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Agribusiness of poultry and poultry products in Bangladesh

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Abstract

The present research has been undertaken to study the agribusiness of poultry with the following objectives: to study the market structure and distribution system of important inputs used in poultry farms; to estimate the cost, return and profitability of broiler and layer farms; to examine the existing marketing system and estimate the cost, margin and profit of traders involved in the marketing chain; and to suggest some policy measures for sustained development of poultry industry. According to farm owners the Aratdars were mainly responsible for different crisis in poultry sector. Eighty two Aratdars in Tejgaon area control the whole poultry business in Dhaka. The government has no control over them. They fix price according to their will. The Aratdars reputed the farm owners' complain. They stated that they earned only Tk. 5 as profit from selling 100 eggs.The farm owner association reported that there is no appropriate government policy for poultry industry.

Keywords: Agribusiness, Poultry, Poultry products, Bangladesh

Introduction

Agribusiness encompasses all activities from the "paddock to the consumer" that are relevant to the eventual, transformation/value adding distribution and retailing of food, fibre and associated products. Agribusiness is a name given to the farm inputs, farm and associated consumer products business and their study as an economic and business system. Poultry, an important agribusiness sector, witnessed spectacular expansion in the recent past. A larger number of commercial poultry farms have been established. For supplying day old chicks to these farms a substantial number of poultry hatchery was established in private sector. The scenario in the poultry farming is that almost every day there are new farms coming up and some of the old ones closing down. Sometimes egg and broiler prices go so down (which is lower than the production cost) in the wholesale market that many small and medium farms have no other alternative but to close down temporarily (Prothom Alo, 30/03/02). Moreover, there is high fluctuation of egg and broiler prices. It is blamed that the Aratdars have been earning more profit although the farm owners were selling eggs and broiler at low price. Consequently, the consumers are not getting the benefit of the price. The farm owners blamed that the Aratdars compelled them to sell egg and broiler at low price despite high demand in the market. This study is expected to be useful both at micro and macro levels. It will identify some basic problems that are faced by the owners of broiler and layer farms and will also suggest measures for probable solutions. The research may be of use to the officials of the relevant government and non-government agencies and extension workers in making an appropriate decision regarding further expansion of poultry farming. The unemployed people and potential entrepreneurs will have an avenue for earning income through poultry farming as it is revealed to be a profitable business.

Materials and Methods

The research used data both from secondary and primary sources. Secondary sources include previously done thesis, reports and researches. In order to substantiate the findings from the secondary sources, empirical data were collected from broiler and layer farmers. Field visits were made in Kishoregonj, Savar, Gazipur and Kaliakoir areas during July 2002. To know about the marketing margins, costs and net margins, the Dhaka city market was surveyed at the same time. The findings were also subjected to sensitivity analysis to confirm the stability of the results. Both tabular and statistical methods were used in this study. For collecting empirical data the farmers were divided into three classes: small, medium and large. Costs, returns and profits of layer and broiler farms were estimated. A field survey was conducted in 2002 to look into the profitability of layer birds. Eighteen small, 12 medium and 10 large layer farms were selected. For marketing study, Gazipur district and Dhaka city were selected as producing and consuming areas for poultry products respectively. From each type of trade (egg and broiler) 15-farm owners, 10 Aratdars, 6 wholesalers and 15 retailers totaling 46 traders and farm owners were interviewed for this study. That means the total sample size was 92(46+46). To know the spatial price integration of eggs, Dhaka, Chittagong, Gazipur, Rajshahi, Sylhet and Bogra districts were chosen. Apart from primary data, the average weekly wholesale prices of eggs of the selected markets during 1991 to 2001 were collected from the Directorate of Agricultural Marketing (DAM). Ratio to moving average method was used for estimating seasonal price variation of egg and chicken for Dhaka market during 1991 to 2001. A commonly employed method for measuring the integration between agricultural markets is that of correlating time series price data for different market places and products. Simple correlation coefficient using nominal price as a measure of market integration has been criticized by many authors (Blyn, 1973; Harriss, 1979; Lundahl and Petersson, 1982). Therefore, in this study, the correlation coefficient using first difference in nominal prices was calculated for weekly and monthly egg prices.

Results and Discussion

Market structure and distributions system of important inputs used in poultry farm: The main inputs used by poultry farms are: day old chicks, feed and medicine. The market structure and distribution system of these inputs are discussed below:

Day old chicks

There are over one hundred poultry hatchery farms in Bangladesh. The market structure of hatchery is oligopolistic in nature. One study (Hossain, 2003) showed that the largest four hatcheries controlled 45% and 65% of production in case of broiler and layer respectively. They have associations and price of chicks differs a little among the farms (Table 1). In this market structure the big farms fix the price and the small ones follow them. The individual hatchery sets price unilaterally considering the probable reaction of other farm. This type of price determination may be termed as interdependent action without agreement. The other characteristics of this industry are: atomistic buying condition, evidence of product differentiation in the form of strain and existence of barrier to entry in the form of huge capital requirement. In order to get chicks the poultry farms have to place order through agent well ahead. For ensuring timely delivery of day old chicks the farms require advance deposit of a portion of contract value. The farm owners have to wait 3 to 8 weeks for delivery of day old

chicks after advance payment. After receiving chicks, the agent sells them to farm owner and receive commission fixed by the hatchery. Generally the price of chick remains the same throughout the year. Sometimes price changes due to change in demand. As it is very difficult for them to identify good chicks, sometimes they have to accept bad quality (C grade) chicks. Generally they cannot purchase chicks directly from the hatchery and have to book earlier through agent. They have no scope to bargain and have to purchase at prices fixed by the hatchery owners. The price, according to them, is much higher and the hatchery earns abnormal profit.

Table 1. Price of Day-old Chicks for Different Companies

Name of company	Broiler chicks		Layer Chicks	
National	22.00	13.00	16.00	11.00
Naris	23.00	14.00	17.00	10.00
Dhaka	20.00	12.00	16.00	10.00
Kazi	20.50	12.00	15.00	10.00
Paragon	22.00	13.00	16.00	11.00
Finix	18.00	10.00	-	-
Royal	19.00	11.00	-	-
BRAC	19.00	14.00	-	-
Sylhet	-	-	-	9.00

Feed

The broiler farm owners purchase ready made feed for their birds. On the other hand, the layer farm owners prepare own feed after purchasing ingredients from the market. Like hatchery, the feed mills supply feed through their agents/dealers via their sales centre at a price fixed by them. The price of feed does not vary much throughout the year. However, at times of high demand the agents raise price by creating artificial scarcity. The structure of feed mill industry in Bangladesh is moderately concentrated oligopoly. It was found that the largest four farms produce one-thirds of total industry's production (Roy, 2001). A degree of interdependency in determining price was found among the farms. They are always conscious about the probable reaction of the rivals in the case of setting/changing price. As a result, the price variation across farms is not significant. The price per kg of feed ranged from Tk. 14 to 16. Atomistic buying condition, product differentiation in the form of quality and entry barrier in terms of less access to liquid fund are the major characteristics of this industry. The capacity utilization of this industry is satisfactory, which was 94% during 1999 and the economic profit rate was found positive (Roy, 2001). The layer farm owners purchase ingredients like maize, bran, soybean and oyster shell from wholesaler; protein, lysine, enzyme plus, mythionine and layer premix from agents/dealers and salt from retailers. The price of ingredients such as protein, enzyme, premix etc. supplied by different companies was more or less the same in the study area. The farm owners faced problems of selecting good quality of feed. As a result, sometimes they incurred loss by purchasing adulterated feed. Sometimes necessary feed was not available in the market. The layer farm owners complained on the non-availability of ready feed in the market.

Medicine

The farm owners purchased medicine from agents at price fixed by the company. At the time of large-scale disease attack the agents raised the price of necessary medicine by creating artificial scarcity. The price of the same medicine varied markedly across different companies. For example, the retail price of Arif's Allvit was Tk.182 per 100g, whereas the same medicine/vitamin of Square named Megavit was sold at Tk.400 per 100 g.

Profitability of broiler and layer production

A study (Karim, 2000) was conducted on broiler farms that were contract growers under Aftab Bahumukhi Farm Ltd. (ABFL) in Kishoregonj (Table 2). The Aftab farm provided some support services and guaranteed price. The net return per 100 birds amounted to Tk. 1205, Tk. 1204, Tk. 1345 and Tk.1267 for small, medium, large and all farms respectively. As ABFL supplied necessary inputs on credit as well as provided technical services to contract growers, it offered lower than market price to the growers. As a result their net return was found lower. These returns appear to be the lower bound return of broiler farming. Fokrul *et al.* (2002) obtained similar results which showed that larger farms achieved higher efficiency not only due to better cost economy but also due to better technical performance of the flock. To explore the profitability of layer farms, a very recent survey was conducted in Gazipur in 2002 (Table 3). The findings of this study were substantiated by Khanum's study (Table 4). According to the recent survey, costs per 100 birds amounted to Tk. 52581, Tk. 50135, Tk. 48398 and Tk. 50070 for small, medium, large and all farms respectively. Annual net return per 100 birds amounted to Tk. 23310, Tk. 20115, Tk. 22236 and Tk. 21946 for the small, medium, large and all farms respectively. The net return per 100 birds obtained from Khanum's study (2002) amounted to Tk. 19551, Tk. 22416, Tk. 23909 and 19480 for the small, medium, large and all farms respectively. The findings of the two studies vary slightly. Hence it appears that both broiler and layer farming are profitable enterprises. Layer farming, however, is more profitable than broiler farming. Assuming a flock size of 8000 layer birds, the annual net returns may range between Tk. 16.00 lakh to Tk. 17.00 lakh. Farmers, however, are still more interested to broiler rearing because of quicker returns.

Table 2. Cost and return of contact broiler growers by farm size (Tk. /100 birds)

Particulars	Small	Medium	Large	Aii farms	% of total cost
Variable Cost Items					
Feed cost	4066	4046	4066	4057	52.55
Day old chick	2200	2200	2200	2200	28.50
Hired labour	165	155	145	154	1.99
Veterinary cost	406	492	532	493	6.39
Clearing	34	38	34	36	0.47
Transportation	120	119	113	117	1.52
Electricity	107	95	78	90	1.17
Litter cost	33	35	30	33	0.43
Total variable cost	7131	7180	7198	7180	93.01
Fixed Cost Items					
Family labour	110	73	54	73	0.95
Housing	126	119	106	115	1.49
Tools & Equipment	28	30	34	31	0.40
Interest on operating capital	303	305	305	304	3.94
Land use cost	18	29	28	17	0.22
Total Fixed Cost	585	556	528	540	6.99
Total cost	7716	7736	7726	7720	100.00
Total Gross Return	8921	8940	9071	8987	.
Net return	1205	1204	1345	1267	.
Benefit-Cost Ratio	1.16	1.16	1.17	1.16	.

Source: Karim, 2000

Table 3. Cost and return of layer production or farming by farm size (Tk. /100 birds)

Particulars	Small	Medium	Large	All farms	% of total cost
Variable cost items					
Feed cost	40536	39512	39213	39682	79.25
Hired labour	1825	1655	1473	1622	3.24
Veterinary cost	941	980	896	933	1.86
Electricity	594	485	354	458	0.91
Carrying cost	413	314	173	280	0.56
Litter cost	340	227	136	219	0.44
Day-old-chick	2420	2322	2200	2296	4.59
Total Variable Cost	47069	45494	44446	45489	90.85
Fixed Cost Items					
Family labour	1504	984	654	984	1.97
Housing	679	605	514	586	1.17
Tools & Equipment	722	540	484	566	1.13
Interest on operating capital	1586	1587	1546	1569	3.13
Land use cost	1018	925	754	876	1.75
Total Fixed Cost	5512	4641	3952	4581	9.15
Total cost	52581	50135	48398	50070	100.00
Total Gross Return	75891	70250	70634	72016	-
Net return	23310	20115	22236	21946	-
Benefit-Cost Ratio	1.44	1.40	1.46	1.44	-

Source: Field Survey, 2002

Table 4. Cost and return of layer production or farming by farm size.(Tk. /100 birds)

Particulars	Small	Medium	Large	All farms	% of total cost
Variable cost items					
Feed cost	42931	42140	41889	43346	78.28
Hired labour	1809	2015	1796	2025	3.66
Veterinary cost	999	1002	1004	1002	1.80
Electricity	668	495	404	535	0.97
Carrying cost	446	301	146	298	0.54
Litter cost	354	231	142	242	0.44
Day-old-chick	2410	2154	1992	2185	3.95
Total Variable Cost	49617	48338	47374	49632	89.64
Fixed Cost Items Family labour	1659	1038	711	1063	1.91
Housing	778	604	518	633	1.14
Tools & Equipment	787	601	504	631	1.14
Interest on operating capital	2481	2497	2369	2482	4.48
Land use cost	1278	982	635	929	1.68
Total Fixed Cost	6983	5722	4737	5737	10.36
Total cost	56600	54060	52110	55369	100
Total Gross Return	76151	76476	76019	74849	-
Net return	19551	22416	23909	19480	-
Benefit-Cost Ratio	1.35	1.41	1.46	1.35	-

Feed comprises a large share of total cost in broiler and layer rearing. For broiler rearing feed cost roughly comprises around 50 per cent of the total cost. The corresponding cost for layer rearing constituted closer to 80 per cent. There is a scope to reduce feed cost by increasing management efficiency. Timely availability of feed and its quality very often cause higher feed cost to poultry farmers.

Marketing chains of broiler and eggs

Egg

The market participants involved in marketing of egg are farm owner, Dalal, Aratdar (large wholesaler), Wholesaler, hawker and retailer. The farm owners sold 90% of their eggs at their farm gate to the Aratdar and 10% to wholesaler through Dalal. Dalals are the local people who arrange contacting farm owners with Aratdar or wholesaler for transaction. They received Tk. 4 to Tk. 5 for selling 100 eggs from the farm owner for their service. Sometimes they do not disclose the actual selling price to the farm owner. After purchasing eggs from farm owner, the Aratdars sold two-thirds of their eggs to wholesaler and one third to retailer (Fig. 1). The wholesalers purchased most of their product from Aratdars (large wholesaler) and sold two-thirds to retailers and one fourth to hotel owners. They disposed of some amounts to Hawker and directly to consumer. Retailers purchased 60% eggs from wholesalers and 40% from Aratdars and sold 70% to consumers and 30% to hotel owners.

Broiler

Like egg marketing chain, the participants involved in broiler marketing are farm owner, Dalal, Aratdar (large wholesaler), wholesaler, hawker and retailer. The broiler farms sold 80% of their produce to the Aratdar and 20% to wholesaler at their farm gate through Dalals who help the owner to sell product. Dalals generally obtained Tk. 50 for selling per 100 kg of broiler. The Aratdars, on the other hand, sold 73% of their product to wholesaler, 15% to hotel owner and 12% to retailer (Fig. 2). The wholesalers vend one half to retailer and one fourth directly to consumer. They also disposed of over 20% to hotel owner and a few amounts to hawker. Retailers purchased 80% eggs from wholesalers and 20% from Aratdars and sold 86% to consumer and 12% to hotel owner. They sold very small quantity to Hawker.

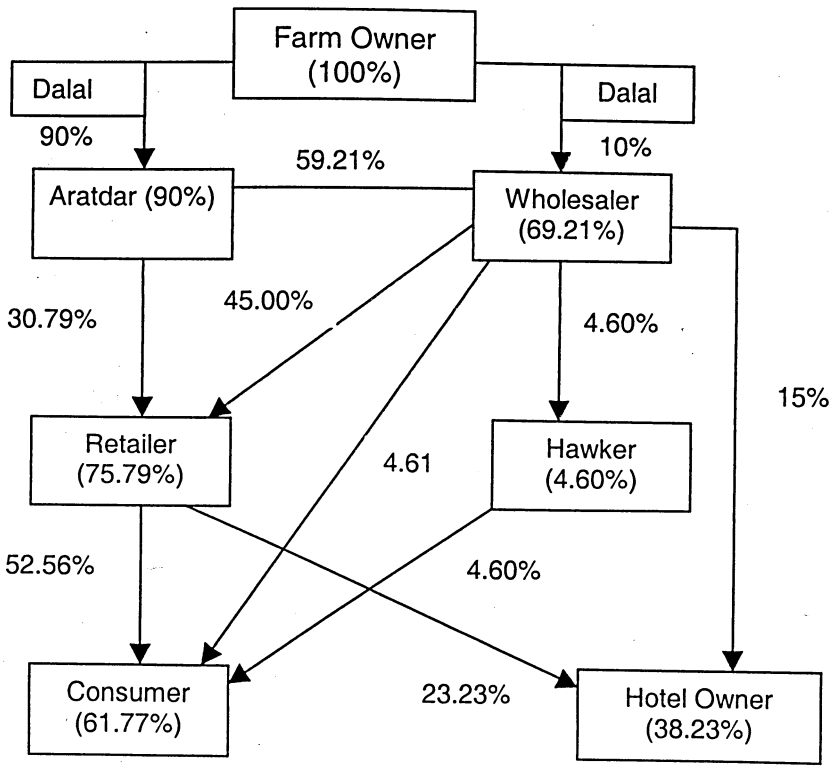

Fig. 1 Marketing Chain of Egg in Dhaka City

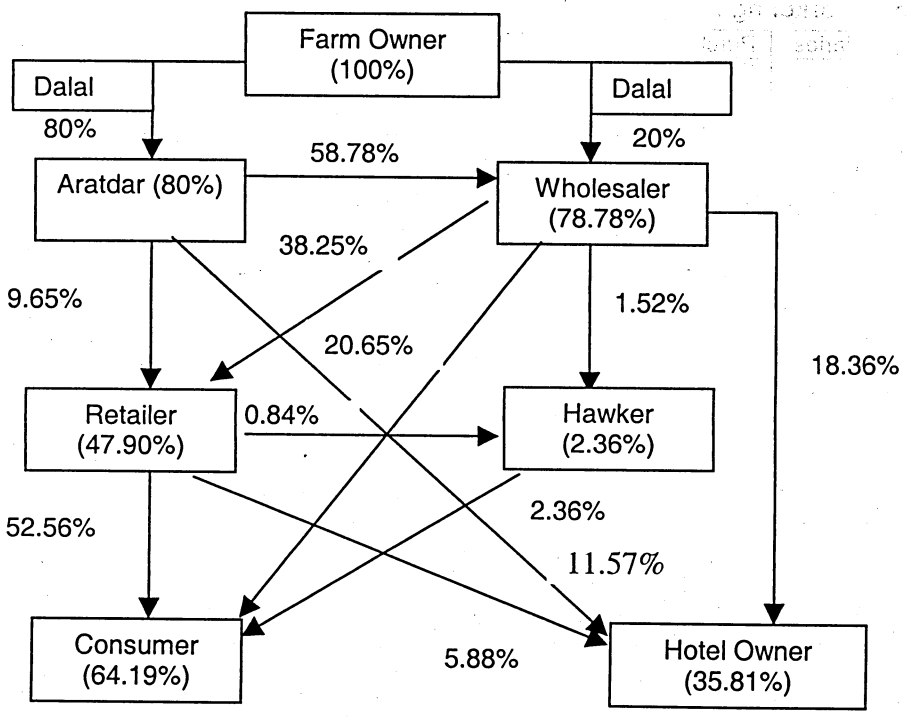

Fig. 2 Marketing Chain of Broiler in Dhaka City

MARKETING COST, MARGIN, PROBLEMS AND PRICE FIXATION PROCEDURE

Marketing cost and margin

Egg: The total marketing cost incurred by different intermediaries for one hundred eggs was calculated at Tk. 12.67, of which more than three fourths (78%) was shared by Aratdar (Table 5). Transportation was the highest cost item, accounted for about one half of total cost. As Aratdars bring eggs directly from farms, which are located far away from Dhaka city, they incurred higher transportation and wastage cost compared with other traders. Among the traders, retailers' net margin or profit was over three times higher than that of wholesalers (Table 6) because of the fact that they assumed more risk compared with other traders. Retailers have to wait long time to sell a fixed quantity of egg compared with other traders. Although Aratdars' per unit profit was lower (4% of sale price), their total profit per unit of time must be higher because of selling large quantity of eggs in a day.

Table 5. Marketing Cost of Egg Intermediaries. (Tk./100 eggs)

Cost item	Aratdar	Wholesaler	Retailer	Total	Percentage
Transportation	5.32	0.38	0.55	6.25	49.33
Storage	0.63	0.10	0.00	0.73	5.76
Market toll	0.28	0.15	0.12	0.55	4.34
Labour	0.31	0.05	0.08	0.44	3.47
Wastage	2.21	0.33	0.50	3.04	24.00
Rent	0.57	0.25	0.19	1.01	7.97
Miscellaneous	0.52	0.09	0.04	0.65	5.13
Total	9.84	1.23	1.48	12.67	100.00

Table 6. Marketing Margin of Egg Traders (Tk./100 eggs)

Intermediaries	Purchase price	Sale price	Marketing margin	Marketing cost	Net Margin
Aratdar	229.76	249.15	19.39	9.84	9.55
Wholesaler	272.13	279.50	7.37	1.35	6.02
Ratailer	281.86	303.33	21.47	1.48	19.99

Broiler: Among the traders, Aratdars' marketing cost was the highest comprising about 60 per cent of total marketing cost of all traders because of the fact that they ship product from long distance (Table 7). Transportation, the highest cost item, accounted for about 40 per cent of total cost, followed by wastage of 20 per cent and storage 15 per cent. Unlike egg traders, wholesalers' profit was found higher than that of other traders, although retailers bear more risk (Table 8). This has happened due to the fact that contrary to egg wholesalers, broiler wholesalers sold more than one half of their product either directly to the consumers or to the hotel owners. They may be called as wholesaler cum retailer instead of simply wholesaler. As Aratdars trade more amount of product per unit of time, their total profit must be higher than that of other traders.

Table 7. Marketing Cost of Broiler Intermediaries (Tk. /100 broiler)

Cost item	Aratdar	Wholesaler	Retailer	Total	Percentage
Transportation	2.56	0.30	0.18	3.04	38.83
Storage	0.49	0.43	0.27	1.19	15.20
Market toll	0.08	0.12	0.17	0.37	4.73
Labour	0.45	0.12	0.13	0.70	8.94
Wastage	0.85	0.28	0.43	1.56	19.92
Rent	0.19	0.23	0.22	0.64	8.17
Miscellaneous	0.03	0.15	0.15	0.33	4.21
Total	4.65	1.63	1.55	7.83	100.00

Table 8. Marketing Margin of broiler intermediaries (Tk. /100 broiler)

Intermediaries	Purchase price	Sale price	Marketing margin	Marketing cost	Net Margin
Aratdar	53.20	60.16	6.96	4.65	2.31
Wholesaler	58.00	63.70	5.70	1.63	4.07
Retailer	59.41	64.58	5.17	1.55	3.62

Price fixation procedure

Aratdars and farm owners jointly determine the farm level broiler and egg prices. At Arat level, price is settled by open bargaining mainly based on competition among the Aratdars. Wholesale price is fixed on the basis of competition among the sellers. Finally, retailers follow mark-up method to fix up selling price.

Marketing problems

Illegal payment, hooliganism, terrorism, fluctuation of prices and death of birds are the major problems mentioned by all broiler traders. Additionally, the wholesalers and retailers pointed out weight loss and increase in feed cost due to delayed sale as problem. Like broiler traders, egg traders mentioned illegal payments, terrorism, price fluctuation, wastage of eggs are the major problems. Besides, Aratdars cited poor communication system, presence of Dalal, Hartal, blockade etc. as the main problems.

Spatial Price Variation

The estimated correlation coefficients between different markets for weekly and monthly prices are presented in Tables 10 and 11 respectively. In case of weekly prices, all the coefficients are below 0.30 and only 8 out of 15 coefficients were significant. This indicates that all the selected egg markets are either not integrated or integrated poorly in the short run.

Table 9. Correlation Coefficient Matrix of Weekly Egg Prices in Selected Markets

Markets	Dhaka	Chittagong	Rajshahi	Gazipur	Bogra	Sylhet
Dhaka	1.00	0.28*	0.13*	0.18*	0.04	0.13*
Chittagong	0.28*	1.00	0.13*	0.06	-0.007	0.19*
Rajshahi	0.13*	0.13*	1.00	0.19*	0.06	0.09
Gazipur	0.18*	0.06	0.19*	1.00	0.07	0.07
Bogra	0.04	-0.007	0.06	0.07	1.00	0.12*
Sylhet	0.13*	0.19*	0.09	0.07	0.12*	1.00

* Significant at 1% level

Table 10. Correlation Coefficient Matrix of Monthly Egg Prices in Selected Markets

Markets	Dhaka	Chittagong	Rajshahi	Gazipur	Bogra	Sylhet
Dhaka	1.00	0.75*	0.49*	0.53*	0.23*	0.39*
Chittagong	0.75*	1.00	0.49*	0.52*	0.26*	0.49*
Rajshahi	0.49*	0.49*	1.00	0.45*	0.34*	0.30*
Gazipur	0.53*	0.52*	0.45*	1.00	0.44*	0.32
Bogra	0.13*	0.26*	0.34*	0.44*	1.00	0.22
Sylhet	0.39*	0.49*	0.30*	0.32*	0.22*	1.00

* Significant at 1% level

For monthly price data, all the coefficients are low but significant. Except coefficient between Dhaka and Chittagong, all the coefficients are below 0.60. The correlation coefficient between Dhaka and Chittagong markets is highly related in the long run. This has happened due to the good communication (road and telephone) between these two markets. All other markets are moderately integrated in the long run.

Conclusions

Input sector: Poultry inputs like chick, feed and medicine markets are oligopolistic in nature, in which prices are determined individually considering probably reaction of others. Invisible collusion in determining prices exists among the farms and the possibility of earning abnormal profit cannot be ruled out. For that reason the prices of inputs of different farms were noted to be high and by and large equal. Except in case of medicine, prices vary a little across the farms. The prices do not vary significantly throughout the year. However, at times of high demand the agents raise price by creating artificial scarcity. The farm owners have little knowledge to select the good quality inputs and incur loss by using poor quality inputs. They have no choice but to accept inputs at a price fixed by the company through agent.

Production Sector: It was observed that both broiler and layer farming are profitable enterprises. Farmers, however, are more inclined to broiler production because of quicker returns. These enterprises, at present, are confronted with a number of technical, biological, marketing and management constraints.

Marketing Sector: Although farm owners and Aratdars jointly determine the farm level prices of eggs, the demand and supply forces are very important in determining prices in the market. However, because of weak bargaining power of producers compared with Aratdars have an upper hand in fixing prices. Farm owner sometimes reportedly incurs loss by selling eggs and broiler at a price lower than their production cost whereas such situation never arises in case of Aratdars. That means Aratdars' profit is certain and constant while producers' profit remains very uncertain and fluctuating. In majority of cases, the transaction between Aratdar and farm owner has taken place through local Dalal. For this reason both the parties incur loss to the amount paid to the Dalal as commission. Although Aratdars' profit (4% of sale price) is lower, their total profit per unit of time must be higher as they handle larger volume of product. High wastage cost (about one-fourth of total marketing cost) implies lack of physical facilities, especially storage, in the market.

Egg and broiler prices show a distinct and regular seasonality in a year. The pattern of price is a reflection of a number of factors including, among other things, availability of eggs and broiler (both commercial and indigenous) and change in demand arising from change in weather condition. As a perishable commodity, this high fluctuation of prices makes poultry industry very much uncertain. The study also shows that egg markets are poorly integrated despite development in communication in the recent past.

(i) Government should take appropriate policy measures for ensuring supply of quality feed and day old chick to the farm owners.
(ii) Farmers should be given short-term training to improve their management skill.
(iii) Appropriate housing design, especially to reduce summer stress is essential for reducing production loss due to heat stress.
(iv) Extension services need to be strengthened for imparting improved feeding, housing, nutrition, management and disease control measures.
(v) Establishment of grandparent farms is needed which could certainly reduce the price of day old chicks resulting in higher profit of farms.
(vi) Introduction of processing (dressed) and further processing (cut up parts) of poultry and use of poultry egg and meat in value added products could help to reduce price fluctuation.
(vii) Farm owners may be organized in an association so that they can sell their produce directly to the Aratdars instead of via Dalal. Besides, in this way their bargaining power will be improved.

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