

Preparation of Masmin - An Improved Method

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An improved method for the preparation of 'Masmin' the traditional smoked tuna of the Lakshadweep is described.

Lakshadweep is well known for its rich tuna fishery. Almost the entire tuna landed here is converted by a special method into 'Masmin', a heavily smoked, hard-dried product. The method of preparation is very primitive so that the product lacks the qualities expected of it. Since the masmin industry contributes a major share to the economy of the islands and the product is esteemed as a delicacy in Sri Lanka, Singapore and Malaysia, improvement in the quality of the product is sure to find better acceptability and in turn improve the islands' economy. Valsan (1968) reported a method to control the insect attack in masmin. But no attempt has so far been made to standardise and improve the method of its preparation. This paper reports results of such a study. The traditional and improved methods are compared as regards the quality of the products.

Materials and Methods

Fresh tuna (*Euthynnus affinis*) was beheaded, cut open, guts removed, washed well and filleted longitudinally. The fillets were cut lengthwise into uniform strips of about 5 cm thickness and 15 cm length and washed in fresh water, divided into two equal lots and processed as described below.

Traditional method

Each strip was carefully wound round with green coconut leaves, boiled for 1 h in a mixture of sea water and fresh water (3:1) and left as such for about 12 h, then taken out, coconut leaves removed, spread on wire trays placed inside a smoking

chamber and smoked for 12 h continuously using coconut husk and saw dust, dried in sun for about 6 h, smoked again for 6 h and dried to dark hard sticks.

Improved method

Strips prepared above were dipped in saturated brine (1 kg: 1 litre) for 30 min, taken out and exposed to steam for 1 h. The steamed strips were sun dried to about 40% moisture and then smoked for 4 h till the characteristic glossy appearance, brown colour and smoky flavour developed. The smoked strips were then dried to a moisture of about 10%. The products were analysed for chemical composition according to the methods of AOAC (1960).

Results and Discussion

Boiling in salt water followed by leaving the cooked meat in the liquid for a long time apparently results in greater concentration of salt in the meat and loss of nutrients as shown by the decrease in nitrogen factors (Table 1). Further, winding each strip with green coconut leaves to prevent the meat from breaking off during boiling is time consuming and laborious. This part of the process is conveniently avoided in the improved method with much less loss of flavour constituents.

Variations in the steaming process have been tried to determine the optimum stages of brining and steaming and their effects upon the quality of the product (Table 2). Brining followed by steaming gave the best results. After steaming, the strips were partially dehydrated to a moisture level of about 40% with a view to making the surface of meat to retain enough moisture

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Table 1. *Analytical characteristics of the product (Values in moisture and salt free basis)*

	Mois- ture	Ash	Sodium chloride (mois- ture free basis)	Total nitro- gen	Amino nitro- gen	Diges- tible nitro- gen	Residual nitro- gen	Remarks
	%	%	%	%	%	%	%	
Traditional product	6.8	8.1	7.6	10.61	0.1445	10.08	0.53	Dull dark colour, hardened crust on the surface, pungent smoky odour, highly salty, very hard, fibrous and difficult to chew
Improved product	10.2	9.5	1.6	11.94	0.5702	11.68	0.26	Uniformly dark brown appearance, mild smoky flavour blending very well with the characteristic fishy flavour, moderately hard, soft to chew and mild salty taste

Table 2. *Variations in the steaming process and their effect on the quality of the smoked product*

Type of process	Appearance	Flavour	Taste	Remarks
1	Good, uniform dark brown colour	Mild smoky flavour blending very well with the characteristic fishy flavour	Moderately salty, soft to chew	Excellent
2	Not good, dark ash colour with stray white patches on the surface	Predominantly smoky flavour masking the fishy flavour	Prominently salty with smoky taste	Good
3	Not good, very dark appearance	Not good, prominent smoky flavour	Highly salty, bitter taste	Poor

1. Dipped in saturated brine for 30 min and then steamed without pressure for 1 h
2. Immersed in 15% brine and steamed for 1 h without pressure
3. Steamed for 1 h without pressure and then brined for 30 min in saturated brine

to absorb smoke vapours and produce the characteristic flavour and dry enough to allow the smoke components to react with the surface protein to produce the desired colour. Ruiter (1979) observed that hot smoking gives rise to ideal colour, flavour and glossy appearance if the moisture content of the sample is less than 65%. In the conventional process there is no pre-drying of the meat and the product acquires a dull dark appearance after smoking. Excessive interaction between smoke components and surface proteins inhibits the penetration of smoke constituents. As a result, the sub-surface remains unsmoked, soft and susceptible to rapid degradation, while the surface develops a hardened crust with a pungent smoky odour as in the case of the traditional product. Hence smoking time was limited to 4 h, during which the product acquired a glossy appearance, characteristic brown colour and the desired flavour.

The smoked product can be dried in sun or in artificial dryers to a moisture level of

10%. It is usual in the traditional process to dry the product hard till it reaches almost the consistency of wood. Heavy smoking followed by hard drying significantly alters the composition of the protein fraction of the meat. This contributes to the comparatively high amount of non-digestible form of protein and low quantity of amino nitrogen in the traditional product. Leaching out during cooking and subsequent holding in the brine also may be the causative factors for the latter phenomenon.

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