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Covid-19 Effects on Dairy Farmers' Livelihood

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ABSTRACT

The study's objectives wereto describe some selected characteristics of the dairy farmers, determine the extent of covid-19 effects on dairy farmers' livelihoods, and identify the factors that influence covid-19 effect on dairy farmers' livelihoods. In Pungali union, Faridpur Upazila, Pabna district, 95 dairy farmers were randomly chosen to participate in the study. In order to gather data from the respondents in May 2022, a pre-tested interview schedule was implemented. The study's independent variables were nine specifically chosen characteristics of the respondents, whereas the dependent variable was the effects of COVID-19 on the livelihoods of dairy farmers. The interview survey revealed that the highest proportion (91.6 percent) of the respondents explained that covid-19 significantly affected dairy farmers' livelihoods. In comparison, 8.4 percent of farmers explained that covid-19 did not affect dairy farmers' livelihoods. Among selected characteristics of the respondents, viz., the problem faced in the covid-19 situation and contact with communication media significantly contributed significantly to their covid-19 effects on dairy farmers' livelihoods. Therefore, to lessen the consequences of COVID-19 on the livelihoods of dairy farmers, policymakers should take these critical issues into account.

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INTRODUCTION

The current worldwide COVID-19 pandemic resulting from coronavirus has portrayed worldwide devotion to coronaviral infections and highlights the significance of understanding this pathogen. Coronaviruses are single-stranded RNA viruses that fall into the alpha, beta, gamma, and delta-significant subgroups. They frequently cause respiratory infections like the common cold in humans, mammals and birds; however, more severe manifestations are rare. (Ho et al., 2020). Bangladesh is a highly populated nation with a severe milk shortage. Typically, one or two cows are used to cultivate dairy as part of a crop-livestock agricultural system in the nation. Due to the low productivity of dairy animals and inadequate management, Bangladesh produces less milk on average. (BER, 2021).

There is a significant opportunity for growth of the dairy industry due to the severe shortage in national milk output and the increasing income elasticity of milk demand. The development of dairy farming needs to catch up with the speed of the nation's needs, despite the increasing demand for the products. Between 2015–16 and 2018–19, Bangladesh's cattle production increased from 22.80 million to 23.17 million, but milk production fell from 2.27 million metric tons to 2.12 million metric tons. Even though milk production peaked in 2017–18 at 2.66 million metric tons (BER, 2020). Bangladesh's economy depends on the cattle industry, which contributed 2.57 percent of the country's GDP in 2010–11 compared to 2.88 percent in 2006–07. Even though the share of livestock in the GDP has decreased over the past few years, livestock production has been quite effective in increasing the number of livestock (BER, 2015).

After meat and eggs, milk is the second-most common source of animal protein. Despite the minimal need for 250 ml, Bangladeshis barely consume 45 ml of milk (DLS, 2021). There is a significant disparity between the amount of milk needed and what is available. Small-scale dairy farming and thoughtful backward and forward linkage activities in marketing, input supply, etc., can significantly increase employment and reduce poverty (Jabbar, 2010). Compared to crops, dairy production, processing and marketing yield more employment overall and higher usual cash pay (Asaduzzaman, 2000; Omore et al., 2002). The current study aimed to ascertain the volume of milk produced by dairy cows in a

few chosen regions of Bangladesh's Pabna district. The study will help outline appropriate future strategies for enhancing the milk production system in Bangladesh's rural areas.

As a key provider of agricultural power services, employment opportunities, and a source of meat protein, livestock is an integral part of Bangladesh's complex farming system. Twenty percent of the population is employed full-time, and fifty percent is employed part-time in the livestock subsector (BBS, 2021).The share of livestock in the agriculture sector is very much potential due to its outstanding contribution. It plays a significant role in poverty reduction strategies. This sector may flourish quickly as all necessary inputs are available in sufficient amounts in the country. Live stock is essential to the development of sustainable food systems. For instance, manure is a significant source of organic fertilizer, and livestock used as draft animals can increase productivity in areas with little automation. For communities that are at risk, livestock is a valuable resource.

The small livestock sector has the potential to boost the direct consumption of animal-source foods (ASFs) and contribute to income generation and support the creation of job opportunities. They are allowing farmers to access other foods like fruits and vegetables not grown on their farms from markets. That is why the current study has been taken to determine the covid-19 effects on dairy farmers' livelihoods. In this context, the present study has been accepted with a view to the following objectives.1) To describe some selected characteristics of the dairy farmers; 2) To determine the extent of covid-19 effects on dairy farmers' livelihoods; 3) To identify the factors that influence covid-19 effect on dairy farmers' livelihoods.

The current study aims to ascertain how COVID-19 will affect the lives of dairy farmers. With the following goals in mind, the current study has been approved in this context. 1)To characterize a few specific traits of dairy farmers; 2)To assess the impact of COVID-19 on their way of life, and 3) To find out the variables that affect COVID-19's impact on their way of life.

REVIEW OF LITERATURE

In their findings, Menon and Schmidt-Vogt (2022) found that Indian farmers, especially thesouthern Indian state of Kerala farmers, were

suffering from acute problems with COVID-19.Rahman and Das (2021)found in their study that the COVID-19 pandemic affected about 33 thousand dairy farms in different parts of Bangladesh and drastically collapsed the marketing of milk and milk products resulting in heavy loss of farmers. Gatto and Islam (2021) founda significant relationship in their rapid assessments of the effects of COVID-19 on agricultural production.

Popat et al. (2020)found that during the COVID-19 pandemic, the daily demand for milk in the market was continuously decreasing. They showed that although in the initial stage, the collection centres were collecting regular milk collection, soon after the lockdown condition, they stopped collecting. As a result, produced milk stayed at farmers' homes without selling. The researcher found that the farmers during COVID-19 faced substantial economic losses.

METHODOLOGY

Location

The study was carried out in the Pabna district's Faridpur Upazila. There are six unions in Faridpur Upazila, and the Pungali union was purposefully chosen as the study's focus. Since Ratanpur village has many dairy farmers, it was chosen as the study area.

Population and Sampling Procedure

With the assistance of the Sub-Assistant Livestock Officer (SALO) of the Faridpur Upazila Livestock Office, the researcher created a list of dairy producers in the study region. The study's population was made up of 951 dairy farmers, and from the lists, 95 dairy farmers (10% of the entire population) were chosen as the study's sample.

Table 3.1: *Distribution of the population's farmers and sample size in the chosen villages in Faridpur Upazila*

Upazila	Union	Villages	The number of dairy farmers	
			Populations	Samples size (10%)
Faridpur	Pungali	Ratanpur	951	95
Total			**951**	**95**

Development of Instrument

Direct interviewing was used throughout data collection. For this, a structured interview schedule with closed- and open-ended questions was created. Simple and direct questions were provided to get the farmers' thoughts. It successfully conducted a pre-test using a draft interview schedule with ten farmers. Data was gathered using the direct interviewing technique. The time frame for this was starting on April 30, 2022. The pre-test results were used to adjust and modify the interview schedule before it was finalized.

Data Collection Procedure

Face-to-face interviews were used to gather information from the 95 dairy producers that were chosen. Systematic questioning was used, and explanations were provided when needed. The respondents were questioned in their free time to ensure accuracy. There were no substantial obstacles to the investigation. The researcher attempted to create conditions that promoted maximum trust, maintained each respondent's attention, and minimized status disparity in the interview situations to foster rapport and motivation. The final data was gathered on April 5, 2022.

Variables

A variable is any characteristic which can assume varying or different values in successive individual cases (Ezekiel and Fox, 1959). At least two significant variables, such as dependent and independent variables, are often present in a well-organized study.

Measurement of Dependent and Independent Variables

The dependent variable for the study was the impact of Covid-19 on the incomes of dairy farmers. The dependent variable was evaluated based on the farmers' affirmative or negative foundation for agricultural purposes. The following is a description of how both groups were scored:

The extent of the covid-19 effect	Assigned score
Yes	1
No	0

Farmers who responded "yes" received a score of 1, while those who said "no" received a score of 0. As a result, the Covid-19 impact score ranged from 0 to 1.

Table 2.A: *Short Description of Independent Variables*

Variables	Types	Measuring technique
Age	Continuous	1 for one year
Education	Continuous	1 for one year of schooling and 0 for no education, 0.5 for can sign only
Family Size	Continuous	1 for-1 member
No of cows	Continuous	1 for 1 cow
Income from a dairy farm	Continuous	1 for 1000 taka
Attitude towards mobile phone use	Binary	1 for mobile use and 0 for not mobile use
Problems faced in a covid-19 situation	Continuous	score
Contact with communication media	Continuous	score
Vaccination during covid-19	Continuous	score

Data Processing and Analysis

The acquired raw data were carefully inspected to spot any significant errors and omissions. The Investigator created a thorough coding scheme after speaking with the study supervisor. After that, data were coded into a coding sheet. To convert qualitative data into quantitative forms, appropriate scoring methodologies were used together with the proper weighting of each trait. Following the study's goals, data were gathered, assembled, tabulated, and analyzed. The study variables were described using various statistical measures, including the number and percentage distribution, range, mean, standard deviation, and rank order. For ease of understanding, data were presented using tables and figures.

Binary logistic regression, also known as the logit model, was used to determine the contribution of the respondents' attributes to their covid-19 effects on the livelihoods of dairy farmers (Hasan, 2017). The following is the study's model:

$$\text{Log}\ [P/1-P] = \beta0+\beta1X1+\beta2X2+\beta3X3+\beta4X4+\beta5X5+\beta6X6+\beta7X7+\beta8X8+\beta9X9+e$$

Where,
P= probability of an outcome
β0 = Intercept

β1-β9 = age, education, family size, number of cows, income from a dairy farm, attitude towards mobile phone use, the problem faced in the covid-19 situation, contact with communication mediaand vaccination during covid-19.

X1-X9 = Coefficient for age, education, family size, number of cows, income from a dairy farm, attitude towards mobile phone use, the problem faced in the covid-19 situation, contact with communication media and vaccination during covid-19.

e = Random error

The analysis was carried out utilizing the SPSS (version 24) program. The level of probability utilized to reject the null hypothesis was 5% (0.05). One asterisk (*) and two asterisks (**) are used to denote the significance of the coefficient values at the 0.05 and 0.01 levels, respectively.

RESULTS

Selected Characteristics of the Farmers

Table 3: *The Salient Feature of Selected Characteristics of The Farmers*

Variables	Range		Categories	Respondents		Mean	SD
	Minimum	Maximum		Number	Percent		
Age	20.00	70.00	Young (up to 35) Middle (36-50) Old (> 50)	28 49 18	29.8 35.7 34.5	42.84	10.73
Education	.00	16.00	Illiterate (0-0.5) Primary (1-5) Secondary (6-10) Above secondary (>10)	32 28 25 10	33.7 29.5 26.3 10.5	5.07	4.50
Family size	2.00	14.00	A small family (up to 3) Medium family (4-7) A large family (>7)	11 72 12	11.6 75.8 12.6	5.47	2.21
Number of cows	2.00	27.00	Little cows (up to 4) Medium cows (5-12) Large cows (>12)	18 60 17	18.9 63.2 17.9	8.92	4.45
Income from the dairy farm	44.00	1500.00	Low income (up to 167) Medium income (168-689) High income (>689)	17 63 15	17.9 66.3 15.8	423.64	266.98
Attitude towards mobile phone use	.00	1.00	Yes (1) No (0)	66 29	69.5 30.5	0.69	0.46
Problems faced in a covid-19 situation	6.00	20.00	Low problem (up to 9) Medium problem (10-15) High problem (>15)	27 46 22	28.4 48.4 23.2	12.08	3.73
Contact with communication media	3.00	21.00	Low contact (up to 5) Medium contact (6-13)	21 54	22.1 56.8	9.64	4.67

According to the MoYS, aged farmers were divided into three groups (2012). The farmers' average age was 42.84, with the highest age being 35.7. The findings showed that the most significant proportion of farmers (33.7%) was illiterate. Following the BBS classification, the respondents were divided into three groups based on the size of their families (2018). Most farmers have small to moderately sized families (87.4 percent). The average family size of the research area's respondents (5.47) was more significant than the country's average (4.4), according to the Bangladesh BBS (2021). Based on their number of cows, most of the respondents had a medium number of cows (63.2%).The majority (66.3%) of the farmers had medium income from dairy farms, and about 69.5% used mobile phones. Less than half (48.4%) of the farmers faced a medium problem. Just above half (56.8%) of the farmers had medium media contact. Table 3 revealed that 86.3% of the farmers completed their second vaccination dose.

Covid-19 Effects on Dairy Farmer's Livelihoods

The study's dependent variable was the impact of COVID-19 on dairy farmers' livelihoods. The dairy farmers' scores on the Covid-19 effects on their livelihoods varied from 0 to 1. The standard deviation was 0.28, and the mean scores were 0.92. The farmers were divided into two groups based on their Covid-19 effects scores, as indicated in Table 3.

Table 4*: Distribution of farmers based on the consequences of COVID-19*

Categories (Scores)	**Farmers**		**Mean**	**SD**
	Number	**Percent**		
No effect (0)	8	8.4	0.91	0.28
Yes, effect (1)	87	91.6		
Total	95	100		

Table 4 showed that most respondents (91.6%) claimed that covid-19 had a significant impact on dairy farmers' lives, whereas 8.4% of farmers explained that covid-19 had no impact.

Contributing Factors on the Covid-19 Effects on Dairy Farmer's Livelihoods

Binary logistic regression analysis was employed, as indicated in Table 5, to estimate the contributing elements of the covid-19 effects on dairy farmers' livelihoods from the independent variables.

Table 5: *Binary logistic regression coefficients of the relevant variables that affected how the covid-19 impacts affected the livelihoods of dairy farmers*

Dependent Variable	Independent Variable	B	S.E	Wald	Sig.	Exp (B)
Covid-19 effects on dairy farmer's livelihoods	Age	-.026	.073	.130	.719	.974
	Education	-.230	.165	1.944	.163	.795
	Family Size	-.478	.337	2.013	.156	.620
	No of cows	.089	.164	.295	.587	1.093
	Income from a dairy farm	.003	.004	.566	.452	1.003
	Attitude towards mobile phone use	2.679	1.727	2.406	.121	14.564
	Problems faced in a covid-19 situation	.449	.198	5.149	.023*	1.567
	Contact with communication media	-.676	.274	6.100	.014*	.509
	Vaccination during covid-19	-.924	1.368	.456	.500	.397

* Significant at $p < 0.05$
The overall percentage of correct prediction = 95.5%
Omnibus test of model coefficient = 71.170**
Cox and Snell R2 = 0.580
Nagelkerke R2 = 0.737

DISCUSSION

Table 5 demonstrates that the issue with the COVID-19 situation and engagement with the media was the major contributing causes (significant at the 5 percent significance level). The information in Table 5 supports the final null hypothesis. The likelihood that covid-19 will impact dairy farmers' livelihoods is unrelated to the selected parameters (age, education, family size, number of cows, income from dairy farm,

attitude towards mobile phone use and vaccination during covid-19). Binary logistic regression analysis was utilized to determine the parameters contributing to the covid-19 impacts on dairy farmers' livelihoods. According to the analysis, relevant authorities should consider the respondents' difficulty in the COVID-19 situation and their contact with the media.

The amount of trouble experienced by respondents in the COVID-19 circumstance and contact with communication media can be linked to 58% of the variation in the respondents' Cox and Snell R2 = 0.580 of the probability of use of mobile phones by farmers in obtaining agricultural information. However, each predictor could account for some of the variations in respondents' effects on the livelihoods of dairy farmers as a result of chance. Additionally, the omnibus test of the model coefficient is 71.170, which is significant at the 1% level, and the total percentage of proper predicates is 95.5 percent (Table 5). These results show that the model is reliable.

RECOMMENDATIONS

The following advice and recommendations could be used by the dairy farmers in the research area to succeed in running their farms:

Priority should be given to the private sector when setting up a small-scale cattle-feeding business, as these financial industries would feed the registered dairy farms at a fixed cost as periodically advised by the government. By promoting HYV grain cultivation, the lack of feeds and fodder may be somewhat alleviated. The spread of the HYV feed development innovation in rural areas should be a top priority for the government and non-governmental groups. The best semen should be stored centrally and distributed to the AI centres for use in advance as needed.

The farm owners' access to veterinary care and services has to be improved. The owners of farms should regularly get a brief training program on the unique management of dairying, as well as a short-term institutional loan or credit, which should also be regularly inspected. Through government action, the milk price should be set at a reasonable level, and the milk-marketing structure should advance. Milk preservation facilities need to be built to ensure the farmer's product is marketed. Communication, power, water supply, and modern dairy storage facilities must be improved.

The public and private sectors must develop strategies for making bank loans accessible to smallholders on straightforward terms and through streamlined processes. Imports of powdered milk should be reduced to support dairying in Bangladesh, and the National Milk Improvement Cooperative needs to grow. Locally created equipment should be accessible for dairy-producing facilities. Production of vaccines and market supply should be empowered and screened to ensure their quality.

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CONFLICT OF INTEREST

There is no conflict of interest.

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