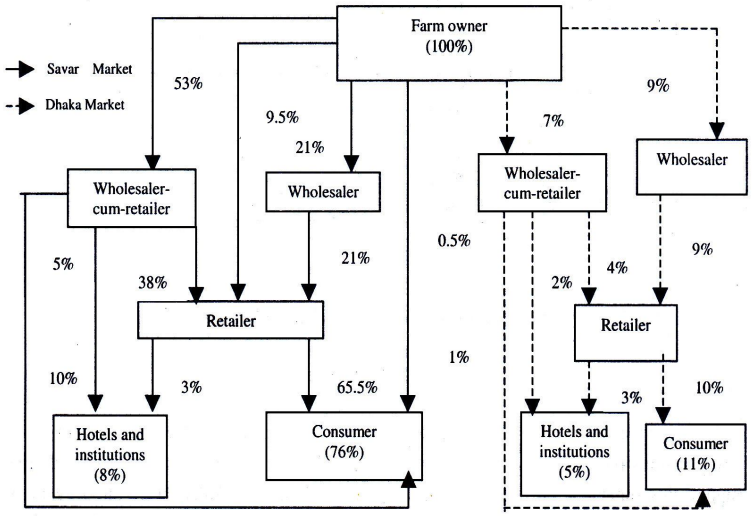
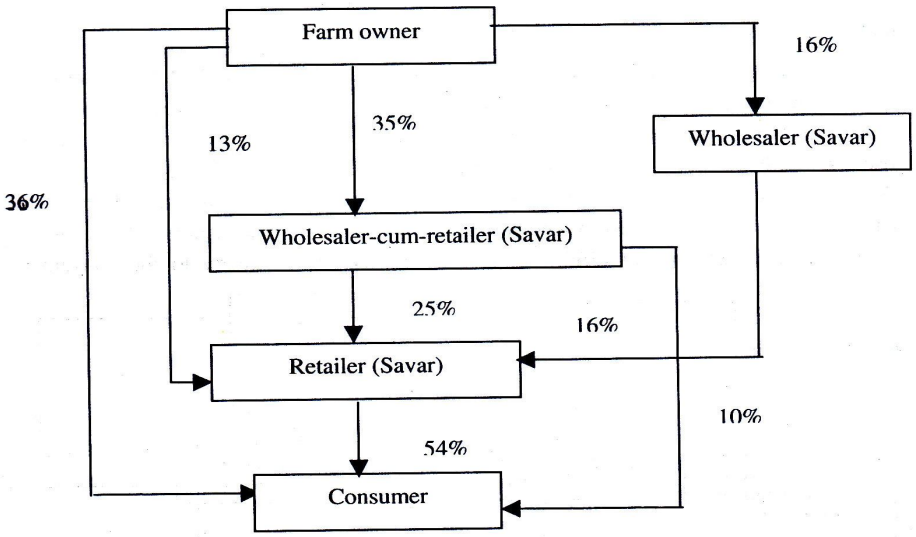


Fig.1: Marketing channels of live broiler in normal situation

Besides, farm owner's sale to retailers also increased from 9.5% in normal situation to 13% in bird flu situation. On the other hand, wholesalers started selling broiler directly to the consumers in bird flu situation. Another mentionable matter is that the hotel and institution owners stopped buying broiler during bird flu situation. As in bird flu situation the intermediaries purchased less amount of broiler due to lower demand than normal situation, the farm owners were bound to sell their product directly to the consumers. At the abnormal time they sold their broilers in local markets or by the side of the roads in local areas. Few farm owners jointly sold their broilers by making announcement that there was no bird flu in Bangladesh.



Fig, 2: Marketing channel of live broiler in bird flu situation

Marketing Cost

It is evident from Table 2 that the total marketing cost of all intermediaries was higher in bird flu situation. Pair 't' values, which are significant at 1% level for all intermediaries, support this statement. Although the number of labour and their salary were almost same in both situations but the quantity of broiler sold in bird flu rumour period was less. Additionally, more time was required to sell same quantity of broiler in bird flu situation compared with normal situation; which resulted in increase not only per unit fixed cost but variable cost also. That means per unit marketing cost went up due to lower volume of transaction.

Among all intermediaries, retailers incurred higher amount of marketing cost in both the situations. Although average transportation cost of retailers was lower than that of other intermediaries as some retailers purchased broiler directly from wholesaler-cum-retailers or wholesalers of same market, but feed cost was higher than that of others as they had to keep broiler more time than others. Additionally, the quantity of transaction of broiler per day for retailers was lower than that of other intermediaries. That means retailers need more time to sell 100 kg live broiler; which caused increase in per unit of fixed cost. As a result, the total marketing cost of retailers was found higher.

Table 2. Comparison of total marketing cost between normal and bird flu situations

Markets	Intermediaries	Total marketing cost (Tk./100 kg)		Change from normal situation (%)	t-values (Paired test)
		Normal situation	Bird flu situation		
Savar	Wholesaler-cum-retailer	301.01	357.58	+18.79	10.75***
	Wholesaler	281.29	312.96	+11.26	23.05***
	Retailer	321.80	374.14	+16.26	6.37***
Dhaka city	Wholesaler-cum-retailer	340.29	393.42	+15.61	8.95***
	Wholesaler	284.95	315.88	+10.85	20.52***
	Retailer	347.85	427.94	+23.02	21.21***
Average marketing cost of all intermediaries		312.87	363.65	+16.23	13.38***

*** Significant at 1% level.

Marketing Margin

The gross and net marketing margins of different intermediaries in normal and bird flu situations were presented in tables 3 and 4 respectively. The gross marketing margins of all traders but wholesalers cum retailers of Dhaka city were found significantly lower in bird flu

Table 3. Marketing margins of different intermediaries of live broiler in Savar and Dhaka city markets in normal and bird flu situations.

(Tk. per 100 kg)

Markets	Intermediaries	Situation	Purchase Price (A)	Sale price (B)	Gross marketing margin (C=A-B)	't' values (Paired test)
Savar	Wholesaler-cum- retailer	NS	5745.00	6236.50	491.50	3.66**
		BFS	3600.00	4065.50	465.00	
	Wholesaler	NS	5745.00	6170.30	425.30	56.38***
		BFS	3600.00	4010.00	410.00	
	Retailer	NS	6012.00	6647.00	635.00	13.45***
		BFS	3942.50	4500.50	558.00	
Dhaka city	Wholesaler - cum-retailer	NS	5849.50	6321.50	472.00	2.09
		BFS	3695.00	4157.00	462.00	
	Wholesaler	NS	5805.00	6215.00	410.00	2.99*
		BFS	3672.10	4067.30	395.20	
	Retailer	NS	6195.32	6897.62	702.30	17.58***
		BFS	4052.00	4695.00	643.00	

Note: NS & BFS denote normal and bird flu situations respectively.

***, ** & * Indicate significant at 1%, 5% & 10% levels respectively.

situation against normal situation. Since volume of transaction in bird flu situation was lower, the results indicated positive relationship between margin and volume of sale. As marketing cost increased significantly in bird flu situation, net margin or profit decreased more than gross margin for all traders in the study area. Thus, contrary to belief of constant mark up, the study revealed that traders' margin as well as profit decreased with the decrease of volume of trade.

Table 4. Comparison of net marketing margins between normal and bird flu situations.

Market	Intermediaries	Net marketing margin (Tk./100 kg)		Change from normal situation(%)	t-values* (Paired test)
		Normal situation	Bird flu situation		
Savar	Wholesaler-cum-retailer	190.49	107.42	-43.61	22.93***
	Wholesaler	144.01	97.04	-32.62	28.55***
	Retailer	313.20	183.86	-41.30	17.23***
Dhaka city	Wholesaler-cum-retailer	131.71	68.58	-47.93	10.32***
	Wholesaler	125.05	79.32	-36.57	9.64***
	Retailer	354.45	215.06	-39.33	33.81***
All intermediaries		209.82	125.21	-40.33	11.91***

***Significant at 1% level.

Marketing Efficiency

It is evident from table 5 that the marketing efficiencies of both the markets for all methods decreased significantly in bird flu situation. High marketing cost and low farm and retail prices caused the marketing efficiency to decrease in bird flu situation. Again, in the case of all methods decrease in efficiencies were slightly higher for Dhaka market against Savar market.

Table 5. Comparison of marketing efficiencies between normal and bird flu situations.

Market	Methods	Marketing efficiency		Change (%)
		Normal situation	Bird flu situation	
Savar	Conventional	1.00	0.86	-13.82
	Shepherd	7.35	4.31	-41.36
	Acharya	3.70	2.51	-32.16
Dhaka city	Conventional	1.10	0.89	-19.09
	Shepherd	7.09	4.13	-41.75
	Acharya	3.68	2.46	-33.15

V. PRICE AND CONSUMPTION OF BROILER

Price of Broiler

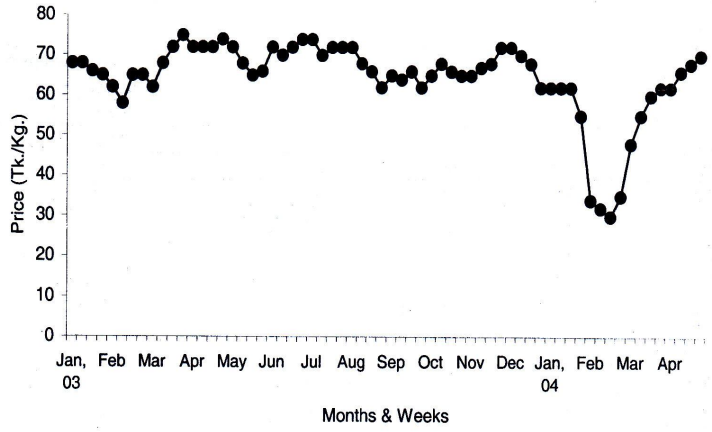
The factors, which affect the price of agricultural products, may be tangible, like the quantity of arrivals at a particular point of time in the market, or heavy rainfall; or they may be intangible, like the announcement of a particular government policy or any rumour regarding the quality or quantity of the product. All these factors influence price by affecting either the demand behaviour of buyers or the supply behaviour of sellers.

Although the broilers of Bangladesh were free from the danger of bird flu according to the report of WHO and other organizations, but the price of broiler decreased sharply during the bird flu period in the world mainly due to intangible factor of rumour. At that time the price of broiler was found to decrease by 50 percent in wholesale and retail market. The movement of retail prices of broiler from January 2003 to April 2004 in Bangladesh is shown in figure 3 and in appendix table 1.

Although retail price of broiler was in the limit between Tk. 60 per kg. to Tk. 75 per kg. during normal period from 1st week of January 2003 to 3rd week of January 2004, but the price began to fall down from the 4th week of January 2004. It decreased sharply in the 1st week of February 2004 and continued to the last week of February 2004. The price began to increase from the 1st week of March and it became normal in the last week of March.

Table 6 shows the price indices of broiler (base: 3rd week of January 2004) during the period when bird flu rumour was widespread. It is evident from table that the change in price

Fig. 3. Weekly average retail price of live broiler during Jan, 2003 to April, 2004



was started from the 4th week of January and continued up to 3rd week of March and thus it prevailed in total 8 weeks. The price decreased from the lowest 3 percent in 3rd week of March to the highest 52 percent in 3rd week of February. That means it took four weeks to reach price at the lowest level and again after four weeks price reached at the original level. Thus, it is indicated that all consumers did not respond instantly to the information of bird flu. The price became equal to base week in the last week of March.

Table 6. Change in broiler price during the period of bird flu rumour in Bangladesh.

Month	Week	Price (Tk/kg)	Price indices (Base: 3rd week of January)
January `04	3rd	62	100
January	4th	55	89
February	lst	34	55
February	2nd	32	52
February	3rd	30	48
February	4th	35	56
March	1 st	48	77
March	2nd	55	89
March	3rd	60	97
March	4th	62	100

In the Table 7, an attempt was made to compare between the prices of same months of previous and current year to find out the change in price both in bird flu and normal situations. The price of current year from the month of January to April was less than that of previous year. In bird flu situation the decrease in price of broiler was the highest of 54

Table 7. **Comparison of broiler prices between same months of previous and current years.**

Month	Week	Price in 2003 (Tk/kg)	Price in 2004 (Tk/kg)	Change from same months of previous year (%)
January	lst	68	62	-8.82
January	2nd	68	62	-8.82
January	3rd	66	62	-6.06
January	4th	65	55	-15.38
February	lst	62	34	-45.16
February	2nd	58	32	-44.83
February	3rd	65	30	-53.85
February	4th	65	35	-46.15
March	lst	62	48	-22.58
March	2nd	68	55	-19.12
March	3rd	72	60	-16.67
March	4th	75	62	-17.33
April	lst	72	62	-13.89
April	2nd	72	66	-8.33
April	3rd	72	68	-5.56
April	4th	74	70	-5.56

percent in the 3rd week of February and the lowest of 15 percent in the 4th week of January with average of 33 percent. In normal situation it was the highest of 17 percent in the 4th week of March and the lowest of 6 percent in the last week of April; average being 9 percent. That means compare with previous year, the average fall in price in bird flu period was more than three times against that in normal period.

The following reasons were identified for decreasing the price of broiler in bird flu situation after discussing with the farm owners, intermediaries and consumers in the study area:

i) The price was found to decrease mainly for the rumour of bird flu which created fear among the consumers to consume broiler. This rumour was created because of wide coverage of the news of bird flu in the world with live picture by different TV channels and newspapers in Bangladesh. The death of few thousand commercial poultry birds in Gazipur district made this suspicion more strong. But the death was caused for wrong vaccination. The death of 20 people at that time in Bangladesh by unknown disease gave this suspicion a new dimension. Later it was proved that the unknown disease was occurred for the virus of NIPAH and HENDRA.

ii) The price of broiler was mainly determined by the interaction of demand and supply. During the bird flu period cattle meat was available to consumers due to Eid-ul-Azha. So, the demand for broiler was less than that of normal period but the supply was normal. As a result, the price of broiler decreased sharply.

iii) For celebrating the festival of Eid-ul-Azha with relatives, a large number of inhabitants of Dhaka city went to their villages which involved a lot of expenses of cash money. After returning from village they had not enough capacity and willingness for purchasing broiler due to lack of cash money and rumour of bird flu. In the whole country, the people had to bear an extra expense of cash money for celebrating Eid-ul-Azha. For thal reason, they were not able and interested to purchase broiler.

Consumption of Broiler

Impact of bird flu on consumption for different occupational classes is shown in the Table 8. Eighty percent farmers, each one-half service holders and businessmen and 40 percent religious leaders gave up broiler consumption for bird flu. It was found that rural, poor and illiterate people were less influenced by bird flu rumour compared with their urban, rich and literate counterparts. (Rahman, 2004) Thirty percent businessmen and each 20 percent religious leader and service holder decreased consumption while nobody but 10 percent religious leaders increased consumption in the period of bird flu. On the other hand, each 30 percent religious leaders and service holders and each 20 percent businessmen and farmers did not change their consumption on account of bird flu rumour. On an average, more than one-half of consumers stopped consuming broiler in the bird flu rumour period.

Table 8. Impact of bird flu rumour on consumption based on occupation.

(Percentage)

Occupation	Impact			
	Reject broiler	Decrease consumption	Increase consumption	No change
Farmer	80	-	-	20
Religions leader	40	20	10	30
Service holder	50	20	-	30
Businessman	50	30	-	20
All consumers	55	17.5	2.5	25

VI. CONCLUSIONS

Because of bird flu rumour, poultry farm owners' loss became so large that they earned only Tk 61 by investing Tk 100. In order to minimize the loss they had no other alternatives but to shut down farm temporarily.

Marketing chain became shorter as direct marketing between producer and consumers increased significantly in the bird flu period. Marketing cost of intermediaries increased markedly during bird flu period because of lower volume of transaction compared with their fixed cost. Gross as well as net marketing margin or profit of traders decreased significantly in the abnormal period due to lower volume of sale. This reveals that margins were positively related to volume of trade. Thus, this result does not support the evidence of constant mark up of traders. Marketing efficiency decreased significantly during bird flu situation because of high marketing cost and low farm and retail prices.

Consumers did not respond instantaneously to the rumour as it took four weeks to fall the price of broiler at the lowest level. When prices of same months of previous and current years were compared, it was found that average fall in price in bird flu period was more than three times as much as the fall in price in normal period. The study showed that apart from bird flu rumour, there were other factors, for instance, more availability of meat during Eid-ul-Azah, were responsible for decrease in price. Finally, it is found that more than one half of consumers stopped consuming broiler due to rumour of bird flu and majority of them were urban, rich and literate people.

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APPENDICES

Appendix Table 1: Weekly retail prices of live broiler during January 2003 to April 2004 in Bangladesh.

Month	Week	Price (Tk/kg)	Month	Week	Price (Tk/kg)
Jan, 03	1st	68	Sep	1st	65
Jan	2nd	68	Sep	2nd	64
Jan	3rd	66	Sep	3rd	66
Jan	4th	65	Sep	4th	62
Feb	1st	62	Oct	1st	65
Feb	2nd	58	Oct	2nd	68
Feb	3rd	65	Oct	3rd	66
Feb	4th	65	Oct	4th	65
Mar	1st	62	Nov	1st	65
Mar	2nd	68	Nov	2nd	67
Mar	3rd	72	Nov	3rd	68
Mar	4th	75	Nov	4th	72
Apr	1st	72	Dec	1st	72
Apr	2nd	72	Dec	2nd	70
Apr	3rd	72	Dec	3rd	68
Apr	4th	74	Dec	4th	62
May	1st	72	Jan, 04	1st	62
May	2nd	68	Jan	2nd	62
May	3rd	65	Jan	3rd	62
May	4th	66	Jan	4th	55
Jun	1st	72	Feb	1st	34
Jun	2nd	70	Feb	2nd	32
Jun	3rd	72	Feb	3rd	30
Jun	4th	74	Feb	4th	35
Jul	1st	74	Mar	1st	48
Jul	2nd	70	Mar	2nd	55
Jul	3rd	72	Mar	3rd	60
Jul	4th	72	Mar	4th	62
Aug	1st	72	Apr	1st	62
Aug	2nd	68	Apr	2nd	66
Aug	3rd	66	Apr	3rd	68
Aug	4th	62	Apr	4th	70

Source: Poultry Khamar Bichitra (Monthly Magazine), 188 Elephant Road, Hatirpul, Dahaka-1205