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**POULTRY FARMS  
AND  
POULTRY FEEDS IN BANGLADESH:  
SURVEY RESULTS**

**MD. ABUL QUASEM**

**FEBRUARY 1991**

*FMRSP Working Paper No. 30*

**FMRSP** Bangladesh

Food Management & Research Support Project

Ministry of Food, Government of the People's Republic of Bangladesh

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*This work was funded by the United States Agency for International Development (USAID)*

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\* Senior Research Fellow, BIDS and Consultant, FMRSP

*The views expressed in this report are those of the author and do not necessarily reflect the official position of the Government of Bangladesh or USAID.*

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## EXECUTIVE SUMMARY

The number of poultry farms in the country has been growing at an annual rate of six percent in the 1990s. At present there are over sixty thousand farms, of which about three-fourths are layer farms. In recent years broiler farms are growing fast. Household farms are small and their housing conditions are usually poor.

The poultry farms use mixed feedgrains, maize and wheat, and also manufactured feeds commonly known as ready feeds. Mixed feeds are prepared by individual owners, generally by following the prescriptions given in booklets distributed by the Department of Livestock Services and the feed mills. In the making of feeds, household or small-scale farms seem to be at a disadvantage due to a lack of proper technical knowledge and price information. The present study, based on a small field survey covering 71 farms spread over three districts (Gazipur, Manikganj and Cox's Bazar) examines existing feeding practices and their efficiency at both household and commercial levels and also analyses maize and wheat markets, keeping in view the prospects of the poultry industry in the country.

The majority of surveyed poultry farms, particularly broilers, were established after 1995. The average cost of establishing a farm was Tk. 3,30,571 (Table 1). Commercial layer farms cost as much as Tk. 1060 thousand. Broiler farms, however, have a lower investment cost (Tk. 42,000), the least costly establishment being the household broiler farms. This suggests that NGOs can support the establishment of broiler farms in their poverty alleviation programs.

**Table 1 — General Characteristics of Surveyed Poultry Farms**

	Layer farms		Broiler farms		All Farms
	Household	Commercial	Household	Commercial	
No. of Farms Surveyed	33	20	9	9	71
Age of Farms (Years)	3.9	6.1	4.3	6.6	5.1
Percent of Farms Established after 1995	73	25	67	67	61
Initial Cost of Investment (000Tk.)	47.8	1059.9	20.0	70.11	330.6
Stock of Birds (No.)	607	4870	622	1544	1872
No. of workers	1.66	5.90	1.74	2.89	-

Source: Quasem (2001).

The present stock of birds on a farm is 1083 broilers and 2139 layers.

Commercial layer farms raise as many as 4870 birds. All farms, at present, are using three-fourths of their existing capacity, the highest utilization being at Gazipur (82%)

Poultry farms consume both maize and wheat, while among non-grain feed ingredients, rice polish, soybean meal, and vitamins are important. Of the selected farms, half are exclusively maize users, 24% consume ready feeds and the remaining consume both maize and wheat. The exclusive use of maize is predominant at layer farms in Gazipur, while ready feeds are predominant at Manikganj and also the broiler farms at Cox's Bazar.

In the individually prepared feed mixture, grains constitute over half of feed weight and the share of maize in feedgrains is very high (85%). Feed mills use a negligible proportion of wheat in their manufactured feeds.

A household broiler during its growing period of six weeks consumes 3.64 kgs of mixed feeds; this number is marginally lower in commercial farms. Similarly, a household layer in the growing period of 20 weeks consumes 6.9 kgs as shown in Table

**Table 2 — Feeding Practices, Weight Gained and Mortality**

	Layer farms		Broiler farms	
	Household	Commercial	Household	Commercial
i. Amount of Feeds consumed by a bird during the Growing Period (kgs)*	6.86	6.45	3.64	3.17
ii. Proportion of Maize to Total Feed Weight (%)	45.1	45.3	44.7	40.8
Proportion of wheat to Total Feeds Weight (%)	6.3	4.9	15.8	17.8
Proportion of Non-grains to Total Feed Weight (%)	48.6	49.8	39.5	41.4
iii. Weight Gained during the Growing Period (kg)	1.5 (Average)		1.84 (Average)	
iv. Mortality of Birds (%)	10	10	9	10

Source: Quasem (2001).

Note: \* The growing period for a broiler is considered to be six weeks and that for a layer is 20 weeks.

2. It may be noted that commercial layers are fed with lower amount of feeds. An adult layer consumes 105 gms per day amounting to total annual consumptions of 30 kgs of feeds inclusive of the quantity used during its growing period of 20 weeks. An average size broiler and a layer farm annually consume 23 and 64 tons of feeds respectively where maize has a share of about 45 percent (Table 2).

The feeding efficiency in broiler farms is 52% with a range of 46-62 percent for household and commercial farms. Commercial farms are found to be more efficient. Feeding efficiency is far less in layers (22%) with little difference between household and commercial layers. The live weight growth of a broiler during the growing period is 43 gms per day and it is higher by 17% in commercial farms. Such growth is only 11 gms in the case of layers. The use of mixed feeds appears to be more useful to both broiler and layers.

It seems that feeding efficiency in broilers can be raised substantially particularly in household farms. The farm owners may be properly trained in feeding principles and farm management.

Employment opportunities created through the establishment of poultry farms at the household level are largely limited to self-employment. A layer farm, on average, employs three persons, while a broiler farm employs only two persons. Household farms engage less than two persons; commercial layer farms employ six people on average. Self-employment in household farms comprises about three-fourths of the labor but in a commercial farm this is much lower (27%). The number of birds supervised by a worker is estimated to be about 300 layers and 365 broilers at household level. This is however higher in the case of commercial farms as expected. It may be reported that an investment of Tk. 10,000 is required for about 375 broilers but in layers it is just over 100.

A rough estimate on costs and returns of a poultry farm indicates that it is a profitable enterprise. Commercial farms are more efficient with higher returns in both broiler and layers. At the household level, broilers are more profitable than layers.

Prices of feedgrains (both maize and wheat) have been fairly stable across regions and over time. The feedgrain market in the country is, thus, performing reasonably well. In 1998 and 1999 retail prices of maize in the samples were lower (Tk. 0.45 per kg) than wheat. The monthly price range is observed to be within Tk. 1.00 per kg, which appears to be normal in the Bangladesh context. Commercial layers paid a lower price for feedgrains than household farms. This seems to be due to large-scale grain purchases by commercial layers and perhaps their easier access to markets. The price trend in maize and wheat during the period of 1995-1999 indicates that it is reasonably stable. Their market prices, if adjusted against the country's inflation rates, appear to have declined over time. Along with feedgrains, prices of other non-grain ingredients, including one-day chicks, are also found to be stable. The existing degree of stability in prices of all principal feed ingredients suggests that input markets are favorable to the development of poultry farms in the country. Regarding the prices of poultry products (eggs and meat) during this period, no definite comment can be made as no such price analyses have been

carried out in this paper. The DAM (Department of Agricultural Marketing) collected market prices for 1998-2000 and shows almost the same annual price for eggs (Tk. 308 for 100 eggs). Broilers, however, record a marginally rising price trend at that time. Monthly price fluctuations are also small, suggesting that product markets are somewhat stable.

However, poultry farming in Bangladesh is largely import dependent with respect to feed ingredients and chicks. There are unfortunately no clear rules and regulations regarding import and quality testing of these products. Quality inspection for imported feed ingredients and chicks is an urgent need. Appropriate steps should also be taken to produce all the chicks domestically, thereby reducing foreign dependency for their supplies. It is however, not known why the parent chick production farms are not growing in the country; the area needs to be carefully researched. Adequate measures are also needed for the increased production of maize and soybean, which have large potentials in the country.

Poultry farms in the country are now utilizing three-fourths of their production capacity. It is much lower in household farms (below 65%), reportedly due to cash constraint. For efficient capacity utilization, formal credit supports are required. Mortality of birds is also high (10%) which can be reduced through adequate supplies of disease free chicks and quality vaccines and feeds.

Towards the long-term development of poultry industry in the country, environment friendly technologies should be applied in the disposal of poultry litters and industrial wastes containing toxic elements to avoid health hazards in the locality. It is reported that institutional credit supports to the establishment of bio-gas plants using litters by farm owners can greatly help in this regard.

The present study has not examined the degree of price competition in poultry, eggs, meat and other production inputs between Bangladesh and its neighboring countries. Such a study is essential to identify the factors causing differential levels of

performance, as is evident in their price differentials. Moreover, for the creation of export markets in poultry products, some special market study may also be initiated.

## 1. INTRODUCTION

Poultry farms in the country are growing at an annual rate of over six percent (Islam, 2000) and informed sources report that in 1998 there were 60 thousand farms in the country including both broilers and layers.<sup>1</sup> These farms are not, however, well distributed in the country. They are concentrated around the cities and the district towns; and more so in the districts of Gazipur, Dhaka, Manikganj, Chittagong, Jessore, Faridpur, Bogra, etc. This may be due to a larger demand for poultry products and their easy marketing in these areas.<sup>2</sup> Dhaka division alone has over half of the country's total farms, followed by Chittagong. Of the total farms, three-fourths are reportedly layers, though this figure seems to be on the high side as people are expected to be more interested in broilers due to their quick turnover within six weeks. In the case of layers, eggs are received from the 20th week and thus, one has to wait a longer period for return and larger investments are needed. Thus, there are possibilities for inter-farm changes i.e. broilers to layers and layers to broilers, depending on the relative rates of return and the degree of risks considered.

In recent years there has been faster growth in poultry farms, facilitated by smooth supplies of one-day chicks, feedgrains and manufactured feeds. Private companies in this context are principal initiators. They are investing a huge amount, sometimes with bank support. Some of them in turn also extend support to individuals through sales of chicks and feed on credit. They sometimes also arrange for direct supplies of chicks to the farms. There are about fifty such hatcheries and feed mills in the country. Privately

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<sup>1</sup> Farms include those poultry establishments having birds above 200 raised commercially for markets. It excludes households owning scavenging birds even if they have larger stock of 50 birds or more.

<sup>2</sup> Personal communication with the Department of Livestock Services, Dhaka.

\*The author is very grateful to Dr. Paul Dorosh, Chief of Party IFPRI for his valuable comments on its earlier draft.

owned feed mills have an annual production capacity of 2,30,000 tons of finished feeds (Fattah, 1999). It is, however, unfortunate that we are little aware of their systems of functions, exact sources of parent stock and the feed ingredients used etc.

In addition to private companies, some NGOs such as BRAC, GKT, and PROSHIKA, have also established hatcheries and feed mills as their supporting enterprises with the objective of alleviating poverty of their members and to make themselves financially sustainable. NGO members generally get chicks and feed on credit, as well as free veterinary services from the NGOs. They repay their loans from their sales receipts. There are, however, reports that sometimes they do not get an adequate number of chicks in time and thus, poultry production activities cannot be continued uninterrupted. We still do not know whether the NGO members are efficient and whether they have benefited, relative to individual farm owners who are dependent on the open market for their production inputs.

Furthermore, it is noteworthy that all poultry farm owners are not equally well aware of the modern feeding practices. Many of them are not even trained. They are learning by doing. While feeding the birds, many variables, such as age, breed, stage of growth and weather, are to be duly taken care of and some adjustments are necessary from the prescribed principles. Sometimes inadequate input supplies and lack of finance may also hinder adopting proper feeding practices. Deviations from the standard practice of feeding may cause slower growth in broiler weight and a reduced size of layers and a fall in production of eggs may even cause financial losses to the owners, resulting in possible farm closures. There are reports of feeding birds poor quality maize and wheat thereby causing higher mortality of birds. Wide price fluctuations of feedgrains and farm outputs may also lead to drop-outs of poultry farms. It is not known how many drop-outs there are and the reasons for them. It is useful to know the rates of drop-outs by type and size of farms. Suggestions offered by poultry farms are also useful towards the development of the poultry industry.

The present study will explore some of the issues raised above. In particular, the study examines some of the basic issues such as:

- i) Feeding practices followed by household and commercial broiler and layer farms;
- ii) Levels of feed consumption and production efficiencies;
- iii) Market supplies of feedgrains, their price fluctuations and substitutions; and
- iv) Suitable policies to promote the development of the poultry industry.

The limitations of the present study are that it is not a broad-based country-wide study. It has been carried out in a few locations where poultry farms are concentrated, where infrastructure facilities are more developed. The emphasis in the present study thus is given to individual private farms - both broilers and layers.

The study report has seven sections that have been organized in the following manner. Following the introduction, the second section describes the survey methodology and the third section describes the general characteristics of the poultry farms selected for the study. The next section analyses prevailing feeding practices and their efficiencies. The fifth section examines the maize and wheat feed markets with particular reference to their retail prices. Some indicative exercises relating to the future of the poultry industry and limited policy suggestions have been presented in section six. The report ends with a short summary and conclusions in section seven.

## 2. SURVEY METHODOLOGY

The present study is a small-scale research project based on both secondary information and the limited field survey carried out in some selected areas of the country. The field survey covers three districts where there are high concentrations of poultry farms. In those selected areas, both broiler and layers farms are covered in the field survey. Twenty four poultry farms are covered in each area totalling 72 farms in the study areas, as where possible, all poultry farms in a district were selected from one upazila if the requisite number of farmers was available for the survey. This was done for the convenience of the survey administration.

In choosing the distribution of sample farms between broilers and layers we followed the existing proportional shares of farms at the national level. According to DLS (Department of Livestock Services) information, the country has 60,694 poultry farms of which over three-fourths are layer farms and the remaining are broilers. Dhaka division has the largest share of farms (55%) followed by Chittagong (25%). Further, the broiler farms are highly concentrated in Dhaka and Chittagong. Following the available national pattern of distribution, 75% of farms selected were layer farms (18 in each area of study), and the remaining six were broiler farms. Further, to capture differential levels of efficiency, if any, the scale of operation has been taken into account and to that end farms managed at both household and commercial levels have been selected. Household farms are generally small. Their investment cost is also small and the feeding practices also seem to be different. So, we have grouped the selected farms into (a) Household and (b) Commercial; with farms having a stock of up to 1000 birds considered to be household or small size farms. In each of the study areas, equal numbers of household and commercial farms were covered. That means, in our selected area, out of the 24

planned number of farms, 12 were household and 12 were commercial, of which nine were layers and three were broilers.

The planned selection procedure could not, however, be strictly followed at Manikganj as commercial layer farms there are few. As a result, we increased the household layer farms to 15 instead of 9 farms while only two commercial layer farms could be selected. In total, we have 71 poultry farms of which 53 are layers and 18 are broilers (Table 2.1). Household layer farms number 33 and commercial ones number 20.

**Table 2.1 — Distribution of Selected Poultry Farms by Their Types and the Study Area**

Area of Study	(Number of Farms)						All Farms
	Layer Farms		Broiler Farms		Total Farms		
	Household Farms	Commercial Farms	Household Farms	Commercial Farms	Household Farms	Commercial Farms	
Gazipur	9	9	3	3	12	12	24
Manikganj	15	2	3	3	18	5	23
Cox's Bazar	9	9	3	3	12	12	24
All Areas	33	20	9	9	42	29	71

Source: Poultry Feed Survey, 2000

Note: In Gazipur Sreepur Upazila, in Manikganj Manikganj Sadar Thana and at Cox's Bazar Cox's Bazar Sadar Thana are selected for the survey of poultry farms considering their concentrations in those thanas.

Besides the poultry farms we collected some relevant information from poultry hatcheries and feed mills in the country. This was necessary to understand the level of consumption of maize and wheat and other feed ingredients. Hatcheries import breed chicks from abroad and so their feeding practices, in the case of parent stocks, may be different. We could however, have access to only 10 hatcheries and seven feed mills. Of these hatcheries, four are located at Chittagong and all the other selected hatcheries and feed mills, except one, are located in and around Dhaka city.

The principal limitation of the study is that the field survey carried out does not cover the entire country and the findings thus, cannot be considered representative at a national level. Rather, the results reflect the production situations of more progressive areas having access to developed infrastructure facilities. The selection of farms is also not random. Cooperative poultry establishments are over-represented in the sample. Further, as a link industry to poultry, some hatcheries and feed mills more accessible to us have been included for the study. It is however, considered that constraints identified by the study are expected to be equally applicable to farms located in both more accessible and less accessible areas.

### 3. GENERAL CHARACTERISTICS OF POULTRY FARMS:

Principal characteristics of the poultry farms considered for the present study are (a) farm owners' age, years of schooling and the ownership status of the household farms; (b) initial cost of investment (c) stock of birds and (d) housing condition of farms.<sup>3</sup> All the farm owners, except one, are men, although quite a few women members (42%) at Manikganj supervise the household farms. There is only one woman owner at Cox's Bazar who is reportedly quite successful in the poultry business -- both broiler and layers. Most of the owners are above forty. Of all the farms 45% are individually owned and this is much higher in broiler farms. Household farm owners are a little younger (38 years). Every farm owner is literate. About two thirds of the household farm owners are SSC passed over one-third of whom are graduates. Commercial farm owners are more educated which is obvious. They are also more experienced in poultry farming.

#### AGE OF FARMS

The study finds that household farms are more recent with only four years of experience (Table 3.1). Commercial farm owners on the other hand are a bit older (seven years). Among the three study areas Cox's Bazar owns older farms especially in the case of commercial farms.

**Table 3.1 — Age of the Poultry Farms by Type and Study Area**

Area of Study	(Age in Years)				
	Layer Farms		Broiler Farms		All Farms
	Household	Commercial	Household	Commercial	
Gazipur	3.6	5.1	3.3	6.0	4.4
Manikganj	3.9	4.5	5.2	6.5	4.7
Cox's Bazar	4.2	7.3	3.7	7.3	5.8
All Areas	3.9	6.1	4.3	6.6	5.1

Source: Poultry Feed Survey, 2000.

<sup>3</sup> These questions have been kept limited to only household farms on consideration that commercial owners are more educated and well oriented to markets.

## PERIOD OF ESTABLISHMENT

Fifty eight percent of poultry farms were established in the last four years. Larger numbers of broiler farms are recently established (67% against 55% in layer farms as shown in Table 3.2) but there are almost no differences between household broiler and household layer farms. Newly established farms are highest at Manikganj (65%), perhaps facilitated by an NGO, (BRAC) in terms of chicks and feed supplies. In the case of layer farms, about three-fourths of household farms are recently established, which is opposite in commercial broilers (Table 3.3).

Table 3.2 — Period of Establishment of Poultry Farms by Study Area

(Percentage farms)

Area of Study	Layers		Broilers		All Farms	
	Before 1995	1996 to 1999	Before 1995	1996 to 1999	Before 1995	1996 to 1999
Gazipur	50	50	16	84	42	58
Manikganj	29	71	50	50	35	65
Cox's Bazar	56	44	33	66	50	50
All Areas	45	55	33	66	42	58

Source: Poultry Feed Survey, 2000.

Table 3.3 — Period of Establishment of Poultry Farms by Study Area

(Percent of Farms)

Areas	Layers				Broilers				All Farms			
	Household		Commercial		Household		Commercial		Layers		Broilers	
	Before 1995	1996 – 1999										
Gazipur	22	78	78	22	0	100	33	67	50	50	17	83
Manikganj	27	73	50	50	67	33	33	67	29	71	50	50
Cox's Bazar	33	67	78	22	33	67	33	67	56	44	33	67
All Areas	27	73	75	25	33	67	33	67	45	55	33	67

## INITIAL COST OF INVESTMENT AND SOURCES OF FUNDING

Poultry farming is sometimes suggested for poverty alleviation in the country. This is particularly so in NGO operated areas at Manikganj. It is expected that the poor, with NGO credit support, can easily establish small size poultry farms as an income generating activity and can come out of poverty. The study, however, finds that investment costs for an average size of farm is rather high: as high as Tk. 42 thousand for a household farm and many times higher for commercial farms (Tk. 750 thousand), as shown in Table 3.4. Commercial layer farms at Gazipur had the highest investment cost. Such costly farms are not observed in all other areas. Household broiler farms at Manikganj cost only Tk. 12 thousand and at Cox's Bazar it is Tk. 18 thousand (Table 3.4). Their stock of birds is, however, small. Small-scale poultry farming appears feasible as an income generating activity for the poor and can be financed out of micro-credit programs at least in terms of initial capital costs.

**Table 3.4 — Initial Investment Costs on Establishment of Poultry Farms by Type of Farm and the Study Areas**

Areas of Study	(Taka Per Farm)						Total
	Layer Farms		Broiler Farms		All Farms		
	Household	Commercial	Household	Commercial	Household	Commercial	
Gazipur	52389	2131944	30667	86667	46958	1620625	833792
(Self-financing %)	(99)	(39)	(100)	(100)	(99)	(39)	(41)
Manikganj	60500	120000	11667	105667	52361	111400	65196
(Self-financing %)	(67)	(100)	(86)	(84)	(68)	(91)	(76)
Cox's Bazar	22117	183556	18333	18000	21171	142167	81669
(Self-financing %)	(100)	(67)	(100)	(100)	(100)	(68)	(72)
All Areas	47820	1053974	20028	70111	41906	748638	330571
(Self-financing %)	(81)	(41)	(98)	(92)	(82)	(43)	(46)

Note: Figures within parenthesis indicate proportion of self-financing.

Source: Poultry Feed Survey, 2000.

## QUALITY OF HOUSING

There are, broadly, three types of housing in poultry farms: (a) Pucca (b) Semi-pucca and (c) Kutchha. A pucca house is actually a building; whereas semi-pucca is a

house that has a pucca floor but a roof of either corrugated iron sheets or straw/wild grass. Kutchha houses on the other have earthen floors and thatched roof. The earthen floor is generally covered by mixed saw dust and rice husks. All these types of poultry houses are found among the surveyed farms. Over one-third of all farms have kutchha houses, predominantly at Cox's Bazar and Manikganj. Broiler farms have more kutchha houses (55%). Sixty percent of them are operating at household levels. In these two areas they make bamboo-made flat on the earthen floors with thatched roofs. These houses are cheaper and the rooms are cooler. Poultry buildings are more expensive in Gazipur. They are all commercial farms, mainly in layers. Building owners consider that their recurring costs are lower and more favorable to growth of birds.

Almost all poultry farms are electrified (96%). The few non-electrified houses observed in the sample are household broiler farms, located at Manikganj. Most of these are very recently established.

It is of interest to report that investment costs of a farm are either self-financed or largely credit supported, depending on the type of farm and the area of study. Commercial farms are highly bank financed, especially at Gazipur (60%); whereas household farms are supplied to the extent of only 18% (Table 3.4). Credit supports are almost absent in the case of household broiler farms. This suggests that small household broiler farms are still deprived of financial supports, despite their commercial practices.

#### HOUSING CAPACITY AND STOCK OF BIRDS

The housing capacity utilized in raising birds in the study areas varies widely in both broiler and layer farms, the average being 78%. It is highest at Manikganj (Table 3.5) and the lowest at Cox's Bazar (71%). But if broilers are considered separately it is lowest at Gazipur. Full utilization has been made by the commercial farms of Cox's Bazar. The under-utilization of layer farms at Cox's Bazar is understandably due to inadequate chick supplies. It may, however, be noted that capacity utilization by poultry farms is at a satisfactory level (about 80%).

The existing stock of birds in broiler farms is just half of the layer farms, the all farm average being 1872 birds with a wide regional variation from 569 to 3446. Among the commercial farms, Gazipur has the largest stocks, the lowest being at Manikganj (Figure 3.1). In the case of broiler farms, household farms have less than half the stock of commercial farms (Table 3.6). Layer farms at Manikganj have the lowest stock of only 279 birds where the capacity utilization is only 65%. Farm owners there are afraid of flooding as the area is a low-lying, flood-prone region. Flood free land at Manikganj is quite scanty and that too is used for houses and homestead gardening. It has been reported that in 1998 many farm owners incurred heavy losses due to flooding of their farms.

**Table 3.5 — Capacity Utilization of Poultry Farms by Type of Farm and the Study Areas**

Area of Study	(Percentage)						
	Layer Farms		Broiler Farms		All Layer Farms	All Broiler Farms	All Farms
	Household	Commercial	Household	Commercial			
Gazipur	62	88	47	73	85	65	79
Manikganj	65	78	89	82	75	92	85
Cox's Bazar	46	66	85	98	66	93	71
All Areas	57	81	70	82	76	82	78

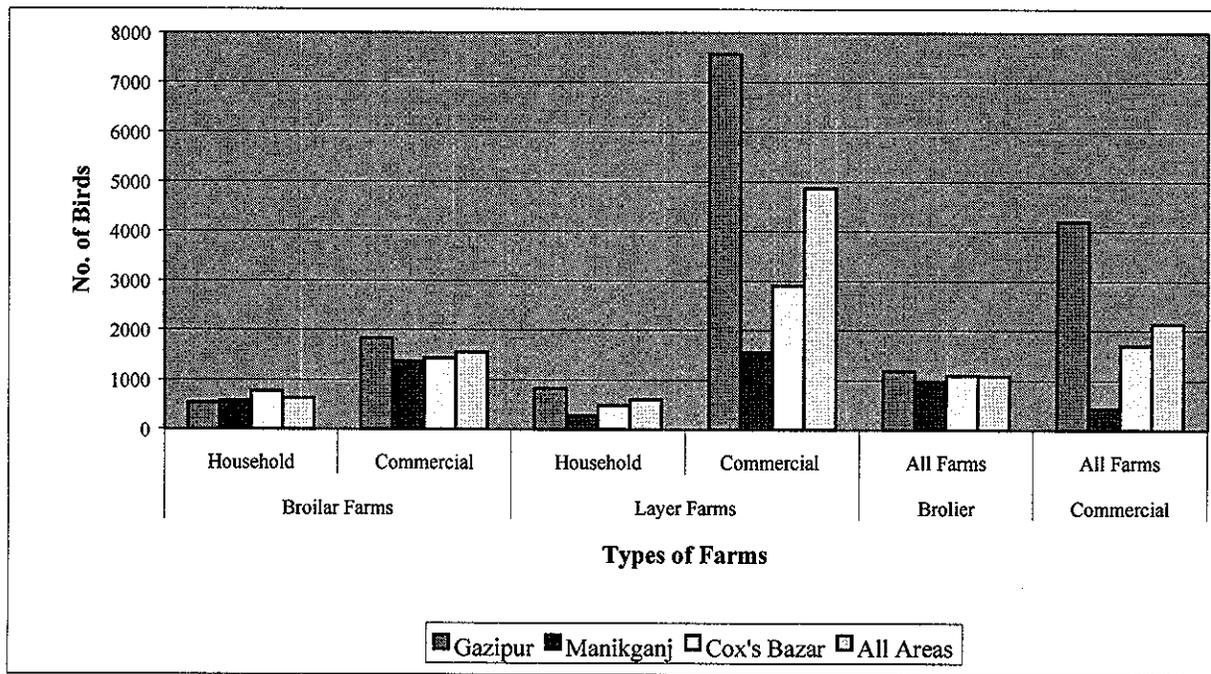
Source: Poultry Feed Survey, 2000.

**Table 3.6 — Stock of Birds Raised Per Batch by Study Area**

Area of study	Layer farms		Broiler farms		All layer farms	All broiler farms	All farms
	Household	Commercial	Household	Commercial			
Gazipur	828	7572	533	1833	4200	1183	3446
Manikganj	279	1550	(7)	(8)	428	(7.7)	569
			567	1367		(5.3)	
Cox's Bazar	483	2906	767	1433	1694	1100	1546
			(5)	(6)		(5.5)	
All Areas	607	4870	622	1544	2139	1083	1872
			(6)	(7)		(6.2)	

Note: Figures with parentheses indicated number of batches of broilers raised a year  
Source: Poultry Feed Survey, 2000.

**Figure 3.1 — Number of Birds Raised per Batch by Study Areas**



## 4. FEEDING PRACTICES AND THE EFFICIENCY

### FEEDING INGREDIENTS

Feeding practices for poultry are different depending on the type of farm-broiler and layer and also on the type of breed, age and levels of growth of birds. There are five major feed ingredients: carbohydrates, proteins, fat, mineral and vitamins (Department of Livestock Services, 1993). As a source of carbohydrates both maize and wheat are used. In recent years the use of maize seems to have increased (to be examined later on). The share of grains to feed content is about half. The other ingredients used are rice polish, soybean meal, salt, vitamins, proteins etc. The non-grain feeding ingredients vary following the age and type of bird. According to the age of birds the broiler feeds are largely of two types -- (a) broiler-starter (up to 3 weeks) and (b) broiler-grower (4 to 6 weeks). There are four types of layer feeds -- (a) layer-starter (up to 8 weeks), (b) layer-grower (8 to 16 weeks), (c) Pre-layer (17 to 20 weeks) and (d) full layers (20 weeks & above). Besides these broad grades of feeding, there are occasional changes in feeding ingredients depending on the health of birds and eggs laid by a bird.

### CONSUMPTION OF FOODGRAINS

The distribution of selected poultry farms by type of grains consumed shows that 18 farms i.e. one-fourth of total farms, are at present using manufactured or ready feeds predominantly by household layers at Manikganj and broilers at Gazipur (Table 4.1). Half of the total farms use exclusively maize and that is overwhelmingly in layer farms, at Gazipur. The remaining one-fourth consumes mixed grains, both maize and wheat, in different proportions. Such pattern of use is prominent in broiler farms at Manikganj and layers at Cox's Bazar. Exclusive consumption of wheat is noticed in only one farm. Between the two types of farms, exclusive maize use is noted higher by household farms. Consumption of mixed grains is little higher by commercial farms. The overall situation

is that half are exclusively maize consumers and one-fourth use ready feeds. There is little difference in consumption patterns between household and commercial farms.

To be specific regarding the amount of consumptions of feedgrains by poultry farms, over half are noted to be grains (53%) of which 85% is maize. Wheat has a share of only 15%. Non-grain feed ingredients constitute 47% of the feed weight. Broilers consume more grains (60%), where wheat has a substantially higher share (18% of the total feed weight). There is little difference in the share of feed ingredients by household and commercial farms either in broiler or layer farms. Besides the poultry farms, hatcheries also use feedgrains for their parent stocks where maize constitutes 86% and 14% is wheat. The use of wheat is almost absent in feed mills. Some wheat, amounting to less than five percent, is used in manufacturing of feeds, consumed by layer-starter and broiler-finisher.

**Table 4.1 — Distribution of Farms by Type of Feedgrains Consumed and the Study Areas**

Area of Study	(Number of Farms)								All Farms
	Exclusively Maize		Exclusively Wheat		Mixed Maize and Wheat		Ready Feeds		
	House hold	Commer- cial	House- hold	Commer- cial	House- hold	Commer- cial	House- hold	Commer- cial	
<b>Layer Farms</b>									
Gazipur	9	9	-	-	-	-	-	-	18
Manikganj	2	1	L	-	1	1	11	0	17
Cox's Bazar	5	4	-	-	4	5	-	-	18
All Areas	16	14	1	-	5	6	11	0	53
(Percentage)	(30)	(26)	(2)		(9)	(11)	(21)	(0)	(100)
<b>Broiler Farms</b>									
Gazipur	-	-	-	-	-	-	3	3	6
Manikganj	-	-	-	-	3	2	-	1	6
Cox's Bazar	3	2	-	-	-	1	-	-	6
All Areas	3	2	-	-	3	3	3	4	18
(Percentage)	(17)	(11)			(17)	(17)	(17)	(22)	(100)
All Farms	19	16	1	-	8	9	14	4	71
(Percentage)	(27)	(22)	(1)		(11)	(13)	(20)	(6)	(100)

Note: \* Feeds manufactured by feed mills

Source: Poultry Feed Survey, 2000.

*Amount of Feeds Consumed*

The level of consumption of feed by a bird rises with age up to a certain point. Broilers are generally sold at the age of 5-6 weeks when they attain a weight of about 2 kgs. Layers, on the other hand, are raised for a period of up to about 80 weeks, depending on production of eggs. Feeding a layer is kept restricted after 20 weeks when they reach the weight of about 2 kgs and start laying eggs. In the present exercise, feed consumption by a bird has been estimated for its growing period - six weeks in the case of broilers and 20 weeks for layers. During the growing period of 20 weeks a household layer consumes about 7 kgs of feed which is marginally lower (6%) by commercial layers, the average being 6.70 kgs (Table 4.2). Broilers at household farms, during the growing period of six weeks, take 3.64 kgs. Commercial broilers consume a lower amount by 13%. The survey findings clearly show that commercially raised birds are fed with less feed. Consumption variations among the study areas are little in the case of household broilers and commercial layers. Per day consumption of feeds during the growing period by a layer is 48 gms and that for a broiler is 81 gms.

Of the total feed consumptions by a layer during the growing period, over three-fourths are consumed during 8-20 weeks (Table 4.2). In the case of broilers, consumption between 3 to 6 weeks amounts to about 70%, which is usual as the requirement of a bird rises at that age. A broiler eats a significant amount of feed (26%) between 1-3 weeks. The proportion is, however, less in the case of commercial broilers.

It is relevant to report that an adult layer, during the laying period of about 60 weeks consumes 105 gms of feed of which half are grains. Our estimates for consumption of feeds by an average size poultry farm is 51 tons a year, of which the maize share is 23 tons and only four tons by wheat (Table 4.3). A layer farm has an annual consumption at 64 tons of feeds by a stock of 2139 layers.

**Table 4.2 — Total Amount of Feeds Consumed by a Bird during its Growing Period by Type of Farm\*\***

Area of Study	(Percentage)								
	Household					Commercial			
	Total Feeds (Kgs)	Up to one week	1-3 weeks	3-8 weeks	8-20 weeks	Total feed (Kgs)	Up to 7 weeks	8-14 weeks	15-20 weeks
<b>Layer Farms</b>									
Gazipur	7.02	0.92	3.54	20.15	75.38	6.49	20.0	38.33	41.83
Manikganj	6.59	1.15	3.44	21.80	73.61	6.55	20.63	38.61	40.76
Cox's Bazar	6.81	0.95	3.80	21.55	73.69	6.38	19.80	37.05	43.14
All Areas	6.86	0.94	3.62	20.94	74.33	6.45	19.93	37.69	42.21
<b>Broiler Farms</b>									
						Total feeds (Kgs)	Up to One week	1-3 weeks	3-8 weeks
Gazipur	3.59*	-	-	-	-	-	-	-	-
Manikganj	3.60	4.80	23.12	72.07	-	2.64	4.9	23.67	71.43
Cox's Bazar	3.68	6.16	28.74	65.10	-	3.53	10.09	14.37	75.54
All Areas+	3.64	5.64	26.11	68.55	-	3.17	8.50	17.35	74.15

Note: \* Amount of ready feeds.

+ Average of only Manikganj and Cox's Bazar.

\*\* Growing period for layer is 20 weeks and that for broiler is six weeks

Source: Poultry Feed Survey, 2000.

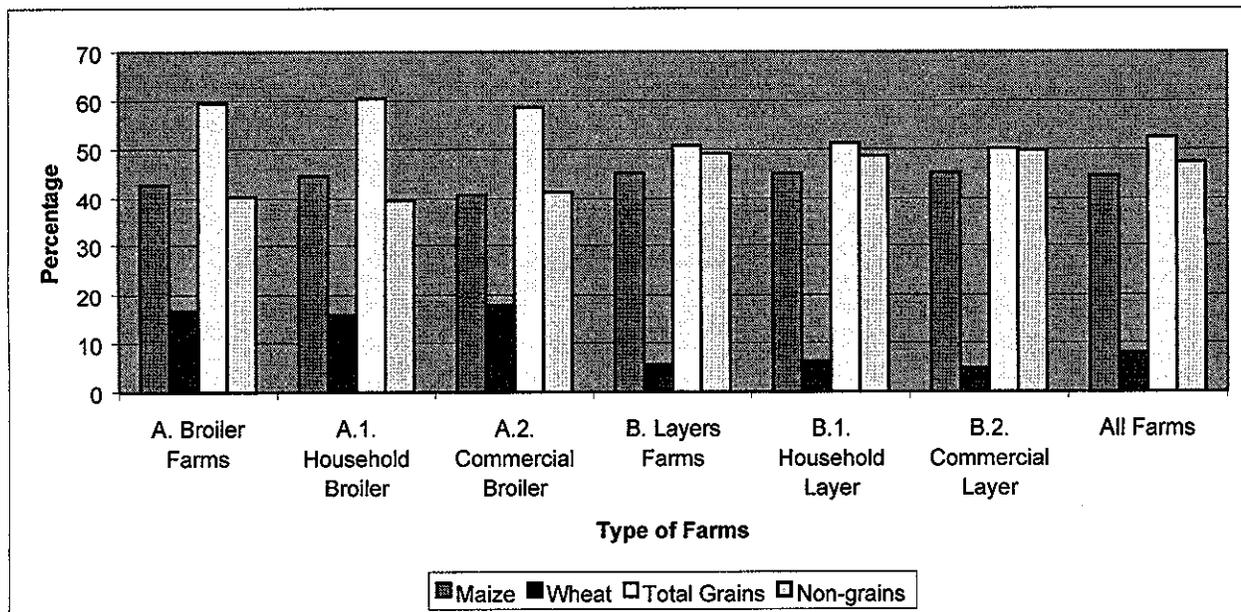
Table 4.3 — Consumption of Feeds by a Poultry Farm by Type

Type of Farm	No. of Birds Per Farm	Annual Consumption of Feeds by a Bird (kgs)	Annual Consumption of Feeds by a Farm (M. tons)	Share of		
				Maize (M. ton)	Wheat (M. ton)	Non-grains (M. ton)
Layer Farm	2139	30.22 <sup>1</sup>	64.64	29.22 (45.2) <sup>4</sup>	6.33 (5.6)	31.80 (49.2)
Broiler Farm	1083	21.08 <sup>2</sup>	22.83	9.80 (42.9)	3.81 (16.7)	9.22 (40.4)
All Farms	1872	27.35	51.20 <sup>3</sup>	22.89 (44.7)	4.04 (7.9)	24.27 (47.4)

Notes:

1. For a layer farm consumption of feeds by a young layer chick during its growing period of 20 weeks is estimated to be 6.70kgs and for the remaining 32 weeks is 23.52 kgs. i.e. it totals to 30.22 kgs a year.
2. For a broiler its consumption in six weeks is estimated to be 3.40 kgs and for 6.2 batches of broilers annual consumption is (3.40 x 6.2) or 21.08 kgs.
3. It seems on the high side as higher weight has been given to layer farms while selecting the farms.
4. Figures within parentheses indicate percentage.

Figure 4.1 — Proportional Shares of Grains and Non-grain Feed Ingredients in 1999



**Table 4.4 — Non-grain Feed Ingredients Used by Poultry Farms**

(Percentage of total feeds including grain)

Area of Study	Rice Polish	Protein	Soybean Meal	Salt	Vitamins	Others+
<b>Household Layers</b>						
Gazipur	18	8	19	0.4	0.3	5
Manikganj	16	6	14	1.0	0.4	5
Cox's Bazar	21	8	13	0.3	0.6	7
All Areas	19	7	16	0.4	0.4	6
<b>Commercial Layer Farms</b>						
Gazipur	17	7	18	0.4	0.3	7
Manikganj	16	7	14	0.4	0.3	6
Cox's Bazar	19	7	11	0.3	0.5	10
All Areas	18	7	15	0.3	0.4	8
<b>Household Broilers</b>						
Gazipur	-	No Mixed Feeding		-	-	-
Manikganj	6	8	20	0.4	0.4	0.6
Cox's Bazar	9	8	23	0.3	0.4	8.0
All Areas	7	8	22	0.3	0.4	0.4
<b>Commercial Broilers</b>						
Gazipur	-	No Mixed Feeding		-	-	-
Manikganj	6	8	24	0.8	0.1	0.1
Cox's Bazar	5	8	26	0.1	0.4	4.0
All Areas	5	8	26	0.4	0.3	2.0

Note: + Others include linseed meal, oyster, meat bone etc.

Source: Poultry Feed Survey, 2000.

### *Non-grain Feeding Ingredients*

The non-grain feed ingredients constitute about half of feed mixtures. Major shares go to soybean meal and rice polish (Table 4.4). In the case of layers, rice polish is 18% of the total feed weight which goes down to six percent in broilers that consume a large amount of soybean meal (24%), higher by more than 50% of layers' consumption. Consumption shares of other ingredients are similar. The existing patterns of feed consumption tend to suggest that the farm owners, in general, follow the instructions given in the booklets.

### *Feed Ingredients for Ready Feeds*

Feed mills produce different types of feed required, for different ages of birds. Broadly we categorized them into four - (a) Broiler Starter; (b) Broiler Finisher; (c) Layer Starter and (d) Larger-Layer. Proportional shares of major ingredients are changed depending on the type of feeds produced (Table 4.5). Maize is the major input sharing about 50%. Wheat is also used but its share is less than five percent totalling grain share to about 55% of the feed weight. Maize has the highest share of 54% in Layer-Starter, which has, on the contrary, the lowest proportion of 5.5% of protein. Broiler feeds are richer in protein content.

**Table 4.5 — Ingredients Used in Ready Feeds by Feed Mills**

Type of Feed	Maize	Wheat	R. Polish	Soybean	Protein	Vitamins
Broiler Starter	47.43 (5)	3.0 (1)	13.80 (5)	17.36 (5)	8.85 (5)	0.21 (4)
Broiler Finisher	48.83 (5)	4.0 (1)	15.53 (5)	16.00 (5)	10.35 (5)	0.20 (4)
Layer Starter	54.03 (4)	5.0 (1)	10.69 (4)	17.40 (4)	5.48 (4)	0.77 (4)
Layer Layer	51.47 (6)	-	11.27 (6)	15.83 (6)	8.12 (6)	0.71 (5)

Note: Figures within parentheses indicate number of farms reported.

Source: Poultry Feeds Survey, 2000.

## FEEDING EFFICIENCY

It is expected that there will be differential levels of efficiency in feeding by poultry farms. This might be due to housing conditions and the nature of management. Feeding efficiency in this report has been measured in terms of (a) live weight gained in the growing period, (b) starting time of laying eggs by layers and (c) mortality rates.

### *Live Weight Gained by a Bird*

The feeding efficiency in broiler farms is recorded to be 52%, i.e. live weight gained by a broiler is half of the amount of feeds consumed. Commercial broiler farms have a higher efficiency of 62%. It is only 46% in household broilers (Table 4.6). Broiler farms at Manikganj have the highest efficiency of 62% (75% in commercial and 56% household broilers). Feeding efficiency in layer farms is only 22% with little difference between household and commercial farms and also among the study areas.

The study also finds that per day growth of live weight of a broiler is 43 grams (40-47 gms) and that in the case of layers is 11 gms where the growing period is taken to be 20 weeks. Broiler farms at Manikganj have a daily growth of 48 gms which is higher than the two other areas. Feeding efficiency indicates that Manikganj farms are doing better, which seems to be due to mixed feeding of maize and wheat.

### *Mortality of Birds*

Mortality of birds is another important indicator for the measurement of the efficiency of a farm. The mortality rate is reported to be 10% in both the broiler and layer farms, the highest being at Gazipur (13%) and the least at Cox's Bazar. The higher rate of mortality is to some extent caused by Gumboro disease, carried by chicks. Mortality of chicks in the parent stock of hatcheries is observed to be 9% and the proportion of infertile eggs amounts to 18% which seems quite high. Cox's Bazar in this respect, does the best of all areas (Table 4.7) where both the layer and broiler farms have the least record of mortality despite their poor housing condition. This is an outcome of their long

Table 4.6 — Feeding Efficiency by Type of Farm and the Study Areas

Area of Study	Efficiency (%)*		Efficiency for All Birds	Per Day Growth + during growing period (gms)	
	Household	Commercial		Household	Commercial
<b>Layer Farms</b>					
Gazipur	22	24	23	11	11
(Weight Gained)	(1.53)	(1.56)			
Manikganj	24	25	24	11	12
(Weight Gained)	(1.57)	(1.63)			
Cox's Bazar	20	21	21	10	10
(Weight Gained)	(1.38)	(1.35)			
All Areas++	22	23	22	11	11
(Weight Gained)	(1.52)	(1.47)			
<b>Broiler Farms</b>					
Gazipur**	48	53	50	41	40
(Weight Gained)	(1.73)	(1.67)			
Manikganj	56	75	62	48	47
(Weight Gained)	(2.02)	(1.98)			
Cox's Bazar	37	56	46	32	47
(Weight Gained)	(1.35)	(1.98)			
All Areas	46	62	52	40	47
(Weight Gained)	(1.69)	(1.98)			

Notes: Figures within parentheses indicate the live weight gained.

\* Efficiency is measured in terms of growth in live weight with respect to total mixed feeds consumed.

\*\* Estimate for ready feeds

+ Growing period is considered to be 6 weeks in broilers and 20 weeks for layers.

++ Average of Manikganj and Cox's Bazar.

Table 4.7 — Mortality of Birds by Type of Farm and the Study Areas

Area of Study	(Percent)						
	Layers ++		All Layers	Broilers +		All Broilers	Total Farms
	House hold	Commer cial		House hold	Commer cial		
Gazipur	13	15	14	12	11	12	13
Manikganj	9	9	9	8	14	11	10
Cox's Bazar	7	7	7	7	5	6	7
All Areas	10	10	10	9	10	10	10

Notes: + Up to about 45 days

++ Up to 560 days or 80 weeks

Source: Field Survey, 2000.

experience in poultry farming (about six years). Commercial farms there have experience of seven years. Farm owners there are also more educated (SSC and above).

Birds are noted to die in all age groups. Close observation of household farms finds that both broilers and layers up to the age of 4 weeks have a higher rate of mortality (5.0 and 5.6% respectively for broilers and layers) than those above four weeks (4% in both broilers and layers). Young chicks of up to two weeks have a mortality record of 2.4% in household farms. Such age-specific analysis has not been done for commercial farms on the understanding that they will have a reduced record of mortality.

#### *Starting Age of Laying Eggs*

It is argued that proper feeding to layers can help them to attain timely maturity and to start laying eggs at around the 20th week. Available information indicates that layer farms at both household and commercial levels reach maturity at the expected age when over five percent of the stock start laying. The peak period is reportedly to be the 24th week when 85% of layers lay eggs. Attainment of timely maturity and the laying capacity of eggs suggest that the existing practice of feeding layers by farm owners in all areas is good.

#### *Types of Feeding and Efficiency*

The observed differential levels of efficiency from different feeding practices indicate that mixed feeding by maize and wheat appears better than feeding exclusively by maize and also by ready feeds in both broiler and layer farms. The incremental gain is of course, marginal and needs more careful analysis. Furthermore, the use of ready feed is recent (only two years) and its users are found to sell their broilers four days earlier and thus, proper weight could not be ascertained. The current information however, shows that mixed feeding at Manikganj, especially in broiler farms is more beneficial where wheat has the share of half of total grains.

### *Number of Workers in a Farm*

Poultry farming is sometimes considered to be a better employment opportunity in rural areas and therefore, its rapid expansion is recommended by policymakers. The present study finds that a layer farm on average employs three persons (six persons by a commercial layer and 1.66 persons by a household layer). Broiler farms, on the other hand, engage only 2.3 persons (2.9 persons by a commercial broiler and 1.7 persons by a household broiler farm) as shown in Table 4.8. Of the existing number of farm workers, half are self-employment in broiler farms and two-fifths in layer farms. Household farms are largely self-employed. Casual employment is small and it is almost zero in household farms. Employment opportunities created through the establishment of poultry farms are largely self-employment and the scope for hired employment is not that bright.

**Table 4.8 — Number of Workers, Birds Raised by a Worker and Stock for Investment of Tk. 10,000.00**

Area of Study	Layer Farms			Broiler Farms		
	No. of workers	No. of Birds Raised by a worker	No. of Birds for Investment of Tk. 10,000	No. of workers	No. of Birds Raised by a worker	No. of Birds for Investment of Tk. 10,000
<b>Household</b>						
Gazipur	1.88 (77)	440	158	2 (66.5)	267	174
Manikganj	1.33 (100)	210	46	1.53 (78.43)	370	486
Cox's Bazar	1.88 (59)	257	218	1.67 (60)	459	418
All Areas	1.66 (78)	286	124	1.74 (68)	365	359
<b>Commercial</b>						
Gazipur	8.89 (18)	852	36	2.66 (50)	689	212
Manikganj	2.00 (75)	775	129	3.33 (30)	410	129
Cox's Bazar	3.78 (26.45)	769	158	2.67 (37.45)	537	796
All Areas	5.90 (22)	807	100	2.89 (38.4)	545	379

Note: Figures within parentheses indicate self-employment (%).

Source: Poultry Feed Survey, 2000.

About the efficiency of a worker in a farm it may be reported that a worker looks after only 286 layers or 365 broilers in a household farm. They performed better in commercial farms (800 layers or 545 broilers as the case may be). There are, however, wide variations among the farms. With respect to capital efficiency, broiler farms are more efficient at present (360 broilers per batch for an investment of Tk. 10,000.00, contrary to just over 100 layers). Cox's Bazar is performing better. The long term utilization may however change the above observed situation.

#### *Net Return of a Farm*

Originally the study did not plan to examine the income situation of farms because this can be embarrassing for farm owners. Later, just to understand the differential level of financial efficiency between household and commercial farms, a rough exercise was been carried out. So, any policy conclusion based on the present estimates needs very careful judgment.

Estimates on costs and returns show that there is a significant differential rate of return between household and commercial farms in both broiler and layers. A household broiler farm earns a profit of only Tk. 5 per bird against Tk. 23 by a commercial farm in a period of six weeks. A layer farm at the household level reaps a profit of Tk. 28 in 76 weeks (Table 4.9). The commercial farm, on the contrary, earns a much higher income (Tk. 166 per layer). In a broiler farm the difference in net gain is mainly due to higher weight gained by a bird in commercial farms. In the case of layer farms the difference is due to costs of production where the size of a farm seems to be a major factor. In a household farm, the cost of labour for a layer is estimated to be Tk. 128 in its lifetime of 76 weeks. In commercial farms it comes down to only Tk. 40, i.e. less than one-third of the household layer. However, the commercial farm has, higher cost of capital (three times of that in household layer farm). From Table 4.9 it may also be noted that between

broiler and layer farms at the household level, broilers are more profitable if nine batches are raised during the period of 76 weeks, usually taken by a batch of layers.

**Table 4.9 — Costs and Return Per Bird by a Poultry Farm**

Items	Layer		Broiler	
	Household	Commercial	Household	Commercial
A) Costs				
A.1. Chick (Tk)	26.60	26.60	25.20	24.00
A.2. Labour (Tk)	128.00	40.00	16.50	23.00
A.3. Feeds (Tk)	552.00	536.00	39.50	38.00
A.4. Cost of Investment (Tk)	12.00	33.00	0.50	0.65
A.5. Utilities (Tk)	26.50	23.50	5.00	4.00
A.6. Sub-Total	745.10	695.10	86.74	89.65
A.7. Cost at the survival Rate of 90%	828	732.00	96.4	99.6
B) Return				
B.1. a) Sales Price (Tk per kg)	-	-	60	62
b) Sales Price (Tk per 100 eggs)	250	250	-	-
B.2. a) Weight gained (kg)	-	-	1.69	1.98
b) Eggs laid by a layer (No.)	314	333	-	-
B.3. a) Value of a broiler (Tk)	-	-	101.4	122.8
b) Value of Eggs (Tk)	785	833	-	-
B.4. Sales Value of layer (Tk)	70	65	-	-
B.5. Sales of Poultry litters (Tk)	0.5	0.5	-	-
B.6. Gross Income	855.5	898.5	101.4	122.8
C) Net Return (Tk)	27.5	166.5	5.0	23.3
D) Net Return of a Broiler Farm Per Batch (Tk)	-	-	3110	35821
E) Net Return of a Layer Farm Per Batch (Tk)	16692	810855	-	-

Notes: Broiler Farms

- 1) Labour – 1.74 person for two months
- 2) Investment Cost – Tk. 20,028 for Household and Tk. 70,111 for Commercial farm @ 10% interest for two months.
- 3) Utilities – They include electricity bills, feeding equipment etc.

Layer Farms

- 1) Labour – 2 persons for Household and 4 persons for Commercial farm for 18 months.
- 2) Investment on – Tk. 41,908 for Household and Tk. 748,638 for commercial farm @ 10% for the period.

## 5. MARKETS FOR MAIZE AND WHEAT

The field survey finds that maize is the principal feed ingredient for poultry production. Wheat has a minor share (15% of total feed grains), which was just opposite a few years ago (Iqbal, undated). The immediate concern is how far their grain markets are favorable to poultry production or do the poultry farms face any constraint in terms of grain supplies and their prices prevailing in the country. To that end, we collected monthly prices of maize and wheat and seek the opinions of farm owners about timely availability and their price fluctuations. Also, an investigation has been carried out to examine the practice of substitution of maize and wheat.

### PRICE OF MAIZE AND WHEAT

Monthly price information for maize and wheat have been collected for only two years (1999 and 1998) from two sources – household layers and commercial layer farms. The estimated annual average price of maize (Tk. 8.4/kg) was found to be lower by 5-6 percent than that of wheat (Tk. 8.9/kg) in both the years and their prices remained almost unchanged (Table 5.1). There are marginal price differences among the study areas and Gazipur farms paid the lowest price for maize. Cox's Bazar experienced the highest prices for both maize and wheat, maybe because of higher costs of transport caused by small size of handling. The existing price differences between the study areas are not unexpected.

Table 5.2 also shows that commercial layer farms paid a lower price in both maize (below two percent) and wheat (below four percent) than that paid by household layer farms. This seems to be because of their large-scale purchase of grains and their advantageous locations. This is somewhat clear from the reverse price situation at Mankiganj where commercial farms are few and thus, bulk purchases are few.

**Table 5.1 — Annual Average Procurement Price of Maize and Wheat Reported by Household Layer Farm Owners**

(Tk per kg)

Area of Study	Maize		Wheat		Monthly Price Range for			
					Maize		Wheat	
	1999	1998	1999	1998	1999	1998	1999	1998
Gazipur	8.12	7.90	-	-	8.05-8.21	7.18-8.18	-	-
Manikganj	8.59	8.34	8.36	8.14	8.38-9.13	8.01-8.63	8.10-8.70	7.90-8.35
Cox's Bazar	8.67	8.85	9.15	9.33	8.54-8.81	8.70-9.98	8.86-9.38	9.06-9.60
All Areas	8.43	8.37	8.88	8.93	8.05-9.13	7.18-8.98	8.10-9.38	7.90-9.60

Source: Poultry Feed Survey, 2000.

**Table 5.2 — Annual Average Procurement Price of Maize and Wheat Reported by Commercial Layer Farm Owners**

(Tk per kg)

Area of Study	Maize		Wheat		Monthly Price Range for			
					Maize		Wheat	
	1999	1998	1999	1998	1999	1998	1999	1998
Gazipur	7.92	7.88	-	-	7.52-8.21	7.67-8.07	-	-
Manikganj	8.82	8.47	8.22	8.08	8.05-9.02	8.20-8.68	8.0-8.50	7.6-8.2
Cox's Bazar	8.47	8.56	8.62	8.92	8.21-8.68	8.43-8.69	8.32-8.8	8.47-9.35
All Areas	8.27	8.26	8.55	8.78	7.52-9.02	7.67-8.69	8.0-8.8	7.6-9.35

Source: Poultry Feed Survey, 2000.

In the year 1999 the monthly price range for maize and wheat was limited within Tk. 1.00 per kg (Tk. 8.05 – 9.13 per kg in maize and Tk. 8.10-9.38 per kg in wheat), which is not unexpected between the selected areas of study. It was, of course, higher in 1998. The limited price range in 1999 tends to suggest that supplies of feedgrains at the farm level were not a problem and the degree of price fluctuations has rather declined in that year. This can be better seen in Figure 5.1(a) where fluctuating trends in monthly prices of maize and wheat are almost similar. The degree of price fluctuation is noted to be lower in maize. Actually procurement price of maize by poultry farm owners remains almost the same throughout the year. In wheat, the 1999 price was lower with the commercial layers but it was not so with the commercial broilers who instead paid a marginally higher price, which might be due to their smaller size of purchases. Further, it

Figure 5.1 — Monthly Avg. Price of Maize and Wheat in 1999 and 1998

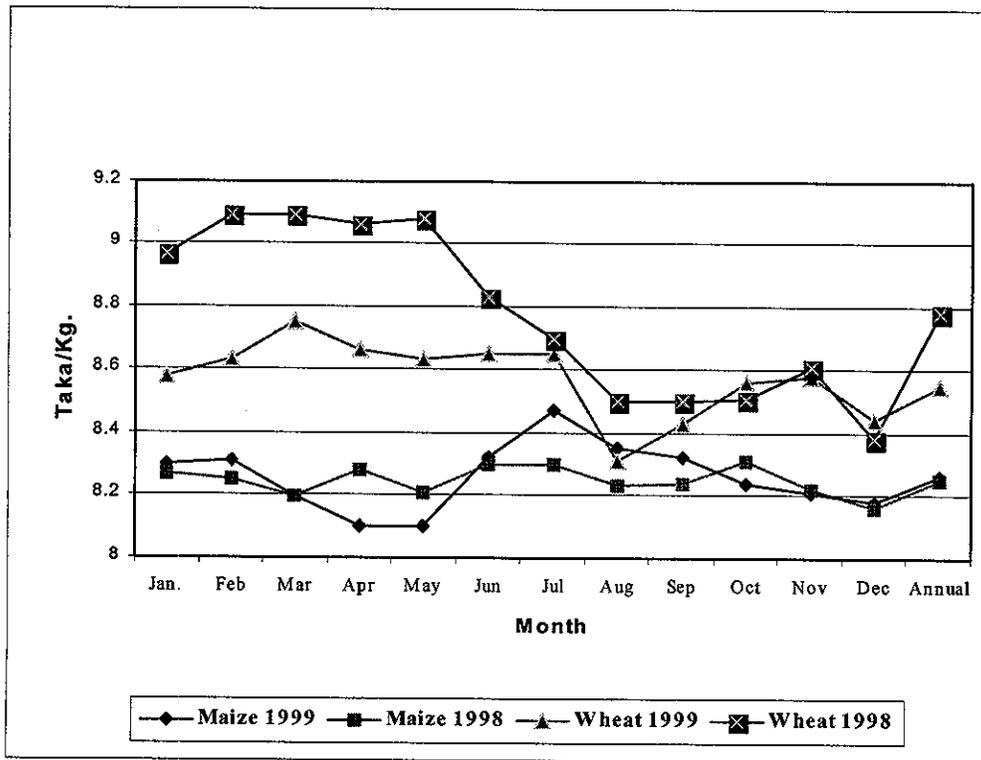
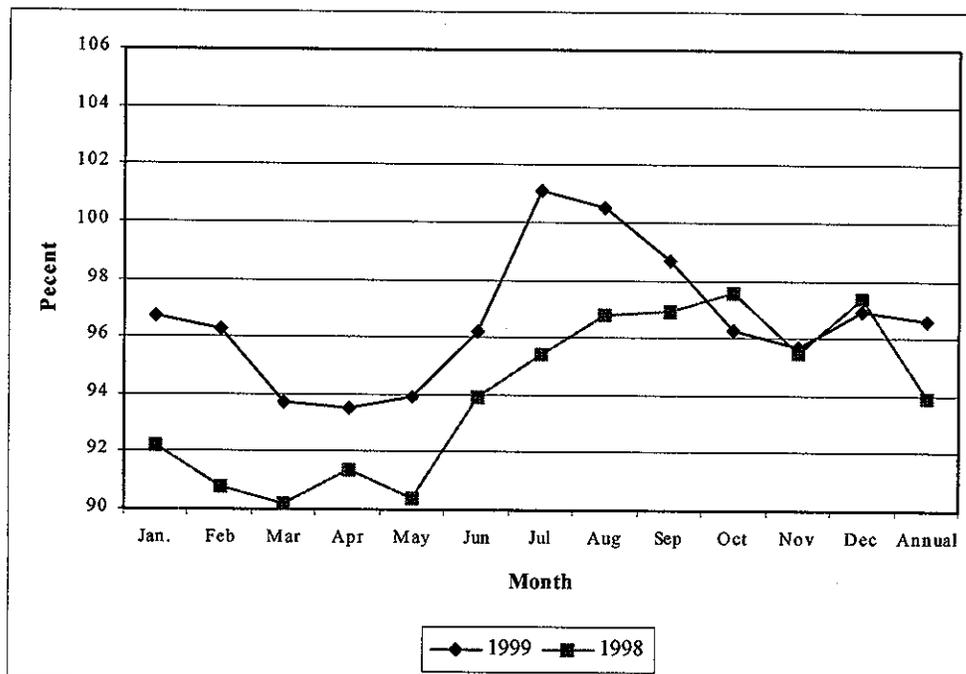


Figure 5.2 — Relative Price of Maize to that of Wheat (percent)



is also of interest to report that in both years, prices of feedgrains, especially wheat, started to decline in the month of June and reached the lowest level in August and continued to remain so up to mid-September (Figure 5.1). This does not exactly follow in commercial broiler farms. The availability of domestically produced wheat and maize in the market may result in such decline at that time and also to some extent perhaps due to a fall in their demand in those monsoon months when many poultry farms, especially the broiler ones, are closed temporarily for fear of losses due to flooding and heavy rains as observed at Manikjanj.

About the relative price of maize with respect to wheat, the monthly price trend is observed to be similar in both the years (Figure 5.2(a) and 5.2(b)). The relative price of maize increased in 1999 as reported by commercial layers but it does not follow so with the commercial broiler farms (Figures 5.2(b)). This is a complex question and needs careful price analysis.

#### PRICE TREND DURING 1995-1999

Price trends for maize and wheat during 1995-1999 are noted to be reasonably stable although there has been a marginal rise in wheat prices (Table 5.3). This clearly indicates that the existing feedgrain markets are favorable to poultry production. Price statistics also show that in the last five years, the price of maize remains always lowest at Gazipur, which may be due to its larger market and bulk transports by traders.

It may also be noted that overtime relative prices of maize to wheat have declined to 83% since 1995 when the price of maize was equal to wheat (Figure 5.3). Actually in the last three years the international price of maize declined considerably (Mallick, 2000). Investigation into feed mill information also reveals that a proportional share of maize to total grains purchased by them has gradually increased from 75% in 1995 to 95% in 1999 (Table 5.4). Increasing the share of maize in feed grain consumption appears to have been facilitated by its relative price decline and also, to some extent, to supplies of poor quality wheat, according to poultry farm owners.

**Table 5.3 — Prices of Maize and Wheat in the Selected Markets during 1995-1999  
(Poultry Layers)**

Year	(Tk/kg)							
	Gazipur		Manikganj		Cox's Bazar		All Areas	
	Maize	Wheat	Maize	Wheat	Maize	Wheat	Maize	Wheat
1995	6.88	Nil	8.10	8.00	9.16	8.81	8.05	8.41
1996	7.29	Nil	8.15	8.50	9.22	9.06	8.22	8.79
1997	7.57	Nil	8.15	8.35	8.88	9.17	8.20	8.76
1998	7.70	Nil	8.08	8.50	8.54	9.19	8.11	8.85
1999	7.97	Nil	8.30	8.90	8.51	8.96	8.26	8.93

Source: Poultry Feed Survey, 2000.

**Table 5.4 — Proportional Share of Maize and Wheat Procured by the Feed Mills  
during 1995-1999 and Relative Price of Maize and Wheat**

Year	Annual quantity of Feedgrains procured (Ton)	Quantity Procured (%)		Price of wheat (Tk/ton)	Maize Price Relative to Wheat (%)
		Maize	Wheat		
1995	6998	75	25	7708	100
1996	7639	79	21	8122	95
1997	9020	89	11	8682	87
1998	9325	93	7	9013	83
1999	13429	95	5	9031	83

Source: Poultry Feed Survey, 2000.

**Table 5.5 — Proportions of Feed Ingredients used by Commercial Farms during  
1997-1999**

	Maize	Wheat	R. Polish	Protein	Soybean	Salt	Vitamins	Others+
<b>Commercial Layers</b>								
1997	41.70	7.60	18.35	7.03	15.30	0.34	0.40	8.29
1998	43.05	6.20	17.80	6.88	15.10	0.35	0.41	8.55
1999	45.22	5.64	18.28	7.19	15.31	0.36	0.41	7.12
<b>Commercial Broilers</b>								
1997	38.60	16.8	6.60	8.70	25.50	0.36	0.26	3.45
1998	39.99	17.8	5.20	8.08	25.50	0.36	0.24	3.05
1999	40.80	17.8	5.20	8.10	25.50	0.36	0.26	2.25

Note: + Include linseed cake, oysters, meat bone etc.

The increasing share of maize in the consumption of feedgrains in the last three years is also visible in layer farms, where wheat consumption has slowly declined the total share of grain remains the same at around 50%. Such a pattern of consumption has however not been observed with commercial broilers where proportional shares of both maize and wheat rose slightly totalling to about 58%. Actually, grain consumption is found to be higher in broilers. Proportional shares of other feed ingredients remain almost unchanged (Table 5.5).

#### SUBSTITUTION OF MAIZE BY WHEAT

In the individually prepared feed mixtures, both maize and wheat are used. In recent years, the use of maize is rising. There are poultry farms (over half of layers and one-third of broilers) which at present consume only maize. The question of substitution arises little. Some farms (11 layers and 6 broilers) use both maize and wheat whose proportional shares are changed depending on their market prices and their own feeding criteria. The opinion survey indicates that about half of layer and two-thirds of broiler farm owners prefer to continue with maize. In this respect, commercial layer owners are found to be more rigid. No such differential behavior has been observed between commercial and household broiler farms.

The farm owners who expressed interest in substituting maize by wheat have been grouped into two categories following the conditions given by them. In the first category of layer farms, either commercial or household, one-fifth plans to substitute maize by wheat when the price of wheat becomes equal to that of maize. That means, in the study year of 1999, the average price of wheat should come down by Tk. 0.67 kg or 7.5% for the purpose of such a substitution. The second category, numbering to about one-third of layer owners, asks for a drastic reduction in wheat prices for its substitution. Its price should be lower than the maize price by at least Tk. 1.0 per kg. when wheat sells at a higher price. For substitution of maize, the average price of wheat should be brought down by Tk. 1.67 per kg. i.e. by about 20% of the 1999 price of wheat. In broiler farms,

cases preferring substitution are few (only four). Most of them desire to continue with the present practice of feeding either with maize or ready feeds as the case may be.

Maize is sometimes considered superior to wheat in terms of calorie content and tastes to chicks, its lower price notwithstanding. According to farm owners, wheat is quickly digested by birds and thus, its requirement rises and consequently the cost of feeding becomes higher. They also believe that wheat causes diarrhoea in birds. However, they record one special merit of wheat by pointing to its low fat content enabling a higher production of eggs.

#### PRICES OF READY FEEDS

In the context of feed markets it seems relevant to report the prevailing prices of ready feeds, which have been in use by some poultry farms for two years. Broiler farms at Gazipur and layer farms at Manikganj use ready feeds. Their average annual price is Tk. 12.50 per kg. It is surprising to report that their monthly prices remain almost unchanged in the last two years at Manikganj. At Gazipur their prices, however, increased by Tk. 1.00 per kg in 1999 over that in 1998. Anyway, it can be concluded that prevailing prices of ready feeds are stable. Mixed feeds prepared by individual farm owners are reportedly cheaper than ready feeds by about Tk. 1.00 per kg.

#### PRICES OF NON-GRAIN FEED INGREDIENTS

Among the non-grain ingredients, vitamins are costly and they sell at around Tk. 160 per kg (table 5.6 and Figure 5.3). The cheap ingredient is rice polish. In the last five years, ending 1999 prices of all the ingredients are noted to be quite stable and thus, it can be concluded that the input markets for feeds are quite dependable.

**Table 5.6 — Current Prices of Non-grain Feed Ingredients during 1995-1999**

All areas	(Taka/kg)			
	R. Polish	Soyabean Meal	Protein	Vitamins
1995	4.29	13.08	32.71	156.38
1996	4.63	12.51	33.37	160.08
1997	4.56	13.00	33.71	160.15
1998	5.28	12.29	34.16	163.70
1999	5.86	12.42	34.80	163.00

Source: Poultry Feed Survey, 2000.

#### STOCK OF FEEDGRAINS WITH THE POULTRY FARMS

The smooth operation of feedgrain markets can also be evidenced from the small size of the stock of grains maintained by a poultry farm. Broiler farms (either household or commercial) have a stock of only 564 kgs for a period of only 12 days (Table 5.7). Of the total stock of grains, maize has a share of 64%. In the case of layers, household farms have a stock of only 272 kgs for one week. It is much higher in commercial layer farms at Gazipur (five tons) where the period of stock is less than two weeks. This is not unusual as the stock of layers is also higher there (about 5000 i.e. eight times) against only 600 by household layer farms). Such a small size of grain stock by a poultry farm for a short period of one to two weeks suggests that the existing feedgrain market is efficient.

**Table 5.7 — Stock of Grains Maintained by Poultry Farms and the Period of Stocking**

	Amount of Stock (kgs/per Farm)				Period of Stock for Maize (Days)	
	Layer Farms		Broiler Farms		Layer Farms	Broiler Farms
	Maize	Wheat	Maize	Wheat		
Gazipur	5111	-	556+	-	7+	11(9)+
Manikganj	693	125	294	106	7	13
Cox's Bazar	871	348	418	300	10	12
All areas	2710	307	361	203	9	12

Note: + Ready Feeds.

Source: Poultry Feed Survey, 2000.

### AMOUNT OF FEEDGRAINS PROCURED

Amount of procurement of feedgrains by poultry farms, hatcheries and feed mills reveal that it is lowest by broiler farm (Table 5.8) and highest by feed mill (8764 metric ton). In all such procurements, maize has the overwhelming share. Feed mills use a negligible proportion of wheat; while broiler farms procure wheat to the extent of over one-third of their procurements. In the feed mixtures, broiler farms use more wheat than layer farms (Table 5.9). Between household and commercial broilers, the latter consumes a marginally higher proportion of wheat (Figure 5.4). The existing consumption situations thus, confirm that maize has become the principal grain for poultry feed.

**Table 5.8 — Annual Procurement of Feedgrains by Type of Grains and the Farm**

Type of Farm	Annual Purchase (metric ton) / Per Farm	Proportional Share of	
		Maize	Wheat
i) Layer Farm	41.32	92.8	7.2
ii) Broiler Farm	16.65	65.5	34.5
iii) Hatchery	272.30	86.4	13.6
iv) Feed Mill	8764.0	98.6	1.4

Source: Poultry Feed Survey, 2000.

**Table 5.9 — Proportional Shares of Grains and Non-grain Feed Ingredients in 1999**

Type of Farm	Maize	Wheat	Total Grains	Non-grains
<b>A. Broiler</b>	<b>42.9</b>	<b>16.7</b>	<b>59.6</b>	<b>40.4</b>
A.1. Household	44.7	15.8	60.5	39.5
A.2. Commercial	40.8	17.8	58.6	41.4
<b>B. Layers</b>	<b>45.2</b>	<b>5.6</b>	<b>50.8</b>	<b>49.2</b>
B.1. Household	45.1	6.3	51.4	48.6
B.2. Commercial	45.3	4.9	50.2	49.8
<b>All Farms</b>	<b>44.7</b>	<b>7.9</b>	<b>52.6</b>	<b>47.4</b>

Source: Poultry Feed Survey, 2000.

## 6. FUTURE OF POULTRY INDUSTRY AND SUITABLE POLICY SUGGESTIONS

Poultry farming in Bangladesh is expanding fast as the demand for both meat and eggs is rising. Layer farms in the country are understandably growing faster than the broilers, which on the contrary are doing better at the household level as their size is small (up to 1000 birds) and return is quicker. Available information indicates that supplies of poultry feeds and their ingredients and one-day chicks are not seriously constraining the expansions of poultry farms. Their retail prices also appear to be within easy reach and are noted to be quite stable. Some problems reportedly lie with the quality of wheat grain and sometimes difficulties are faced with maize when kept stored for a longer period.

In the year 1998 there were complaints of inadequate supplies of one-day chicks and consequent rise in their prices. This led to poor utilization of farm capacity - space and manpower. There are also complaints of price fluctuations in broiler and eggs particularly when there are imports from India. All these aspects need very careful study. Despite all such constraints, most of the farms have plans for increased production through a larger utilization of existing capacities and also (b) by making extra provision of space for new stocks to be raised.

### CAPACITY EXPANSIONS BY POULTRY FARMS

Capacity utilization by household farms is lower than commercial farms. Household farms, both broiler and layer, at present could utilize the existing capacity to the extent of about 82 and 76 percent respectively. It is over 80% in commercial farms. All the selected farms have plans for utilization of unused capacity. To that end, they need adequate credit supports at a reduced rate of interest. Financial assistance is also sought by several farms having plans for construction of new sheds for additional birds

proposed to be raised. Such estimates find that an average household poultry farm plans for extra space for 1019 layers in the next five years. Broiler farms have also plans for expansion to the extent of about 2000 birds--almost double of layer farms. The proposed extra farm space is actually higher than the existing stock of birds. Additional capacity is going to be raised by over 100% in the next five years which is not unusual as the demand for poultry products is expected to be rising fast.

### PRESENT USE OF POULTRY LITTERS

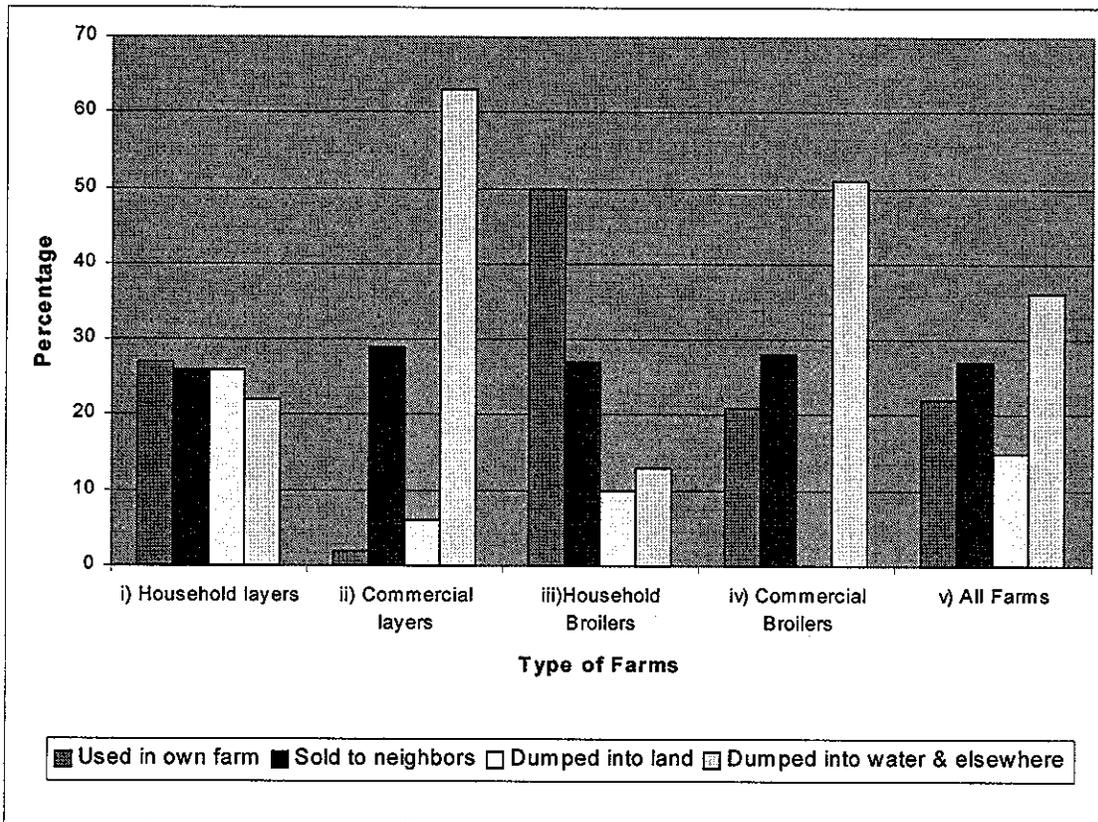
With the establishment of poultry farms in a locality, the living environment there is adversely affected by polluting air and water due to bad smells and haphazard dumping of poultry litter. Information relating to use of poultry litter and industrial wastes by farm owners show that only half of litter produced is used in farming either in their own farms or on neighbors' farms. The amount disposed of into water and open land is also substantial as shown in Table 6.1 and Figure 6.1. The existing practice of disposal of wastes is not at all environment-friendly and should be discouraged. There are farms that have been planning for the establishment of bio-gas plants using poultry litters. They, however, need appropriate technical advice and adequate financial supports.

**Table 6.1 — Existing Practice of Disposals of Poultry Litters by Type of Farm**

Type of Poultry Farm		(percentage)			
		Used in own farm	Sold to neighbors	Dumped into land	Dumped into water & elsewhere
i)	Household layers	27	26	26	22
ii)	Commercial layers	2	29	6	63
iii)	Household Broilers	50	27	10	13
iv)	Commercial Broilers	21	28	0	51
<b>All Farms</b>		<b>22</b>	<b>27</b>	<b>15</b>	<b>36</b>

Source: Poultry Feed Survey, 2000.

**Figure 6.1 — Existing Practice of Disposals of Poultry Litters by Type of Farms**



It is unfortunate to report that 45 percent of industrial waste and 25 percent of poultry litter produced by hatcheries is simply grounded while 20 percent of industrial waste is dumped into water. This type of disposal of waste is very unhealthy and cannot continue.

#### CHICK BREEDS AND THEIR SOURCES OF SUPPLIES

It is relevant to report that poultry farms in Bangladesh are almost wholly dependent on imported chicks. All hatcheries import either parent chicks or eggs. Breeds of layer chicks grown in the country are (a) Babcock BV -300, (b) Hi-sex Brown (c) Star Cross (d) Lohmenn Brown; while in the case of broilers, the major breed is Star-Bro and

the others are Shavarco, Arbor-Acres, Kasila etc. Prominent poultry hatcheries in Bangladesh are (b) Biman (ii) BRAC (iii) Paragon (iv) Phenix (v) Goalando (vi) Gonakallayan (vii) Kajali (viii) Usha etc. The establishment of hatcheries is quite costly. Initial cost of investment was noted to be Tk. 10 million of which bank loan amounts to only 11 percent. Actually among our selected hatcheries only three received bank loans.

Hatcheries import both breed chicks and eggs for their parent stocks. Sometimes they also sell their imported chicks to poultry farms. Among the selected hatcheries almost all are imported breed chicks; while only four imported breed-eggs exclusively meant for broilers. For layers, there is no import of eggs. The principal importing countries for broiler chicks are India, Canada, France and the Netherlands. Layer chicks are also imported from India and, among others, Germany and the Netherlands. Breed-eggs are imported predominantly from India. There is only one hatchery importing eggs from Thailand. The C&F prices for 100 pieces of broiler chicks lies between US \$ 225-250. The price for 100 eggs is US \$ 20-27, indicating marginal price differences among the exporting countries. Price differences are however, wide in the case of layer breed chicks ranging between US \$ 300 - 400 for 100 pieces, depending on the source of imports.

The average monthly import of broiler breed chicks by a hatchery number 1731 pieces. There is however, one hatchery that has a record import of 161 thousand. Import of broiler eggs by three farms accounts for only 12 thousand per month. The monthly import of layer chicks is low (744 pieces, by a hatchery). Import of layer chicks by hatcheries outside our survey area is much higher.

About the domestic distribution of chicks to poultry farms, private brokers and the agents appointed by hatcheries have a major role. Sometimes individual farm owners also collect their chicks directly from hatcheries. Farms at Cox's Bazar collect their layer chicks from Dhaka, which is a long distance of about 400 kms. Gazipur and Mankiganj have easy access to hatcheries. BRAC is the prime source of chicks to Manikganj farms.

**Table 6.2 — Breeds of Chicks Raised, Their Sources of Supplies and Prices**

Area of Study	Household Layers			Commercial Layers		
	Major Type of Chicks	Sources of Supplies	Price per piece (Tk.)	Major Type of Chicks	Sources of Supplies	Price per piece (Tk.)
<b>Layer farms</b>						
Gazipur	Lohmenn Brown & BV-300	Phenix and Ganakallayan (39 kms)	25.2	BV-300 & Star - Cross	Phenix & Goalando (73 kms)	25.6
Manikganj	Hi-sex Lohmenn Brown	BRAC & Brokers (4 kms)	24.0	BV-300	Phonex & Goalando (73 kms)	25.0
Cox's Bazaar	BV-300	Phenix & Broken (346 kms)	28.3	BV-300 & Star Cross	Phenix (90kms)	28.0
<b>All Areas</b>	-	-	<b>25.9</b>	-	-	<b>26.6</b>
<b>Broiler farms</b>						
Gazipur	Star-Bro	Paragon (11 kmd)	24.7	Star-Bro	Paragon (11 kms)	25.0
Manikganj	Star-Bro	Conokallayan & BRAC (5 km)	26.6	Star-Bro	Paragon & Usha (47 km)	24.3
Cox's Bazaar	Star-Bro	Goalando & Broker (173 km)	24.4	Star-Bro	M.M Aga & Broker (216 kms)	26.3
<b>All Areas</b>	-	-	<b>25.2</b>	-	-	<b>25.2</b>

Note: Figures within parentheses indicate distance of the farms from the sources of collections.

Source: Field Survey, 2000.

#### SALES PRICES OF CHICKS

Besides the prevailing stable grain markets, prices of chicks are also important for the smooth development of the poultry industry. Sales prices of chicks, both layers and broilers, in the last three years are noted to be reasonably stable at around Tk. 24.00 and Tk. 26.00 per piece of broiler and layer chick respectively. In the study year, prices suddenly increased by 20-25% due to shortages. The prevailing stable situation in prices of chicks tends to suggest that there is a favorable environment for poultry development

in the country. There are however, some other problems, as revealed from the opinion survey carried out.

#### PROBLEMS FACED BY FARM OWNERS

Problems reported by poultry farm owners can be broadly grouped into two; (a) poor quality of feeds, and (b) inadequate supplies of chicks. Regarding quality, the owners are more concerned of the quality of wheat than of maize and its timely availability. Further, they also suffer from poor quality non-grain ingredients, especially of protein and vitamins available in the market as they are not capable of testing their quality. According to workshop reports there is an urgent need for quality testing laboratories in the country both for feed ingredients and finished feeds (ATDP, 1999).

Several farm owners also face difficulties in collecting an adequate number of chicks in time, despite advancing half of the value of chicks, requisitioned by them. It has also been reported that there are some supplies of chicks are infected by Gumboro disease. Screening of weak chicks by local hatcheries is not done properly. In consequence, the mortality of birds in the farms is high. The reported high rate of mortality is a threat to the poultry industry.

#### POSSIBLE RECOMMENDATIONS

Smooth marketing of farm products suggests that the demand is not a constraint in the country. Problems are mainly related to supplies of quality inputs, including chicks. First, quality for feed ingredients and chicks should be ensured. In the absence of standard rules and regulations, there are possibilities for the use of adulterated and toxic ingredients. Further, the antibiotics, hormones and feed additives used in an intensive production system may increase the risk of heavy metals in livestock products (Fattah, 1999). To get rid of such toxic materials and heavy metals, Public Quality Acts should be framed. Also domestic production of breed chicks should be encouraged and, if possible,

their prices may also be reduced to make our industry competitive with neighbouring countries. Poultry farms may be brought under an insurance program.

To ensure quality supplies of feeds, domestic production of maize and wheat should be encouraged. This is also necessary for the reduction of external dependency for poultry feeds. Some farm owners as usual suggest a reduced price of maize and ready feeds and also seek bank loans for the establishment of bio-gas plants using poultry litter. Institutional credit is therefore, sought for efficient utilization of existing farm capacity as well as for construction of new farm space.

As earlier reported, the present practice of disposal of poultry litters is damaging to the environment. An organic fertilizer farm based on poultry litters may be established in the country. Similarly bio-gas plants for poultry farms may be encouraged. Provision of liberal credit and, if possible, some subsidy may also be given to this end.

## 7. CONCLUSIONS

This paper is based on secondary information and the results of surveys conducted in Cox's Bazar, Manikganj and Gazipur districts in 1999. 71 poultry farms were studied, of which 33 were household layer farms, 20 were commercial layer farms, 9 were household broiler farms and 9 were commercial broiler farms. Fewer commercial poultry farms were found in Manikganj district; therefore the majority studied there were household farms. Farms having a stock of up to 1000 birds were considered to be household farms and, following the national ratio of 3:1 layer to broiler farms (Department of Livestock Services information), about 75% of the poultry farms studied were layer farms.

The number of poultry farms in the country has been growing fast in the 1990s (6% a year). At present there are over sixty thousand farms, of which about three-fourths are layer farms. Of the poultry farms, household-level layer farms are small with poor housing conditions while commercial farms are large and mostly located around the cities and district towns, a possible reflection of local demand.

The poultry farms use mixed feedgrains; maize, wheat and manufactured feeds commonly known as ready feeds. Mixed feeds are prepared separately according to their own criteria and prescriptions given in the booklets but the differential impact of such practices is not known. Furthermore, farm owners adjust their intensity of use depending on prices of inputs. Such adjustments are not uniform. Small household farms seem to face more difficulties in such adjustment processes, mainly because of price fluctuations and a lack of adequate knowledge. We still do not entirely understand the production efficiency of poultry farms and their relationship with the prevailing markets for feeding ingredients such as maize and wheat. The present study, based on a small field survey carried out in three areas (Gazipur, Manikganj and Cox's Bazar), examines existing

feeding practices and their efficiencies at both household and commercial levels and also analyzes maize and wheat markets vis-a-vis the poultry industry.

Poultry farms in the study areas are relatively new. Most, particularly broiler farms, were established after 1995. But poultry houses are generally of poor quality. One-third of poultry farms are housed in thatched/kutchha houses. These houses are prominent at Cox's Bazar poultry farms. The average cost for establishing a poultry farm is Tk. 3,30,571 while commercial farms can cost as much as Tk. 750 thousand. Broiler farms have a lower establishment cost (Tk. 42,000). Therefore, the least costly type of poultry farm is a household level broiler farm (Tk. 20,000). This would suggest that NGOs are able to support the establishment of broiler farms in poverty alleviation programs.

The average stock of birds raised per batch of the combined study areas was found to be 1083 broilers and 2139 layers. Household broiler farms averaged a stock of 600 birds while commercial broiler farms raised 1544 birds. At commercial layer farms in the study areas the average was 4870 birds. At present, these farms are using about three-fourths of their existing capacity with wide regional variation, the highest utilization being at Gazipur (88%).

Poultry farms consume both maize and wheat, while among non-grain feed ingredients, rice polish, soybean meal, and vitamins, are important. Of the selected farms half are exclusively maize users, 24% consume ready feeds and the remaining consume both maize and wheat. The exclusive use of maize is predominant at layer farms in Gazipur, while ready feeds are mostly used in Manikganj and the broiler farms of Cox's Bazar.

In individually prepared feed mixtures, grains constitute over half of feed weight and the share of maize in feedgrains is very high (85%). Feed mills use a negligible proportion of wheat in their manufactured feeds.

Household broilers during their six-week growing period consume about 3.6 kilograms of mixed feeds; this number is marginally lower at commercial farms. Similarly, household layers in their twenty-week growing period consume a higher amount than commercial layers. It may be concluded that commercial layers are fed less feed. An adult layer consumes 105 grams per day amounting to an annual consumption of 30 kilograms of feed inclusive of the twenty-week growing period.

Feeding efficiency at broiler farms is 52% with a range of 46-62% at household and commercial farms. Commercial farms were found to be more efficient. Feeding efficiency is far less with layers (22%) with a small difference between household and commercial layers. The live weight growth of a broiler during the growing period is 43 grams per day while a layer will grow at a rate of 11 grams per day. The use of mixed feeds appears to be more efficient in both broiler and layers.

Employment opportunities created through the establishment of poultry farms at the household level are largely limited to self-employment. A layer farm employs an average of three persons while a broiler farm employs an average of two persons. Household farms engage less than two persons and commercial layer farms employ six people on average. The number of birds supervised by a worker is estimated to be about 300 layers and 365 broilers at the household level. As expected, this number is higher at commercial farms. An investment of Tk. 10,000 is required for just over 100 layers and about 375 broilers.

A rough estimate on costs and returns of a poultry farm indicates that it is a profitable enterprise. Commercial farms are more efficient with higher returns in both broiler and layers. At the household level, however, broilers are more profitable than layers.

Prices of feedgrain (both maize and wheat) have been fairly stable across regions and over time. The feedgrain market in the country is performing reasonably well. In 1998 and 1999 the retail prices of maize in the samples were Tk. 0.45 per kg lower than

wheat. The monthly price range was found to be within Tk. 1.00 per kg, which appears to be normal in the Bangladesh context. Commercial layers paid a lower price for feedgrains than household farms. This seems to be due to large-scale grain purchases by commercial farms and easier access to markets. The price trend in maize and wheat during the period of 1995-1999 indicates that it is reasonably stable. If adjusted against the country's inflation rates, grain prices appear to have declined over time. Along with the price of feedgrains, prices of other non-grain ingredients including one-day chicks were found to be stable. The existing degree of stability in the prices of all principal feed ingredients suggests that input markets are favorable to the development of poultry farms in the country. Price analyses on poultry products such as eggs and meat were not completed and no definite comment on these is possible. The Department of Agricultural Marketing (DAM) collected prices in 1998-2000 and found almost the same annual price for eggs (Tk. 308 for 100 eggs), but a marginal rising price trend was recorded for broilers at that time. Monthly price fluctuations are also small suggesting that product markets are somewhat stable.

Poultry farming in Bangladesh is largely dependent on the import of feed ingredients and chicks. However, there are no clear rules and regulations regarding the import and quality testing of these products. There is an urgent need for quality inspection of imported feed ingredients and chicks. The country should also take appropriate steps to produce all our chicks locally therefore reducing dependency on foreign supplies. It is not known why chick production farms are not being established in the country and the reasons should be carefully researched. Adequate measures should also be taken to increase the production of maize and soyabean—two crops that have a large potential in Bangladesh. Adoptive research and a targeted extension program should be introduced.

Poultry farms in the country are now using three-fourths of their production capacity. It is much lower in household farms (below 65%), reportedly due to financial

constraint. Formal credit supports are therefore required to improve the efficiency of capacity utilization. The mortality of birds is also high (10%) and this can be reduced through an adequate supply of disease free chicks and quality vaccines.

It seems that the broiler feeding efficiency can be raised, particularly in household farms. To this end, farm owners should be properly trained in feeding principles and farm management.

For the long-term development of the poultry industry in Bangladesh, environment-friendly technologies should be applied in the disposal of poultry litter and industrial wastes containing toxic elements in order to avoid health hazards. Institutional credit supports and technical assistance that help poultry farmers to establish fertilizer farms or bio-gas plants may be a solution.

The present study has not examined the extent of price competition in poultry, eggs, meat and other production inputs between Bangladesh and its neighboring countries. Such a study is essential to identify the factors causing differential levels of successes, as evident in price differentials. Furthermore, a special market study may also be initiated in order to explore the possibility of the creation of an export market in poultry products.

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