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Market structure of poultry hatchery industry in Bangladesh

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Abstract

In this paper an attempt has been made to analyze the market structure of poultry hatchery industry in Bangladesh. Both the primary and secondary data were used. The primary data were collected from hatcheries located at different districts of Bangladesh. Out of 130 hatcheries only 36 hatcheries were selected purposively for the study. The hatchery sold larger portion of their day-old chicks through their agents. Sometimes they sold a portion of their products directly to the commercial poultry firm owners. In the case of broiler and layer hatchery industry, the four firms concentration ratios were found very much similar to the type IV industry and nearly similar to type II oligopoly of Bain's classification respectively. The market structure of hatchery industry in Bangladesh was exhibiting oligopolistic with low moderate concentration in the case of broiler and highly concentrated in the case of layer. Atomistic buying condition was prevailing in the hatchery industry. There were about 11 strains for broiler chick and 9 strains for layer chick and prices varied for different strains. Barrier to entry in the form of huge capital requirement was also present in the industry.

Keywords: Poultry hatchery, Distribution, Market structure

Introduction

Poultry production and poultry related industry contribute much more to total livestock sub-sector in Bangladesh. Livestock sub-sector contributes 15.07 per cent to total Agricultural GDP in 2001-2002 at current prices. In agro-based economy of Bangladesh livestock plays a potential role contributing about 2.95 per cent of GDP in 2000-2001. In Bangladesh, production of poultry eggs and meat per annum are about 4424.4 million numbers and 0.78 million ton respectively (EPB, 2002). Poultry plays an important role in reducing the gap between demand and supply of protein in the country. It provides about 25 per cent of the total animal protein source in Bangladesh (Haque, 1991). Consumption of eggs and meat per head per annum were only 26 numbers and 4.38 kg respectively (DLS, 1999-2000). Per capita per day protein availability was 102.64 gm and requirement was 125 gm in 1997-98 (Khan and Husain, 2002). Shortage of animal protein is also a vital issue for a populated country like Bangladesh. Considering the nutritional and economic point of view, the importance of poultry farming in this country can not be ignored.

Poultry is very efficient in converting agro industrial by products into protein rich food for human. In the country average per capita calorie intake is 2244 k. cal (BBS, 1997). The sources of meat for human consumption are mainly cattle, goat, sheep, pork and chicken; but the common source is chicken, which can be produced commercially within the shortest possible time. Besides, hatchery in Bangladesh can play an important role for generation of employment opportunities and income for the unemployed youth. In livestock sub-sector 26.02 per cent are self-employed to total agricultural sector (ECNEC, 1999).

To have a clear understanding about the hatcheries, the present study is a modest attempt to examine the market structure of poultry hatchery in Bangladesh. In brief that the present study is justified on the following grounds: Firstly, there was only one earlier study, conducted in 1998, on poultry hatchery industry in Bangladesh. So, it would provide recent information about the hatchery industry. Secondly, market structure changed over time and different structures need different types of policy and planning. Present study would bring valuable recent information, which would be used for policy formulation and used to solve present problems. With this regard the present study was undertaken to attain the following specific objectives.

- (a) To identify the existing distribution system of day-old-chicks.
- (b) To analyze the market structure of poultry hatchery industry in Bangladesh.

Materials and Methods

To achieve the purpose of the study necessary data were collected from hatchery firms all over the country. Dhaka, Savar, Gazipur, Kishoregonj, Faridpur, Rajbari, Chittagong, Noakhali, Bogra, Narayanganj, Tangail and Chuadanga districts were selected to collect data for the year 2002 from hatchery owners during the period of mid February to mid April, 2003 for the present study. All hatchery firms of Bangladesh were considered as the population for this study. Out of 130 hatchery firms, 36 firms were selected purposively considering the time and resource constraints for this study. Among the selected firms, although all firms produced boiler chicks but only 13 firms produced both boiler and layer chicks. The selected hatchery owners were categorized into three groups viz. (i) Small (having production capacity below 1,25,000 day-old-chicks per week) (ii) Medium (having production capacity of 1.25 to less than 2.0 lac numbers of day-old chicks per week) (iii) Large (having production capacity above 2.0 lac numbers of day-old chicks per week). Out of 36 firms 18 were small, 12 were medium and 6 were large. For this study data were collected from both primary and secondary sources. Average and percentage were the major statistical tools employed to show the results in a comprehensive manner. The concentration ratio was used for measuring the degree of seller concentration in this study. In symbolic form concentration ratio is expressed as;

$$CR_m = \sum_{i=1}^m S_i$$

Where, CR_m = the m firm concentration ratio,

S_i = the market share of i -th firm in descending order;

$$S_i = \frac{q_i}{Q}$$

q_i is the sales figure of i -th farm and Q is the total industry's sale
 $m = 3, 4$.

Distribution system of day-old chicks

Distribution refers to the physical movement of products from production points to points where consumers are located (Branson and Norvell, 1983). The channel of distribution can be thought as the sequence and combination of agencies through which one or more marketing flows move. These flows include physical possession, ownership and title transfer, negotiation, financing, information, risk taking, ordering and payment (Sims *et al.* 1977).

In the present study, it was found that the distribution system of day-old-chick was very simple. The three components of the day-old-chick distribution system are discussed in turn in the succeeding paragraphs.

Distribution channel

Distribution channels are composed of those intermediaries or middleman through whom the transaction of goods takes place between producer and consumer. Details pertaining to the present status of distribution channels in the hatchery industry are illustrated in Fig. 1.

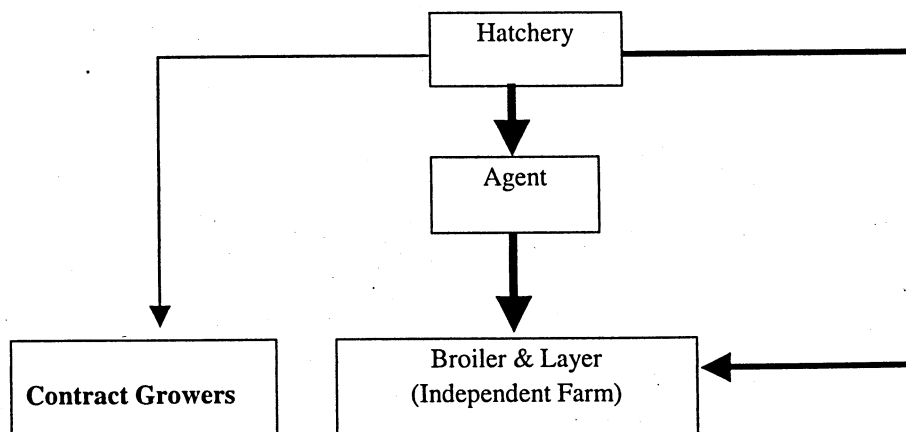









Fig. 1. Marketing channels of day-old chicks

Note:

-  More important channel
-  Important channel
-  Less important channel (used only by 2 hatcheries)

On the basis of Figure 1 the following channels of distribution can be identified:

- i. Hatchery  Agent  independent farm owner
- ii. Hatchery  independent farm owner
- iii. Hatchery  Contract grower

The hatchery sold larger portion of their day-old-chicks to the poultry farms through their agents. Sometimes, they sold a portion of their day-old-chicks directly to the commercial poultry farm owners. Two hatcheries had contract growers for broiler raising/rearing. So, besides normal sales to the poultry farm owners, they supplied broiler chicks to the contract growers.

A brief description of the market participants involved in the distribution channels of poultry hatchery industry are discussed below:

Market participants

(a) **Hatchery:** Of the 36 broiler hatcheries only 4 firms reared 7 per cent and only 2 layer hatcheries (out of 13) used 7.5 per cent of their chicks in their own firms. Thirty one per cent broiler and 15 per cent layer hatchery firms sold all of their chicks through agent. That means, the remaining 69 per cent broiler and 85 per cent layer hatchery firms sold their product to the poultry firms either through agent or not through them.

(b) **Agent:** In the distribution of day-old-chicks, agents are appointed by the hatchery on commission basis. The commission ranged from Tk. 1 to Tk. 2 per chick sold. The agents had to deposit security money generally Tk. 25000 per thousand chicks; but it varied from hatchery to hatchery before appointment. They mainly supply day-old-chick to poultry farm after receiving them from the hatchery. All the selected hatcheries sold their chicks (80%) with the help of agent. The rest were sold directly to the poultry farm owners.

(c) **Contract Growers:** Contract growers were those poultry farm owner, who reared broiler and layer on contract basis. According to the agreement of firms having contract growers, it extends a full credit facility to the farmers for supply of required numbers of day old chicks as per house capacity, monitoring of health, vaccines, medicines, feed, technical services etc. and marketing the final products. They purchased day old chicks from the hatchery on credit through contractual arrangement.

(d) **Farm owners:** Farmers referred to both the broiler and layer farms owners. These farms were privately owned business enterprises, which were located at different places of the country. Almost all farms were owned by a single person.

Marketing Function

Marketing function may be defined as a major specialized activity performed in accomplishing the marketing process (Kohls and Uhl, 1980). In this paper the marketing functions of poultry hatchery has been broken down into the following functions. Such as:

(a) **Buying and Selling:** The main buyers of day old chicks were poultry farm owners. The hatcheries usually sell their products to the poultry farm through their agent. Sometimes, they sell directly to the farm.

(b) **Packaging:** In the hatchery special kind of facilities and arrangement were required for packaging of day-old chicks in the process of their marketing. Different kinds of paper boxes and bamboo baskets were used for packaging day-old-chicks and in each box forty to fifty one chicks were placed. Cost per box or basket varied from Tk.17 to Tk. 23 in the case of paper box and from Tk. 7 to Tk. 13 Tk. in the case of bamboo basket. Cost of boxes or baskets varied on the basis of quality.

(c) **Transportation:** About 50 per cent of hatcheries used own vehicle to carry the day old chick to sales center or to the poultry farm and rest of them had no transportation facilities. The average transportation cost per chick was estimated at TK. 0.04 to Tk. 0.33. The transportation cost varied across firms because of variation in utilizing the capacity of vehicles.

(d) **Grading:** In the hatchery first of all, abnormal chicks were removed and then male and female chicks were separated by using auto-sexing method in the case of layer chicks. Finally, the chicks were graded like A, B, B⁺, C on the basis of some features such as dry feathers, weight, vigorousness and other attributes.

(e) **Pricing:** Each hatchery determined the price of its product based on the demand and supply of the product in the market. They follow cost pricing method and imitation of competitors pricing method for fixing their product. As a result, chick's price varied among the hatcheries.

(f) **Market Information:** The hatcheries contacted individually with foreign company for buying parent stock and they sold their day old chicks directly to the poultry farm. There were many organized system of market intelligence for the hatchery such as consultancy firms, poultry related magazine, agents etc. from which hatcheries got information about their competitors and target consumers.

(g) **Financing:** Financing includes various forms of advances from different lending institution or sources. For an effective operation of the hatchery business the hatchery owners need sufficient money. It was observed that all hatcheries ran their business by their own capital plus loan taking from the bank.

Market structure

Market structure refers to the organizational characteristics of a market; and for practical purposes we emphasize those characteristics which determine the relations (a) of sellers in the market to each other, (b) of buyers in the market to each other, (c) of the sellers to buyers, and (d) of sellers established in the market to potential new firms which might enter the market (Bain, 1968). From the definition quoted from Bain, the following dimension or salient aspects of market structure can be identified.

- (a) The degree of seller concentration.
- (b) The degree of buyer concentration.
- (c) The degree of product differentiation.
- (d) The condition of entry of the market.

The main purpose of this paper is to examine the market structure of poultry hatchery industry. Here, the present paper takes a close look at the dimensions of market structure.

(a) **Degree of Seller Concentration:** The term degree of "seller concentration" refers to the number of sellers in a market, and to the relative sizes of sellers with any given number (Bain, 1968). In order to examine the degree of seller concentration of poultry hatchery industry in Bangladesh, one measure of concentration, which is concentration ratio can be used. However, considering the availability of necessary data, volume of sales was used in the present study for measuring concentration.

The concentration ratio: The concentration ratio is the numerical index most widely used by the specialists for measuring size distribution of firms in a market. On the basis of sales volume the m-firm concentration ratio is the share of total sales accounted for by the m-largest firms in the market. The concentration ratio is thus calculated by ranking the relevant firms in terms of their sales volume and then dividing the sales volume of m largest firms by the industry total. M can take any number i.e., 3, 4, 8 etc.

The three firms and four firms concentration ratio of poultry hatchery industry were computed for five years (1998 –2002) and presented in Table 1. In the case of broiler hatchery industry, the four firms concentration ratios were found very much similar to the type IV industry of Bain's classification. Bain denominated the type IV industry as oligopoly with low moderate concentration. Criteria stated for this category were roughly 35 to 50 per cent of the markets controlled by four firms and roughly 45 to 70 per cent by eight firms with large numbers of sellers (Bain, 1968). Hence on the basis of Bain's classification an inference can be drawn here that the broiler hatchery industry in Bangladesh exhibits a low moderately concentrated oligopoly.

Table 1. Concentration ratios in different years in the case of broiler and layer chicks

Year	Concentration ratio (%) on the basis of sales volume			
	Broiler Chicks		Layer Chicks	
	3 firms	4 firms	3 firms	4 firms
1998	35.71	42.77	59.32	77.60
1999	33.18	39.90	56.08	67.42
2000	41.20	49.58	60.27	68.13
2001	39.09	46.27	57.59	70.75
2002	39.89	45.04	57.93	62.38

In the case of layer hatchery industry the four firms concentration ratios were found nearly similar to type II oligopoly. Bain denominated the type II industry as oligopoly with high concentration. Criteria stated for this category were roughly 65 to 75 per cent of the market controlled by first four firms and roughly 80 to 90 per cent by eight firms and by a competitive fringe of small seller usually ranging firm 20 or 30 to above 100 in number (Bain, 1968). Hence on the basis of Bain's classification an inference can be drawn here the layer hatchery industry in Bangladesh exhibited a highly concentrated oligopoly.

(b) Degree of Buyer Concentration: Buyer concentration has similar significance in determining the character of competition among buyers and the characters of the relationships between buyers and sellers that condition ultimate market performance (Bain, 1968). It was found that the buyers of poultry hatchery industry in Bangladesh were mainly the private owned broiler and layer firms. These firms were numerous in number, small in size and located scattered all over the country. Each buyer purchases so little amount of day-old chicks that he cannot influence the price either by restricting his purchase or by bargaining with sellers. So, on the basis of these features it can be concluded here that, no evidence of buyer concentration was found rather atomistic buying condition was prevailing in the industry.

(c) Degree of Product Differentiation: The degree of product differentiation refers to the extent to which buyers differentiate, distinguish or have specific preferences among the competing outputs of the various sellers established in an industry (Bain, 1968). Generally, day-old-chicks of hatchery industry can be differentiated by using one or more of the sources such as (i) ignorance of the buyers about the product characteristics, (ii) differences in quality of the day-old chicks of different hatcheries, (iii) sales promotion practices, (iv) packaging and relative prices, (v) brand and good will of the hatchery (vi) location of the hatchery and (vii) ancillary services.

Almost all the respondents mentioned that, product differentiation was present in the poultry hatchery industry. The product of poultry hatchery industry can be classified into broiler day-old chick and layer day-old chick. The different hatcheries use various strains for broiler and layer chicks. Tables 2 and 3 show the various broiler and layer strains of poultry in Bangladesh respectively.

There are, on an average, about 20 strains for layer and 25 strains for broiler in Bangladesh (DLS, 1997). But the sample hatcheries used 11 strains for broiler and 9 strains for layer.

Table 2. Broiler strains of different hatchery firms

Strain	No. of firms	Percentage of firms
STAR BROW	15	41.67
ARBOR ACRES	9	25
HB-CLASSIC	8	22.22
KASILA	6	16.67
HB-HI-Y	4	11.11
VENCOBB	4	11.11
MPK 30	2	5.56
COBB-500	2	5.56
COBB-100	1	2.78
CNM	1	2.78
ISA-V	1	2.78

Table 3. Layer strains of different firms

Strain	No. of firms	% of firms
SHAVER STAR CROSS 579	4	30.77
HYLINE BROWN	3	23.08
HISEX BROWN	3	23.08
BROWN NICK	2	15.38
BABCOCK BV300	2	15.38
BOVANS NERA	2	15.38
LOHMANN BROWN	1	7.69
NICK CHICK	1	7.69
ISA BROWN	1	7.69

In case of Broiler chicks, one firm had 4 stains, 4 firms reared 3 strains, 5 firms had 2 strain and the rest 26 firms had 1 strain. In case of layer hatchery, 2 firms had 3 strains, another 2 firms had 2 strains and the rest 9 firms had 1 strain. All the respondents opined that well growth of chicks, low mortality rate, highly resistant to diseases, good health of chick, more egg production etc. enabled the buyers to differentiate the day old chicks of different hatcheries of the industry.

The existence of product differentiation in this industry would greatly expand the market strategies open to the hatchery owners. Thus the industry is characterized by moderate degree of seller concentrations and high product differentiation.

(d) Condition of Entry to the Market: The condition of entry to an industry determines the competitive relationships between established seller and potential entrant-sellers. Actually the condition of entry measures the ability of established firms to secure a higher profit without attracting new competitors. The condition of entry to an industry is an indication of presence of barriers to entry to that industry. The barriers to entry in the hatchery industry are discussed below:

Sources of Barriers to Entry

Barriers to entry are some sources of disadvantage to potential entrants as compared with established firms. In general these barriers to entry are mainly of three types;

- (i) Advantages of established firms over potential entrant firms due to economies to large-scale firms.
- (ii) Absolute cost advantages of established firms over potential entrant firms.
- (iii) Product differentiation advantages of established firms over potential entrant firms.

In addition, government policies can also raise some barriers to entry. Among such policies the grant of licenses, the regulation of price and entry, taxation policy etc. are mentionable.

In hatchery industry there was no real barrier to entry for potential entrant firms. All the hatcheries imported parent stock from abroad. So, none of them controlled the supply of resources and patent right. It was found that, economies of scale could not create a noticeable barrier to entry in this industry. Because, various sizes of hatchery equipment could be used profitably. Product differentiations in day-old chicks were present in the poultry hatchery industry. The major source was ignorance of the buyers about different characteristics of various poultry strains.

Present position of barriers to entry in the poultry hatchery industry

In this paper an attempt was made to examine the prevalent conditions of entry in poultry hatchery industry. The barriers to new entry to poultry hatchery industry are presented in table 4.

Table 4. Barriers to entry in the poultry hatchery industry

Sources of barrier	No. of respondents	Per cent of respondents
Non availability of capital and loan	20	55.56
Lack of suitable site	18	50.00
Lack of technology	12	33.33
Lack of technical skill	10	27.78
Lack of expertise on proper management of parent stock	6	16.17

Table 4 shows that, non-availability of capital was the greatest barrier to entry, followed by lack of suitable site for the hatchery, lack of technology, lack of technical skill and lack of expertise on proper management of parent stock. All the advantages enabled the established firms to charge higher prices and secure market shares for supplying an efficient scale of production operations.

The sampled firms opined that the capital requirement would be a great problem. Actually huge amount of capital was required to enter the hatchery industry in Bangladesh. In Bangladesh condition, the potential entrant could not raise enough fund to finance entry but an established firm could raise money for expansion more easily and cheaply. It may be concluded that factually there was no serious barrier to entry to hatchery industry in the country. The problem arises for the potential new entrants are very general in nature.

Conclusion and policy recommendations

The findings of the analysis indicate that the poultry hatchery industry in Bangladesh was exhibiting oligopoly or oligopolistic with low moderate concentration and highly concentrated in the case of broiler and layer hatchery respectively. Atomistic buying condition was prevailing in the hatchery industry, clear evidence of product differentiation and non-existence of high barriers to entry. Barriers to entry in the form of huge capital requirement was present in this industry.

The poultry hatchery industry is performing a vital role in the development of poultry industry as well as livestock sub-sector in Bangladesh. In this paper the structural features of the industry were found satisfactory and improving day-by-day. Through more participation from the entrepreneurs and patronization from the government agencies, the industry will be able to contribute more development of livestock sub-sector of the country in future.

In fact the poultry sector needs sufficient effective support and detailed policy guidelines to grow more favourably. Policy issues may be identified as below:

1. The poultry farmers should be encouraged by inducing bank credit at minimum interest rate and the credit should be available to them easily.
2. Rates for electricity utilized in poultry and feed production should be at par prevailing charges in other agricultural enterprises.
3. To ensure availability of commercial day old chicks among the farmers at reasonable rate.

References

- Bain, J.S. (1968). *Industrial Organization*. Second Edition. pp.7-8, 141,197and 223, John Wileyand Sons. Inc., New York.
- Export Promotion Bureau (2002). Economic Report. Department of Livestock Services. Farmgate. Dhaka.
- Bangladesh Bureau of Statistics (1997). *Statistical Pocketbook of Bangladesh*. Ministry of Planning, Government of the peoples Republic of Bangladesh, Dhaka.
- Branson, R.E. and Norvell, D.G. (1983). *Introduction to Agricultural Marketing*. Mc Graw-Hill Book Company, New york.
- Department of Livestock Services (1997). Annual Report on Livestock Conservation and Development Programme, Farmgate, Dhaka.
- Department of Livestock Services (1999-2000). Production of total Livestock Product and per capita requirement and availability. Farmgate, Dhaka.
- ECNEC (1999). Executive Committee for National Economic Council Report, Dhaka.
- Haque, Q.M.E. (1991). Duck Production System in Bangladesh. *Asian Livestock*, 16(2):pp. 18-23.
- Kohls, R.L. and Uhl, J.N. (1980). *Marketing of Agricultural Products*. Fifth edition, p. 23, Macmillan Publishing Co. Inc. Newyork
- Khan, M.M. and H.B. Husain (2002). "Micro Economic (supply and demand situation) analysis of poultry sub-sector". Khamar, A monthly magazine on Poultry, Livestock and Fisheries. January, (2002).
- Sims, J.T., J.R. Foster, and A.G. Woodside (1977). *Marketing channels systems and Strategies*. p.21, Harper and Row Publishers, New York.
- Winter, A. R. and E. M. Funk (1968). *Poul science and Practice* Fifth Edition. J. B. Lippin Cot Company, Philadelphia, New York.