

COVID-19 effect on Poultry Farming in the selected area of Chattogram, Bangladesh



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List of Abbreviations

Abbreviations	Elaboration
COVID	Corona virus Disease
DOC	Day old chick
BDT	Bangladeshi Taka
%	Percentage

Abstract

The COVID-19 pandemic had gravely affected innumerable economic sectors across the world, including livestock production in which poultry sector was affected greatly by this pandemic. This study investigated how the pandemic had affected the poultry production and distribution network (PDN), analyzed economic circumstances of the farmer before pandemic and after pandemic in the Rangunia Upazilla, Chittagong. Twenty five poultry farms from Rangunia Upazilla were selected to find out what extent the farm was affected by the COVID-19 crisis besides some retail sellers also included for getting data about price fluctuation in chicken meat and eggs. Per bird average annual gross cost for rearing of broiler and layer were 895.5 BDT and 1557.5 BDT, respectively before pandemic and average annual gross cost/bird for rearing of broiler and layer are 985.5 BDT and 1652.5 BDT, respectively throughout pandemic which turns into annual cost/bird for rearing of broiler and layer were 913.5 BDT and 1633.5 BDT, respectively immediate after COVID pandemic. The study showed that the poultry sector was damaged by the COVID-19 pandemic, partly as a result of the lockdown and also by rumors that poultry and their products could transmit the disease. Huge disaster occurred in poultry production due to disrupted production and transportation, falling down consumer demand and volatile markets also brought huge financial struggling, even leading to the permanent closure of many farms.

Keywords: Poultry sector, COVID-19, Farmers, Broiler, Layer

Chapter-I

Introduction

The corona virus disease (Covid-19) is caused by novel corona virus (Co-V) called SARS-CoV-2 belonging to the species severe acute respiratory syndrome within the genus Beta corona virus (WHO, 2020). The first case of covid-19 was reported in Bangladesh on 8th March 2020 and up to November 2020 overall 441,159 confirmed cases and 6305 deaths have been reported (IEDCR,2020).

This Covid-19 created chaos not only in Bangladesh but also around the globe. In neighbored country India, losses between January to March 2020 amount to USD 236 million. The covid 19 pandemic has hit Myanmar's economy hard and GDP was fall by at least 17.4% compared with 2019 (Marchant-Forde and Boyle, 2020). Poultry is one of the promising sectors of livestock which is greatly devastated by covid-19. The poultry sector produces around 33 million eggs per day and creates a demand of about million- and seventy-thousand-day old chicks per week (WPSA-BB 2020). The covid -19 has awfully disturb the poultry production system and created a mismatch between demand and supply of poultry products. The devastating covid-19 resulted in about 35% drop-in commercial day-old-chicks (DOC), eggs and meat production in our country (Miah *et al*, 2020). As per Bangladesh Poultry Industries Centre Council (BPICC) the total loss in poultry sector is about 7000 crore and about 25-30% of the entrepreneurs lost their working capital due to covid-19. The negative impact of covid-19 was much more severe during April to June, 2020 (Ali, 2020).

To control the pandemic situation government took some measures including national lockdowns, travel restrictions, border closures and control which brought some inevitable negative consequences with regard to the livestock sector. Due to lockdown, local and international movement of animals and animal product was restricted, besides there were difficulties for supplying feed and medicine in this critical situation. (Food Agriculture Organization, 2020a). Access to labor and professional services along with provision of other production inputs and equipment's also hampered. Due to movement restriction along with closure of schools,

restaurants, shops, and markets the demand of animal's products was decreased. Therefore, farmers depopulate their farms to reduce the maintenance cost of animal population which they could neither feed or trade which ultimately affected poultry production and trade (Berkhout, 2020).

Poultry sector considered as an important sector as 37% of the country's total meat production comes from this sector and also contribute in animal protein supply by providing 22-27% protein which form's a substantial fraction of livestock's sector 1.47% contribution to the country's GDP.(DLS: Department of Livestock Services, 2020). This promising poultry sector has encountered a loss of a minimum of 115 billion Bangladeshi taka within just two weeks from March 20 to April 4, 2020(Genoni *et al*, 2020). In an overview of the impact the pandemic had, the Bangladesh Poultry Industries Central Council (BPICC) reported an approximate loss of above BDT 300 billion in the country's poultry industry between 26 March and 30 April 2020 (Hamid *et al*, 2020).

According to BPICC, during first wave of covid-19, the production was significantly dropped: Day-old-chicks (DOC) about 45%, eggs about 28%, 45% in chicken meat and 40% in feed. But gradually the negative impact on the sector was found reduced about 83% during July to September 2020 due to proper measures taken by the farmers, private sectors, service providers, government and other stake holders (Agri news, 2021). But still price fluctuation existing in meat and live bird's price. Fluctuating price create changes in supply and demand which cause chicken and egg price to change regularly. This in coordination sometimes goes to beyond the reach of many consumers and sometimes so severely that farmers suffer too badly to continue his farm (Takashi and Chhabi, 2010).

Of course, covid-19 is not first challenge to this growing sector, the outbreak of avian influenza in 2007 had a catastrophic effect as it causes shutting down of more than half of the country's total poultry farm and hatcheries and the emergence of disease continue to afflicts the farmer (Hamid *et al*, 2020). To evaluate the effect of COVID 19 on the poultry sector of Rangunia Upazilla this study were designed and following objectives were considered for the study:

Objectives of the study:

A systemic survey aimed at gathering information on covid-19 effect on poultry farming before, during and after COVID pandemic period.

Monitoring the price of egg, meat, feed throughout the pandemic period and before pandemic.

To evaluate the social economic changes of the poultry farmers due to COVID pandemic.

Chapter-II

Materials and method

2.1: Study period and study population

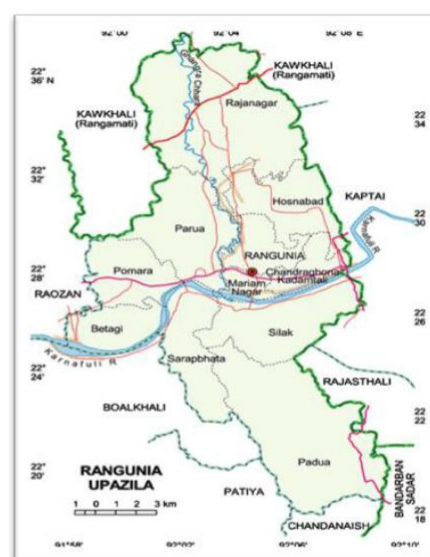
The study was carried out for the period of 3 months from 1st February 2021 to 31st April 2021 at Rangunia Upazilla, Chattogram. Twenty five poultry farms from Rangunia Upazilla were selected for the study to evaluate the impact of covid-19.

2.2: Study area:

The study was performed at Upazilla Livestock Office, Rangunia in Chattogram district, Bangladesh. Rangunia Upazilla is located in between 22°18' and 22°37' north latitudes and in between 91°58' and 92°08' east longitudes. It has 46,176 households and a total area of 347.72 km². It is surrounded by Chandanaish Upazilla on the south; Patiya Upazilla, Boalkhali Upazilla, Raozan Upazilla & Kawkhali Upazilla of Rangamati district on the west; Kawkhali Upazilla of Rangamati district on the north and Kaptai Upazilla & Rajasthali Upazilla of Rangamati district and Bandarban Sadar Upazilla on the east.



(a)



(b)

Fig 2.1: Geographical distribution of data collection site (a) Map of Bangladesh; (b) map of Rangunia Upazilla in Chittagong District.

2.3: Data collection:

Passive surveillance data of the time were collected from register and active surveillance data were collected by asking questions to the farm officials. Production data like egg and meat production were taken from farm register. Management data such as housing, feeding, deworming, vaccination etc. were taken from observation and information that were obtained from questionnaire that was used during data collection.

2.4: Statistical analysis:

The obtained data was stored in Excel-2007 and descriptive statistics (means, standard deviation, frequencies) were calculated to compare the different variables.

Chapter-III

Results

3.1: General description of the farm:

Table 3.1 showed that mean farm size(number of bird) was 4336.84 ± 541.99 with range 1000-10000 before covid-19 and 3452.343 ± 43 with range 1000-5000 immediate after covid-19 in case of broiler farm. The mean layer farm size was 5252.63 ± 708.61 with range 1500-10000 before pandemic and 3423.4543 ± 23 with range 1200-5000 immediate after pandemic. In case of sonali and deshi the mean was 2354 ± 432 & 20.55 ± 2.25 before covid-19 with range 1000-5000 & 2-40, respectively and immediate after pandemic the mean was 2245.32 ± 232 & 20.55 ± 2.25 with a range 1000-3000 & 2-40, respectively.

Table 3.1: Analysis of farm size according to farm types.

Type of farm	Mean+SE		Range	
	Before Covid-19 (Dec-Feb)	Immediate after Covid-19 (Mar-Jun)	Before covid-19 (Dec-Feb)	Immediate after covid-19 (Mar-Jun)
Broiler	4336.84 ± 541.99	3452.343 ± 43	1000-10000	1000-5000
Layer	5252.63 ± 708.61	3423.4543 ± 23	1500-10000	1200-5000
sonali	2354 ± 432	2245.32 ± 232	1000-5000	1000-3000
Deshi	20.55 ± 2.25	20.5 ± 4.23	2-40	2-40

3.2: Common management practice in poultry farms under study:

Table 3.2: Management practices of the selected farms showed:

Management practice in the farm			
Variables	Catagories	No of farm	Percentage
Floor	Concrete	20	80
	Muddy	5	20
	Slats	0	0
Roof	Iron sheets	21	84
	Concrete	4	16
	Bamboo & leaf	0	0
Sidewall	Wire netting	25	100
	Bamboo splint	0	0
Rearing system	Floor	14	56
	Case	9	36
	Free range	2	8
Litter material	Rice husk	14	56
	Saw dust	2	8
	Wood shavings	0	0
Frequency of litter change/month	2 times	8	32
	3 times	6	24
	4 times	0	0
Feeder tye	Hanging plastic feeder	12	48
	Pot/bucket	2	8
	Attached	6	24
Feed type	Self prepared	3	12
	Readymade mash	6	24
	Readymade pellet	12	48
Amount of feed /day	<115gm	2	8
	115-120gm	6	24
	>120gm	2	8
	Adlibitum	12	48
Drinker type	Hanging drinker	12	48
	Pot/bucket	3	12
	Atthached	7	28
Water supply	Manual	5	2
	pump	15	6
Use of fan	Yes	13	52
	No	7	28
Disease management	Own effort	3	12
	Quack	12	48
	Vet	4	16
	All	4	16
Vaccination & Deworming	Regular	15	6
	Irregular	6	24
	Not at all	3	12
Biosecurity	Strictly folloewd	2	8
	Moderately followed	12	48
	Not followed	10	

3.3: Factors associated with socio-economic status of the farmers:

Different factors associated with socio-economic condition of the farmers of Rangunia Upazilla are listed in Table 3.3.

Table3.3: Different factors associated with socio-economic status of the farmer.

Variables	Catagories	No of farm/farm owner	Percentage(%)
Type of farmer	Landless(0.00-0.50 acre)	3	12
	Marginal(0.51-1.24 acre)	5	20
	Small(1.25-2.47 acre)	11	44
	Medium(2.48-4.94 acre)	3	12
	Large(>4.95 acre)	3	12
Soure of invesment	Own	9	36
	Bank loan	4	16
	With interest from money lender	4	16
	Sharing Partner	7	28
Number of birds	<3000	10	40
	3000-5000	9	36
	>5000	6	24
Training on poultry farming	yes	8	32
	No	17	68
Family type	Single	18	72
	Joint	7	28
Amount of loan(BDT)	No loan	16	64
	<10000	4	16
	10000-50000	5	20
	>50000	0	0
Educational qualification	Hig(Above seceondary)	1	4
	Medium(secondary)	7	28
	Poor(Primary)	17	68
Level of poultry farm management skill	High	4	16
	Medium	14	56
	Poor	7	28

3.4: Economic analysis

Table 3.4 showed the average cost/bird annually. Per bird average annual gross cost for rearing of broiler and layer were 895.5 BDT. & 1557.5 BDT, respectively.

Table 3.4: Average annual cost/bird before COVID pandemic

Items	Expenditure before covid-19(Dec-Feb,2020)					
	Per bird cost in one batch for broiler			Per bird annual cost for layer		
	Gross cost(BDT.)	Depreciation cost(BDT.)	Total cost(BDT.)	Gross cost(BDT.)	Depreciation cost(BDT.)	Total cost(BDT.)
DOC	32	-	32	34	-	
Feed	95	-	95	1500	-	
Labor	10	-	10	10	-	
Medication	10	-	10	10	-	
Housing	-	2	2	-	3.00	
Equipment	-	0.25	0.25	-	0.50	
Total gross	147	2.25	149.25	1554	3.50	1557.5
Total gross cost for 6 batch	149.25*6	=895.5				

Average annual cost/bird for rearing of broiler and layer were 913.5 BDT and 1633.5 BDT, respectively immediate after COVID pandemic. (Table 3.5)

Table 3.5: Average annual cost/bird immediate after COVID pandemic (Mar-May, 2020).

Items	Expenditure immediate after pandemic(March-May,2020)					
	Per bird cost in one batch(BDT.) for broiler			Per bird annual cost (BDT.) for layer		
	Gross cost (BDT.)	Depreciation cost (BDT.)	Total cost (BDT.)	Gross cost (BDT.)	Depreciation cost (BDT.)	Total cost (BDT.)
DOC	28	-	33	35	-	35
Feed	100	-	50	1575	-	1200
Medicine	12	-	10	10	-	10
Labor	10	-	10	10	-	10
Housing	-	2	2	-	3	3
Equipments	-	0.25	0.25	-	0.25	0.25
Total	150	2.25	152.25	1630	3.25	1633.25
Total cost for 6 batch broiler	152.25*6		913.5			

Table3.6 showed average annual gross cost/bird for rearing of broiler and layer are 985.5 BDT & 1652.5 BDT, respectively throughout pandemic (Feb-Apr).

Table 3.6: Per bird annual gross cost (Average) throughout pandemic (Feb-Apr).

Items	Expenditure throughout the pandemic(Feb-Apr,2021)					
	Per bird cost in one batch(BDT.)			Per bird annual cost (BDT.)		
	Gross cost (BDT.)	Depreciation cost (BDT.)	Total cost(BDT.)	Gross cost (BDT.)	Depreciation cost (BDT.)	Total cost(BDT.)
DOC	45	-	45	45	-	45
Feed	95	-	98	1580	-	650
Medicine	12	-	12	12	-	14
Labor	10	-	10	12	-	12
Housing	-	3	3	-	3.5	3.5
Equipments	-	0.3	0.3	-	0.35	0.35
Total	162	3.3	164.3	1649	3.85	1652.85
Total cost of 6 batch broiler	164.3*6		985.8			

The Per bird gross return of broiler and layer are shown in the Table 3.7. Per bird gross return of broiler and layer were BDT. 900 and BDT. 1980, respectively before pandemic(Dec-Feb,2020). (Table 3.7)

Table3.7:Average annual gross return/bird before pandemic(Dec-Feb,2020).

Items	Broiler(BDT.)	Layer(BDT.)
Selling of bird(Broiler/spend hen)	900	160
Selling of eggs(280)		1820
Total gross return	900	1980
Per bird annual cost benefit ratio(Annual per bird total gross return/annual per bird total gross cost)	1:1005	1:1.27

Average gross return/bird of broiler and layer showed in the Table 3.8. Per bird gross return of broiler and layer were BDT. 700 and BDT. 1920, respectively immediate after pandemic(Mar-May,2020) which is lower than net cost due to sharp fall down of price of chicken and meat due to lockdown and rumour.

Table 3.8: Average annual gross return/bird immediate after pandemic(Mar-May,2020)

Items	Broiler(BDT.)	Layer(BDT.)
Selling of bird(Broiler/spend hen)	700	120
Selling of eggs(280)		1800
Total gross return	700	1920
Per bird annual cost benefit ratio(Annual per bird total gross return-annual per bird total gross cost)	1:0.72	1:1.2

Average gross return/bird of broiler and layer showed in the Table 3.9. Average gross return/bird of broiler and layer were BDT. 1080 and BDT. 2970, respectively throughout pandemic(Feb-Apr,2021) which is higher than net cost. (Table 3.9)

Table 3.9: Per bird annual gross return average throughout pandemic(Feb-Apr).

Items	Broiler(BDT.)	Layer(BDT.)
Selling of bird(Broiler/spend hen)	1080	170
Selling of eggs(280)	-	2800
Total gross return	1080	2970
Per bird annual cost benefit ratio(Annual per bird total gross return-annual per bird total gross cost)	1:1.09	1:1.74

3.5: Cost Benefit Ratio:

The cost benefit ratio showed in Fig 3.1. The result of cost benefit ratio before pandemic, Immediate after pandemic and throughout the pandemic were 1:1.005,1:0.72,1:1.09, respectively in broiler production and 1:1.27,1:1.2,1:74 respectively, in layer production.

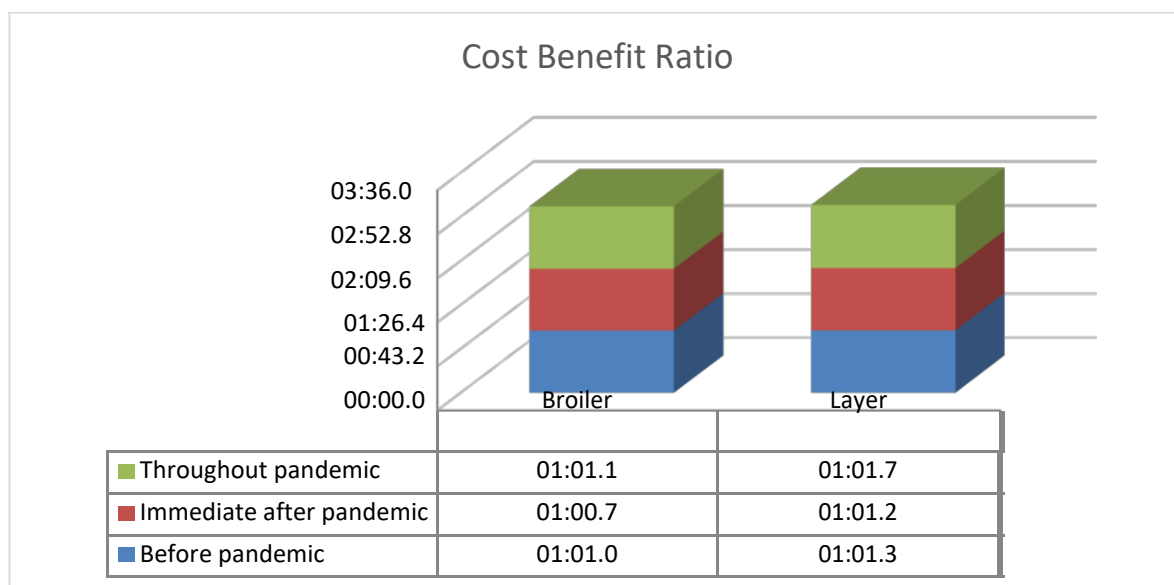


Fig 3.1: Cost Benefit Ratio

3.6: Fluctuation in the Price of Live Chickens and Eggs over Time

An explicit blow of COVID-19 on the poultry sector was changeability in live chicken and egg prices prior to, during and following lockdown (January–June 2020). For each commodity, namely exotic broiler chickens, Sonali chickens and layer eggs, showed fluctuation. (Jan-sep, 2020)(Fig 3.2).

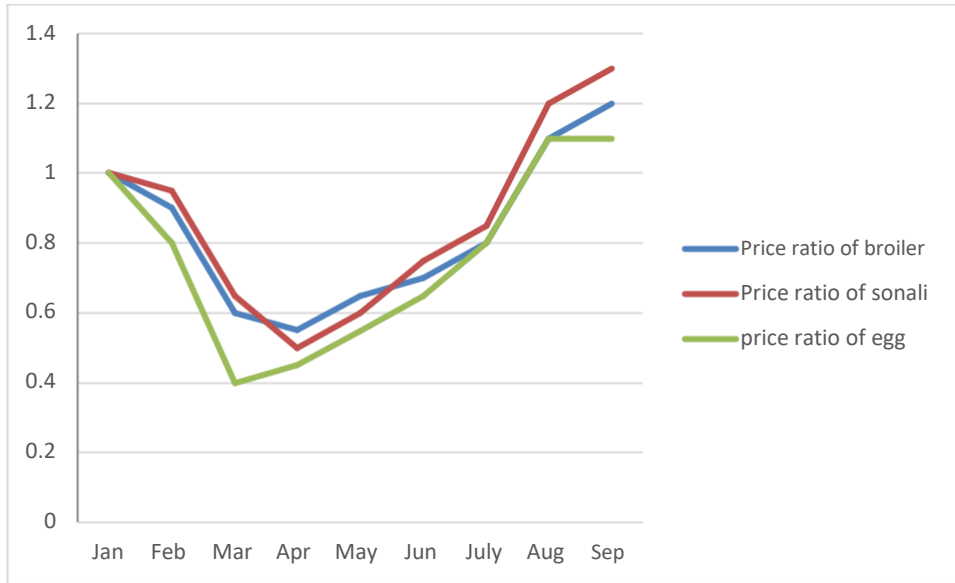


Fig 3.2: Price ratio of broiler, Sonali and egg at Rangunia Upazilla

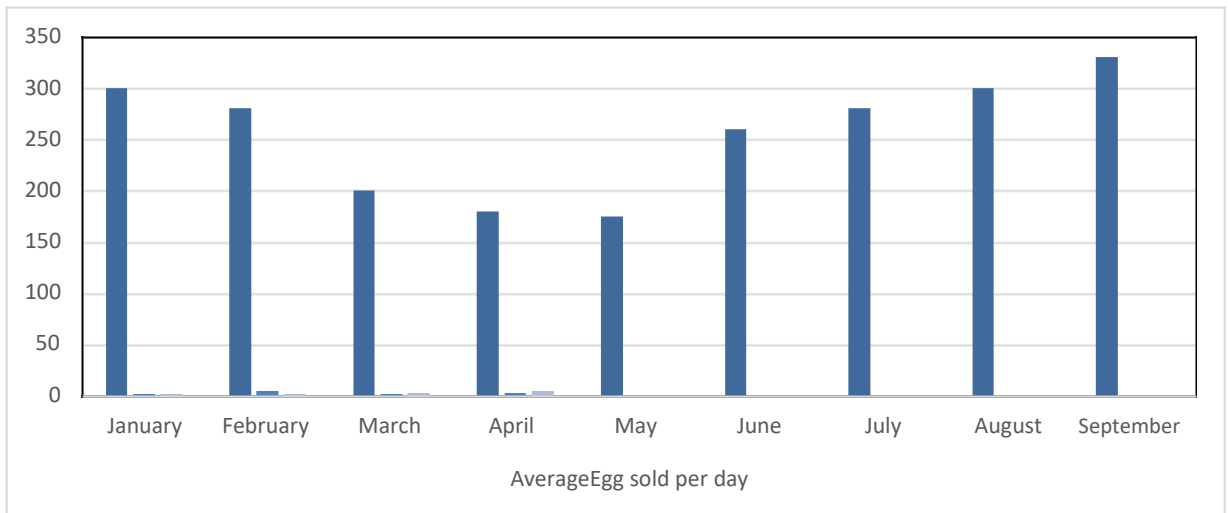


Fig3.3: Average egg sold per day at Rangunia Upazilla (Jan-Sep, 2020)

Chapter IV

Discussion

Prices of exotic broiler chickens, Sonali chickens and eggs decreased in the period immediately following the declaration of the General Holiday on 22 March 2020, with the utmost impact on exotic broilers (Fig3.2). By 25 March their price had dropped by 28% compared with their price on 1 January 2020(Fig3.2). As Ramadan started, on 24 April, the price of chickens and eggs rose. As a result, the price of chicken also rises (New Age, 2020).The price of exotic broiler was then almost twice as high as at the start of the lockdown. This may indicate some recovery in consumer demand brought about by activities associated with these holidays (New Age, 2020).). As the lockdown was elated (30 May 2020), prices outstretched to fluctuate while remaining higher than during the pre-lockdown period (Hamid *et al*, 2020). Sonali chicken prices showed smaller fluctuations and it makes up a smaller proportion of the chicken products sold as compared to broilers, and they sell for a higher price to mostly affluent customers. As for eggs, prices were inevitably 20% lower during lockdown than in the instantly foregoing period (Genoni *et al*, 2020).

In 2018–19, the total production of eggs in Bangladesh was 1711 crore in number which met 98.8% of the country's demand including Overall meat production was 75.14 lakh metric tons (DLS-Department of Livestock Service, 2020a). In 2019, poultry meat made up 37% of production (FAOSTAT, 2019). After March 2020, these production levels fell by at least half (Berkhout, 2020) and later period the production increases disruption to supply and overall egg and meat production in 2020-2021 is 2057.64 crore in number and meat production is 84.40 lakh metric ton(DLS-Department of Livestock Service, 2020a).Input suppliers noticed the demand for poultry and poultry products dropped drastically with the onset of the COVID-19 crisis.

People steer clear of consumption of chicken and egg as the COVID-19 outbreak had started which notably reduced demand for meat, egg, and other processed food. This had a remarkably unfavorable effect on all stakeholders along the transaction chain, from producers to sellers, resulting in a sudden drop in chicken prices and sales over a very short period due to lockdown imposed for preventing spread of Covid-19(TBSNEWS, 2020).

Furthermore, various events such as weddings, parties, religious gatherings, election campaigns, where chicken and eggs were necessary food items, were banned (Amin, 2020).

In this situation some had to close or adapt their business practices for compensating their loss. Consumers were decreased due to limited business hour with high infection rate of covid-19(Rosen, 2020). Poultry traders also reported that the progressive increase in the strictness of lockdown measures (World Health Organization, 2020b), together with the interim closure of businesses and workplaces, had reduced consumer incomes. According to one study, about 95% of households experienced income loss in the first two months of the pandemic, and 62% of earners reported lost jobs (Miah et al., 2020)..

Though there is temporary positive turn in price on the period of Ramadan and 'Eid, the ultimate loss led to a great harm to poultry sector that's why the demand for chicken and eggs did not match that of previous years and that this interferes the input suppliers, farmers and traders from making the profits they expected(Khan,2021). Due to the closure of many farms, disrupted production, and unavailability of transportation facilities, the supply and sales percentage of chickens in the market were low and it did not return to normal until June 2020 (Mahmud, 2020). Thus, although prices may have increased in response to increasing demand during this period that does not necessarily indicate a substantial enough recovery throughout the production and distribution prior to COVID-19(Rahman and Ruszczyk, 2020).

It is typical for the prices of chickens and eggs to varying over the year and so some stakeholders anticipated market volatility as soon as the pandemic began. However, despite varying levels of imprecation, most were unable to respond swiftly. The initial drop in price resulted in many stakeholders temporarily shutting down operations or focusing on alternative agricultural endeavors (Rahman and Ruszczyk, 2020). The Bangladesh Poultry Industries Central Council (BPICC) reported that 50–60% of all poultry farms closed temporarily in response to COVID-19 (Ali, 2020). Although a portion of the broiler farmers restarted farming by June (IDLC, 2020), the permanence of most of these closures is still unclear, in February 2021, 30% of broiler farms and hatcheries that closed due to the pandemic in April 2020 had remained closed to date (Financial Express, 2021).

For farmers, this meant from the earlier retail price of BDT 130–150 per kg of broiler, the price fell below BDT 90 in March and April. This was challenging for farmers as the production costs for broilers per kg were between BDT 90–100. This is confirmed by a report from the Food and Agricultural Organization of the United Nations (FAO), stating that about 70% of chickens were said to remain unsold (FAO, 2020)). As a result, farmers were insisted to sell birds and eggs at a very low price.

Consequently, around 70% of small to medium-sized broiler farms were closed by April (IDLC, 2020) and small-scale farms were hit badly. Besides, many large-scale farms reduced their flock size, which lead to decline of meat production rapidly from 90,000 to 25,000–27,000 tons/month (Ali, 2020).

For layer farmers, the cost of production per egg was around BDT 5.50, but the market price fell to BDT 4.00 with nearly 50% of eggs remained unsold (FAO, 2020). From the onset of the pandemic until April, 32–35% of the layer farms were completely closed (Ali, 2020)&farmers were forced to sell their laying hens as spent hens before the end of their laying cycle to compensate financial losses(Mahmud,2020).

The prices of DOC reportedly declined by 75% in layer and 90% in broiler. Moreover, 40–50% of newly hatched DOCs were reported to be unsold (FAO, 2020). Several hatcheries reported that they had to cull unsold DOCs and sell hatchable eggs as table eggs at the very low price of BDT 3.9–5.5 (USD 0.046- 0.065)(Khan,2021).

The cost benefit ratio value in my study different from Alam, J, (1997), he found 1:1.22 cost benefit ratio for intensive farms due to dramatic change in poultry sector due to covid-19 pandemic during my study period.

Chapter-V

Conclusion

Poultry sector is one of the promising sectors & poultry farming is a great opportunity as a means of income generation in Bangladesh. But we had seen a devastating scenario in poultry sector due to pandemic covid-19. Although there was sharp fall down of demand of meat and egg, immediate after covid-19, situation is changing now. Since most of the people irrespective of caste and religion prefer chickens and eggs, its demand and price are gone up. Stockholders, veterinarians, farmers, and all the partners of the chain of poultry production need to be more involved in the current situation and the strategic future of the industry to fulfill human demands and ensure sustainable agriculture study. This study also suggests that the farmers need to train and they should develop their skill as they can fight back harsh situations like COVID in future.

CHAPTER VI

Limitations

Record keeping was not done properly in some farms. Some data were collected indirect way. No fixed protocol was practiced for management. The period of the study was short to analyse the productive performance. Moreover, due to pandemic of the COViD19 outbreak, data collection was not possible directly at the ending of the study.

CHAPTER VII

References

- Agri News 24 (2020). The Ministry of Fisheries and Livestock Will Provide Feed to the Farmers at Subsidized Price (In Bengali). (Accessed December 28, 2020).
- Alam J. (1997). Impact of smallholder livestock development project in some selected areas of rural Bangladesh. Livestock for Rural Development.
- Ali S. (2020). Poultry Production Falls Alarmingly. (Accessed December 28, 2020).
- Amin M. A. (2020). Tackling Coronavirus: PM Announces Tk5, 000cr Package for Bangladesh's Agriculture Sector. (Accessed April 12, 2020).
- Berkhout N. (2020). Bangladesh Poultry Production Plumets. (Accessed May 22, 2020).
- DLS (Department of Livestock Services) (2020). Livestock Economy at a Glance. (Accessed December 24, 2020).
- FAO (Food and Agriculture Organization) (2020). Rapid Assessment of Food and Nutrition Security in the Context of COVID-19 in Bangladesh. (Accessed December 28, 2020).
- Financial Express (2021). Poultry Meat Gets Dearer in Dhaka. (Accessed February 20, 2021)
- Genoni M. E., Khan A. I., Krishnan N., Palaniswamy N. and Raza W. (2020). Losing Livelihoods: The Labor Market Impacts of COVID-19 in Bangladesh. Washington, DC: World Bank. doi: 10.1596/34449.
- Hamid M., Rahman M., Ahmed S. and Hossain K. J. (2017). Status of poultry industry in Bangladesh and the role of private sector for its development. Asian J. Poult. Sci. 11, 1–13. doi: 10.3923/ajpsaj.2017.1.13.
- IDLC (2020). Feed industry of Bangladesh: sustaining COVID-19 and potentials in upcoming days. (Accessed December, 2020).

IEDCR (Institute of epidemiology disease control and research) (2020). Bangladesh Coronavirus (COVID-19) Update (Accessed Oct. 24, 2020).

Khan M. R. (2021). Lockdown Deals Fresh Blow to Poultry Farmers. (Accessed April 13, 2021)

Marchant-Forde J. N. and Boyle L. A. (2020). COVID-19 effects on livestock production: a one welfare issue. *Front. Vet. Sci.* 7:585787. Doi 10.3389/fvets.2020.585787.

Mahmud N. (2020). Coronavirus: Local Poultry Industry Facing a Massive loss. (Accessed December 28, 2020).

Miah A., Islam T., Anika I. A. and Swarna N. R. (2020). Economic Impact of COVID-19 and Way forward for Bangladesh (Accessed December 28, 2020).

New Age (2020). Prices of Ramadan Essentials Rise (Accessed December 24, 2020).

Rahman, M. F., and Ruszczyk H. A. (2020). Coronavirus: How Lockdown Exposed Food Insecurity in a Small Bangladeshi City. (Accessed 24 September, 2020).

Rosen L. (2020). Field Notes: Bangladesh in Times of COVID-19 and Food Security (Accessed December 28, 2020).

Takashi M .S. S. and Chhabi K.Q.N. (2010). Current Scenario of the Small-scale Broiler Farming in Bangladesh: Potentials for the Future Projection. *International Journal of Poultry Science*, 9 (5): 440-445.

TBSNEWS (2020). Close Shops, Super shops, Kitchen Markets by 7pm daily: DMP. (Accessed December 28, 2020).

WPSA (World's Poultry Science Association) (2020). Poultry at a Glance (Accessed May 02, 2020).

WHO (World Health Organization) (2020). WHO Coronavirus Disease (COVID-19) Dashboard (Accessed March 21, 2020).

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