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UTILIZATION OF SOLID WASTE GENERATED BY FISH PROCESSING

Anjani Rani, Ph. D.

Assistant Professor, Department of Zoology, Governmrnt College NOIDA, UP

Abstract

Fisheries sector has its own importance in economic development of the country. It has been recognized as a powerful source of income and employment generator as it stimulates growth of many subsidiary industries; also it is a source of cheap and nutritious food besides being a source of foreign currency. It is the source of livelihood for a large section of economically backward population of the country. The growing interest in the sea and its resources with the rapid growth in information and technology has made the sea as the centre of activities ranging from industrial, transportation, oil and natural gas, mining, Mari-culture and a host of other activities related to tourist importance. It is also a source of raw food material for seafood industry all over the world. The resultant diverse use of the sea and further expansion in future is likely to have adverse impact on the sea and its marine ecosystem. It calls for eco-friendly exploration and exploitation of the ocean by all to save this common heritage of mankind from going catastrophic.

Keywords: *Fish processing Industries, Solid waste, Utilization,*

Material , Methods and Discussion: Solid waste created at Fish processing factories are dried and converted in to fishmeal., to find out solid waste created from individual fish varieties created from different factories were studied. Waste utilization is an important issue for the seafood industry from both a regulatory standpoint as well as one that has potential economic impacts. A large volume of solid waste is currently processed into fish meal, fish protein hydrolysate, and fertilizers. A small percentage is processed into higher valued items, such as, seafood flavorants, colorants, chitosan, enzymes, etc. The recovery of chemical components from seafood waste materials, which can be used in other segments of the food industry, is a promising area of research and development for the utilization of seafood by-products. Researchers have shown that a number of useful compounds can be isolated from seafood waste including enzymes, gelatin, and proteins that have antimicrobial and antitumor capabilities. Chitosan, produced from shrimp and crab shell, have shown a wide range of applications from the cosmetic to pharmaceutical industries.

Value can be added to fish and fishery products according to the requirements of different markets. The product ranges from live fish and shellfish to ready to serve convenience products. In general, value addition means "any additional activity that in one or another way

changes the nature of the product. thus adding to its value at the time of sale." As far as fish processing industry is concerned, value addition is one of the possible approaches to raise profitability since this industry is becoming highly competitive and increasingly expensive.

Major Solid waste generated during fish processing: Chitin, Fish Skin, Fish Glue

A large number of value added and diversified marine products both for export and domestic market based of certain fish, shellfish and minced meat from low priced fish as well as products prepared from waste have been identified. A brief description is given below.

UTILIZATION OF WASTE

CHITIN

Raw material: Prawn head and shell waste / crab shell / squilla Hydrochloric Acid, Caustic Soda.

Processing:

Dehydration: Use dry or fresh shell waste. Make 5 % (WN) solution of caustic soda in water. Boil, and keep the waste in boiling alkali for a few minutes. Filter off the liquid containing dissolved protein using a cloth or linen. Use the residue for demineralization.

Demineralization: Wash the residue from previous operation in water until free from alkali. Pour in dilute hydrochloric acid (1.2N) and stir well. The shell becomes soft. If needed add more acid to complete the process. It may take up to one hour for complete demineralization. The resultant product is Chitin.

Washing and drying: Wash the dematerialized product in water. Repeat until completely free from acid. Dry in sun or in a hot air drier.

Uses: Powder the Chitin to the required mesh size using pulverizer. Pack in polythene bags. For preparation of Chitosan, glucosamine hydrochloride and other derivatives. It is a growth promoter in animal feeds.

Fish Soup Powder:

Fish soup powder can be formulated from any type of fish having very low fat content. Soup powder prepared from different food materials like vegetables, meat, eggs are in use in different parts of the world. These are dry products rich in dietary constituents like protein and minerals. The soup powder prepared out of miscellaneous fish and waste of fish processing industries is also rich source of animal protein and other nutritional factors. There is great demand for sea food based products in ready to eat I ready to cook convenience form.

FISH SKIN

Introduction: The hides of fish, can be used in several ways, is not profitably utilized at present. There are several species of fish big enough to permit the removal of skin for the further processing into useful articles. Ghol (Protonibea dicanthus) are larger scaled and Koth (Otolith us biauritus) are with small scales. When fish fillets are exported they should be skinless. The skin should be removed in such a way that fish meat is not disturbed or damaged. Dholakia, (1987) has suggested stepwise methodology for removal of skin. At present the skin is being thrown as waste. This skin be made useful if scales are removed it gives special design on skin.

Processing: Skin is carefully removed from suitable species of fish, either on board the vessel or immediately after landing. Skin should be free from defects like scare cuts, wrinkle or excessive variation in thickness. Adhering meat is scraped off and the skin is cured with salt by spreadibng it over the flesh side, Alternatively, skin can be preserved by drying for processing later.

Removal of Scales: Scales can be removed by application of 2.5 % sodium chloride and it is to be kept in piles with scale side up for 24 hours. The scales are rubbed off from tail and upward after washing in water. The de-scaled skin is soaked in a solution containing 6 % lime and 0.5 % Sodium Sulphate for 2 days, stirring twice a day. Any adhering flesh is to be removed and again soaked in an equal amount of water (W/w) containing 1 % ammonium sulphate for 20 hours. After washing free of lime the skin is kept in a solution containing 8 % sodium chloride and 1 % conc. Sulphuric acid for 1 hour or until the pH of the skin is 4.5The skin is ready for tanning. If immediate tanning is not possible the skin can be dried in shade for 24 - 36 hours until the moisture is below 8 %.

FISH GLUE

The smell of a hot solution of glue will often indicated the source I.e. hide, bone or fish. The glue value of fish waste depends upon the amount of collagen present. Fish heads and bones, which however contain a great proportion of soluble protein (mucous), make a very poor quality of glue.

Use of by products developed from Fish processing industry :

Cosmetic pharmaceutical, Chitin/chitosan Shrimp exoskeleton Industrial flocculants, wound healing, haemostatic agent Absorbable surgical Fish gut Ophthalmic and other suture microsurgeries, Collagen-chitosan Air ladder and shrimp Artificial skin in severe burn and

wound, dental surgery, tissue membrane shell regeneration Isinglass Fish swim bladder Wine industry for clarification Chondroitin sulphate Shark cartilage Treatment of arthritis and allied disorders, protein treatment Protease Guts Processing aid Squalene Fish liver oil Anticancer EPHA & DHA Fish oil Cardiovascular disease

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