



Production of different type of dry fish and its yield measurement at Veraval, Gujarat, India

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Abstract

Drying is one of the oldest, cheapest and popular known method of preservation of food. Dry products are in great demand both within and outside the country and form an important source of protein rich food in various forms. The consumption of dried fishes is about 32% of the total marine landings in India. Marine fish drying is a very common in Veraval coastal areas. The dry fish marketing involves a long marketing channel system starting from the fresh fish supplier, dried fish processor, Wholesalers to Retailers and consumers. Primary data were collected by face-to-face interview and secondary data were collected from various sources. Veraval is one of the leading fish producer in Gujarat state. Major species available in this region are Silver croaker, catfish, gropers, ribbon fish, lizard fish, mackerels, Tuna, shrimp etc. Processed fish are sun dried on racks, pole, platform or mats lay on the ground. Fish yield calculated on the base of processed (whole, fillet, headless) fish for drying. After drying, dried fish are stored in yard, which is purchased by wholesalers and retailers. Dried fish transport is either mechanized vans or small trucks. Local fisher woman sale the collected dried fish in nearby region market. Drying is good source to utilize bycatch and source of income for poor people. Marine dried fish marketing play an important role in the economy of Veraval as well as in India, contributing to increase food production, diversification of the economy and increase employment opportunities.

Keywords: Drying, Fish, Veraval, Wholesaler, Retailer.

Introduction

Drying is one of the oldest known method of preservation of food. Through the technology off food preservation and processing has undergone revolutionary changes over the year and several new products processed employing diverse techniques have made their firm presence in the market, drying stills continues to be the most widely used method for preservation of several foods including fish. Demand of dry products are in both, inside and outside the country and form good source of protein. Fish drying over the years, has grown from a subsistence kind of occupation to a full-fledged flourishing business. Use of dry fish in different way that include fish/prawns for human consumption, low value fishes for the preparation of fish feed as well as poultry feed¹.

Effectiveness of drying as a means of increasing the shelf life of fish is due to reducing growth of microorganism by reducing the availability of water. Drying is the process of removing liquid from water from solid. In case of air-drying of either whole or split fish, or fillets, the liquid water must diffuse from within the fish to its surface, pass through any skin or surface layer, and evaporate into the surrounding air².

The fisheries and aquaculture sector is a vital source of livelihoods, nutritious food and economic opportunities. Fish

and fishery products are among the most important agricultural commodities. From 2007 to 2013, the global fishery production had continuously increased from about 140.7 million metric tonne to 160 million metric tonne. With this increasing production and greater availability for consumers, percapita fish consumption continues to rise up from 10 kg in the 1960s to more than 19 kg in 2013³. Among the world, India is the second fish producing country and contribution of 5.43% of total global fish production. In terms of nutritional quality of fish, sometimes dry fish have higher quality standards compared to fresh fish⁴.

In India, consumption of dried fishes is about 32% of the total marine landings and about 17% of the total catch used for the production of dry fishes. In drying salt is used to destroy the non-halophilic, spore forming bacteria and osmophilic fungi⁵. Dry fish is an important source of animal protein supplement, which is preferred as a key dish or used as a flavoring agent in combination with other food items. In the coastal region where fresh fish is in abundance, such as Acetes, flatfishes, silverbellies, small scads, lizardfish and sciaenids are preferred in the dried form.

However, all dry fish are great demand during the fishing ban period when availability of fresh fish in market is lower⁶.

Earlier people that involve in dry fish production add less value and make less profit. Main reason for this at small-scale producer level are poor product quality, availability of raw material, hygienic condition and lack of market access (high transportation cost, toll taxation) price. Fish drying starts in October and ends in April. Various forms of dry fish prepared in Veraval coast like whole dried, fillet dried etc. These dried fish supplied to different markets like Ahmedabad, Rajkot, Valsad, and Surat in Gujarat state. It is also supplied to various state like Tamil Nadu, Madhya Pradesh, Andhra Pradesh, Maharashtra, Kerala etc. High quality dried fish supplied to foreign dry fish market like Sri Lanka, Malaysia, Singapore, United Arab Emirates etc.⁷.

The main objective of this survey to collect baseline information regarding type of fish used for drying, method of drying, yield of dried fish and price of dried fish in Veraval. For this all purpose methodology is followed by Faruque⁸.

Materials and methods

Surveying of Fish drying yard and dry fish market along Veraval coast: Generally, dry fish marketing contain an extensive market channel, which include fresh fish supplier, dried fish processor, wholesalers, retailers and consumers. A standard survey report prepared which include questionnaire like types of fish used for drying; dried fish forms, different drying techniques etc. And this standard report used to survey some individual of this above channel. Mainly dried fish yard and dry fish market located in Bhidiya harbor and Kharakuwa fish market along coastal area of Veraval. The dry fish processor, dry fish vendor and other groups interviewed at their yard as well as in Kharakuwa market.

Collection and analysis of surveyed data: Primary data collected through surveyed report, which include personally questionnaire. Moreover, secondary data viz., yield of dried fish collected by experiment at fish drying yard. To avoid inaccuracy, all collected data transformed in to standard unit by using Microsoft Excel.

Results and discussion

Marketing Chain at Veraval dry fish market: Various categories of stockholders such as dry fish processor, wholesalers, retailers and local fish vendors found to engage in marketing chain. Wholesalers and retailers buy dry fish form dry fish processor and transported to other areas. Local fish vendor sell dry fish in Kharakuwa fish market.

Species availability: Veraval is one of the leading fish producers in Gujarat state about 3.18-lakh tone fish production. Good landing of marine fish recorded in this coastal area. Major species available in this region were silver croaker, catfish, goppers, ribbonfish, lizardfish, mackerels, tuna, shrimp etc. Species availability varies from season to season. Major fish used for drying described in Table-1 with their common name and local name.

Method of drying: After collected fish from fish producer, it was wash and clean. After pre-processing, either processed into fillet, chunk, headless or whole. Processed fish were sun dried on racks, pole, platform or mats, which take average time about 14-18 hours. Dried fish sorted and stored in the drying yards before transportation.

Table-1: Different types dried fishes available in Veraval.

Scientific name	Common name	Local name
<i>Saurida tumbil</i>	Lizard fish	Bhungar
<i>Harpodon nehereus</i>	Bombay duck	Bumbla
<i>Sphyrna obtusata</i>	Barracuda	Jeera
<i>Epinephelus diacanthus</i>	Reef cod	Vekhli
<i>Colia dussumieri</i>	Golden anchovy	Mendli
<i>Acetes indicus</i>	Paste shrimp	Javlo
<i>Solenocera crassicornis</i>	Coastal mud prawn	Red colmi
<i>Zebrias quagga</i>	Zebra sole	Jibh
<i>cynoglossus lingua</i>	long tongue sole	Jibh
<i>Congresox talabonoides</i>	Indian pike conger	Vam,eel
<i>Otolithes cuvieri</i>	Lesser tooth croaker	Silver dhoma
<i>Hilsa toil</i>	Toil	Kati
<i>Lepturacanthus savala</i>	Silver ribbon fish	Baga
<i>Eupleurogrammus muticus</i>	Small head hair tail	Rasi bagi



Pole drying



Platform drying



Rack drying



Met drying

Figure-1: Different type of drying method used in Veraval drying yard.

Yield of Dried fish: Different processed fish used for drying. Fish yield calculated on the base of processed (whole, fillet, headless) fish for drying. Yield measure by weighing of fish during different processing step. Sometimes fish yield used for measurement of profit rate. Yield of different dried fish described in Table-2.

Table-2: Yield of different dried fishes.

Species	Type of cutting	Final yield (in %)
<i>Saurida tumbil</i>	Fillet	16
<i>Harpodon nehereus</i>	fillet/whole	9
<i>Sphyræna obtuata</i>	Head cutting	14
<i>Epinephelus diacanthus</i>	Head cutting	14
<i>Colia dussumieri</i>	Whole/headless	14/10
<i>Acetes indicus</i>	Whole	12
<i>Solenocera crassicornis</i>	Peeled and whole	12
<i>Zebrias quagga</i>	Head cutting	25
<i>Congresox talabonoides</i>	fillet/whole	20
<i>Otolithes cuvieri</i>	Head cutting	14
<i>Scoliodon laticaudus</i>	Chunk/fillet	20
<i>Lepturacanthus savala</i>	whole	55

Transport of dried fish: Kharakuwa fish market and other fish-drying yard located in coastal areas of Veraval. Wholesalers and retailers purchased stored dried fish in bulk quantity. Dried fish were transported through mechanized and small trucks from one region to another region.

Table-3: Price of raw and dried fishes.

Species	Price of raw fish/kg (In Rs.)	Selling price of dry fish/kg (In Rs.)
<i>Saurida tumbil</i>	32	225
<i>Harpodon nehereus</i>	18	225
<i>Sphyræna obtuata</i>	15	170
<i>Epinephelus diacanthus</i>	15	170
<i>Colia dussumieri</i>	15	90
<i>Acetes indicus</i>	8	90
<i>Solenocera crassicornis</i>	70	350
<i>Zebrias quagga</i>	25	175
<i>Congresox talabonoides</i>	28	120
<i>Otolithes cuvieri</i>	15	170
<i>Scoliodon laticaudus</i>	40	130
<i>Arius thalassinus</i>	17	100

Price of dried fish and fresh fish at Veraval dry fish market and dry fish Yard: In this region, the price of dried fish depends on size and quality of fresh fish, fish availability, form of dry fish, transport mode, labour and season. Price of dry fish mainly affected by type of fish and season. During winter season, the rate of all the available fish increase as drying of fish was higher in this season. The comparative rates of raw fish and dried fish given in Table-3.

Traders: Several fish-drying yard present in Veraval coast. It is estimated that around 30-40 dry fish yard is present here. The market remains most active during post monsoon and pre-monsoon. The dry fish trading system of Veraval depends on numbers of fish producer, dry fish processor, wholesalers and Retailers.



Vacuum packaging



Tray packaging



Pouch packaging

Figure-2: Types of packaging used for dried fishes.

Ideal packaging: Dry fish is one of the popular food item now a day. For this dry fish, processor can use different packaging material to attract consumer. The low-income group usually avoid attractive packaging due to its high cost. However, the high-income processor can sell dry fish at higher rate through innovative and attractive packages. For this, we suggest some packaging material that is cheap and useful in long-term suitability. Advance packaging have many advantages over traditional drying packaging. Different packaging are described in Figure-2.

Marketing cost: Cost of dried fish marketing involves expenditures such as raw material price, seasonal availability of raw material, volume of fish transport, transport mode and distance, type of packaging material, electricity and labor cost.

Sanitary condition: Sanitary condition at dried fish processing sites was poor such as fecal contamination and inadequate market structure. Such unhygienic condition will encourage flies population, which cause damage fish during drying. To avoid unhygienic condition at fish drying yard, bleaching powder and insecticide should be used. Hygienic condition is very important for product quality because it concern human health.

Conclusion

Drying is good source to utilize by catch and source of income for poor people. Dried and dehydrated foods are more concentrated, than any other form of foodstuffs. They are less costly to produce, less storage area required; use of processing equipment is limited compared to other processing methods like frizzling and smoking. Major advantage of dried foods are less expensive to produce, stable at ambient temperature and retains most of the major nutrients with higher concentration of proteins, vitamins and calcium. There is a great demand of dried fish in all coastal areas of India. In addition, there is a good export market too available for dry fish. Dry fish has a shelf life of more than six months.

Dried fish marketing play an important economic role in coastal areas of Veraval by contributing to increase food production and employment opportunities. In many coastal areas, dry fish marketing is only employment opportunity for local fisherwoman.

Major problem related to dry fish marketing in this region were poor hygienic condition, poor road facility, improper market infrastructure, lesser modern techniques uses and lesser government support for credit facilities. However, this fish-drying yard is nearer to bigger port like Pipavav, which provide good opportunity to dry fish processor to exporter dry fish in India and abroad.

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