

Indian Fisheries - A Retrospect

Part IV. Preservation and Processing

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Simple drying of the fish as such exposed to sun light must have been the earliest method of preservation of this perishable commodity in a tropical country like India, even though burying in natural ice would have been practised in other areas having cold climatic conditions. It is the simplest and cheapest method of preservation and possesses the advantage of retaining all the nutrients contained in the original material. However, the products prepared by it are easily prone to attack by bacteria, fungi, insect etc. This method is highly suitable and widely employed for small/thin fishes like Bombay duck, ribbon fish, small prawns, silver bellies, white baits etc all along the Indian coast from time immemorial. The products have however to be disposed off as quickly as possible in order to avoid loss due to spoilage. In places like interior Assam, fresh water fishes like carps are gutted and dried on raised platforms in the sun continuously for one week or ten days. In the pre-independence days, 35.7% of the total fish catches from the sea and 1.8% of those from fresh water used to be preserved by simple sun drying.

Curing using salt scores over the simple sun drying method in the following aspects: (1) Salt destroys most of the bacteria present on the fish by dehydrating them, which otherwise cause spoilage of the fish muscle. (2) Salt denatures/inactivates most of the enzymes responsible for spoilage. (3) Salt extracts a good portion of the moisture present in the fresh fish muscle. (4) Salt prevents the spoilage which occurs in the time interval required for simple sun drying until the muscle gets sufficiently dehydrated, especially in the case of larger fishes with thick flesh. Until about the middle of the last century, people in India prepared common salt from sea water for domestic use as well as for curing fish. Excise duty was then imposed on salt by the British Government, which enhanced its cost, resulting in an almost complete break down of the fish curing industry in the country by the third quarter of the century.

In order to solve this problem and revive the industry, the provincial governments established salting enclosures and supplied duty-free salt for genuine fish curers in the interests of the public by providing them with more wholesome salted fish. The earliest such enclosure

was opened in 1874. The main purpose of starting them was to dissuade people from extracting salt from sea water illegally and hence such fish curing yards are not seen in any other country. These enclosures or 'fish curing yards' as they are designated gained popularity and the Madras Province alone had 108 yards in 1892, even though the fish eating public could not appreciate the difference between the products turned out by them and those produced outside under less hygienic conditions. They were under the administrative control of the Salt Department of the Government of India, whose services were limited to exempting the yards from the excise duty on salt. All other expenses on construction of salt godowns, maintenance of the yards, pay of the establishment, cost of transport of salt to the yards etc were recovered by an extra charge on the issue price of salt. The Central Government was also very choosy in opening more fish curing yards as they did not want to incur financial loss by doing so in non-remunerative areas. The yards in Madras and Bombay provinces were transferred to the provincial fishery authorities in 1924 and 1934 respectively, since the administrative expenses continued to increase after 1908 and the former was reluctant to incur losses in this account.

The provincial government in turn increased the issue price of salt considerably to avoid financial losses and opening of new yards was made subject to the applicants undertaking to provide the site, to construct at their own expenses buildings/sheds to the standards laid down by the governments and to fence them to their satisfaction. Other maritime provincial governments followed suit by opening fish curing yards

under their areas of jurisdiction. The excise duty on salt was removed in April 1947; but due to the inflation during the war and escalation of the costs of production, the governments had to increase the issue price of salt about three-fold, which brought it to the levels obtaining in the open market, adversely affecting the operations inside the yards.

Around the time of independence, we had 187 fish curing yards along the coast line of the entire country, 120 on the west coast and 67 on the east coast, each under the supervision of a Sub-Inspector/Petty Yard Officer depending upon the size of the yard. The number of curers, 'ticket holders' as they were termed, in a yard varied between 5 and 120. Salt was issued at subsidised rates and all operations had to be conducted inside the yards under the supervision of the government official posted there. The sheds were constructed in rows along the fence facing the open quadrangle in the centre, which was used for drying the salted fish. Salting tanks, drying mats etc were to be provided by the curers themselves. The yard had only one entrance at which the office was also situated. The fish as they were brought in was weighed and salt at subsidised rates in proportions fixed up by the government depending upon the variety/size of the fish issued and all operations supervised by the Sub-Inspector. Such activities resulted in better quality products being turned out in the government curing yards than those produced in the fishermen's huts and on the open beaches and increased the quantity of fish preserved by curing (sun drying and salt curing together) from about 37.5% of the pre-independence era to nearly 51% of the total catches thereafter. This level was maintained up to 1959, to be followed by a

drastic fall in the ensuing years to about 43% and further to less than 20% in recent years.

This note-worthy change is attributable mainly to the larger in take by the fresh fish market consequent on the application of quicker modes of transportation and to a lesser extent to the introduction of the modern sophisticated methods of preservation like freezing and canning. The history of expeditious transportation of fish in India dates back to 1929 when motor boats were employed for collecting fresh fish and delivering at the Calcutta market. A scheme of collecting fish and transporting it to Bombay market from neighbouring places initiated with one power boat in 1933 extended its activities by covering 200 to 300 miles from Bombay in a couple of years' time. The number of carrier boats increased to 4 in 1938 and to 38 in the next decade and the quantity of fresh fish thus transported increased from 1.2 tonnes in 1933 to 1673 tonnes in 1948.

It may be of interest in this context to note that the impetus for introduction of power fishing in developed countries in the last century was derived from the development of railways and consequent quick movement of the fish into the hinterland areas. Though in India the inspiration for mechanised fishing was received from the increased demand for prawns for freezing and export, transport facilities by both rail and road were also developed simultaneously resulting in increased intake in the fresh fish market, culminating in consumption of two-thirds of the entire fish catches of the country in this manner.

Mechanised fishing has made rapid strides in the country in recent years

with the number of boats touching an all time record of 19,000, with the result that the operations are becoming uneconomic. The boat owners are therefore inclined to press the government for duty-free fuel. This is a situation analogous to the one obtaining in the fish curing industry immediately after independence where the issue of subsidised salt could effectively enliven it. However, under the present circumstances, issue of duty-free fuel can at the most reduce the cost of operation; but whether it can improve the quantum of fish caught in any way is yet to be seen as long as the area of operation of the boats does not extend farther.

Coming to the processing aspects, apart from the usual dry and wet salting procedures, smoking was also widely employed in India for preservation of fish. Because of the warm climatic conditions prevailing in the country, smoking does not become necessary for drying purposes except perhaps during rainy season. However, exposing brined eviscerated fish to smoke produced by burning saw dust, paddy/coconut husks etc besides dehydrating the fish due to heat, exercises preservative action by its antiseptic constituents like creosote, acetic acid etc and imparts an attractive delicious flavour to the product. Pickling with salt and Malabar tamarind called 'Colombo curing' was also practised on the west coast. Prawns were converted into dry prawn pulp by the traditional method of boiling, drying and breaking the shells by beating the dried prawns taken in bags against hard surfaces on the west coast and by smoking-cum-drying on the east coast. In the Madras Province, a special product called 'semi-dried prawns' was

also developed retaining a higher percentage of moisture in the pulp, so that it has a pliable consistency. This product when packed under an atmosphere of carbon dioxide was claimed to have a shelf life of about an year.

Some other methods of processing employed in the country consisted of smearing salted and dried slices of fish with a paste of chillies, mustard, garlic and tamarind and further drying. This method was followed on the Malabar coast. In upper Assam, powdered dry fish was mixed with crushed stems of a local plant and made into balls. Further up, a paste was made from small varieties of fish and buried in the ground for a month in earthenware pots, after which it was dried, powdered and packed in bamboo tubes with or without spices like ground pepper. A popular fish paste used to be prepared in Assam by soaking dried fish in water for a few hours, packing closely in earthenware pots smeared internally with fish oil, sprinkling fish oil in between the layers and burying the entire pot in the ground for several months. In the south, 'pit-curing' was widely practised until recently, in which eviscerated and salted fish used to be buried in pits dug in the beach with a lining of bamboo or palm-leaf mats and leaving as such for several days. 'Mas min' from tuna was another traditional product prepared on

commercial scale in the Laccadive Islands.

It is interesting to note that a fish canning factory was established at a place called 'Chaliam' in Malabar District of the Madras Province as far back as 1911 (the first such one to be put up in the country), which operated for about one and a half decades. It had to be wound up afterwards due to several reasons like non-availability of cheap containers, poor and interrupted supply of raw material, high processing costs and inability to compete with better quality imported stuff.

Developments in this field in the past three and a half decades are still fresh in our memory. Freezing picked up from the mid-fifties and is now the largest single method of preservation of fish employed in the country value-wise, mainly intended to serve the export market. Canning was initiated by the late fifties and flourished till the early seventies, to be followed by a pathetic fall from the middle of that decade. It now exists as a nominal one in the country. Exports of salt-cured fish also dwindled in recent years as our neighbouring countries which were our main markets for cured fish products restricted their imports. However, one-fifth of the total fish catches in the country is preserved by this method, mainly for the internal market. ○