

# Health of Aquatic Animals

**Henk Stander**, Division of Aquaculture, Faculty of Forestry and Agricultural Sciences, University of Stellenbosch, Office: (021) 8082544, Fax: (021) 808 5833,  
E-mail: [hbs@sun.ac.za](mailto:hbs@sun.ac.za)

## 1. Introduction:

Aquaculture refers to the controlled production of water living organisms such as algae, plants, shellfish, crustaceans, finfish and even reptiles such as crocodiles, tortoises and frogs. Aquaculture is conducted over a wide range of water ecosystems that include fresh-, brackish- and seawater, as well as cold temperature, and warm water systems. The harvesting of natural fisheries resources is declining rapidly on a worldwide basis, due to the overexploitation of resources and the disturbance of natural habitats. The sustainable catch of fisheries on a worldwide basis is estimated at about 110 million metric tons per annum, whilst the annual harvest already exceeds 118 million tons.

This overexploitation and declining harvests of natural fisheries has led to the rapid development of aquaculture technologies through which man can supplement its ever-increasing food requirements. The world aquaculture production already contributes about 21% of the total human consumption (2000), an increase from 15% in 1995. Aquaculture is seen as a strategic industry for securing future food requirements of the world.

## 2. Significance and Principles:

An outbreak of disease jeopardizes regular aquaculture and threatens fish yields. Therefore, controlling disease is one of the most vital tasks in fish culture. The diseases from which aquatic animals in farms suffer are many, and varied, and are described in specialist books. The purpose of this paper is to give a general introduction to these diseases, and more important, to outline the precautions necessary for the prevention of these diseases. Most diseases can be treated, but treatment is often of doubtful value. The cost of the treatment can be high. Sick fish do not grow and sick fish die, this is of course then a total loss to the farmer. Not only the loss of the fish and its anticipated value but also the loss of the money invested in the fish. If the fish is near market size when it dies, these losses are severe.

The principle of fish disease control is all around prophylaxis: “prevention is better than treatment”. In the event of an outbreak of disease, fish should be treated in the early stages. However, because of the difficulty in observing the activities of the fish, it is difficult to correctly diagnose and treat an infection in its early stages.

## 3. Major Types of Fish Diseases:

### a. Infectious Diseases

Infectious diseases are mainly caused by viruses, bacteria, fungi, or unicellular algae. Infectious diseases account for approximately 60 per cent of the production lost as a result of the disease. Most pathogens of infectious diseases show a preference for certain species and certain organs. For example, bacteria of *enteritis* only affect grass carp and black carp. Likewise, *branchiomyces* parasitize only the gills.

### b. Non-infectious (Parasitic) Diseases

Parasitic diseases are caused by animal parasites such as *trichodinosis*, *ichthyphthiriasis*, *lernaesis*, *argulusis* etc. Like infectious diseases, parasitic diseases often appear in different seasons. This is because the pathogens and the fish are influenced by external factors

(location, climate, etc.) and internal factors (growth and physiological status). Pathogens may also be species specific or organ tropic.

#### c. Non-Parasitic Diseases

Bad water quality, physical and chemical factors, or the influence of other organisms within the pond may retard growth or even kill the fish. For example, gasping and suffocation may upset the physiological balance of the fish and if serious, cause mass mortality.

Diseases can be classified in more detail under the following headings:

1. Viral diseases
2. Tumours
3. Bacterial diseases
4. Fungal diseases
5. Parasitic diseases
6. Non-Parasitic diseases

#### **4. Prevention of Disease:**

There are certain basic rules which must be observed if outbreaks of disease are to be prevented. The water supply to each pond must be separate. It is very bad farming practice to supply a pond with water from another. Water from a fish pond may carry disease and will probably be deficient in oxygen, and with a high level of metabolic products such as ammonia. Fish must not be stressed. When they are handled, the greatest care must be taken to upset them as little as possible. Harsh handling of fish damages their skin, rubbing off the scales and the protective mucus. This can allow the entrance of disease organisms. Fish must be kept in optimum conditions at all times. They must be kept in water with plenty of oxygen, with the correct pH, and with a low ammonia content. The fish must have an assured food supply, either supplied as manufactured feed or by natural production in the pond. Great care must be exercised when mixing populations of fish from different ponds, or when introducing new fish into the farm so that no diseased fish are introduced. Fish new to the farm site should be held in quarantine, until it is certain that they have no disease. Separate equipment should be kept for each pond as disease is easily spread from pond to pond. All major equipment such as nets and aerators should be sterilized after use as a matter of routine. A useful agent for this is benzalkonium chloride solution containing 600 ppm of active ingredient. Good farm practice and regular inspection of stock is essential to good management.

#### **5. Diagnosis:**

Disease diagnosis is the first step toward effective treatment, and care must be taken in making a diagnosis. The fish must be alive or recently dead and the body must be kept damp. Try to keep the dissected organs as complete as possible. Keep the autopsy instruments clean to avoid cross contamination of pathogens among organs. Use distilled water for microscopic observation of the skin and use 0.85 per cent normal saline for microscopic observation of the internal organs. Preserve the samples for further identification if there is any doubt about the pathogens or the clinical signs. If complications are discovered during the diagnosis, diagnose the primary and secondary disease and implement the appropriate treatments separately or simultaneously.

Methods of diagnosis include surveying the pond and examining the fish with the naked eye and microscopically.

## **6. Microscopic examination:**

Normally, only the skin, gills, intestines, eyes, and brain need to be observed microscopically. For example the skin: Scrape a little tissue and mucus from the skin, put them on a slide with a drop of distilled water and observe the combination under a microscope after pressing with a cover slip. One should always start with the low power objectives. Samples from at least three different points on the skin should be inspected. Common parasites on the skin are *Trichodina*, *ichthyophthirius*, *Chilodonella*, *Costia*, *Glochidium*, and *Myxosporidia*.

## **7. Advantages of Herbs used for fish disease control:**

1. No pollution to the water environment
2. No drugs-resistance
3. Increase the immunity
4. Not poisonous to the fish
5. Safety advantage
6. Low cost, rich in natural resources
7. Two way of function to metabolism
8. Green products (organic), more sustainable

Remember, good husbandry reduces fish mortality and increases both growth rate and feeding efficiency. Good husbandry thus leads to higher production levels in Aquaculture.

Good luck and try to keep your fish healthy and happy!

Henk