Saleena Mathew · Maya Raman
Manjusha Kalarikkathara Parameswaran
Dhanya Pulikkottil Rajan

Fish and Fishery Products Analysis

A Theoretical and Practical Perspective

Springer

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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.

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Bioactive Compounds from Marine Sources

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Over the past several decades, scientists have given increasing attention to marine organisms and the secondary metabolites they produce. Investigations on marine natural products have focused on areas like marine nutraceuticals, biopolymers, biofilms, CNS-membrane active toxins and ion channel effectors, antifouling, anti-cancer and antiviral agents, tumor promoters, anti-inflammatory agents, as well as metabolites that control microfilament-mediated processes. The marine natural products field is encouraging a multidisciplinary approach between biologists, chemists, and pharmacologists. It is also important to note that the number of compounds reported annually is increasing steadily, indicating that marine organisms will continue to be sufficient sources of natural bioactive substances.

7.1 Marine Biopolymers and Derivatives

Fish processing generates solid wastes (skin, scales, and bones) that can be as high as 80% of the original raw material and are excellent sources of high value products. The utilization of fish wastes helps to eliminate harmful environmental aspects of pollution and improve quality in fish processing. An important waste reduction strategy for the industry is the recovery of marketable by-products from fish wastes. The two most important marine biopolymers collagen as well as the polysaccharide polymer, chitin, and their derivatives gelatin and chitosan, respectively, are a promising entity in this regard.

7.1.1 Collagen and Gelatin

Collagen is the most abundant and ubiquitous protein in the body of almost all metazoan organisms, as a major component of extracellular matrix (Balian and Bowes 1977) and renowned as the most abundant protein in mammals, making up from 25% to 35% of the whole-body protein. Collagen in the form of elongated

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