14. Microbial Safety of Fishery Products

Indrani Karunasagar, Iddya Karunasagar and Ammini Parvathi
Department of Fishery Microbiology,
University of Agricultural Sciences,
College of Fisheries, Mangalore-575 002, India.

Introduction

Fish and fishery products constitute an important food component for a large section of world population, more so in developing countries, where fish forms a cheap source of protein. In the last two decades there has been an increase in awareness about the nutritional and health benefits of fish consumption. The low fat content of some fish and the presence of poly unsaturated fatty acids in red meat fishes which are known to reduce the risks of coronary heart diseases, have increased the dietary and health significance of seafood consumption (Din et al., 2004). In USA, seafood consumption has increased from an average of 4.5 kg per person in 1960 to about 7.0 kg per person in 2002 (NOAA, 2003). Total fishery production in 2001 was reported to be 130.2 million tonnes, of which 37.9 (30%) million tonnes was from aquaculture, 90% of which came from Asian countries. On the other hand, seafood is also known to have been responsible for a significant percentage of food borne diseases. With increased fish consumption, there is also an increase in the number of food-borne illness associated with fishery products. In the United States, 10-19% of food-borne illness involved seafood as a vehicle and between 1993 and 1997, 6.8% of the food-borne illnesses involved consumption of fish and shellfish (FAO, 2004). In Japan, where seafood consumption is high and raw fish consumption is popular, 70% of food-borne illness is attributed to seafood. These data highlight the importance of seafood as vehicles for human illness.

However, the true incidence of seafood-borne diseases worldwide is not known, as there is no surveillance system in the developing countries. In addition to being responsible for human health problems, the presence of infectious agents in seafood results in rejection of seafood consignments leading to major economic losses to exporting countries in general, and to seafood processing industries in particular. Maintenance of seafood quality is central to ensuring the safety of seafood. This has been a major area of concern for seafood processing industries and a great challenge to scientists and researchers worldwide. This review focuses on agents and causes of human illness encountered in seafood and issues related to seafood safety and quality management.

Causes of seafood-borne illness

Seafood often harbour infectious agents that are present naturally in the aquatic environment or introduced through human activities. The illness may be due to the infection caused by the microorganism or due to the intoxication by products of microorganisms. Viruses, bacteria and parasites are the agents of human disease associated with seafoods. The products of microorganism such as bacterial toxins, algal toxins or products of bacterial metabolism such as histamine can cause intoxication when fish or shellfish harbouring these products are consumed. In the case of live finfish, microorganisms may be associated with gill, gut and skin. Filter feeding shellfish like molluscks concentrate different types of microorganisms present in the environment around them. Some of the microorganisms of human health concern may be native to the aquatic environment such as the members of the genus *Vibrio*, but others like *Salmonella*, *E. coli* and many viruses are introduced into the aquatic environment through human activities such as contamination by domestic sewage. The type of microorganism associated with seafood may vary depending upon whether it is fresh or processed. Most of the outbreaks of illnesses occur in countries where seafood is eaten raw or is inadequately cooked. For example, in Japan where seafood is eaten raw, 70% of food borne human illness is seafood associated (Scoging 2003).

Viruses associated with seafoods

Viruses constitute an important cause of seafood borne diseases. The intensity of human illness is known only from developed countries. For example in the USA, it is estimated that 80% of food borne illness are due to enteric viruses (Sair et al., 2002). The major limitation in diagnosing viral infections is the non-availability of techniques or facilities for detecting or identifying viral pathogens. The recent advances in

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Microbial Safety Of Fishery Products:

Microbial Safety of Fishery Products C. O. Chichester,H. D. Graham,2013-09-03 Microbial Safety of Fishery Products discusses the many aspects of the safety of marine products from a microbiological and toxicological standpoint This book emphasizes the objectives and requirements for the marketing of safe and wholesome fish and fishery products status of the sanitary quality of fishery products in the Western Hemisphere and fishery resources of the Caribbean and their potential The microbiological considerations in the handling and processing of molluskan shellfish microbiology of prepared and precooked fishery products and some toxins occurring naturally in marine organisms are also elaborated This text likewise covers the enteric pathogens in estuary waters and shellfish control of prepared fishery products in industry and aflatoxins as contaminants of feeds fish and foods This publication is a good reference for food scientist and nutritionists researching on the sanitary quality of fishery products **Microbiological Safety and Quality of Food** Barbara M. Lund,Tony C. Baird-Parker,Grahame W. Gould,2000 This authoritative two volume reference provides valuable necessary information on the principles underlying the production of microbiologically safe and stable foods The work begins with an overview and then addresses four major areas Principles and application of food preservation techniques covers the specific techniques that defeat growth of harmful microorganisms how those techniques work how they are used and how their effectiveness is measured Microbial ecology of different types of food provides a food by food accounting of food composition naturally occurring microflora effects of processing how spoiling can occur and preservation Foodborne pathogens profiles the most important and the most dangerous microorganisms that can be found in foods including bacteria viruses parasites mycotoxins and mad cow disease The section also looks at the economic aspects and long term consequences of foodborne disease Assurance of the microbiological safety and quality of foods scrutinizes all aspects of quality assurance including HACCP hygienic factory design methods of detecting organisms risk assessment legislation and the design and accreditation of food microbiology laboratories Tables photographs illustrations chapter by chapter references and a thorough index complete each volume This reference is of value to all academic research industrial and laboratory libraries supporting food programs and all institutions involved in food safety microbiology and food microbiology quality assurance and assessment food legislation and generally food science and technology Fish and Fishery Products Barry Leonard,2011-08 This guidance will assist processors of fish and fishery products in the development of their Hazard Analysis Critical Control Point HACCP plans Processors of fish and fishery products will find info that will help them identify hazards that are associated with their products and help them formulate control strategies It will help consumers understand commercial seafood safety in terms of hazards and their controls It does not specifically address safe handling practices by consumers or by retail estab although the concepts contained in this guidance are applicable to both This guidance will serve as a tool to be used by fed and state regulatory officials in the evaluation of HACCP plans for fish and fishery products Illustrations This is a print on

demand report **Protecting Your Food** Charles N. Bebee,National Agricultural Library (U.S.),1977 Food Hygiene, Microbiology and HACCP S. Forsythe,2012-12-06 Food microbiology is a fascinating and challenging science It is also very demanding with a constantly changing sea of guidelines regulations and equip ment Public concerns over food safety issues can overemphasize certain risks and detract from the normal hygienic practice of food manufacturers This new edition aims to update anyone concerned with the hygienic production of food on key issues of HACCP food microbiology and the methods of microbe detection I have taken a crystal ball approach to certain topics The use of rapid techniques such as lux gene technology and polymerase chain reaction DNA probes are progressing so rapidly in the research laboratory that when this book is in print the techniques may be more readily available New methods for investigating viral gastroenteritis due to small round structured viruses SRSV have been developed past the research stage and may become more standard in the next few years Undoubtedly this will alter our understanding ofthe prevalence of viral food poisoning I have also included issues such as new variant CJD associated with BSE infected cattle which at the time of writing has only caused the deaths of 20 people but due to the uncertain incubation time could be a far more serious problem In the UK there has been a much publicised outbreak of Escherichia coli 0157 H7 which has resulted in a government inquiry and the recommenda tion of the generic HACCP approach Hence this approach to HACCP imple mentation has been included **Fishery Bulletin** United States. National Marine Fisheries Service,1984 **Marine Products for Healthcare** Vazhiyil Venugopal,2008-10-20 Considered Mother Nature s medicine cabinet in many areas of the world marine organisms have been known from time immemorial to possess curative powers But until recently their bioactive compounds nutraceutical properties and commercial potential remained undiscovered Bringing together widely scattered literature Marine Products for Healthca **Bibliography of Agriculture** ,1974 **Sea Food Processing Technology** Mr. Rohit Manglik,2024-07-21 EduGorilla Publication is a trusted name in the education sector committed to empowering learners with high quality study materials and resources Specializing in competitive exams and academic support EduGorilla provides comprehensive and well structured content tailored to meet the needs of students across various streams and levels **Papers Presented at the Seventh Session of the Indo-Pacific Fishery Commission Working Party on Fish Technology and Marketing** Indo-Pacific Fishery Commission. Working Party on Fish Technology and Marketing,1990-01-01 Fish and Fishery Products Analysis Saleena Mathew,Maya Raman,Manjusha Kalarikkathara Parameswaran,Dhanya Pulikkottil Rajan,2019-11-06 This novel and informative book discusses the various aspects of seafood quality The book is divided into 7 broad sections each tackling a different aspect The first section covers the general aspects relevant to the nutritional quality of the fish and the various extraction protocols for macro micro nutrients The second section provides insights into handling and the principles of thermal and non thermal processing techniques for commercially important fishery products The quality standards and safety concerns in the seafood industry and consumption are discussed in this section The freshness indices of the processed products including

biochemical microbiological and toxicological characteristics are also included The third section discusses the physico chemical characteristics and quality parameters of potable water ice The fourth section includes the quality assessment of various toxicants related to seafood products The fifth section deals with the specific aspects such as principle instrument and procedures of conventional and novel analytical instruments relevant to the seafood industry The sixth section deals with the seafood waste management including solid and liquid seafood wastes Presently there is a great awareness regarding environmental sustainable processing preservation techniques The final chapter discusses the bioactive compounds from under utilized marine sources showing pharmaceutical nutraceutical applications Microbial Ecology of Foods V2 International Commission on Microbiological Specifications for Foods,Unknown ICMSF,2012-12-02 Microbial Ecology of Foods Volume II Food Commodities is a comprehensive treatise on the microbiology of specific commodity groups The commodity groups discussed include meat milk egg fish shellfish and their products Other groups included are feeds of animal origin and pet foods agricultural crops and their products fats and oils beverages confectioneries miscellaneous foods and natural mineral waters Composed of 15 chapters this book has chapters that cover the important properties of the food commodity that affects the microbial content The initial microbial flora on flesh foods at slaughter or on vegetable foods at harvest and the effects of harvest transport processing and storage on the microbial content are discussed as well Furthermore this text explains the means of controlling the process and the microbial content Each chapter is a review of applied microbiology compiled by leading authorities selected solely for their expert knowledge The final chapter emphasizes factors that contribute to outbreaks of foodborne disease This volume will greatly appeal to those interested primarily in applied aspects of food microbiology such as food processors microbiologists and technologists veterinarians public health workers and regulatory officials Salmonella Dr. Barakat S M Mahmoud,2012-01-20 More than 2 500 serotypes of Salmonella exist However only some of these serotypes have been frequently associated with food borne illnesses Salmonella is the second most dominant bacterial cause of food borne gastroenteritis worldwide Often most people who suffer from Salmonella infections have temporary gastroenteritis which usually does not require treatment However when infection becomes invasive antimicrobial treatment is mandatory Symptoms generally occur 8 to 72 hours after ingestion of the pathogen and can last 3 to 5 days Children the elderly and immunocompromised individuals are the most susceptible to salmonellosis infections The annual economic cost due to food borne Salmonella infections in the United States alone is estimated at 2 4 billion with an estimated 1 4 million cases of salmonellosis and more than 500 deaths annually This book contains nineteen chapters which cover a range of different topics such as the role of foods in Salmonella infections food borne outbreaks caused by Salmonella biofilm formation antimicrobial drug resistance of Salmonella isolates methods for controlling Salmonella in food and Salmonella isolation and identification methods *Microbiology of Thermally Preserved Foods* Tibor Deák,József Farkas,2013 While introducing the principles and processes of industrial level food canning the

volume clarifies the effects of microorganisms their ecology fate and prevention in canning operations as well as in other thermal processing techniques such as aseptic packaging It covers microbial spoilage and detection for vegetables fruits milk meat and seafood from the raw food materials through individual unit operations facility sanitation and packaging It thus offers a practical introduction to understanding preventing and destroying microbe based hazards in food plants that use thermal processes to preserve and package foods The text surveys major spoilage and pathogenic microbes of interest explaining their toxicity product and safety effects and the conditions of their destruction by heat treatment **Fish Fermentation** Debabrat Baishya,2009-01-15 Fish Fermentation Traditional to Modern Approaches is the first of its kind geared specifically for students interested in pursuing a career in Food Biotechnology and especially in Fish Processing Technology There is information about fermented fish from Southeast Asia Products from this region are highly salted and fermented until the fish flesh is transformed into simpler components and the fermentation process lasts for several months three to nine months and the fish flesh may liquefy or turn into a paste Fermented fish products from the north eastern part of India share many common features with that from other Southeast Asian countries Still some of the steps in the fermentation process are unique to the Northeast India More over the scenario varies with the varieties of the fermented fish items This book aims at bringing out not only the scientific basis of the fermentation process but also endeavors to cite the present market status of the fermented fish With its balanced coverage of historical development microbial diversity nutritional aspects and contemporary application the book provides the tools and basic knowledge necessary for success in this industry Special sections on Probiotics and Fermented Fish Starter Culture in Fish Fermentation are in great detail which is the outcome of various research works This book is therefore suitable for undergraduate postgraduate as well as research students The first chapter Fermented Food Products in India depicts about various fermented food items available in India and international scenario is also highlighted The second chapter Traditional Fish Preservation Techniques gives an idea of traditional system of fish preservation in various parts of the world will surely help the students as well as the research students to carry out various projects in this field and in designing the protocol for standardization of fish preservation technique The third chapter Microbial Diversity describe about the world of microbes in the fermented fish products their role in fermentation desirable and associated types of microbes in fish fermentation the spoilage group of microbes involved in fish fermentation pathogenic microbes and possible health hazards the beneficial group of microbes in the process and the relevant data of various research works In the fourth chapter Nutritional Aspects of Fermented Fish the nutritional value of a variety of fermented fish products are highlighted their role as an important protein supplement for many nutritional diseases is also projected This chapter will give a basic idea of nutritional quality of fermented fish products Chapter 5 and Chapter 6 are mainly aimed at introducing cutting edge technology in the field of fish fermentation which in turn is the result of the advent of modern biotechnological tools Current Catalog National Library of Medicine

(U.S.),1979 First multi year cumulation covers six years 1965 70 **Food Hygiene, Microbiology and HACCP** P.R. Hayes,S.J. Forsythe,2013-11-09 Food microbiology is a fascinating and challenging science It is also very demanding with a constantly changing sea of guidelines regulations and equip ment Public concerns over food safety issues can overemphasize certain risks and detract from the normal hygienic practice of food manufacturers This new edition aims to update anyone concerned with the hygienic production of food on key issues of HACCP food microbiology and the methods of microbe detection I have taken a crystal ball approach to certain topics The use of rapid techniques such as lux gene technology and polymerase chain reaction DNA probes are progressing so rapidly in the research laboratory that when this book is in print the techniques may be more readily available New methods for investigating viral gastroenteritis due to small round structured viruses SRSV have been developed past the research stage and may become more standard in the next few years Undoubtedly this will alter our understanding ofthe prevalence of viral food poisoning I have also included issues such as new variant CJD associated with BSE infected cattle which at the time of writing has only caused the deaths of 20 people but due to the uncertain incubation time could be a far more serious problem In the UK there has been a much publicised outbreak of Escherichia coli 0157 H7 which has resulted in a government inquiry and the recommenda tion of the generic HACCP approach Hence this approach to HACCP imple mentation has been included **Microbial Decontamination in the Food Industry** Ali Demirci,Michael O Ngadi,2012-06-26 The problem of creating microbiologically safe food with an acceptable shelf life and quality for the consumer is a constant challenge for the food industry Microbial decontamination in the food industry provides a comprehensive guide to the decontamination problems faced by the industry and the current and emerging methods being used to solve them Part one deals with various food commodities such as fresh produce meats seafood nuts juices and dairy products and provides background on contamination routes and outbreaks as well as proposed processing methods for each commodity Part two goes on to review current and emerging non chemical and non thermal decontamination methods such as high hydrostatic pressure pulsed electric fields irradiation power ultrasound and non thermal plasma Thermal methods such as microwave radio frequency and infrared heating and food surface pasteurization are also explored in detail Chemical decontamination methods with ozone chlorine dioxide electrolyzed oxidizing water organic acids and dense phase CO2 are discussed in part three Finally part four focuses on current and emerging packaging technologies and post packaging decontamination With its distinguished editors and international team of expert contributors Microbial decontamination in the food industry is an indispensable guide for all food industry professionals involved in the design or use of novel food decontamination techniques as well as any academics researching or teaching this important subject Provides a comprehensive guide to the decontamination problems faced by the industry and outlines the current and emerging methods being used to solve them Details backgrounds on contamination routes and outbreaks as well as proposed processing methods for various commodities including fresh produce meats seafood nuts juices and dairy

products Sections focus on emerging non chemical and non thermal decontamination methods current thermal methods chemical decontamination methods and current and emerging packaging technologies and post packaging decontamination

HACCP in Meat, Poultry, and Fish Processing A. M. Pearson,T. R. Dutson,2012-12-06 The RACCP hazard analysis critical control point concept for food products was an outgrowth of the US space program with the demand for a safe food supply for manned space flights by the National Aeronautics and Space Administration NASA The original work was carried out by the Pillsbury Company under the direction of Roward E Bauman who as the author of chapter 1 describes the evolution of the RACCP system and its adaptation to foods The second chapter discusses the adoption of RACCP principles and explains how they fit into the USDA and FDA meat poultry and seafood inspection systems The next chapter discusses how RACCP principles can be extended to production of meat poultry and seafoods a most important area involved in producing a safe food supply Chapter 4 deals with the use of RACCP in controlling hazards encountered in slaughtering and distribution of fresh meat and poultry while chapter 5 discusses the problem both spoilage and hazards involved in processing and distribution of meat poultry and seafood products Chapter 6 covers the entire area of fish and seafoods including both fresh and processed products from the standpoints of spoilage and hazards *New Methods of Food Preservation* G. W. Gould,2012-12-06

Unveiling the Power of Verbal Artistry: An Mental Sojourn through **Microbial Safety Of Fishery Products**

In a world inundated with screens and the cacophony of immediate communication, the profound energy and emotional resonance of verbal artistry frequently disappear in to obscurity, eclipsed by the continuous assault of sound and distractions. Yet, located within the musical pages of **Microbial Safety Of Fishery Products**, a captivating perform of fictional brilliance that pulses with organic feelings, lies an unique trip waiting to be embarked upon. Composed by a virtuoso wordsmith, this interesting opus manuals readers on a psychological odyssey, softly revealing the latent possible and profound influence stuck within the elaborate internet of language. Within the heart-wrenching expanse with this evocative analysis, we will embark upon an introspective exploration of the book is key themes, dissect their interesting publishing fashion, and immerse ourselves in the indelible impact it leaves upon the depths of readers souls.

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