

# OPTIMAL HEALTH CARE FOR ORNAMENTAL FISH

by Gerald Bassleer



BASSLEER BIOFISH

Goldfish with several anchorworms (*Lernaea*) attached to the base of the dorsal fin

Both freshwater and marine ornamental fish remain highly sought after by hobbyists, the business sector, fishing communities, and public aquaria. Knowledge about, and adherence to proper health care management approaches are essential to prevent widescale occurrence and mortality due to disease.

Table 1: Factors which influence health care, by source

## Introduction

The international trade in ornamental fish has contributed an increasingly large percentage to the livestock industry since the 1960s. Due to its growing importance, more scientific research is being done on ornamental fish, one vital area being fish health management. In the early years (between the 60s and 70s) little was known and investing in keeping ornamental fish healthy was not the norm. Much of which was known came from scientific research on food fish, especially trout and salmon.

Because of the high demand from hobbyists and traders beginning from the 70s and 80s, breeders and fishermen felt under great pressure to fulfill orders. This has caused serious problems, particularly in the quality of the fish, and declining stocks in the wild. Much time, energy and money has been invested to upgrade the quality of the fish industry in general, including fish health care and other new developments to make it possible to continue to control the quality of ornamental fish. The best way to achieve quality is to properly address the health care needs of these fish.

Collected from the wild	Tank raised
Vulnerable to environmental changes	Controlled environment
Natural immunity	Possible to control immunity
Usually infections are not drug-resistant	May be exposed to drug-resistant infections
Many different diseases	Specific diseases
More susceptible to stress	More resistant to stress
Higher risk of mortality	Lower risk of mortality
No health management	Subject to health management rules
Collectors usually have no finance and medicines	Finance and medicines usually available

An important aspect to consider in terms of health and quality is where the ornamental fish come from. Approximately 85 to 90% of the marine ornamental fish in the market are wild caught, with the rest having been raised in tanks; the reverse generally applies to freshwater ornamentals, with some 20% from the wild and 80% tank raised. The main factors which are at

play in influencing the rearing conditions and health of the fish are described briefly in Table 1.

Established companies should have aquatic specialists who should be able to advise on the rearing, packing and transportation of the aquarium fish. He/she should be able to control the quality of the fish at the point of origin (from the supplier) and communicate health care protocols throughout the rearing and export chain. The experience and training of the staff also play a key role in the wellbeing of the fish.

## Aquariology since the 1960s

The study of animals and plants in a controlled aquatic system ('aquariology') has come a long way since the 1960s. Researchers and farmers in those years would have benefitted

from things like (i) a better understanding of the biological processes involved in trading and quarantining fish; (ii) a strict health management plan at all levels: exporter/importer/farm/shop, including a good biosecurity plan; and (iii) good diagnosis methods, especially the use of a microscope in the detection of disease-causing agents. In most cases, people tended to look only at the behaviour and external signs (symptoms) of the diseased fish. Unfortunately many different diseases will show similar disease patterns and there was always the possibility of making the wrong diagnosis due to the lack of diagnostic tools.



*A goldfish with an ulcer, which should be treated as soon as possible with anti-bacterial treatment. It could be too late for this particular fish but others which do not show ulcers yet can still be cured.*

Today, we have:

- More veterinarians, fish doctors, biologists, and fish technicians with knowledge and experience in fish, fish keeping and diseases;
- More trained people who can learn the basics of aquariology and the use of the microscope as a tool for making a more accurate diagnosis;
- More knowledge people on the most common fish diseases which gives us better understanding on how to prevent further outbreaks or transmission;
- Better methods of disease control such as (i) the use of vaccines in the control of several viral and bacterial infections; (ii) the use of immunostimulants like Betaglucans in fish diets to strengthen the immunity of the fish;
- Probiotics (like *Pediococcus lactibacili*) in the fish food to strengthen the bacterial gut flora, and the prebiotics (like garlic or Aloe vera) that help the fish to fight infections and to repair damaged tissues.



Furthermore, research, management, education, awareness building, and conservation goals are now increasingly being integrated into aquariology programmes.

### Increasingly strict export regulations

International trade in ornamental coldwater fish from several countries is currently restricted due to new Health Regulations: fish farms have to be able to show an export license which allows them to ship coldwater fish which are certified free of KHV (Koi Herpes Virus) and SVC (Spring Disease). These fish must be accompanied by an official health certificate, without which they are not allowed to enter the importing country.

The World Organization for Animal Health (OIE) has set up standards and listed diseases that must be reported as well as information on certification (see the OIE website at: [www.oie.int](http://www.oie.int)). Some fish are restricted by CITES because they are endangered: recently, freshwater Stingray and Hypancistrus zebra or L46 (for more info see: <https://cites.org/sites/default/files/notif/E-Notif-2016-056.pdf>).

Certain countries are also controlling the export of their natural resources (in this case, fish). They set quotas and in some cases, make lists of the fish which can be collected and traded. We have for example Project PIABA, which is involved in the protection of fishing grounds and protection of fishermen, e.g. the PIABA campaign: 'Buy a Fish and Save a Tree'. It is already widely accepted that the smallscale collection of wild fish by local populations (as compared to commercial enterprises) is usually sustainable and does not irreparably damage the ecosystem. Through sales of the fish, the PIABA campaign goal is to bring an income to the participating families, enabling them to continue fishing and to set aside funds for schools, health care, pension plans, etc. (for more info see: <https://www.facebook.com/Project-Piaba-332179033504804/>).

ARTICLE 5.6.1 OF 'AQUATIC ANIMAL HEALTH MEASURES APPLICABLE BEFORE AND AT DEPARTURE'

1. Each country should only authorise the exportation from its territory of live aquatic animals and aquatic animal products that are correctly identified, and inspected in accordance with the procedures outlined in the Aquatic Code and Aquatic Manual.
2. In certain cases, the above-mentioned aquatic animals could, in accordance with the wish of the importing country, be subjected to certain biological tests or to prophylactic parasitological procedures within limits of a defined period of time before their departure.
3. Observation of the above-mentioned aquatic animals before leaving the country may be carried out in the establishment where they were reared or at the frontier post. When they have been found to be clinically healthy and free from listed diseases or any other specified infectious disease by a member of the personnel of the Competent Authority or a certifying official approved by the importing country during the period of observation, the aquatic animals should be transported to the place of shipment in specially constructed containers, previously cleansed and disinfected, without delay and without coming into contact with other susceptible aquatic animals, unless these aquatic animals have health guarantees similar to those of the transported aquatic animals.
4. The transportation of aquatic animals for breeding or rearing or slaughter shall be carried out directly from the establishment of origin to the place of shipment or to the processing establishment in conformity with the conditions agreed between the importing and exporting countries.

(Source: Aquatic Animal Health Code, available at no cost on the OIE website [www.oie.int](http://www.oie.int)).

Exporters are usually the ones who collect the fish from the breeders or from fishermen. If they keep the fish in quarantine they need to take appropriate measures to inspect the fish and to apply the correct medical treatments, if needed. Upon them then falls the task of installing a good fish health management plan with strict protocols for quality control.

Prior to shipment, the fish have to be conditioned and packed by skilled people who understand what to do. This has a large impact on the shelf life of the fish. Important is the feedback from their customers and their communication with the breeder or fisherman.



A Sailfin Molly with a necrotic, white open mouth suffers from a common bacterial infection called Columnaris. If detected too late or not treated with anti-bacterial medicine, many fish will die



Cryptocaryon or Marine Ich on a Blue Tang (*P. hepatus*) often occurs when shipments arrive too cold. It can spread easily to other fish so a prevention plan with good biosecurity is important

Prior to shipment, there are several main steps that should be carried out to minimise the possibility that the exported fish are not sick or carrying disease:

- When you have a good holding facility to stock fish, try to feed them with immunostimulants for at least 7 to 10 days before they are selected for shipment. This makes the fish stronger or more resistant to disease;
- Take the fish that is to be exported out from the rest of the fish at least 3 days before shipping; better to select more days in advance;
- Put the selected fish in glass tanks to increase visibility;
- Try to have spare (reserve) fish to replace sick fish so that the shipment can be 100% filled (ask buyer to indicate reserve fish);
- Conduct daily health checks, preferably 2x/day;
- Treat fish 72 to 48hrs before packing; this should be done according to a protocol that has been developed through your own research and experience. Make sure that 24hrs before packing, the medicine is removed and water refreshed;
- No feeding during the 48hrs before packing and avoid stress factors;
- Prepare everything in a checklist
- On the day that the fish is packed, careful handling and netting are required to minimise stress

At the importing side, the fish need to be acclimated, conditioned and quarantined to enhance survival rates. It should be a standard rule that all imports (especially from overseas) are kept in quarantine for a minimum of 3 to 14 days (depending on the origin) before they are sold on the market. While in quarantine, inspection for disease using a microscope is a must since the importer deals with many different suppliers and many different fish diseases. Many pet shops do not have quarantine procedures and therefore the poor quality of the fishes invariably brings about negative press for such establishments.

The following are some quick quarantine tips:

- Prepare aquarium according to the species
- Acclimate the fish according to the species and its origin
- Use a standard protocol to treat the fish in the first 48hrs upon arrival: the protocol is developed according to your research and experience
- The fish should be fed as soon as possible (some of them have probably not seen food for many days)
- Check for health problems during the first 7 to 10 days; use a microscope when necessary so you can be more efficient
- Depending on origin (or regulation in your country) quarantine should be (for imports) at least 7 days

## Conclusion

Over 2 500 species are involved in the global ornamental fish industry, of which over 60% are of freshwater origin. Although relying largely on captive-bred freshwater fishes, the trade also includes significant numbers of fish and invertebrates

collected from the wild. It has been estimated that about 30 freshwater fish species dominate the global market, such as live bearers, neon tetra, angel fish, goldfish, zebra danio and discus. The guppy and neon tetra species alone represent more than 25% of the market by volume and more than 14% by value. (Source: 'The Global Trade in Ornamental Fish', authored by VK Dey; INFOFISH International July/August 2016).

Against this background, it makes sense to focus on sustainability in harvesting as well as health care management of both freshwater and marine ornamentals. The industry (like other livestock sectors) has developed rapidly, and it will continue to do so amidst the expanding demand for ornamentals.

I believe that the concern for 'better quality' plays an important role to generate new developments in the coming decades and this will be important for all players in our aquatic industry. Meanwhile, we will have to strive towards sustainable and responsible collection, production and holding of ornamental aquatic animals, and maintaining high quality standards throughout the entire and distribution chain. Training of staff and workers is the key issue for all players in the ornamental fish industry. 🐟



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