

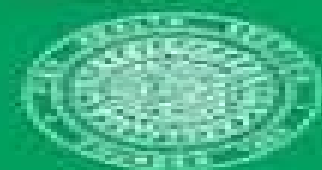
# Health management in Asian aquaculture

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# Health Management In Asian Aquaculture

**Hosakatte Niranjana Murthy**



## **Health Management In Asian Aquaculture:**

Health Management in Asian Aquaculture Subasinghe, Rohana P et al, Subasinghe, 2005 In 1994 world aquaculture production reached 25.5 million tonnes valued at US 39.83 billion Asia contributed 89.9 per cent of this total and has since continued to dominate global production The drive to produce more fish and shellfish to meet the growing demand has led many aquaculturists in Asia to intensify their operations In many instances the complex balance between fish shellfish and their environment is not well understood the organism under culture becoming stressed and prone to infections Disease has been and will continue to be a major constraint to the development of the aquaculture industry Considering the FAO's priority on developing sustainable aquaculture the large Asian contribution to global aquaculture production and the seemingly high losses of revenue due to disease and health related problems FAO in consultation with the Network of Aquaculture Centres in Asia Pacific region NACA the Aquatic Animal Health Research Institute AAHRI the South East Asian Fisheries Development Centre SEAFDEC and the Universiti Pertanian Malaysia UPM and in collaboration with the Fish Health Section of the Asian Fisheries Society FHA AFS organised a Regional Expert Consultation on Aquaculture Health Management in Asia and the Pacific which was held at the Universiti Pertanian Malaysia in Serdang Malaysia in May 1995 This document comprises the technical papers presented at the Consultation and is a supplement to the report of the consultation FAO Fisheries Report No 529 FAO Rome 1995 Contents Chapter 1 Better Health Management in the Asia Pacific through Systems Management by Michael J Phillips Chapter 2 Fish and Shellfish Quarantine The Reality for Asia Pacific by J Richard Arthur Chapter 3 Fish and Mollusc Health Research in the Asia Pacific Present Status and Future Directions by R B Callinan Chapter 4 Shrimp Health Research in the Asia Pacific Present Status and Future Directives by Celia R Lavilla Pigoto Chapter 5 Role of Non Governmental Organizations NGOs in Fish Health Management in the Asia Pacific by Mohammed Shariff Chapter 6 Training and Extension in Aquaculture Health Management in the Asia Pacific Present Status and Future Requirements by Kamonporn Tonghuthai Chapter 7 Health Management Strategy for a Rapidly Developing Shrimp Industry An Indian Perspective by C V Mohan Chapter 8 A Review of the Traditional and Innovative Aquaculture Health Management in the People's Republic of China by Jiang Yulin Chapter 9 An Overview of Health Management of Coldwater Fish and Shrimp in Japanese Aquaculture by Kiyoshi Inouye Chapter 10 Aquaculture Health Management in Singapore Current Status and Future Directions by Frederic H C Chua Chapter 11 Shrimp Farming in Sri Lanka Health Management and Environmental Considerations by P K M Wijegoonawardena and P P G S N Siriwardena Chapter 12 Quarantine Practices Used in Papua New Guinea for Introduction and Transfers of Live Fish by Ursula M Kolkolo

*Health Management in Asian Aquaculture* Rohana P. Subasinghe, James Richard Arthur, Mohamed Shariff, Food and Agriculture Organization of the United Nations, 1996-01-01 In 1994 world aquaculture production reached 25.5 million mt valued at US 39.83 billion Asia contributed 89.9% of this total and has since continued to dominate global production The

drive to produce more fish and shellfish to meet the growing demand has lead many aquaculturists in Asia to intensify their operations In many instances the complex balance between the fish shellfish and the environment is not well understood the organism under culture subsequently becoming stressed and prone to infections As we have already witnessed disease has been and will continue to be a major constraint to the development of the aquaculture industry Considering the FAO s priority on developing sustainable aquaculture the large Asian contribution to global aquaculture production and the seemingly high losses of revenue due to diseases and health related problems FAO in consultation with the Network of Aquaculture Centres in the Asia Pacific NACA the Aquatic Animal Health Research Institute AAHRI the South East Asian Fisheries Development Centre SEAFDEC and the Universiti Pertanian Malaysia UPM and in collaboration with the Fish Health Section of the Asian Fisheries Society FHS AFS organized a Regional Expert Consultation on Aquaculture Health Management in Asia and the Pacific which was held at the Universiti Pertanian Malaysia in Serdang Malaysia in May 1995 This document comprises the technical papers presented at the Consultation and is a supplement to the report of the consultation FAO Fisheries Report No 529 Health Management in Asian Aquaculture Rohana P. Subasinghe,James Richard Arthur,Mohamed Shariff,2005 **Asia Regional Technical Guidelines on Health Management for the Responsible Movement of Live Aquatic Animals and the Beijing Consensus and Implementation Strategy** Food and Agriculture Organization of the United Nations,2000-01-01 With the support of an FAO Technical Co operation Programme TCP implemented by NACA this document was compiled by a group of aquatic animal health experts within and outside the region to assist the development of effective health management procedures for safe movement of live aquatic animals within and between countries in the region It summarises the results of the FAO NACA review process and proposes practical and effective regional guidelines for reducing the risks associated with transfer of pathogens in the Asia Region **Bioactive Compounds in Mangroves and their Associates** Hosakatte Niranjana Murthy,2025-09-29 This reference work offers a comprehensive overview of the chemistry and bioactivity of mangrove ecosystems focusing on their specialized metabolites and biological activities Through this volume readers will discover the novel secondary metabolites from mangrove flora and their potential applications in various fields The chapters cover a wide range of topics including the phytochemistry and biological activities of specific mangrove species such as *Acanthus ilicifolius* *Avicennia marina* and *Rhizophora mucronata* The chapter authors present an expert analysis of the bioactive compounds found in these species exploring their pharmacological and toxicological properties Particular attention is given to the anticancer activities of certain compounds as well as the role of mangrove associated bacteria and fungi in health management and bioremediation Readers will also encounter discussions on the synthesis of nanomaterials from mangroves and their antimicrobial properties This book is an essential resource for researchers scholars and practitioners in the fields of botany pharmacology and environmental science It invites readers to think through critical questions about the ecological and medicinal significance of mangroves offering

diverse perspectives from expert contributors      *Biology and Culture of Asian Seabass Lates Calcarifer* Dean R. Jerry, 2013-10-26 This book covers the biology ecology genetics and aquaculture of the Asian Seabass or barramundi *Lates calcarifer* a commercially and recreationally valuable species It brings together in the one place reviews written by world experts in Asian seabass taxonomy genetics nutrition ecology aquaculture reproductive and developmental biology      *Field guide to the control of warmwater fish diseases in Central and Eastern Europe, the Caucasus and Central Asia* Food and Agriculture Organization of the United Nations, 2019-05-01 Due to the recent rapid development of freshwater aquaculture in the Caucasus Region many new and previously known fish diseases have appeared One of the most prominent features of the region s aquaculture is that it is mostly based on the rearing of cyprinids mainly the common carp *Cyprinus carpio* as well as a few other predatory fish species As a result this book focuses on the diseases that affect these and other important warmwater fish species Although this field guide covers the diseases of warmwater fish of Central and Eastern Europe the Caucasus and Central Asia it also draws upon the extensive knowledge base available for the countries of Central Europe and the former Soviet Union as well as recent research findings from the Islamic Republic of Iran and from Turkey The major warmwater fish species cultured in the region and their health status are discussed and two major categories of disease are recognized biotic and abiotic diseases Although there are numerous biotic diseases abiotic factors e g lack of oxygen temperature feeding mistakes remain the main cause of losses in aquaculture The best practices for the field and laboratory examination of disease outbreaks are reviewed and the importance of accurate and detailed data recording emphasized Prevention as a key factor in avoiding the spread of disease is highlighted and actions to prevent the spread of diseases between farms regions countries and continents are discussed Possible methods for the treatment of each disease are reviewed unfortunately the chemicals available for use in aquaculture are now rather limited as many of them are hazardous to both the environment and human health Of the viral diseases discussed spring viraemia of carp SVC and koi herpesvirus KHV pose the greatest threats to the world s carp populations Of the bacterial diseases ulcer disease is still the main problem in carp culture while among the parasites *Ichthyophthirius multifiliis* the cause of white spot disease is among the most important Exotic parasites such as various *Thelohanellus* species as well as tapeworms belonging to the genera *Bothriocephalus* and *Khawia* are responsible for a considerable amount of damage Some diseases of unknown aetiology are also discussed      **Aquatic Food Security** Margaret Crumlish, Rachel Norman, 2024-03-04 Aquatic Food Security explores a range of issues related to this subject using global examples to illustrate both strengths and weaknesses within the existing aquatic food supply chain This is already an area of vital importance and it will increase in importance as the aquaculture industry grows for the foreseeable future The book covers topics such as the role of intensification in global aquaculture production the importance of nutrition and selective breeding diseases and public health considerations the role of markets and of processing and retail sectors and quality issues in our global seafood 5m Books      Case Studies in Ecohealth Susan

C. Cork, Douglas P. Whiteside, 2024-04-12 Case Studies in Ecohealth is primarily intended to be a student textbook using a series of case studies to illustrate key concepts applicable to EcoHealth with a focus on taking an interdisciplinary approach to solving complex problems at the interface between animals and their environment Using case studies the book will illustrate key concepts in EcoHealth allowing readers to better understand the strengths and challenges of taking an Eco Health approach Within the key themes addressed in the book the reader will gain insight into how to approach complex problems at the animal environment interface using a transdisciplinary approach Access to the case studies presented in the book along with supplementary material on line will provide the reader with good examples of current and emerging issues for discussion in the class room or for field experience programs 5m Books *Desarrollo de la acuicultura* Food and Agriculture Organization of the United Nations, 1999-06-30 La acuicultura es un de los sistemas de produccion de alimentos que estan registrando un crecimiento mas rapido en todo el mundo En esta publicacion se ofrecen anotaciones a los principios del Artículo 9 delCodigo de Conducta para la Pesca Responsable **Innovations in Agriculture for a Self-Reliant India** P.K. Ghosh, Prabhat Kumar, Debashis Chakraborty, Debashis Mandal, P.N. Sivalingam, 2021-11-29 The book brings out an encyclopaedic picture of the potential areas of transformative Indian agriculture through innovations in science technology institutional and policy affairs directed in building a self reliant India Atmanirbhar Bharat The book has addressed the challenges to make India free from hunger poverty and undernutrition and suggested interventions with focus on all inclusiveness and sustainability peace and prosperity and resilience to climate and other volatilities Most of these propositions are analogous to the Sustainable Development Goals Agenda 2030 which India has committed to achieve The book especially covers critical needs for development on different fragile ecosystems such as coastal desert hill ravine and other marginal ecosystems The book will act as very useful guidance for the policy makers and development communities and a reference document to academicians as well Note T F does not sell or distribute the hardback in India Pakistan Nepal Bhutan Bangladesh and Sri Lanka This title is co published with NIPA The First Global Integrated Marine Assessment United Nations, 2017-04-17 The World Ocean Assessment or to give its full title The First Global Integrated Marine Assessment is the outcome of the first cycle of the United Nations Regular Process for Global Reporting and Assessment of the State of the Marine Environment including Socioeconomic Aspects The Assessment provides vital scientifically grounded bases for the consideration of ocean issues including climate change by governments intergovernmental agencies non governmental agencies and all other stakeholders and policymakers involved in ocean affairs Together with future assessments and related initiatives it will support the implementation of the recently adopted 2030 Agenda for Sustainable Development particularly its ocean related goals Moreover it will also form an important reference text for marine science courses Diagnosis and Control of Diseases of Fish and Shellfish Brian Austin, Aweeda Newaj-Fyzul, 2017-03-20 There has been a continual expansion in aquaculture such that total production is fast approaching that of wild caught fisheries Yet the

expansion is marred by continued problems of disease New pathogens emerge and others become associated with new conditions Some of these pathogens become well established and develop into major killers of aquatic species Diagnosis and Control of Diseases of Fish and Shellfish focuses on the diagnosis and control of diseases of fish and shellfish notably those affecting aquaculture Divided into 12 chapters the book discusses the range of bacterial viral and parasitic pathogens their trends emerging problems and the relative significance to aquaculture Developments in diagnostics and disease management including the widespread use of serological and molecular methods are presented Application dose and mode of action of prebiotics probiotics and medicinal plant products used to control disease are examined as well as the management and hygiene precautions that can be taken to prevent control the spread of disease This book will be a valuable resource for researchers students diagnosticians veterinarians fish pathologists and microbiologists concerned with the management of diseases of fish and shellfish

**Marine Fish Culture** John W. Tucker Jr., 2012-12-06 4 Water Sources 149 Criteria 149 Major types 150 Summary 152 5 Water Treatment 155 Requirements 155 Materials 155 Treatment options 156 System design 169 System monitoring and control 172 Environmental considerations 174 Summary 174 6 Culture Units 175 Considerations in choosing culture units 175 Characteristics of culture units 175 Applications of culture units 191 Hatchery design 208 Summary 210 7 Obtaining Fish for Stocking 211 Stock from the wild 211 Stock from the hatchery 211 Spermatogenesis sperm formation 232 Oogenesis egg formation 232 Oocyte maturation 233 Endocrine control of oocyte maturation and ovulation 237 fuduced ovulation 238 Timing and egg quality 257 Artificial fertilization 265 Care of eggs 267 Storage of gametes 269 Natural ovulation 270 Care of broodfish 289 Egg collection 290 fuduced vs natural ovulation 290 Broodfish adaptability 291 Examples 291 Genetic considerations 295 Hybridization 296 Sex control 296 Summary 298 vi 8 Nutrition of Larval Fish 299 Feeding criteria 299 Choice and culture of foods 307 General feeding practices 336 Specific feeding practices 352 General methods used in our hatchery 372 Industrial scale larval food processing in Italian hatcheries 373 Summary 374 9 Nutrition of Juvenile and Adult Fish 375 375 Requirements and components Broodstock nutrition 407 Nutritional disorders 408 Environmental considerations 411 Feed studies 411 Suggested feed formulas 460 Making and storing feeds 461 Feeding methods 464 Summary 467 10 Energetics 469 Energy budget components and influencing factors 469

The State of the World's Biodiversity for Food and Agriculture Food and Agriculture Organization of the United Nations, 2019-03-12 The State of the World's Biodiversity for Food and Agriculture presents the first global assessment of biodiversity for food and agriculture worldwide Biodiversity for food and agriculture is the diversity of plants animals and micro organisms at genetic species and ecosystem levels present in and around crop livestock forest and aquatic production systems It is essential to the structure functions and processes of these systems to livelihoods and food security and to the supply of a wide range of ecosystem services It has been managed or influenced by farmers livestock keepers forest dwellers fish farmers and fisherfolk for hundreds of generations Prepared through a participatory country driven process the report

draws on information from 91 country reports to provide a description of the roles and importance of biodiversity for food and agriculture the drivers of change affecting it and its current status and trends It describes the state of efforts to promote the sustainable use and conservation of biodiversity for food and agriculture including through the development of supporting policies legal frameworks institutions and capacities It concludes with a discussion of needs and challenges in the future management of biodiversity for food and agriculture The report complements other global assessments prepared under the auspices of the Commission on Genetic Resources for Food and Agriculture which have focused on the state of genetic resources within particular sectors of food and agriculture

### **Epizootic Ulcerative Fish Disease Syndrome**

Devashish Kar,2015-08-06 Epizootic Ulcerative Fish Disease Syndrome covers both the background and current information on the EUS disease relevant to fisheries and aquaculture delivered in a systematic and succinct way The book is an essential resource for the aquaculture and fisheries researcher interested in finding solutions to the spread of the disease across the globe and students in relevant programs including an in depth description and analysis of the disease as well as the structure and composition of the virus while offering prevention and control methodologies Clinical veterinarians aquaculture disease practitioners farmers and those who are interested in aquatic virology will find this book to be a useful guide on the topic Examines different manifestations of the disease and includes different methodologies of studies such as histopathological histochemical bacteriological mycological virological and enzymological Provides background information describing fish as a significant food source and avocation the diversity of fishes in the globe and the panorama of diseases fish can be exposed to Describes all major species affected by EUS and its pattern of spread along with suggested strategies for control and prevention

*Ecology of Invertebrate Diseases* Ann E. Hajek,David I. Shapiro-Ilan,2018-01-16 A rapidly growing interdisciplinary field disease ecology merges key ideas from ecology medicine genetics immunology and epidemiology to study how hosts and pathogens interact in populations communities and entire ecosystems Bringing together contributions from leading international experts on the ecology of diseases among invertebrate species this book provides a comprehensive assessment of the current state of the field Beginning with an introductory overview of general principles and methodologies the book continues with in depth discussions of a range of critical issues concerning invertebrate disease epidemiology molecular biology vectors and pathogens Topics covered in detail include Methods for studying the ecology of invertebrate diseases and pathogens Invertebrate pathogen ecology and the ecology of pathogen groups Applied ecology of invertebrate pathogens Leveraging the ecology of invertebrate pathogens in microbial control Prevention and management of infectious diseases of aquatic invertebrates *Ecology of Invertebrate Diseases* is a necessary and long overdue addition to the world literature on this vitally important subject This volume belongs on the reference shelves of all those involved in the environmental sciences genetics microbiology marine biology immunology epidemiology fisheries and wildlife science and related disciplines

### **Freshwater Aquaculture**

Biplab Kumar Bandyopadhyay,2022-06-01 Freshwater Aquaculture the



study of breeding rearing and commercialization of organisms fish in particular which inhabit in fresh water Even though there remains some fragmentary information regarding the history of development of aquaculture in India but those seem to be far from being complete In the present communication the same has been given elaborately The book concentrates on the culture technology of commercially important fresh water fishes Various types of culture techniques including Aquaponics Bioflocs Recirculatory Aquaculture Systems RAS apart from the conventional Cage culture Pen culture Integration of fish culture with other crops viz paddy vegetables dairy piggery poultry etc have been dispensed in detail Note T F does not sell or distribute the Hardback in India Pakistan Nepal Bhutan Bangladesh and Sri Lanka

Checklist of the Parasites of Fishes of the Philippines James Richard Arthur, Susan Lumanlan-Mayo, Food and Agriculture Organization of the United Nations, 1997-01-01 This checklist summarizes information on the parasites of Philippine fishes contained in the world literature dating from the earliest known record de Blainville 1822 to the end of 1996 Information is presented in the form of parasite host and host parasite lists Included are 201 named species of parasites distributed among the higher taxa as follows Apicomplexa 1 Ciliophora 16 Mastigophora 2 Microspora 1 Myxozoa 9 Trematoda 90 Monogenea 22 Cestoda 6 Nematoda 20 Acanthocephala 5 Mollusca 1 Branchiura 2 Copepoda 21 and Isopoda 5 Also included are many records of parasites not identified to species level Parasites have been reported from 172 of the more than 2030 species of marine and freshwater fish occurring in Philippine waters and from another 17 species of freshwater aquarium fish examined in the Philippines but not found in natural waters The Parasite Host List is organized on a taxonomic basis and provides information for each parasite species on the environment fresh water brackish water marine the location site of infection in or on its host s the species of host s infected the known geographic distribution by island in the Philippines and the published sources for each host and locality record The Host Parasite List is organized according to the taxonomy of the hosts and includes for each host the English language and local typically Tagalog common names environment fresh water brackish water marine status in the Philippines native or exotic and information on the known Philippine distribution of the parasites Both lists are accompanied by remarks and footnotes as warranted giving specific information on points of systematics nomenclature possible misidentifications introductions pathogenicity etc Citations are included for all references and a supplementary list of references contains other literature on Philippine fish parasites Parasite and host indices are included The following new taxonomic combinations are made *Prosorhynchoides philippinorum* Velasquez 1959 n comb for *Bucephaloides philippinorum* Velasquez 1959 *Prosorhynchoides sibi* Yamaguti 1940 n comb for *Bucephaloides sibi* Yamaguti 1940 *Genolinea awa* Yamaguti 1965 n comb for *Pseudobunocotyla awa* Yamaguti 1965 and *Procamallanus Spirocamallanus philippinensis* Velasquez 1980 n comb for *Spirocamallanus philippinensis* Velasquez 1980

**World Seas: An Environmental Evaluation** Jean-Francois Hamel, 2018-09-07 *World Seas An Environmental Evaluation* Second Edition Volume Three Ecological Issues and Environmental Impacts covers global issues relating to our seas including a biological description of the coast and

continental shelf waters the development and use of the coast landfills and their effects pollutant discharges over time the effects of over fishing and the management methods and techniques used to ensure continued ecosystem functioning The relative importance of water borne and airborne routes differ in different parts of the world is explored along with extensive coverage of major habitats and species groups governmental education and legal issues fisheries effects remote sensing climate change and management This book is an invaluable worldwide reference source for students and researchers concerned with marine environmental science fisheries oceanography and engineering and coastal zone development Provides scientific reviews of regional issues empowering managers and policymakers to make progress in under resourced countries and regions Covers environmental issues arising from the human use of both the sea and its watershed Presents informed commentary on major trends problems and successes and recommendations for the future

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