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Nota di contenuto	Cover; Title Page; Copyright; Contents; List of Contributors; Preface; Chapter 1 The Gastrointestinal Tract of Fish; 1.1 Introduction; 1.2 Anatomy of GI tract; 1.3 Stomach and intestinal bulb; 1.4 Pyloric caeca; 1.5 Intestine; 1.6 Endogenous inputs of digestive secreta; 1.7 Luminal pH; 1.8 Passage rate and residence time; 1.9 Acknowledgements; References; Chapter 2 Immune Defences of Teleost Fish; 2.1 Introduction; 2.2 Innate immunity; 2.3 Antigen-specific adaptive immunity; 2.3.1 T cells: molecular and functional characterization; 2.3.2 B cells, immunoglobulins and humoral immunity 2.4 Cytokines drive immune responsiveness 2.5 Immune tissues; 2.5.1 The thymus; 2.5.2 The head kidney and spleen; 2.5.3 The skin-associated lymphoid tissue; 2.5.4 The gill-associated lymphoid tissue; 2.5.5 The gut-associated lymphoid tissue; 2.6 Mucosal immunity; 2.7 Common pathogens infecting teleosts: what immune responses are

required?; 2.8 Future considerations; 2.9 Conclusion; References; Chapter 3 Gastrointestinal Pathogenesis in Aquatic Animals; 3.1 Introduction; 3.2 *Vibrio* spp.; 3.2.1 *Vibrio anguillarum*; 3.2.2 *Vibrio salmonicida*; 3.2.3 *Vibrio vulnificus*; 3.2.4 *Vibrio ichthyoenteri*; 3.2.5 *Vibrio harveyi* (*Vibrio carchariae*); 3.3 *Aeromonas* spp.; 3.3.1 *Aeromonas salmonicida*; 3.3.2 *Aeromonas hydrophila*; 3.4 *Yersinia ruckeri*; 3.5 *Edwardsiella* spp.; 3.5.1 *Edwardsiella ictaluri*; 3.5.2 *Edwardsiella tarda*; 3.6 *Piscirickettsia salmonis*; 3.7 *Pseudomonas anguilliseptica*; 3.8 *Photobacterium damsela* subsp. *Piscicida* (*Pasteurella Piscicida*); 3.9 Streptococcosis; 3.10 "Candidatus arthromitus"; 3.11 *Mycobacterium* spp.; 3.12 Conclusion; References; Chapter 4 The Gut Microbiota of Fish; 4.1 Introduction; 4.1.1 Current knowledge of the gut microbiota in fish; 4.1.2 Viruses; 4.1.3 Yeast; 4.2 The importance of the microbiota; 4.3 Composition of the microbiota in early life stages; 4.4 Factors that influence microbiota composition; 4.4.1 Host factors; 4.4.2 Diet; 4.4.3 Environmental factors; 4.5 Conclusion; References; Chapter 5 Methodological Approaches Used to Assess Fish Gastrointestinal Communities; 5.1 Culture-dependent approaches; 5.2 Molecular techniques; 5.2.1 PCR based methods; 5.2.2 Electrophoresis based methods; 5.2.3 Quantitative real-time PCR (qPCR); 5.2.4 Clone libraries; 5.2.5 Next-generation sequencing (NGS); 5.3 Fluorescence based methods; 5.4 Electron microscopy; 5.5 Microbial activity and functionality; 5.6 Summary; 5.7 Acknowledgements; References; Chapter 6 Indigenous Lactic Acid Bacteria in Fish and Crustaceans; 6.1 Introduction; 6.2 Lactic acid bacteria; 6.3 Salmonidae; 6.3.1 Carnobacteria; 6.3.2 *Lactobacillus*; 6.3.3 *Lactococcus*; 6.3.4 *Leuconostoc*; 6.3.5 *Streptococcus*; 6.3.6 *Enterococcus*; 6.3.7 *Vagococcus*; 6.3.8 *Weissella*; 6.3.9 *Bifidobacterium*; 6.4 Gadidae; 6.5 Clupeidae; 6.6 Anarhichadidae; 6.7 Acipenseridae; 6.8 Percidae and sciaenidae; 6.9 Moronidae; 6.10 Sparidae; 6.11 Pleuronectiformes; 6.12 Cyprinidae; 6.12.1 Common carp (*Cyprinus carpio* L.); 6.12.2 *Carassius* spp.

Sommario/riassunto

Manipulation of the microbial gut content of farmed fishes and crustaceans can have a marked effect on their general health, growth, and quality. Expertly covering the science behind the use of prebiotics and probiotics this landmark book explains how the correct manipulation of the gut flora of farmed fishes and crustaceans can have a positive effect on their health, growth rates, feed utilization, and general wellbeing. *Aquaculture Nutrition: Gut Health, Probiotics and Prebiotics* provides a comprehensive overview of the current knowledge of the gut microbiomes of fish and their importance
