

NOTES

Penetration of Sodium Chloride During Prolonged Salting of Fish

Curing by salting and drying has been the oldest, simplest, cheapest and most widely practised method of preservation of fish throughout the world. Not much research has been done to study the progressive absorption of salt by the fish muscle during prolonged salting. Changes occurring in moisture and sodium chloride contents in the muscle of mackerel in gutted and split open forms while salting for 48 h in the ratio 5:1 at room temperature have been reported by Sen *et al.* (1961) and those in the split open fish under the same conditions but with varying proportions of salt to fish from 1:4 to 1:12 by Lahiri *et al.* (1961). Govindan (1969) studied similar changes in oil sardine and mackerel during different stages of salting and drying.

The present work deals with absorption of salt and expulsion of moisture in threadfin bream (*Synagris japonicus*), jew fish (*Sciaenids sp.*) and lactarius (*Laotarius lactarius*) during prolonged salting. The fishes used in this study were procured fresh and handled immediately. They were gutted, gilled, cleaned well and salted as per details indicated. Moisture and sodium chloride were determined by the methods described in AOAC (1960).

Fig. 1 shows the changes in moisture and sodium chloride in the muscle of threadfin bream of average length 15 cm, gutted and salted in the ratios 1:3, 1:5 and 1:7 (salt to fish) at room temperature (28°C) for 4 days. Changes in moisture and sodium chloride in jew fish muscle (average length 20 cm), gutted and salted in the ratio 1:3 (salt to fish) for 5 days at 10°C, 28°C and 40°C are depicted in Fig. 2. Table 1 reports similar changes in gutted lactarius of average length 17 cm, salted in the ratio 1:3 at room temperature (38°C).

It is seen from Fig. 1 that the greater the proportion of salt employed, the quicker is its absorption and shedding of moisture

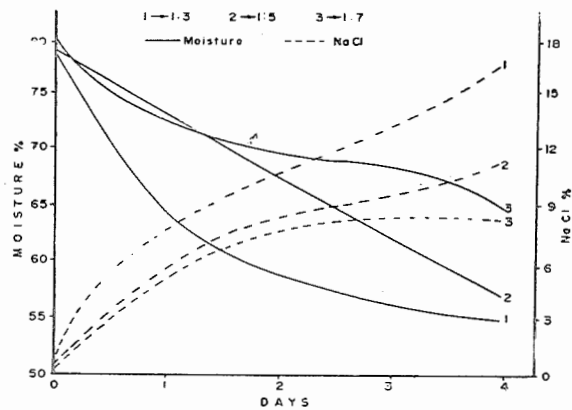


Fig. 1. Changes in moisture and sodium chloride in threadfin bream during salting at different salt ratios

by the muscle. The final levels of sodium chloride and moisture attained also are dependent on the salt ratio, moisture recording minimum and salt maximum values after 4 days with 1:3 ratio and *vice versa* with 1:7 ratio and a via media followed by 1:5 ratio. Temperature exerts a definite influence on rates of salt penetration and moisture loss as seen from Fig. 2. These are maximum at 40°C, minimum at 10°C

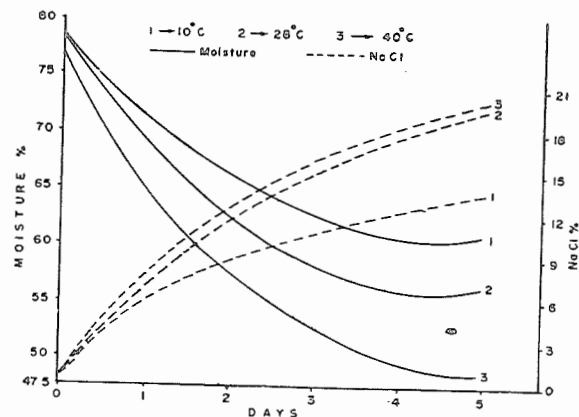


Fig. 2. Changes in moisture and sodium chloride in jew fish during salting at different temperatures

Table 1. *Changes in moisture and sodium chloride in Lactarius during salting for five days*

Salting days	Sodium chloride	Moisture
	%	%
Fresh	0.20	78.68
1	8.20	61.97
2	12.50	57.51
3	15.03	56.25
4	17.02	56.23
5	17.05	56.10

and in between at 28°C. In the case of Lactarius salted in the ratio 1:3, rates of penetration of salt and expulsion of moisture were rapid, even though the experiment was conducted at room temperature, which is attributable to the high ambient temperature of 38°C of the summer weather at Kakinada. Hence larger salt proportions and higher temperature of salting both accelerate the rates of absorption of salt and shedding of moisture by fish muscle during salt curing.

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References

- AOAC. (1960) *Official Methods of Analysis*. Association of Official Agricultural Chemists, 9th edn., Washington.
- Govindan, T. K. (1969) *Indian Fd Packer*. 23, 18
- Lahiri, N. L., Sen, D. P. & Visweswariah, K. (1961) *Fd Sci*. 10, 139
- Sen., D. P., Visweswariah, K. & Lahiri, N.L. (1961) *Fd Sci*. 10, 123

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