

Development and Storage Characteristics of Dehydrated Salt Mince from Low Priced Fish

P. RAVINDRANATHAN NAIR and K. GOPAKUMAR

Central Institute of Fisheries Technology, Cochin-682 029

The study showed that less initial moisture with high salt content will be the best condition for enhanced storage life of dehydrated salt mince. Between sample I (10% salt per meat weight) and sample II (15% salt per meat weight) the latter was comparatively better in colour, odour and longer shelf-life. At room temperature the dehydrated salt mince has not showed any increase in total bacterial count. It is also found that the storage life of the salt mince can be enhanced to a significant extent by lowering the moisture content to below 10% and increasing the salt content to above 30%. Peroxide value, free fatty acid value, total volatile nitrogen and trimethylamine registered gradual increase during storage at room temperature for all the three samples. Among the three samples, the sample treated with 0.1% citric acid and 0.125% butylated hydroxy anisole was comparatively better in appearance and showed less rancidity as indicated by TBA values, upto a period of 15 weeks and thereafter all the three samples were almost similar in storage characteristics. Hence, the treatment with citric acid and B.H.A. has apparently not much significance in improving shelf-life and quality of salted dehydrated fish mince.

Minced fish is the flesh separated in comminuted form from skin, bones, scales and fins from fish (Grantham, 1981). Yield of minced fish from a number of species of Indian fish was worked by Perigreen (1981). According to him it varies from 29% (in shark) to 57% (in medium size soles). On an average, most of the species give a yield of about 45%. According to Perigreen & Jose (1983) minced threadfin bream has an accepted storage shelf-life at 23°C for 28 weeks beyond which the meat becomes inedible. Perigreen *et al.* (1979) have also calculated yield of minced fish from filleting waste. They have recovered about 6–10% minced meat from various species of fish. However, it should be noted that minced fish has not captured a market in India. This paper deals with the studies on development of dehydrated salted fish mince and its shelf-life at ambient temperatures.

Materials and Methods

Jew fish (*Johnius* sp.) procured from Fort Cochin was brought to the laboratory in ice. Minced meat was prepared by

using a hand separator after evisceration, cleaning, washing etc. Two samples were prepared using 10% and 15% salt to the minced meat weight. After proper mixing and shaping, samples I and II were dried in an air oven at 50–52°C (about 20 h). The salted, semi-dried minced meat were packed in polythene and kept at room temperature for storage studies. For the second batch, after applying salt, the samples were kept in a chill room overnight and dried in a tunnel drier at a temperature of about 50°C (about 22 h). After drying the samples were packed in polythene, sealed and kept at room temperature for storage studies. The chemical as well as the microbiological analysis of the minced meat and partially dried salt mince were carried out periodically.

A third batch of dehydrated salt mince has been prepared from threadfin bream (*Nemipterus japonicus*) using a mechanical meat separator. The yield of minced meat from the whole fish was around 41%. Three samples I, II and III were prepared for detailed studies on microbial,

physical and biochemical changes due to storage at room temperature in sealed polythene covers. From the studies carried out on the earlier batches it was found that 15% salt to minced meat weight was ideal. Samples I and II contained meat plus 15% salt. Sample I, after salting was kept in a chill room overnight and dried in a tunnel dryer after making round shaped blocks. Sample II, after salting was dried immediately in a tunnel dryer. In samples III, 15% salt, 0.1% citric acid and 0.125% butyl hydroxy anisole (B.H.A.) were added and dried in a tunnel dryer immediately like sample II. All the samples were tunnel dried initially and then sundried. The temperature of drying was around 51°C and the period of drying was around 30 h altogether. The dehydrated samples were packed in polythene covers and sealed for storage studies.

The initial analyses of the samples of all the batches were carried out immediately after drying and packing. For the first batch the samples were examined after 4 and 9 weeks and for the second batch after 6 and 14 weeks to assess the quality of the product by physical as well as microbiological changes. In the case of the batch III from threadfin bream, sampling was carried out after 4, 8, 15, 24 and 35 weeks. The quality of the product has been assessed by physical, microbiological and chemical analyses.

Moisture, protein, fat, ash and sodium chloride were determined by A O A C method (1975), peroxide and free fatty acid values by the method of Lea (1952) and A O C S (1946) respectively. The thio-barbituric acid values were estimated by the method of Tarladgis *et al.* (1960). Total volatile nitrogen and trimethylamine were esti-

mated by the Conway microdiffusion method (1947) by using the alcoholic extract prepared from the salt mince samples. All the salted mince samples were first taken for microbiological examination and subsequently for chemical analyses. For all the batches storage studies were discontinued when the samples were not very good for further storage.

Results and Discussion

Proximate composition of the minced meat of batch I and II (Jew fish) and batch III (threadfin bream) are given in Table 1A and the proximate composition of the dehydrated salt mince immediately after drying for all the three batches are given in Table 1B. From Table 1B, it can be noticed that the batch III samples contain less moisture and more salt compared to the other two batches. From the storage studies of the batches I and II it was noticed that less moisture and high salt content would be the best condition for enhanced storage life. The optimum moisture and salt content for the salt mince was used for the batch III experiment to below 10% for moisture and above 30% for salt content for a better storage life at room temperature.

Table 1a. Proximate composition of the minced meat

	Jew fish		Threadfin bream
	Batch I	Batch II	Batch II
Moisture, %	78.05	79.05	78.40
Fat, %	1.82	0.90	1.69
Protein, %	19.05	19.09	18.50
Ash, %	1.23	1.10	1.24

Table 1b. Proximate composition of the dehydrated salt mince

Parameters	Batch I		Batch II		Batch III		
	Sample I 10% salt	Sample II 15% salt	I 10% salt	II 15% salt	I	II	III
Moisture %	23.87	33.17	24.25	30.25	4.86	5.59	3.61
Fat %	3.71	4.63	2.50	2.31	6.44	6.05	5.96
Protein %	51.79	42.99	51.80	45.50	49.70	51.09	50.59
Ash %	24.21	23.1	24.27	29.31	37.59	36.45	39.77
Sodium chloride %	18.80	18.65	19.70	24.40	32.38	35.90	36.02