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ORIGINAL RESEARCH ARTICLE



## A study on consumer preferences towards duck meat in Mymensingh city of Bangladesh

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### ABSTRACT

This paper examined the consumer preferences of duck meat in Mymensingh city of Bangladesh. The aim of the study was to find out how much people like or dislike to consume duck meat and what amount do they consume. Purposive sampling technique was carried out among 80 consumers of duck meat. A five-point Likert scale was used to measure consumers attitudes towards duck meat and Discriminative Power (DP) value was computed to find out the lowest and the highest variability of responses. Nearly no study related to the preferences of duck meat consumption was conducted before in the selected study area. The findings of this study revealed that 63.75% consumers disfavored duck meat and 30% consumers favored it. Results indicated that the majority of the consumers strongly agreed that dressing slaughtered duck is complex and duck meat is nutritious and delicious. The highest variability in consumers responses was to statement, "duck meat can be used in any occasion. And the lowest variability of responses was to the statement that, "duck meat is very fatty" as almost all the respondents agreed. Therefore, it can be concluded that consumers showed unfavorable attitudes towards duck meat consumption. The reason behind this disfavoring attitudes were allergy, asthma and seasonal pattern of duck meat consumption. This means that the respondents showed differentiated response, when they were responding on the statement that duck meat can be used in any occasion while the respondents were somewhat in differentiated while they were responding that the duck meat is very fatty. Traditionally duck is consumed in winter season in Bangladesh. That's why, the year-round consumer preferences including warmer seasons resulted in lower total year-round preferences.

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### INTRODUCTION

In Bangladesh, since the beginning of 21st century, the poultry industry has become an unparalleled platform for a quick profit, the generation of local employment, and the production of cheaper animal proteins (Morduzzaman *et al.*, 2015). Bangladeshi poultry industry primarily produces chicken, although a few other species like duck, pigeon, quail, goose, turkey, and guinea fowl are available throughout the year (Das *et al.*, 2018). Duck is a promising species of poultry in Bangladesh (Hossain,

1989; Magor, 1986; Jha and Chakrabarti, 2017). About 95% of the ducks reared in Bangladesh are of the indigenous type. Duck rearing has exerted greater impact on improving socioeconomic & economic empowerment of haor women (Khanum and Mahadi, 2015). There are approximately 55.8 million duck population in Bangladesh (DLS, 2016, 2018, 2019) of which most of the ducks are reared in backyard system. 90% farms, housewives took care of the crossbred duck & spent the money earned from farming (Jalil, 1997; Mayhew and Simonoff, 2015). Most of the farmers vaccinated (90%) & de-wormed (94%) their

crossbred ducks (Begum et al, 2018). Duck rearing is considered to be potential both for poverty alleviation and food production, especially for the rural poor women. The climate and environment of Bangladesh are suitable for duck habitation and her innumerable water bodies are also favorable for duck production. Consumption of duck meat and eggs in the country is estimated about 30% of total poultry meat and egg consumption (Islam et al., 2003). And duck is a good source of protein in our demographics. This study tried to find out consumer's attitude towards duck meat so that the production and market situation can be better understood and demand in the market be fulfilled. Very few or limited studies had been done on consumer preferences of duck meat consumption in this area. In Kishorganj district a study was conducted in purposively selected 5 villages of Karimganj upazilla where data was collected from selected 50 duck raising farms, that study found out the total cost of 1000 ducks were estimated Tk. 74455.57 per batch, the average female contribution was 51% of total duck rearing activities (Afrin et al., 2016) Further research on duck meat market situation is necessary to determine the exact demand situation in the market. This study paved the ways for further research in that direction. Thus, as per discussion this study is effective not only for the market participants but also for duck producers to determine the demand on duck meat. Therefore, this is very important to evaluate the demand and supply of duck meat on the basis of consumer preferences for producers and market policy makers.

## MATERIALS AND METHODS

### Selection of the study area

Mymensingh city area was purposively selected for the study as it is a city with growing demand and huge potentials for duck meat. The selected samples consisted of 80 duck meat consumers. The primary data for the study were collected during the month of August and September, 2019 through face to face interview schedule.

### Methods of data collection

Necessary data had been collected by the researcher herself by using questionnaire. In addition, the researcher also collected data through several previous research works, web information, several journals and magazines. Before beginning the interview, each respondent was given a brief description about the purpose of the study. Then the questions were asked with a simple manner with explanation of each question. MS Excel was used for data analysis. Finally, required numbers of tables had been prepared and results were obtained by using various statistical techniques (Keppel and Zedeck (1989).

### Analytical techniques

Descriptive statistics like frequency, percentage and mean, ranking etc. were used to determine the different attributes. Five-point Likert scale was applied to measure the consumer's

attitudes towards duck meat consumption. To apply the Likert scale, a series of items have been taken that expressed a wide range of attitudes, from extremely positive to extremely negative. Each item calls for checking one of five fixed alternative expressions such as "strongly agree", "agree", "neutral", "disagree" and "strongly disagree". In this five-point continuum, weights of 5,4,3,2,1 for favorable items to duck meat consumption and 1,2,3,4,5 for unfavorable items to duck meat consumption were assigned. The direction of weighting being determined by the favorableness or un-favorableness of the scale items used in the frame. After that a total score for each respondent is calculated by summing the value of each item that checked. Item analysis has been done to select the item for final scale. With item analysis, each item is subjected for the analysis and measurement of its ability to separate the highs from the low, this is called the discriminative power (DP) of item (Nachmias and Nachmias, 1992). Discriminative power is calculated by following formula:

$$DP = Q_1 - Q_3$$

Where,  $Q_1$  = range above the upper quartile and  $Q_3$  = range below the lower quartile

The DP value was computed for each of the scale items and those with the largest DP values are the items that best determine among individuals expressing deferring attitudes toward the measured attitudes. In calculating the DP, sum the scored items for each respondent and place the scores in an array, usually from lowest to highest. Next, compare the range above the upper quartile (Q) with that below the lower quartile (Q), and the DP value is calculated as the difference between the weighted means of the scores above Q and of those that fall below Q consumers' expression was checked for twelve scale items. The following twelve statements (four positive and eight negative) have been taken to measure consumers' attitude toward duck:

### Four positive statements

- i) It is available everywhere.
- ii) Duck meat is a good source of protein.
- iii) Duck meat is nutritious and delicious.
- iv) Duck meat can be used in any occasion.

### Eight negative statements

- i) Duck is expensive.
- ii) Duck meat causes allergy.
- iii) Duck meat is very fatty.
- iv) Dressing slaughtered duck is complex.
- v) Duck is time consuming to cook.
- vi) Duck meat has a much stronger flavor and odor than other meat.
- vii) Duck meat is high on cholesterol.
- viii) Duck meat increases asthma.

## RESULTS AND DISCUSSION

### Likert scale aggregation

The Likert scale is a five-point scale which is used to allow the individual to express how much they agree or disagree with a particular statement. To examine the consumer's attitude, a five-point Likert scale was used here along with 4 positive and 8 negative statements (Table 1). Table 1 depicts that the 6th statement gained highest 'strongly agree' responses (47.5%) from the consumer. In other words, the largest segments of consumers were agreed with the statement of dressing slaughtered duck is complex. 3rd statement gained highest "agree" response (56.25%) meaning 56.25% respondent thought "duck meat is nutritious and delicious". 5th statement had the highest "disagree" response (15%) i.e. 15% respondents disagreed with the statement "duck is expensive" and 22.5% respondents strongly disagreed with the statement that "duck meat can be used in any occasion". Among 4 positive statements, the 3rd statement "duck meat is nutritious and delicious" had highest "agree" responses (56.25%). According to 1st statement 70% respondents agreed that duck is available in different markets of Mymensingh city, 86.25% responded that duck meat is good source of proteins 91.25% agreed that duck meat is nutritious and delicious and 42.5% respondents agreed that duck meat can be used in any occasion. Calculation in Table 1 for positive statement number 1 is  $(17 \times 5) + (39 \times 4) + (20 \times 3) + (1 \times 2) + (3 \times 1) = 306$  Calculation in for negative statement number 5 is  $(18 \times 1) + (27 \times 2) + (19 \times 3) + (12 \times 4) + (4 \times 5) = 197$ .

### Determination of the discriminative power (DP)

After calculating the total score for each respondent, DP value

was calculated for the purpose of "item analysis". Calculation of DP value is shown in Table 2. From the Table 2 it is seen that weighted total and weighted mean for the high 25% were 86 and 4.3 respectively. For low 25% weighted total and weighted mean were 77 and 3.85 respectively. After calculation it was depicted that the DP value was 0.45.  $(11 \times 5) + (6 \times 4) + (2 \times 3) + (0 \times 2) + (1 \times 1) = 86$ ;  $86/20=4.3$ ;  $4.3-3.85=0.45$  In case of other statements (2-12), each DP value has been calculated separately (Table 2).

### Arranging statements on the basis of DP value

The DP value is computed for each of the scale items and the items with the highest DP values were selected. These were the items that had greater ability to separate the highest 25% from the lowest 25%. These statements showed larger bipolar results with strongly agree and strongly disagree end points. All the DP values are shown in Table 3 where the statements are arranged in descending order. If two or more statements have same DP value then statements are based on the value of weighted mean of quartile one, Q1. Statement that had higher quartile one weighted mean was placed higher in ranking statements that had same DP value. The highest DP value was 1.5 for the statement "duck meat can be used in any occasion". That means this statement was much more influential than the other and the difference between two end points "strongly agree" and "strongly disagree" was greater. A higher DP value of course indicates more strongly agree weights in the highest 25% than the lowest 25% summated scores. The lowest DP value was 0.2 for the statement "duck meat is very fatty" indicating lowest separability between the highest 25% and the lowest 25% summated scores of consumer responses.

**Table 1.** Consumer preference using Likert scale.

S.N.	Statement	Response					Total
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree	
1	Duck meat is available everywhere	17 (21.25)	39 (48.75)	20 (25)	1 (1.25)	3 (3.75)	306
2	Duck meat is a good source of protein	29 (36.25)	40 (50)	9 (11.25)	2 (2.5)	0 (0)	336
3	Duck meat is nutritious and delicious	28 (35)	45 (56.25)	7 (8.75)	0 (0)	0 (0)	341
4	Duck meat can be used in any occasion	20 (25)	14 (17.5)	23 (28.75)	5 (6.25)	18 (22.5)	253
5	Duck is expensive	18 (22.5)	27 (33.75)	19 (23.75)	12 (15)	4 (5)	197
6	Dressing slaughtered duck is complex	38 (47.5)	33 (41.25)	4 (5)	5 (6.25)	0 (0)	136
7	Duck meat is very fatty	11 (13.75)	37 (46.25)	30 (37.5)	2 (2.5)	0 (0)	183
8	Duck meat causes allergy	6 (7.5)	17 (21.25)	43 (53.75)	10 (12.5)	4 (5)	229
9	Duck is time consuming to cook	31 (38.75)	38 (47.5)	7 (8.75)	2 (2.5)	2 (2.5)	146
10	Duck meat has a much stronger flavor and odor than other meat	15 (18.75)	30 (37.5)	24 (30)	8 (10)	3 (3.75)	194
11	Duck meat is high on cholesterol	16 (20)	40 (50)	21 (26.25)	3 (3.75)	0 (0)	171
12	Duck meat increases asthma	4 (5)	11 (13.75)	53 (66.25)	11 (13.75)	1 (1.25)	234
Total		609	1018	780	228	91	2726

Source: Field Survey, 2019; Note: Figures in the parentheses indicates percentage.

**Table 2.** Calculation DP value using different variables.

		For favorable statement							
Group	Number of consumers in group	5	4	3	2	1	Weighted total	Weighted mean	DP= (Q <sub>1</sub> -Q <sub>3</sub> )
Statement 1									
High (25%) Q1	20	11	6	2	0	1	86	4.3	0.45
Low (25%) Q3	20	1	15	4	0	0	77	3.85	
Statement 2									
High (25%) Q1	20	14	4	1	0	1	90	4.5	0.40
Low (25%) Q3	20	4	14	2	0	0	82	4.1	
Statement 3									
High (25%) Q1	20	14	6	0	0	0	94	4.7	0.55
Low (25%) Q3	20	3	17	0	0	0	83	4.15	
Statement 4									
High (25%) Q1	20	13	6	0	0	1	90	4.5	1.5
Low (25%) Q3	20	2	4	9	2	3	60	3	
		For unfavorable statement							
Group	Number of consumers in group	1	2	3	4	5	Weighted total	Weighted mean	DP= (Q <sub>1</sub> -Q <sub>3</sub> )
Statement 5									
High (25%) Q1	20	2	3	4	7	4	68	3.4	1.15
Low (25%) Q3	20	2	11	7	0	0	45	2.25	
Statement 6									
High (25%) Q1	20	1	14	2	3	0	47	2.35	1.05
Low (25%) Q3	20	14	4	0	1	0	26	1.3	
Statement 7									
High (25%) Q1	20	1	8	9	2	0	52	2.6	0.20
Low (25%) Q3	20	2	8	10	0	0	48	2.4	
Statement 8									
High (25%) Q1	20	1	0	13	5	1	65	3.25	0.35
Low (25%) Q3	20	0	5	13	1	1	58	2.9	
Statement 9									
High (25%) Q1	20	2	11	4	2	1	49	2.45	1.05
Low (25%) Q3	20	13	6	1	0	0	28	1.4	
Statement 10									
High (25%) Q1	20	2	4	8	3	3	61	3.05	1.00
Low (25%) Q3	20	4	11	5	0	0	41	2.05	
Statement 11									
High (25%) Q1	20	1	9	7	3	0	52	2.6	0.30
Low (25%) Q3	20	1	12	7	0	0	46	2.3	
Statement 12									
High (25%) Q1	20	0	1	14	4	1	65	3.25	0.30
Low (25%) Q3	20	1	1	16	2	0	59	2.95	

Here, Weighted total =  $\sum$  (Score of the response\* Number of respondents who provided the response); Weighted mean = Weighted total / Number of consumers in the group.

### Favorableness and un-favorableness of consumer's preference on duck meat

From the calculation of the total score value of individual, favorableness and un-favorableness of duck meat consumption is presented in Table 4. The consumers were categorized into four types;

- i) Highly favored attitudes on duck meat (Range value 49-60)
- ii) Favorable attitudes on duck meat (Range value 37-48)
- iii) Disfavored attitudes on duck meat (Range value 25-36)
- iv) Highly disfavored attitudes on duck meat (Range value 12-24)

From Table 4 it shows that about 30% consumers showed their favored attitudes on duck meat and 63.75% showed disfavored attitudes on duck meat while 6.25% highly disfavored duck meat.

### Researchers view on disfavored attitude

From Table 4 it is clear that majority of the respondents disfavored duck meat, the exact number was 51 of 80 respondents which was 63.75% of the sample. The researcher suggested that this disfavoring attitude did not mean people dislike duck meat. From Table 4 it is apparent that majority of the respondents agreed with some negative statements like, duck is expensive, dressing slaughtered duck is complex, duck meat is very fatty, duck meat is time consuming to cook and duck meat is high on cholesterol. Moreover, there is adamantly seasonality in consumption pattern of duck meat. People usually like to consume more duck meat in winter season and avoid duck meat consumption in summer, as duck meat consumption makes people feel hot and sweaty for its high cholesterol composition. However, as this study investigated people's overall preference throughout the year, the results also represented yearly preferences. The researcher also suggests that some respondent's result showed disfavored attitude due to them being allergic to duck meat, having asthma or simply not liking duck meat.

### Conclusion

As government is looking for ways to meet up the national

requirement of meat consumption, the results of this study provided some relatively new information about consumer's preferences on duck meat consumption which will able the government to take proper policy actions. The findings of the study revealed that men are the main earning member of the family males are responsible for buying meat. So if they prefer duck more, they will buy more duck meat. There were female respondents also who took decision about family food consumption. But the percentage is higher for the male and that most of the consumers responded that "Duck meat is nutritious and delicious", "Duck meat is high on cholesterol" and "Dressing slaughtered duck is complex". Moreover, highest variability in consumer's responses were towards the statement, "Duck meat can be used in any occasion" and Lowest variability of response was towards the statement, "Duck meat is very fatty" as almost all the respondents agreed with the statement. Most of the respondents thought duck meat was tasty ,has an attractive color, possesses great aroma when cooked and its texture is splendid. In the study duck had a seasonality of consumption as average consumption as average consumption was three times higher in winter than in summer. From the study it was also found that 63.75% consumer disfavored duck meat and 30% consumer favored it. The researcher suggested that this disfavoring attitude did not mean people dislike duck meat. It is apparent that majority of the respondents agreed with some negative statements like, duck is expensive, dressing slaughtered duck is complex, duck meat is very fatty, duck meat is time consuming to cook and duck meat is high on cholesterol. The study found the clearly seasonality in consumption pattern of duck meat. People usually like to consume more duck meat in winter season and avoid duck meat consumption in summer, as duck meat consumption makes people feel hot and sweaty for its high cholesterol composition. However, as this study investigated people's overall preference throughout the year, the results also represented yearly preference. The study also provided some suggestions to the consumers for their disfavored attitude on duck meat consumption

**Table 3.** Statements ranked according to DP value.

S.N.	Statement	DP value	Ranked by DP value
4	Duck meat can be used in any occasion	1.5	1
5	Duck is expensive	1.15	2
6	Dressing slaughtered duck is complex	1.05	3
9	Duck is time consuming to cook	1.05	4
10	Duck meat has a much stronger flavor and odor than other meat	1.00	5
3	Duck meat is nutritious and delicious	0.55	6
1	It is available everywhere	0.45	7
2	Duck meat is a good source of protein	0.4	8
8	Duck meat causes allergy	0.35	9
11	Duck meat is high on cholesterol	0.3	10
12	Duck meat increases asthma	0.3	11
13	Duck meat is very fatty	0.2	12

**Table 4.** Favorableness and un-favorableness of consumer's preference of duck meat.

Score	Particulars	No. of consumer	Percent
12-24	Highly disfavored attitudes on duck meat	5	6.25
25-36	Disfavored attitudes on duck meat	51	63.75
37-48	Favorable attitudes on duck meat	24	30
49-60	Highly favored attitudes on duck meat	0	0
Total		80	100

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