Fishery Technology 57 (2020) : 51 - 58

Comparative Analysis of Consumer Behaviour between Traditional Fish Markets and Modern Retail Outlets in Kolkata, West Bengal

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Abstract

The present study was conducted in Kolkata, to examine if there is any difference in consumer behavior from traditional fish markets to modern fish markets. The survey included 300 households, 150 each from the traditional fish markets and modern retail outlets. The perception study showed that 49, 70 and 61% of the respondents perceived quality, variety and price of fish as good, plenty and reasonable, respectively in traditional fish markets, while 67, 53 and 49% of the consumers perceived quality, variety and price as average, very few and very high respectively in modern retail markets. Perception index score revealed that 82.67% had perceived traditional market as good (>0.66) in the context of quality, variety and price, while modern retail outlets are perceived poor, (<0.33) by 62% of consumers. The regression adjustment model revealed that anticipated expenditure of consumer on fish and fish products was Rs. 980 more in modern retail outlets than the traditional fish markets. To enhance the efficiency and enhance consumer's satisfaction, modern retailers should increase the variety of fishes while traditional markets need to improve hygiene.

Keywords: Consumer perception, Traditional and modern fish market, consumer's behaviour

Introduction

Cultural and socioeconomic factors such as financial status of people, awareness about the health benefits of fish, cost and availability of fish in the market are factors that play a major role in fish consumption. The growing Indian economy and increasing fish production over the years have witnessed subsequent changes in the market structure of domestic and international fish markets particularly in wholesaling and retailing. The annual global per capita fish consumption was 20 kg in 2015 (FAO, 2016). In India, about 28% of households i.e. 600 lakh families consume fish on a regular basis and the estimated monthly per capita consumption of fish was 0.204 kg (Anon, 2014). The annual per capita fish consumption of the entire population in India was 5 to 6 kg whereas that of the fish-eating population was 8 to 9 kg (Salim et al., 2016). West Bengal's per capita fish consumption in a rural area was 9.76 kg and for urban people, on the other hand, was 12.98 kg per annum (Anon, 2015). Higher per capita consumption figures were found in the urban area.

The technological advances in the fishing industry have led to the considerable changes in fish marketing. In the earlier days, when there was no modern retail, purchase of fish was done only from the traditional fish market. The traditional fish markets were very unhygienic and overcrowded. People faced a lot of difficulties in purchasing fish in such markets and some people avoided visiting such markets. The need for improvement of the domestic unorganized fish retail began to attract the attention of the policymakers. However, after liberalization of Indian economy, the transformation of unorganized fish retail marketing into organized retailing has been noticed, through the entry of private retailers such as Spencer's, Reliance Fresh, More, Star Bazar, etc. The Tamil Nadu Fish Development Corporation Ltd. (TNFDC) operates the fish retail outlet named 'Neidhal' in Chennai. MATSYAFED has a chain of retail outlets named 'Fresh Fish Point' in Kerala (Kumar et al., 2008).

Received 23 January 2019; Revised 27 June 2019; Accepted 27 December 2019

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With the establishment of modern retail, it was expected that those people who wanted to avoid fish markets would buy the fish in modern retail in hygienic, convenient and easy-accessible fish markets which could boost overall fish consumption in India. It was also expected that the increasing number of modern retails would increase the earning of fish producers due to the less number of intermediaries involved in the supply chain. In India, most of the studies on fish markets and marketing were related to unorganized retail market mainly concerning gender, age and credit (Tietz, 2004), frozen fish retailing (Agbeja, 2004), marketing facilities, hygiene and sanitation (Bestari, 2004). There is hardly any literature available on the impact of such modern retail chain on the fish consumption in India, particularly for West Bengal. Therefore, the need was felt to study the changes in the consumption pattern of the fish and fish products due to the growing modern retail markets. Against this background, the present study was taken up to understand the changes in consumption of fish and behavior of fish eaters due to the establishment of the modern retails.

Materials and Methods

The study is based on primary data collected with the help of pre-tested interview schedule from fish consumers in traditional and modern retail markets. Data were collected from 300 fish consumers, visiting the fish market in Kolkata, West Bengal. Out of 300 respondents, 150 respondents were from the traditional fish market and remaining 150 were from the modern retail market. The primary data was collected on following aspects: -

i. General information from the individual respondents on their socio-economic and demographic characteristics.

ii. Monthly household expenditure on food and non-food items in general and fish and fish products in particular.

iii. The quantity of fish consumed per household.

iv. Type of fish and fish products consumed and the different forms of fish preferred.

v. Type of fish market they chose to visit

To describe most of the social and economic parameters having nominal and ordinal scale values frequency and percentage analysis was used.

The Kruskal-Wallis 't' test was used to test the significant difference in variables among both the traditional and modern retail market.

Perception of consumers towards the traditional fish market and the modern retail market was analysed using data generated through a 3 point Likert scale (Table 1).

Table 1. Likert 3 point scale

Parameters	Scores			
Quality	Poor	Average	Good	Excellent
	0	1	2	3
Variety	Very few	Few	Adequate	Plenty
	0	1	2	3
Price	Very high	High	Genuine	Cheap
	0	1	2	3

The combined score was standardized and the formula for standardization is:

$$\text{Standardization} = \frac{\text{Actual Value} - \text{Minimum Value}}{\text{Maximum Value} - \text{Minimum Value}}$$

To determine the factors affecting the quantity of fish purchased per visit, multiple linear regression analysis of the form given below was used.

$Y = a + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots + \beta_n X_n$ (General multiple linear regression model)

Where, Y = Quantity of fish purchased per visit (grams)

X_1= Age of the head of household

X_2= Family size

X_3= No. of non-vegetarians in the family

X_4=No. of fish eaters

X_5= Monthly income (Rs.)

X_6= Household expenditure (Rs. /month)

X_7= Expenditure on food (Rs. /month)

X_8= Expenditure on veg items (Rs. /month)

X_9= Expenditure on non-veg items (Rs. /month)

X_{10}= Expenditure on fish and fish products (Rs. /month)

X_{11}= Frequency of visit

X_{12}= Cost/visit

a = intercept or constant term

β = regression coefficient

X_1, X_2 and X_n are dependent variables

"Stepwise and Enter" method of multiple regression analysis were performed using SPSS-20 to find out the independent variables that significantly affect the dependent variables.

To assess the factors affecting monthly expenditure on fish and fish products, "Regression Adjustment Model" was used. In situations, where matching on propensity score is not possible or desirable, regression adjustment and stratification were used.

Here, Y= Expenditure on fish and fish products (Rs. /month)

Treatment = Market (0, 1)

Control: X_1= Age of the head of household

X_2= Family size

X_3= No. of non-vegetarians in the family

X_4= No. of fish eaters

X_5= Monthly income (Rs.)

X_6= Frequency of visit

X_7= Cost/visit

X_8= Quantity of fish purchased per visit (grams)

Results and Discussion

The consumer behaviour is influenced by social and economic factors in his daily decision process. The socio-economic profile of the respondents is presented in Table 2.

Perusal of the table indicates that though both the male and female consumers visit markets for fish purchase, the number of females were very low in comparison to males. Also, the number of female was lesser in traditional fish markets in comparison to the modern retail outlets. The level of education of consumer in the traditional fish markets and modern retail outlets indicated that modern retail

Table 2. Socioeconomic profile of the respondents

Particulars	Categories	Traditional fish market (n=150)		Modern retail market (n=150)	
		Frequency	Share (%)	Frequency	Share (%)
Age (Years)	<35	11	7.3	1	7
	35-59	112	74.7	134	89.3
	>59	27	18	15	10
Gender	Male	133	88.7	129	86
	Female	17	11.3	21	14
Education level	Illiterate	2	2	0	0
	Primary	3	2	0	0
	Secondary	11	7	6	4
	Higher secondary	22	15	11	7
	Graduate and above	112	74	133	89
Occupation	Self-employed	36	24	10	7
	Private	37	25	59	39
	Government	77	51	81	54
Family size	<5	106	71	126	84
	>5	44	29	24	16
Income level (Rs.)	<20000	16	11	0	0
	20001-40000	58	38	24	16
	40001-60000	60	40	76	51
	>60000	16	11	50	33

was patronised by educated persons while the traditional fish markets catered to both educated and illiterate consumers. It also indicated that the employee of government, private sector and entrepreneurs visited the modern retail fish market while the traditional markets were frequented by daily wage earners. The income level of the respondents revealed that those purchasing fish from modern retail outlets were comparatively better off than that of the traditional fish market and also had smaller family size.

The frequency and quantity purchased per visit by the respondents are presented in Table 3. The average fish consumption of household purchasing fish from the traditional fish market is 12-28 kg per month and for the households purchasing from the modern retail market is 8-16 kg per month. Consumer perception towards quality, variety, and price of fish and fish products in the traditional fish markets was analyzed using frequency and percentage analysis and Kruskal- Wallis test. The results are shown in the Table 4.

Significant difference among six traditional fish markets was observed. Among six markets, Rajarhat fish market has maximum mean value because of good sanitation facility, freshness of fish and proper fish waste disposal system practiced in the market. Garia fish market has lower mean score as the fish market was very filthy with no proper drainage system, no sanitation facilities, congested market place and improper disposal of waste. Similarly, significant difference was seen in the price charged for the fish in different fish markets. Maniktala fish market had the highest mean score as the market was one of the largest among the traditional retail markets, selling a wide variety of fish at a reasonable price compared to that in other traditional fish markets. Garia fish market sold the fish at a very low price as the quality of fish was not maintained in the market, the market being filthy and dirty, the price offered for the fish was also very low.

The perception of the consumers' towards quality, variety and price of fish and fish products available in modern retail outlets are presented in Table 5.

Test of significance showed that there was a significant difference in the quality of fish sold in different modern retail outlets. Quality of fish was regarded as one of the most influencing variables that impact the consumers' decision to purchase fish and fish products. Among Spencer's outlets selected, Spencer's South Sinthee has a maximum mean score. The quality of fish sold in Spencer's south city was regarded as poor. Although it was bigger compared to other Spencer's outlets as it sells chicken, beverages, etc. lesser concern was given to the fish sales. Price was mentioned as a powerful and convincing tool to attract consumers to purchase fish from a particular outlet. According to Pride et al. (2005), a price is a tool which informs the consumers about the value of the product. Value ultimately brings satisfaction to the consumer. It was revealed that there was a significant difference in the price of fish sold in different modern retail outlets. Among the markets selected, Spencer's Rashbehari had the highest mean score value.

Perception of consumers was studied with help of Consumers' Perception Index (CPI) in both the traditional and modern retail fish markets of Kolkata, and presented in the Table 6.

Table 3. Frequency of visit and quantity purchase per visit

Particulars	market (n=150) Category	Traditional fish (n=150) Frequency	Share (%)	Modern retail market Frequency	Share (%)
Frequency of visit	Fortnightly	2	1.3	1	0.7
	Once a week	15	10	28	18.7
	Twice in a week	54	36	94	62.7
	More than twice in a week	79	52.7	27	18
Quantity of purchase (Kg/visit)	<1	28	18.7	53	35.3
	1-2	120	80	97	64.7
	>2	2	1.3	-	-

Table 4. Consumers' perception towards quality, variety and price of fish and fish products available in traditional fish markets

Quality	% age	Kruskal - Wallis test (Mean score)
Poor	1	X = 98.62 (Rajarhat fish market)
		X = 49.34 (Garia fish market)
		p=<0.01
Average	38	
Good	49	
Excellent	12	
Variety		
Very few	-	X = 89.24 (Rajarhat fish market)
		X = 60.26 (Maniktala fish market)
		p=0.056
Few	3	
Adequate	27	
Plenty	70	
Price		
Very high	2	X = 87.06 (Maniktala fish market)
		X = 59.94 (Garia fish market)
		p=0.022
High	13	
Reasonable	61	
Cheap	24	

Table 5. Consumers' perception towards quality, variety and price of fish and fish products (Modern retail outlet)

Quality	Percentage	Kruskal - Wallis test - Mean score
Poor	28	X = 96.82 (Spencer's South Sinthee)
		X = 47.06 (Spencer's South City)
Average	66	p<0.01
Good	5	
Excellent	1	
Variety		
Very few	53	X = 84.30 (Spencer's New town)
		X = 68.60 (Spencer's Rashbehari)
Few	42	p=0.697
Adequate	5	
Plenty	-	
Price		
Very high	35	X = 107.66 (Spencer's Rashbehari)
		X = 59.76 (Spencer's Lake Town)
High	49	p<0.01
Reasonable	16	
Cheap	-	

Perception index score revealed low perception index in the modern retail market. The test statistics applied showed that there was a significant difference in the perception of the respondents towards the traditional fish market and modern retail market due to good quality, variety and low price of fish in a traditional fish market in comparison to the modern retail market.

In order to identify the determinants for the household expenditure on fish and fish products, multiple linear regression analysis was performed in STATA13.1. The detailed is presented in Table 7.

The regression model was fitted to check the goodness of fit for the model as the model need to be a good fit for proceeding with regression adjustment model. The coefficient of determination, R^2 is 0.7518, which means 75% of the variation in the dependent variable is explained by the model.

It was revealed that the monthly income of the head of household, the frequency of visiting the market, cost/visit and market type had a significant influence on the expenditure on fish and fish products. With respect to the reference category (0=fortnightly), the expenditure on fish and fish products

Table 6. Consumers' Perception index

Consumers' Perception Index (CPI)	Type of market		't' test
	Traditional fish market (n=150)	Modern retail market (n=150)	X = 0.7224 (Traditional)
<0.33 (low)	-	62%	X = 0.2317
0.33-0.66 (medium)	17.33%	38%	(Modern)
>0.66 (high)	82.67%	-	p<0.01

Table 7. Regression analysis statistics for expenditure on fish and fish products

Independent variable	Beta	Standard error	t-value	Sig.
Constant	-1259.726	409.8573	-3.07	0.002
Age	-4.887163	5.619678	-0.87	0.385
Occupation				
1	89.17076	165.5645	0.54	0.591
2	175.8669	155.7046	1.13	0.260
Family size	28.01734	190.9037	0.15	0.883
No. of non-veg eaters	201.8093	252.339	0.80	0.425
No. of fish eaters	136.6291	188.3079	0.73	0.469
Monthly income	0.224456	0.0036005	6.23	<0.01
Frequency				
1	1084.698	152.4935	7.11	<0.01
2	1683.834	174.9456	9.62	<0.01
3	2392.898	511.6922	4.68	<0.01
Cost/ visit	4.071887	0.632997	6.43	<0.01
Quantity/ visit	-0.111766	0.2186173	-0.51	0.610
1.Market type	893.8329	240.7253	3.71	<0.01
		R^2= 0.7518		
		Adjusted R^2= 0.7405		

Table 8. Regression Adjustment estimates and potential outcome mean for traditional fish market and modern retail outlet

Expenditure on fish and fish products (Rs./month)	Coefficient	Robust std. error	Z value	p>|z|
ATE	980.2269	412.8134	2.37	0.018
Market (1 vs 0)				
PO mean	3815.909	297.7332	12.82	<0.01
Market 0				

(1 = Modern retail market; 0 = Traditional fish market)

per month increased by Rs. 1084.7, Rs. 1683.8 and Rs. 2392.9, if the frequency of visiting the fish market by the consumer changed to once in a week (1), twice in a week (2) and more than twice in a week (3) respectively. It can be seen that for a unit increase in income, the expenditure on fish and fish products increased by Rs. 0.22 per month. It was also observed that for a unit increase in cost/visit (transportation cost), the expenditure on fish and fish products increased by Rs. 4.07 per month. With reference to the reference category (0=traditional fish market), when a consumer changes the place of purchase of fish from traditional fish market to modern retail outlet, the monthly expenditure on fish and fish products were expected to increase by Rs. 893.83.

Regression adjustment model for traditional fish markets and modern retail outlets was performed in STATA 13.1 using treatment effects regression adjustment taking expenditure on fish and fish products per month as a proxy for consumption. The market type was taken as treatment, and other variables like age, occupation, family size, no. of non-veg eaters, no. of fish eaters, monthly income, the frequency of visit, cost/visit, the quantity of fish purchased/ visit were taken as control.

Table 8 revealed that the average treatment effect (ATE) is 980.22, which means that the anticipated expenditure of consumer is Rs. 980/ month more in the modern retail outlet than the traditional fish market. The potential outcome mean (PO mean) is 3815.909 which implied that the mean expenditure of consumer in the traditional fish market was Rs. 3815/ month. Therefore, it can be concluded that the price of fish being very high in modern retail outlet compared to the traditional fish market, if a person changes the place of purchase from traditional fish market to the modern retail outlet, his expenditure on fish and fish products increases.

The study found that there is not much difference in the socioeconomic factors between the respondent of the two markets that is traditional and modern retails markets while significant difference was observed in the frequency of visit which was found to be 52.7% more than twice for traditional markets while in the case of modern retails about 62.7% of consumers visited twice a week. The pattern of quantity purchased each time seemed similar however variation was observed in the quantity purchased which was 80% and 64.7% of respondent purchase 1-2 kg per visit in traditional and modern retail markets, respectively. The perception study on factors like quality, variety and price showed that majority feels it to be good, plenty reasonable for traditional fish markets, while it was perceived to be average, very few and high in modern retails markets. Hence the study concludes though modern retails are emerging as alternative for traditional fish markets even though traditional markets have better perception levels in terms of quality, variety and price. Regression adjustment model applied revealed that average treatment effect (ATE) was 980.22, which means that the anticipated expenditure of consumer was Rs. 980/ month more in the modern retail outlet than the traditional fish market. Hence, modern retail outlets may not play an important role in enhancing consumption of fish and fish products in the short run.

Acknowledgements

The authors wish to express sincere thanks to the Director, ICAR-CIFE, Mumbai, for providing the necessary facilities and financial support to conduct the research work. Support of Dr. M. Krishnan, Head, Education Systems Management, ICAR-NAARM, Hyderabad is duly acknowledged.

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