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Collection of water samples for analysis with special reference to fish processing

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Water and ice are analysed to check their suitability for the seafood processing industry. The analytical report is a requirement of (a) the Export Inspection Agency as part of the procedure for the approval of the plant under IPOC | MIPQC, (b) the importer and | or (c) the industry for the quality of their product. The analytical report is also necessary for Lloyd's

Frequency of Sampling

Sampling frequency for an approved water source is determined by the variability of water quality and the possibility of pollution. Water from a protected well may need to be sampled only once a year, while surface water sources should be sampled a minimum of 4 times a year. Sampling frequency increases if special circumstances arise, for example, high coliform counts. Prior to plant site selection, water available from the site is subjected to complete analysis

Collection of Water and Ice

Samples are collected in separate containers for (a) bacteriological analysis and (b) physical and chemical analysis.

Collection for Bacteriological Analysis

Samples for bacteriological analysis are collected in sterile containers under aseptic conditions and preserved if they

survey.

Over the years the seafood processors used to approach the Central Institute of Fisheries Technology (CIFT) for the analysis of water and ice. In the early years the samples were collected by the field staff of the Institute. Consequent upon the appointment of technologists and quality controllers in the processing factories, the

are not analysed immediately after collection.

Containers

Sterilized glass bottles can be obtained from the testing laboratory. Otherwise the bottles are to be sterilized in the factory. The method of sterilization is described below. The glass bottles (250–500 ml. capacity) are cleaned well before sterilization. Cleaning is carried out with a suitable detergent. The bottles are then rinsed thoroughly with hot water to remove all traces of residual detergent and finally with distilled water. Since certain detergents may contain bacteriostatic or inhibiting substances, care should be taken to remove all the traces of the detergent. Six to twelve successive rinsing with hot water may be required to remove all the traces. After washing, allow the glassware to dry. In order to prevent breakage of the bottles during sterilization

samples collected by them are now being accepted by CIFT for analysis. However, water collected by proper technique will only be accepted for analysis. In this paper the authors discuss the different aspects of the method of collection of samples of water and ice used in fish processing factories.

— Editorial Committee

a strip of paper is provided between the neck of the bottle and the stopper. The closed bottle is then wrapped in wrapping paper and secured with a twine, if necessary. Sterilization is carried out in an autoclave at a pressure of at least 14 lb./in² (121°C) for 20 minutes or in an air oven at 170°C for 60 minutes. The glassware is then allowed to cool.

Dechlorination

If the water to be sampled contains residual chlorine, it is neutralised by adding a dechlorinating agent, in order to prevent the continuation of the bactericidal action of the chlorine during the time the sample is in transit to the laboratory. The examination will then indicate the true bacterial content of the water at the time of sampling. Sodium thiosulphate is a satisfactory dechlorinating agent. 0.1 ml. of 10% solution of sodium thiosulphate is usually added to the bottle be-

fore sterilization. This amount is sufficient to neutralize 1.5 mg of chlorine.

Procedure for Sampling

A suitable tap inside the processing plant is selected for collection of water. Water is allowed to drain from the tap for 2 minutes to ensure that the sample is representative of the water supply. Then the tap is closed and cleaned well. It is sterilized by heating with an ignited piece of cotton soaked in methylated spirit or a blow lamp. The tap is then cooled by allowing water to drain. Just before sampling the wrapper and stopper are removed together and the water collected as quickly as possible from the tap. For collecting the sample the bottle is held at the base with one hand and the stopper and wrapper in the fingers of the other hand. Care is taken not to touch with the fingers or anything else, the inside of the neck of the bottle or the corresponding outer face of the stopper. The water is collected from a gentle stream avoiding splashing. The bottle is filled leaving an air space of about 2.5 cm. below the stopper. This is to facilitate mixing of the sample by shaking during examination. The stopper is replaced immediately and covered with the same wrapper.

In the case of ice, sterile wide-mouthed bottles are used. Ice pieces from the block are collected with the help of a sterilized scoop. Scoop is sterilized by dipping it in spirit and burning. It is made sure that the ice falls directly into the bottle and is not contaminated while sampling.

When samples are collected directly from rivers, streams, lakes, reservoirs, springs or

shallow wells, the aim must be to obtain a sample that is representative of the water. Hence it is undesirable to collect samples too near the bank or too far from the point of the draw off. Samples from these sources can be collected by holding the bottle at the base and plunging it, neck downward below the surface of the water body. The neck is then pointed slight upward towards the current. In a still body of water the bottle is pushed horizontally forward.

Glass bottles with string tied to its neck is used for collecting samples from a well. The bottle is sterilized with the string on. The paper cover and stopper are removed just before drawing the sample. Care is taken to see that the bottle does not get contaminated by contact with any other surface. Another clean string is tied to the sterilized string and the bottle lowered into the water and allowed to fill up. The bottle is pulled up, stopper replaced, string removed and wrapped in the same wrapping paper.

Preservation and storage

Changes occur in the coliform and *Escherichia coli* content of water samples on storage and hence sample is examined as soon as possible. Examination is started preferably within one hour of the collection of the sample. When this is not possible the sample is kept in ice or in a refrigerator till taken for analysis. Analysis of such samples is, however, carried out within 48 hours after collection.

Collection for Physical and Chemical Analysis

The containers used for the

collection of samples for the analysis are chemically clean, practically colourless and are provided with either a ground glass or polythene lined stopper. Polythene bottles may be used instead of glass bottles. The bottle is rinsed at least 3 times with the water to be sampled and a volume of 2.5 L is collected.

If the sample is collected from a tap, water is drained for about 2 minutes before collecting the sample. Samples from well are collected only after sufficient water has been pumped out to ensure that the sample represents the ground water that feeds the well. When samples are collected from rivers and streams, the analytical results may vary with depth, stream flow and distance from the shore. The results may also vary from one shore to the other. The quality of water in lakes and reservoirs also varies. The variation is due to seasonal stratification, rainfall, run off and wind.

The samples are transported to the laboratory without delay and kept at low temperature during transit. The analysis is started as soon as practicable and in any case within 72 hours.

Examination for factors like pH, residual chlorine etc. is carried out immediately after collection of the sample.

In the case of ice, break the block and collect 5-6 kg of ice blocks in a clean polythene bucket and cover it. In case transportation of ice is difficult, the broken pieces may be allowed to melt completely and the melt water may be collected just as in the case of water.

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Information to be submitted with samples

The samples, both for bacteriological and physical and chemical analysis are clearly labelled and sent to the laboratory without delay, accompanied by relevant particulars such as source of the sample, date and time of collection and other information relevant from the sanitary view point.



Shri M. R. Nair, Director, CIFT, speaking at a function held at Anjengo on July 23, 1988, to launch the 200th plywood boat of South Indian Federation of Fishermen Societies, Kerala