



DRY FISH MARKET: AN ANALYTICAL STUDY OF JAGIROAD DRY FISH MARKET, ASSAM, INDIA.

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ABSTRACT:

Various dried fish products are available in Jagiroad Dry Fish market of Assam. The information on diversity and marketing system of dried fish products in the country is scanty. Survey on dried fish was carried out to elucidate the species diversity, market channels and consumer's preference of dried fish and found that there exists a demand-supply gap in this region. Species such as *Channa punctatus*, *Aorichthys seenghala*, *Puntius siphore*, *Amblypharyngodon mola*, *Notopterus chitala*, *Wallago attu*, *Labeo rohita* are imported from several States shares approximately 70 percent of the dried fish market of the country. The dried fish products available in the market are in the form of sun and smoked-dried. Marketing system of dried fish varies for indigenous captured fish, cultured fish and imported fish. Price of dried fish varied greatly being high in winter season associated with increased demand. Hence, this paper tries to focus on consumer's preference on different dried fish species with their bio-chemical and quantitative analysis, quality of the dried fish, traditional knowledge and eco-region.

KEYWORDS:

SPECIES DIVERSITY, SUN & SMOKED DRIED, CONSUMER'S PREFERENCE.

INTRODUCTION

Drying is one of the most commonly practiced method of fish preservation in Assam and is a traditional and primitive preservation method. It is also one of the world's oldest known preservation methods (Govindan, 1985; Paul *et al.*, 2018 & Samanta *et al.*, 2016). Several narratives are also prevailing in this locality reflecting the folkloristic aspects of the folk life of the people, living in Jagiroad area. One such narrative is that, once, a wise man lost everything including his wealth and family. One day, he was sitting at the bank of a river. Suddenly, he saw some fishermen. He went to them and requested them to take him to their village. Out of pity, the fishermen gave him shelter in their village. The wise man taught them how to dry fish and how it could be preserved for future and for a long time. The fishermen listened to what he advised and started the process of drying fish in this Jagiroad locality (Rathakrishnan *et al.*, 2009). Thus this area creates a special identity in respect of both social and economic aspects.

Dried fish is as important as fresh in terms of protein consumption as the crude protein levels are likely to be almost twice those of fresh fish in terms of quantity, if not quality (Murray & Little, 2000). This is especially the case for the poor for whom dried fish represents the most cost-effective animal protein source. Dried fish has years of storage life and is a great source of protein, essential fatty acids, and many minerals (Banu *et al.*, 1985). It is consumed all over the world for its nutritional value, taste and aroma. It is also considered as an important

exportable fishery product (Nowsad, 2007). Dried fish of Jagiroad Dry Fish Market like *Channa punctatus*, *Aorichthys seenghala*, *Puntius siphore*, *Amblypharyngodon mola*, *Notopteruschitala*, *Wallago attu*, *Labeo rohita* are available to the market areas near riversides accessing highway. Different species of dried fish are imported from Kanpur & Bihar to fulfil the ever-increasing demand (Sugathapala *et al.*, 2012). These dry fishes are assembled at Jagiroad Market and after their arrival, they were further dried and sorted out quality wise to different parts of Northeaster Region and even to Neighbouring countries like Nepal (Pradhan *et al.*, 2017). Complete information of on diversity of dried fish products available in Jagiroad market and its marketing system is lacking. Therefore, this survey tried to deals with bio-chemical and quantitative analysis, its quality as well as consumer's preference for dry fish products in Jagiroad Dry Fish Market.

MATERIALS AND METHODS

Study Area: The study was carried out at Jagiroad Dry Fish Market during June 2018 to January 2019. At the survey site, individual fish retailers were questioned. The surveyor envisages interviewing 70 fishermen of the whole sale market. Market intermediaries and other functionaries was conveniently selected out of total market sample. In all, wholesale markets were surveyed. The assessor visualizes interviewing the fishermen. Market conciliators and other functionaries were also conveniently selected out of total market sample.

Analytical Techniques: Descriptive statistics such as frequency distribution and percentage were used to

analyse some socio-economic characteristics of the respondents by graphical representation for fresh fish in the study area. Gross margin analysis was used to determine the profitability of fresh fish marketing in the study area.

The gross margin represented by

$$G.M = G.I - TVC$$

Where

G.M = Gross Margin

G.I = Gross Sales/Income

TVC = Total Variables Cost

Biochemical & Quantitative analysis: For biochemical analysis protein were analysed following Lowry's *et al.* (1951) and for quantitative analysis body weight and body length data (Froese, 2006) are presented as mean and standard deviation.

RESULTS

Diversity of dried fish products

A total of 07 sun-dried and smoked fish species were identified from the collected samples during the survey (Table 1). Some species of dried fish such as *Puntius siphore*, *Amblypharyngodon mola*, *Notopterus chitala*, *Wallago attu*, *Labeo rohita* were found displayed separately into two to three categories in market according to quality and size. Total body weight, total length and price of dried fish and smoked are presented in Table 1

TABLE 1: BODY WEIGHT, TOTAL LENGTH AND PRICE OF SUN-DRIED AND SMOKED FISHES IN JAGIROAD DRY FISH MARKET (MEAN ± STANDARD DEVIATION)

Sl. No.	Fish Species	Body Weight (Kg)	Total Length (cm)	Price/Kg (in Rs.)	
				Sun dried	Smoked
01	<i>Channa punctatus</i>	0.3±0.01	2.5±0.02	500.00	650.00
02	<i>Aorichthys seenghala</i>	1.3±0.02	6.7±0.03	550.00	590.00
03	<i>Puntius siphore</i>	1.5±0.01	5.8±0.05	600.00	680.00
04	<i>Amblypharyngodon mola</i>	0.63±0.001	4.8±0.01	80.00	-
05	<i>Notopterus chitala</i>	1.5±0.03	30.8±0.05	480.00	-
06	<i>Wallago attu</i>	1.0±0.01	38.0±0.04	350.00	-
07	<i>Labeo rohita</i>	0.5±0.002	35.8±0.05	185.00	200.00

During the survey, whole smoked local/indigenous fishes as stated in the Table 1, were found in the hotel and shop nearby the whole sale market. Most of them were indigenous species, captured from river, stream and lakes, and some were imported from Siliguri (West Bengal), Porbandar (Gujarat), Lucknow and Gorakhpur (Uttar Pradesh) and Teliamura (Tripura). The fish smoked in pieces were mixed with salt and spices and smoked over mud oven.

Dried fish and protein analysis

Quantitative analysis of protein was done for sun dried and smoked for the commonly available fishes in the wholesale market and is found to be twice than those of fresh fish. This is especially the case for the poor for whom dried fish represents the most cost-effective animal protein source.

TABLE 2: QUANTATIVE ANALYSIS OF PROTEIN OF SUN-DRIED AND SMOKED FISHES IN JAGIROAD DRY FISH MARKET (MEAN ± STANDARD DEVIATION)

Fish species	Protein content (µg/mL)		
	Fresh fish	Sun dried fish	Smoked fish
<i>Labeo rohita</i>	169±1.02	332±1.07	349±1.02
<i>Channa punctatus</i>	139±0.01	162±0.57	196±1.02
<i>Aorichthys seenghala</i>	292±2.06	305±1.08	311±1.11
<i>Puntius siphore</i>	145±0.08	205±0.47	239±1.09
<i>Amblypharyngodon mola</i>	135±1.01	150±0.44	-
<i>Notopterus chitala</i>	146±1.03	227±1.12	-
<i>Wallago attu</i>	179±1.06	188±1.44	-

Consumer's preference

Consumer's preference on dried fish in Assam and its neighbouring states according to the attributes of dried fish is presented in Table 3.

TABLE 3: CONSUMER'S PREFERENCE OF DRIED FISH

Attributes of dry fish	Consumers' preference
High self - life and easy for transportation	+++
Medical value	+++
Energy provider	++
Alternative to fresh fish	+
Recipe diversity	+++

+ Fair++ High +++ Very high

Profitability Analysis

Availability of species varies from season to season. Most variety is found in winter season than other seasons. According to the respondents of wholesale demand and supply were highest during winter season. Results in table 4 showed that acquisition cost gulped 89.87% of the total variable cost while the cost of labour accounted for 7.22% of the total variable cost. Only 2.91% of the total variable cost was expended on transportation. This indicates that an average marketer earned INR 1507550.00 as gross margin per year suggesting that fresh fish marketing is a profitable venture in the study area.

TABLE 4: COST AND RETURN OF THE RESPONDENTS IN JAGIROAD DRY FISH MARKETING

Items	Cost (N)	% of TVC
Cost of purchase	7527000	89.87
Cost of labour	604640	7.22
Cost of transportation	244120	2.91
Total variable cost (TVC)	8375760	100
Total Fixed cost (TFC)	30000	
Total Cost TC = TVC + TFC	8405760	
Total revenue (TR)	12434550	
Gross margin (GM = TR-TC)	4028790	
Average total variable cost (TVC/n)	119653.71	
Average total revenue (TR/n)	177636.43	
Average gross margin (GM/n)	57554.14	

Respondent (n) = 70

DISCUSSION

Marketing the dry fish products is comparatively easy. Moreover, choosing the type of fish is also easy among the wide array of different fishes available to conduct the business. Another advantage of fish farming for marketing is that this business could be conducted in either large scale or small scale production purpose in response to the demand of consumers. Now, as India is a labour abundant country, therefore, this labour intensive industry of dry fish marketing can open up huge potential for employment generations. Even if the necessary capital falls short, there are various provisions to apply for loans for commercial dry fish marketing. Biochemical and quantitative analysis showed that the dried fish (Sun or smoked) have higher value as compared to fresh fishes.

The study revealed that 100% of the respondents belong to the active segment of the population. The profitability analysis showed that an average marketer incurred a total variable cost of INR 8375760.00 per year but earned average revenue of INR 12434550.00 over the same period. This indicates that an average marketer earned INR 4028790.00 as gross margin per year suggesting that fresh fish marketing is a profitable venture in the study area.

Commercialization of dry fish farming and marketing channels helps in preserving natural ecosystems by allowing the fish to be raised in tanks till they are ready to be marketed. Further, due to the constant care that goes into fish farming, some farm raised fish species of more nutritious value. Dry fish are usually fed a wide variety of protein and nutrient enriched foods. Fish being a major food item in Indian diet, besides being a rich source of protein, its demand is always on the high. Either the price of freshly caught fish or the dry fish and fish related products (more specifically the value added products) are increasing day by day. Since, the production of fish is a relatively easy process; many entrepreneurs around the

globe are inclined towards it.

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