A Comparative Study on the Quality Characteristics of Traditional Masmin and Mechanical Kiln Prepared Masmin

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The quality characteristics of traditional masmin as well as masmin prepared in the mechanical kiln have been compared. The quality of the mechanical kiln prepared product is superior when compared to the traditional product.

In India, tuna (Fam: Scombridae) forms one of the major fishery and its landings have been estimated to be 1.42% of the total marine landings. It's fishery is seasonal and during the peak seasons, it is sold at every low prices. A method to preserve tuna by smoke curing is practised traditionally in Lakshadweep Islands, where tuna is caught in bulk quantities. From Lakshadweep the smoked product is brought to South India and sold in the markets and it has very good demand. The method of preparation practised is highly traditional as well as unhygienic and it lacks in many desirable qualities. Hence a study was undertaken to compare the quality of masmin produced traditionally and using mechanical kiln.

Materials and Methods

In the laboratory, smoked tuna was prepared in Torry mini smoking kiln. In the mechanical kiln, the temperature is controlled by a thermostat and the smoke density is controlled by an absorption/distribution fan which effectively circulates the smoke inside the chamber. The traditional product was procured from the market. The traditional method of masmin preparation is described by Muraleedharan and Valsan (1980).

The raw material was purchased from the landing centre. It was brought to the laboratory and washed well in 5 ppm chlorinated water. After thorough washing, the fish was dressed and fillets were prepared. The fillets were cooked in 12% brine for 1 h. After cooking, the fillets were left to dry in the air for 1 h and smoked in the kiln for 2–3 h at 60°C. After smoking the fillets were cooled immediately. Then it is dried in the sun until hard texture is retained. The dried masmin is packed in polythene bags and stored.

Moisture, protein, fat and ash were estimated using AOAC methods (1975). TMAN and TVBN were estimated using the procedure described by Beatty & Gibbons (1937). For NaCl, FAO (1981) method was followed. Total phenol was estimated using the method of Foster & Simpson (1961). The total bacterial count and spore formers were estimated using the method described by APHA (1976).

Results and Discussion

The biochemical and microbiological aspects of both samples are given in Table 1. The moisture content in the mechanical kiln

Table 1. *Biochemical composition and bacterial count of mechanical kiln prepared masmin and traditional masmin.*

Character	Mechanical kiln prepared masmin	Traditional masmin
Moisture, %	10.18 ± 0.28	6.20 ± 0.14
Protein, %	62.55 ± 0.60	71.01 ± 0.83
Fat, %	0.86 ± 0.06	0.84 ± 0.41
Ash, %	11.94 ± 0.35	7.10 ± 0.75
TMAN, mg/100g	17.50 ± 1.76	37.50 ± 2.96
TVBN, mg/100g	96.00 ± 17.50	200.00 ± 53.00
Total phenols, mg/100g	23.56 ± 0.25	10.50 ± 2.25
NaCl, %	11.87 ± 0.29	6.75 ± 0.05
TBC per g	1.00 x 10^4	6.00 x 10^4
Spore formers per g	1.00 x 10^3	1.60 x 10^4

prepared smoked tuna is high (10.18 ± 0.28) when compared to the traditional product (6.20 ± 0.14).

This may be due to the short period of drying. In the traditional smoke curing, the cooked fish is first smoked, dried for 6 h, again smoked for another 12 h and again dried to hard sticks whereas in the laboratory, the product is directly smoked after cooking and then dried. Resmoking is avoided in the experiment to avoid oversmoking. The fat content is almost same in both the products. The ash content is high in the mechanical kiln prepared product. There is vast difference in the phenol content of both samples. In the traditional method of smoking, eventhough the product is smoked for a long time, the smoke absorption is too low. The high smoke content in mechanical kiln prepared masmin may be due to the temperature maintained in the kiln (60°C). In the traditional kiln, the temperature varied between 30 and 50°C. According to Toth & Pothast (1980), smoke deposition increases with increase in temperature upto 160° F (71.1°C) and not effective beyond 160°F. There is appreciable difference between the TMA and TVB of mechanical kiln prepared masmin and traditional masmin. This may be due to the delay in processing the traditional product.

While comparing the microbiological parameters, the bacterial count was more in traditional product (6.5 x 10^4/g). Similarly the spore formers count was also more (1.6 x $10/^4$g). But significant difference could not be noticed between the samples.

The products are evaluated organoleptically by a taste panel (Table 2). The results show that the mechanical kiln prepared product is more acceptable. According to Linton & Cooper (1934), for effective appearance, both smoke concentration as well as

Table 2. *Sensory score of mechanical kiln prepared masmin and traditional masmin*

Parameters	Mechanical kiln prepared masmin	Traditional masmin
Appearance	6	5
Colour	6	5
Flavour	6	5
Texture	5	5
Odour	5	4
Taste	6	5

Scores:		
	Like extremely —	6
	Like moderately —	5
	Like slightly —	4
	Neither like nor dislike —	3
	Dislike slightly —	2
	Dislike moderately —	1
	Dislike very much —	0

temperature has to be controlled simultaneously. In the mechanical kiln, the temperature during smoking was maintained at 60°C which resulted in a product with good appearance.

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