

Ready to Fry Dried Products from Low Cost Fish

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A method of processing ready to fry dried products from low cost fish like silverbelly (*Leiognathus splendens*), sciaenids (*Johnius carutta*, *Nibea maculata*) and upenoids (*Upeneus sulphureus*) is discussed. It involves dressing the fish, blanching in 10% boiling brine for 1-1.5 min depending on the size and drying in sun or in a drier. Loose central bones are removed and the meat is mixed with a mixture of spices, packed in polythene bags and stored at room temperature. Organoleptic, biochemical and bacteriological evaluation indicated that the products from sciaenids and upenoids were acceptable for five months and those from silver belly upto six months.

Keywords: Low-cost fish, ready to fry products, spices mixture

Many of the shrimp bycatch like silver belly (*Leiognathus splendens*), sciaenids (*Johnius carutta*, *Nibea maculata*) and upenoids (*Upeneus sulphureus*) are largely converted to fishmeal used as ingredient in animal and shrimp feeds. However, conversion of fishmeal protein to animal protein is less efficient than in direct human consumption (Whittle and Wood, 1994). Being a source of very cheap protein, utilisation of these fishes for direct consumption by processing into products involving minimum inputs becomes a priority. The present work is an attempt in this direction.

Materials and Methods

Silverbelly, sciaenids and upenoids were collected from the bycatch of shrimp trawlers. The fish were dressed, headed and washed in potable water. The cleaned fish taken in a mesh basket was immersed in boiling 5% salt solution for 1 to 1.5 min depending on the size. Fish taken out of brine was spread on mats, trays or cement platform and dried in sun for a day or two. During monsoon the fish was dried in a mechanical drier at 55°C. After drying, the central bones were removed and meat was separated as flakes. 10g of a mixture of chilly and turmeric powders in the ratio 5:1 was mixed with 200g flakes. The product was packed in polythene bags, sealed and stored at room temperature (30±3°C).

The samples were analysed once a month for organoleptic, biochemical and bacteriological qualities. The flakes were fried in refined, deodourised groundnut oil for organoleptic evaluation by a panel of five trained persons. Moisture, total protein, fat, ash, sodium chloride and calcium were estimated as per AOAC (1975) methods. Total volatile base nitrogen (TVBN) was determined by the micro-diffusion method (Conway, 1947). Phosphorus was estimated from the ash by the method of Fiske and Subba Rao (1925). Total bacterial count (TBC) and food-borne pathogens viz.,

salmonella, coagulase positive *Staphylococcus aureus* and *Vibrio parahaemolyticus* were determined as per USFDA (1984) methods.

Results and Discussion

Proximate composition and calcium and phosphorus in different samples are given in Table 1. Dried products have high protein, calcium and phosphorus. It was observed that moisture content increased gradually and reached 13.25, 14.58 and 14.05% respectively in silver belly, sciaenids and upenoids in six months. The dried products, when fried in oil became crispy and were relished by the panelists. Sensory evaluation of the dried and fried products during storage is presented in Table 2.

Table 1. Proximate composition, calcium and phosphorus contents of dried products

	Moisture %	Protein %	Fat %	Ash %	NaCl %	Calcium mg/100 g	Phosphorus mg/100 g
Silverbelly	10.31	69.94	2.79	18.57	5.71	1514	1545
Sciaenids	11.02	71.63	3.20	15.85	6.25	529	1141
Upenoids	12.19	66.60	5.70	12.92	6.50	256	1175

Table 2. Sensory evaluation of the dried and fried products

Storage period, months	Silverbelly			Sciaenids			Upenoids		
	A	T	F	A	T	F	A	T	F
1	G	G	G	G	G	G	G	G	G
2	G	G	G	G	G	G	G	G	G
3	G	G	G	G	G	G	G	G	G
4	G	G	G	G	G	G	G	G	G
5	F	G	F	F	G	F	F	G	F
6	F	F	F	P	F	F	P	F	F

A: Appearance; F: Flavour; T: Texture; G: Good; F: Fair; P: Poor

Appearance of the product became unattractive in the case of sciaenids and upenoids after five months. However, the texture and flavour after frying were fair and acceptable. In the case of silverbelly the appearance was fair after six months, but the product on frying was not crisp. It was still acceptable. The TVBN was within limits (Fig. 1) and the products did not produce any off flavour when fried. Total bacterial counts in all the samples were almost similar. The total count increased slowly from initial load of 2.2×10^3 to 3.4×10^4 per g. Only in one sample of upenoids, the count reached 10^6 per g. No human pathogens like salmonella, coagulase positive *Staphylococcus aureus* and *Vibrio parahaemolyticus* were detected in any product.

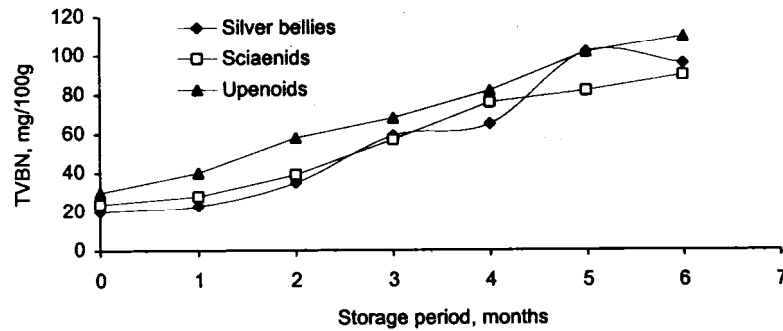


Fig. 1. Changes in total volatile basic nitrogen during storage

The spices mixture of chilly and turmeric serves two purposes, one as a flavouring and the other as an antibacterial and preservative agent for food during storage (Shelef, 1983). On the basis of organoleptic, biochemical and bacteriological evaluation the products were acceptable for five months in the case of sciaenids and upenoids and, six months in the case of silverbelly.

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