NOTE III

QUALITY LOSS IN PRAWNS DUE TO DOUBLE FREEZING

Icing is the practice for preserving prawns on board fishing boats in India. Majority of these boats need to preserve the catch only for a few hours because of the short duration of the fishing trip. However, with the anticipated introduction of a considerable number of bigger fishing vessels which can remain in the fishing ground for longer periods-more than fortnight - preservation methods other than icing are required to retain prime quality. Freezing and cold storage of whole prawns on board followed by thawing and processing on land is a possible proposition. The extent of quality loss in prawns during these operations is one of the important points to be considered. Hence, laboratory scale studies were undertaken on double freezing of prawns and the results are dealt with in this communication.

Prawns - *m. dobsoni* and *p. stylifera* collected from Cochin were washed in sea water and half of the lot was frozen whole at -40°C and the other half was converted to Headless and Peeled and Deveined (2 kgs. and 0.3 kg. blocks) and frozen at -0°C, the latter served as the once frozen samples. The whole frozen material was thawed in running water after a month, then processed as HL and PD forms, this served as the twice frozen blocks. In order to collect information regarding drip loss, some blocks were kept in airtight polythene bags, then thawed in running water and the material quality and drip loss were assessed. The frozen blocks were drawn at intervals, thawed at 4°C for 17 hours and the material was analysed for total nitrogen, and free α-amino nitrogen in addition to the organoleptic and physical characteristics by the methods given earlier. (C. George, 1973).

Results of experiments carried out with *m. dobsoni* are given in tables. The thawed yield dropped from 97 to 93% in 40 weeks of storage in the case of once frozen sample and from 94 to 90% in the case of H L double frozen sample. The initial thawed yields in P D once frozen and double frozen samples are 86.1 and 80.3% respectively; which decreases to 80 and 70% in 40 weeks of storage. The percentage of pieces showing black spots increases during frozen storage and it is more in double frozen samples as is seen in the tables. The cooked characteristics, texture and flavour shows appreciable difference between the once and double frozen lots. The percentage loss of total nitrogen is from 1.4 to 3.2% in HL once frozen lot and from 2.5 to 5.1% in double frozen HL lot in 40 weeks of storage and from 2.8 to 6.6% in PD once frozen lot and from 8.0 to 14.2% in double frozen PD lot. The free α-amino nitrogen shows marked change during frozen storage and it varies from 1.3 to 22.6% in once frozen control HL lot and from 3.1 to 43.1% in HL double frozen lot and from 32.5 to 43.6% in PD once frozen lot and from 46.8 to 57.1% loss in PD double frozen lot in 40 weeks of storage.

Experiments conducted with *p, stylifera* shows similar pattern of changes, but black spot development was absent through-

CHEMICAL, PHYSICAL AND ORGANOLEPTIC CHARACTERISTICS OF ONCE FROZEN (a) AND DOUBLE FROZEN (b) PRAWNS M. DOBSONI:

TABLE I

HL - Form

Weeks of frozen storage	Percentage loss of total Nitrogen		Percentage loss of α—NH_2N		Percentage showing blackening		Thawed yield %	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
0	1.4	2.5	1.3	3.1	6.95	13.35	97.0	94.0
15	2.1	3.9	5.6	9.9	17.95	19.23	96.4	93.2
30	2.5	4.4	18.7	28.9	17.82	25.2	95.0	92.0
40	3.2	5.1	22.6	43.1	33.3	65.0	93.4	90.6

M. dobsoni. HL Form.

Weeks of frozen storage	Appearance		Cooked characteristics			
			Texture		Flavour	
	(a)	(b)	(a)	(b)	(a)	(b)
0	Good	G. F.	Soft & firm	F.	G. F.	F.
15	G. F.	F.	F.	S. tough	F.	F.
30	Fair	F. P.	F.	Mod. tough	F.	F. P.
40	F. P.	Poor	Sl. tough	Tough	F. P.	Poor

TABLE II

PD — Form

Percentage loss of total Nitrogen.		Percentage loss of α—NH2—N.		Percentage showing blackening		Thawed yield %	
(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
2.83	8.0	32.5	46.8	0.0	11.1	86.1	80.3
4.24	9.4	34.1	48.4	1.2	17.0	81.3	76.8
5.35	12.2	42.0	56.3	3.4	21.8	80.9	74.7
6.67	14.2	43.6	57.1	4.0	31.7	80.0	69.7

M. dobsoni. PD Form

Appearance		Cooked characteristics			
		Texture		Flavour	
(a)	(b)	(a)	(b)	(a)	(b)
G. F.	F.	Scft & firm	F.	G. F.	F.
F.	F. P.	Sl. hard	Sl. hard	F.	F. P.
F.	F. P.	Sl. tough	Mod tough	F.	F. P.
Poor	Poor	Sl. tough	Mod tough	P.	Poor

out the storage period, as this phenomenon is of species specific.

The foregoing studies clearly indicate that some changes are brought out by refreezing and when compared to the quality loss in icing, it is less. The major quality defects are high drip loss and high rate of blackening.

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REFERENCE:

Chinnamma George 1973 Technological aspects of preservation and processing of edible shell fishes. III. Freezing characteristics of crab. Fishery Technology, Vol. 10, No. 1.

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