

CANNING OF EDIBLE OYSTER

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ABSTRACT

Edible oyster, *Crassostrea cucullata* was canned in different filling media viz, its own nector, brine and double refined vegetable oil, to study the effect of each, on the flavour and general quality characteristics of the final product, A method was worked out to produce a canned product, of appealing flavour from oysters after light smoking. The paper reports the results of these studies.

INTRODUCTION

Among the edible oysters Rock oyster, *Crassostrea cucullata* (Born) and *C. Gryphoides* (SCHLOTHEIM) are the main Indian species. They occur all along the coast and are fished from large natural beds (Ansari, 1978). Its food value is 405.90 cal/100 gm on dry wt. basis (Suryanarayanan & Alexander, 1972). The U.S. and Japan are the leading countries in the commercial heat processing of oysters. Sufficient work has been done in other part of the world on the canning of oyster (Galtsoff, 1951, Tanikawa and Shamsud, 1965 and R. Motohiro, 1974). This paper gives the maiden account of canning of Indian Rock oyster.

MATERIALS AND METHODS

Oysters were procured from Gujarat from Gujarat State Government Farm Sikka (Jamnager) in moist gunny bag along with some moist algae to keep them fresh. They were washed properly to remove the sand and mud. Oyster meat was shucked in raw condition and nector was kept aside. It was washed vigorously in wire mesh tray to remove sand etc. One portion of the oyster meat was canned in hot oyster nector, one part was canned in hot oyster nector, one part was canned in double refined ground nut oil and other in 1% brine, Remaining oyster meat was smoked and canned in refined

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ground nut oil. Moisture, total nitrogen (TN), Total Non Protein Nitrogen (TNPN) and Ash were determined by standard procedure AOAC (1975). Total lipids by the method of Bligh & Dyer (1959). Glycogen and energy values were worked out using standard factors.

The raw material taken was very fresh. The cleaning of the shucked meat was done thoroughly to remove shell and sand particles. Any piece of shucked meat showing discolouration is to be discarded. It was washed in 3% brine and left for draining for 15 minutes. The meat is packed in 301 X 206 size cans and steamed for 15 minutes at 100°C. Oyster nector (collected while shucking the oyster) is filtered and heated up to 80°C. It was used as filling media. In other batch hot 1% brine was used. In the 3rd batch hot double seamed. Cans were processed for 25.30 minutes at 1.05 kg/cm² pressure.

By several trials the following method was found most suitable for smoking oysters and subsequent canning. On the shucked meat 5% salt (by weight) was sprinkled and rubbed into the oyster meat and kept for 2 hrs. Then it was boiled for 2.3 minutes to make the meat firm. Meat was steamed for 15 minutes. Smoking for one hour was found most suitable. Temperature of the kiln was 45°C + 5.c. Smoked meat was packed in the cans and it was filled with hot ground nut oil. Processing was done at 70 kg/cm² for 30 minutes.

RESULTS AND DISCUSSION

Proximate composition (Table-I) of fresh oyster shows that its having more than 80% moisture. Protein is around 9-10%, Fat 2.72% and cal/100 gm. and is highly palatable.

TABLE — 1
PROXIMATE COMPOSITION OF OYSTER

Fresh Wt. basis.

Moisture	—	81.14%
Protein	—	9.75
Fat	—	2.72%
Glycogen	—	.83
Ash	—	1.56
Energy Value	—	70 cal/100 gm.

Average size of oyster was 110 mm and ultimate yield in canning is 5.79%, Rest 94% is loss in the form of shell and mud etc. During steaming around 18% loss of water and soluble nutrients was noticed.

Results of physical and organoleptic tests are shown (Table-II). In Case of oysters canned in nector drip is milkish in colour and shows slight turbidity. In brine the colour of drip is light gray colour and turbidity is less conspicuous. Oil canned samples shows light greenish tinge in water in the drip. Volume of water is slightly more i.e. 15 ml. The oil is clear and normal. In smoked oyster in oil, the colour of oil is slightly dark and without turbidity.

TABLE — II
Organoleptic and Physical Qualities of Canned Oyster

Characters	Canned in nector	Canned in brine	Canned in oil	Smoked cyster canned in oil
Appearance of can exterior (Interior)	good	good	good	good
Vacumm (mm) Head	above 30	above 50	above 50	above 50
space (mm)	6	5	5	5
Volume (ml)	110	105	100 85 oil 15 water	100 95 oil 3 water
<u>Drip</u>				
Colour	Light Milkish	average light gray colour	clear	light dark
Turbidity	Turbid (Medium)	slight Turbid	Normal	Normal
Colour	Slight greanish	Average	Average	Slight dark colour
<u>Meat</u>				
Flavour	Characteri- stic	Characteri- stic	Not Promi- nant	Smokey
Texture	Slight soft	Slight firm	Slight firm	Firm

The colour of canned meat, in nector is slightly greenish showing incomplete cleaning of guts. The flavour is quite prominent and characteristic to oysters and texture is slightly soft. Canned samples in brine shows normal colour and characteristic flavour and texture is also normal. Oyster canned in oil shows normal colour but the characteristic flavour is missing and texture is slightly dark and flavour is smoky. The texture is slightly firm About colour and texture of oyster requires or special care as no standard can be set for discoloured or natural dark coloured oysters. Texture wise also oysters are quite soft as compared to the flesh of other fishes.

Chemical composition of the canned product (Table-III) shows that the sample canned in nector and brine are quite similar but for salt percentage which more in brine sample. Canned oyster in oil shows less moisture and NPN value. Smoked oyster shows 53% moisture and higher lipped value 12.05%. Amount of Protein in brine samples is 3.28% and NPN 1.05%.

TABLE — III

Chemical Characteristics of Canned Oyster

	MOIS- TURE G/ 100g	PROT- IN G/ 100g	LIPID G/ 100g	SALT G/ 100g	NPN MG 100g	TVN
Canned in nector	68.5	15.62	6.10	1.5	90gm	16.8
Canned in brine	69.4	14.37	5.25	3.3	95	14.5
Canned in oil	65.03	15.15	11.76	2.5	25	12.5
Smoked oyster canned in oil	53	18.25	12.05	7.6	—	—

Problem in the smoking of oyster is high moisture and slime content. Oyster meat get stuck up with wire mesh during smoking and results in the breaking of meat while removing from wire mesh. Oil was applied to the wire mesh to prevent meat getting stuck up. But it was not quite satisfactory. The method discribed in processing methods gave better results as application of 5% salt and 2-3 minutes boiling makes meat firm and its handling becomes easier.

The oyster canned in brine gives good product, with good flavour and texture while the canned sample in nector was very good in flavour but poor in colour and texture. Canned sample in oil has slight firm texture put the characteristic flavour is missing. Light smoked product is also of good quality and has got an appealing flavour of smoke and firm texture.

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