

Quality Improvement in BECHE-DE-MER

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INTRODUCTION

Beche-de-mer or *Trepang* is the commercial name given to processed sea cucumbers. During the last ten years *Beche-de-mer* prices have jumped from a meagre US \$ 2.95 for 17 pc/kg in 1974 to US \$ 16.00 in 1985 in the Singapore market. There is an urgent need to improve the quality of the product to satisfy the export market.

Processing of sea cucumbers was introduced by the Chinese to India. Their methods have been adopted in India with some modifications to suit local conditions. Hornell (1977) in his classical paper traced the history and revival of the *Beche-de-mer* industry in India. James (1973) has given an account of *Beche-de-mer* resources of India and suggested some methods to improve the quality of the product. The industry earlier existed only along the Palk Bay and the Gulf of Mannar on the South East coast of India. It is now processed in the Andaman and Nicobar Islands also. James (1983) has given an account of the *Beche-de-mer* resources and industry in Andamans. There is an urgent need to introduce processing in the

Lakshadweep since many of the valuable commercial species occur there.

FACTORS CONTROLLING QUALITY

The present day processing leaves much to be desired. The quality of *Beche-de-mer* mainly depends on the species used, size, shape, appearance, colour, odour and moisture content. Many of the above factors are controlled during processing. Presently the processing has fallen into the hands of unscrupulous profiteers who not only process them under the most unhygienic conditions but resort to adulteration of the product to make quick money.

SPECIES:

Only about ten species are commercially valuable. Among them the teat fish (*Holothuria (Microthele) nobilis*) ranks first since it commands the maximum price. Prickly fish (*Thelenota ananas*) ranks second; black fish (*Actinopyga miliaris*) ranks third and sand fish (*Holothuria (Metriatyla) (scabra)*) which is the most common ranks fourth in quality.

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SIZE:

Size is the most important criterion to fix the quality. The first grade quality is above 12 cm when processed. Longer, sturdier and stouter ones fetch higher prices than shorter, weak and flexible ones. The sea cucumbers usually shrink to one third the size on processing.

APPEARANCE:

The appearance of the product should be neat and free from any dirt and sand and also from white chalky deposits. This is due to improper processing. Such material needs to be reprocessed. Those which have tear markings, lesions on the skin fetch low prices.

SHAPE:

This depends on the species used. Neat cylindrical forms are preferred. Some species like teat fish and prickly fish have characteristic projections in the end product also. They help in identifying the species of the product.

COLOUR:

If dark coloured products are matched against light coloured products traders pick the former in preference to the later for the consumer believes that darker ones are the true cucumbers. Unscrupulous persons resort to colouring the material and this should be checked.

ODOUR:

Clean and thoroughly dried product has no odour at all. Care should be taken to see that the moisture content is around 8-10%. The product is hygroscopic and absorbs moisture and emits a foul and offensive smell. This can be avoided by thorough drying and packing in polythene bags.

IMPROVEMENT IN HANDLING

Handling the catch on board is foremost in improving the market value of the product, reducing the losses during processing and ensuring cleanliness and hygiene. As soon as sea cucumbers are brought to the boat a slit of 2-3 cm is made near the cloaca and the animal is held out of the boat so that eviscerated material falls into the sea. This way the final product also remains neat and clean. The sea cucumbers should never be kept in palm leaf woven baskets and net bags since the animals closer to the holes shape into them. It is best to keep the sea cucumbers in a plastic fish box having a smooth interior surface and drain holes of one cm diameter or less. If the holes are larger those animals closer to the holes shape into them and the holes get blocked. The box should be clean prior to placing of the animals as dirt or sand particles become embedded into the body wall. If coral bits and algal pieces are found attached to the body they should be removed and the animal is cleaned in sea water before placing them inside the box. Sand fish can be placed one above the other and they flatten out while remaining alive. In case of teat fish a single layer is preferable. If stacked, the outer skin of the body wall tends to break and after processing, these appear as tear marks down-grading the appearance. Prickly fish needs special care as the tubercles get damaged if handled improperly. After capture, the sea cucumbers should never be exposed to sun since the top layer of the animals dry up and start peeling off. The surface of the boat makes an imprint on the animals bringing down the quality of the final product. Nets should not be present on the deck of the boat since the animals easily get

entangled. As far as possible the animals should be processed soon after they are brought to the shore. If they are kept over night in fish boxes, the animals become weak and this affects the quality of the product. If they are kept in pens, lesions due to higher temperature form on the outer skin of the body wall leading to breakage of the body wall and softening.

PRECAUTIONS DURING PROCESSING

During processing a number of precautions have to be taken to ensure a high quality product. If the animals are kept in sea water in boiling pans and heated, the disadvantages are as follows. The animal first consumes water and becomes turgid. It has the capacity to close its mouth and cloaca while being heated and effectively seal both the openings. Heating causes both outside and inside water of the animal to boil. Pressure builds up inside and the body wall bursts unless removed from the pan before boiling is reached. After placing inside the boiling pan and until its time of death the sea cucumber can assume any shape. A cylindrical shape is acceptable in the market. Therefore special attention has to be paid to this aspect. Heating the animal slowly could irritate the animal to form lesions in the outer body wall followed by breakages. During heating process those animals touching the bottom of the pan where heat is intense could easily be damaged. It is also labour intensive to keep on churning the animals inside the pan while heating. On the other hand if the animals are introduced after the water boils, the animals are quickly killed in a few seconds. The first reaction of the animals to adverse situation like intense heat is to contract itself with its longi-

tudinal and circular muscles. This facilitates the formation of cylindrical shape which is the most preferred in the market. The animal has also no chance of taking water and the consequential pressure build up leading to breakage of the body wall. It is necessary to keep the products well stirred during boiling. This makes the product perfectly cylindrical. The shape of the pan used for boiling determines the end product quality. A saucer shallow pan made of cast iron is the most suitable since it distributes heat uniformly to all animals. The most important factor in boiling is to keep intense heat. Slackness or relaxation is detrimental to the quality of the product. Eviscerated holothurians should not be added in bulk to the boiling water since it quickly brings down the temperature. They should be slid along the edges of the saucer-shaped pan one by one. Cleaning of the sea cucumbers after boiling is necessary. Fine mud gets embedded into the outer body wall of the dorsal and lateral surfaces. These have to be removed to have an acceptable product for the market. The traditional method involves bacterial decomposition of the outer layer which is scrubbed off to remove the outer mud-embedded layer and the pigmented layer. Bacterial decomposition is activated by inviting the bacteria from the sand. After boiling, the sea cucumbers are cooled and kept inside pits on the beach and covered by sand. Bacteria multiply fast and eventually cover the entire surface of the body and they penetrate inside the body wall. It is just enough if they penetrate 2 mm or so. Therefore, duration of time for keeping the sea cucumbers inside the pits is an important factor. If kept for a longer period the body wall may become too soft for further

processing. If the material is not moist at the time of burying, bacterial action may be slow and decomposition inadequate. Proper care is necessary in selecting the site for burial. Most beaches near villages are polluted with faecal matter. Also not all beaches are sandy and tidal waters move in and out at certain areas. Therefore clean sandy beaches with little human activity are the best sites. First boiling should be done for 45 minutes. Stirring should continue at every three to five minute intervals. The material removed from the pan should first allowed to cool on the sand. The pit for burying should be in a clean sandy beach 100 cm long, 75 cm wide and 30 cm deep and as far as possible with even flat floor. The sea cucumbers should be arranged in a single layer and they should be packed densely and covered with jute-hessain sac. After sprinkling water on the sac, the pit is closed with sand and marked. After thorough cleaning, those which still have white patches of calcareous deposits are once again boiled and the whole process is repeated. The cleaned product is once again boiled for 45 minutes to kill all the remnant bacteria. The product is now put out for drying on drying platforms or trays in the sun. The product should never be dried on sand since sand particles that stick to them are difficult to remove later and this will bring down the quality of the product. They can also be dried on palmyra mats. The product should never be kept out when drizzling. During rainy season smoke driers can be used. Since the product is hygroscopic it should be put out in the sun now and then to keep the moisture level low. Around 8-10% of moisture content seems to be the best level.

PACKING AND FORWARDING

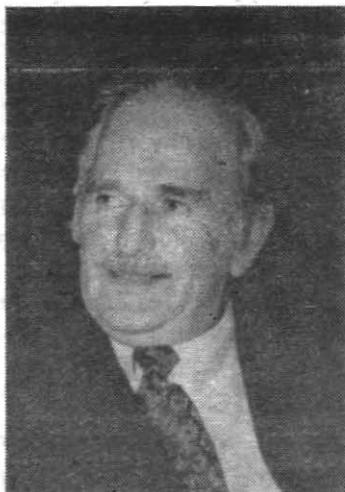
The product has to be packed in box cartons lined by polythene. This will help in extending the storage life and also it is easy to stack them. This way, handling during transport is easy and shipping lines also accept them as hold cargo. If they are packed with jute-hessain sacs lined internally with palm leaves, the shipping lines will accept only as deck cargo. As deck cargo, the product will absorb moisture and will be spoiled. The shipping lines do not prefer to keep this cargo inside and this is a limiting factor. The internal lining of palm leaf woven mat protects the product when carried in open deck and covered by canvas from sea spray, rain spray etc. However this is not a desirable way of packing. If *beche-de-mer* could be sealed inside polythene bags after a good day of drying the chances of moisture absorption is reduced. To prevent tear in the bag it could be kept inside an appropriate box carton. Storage life of the product could be extended this way.

MALPRACTICES TO BE CHECKED

Malpractices have to be checked during processing at any cost. In order to increase the weight of the product processors often resort to processing smaller forms. A part from getting a low grade product they are often rejected since they are full of sand inside. Small forms do not eviscerate and in order to increase the weight of the product they are processed with sand inside. Processing smaller forms will deplete the stocks since the animals do not have any chance to breed. In order to increase the weight of product the processors sometimes mix up sand fish with lolly fish (*Holothuria (Halodeima) atra*). Lolly fish has toxins which fortunately during boiling break down. But there are instances when such

(Contd. on page 10)

Mr. Abraham Kaplan-



Mr. Abraham Kaplan of M/s. Sau-Sea Foods Inc., New York during his recent visit to Cochin was kind enough to find time to extend an interview to the Editor of this Journal.

Mr. Kaplan, a trusted friend of the seafood Industry in India, having a long cordial tie with the exporters, has always been a rapport for the development of the seafood trade for more than about three decades. Mr. Kaplan has never missed a single Indian Seafood Trade Fair so far conducted. He had attended all the fairs and actively participated. Mr. Kaplan who looks very energetic even at his age of 67, is a wide traveller and has gained immense experience in Fishing Industry. This was quite evident from the observations he made about the various aspects of our Industry.

Speaking about his experience with Seafood Exporters of our country, he was very happy to remark that the quality of the products that he gets is very satisfactory. Though he is buying from various countries, Mr. Kaplan said that India is the major supplier with a share of 30% of his total purchase. He further added that his production was increased only after he started buying P & D. Shrimps from India. Mr. Kaplan, who is very keen in the promotion of our exports, observed, that Indian Seafood Exporters should gain the latest marketing techniques and should go in for value added products like I. Q. F., Cooked shrimps and shrimp dishes etc. and he offered his entire co-operation in this regard. Mr. Kaplan felt that the Marine Products Export Development Authority have to play an important role and offer all incentives and assistance to the Seafood Industry in India in the field of marketing and modernisation. He advised that The Seafood Exporters Association should strongly represent to the authorities concerned for the setting up of suitable marketing agency to meet the international standards.

M/s. Sau-Sea Foods Inc.. a family concern of Mr. Abraham Kaplan, is ably assisted in his business by his son Mr. Harvey J. Kaplan, his daughter Ronnie S. Kaplan and his son-in-law Mr. Antonio M. Estadella. While asked about his hobbies, Mr. Kaplan said he plays golf and likes travelling and above all work is worship. Mr. Kaplan offered his best wishes for the Seafood Exporters and for the Organisation.

The Seafood Exporters Association of India thank Mr. Kaplan and Mr. Ahmed Naina of M/s. King Fisher Trading Co., Cochin-5 who are the Agents in India of M/s. Sau-Sea Foods for arranging the interview.

a mixed product is consumed, vomiting and giddiness are caused. In order to make the product free from all white chalky material, some persons add hydroxide during second boiling. Such products are dangerous to consume from the health point of view. Also since many holes are formed, the value of the product is lost.

ACKNOWLEDGEMENTS

The author thanks Dr. P. S. B. R. James, Director, C. M. F. R. Institute, Cochin for his kind interest and encouragement. He also thanks Dr. B. Krishna moorthi, Emeritus Scientist for kindly

going through the manuscript and offering helpful suggestions.

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