

PREPARATION OF DRY-SALTED TUNA *EUTHYNNUS* SPP.*

ABSTRACT

Good quality dry salted tuna was prepared by treating with antifungal agents like sodium propionate and calcium propionate. Propionate treatment was found to enhance the shelf life of dried tuna considerably.

THE TUNA FISH landing in India is about 20,000 tonnes (1985-86). Most of the tuna landed in India is processed as cured fish. A sizeable quantity of tuna landed in Lakshadweep is canned. They also convert it into 'Masmin', a heavily smoked hard dried product (Muraleedharan *et al.*, 1980).

Dry salted tuna prepared in the trade are susceptible to fungal attack during storage. These products have a limited shelf-life. So improved process is necessary to increase the market potential for the dry-salted tuna.

Valsan *et al.* (1961) studied the effect of preservatives like propionic acid in retarding spoilage of cured fish. This present note deals with the studies on the preparation of dry-salted products from tuna using sodium propionate and calcium propionate as antifungal agents.

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Materials and methods

Good quality common salt and the antifungal chemicals *viz.*, sodium propionate and calcium propionate were used for the preparation of dry-salted tuna. Two experiments were conducted. In the first experiment the tuna fishes were washed, a deep cut was made vertically along mid-dorsal line to have two halves and removed the viscera, head and central bone. Number of cuts were suitably made on the inner surface of both the halves longitudinally. Then the fishes were cured in saturated brine containing antifungal agent at 3% of salt used for 24 hrs. They were then dried for 3 days over a suitable platform. Then the dried products were stored in conventional (Palmyrah leaf mat) packing.

The quality of the dry-salted tuna were assessed for organoleptical and chemical qualities as suggested by Venkataraman *et al.* (1955). The total volatile basic nitrogen values of the samples were estimated by the micro diffusion method of Conway (1947). Moisture, acid, insolubles, sodium chloride and protein were determined according to AOAC (1970).

Results and discussion

The trade samples had a limited shelf-life of about 4 weeks (Table 1). The shorter shelf-life was mainly due to the use of spoiled fish; imperfect cleaning and washing; use of impure salt; inadequate salting, curing and drying; and unhygienic conditions of handling. The initial moisture and sodium chloride content

TABLE 1. Storage studies on commercial samples of dry-salted Tuna stored in Palmyrah leaf mat

Samples	Initial product				Final product			
	Moisture %	TVBN mg%	Sodium chloride (DWB%)	Organoleptic test score Max. marks 30	Moisture %	TVBN mg%	Organoleptic test score Max. marks 30	Shelf life in weeks
1 ..	35.3	106.4	18.56	22	37.2	132.0	17	5
2 ..	38.44	224.0	20.12	26	38.0	200.0	16	4
3 ..	39.00	196.0	20.20	26	38.60	200.8	14	4
4 ..	40.69	196.4	19.10	27	44.00	260.0	14	4

5 marks each for appearance, texture, flavour, odour, colour and fungal/insect attack. When the overall score fell down from 30 to 10 or below, the samples become unacceptable.

In the second experiment the entire dressed fishes were divided into four batches. The first batch was immersed in the 3% antifungal agent solution for 15 minutes (1 lit solution/1 kg dressed fish). In the same solution second, third and fourth samples were immersed consequently for 15 minutes. After dip treatment was over, all the treated samples were cured, by salting (ratio salt to fish is 1:3) and kept for 24 hrs. Curing, drying and packing were done as in the first experiment.

of the trade sample ranged from 35.3 to 40.69% and 18.56 to 20.20% respectively. These samples also had high TVBN values ranging from 106.4 to 224 mg%.

The control sample stored in conventional packing was kept well for 12 and 20 weeks. The treated samples were found to keep well for a longer period, than the untreated samples. The sodium propionate treated samples were found to keep well for 35 to 40 weeks and the

calcium propionate treated samples were found to keep well for 33 to 40 weeks. Both the antifungal chemicals were almost given equal effect in arresting the fungal growth. The cost of antifungal treatment using sodium propionate per Kg of fish was Rs. 1.00 and Rs. 0.52 respectively. The appearance of the final products prepared by this method was good.

The results of the second experiment showed that the control sample stored in conventional packing were found to keep well for 10-12 weeks. The treated samples were kept for a

longer period than the untreated samples. The sodium propionate treated samples were kept well for 29-37 weeks (in the first dip treated sample) and the calcium propionate treated samples were kept well for 15-27 weeks (in the first dip treated sample). The first dip sample gave better performance in storage life than the remaining three samples. The cost of antifungal dip treatment for using sodium propionate and calcium propionate per kg of fish was Rs. 1.65 and Rs. 0.85 per Kg respectively. The general appearance of the products prepared in the second experiments was slightly inferior than the products prepared by the first experiment.

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