Seafood safety and eco-labeling

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Abstract

Spoilage of the fish is very rapid particularly in the tropics where the temperature in summer can go up to 40°- 46 °C. Environmental hazards and major seafood safety concerns like, microbial, parasites, toxins, heavy metals, parasites, antibiotics and antimicrobials are discussed. Important characteristics of eco labeling and global eco-labelling which provide guidelines to consumers to choose products and services that cause less damage to environments are also discussed.

Keywords: *Seafood safety, Eco labeling, Global eco-labeling*

1. Introduction

Fish has become a major source of animal protein for mankind. Fish and fishery products have emerged as a group of widely traded food commodity, both at national and internal trade. Approximately, about 40 percent of the fish caught globally enters trade. Fish is a highly perishable commodity, particularly in the tropics where the ambient temperature in summer can go up to 40°- 46 °C. At this temperature spoilage of the fish is very rapid. Environmental hazards are numerous. Lack of good landing centers, availability of ice for chilling the fish immediately after capture, absence of good quality supply of potable water, transport etc. create further problems. The proteolytic degradation through autolysis of tissue and intestinal enzymes and rapid multiplication of microorganisms, including pathogens, can further complicate the spoilage by way of creating hazards to seafood consumption. Therefore, seafood safety assumes great significance to all fish eaters.

The major seafood safety concerns are given below.

1. Microbial
2. Parasites
3. Toxins
4. Heavy metals
5. Parasites
6. Antibiotics and antimicrobials.

Sustain Fish (2006) B.M. Kurup & K. Ravindran (Eds.), School of Industrial Fisheries, Cochin University of Science & Technology, Cochin-682016, India

2. Microbial

A number of Gram negative and Gram positive species of microbes are encountered both in fresh fish and processed fish and fishery products. The major ones are *Salmonella, Clostridium botulinum, Vibrio cholerae, Vibrio parahaemolyticus and Lysteria spp.*

Fresh fish caught from the sea and unpolluted fresh water is safe. However, on contact with contaminated surfaces, water and vessels make the fish unsafe and post severe health hazards.

3. Parasites

A number of parasites are detected from both fresh and processed fish. This includes chiefly from the family of nematodes. Occurrence and treatment of parasites are difficult currently as medical support from hospitals is scanty. Never the system tries to identify the source from which this infection comes. In the absence of such a medical surveillance in India, it is difficult to conclude how much parasitic infection comes to man from fish eating.

4. Toxins

Toxins accruing in fish are called Ichyotoxins. But those toxins occurring in shell fish are called shellfish toxins. Ciguatera toxin, tetradotoxin, scomberotoxin, saurine etc. are some classic well-documented fish toxins. Okadaic acid and domoic acid are well known shellfish toxins. Among the shellfish toxins the most dreaded one is the paralytic shellfish poisoning (PSP). PSP is produced by algae called dinoflagellates. It is mostly seen in mussels, clams, oysters and scallops. These shellfish consume contaminated algae and digest them and get stored in their muscle and other organs. The toxins PSP are heterocylic aromatic compounds of the group guanidine. Numbness of the lips, tongue and oral mucosa and typical symptoms of PSP poisoning. Unless immediate medical attention is given the disease could be fatal.

5. Chemical hazards

According to global environmental monitoring system (GEMS) there are 18 priority contaminants. Among theses the most commonly encountered metallic residues are lead, mercury, cadmium, copper, and Arsenic. FAO, WHO, USFDA, European Unions etc have prescribed maximum permitted residue levels in fish products. These are given below.

Metals	Max. permitted levels, ppm
Mercury	6.5
Cadmium	3.0
Lead	1.5
Arsenic	75
Tin	250.0
Nickel	80.0
Chromium	12

6. Pesticides

Pesticides come from agricultural field and when such water bodies are used for fish farming, these pesticides get absorbed or deposited in the fish muscle. Usually this issue is a major problem in farmed shrimp. Aldrin, Dieldrin, Benzen Hexa Chloride (BHC), Endrin are the important ones considered as risks. The permitted level at ppm level of the aboves ones is 0.3. DDT is not a major issue as its production and use now are very limited in many countries due to eradication of malaria and other reasons.

7. Antibiotics

Recently antibiotics are extensively detected in farmed shrimp. To prevent infection and mortality of fingerlings almost all known antibiotics are now used in most hatcheries. Fish feeds also contain antibiotics. Hence, it is now obligatory that test certificate should be attached with every consignment of processed shrimps for export to Europe and USA. Govt. of India has laid down maximum residual levels for many antibiotics by an order (GOI, 2001). This is applicable to export to EU,USA and Japan. For Chloramphenicol, Furazolidone Neomycin, Nalidixic and Sulphamethazole, extensively used in humans, the MRI level prescribed is "nil", but mild antibiotic like tetracylic 0.1 ppm is permitted. As more and more drugs and chemicals are emerging and being used in fish preservation, hatcheries and feeds more health hazards are likely to develop in future.

8. Seafood safety greater significance

At present there are standards for export only. Export rejects or contaminated fish can be sold in local markets. Our national testing system is week and is also not regulated. There is also no policing their activities. Issues come when calamities of fish poisoning or food poisoning occur. Our medical surveillance system is week and there is no recording in hospitals as from which food the contamination has occurred. Hence, it is difficult to punish the culprit. Litigation is time

consuming and finally the culprit gets escaped due to week reasons and lack of technical support data as to the reasons of food contamination.

We need legal and institutional support if we need to guarantee food safety to the consumer.

9. Eco-labeling

Eco-label defines a product as adhering to pre-defined criteria. There are not much fishery products with eco-labels in the market. When consumers see a product with such labels they know that the product meets a certain energy efficiency that is deemed to be acceptable to United States Environmental Protection Agency Standards, the most widely followed standard. There are number of eco-labels prevalent in the member countries of the European Union. Some of them are reproduced below:

Norway

German "Blue Angel"

France

European Union

10. Global Eco-labeling

What is eco-labeling? Eco-labeling means Environmental labeling. It is a guide to consumers to choose products and services that cause less damage to environments. Following are some of the important characteristics of eco labeling.

1. A legally protected logo
2. Making a positive statement and rewarding environmental leadership.
3. Life –Cycle- Assessment (LCA) of certain product category
4. Voluntary participation of potential licensees. (Non-regulatory)
5. Independence from commercial interests regarding its source of funding and its organizational structure.
6. Open access to all potential licensees.
7. Periodic review and update of both environmental criteria and categories.

   Only very few items are now approved for eco-labelling as is seen by the EU catalogue given below. No fishery product is seen in the approved list. However, packaging materials used by seafood industry certainly come under eco-labelling.

11. European Eco-label Catalogue

Bedding	**Gardening**	**Electronic Equipment**
Mattresses	Soil improvers	Personal computers Portable computers Televisions
Footwear	**Household**	**AppliancesTextiles**
Shoes	Dishwashers Refrigerators Vacuum cleaners Washing machines	Clothing, bed linen and indoor textiles
Do-it-yourself	**Cleaning**	**Paper**
Hard floor coverings Paints and varnishes Light bulbs	All purpose cleaners Dishwashing detergents Hand dishwashing detergents Laundry detergents	Tissue paper Copying

12. The Community eco-label

The aim is to award a Community Eco-label to products and services with reduced environmental impacts. The scheme is VOLUNTARY. Criteria are established for individual product groups, such as paper products, textiles, detergents, paints and appliances such as refrigerators or dishwashers. When you, as a consumer, see products with the eco-label, you will know that these products have been carefully assessed and have been found to make less of an environmental impact than other similar competing products, or those products with sometimes misleading environmental claims on them.

13. How the eco-labeling Scheme works

It takes hard work and commitment to set up criteria. Every product group is designed and crafted to meet high environmental and performance standards. Ecological criteria for each product are defined on the basis of life cycle considerations (LCC) taken from a "cradle-to-grave" view of the environmental impacts of a product group.

This means that key environmental aspects, for which criteria will need to be developed, are defined through the use of LCC. Such LCC mean that the complete life-cycle of a product or a service will be looked at in detail, starting with the extraction of raw materials, progressing through the production, distribution and use phases and ending with disposal after use.

In the case of services, the acquisition of goods for service performance, the service performance and the waste management are the key environmental aspects which are investigated (see Annex I of the Regulation (EC) No 1980/2000).

14. How Eco-label Criteria are developed and adopted

Proposals for the definition of product groups and ecological criteria are made either on the request of the EUEB or by the Commission. The Commission gives a mandate to the EUEB (lead Competent Body) to develop or review the eco-label criteria. Priority product groups will be listed in the joint working plan. On the basis of these mandates the appropriate EUEB member, supported by a working group and the Commission will draft appropriate eco-label criteria and the assessment and verification requirements related to these criteria. The Competent Body will take into account the results of feasibility and market studies, life cycle considerations and an improvement analysis. A regular feed-back process to the whole EUEB is ensured. Finalized criteria are submitted to the Regulatory Committee of national authorities and voted upon. If the Committee takes a favorable view of the proposal, the Commission proceeds with its adoption and publication. Otherwise, the Committee submits the proposal to the Council of Ministers for decision.

Criteria for Adoption of Eco-labeling to a producer for a product according to EU-Methods.