

Processing of Oyster Meat for Freezing

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Experiments were conducted to determine the ideal depuration time for oysters and processing for shucking. A depuration time of 24 h reduced substantially the sand content. Steaming of oysters for shucking yielded better quality meat with good appearance than the hot water dipping method.

Oyster *Crassostrea madrasensis*, is widely distributed along the east and west coasts of India. The oyster meat has high protein, glycogen and mineral contents (Balachandran *et al.*, 1984; Chellappan, 1989). Oysters are depurated to remove or reduce the sand and bacterial contents of the guts (Balachandran & Surendran, 1984). Various processing and shucking methods are adopted for the recovery of meat (Tanikawa, 1971; Anon 1982). This paper deals with the effect of depuration and processing methods on the yield and chemical composition of meat.

Materials and Methods

The study was conducted at Tuticorin Research Centre of Central Marine Fisheries Research Institute during 1984. Live oysters were collected and washed in a jet of sea water. They were kept in filtered running sea water in a depuration tank and half of the oysters was collected after 12 h and the remaining after 24 h depuration. Depurated oysters were dipped in 5 ppm chlorinated sea water. One part of the oysters was dipped in boiling water for 3-5 min in gunny bags. The remaining part was steamed till it opened the shell. The meat was hand shucked and washed in chilled water and drained. It was then dipped in 2% brine solution containing 0.2% citric acid for 10 min, drained, packed in polythene bag, frozen at -40°C and stored at -20°C.

Moisture, total protein, lipid, ash and insoluble ash were determined as per AOAC (1975). Sodium, potassium and calcium were estimated as per Vogel (1960) and iron by APHA (1976). Glycogen (Umbriet *et al.*, 1959); α - amino nitrogen (Pope & Stevens, 1939) and inorganic phosphorus (Fiske & Subbarow, 1925) were determined.

Results and Discussion

The effect of depuration on yield of the meat at various stages of processing are presented in Table 1. The percentage yield of meat was 5.41 and 5.00 respectively for 12 and 24 h depurated oysters shucked after dipping in hot water. The yield of meat from steamed oyster was 4.5%.

Table 1. *Percentage yield of oyster meat at different stages of processing*

Stage	Depuration time	
	12 h	24 h
% weight loss after depuration	1.60	2.58
% weight loss after 4 min dipping in boiling water	6.20	9.02
% yield of meat	5.41	5.00
% yield of meat after acid treatment	5.20	4.82

The proximate composition of the meat before and after depuration is presented in

Table 2. The acid insoluble ash content was reduced substantially by depuration. Significant increase in the α -amino nitrogen was also noticed. There was no mortality after 24 h depuration. The gut of the oysters after 12 h depuration was greenish but after 24 h it changed to white.

Table 2. Proximate composition of the oyster meat before and after depuration

	Before depuration	After 24 h depuration
Moisture, %	79.75	80.09
Protein, %	11.70	12.90
Lipid, %	1.50	1.54
Glycogen, %	6.43	6.22
Insoluble ash, %	0.97	0.01
Alpha amino nitrogen, mg%	97.60	140.00

The oyster meat recovered after steaming had good shape and appearance, firm and tender compared to meat recovered after dipping in boiling water. The latter meat had raw taste and sea weedy odour indicating insufficient cooking. The depurated meat contained no sand particle.

Table 3 compares the changes in the biochemical characteristics of fresh meat after depuration and shucked meats. The moisture loss was high in steamed oyster meat. The meat from steamed oysters had high content of ash compared to boiling water dipped oyster meat. The high loss in potassium and calcium in boiling water dipped as well as steamed meat might be due to the high solubility of these minerals in the fluid as indicated by Lopez *et al.* (1983) in *C. virginica*. The present study indicates that the time of depuration and heating methods for opening the shell influence the yield, composition and quality of meat. A

depuration period of 24 h and steaming for opening the shell for shucking was found to yield good quality meat.

Table 3. Effect of heating methods on the composition and mineral contents of oyster meat

Parameters	Fresh meat	Hot water dipped meat	Steamed meat
Moisture, %	80.09	77.02	71.36
Protein, %	12.90	14.00	17.01
Lipid, %	1.54	1.67	2.18
Glycogen, %	6.22	6.94	8.67
Ash, %	2.25	2.79	3.80
Acid insoluble ash, %	0.013	0.024	0.09
α -amino nitrogen, mg/100g	140.00	95.20	47.60
Sodium, mg/100g	308.89	72.26	105.67
Calcium, mg/100g	403.40	118.80	162.27
Inorganic phosphorus, mg/100g	53.22	52.06	65.78
Iron, mg/100g	11.81	11.54	18.06

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