PUBLIC HEALTH ISSUES IN FISH PRODUCTION

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Abstract

Public health issues in fish production can be considered as those of direct importance to fish and include broader issues involving processing and other delivery systems in fish production. Increasing domestic and industrial pollution predisposed capture fisheries to ecological problems in terms of bio-toxins, heavy metals and other contaminants that could be accumulated in fish flesh. In aquaculture, the cultist often times misuse drugs, chemicals and fertilizers, apart from the presence of water borne diseases and disease vectors associated with fish culture. This paper reviewed these issues and agreed with other authors that the benefits of fish production outweigh the associated health problems.

Key words: fish production, Toxins, Zoonoses, Public health

Introduction

Fish production is basically from aquaculture or the capture sectors which could be freshwater brackish or marine based in terms of water environment. In Nigeria, fish production is mainly from capture sector, especially the artisanal coastal and artisanal inland fisheries. This sector contributes over 80% of total domestic fish production which accounts of for about 40% of the total animals intake in the country (Atanda, 2006). Fish is a major source of animal protein in developing countries. It accounts for 15% animal protein intake globally (Odum, 1980). The fish here means finfish and shellfish with several indirect consumption through fish meal and oil fed to do domestic animals which are then eaten by man. It also serves as sources of employment and income generation to many people. Among several limitations to fish production is the health risk both to the organism and the producer or eventually the consumer if adequate hygienic measures are not in place. Public health concerns are not limited to water related disease alone; the potential risks are encountered during capture, management practices during culture, marketing, processing and consumption of fish. Water related health risks are either infectious or non-infectious. Infectious diseases are transmitted by pathogens and vectors, examples are Malaria, Schistosomiasis and Dracunculiasis (Odaibo, 1998). The non-infectious diseases are important in industrialized areas where fish is cultured or captured. The potentially harmful heavy/trace metals are Mercury, Silver, Iron, zinc, manganese, chromium, lead, nickel, cobalt and vanadium. Omoregie, et al (2002), reported health hazardous levels of such elements in macro-invertebrates and Tilapia species from River Delimi. Nigeria, trace elements have high pollution potentials that could be measured through the use offish (Odukoya and Ajayi, 1987; Silva and Shimizu, 2004; Oyewale and Musa, 2006; Lawal-Are and Kusemiju, 2006). Nigerians are high fish consumers and offer the largest market for fish and fisheries products in Africa. National demand stands at 1.5 million tonnes while only 511,000 tonnes are produced locally and supplemented with 700,000 tonnes of imports worth about N50 billion (NEPAD, 2005). Aquaculture is fast emerging as the solution to the deficit in fish supply, meanwhile some of the cultureable fingerlings are yet obtained from the wild, which may only harbour parasites, but also have accumulated toxins in their fresh. Although fish diseases may not generally be zoonotic, except when fish are consumed in the raw state, the organic load that builds up with use of organic fertilizers in ponds and sewage in other large water bodies may create conducive environment for water borne diseases (Edwrd, 1992). This means all aspects of fish production is attended with peculiar health risks. Information about health hazards concerning fish may not be available by Pfluhr, et al, (1999), on a survey of urban angler’s perception of risk from contaminated fish. The review of these health issues is to create awareness and the import for necessary precautions.

Zoonotic Health Aspects of Fish Production

The zoonotic aspects of fish diseases are almost unknown and are limited to certain pathogenic helminthes that use fish as intermediate or final hosts. Transmission occurs through consumption by man of raw or improperly processed fish flesh. These parasitic diseases were discussed by Odaibo (1998) and John-Yilm et al, (2005), as Diphyllobothriasis, Schistosomoniaus, Opisthorchiasis, metorchiasis, Heterophyiasis, Echinostomiasis and Anisakiasis which are diseases of Cestode, Trematodes and Nematodes of fish that can infect man. Other water borne epidemic applicable in integrated farming systems are Balantidiasis a form of Cholera, Botulism, Capillariasis, Drancunculiasis and Cryptosporidiosis, while Viral epidemics are viral Hepatitis
Health Associated with Bio-Toxins and Chemicals in Fish Production

Safety hazards related to consumption of raw fish are due to presence of bio-toxins produced by algae; these are known to be associated with outbreaks of certain diseases in man. Most of the toxins are due to intakes of algal toxins accumulated in the marine food chain. They are notably: paralytic shelling poisoning. Diarrhoeic shellfish poisoning, Neurotoxin shellfish poisoning, amnesic shellfish poisoning and cigguatera shellfish poisoning. Little is studied about freshwater toxins, Cyanobacteria was reported by Bardach (1997), as toxic in freshwater environment. Apart from the bio toxins, the increasing domestic and industrial pollution has ecological problems in terms of trace metals and other contaminants that could accumulate in fish flesh concentrating in the gills and viscera. Many organic compounds used in agriculture may not be directly toxic to fish but the bioaccumulation can be transferred to human consumers through the food chain. Polychlorinated biphenyls (PCB) and Lipophillics are known to have bio-effects at certain levels (woodwell, 1980). Human tolerance of metal is appreciable and toxicity is often only expressed at very high levels (Silva and Shimizu 2004)

Remediation Measures

To reduce public health risks of pathogens and toxins from the combined precautionary measures of good hygienic conduct must be adopted throughout the production systems. Adequate level of Nutrition, Hygienic conduct must be adopted throughout the production systems. Adequate level of nutrition, hygienic accumulation and proper disposal of human waste, proper storage, decomposition, pre-treated and detoxification of waste will reduce pathogens and parasites. Employers involved should be trained in the proper use and application of chemicals. In processing, physical exposure should be minimized through the use of appropriate clothing, especially groves this also reduces the risk of passive transfer of pathogens through handling of live fish. The technique of holding fish in a densely stocked facility for a depuration period of several days prior to marketing is a pragmatic method to safeguard against transmission of pathogens by fish. Depuration in clean water without feeding will also help to reduce contaminations, however the extent of contamination determines the time of depuration. Complete removal of gills, viscera and major organs and use of portable water for thorough washing prior to storage, marketing or preparation for consumption will reduce the trace metal content of final product. Adequate cooking/processing of fish at high temperature so as to eradicate pathogens entirely may be another way of avoiding hazards to consumers.

Conclusion

Fish is highly noted for its nutritious and health values and the production provides employment for many, the issues of risks should therefore, be taken as important. Well defined hygienic practice should be put in place. Use of antibiotics in fish culture must be regulated. Public health problems concerning fish have been traced through harvest, handling, transportation and storage but there is little risk if the thoroughly washed and cooked which are still effective and best methods for personal protection. With careful selection, quarantine and acclimation procedures most instances of fish parasite problems can be outright avoided, moreover, human tolerance of metals is good to an extent and toxicity is often only expressed at very high levels.

References


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