

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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1.7	Analysis of Minerals	55
1.7.1	Atomic Absorption Spectrophotometry	56
	References	60
2	Fish and Fishery Products: Quality Indices	63
2.1	Processing of Various Fish and Seafood	63
2.1.1	High- and Low-Thermal Preservation Techniques	63
2.1.2	Novel Nonthermal Processing and Preservation Techniques	68
2.2	Biochemical Changes During Processing	85
2.2.1	Postmortem Biochemical Changes	86
2.3	Value Addition	91
2.3.1	Mince-Based Products	91
2.3.2	Allied seafood delicacies	94
2.3.3	Miscellaneous	95
2.4	Determination of Functional Quality of Processed Food	98
2.4.1	Determination of Color and Odor	98
2.4.2	Determination of Salt Content	99
2.4.3	Determination of Water Activity	100
2.4.4	Evaluation of Sensory Parameters	103
2.4.5	Evaluation of Texture	106
2.4.6	Determination of Electrical Properties/Redox Potential	109
2.4.7	Folding Test for Surimi	109
2.4.8	Specific Gravity of Fish Oils	110
2.4.9	Analysis of Starch in Breaded and Battered Products	111
2.5	Determination of Freshness Indices of Processed Food	112
2.5.1	Assessment of Protein Degradation	112
2.5.2	Assessment of Lipid Oxidation	117
2.5.3	Assessment of Carbohydrate Catabolites	121
2.5.4	Assessment of Nonprotein Nitrogen (NPN)	122
2.5.5	Assessment of Nucleotides and Nucleotide Catabolite	123
2.6	Miscellaneous	125
2.6.1	Determination of Na ⁺ /K ⁺	125
2.6.2	Determination of Formaldehyde	125
2.6.3	Determination of Ammonia	126
2.7	Microbiological Parameters	127
2.7.1	Evaluation of Total Plate Count	127
2.7.2	Isolation, Identification, and Characterization of Seafood Bacteria	127
2.7.3	Detection and Identification of Fecal Streptococci	129
2.7.4	Detection and Identification of <i>Salmonella typhimurium</i>	129
2.7.5	Detection and Identification of <i>Vibrio cholerae</i> and <i>Vibrio parahaemolyticus</i>	129
2.7.6	Detection and Identification of <i>E. coli</i>	130

2.1 Processing of Various Fish and Seafood

Even though the nutritive value and the unique taste of seafood (fish, shell fish, mollusks, and echinoderms) have gained immense popularity in all continents, the susceptibility of these to postmortem spoilage and rapid deterioration, and hence, the shortened shelf life, is of great concern. Species, handling, and storage conditions affect the nutritional and microbial qualities of seafood. Further, two most important concerns with respect to marketing and distribution of seafood are their high perishability and poor hygienic quality. To overcome these issues, various preservation methods are being adopted where time-temperature association is the key determinant (Boziaris 2013; Mohan et al. 2008; Borda et al. 2018). Feeding habits, primary microbiological load, season, geographical origin, and handling conditions influence the shelf life of seafood. Therefore, it is decisive to have a science-based comprehension of the growth and activity of spoilage microorganisms in seafood, in order to reduce the losses and preserve the food. Hence, the chief aim of fish preservation is to delay, reduce, or inhibit the enzymatic, chemical, and microbial spoilage by managing the storage temperature, water activity, and pH or by using chemical preservatives. The preservation of seafood can be attained by conventional methods (thermal) such as chilling, drying, smoking, refrigeration or freezing, and canning or by employing novel techniques (nonthermal) such as pulsed light, high hydrostatic pressure, pulsed electric fields, ultraviolet light, high-intensity ultrasound, oscillating magnetic fields, ionizing radiation, etc. Currently, consumers are in continuous demand for minimally processed food with extended shelf life and safety assurance.

2.1.1 High- and Low-Thermal Preservation Techniques

High- and low-thermal preservation can be done either for short and long duration.