



Aquarium
Münster

Fish like us

DR. GERALD BASSLEER

FISH NUTRITION AND FISH DISEASES



www.aquarium-munster.com

D052018P



Dr. Gerald Bassleer

Dr. Gerald Bassleer is a well-known fish pathologist with worldwide reputation.

He has more than 40 years of experience in the ornamental fish industry as biologist, fish pathobiologist, owner, director, CEO, wholesaler, importer/exporter of ornamental fish, fish health manager, trainer of aquarium staff, rapid application of microscopic research and diagnostic tools, consultant for several companies in different countries, author, speaker, developer of DR. BASSLEER BIOFISH FOOD, ex-President of OFI - Ornamental Fish International (2006-2016). Published app Fish Diseases iOS & Android. Recently he wrote a new Ecourse 'Aquariology' for Global Pets Academy.

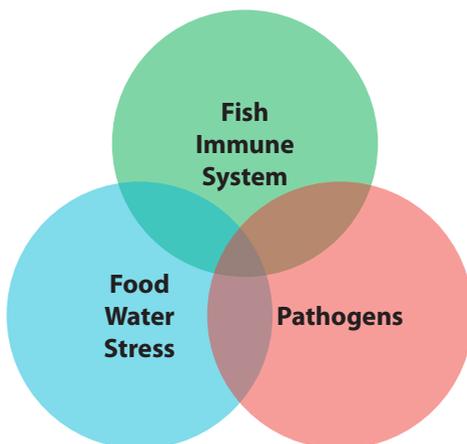
Currently spending lots of time to travel around the world as "The Flying Fish Doctor" and giving services to the industry to improve the wellbeing and health of the livestock = ornamental fish!

Abstract

Without too technical information I will explain what I experienced during my 40+ years of feeding ornamental fish at wholesale level.

In the early 90's, during our daily practice, we had one aim: using a complete food for ornamental fish that would provide high quality fish within a 3 to 7 days, depending on the origin and quality of the fish. Next to the basic ingredients, we have learned in the last 25 years that many other additional feed additives can play an important role to control the health of our fish: to help the immune (defense) system of the fish, to assist in faster repair after damage, to prevent or control infections, etc. In general, with the recent studies and experience (especially in aquaculture) we learned to understand the health benefits of a functional fish food, a food that gives more benefits than just 'feeding fish'.

Hippocrates already said 2000 years ago: 'Let food be thy medicine and medicine be thy food'



What can be different in a Fish Food?

This is an interesting content that our competitors would like to read, although we practice common sense after many years of trial and error while working with millions of ornamental fish!

The main raw ingredient we recommend in its production is fresh wild Scandinavian fish (herring, mackerel, anchovy) which is very rich in proteins and essential Omega-3 DHA fatty acids. In addition this food also contains fresh mollusks and crustaceans such as squids, octopus, shrimps, prawns and krill, as well as fish oils, cereals, yeasts and algae.

In general, the composition of a food for most of our aquarium fish (freshwater and marine) is ideal when it contains high percentage of digestible proteins, many essential Amino acids and Fatty acids, Vitamins A, B, C and D, Trace elements and Minerals. In this article we will not go into detail about the function of each essential food molecule. As reference you can refer to: *Nutrition and Fish Health* by *Lim & Webster*



More important is to share my experience as fish health specialist. During many years of work as fish pathobiologist in 4 continents of the world I did not only look at just feeding the fish with good ingredients but we also added extra health beneficial natural products to make it a functional food.

We also give a large preference to granulated (pelleted) food, (See further for more reasons why this is better for your fish). When we produce a granulated food the majority of ingredients are mixed and then cold-pressed. Then it is cooked for a very short time at only 70° C to eliminate potential virus and bacteria. Once the food is cold but still a little humid, the vitamins and additives (algae, immune stimulants, açai, herbs, aloe vera, garlic, etc.) are added so that none of their exceptional nutritional values are lost.

On the other hand it is outmost important that a food has enhanced palatability= many fish come from specific breeding facilities or from the wild and need to learn to eat a 'new kind' of food. We have put a

lot of attention (especially by using wild fish) that the fish 'smell/taste' the granulates very quickly!

Through our 40 years of experience between millions of fish we learned to understand the problems that the large variety of our ornamental fish encounter/face stress factors like handling, packing, shipping, acclimating, netting, mixing of species, etc.

Next to the selection of good quality fish and shrimp (mostly Scandinavian) we added extra natural products (to produce functional feed) that help in the prevention of bacterial, viral, fungal and parasitic infections or faster repair/recovery after disease.

At the same time we try to optimize digestive and metabolic efficiency: less waste (= less pollution of the aquarium water; very important) and better growth and coloration of the fish.

The investment in good food contributes to less problems with fish, less diseases, less use of medications (especially antibiotics), less work, less costs, etc. and, last but not least, higher quality of fish and higher survival rate. From my personal experience I have seen companies going broke (out of business) because they never wanted to invest in food and they had to spend a lot of money in medications, water changes, excessive working hours combined with high losses, complaints from customers.

What about functional fish food for the health of fish?

Wikipedia: "*Functional food is a food given an additional function (often one related to health-promotion or disease prevention) by adding new ingredients or more of existing ingredients.*"

As explained above, we are specialized in using additives for the wellbeing of our fish! This has become an important issue in 21st Century because the use of antibiotics and other medications will eventually become very much restricted.

We make our functional fish food by coating natural products around each granulate, after production of the granulate, so the quality of beneficial ingredients are guaranteed!

These natural products have a functional purpose with health benefits for the fish: we use different categories: probiotics, prebiotics and plant extracts.

1 Probiotics

Wikipedia: "*Probiotics are microorganisms are believed to provide health benefits when consumed.*"

We recommend the use of *Pediococcus acidilactici* since it has been proven to have great success on health and growth of fish! (Reference: *Nobel prize laureate Élie Metchnikoff & Beneficial effect of yoghurt! In recent years also 'Yakult' for humans.*)

Since we mix the bacteria (as coating) around each granulate we can do this perfectly during our production process.

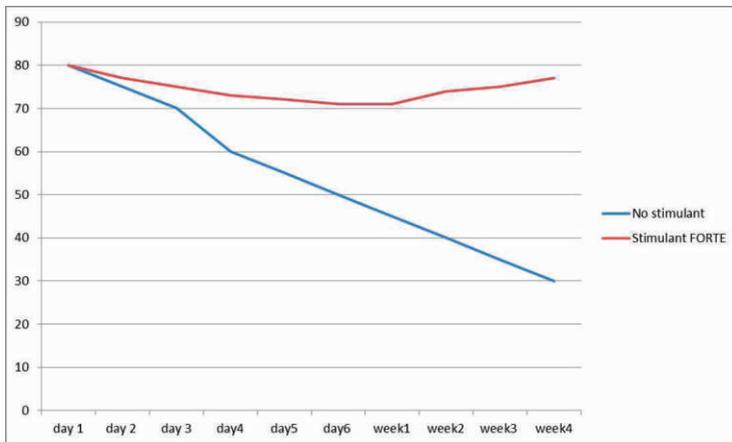
Those beneficial bacteria, introduced by eating the food, change the content of the intestinal flora in a very positive way. The intestinal flora has a great impact on the resistance against infections. A weak gut flora creates a weak defense against infections (the same counts for all animals and humans). Since 2014 many positive scientific reports have been published.

The probiotics are incorporated in our fish food can be fed permanently.

2 Prebiotics

Wikipedia: "Prebiotics are substances that induce the growth or activity of microorganisms (e. g. bacteria and fungi) that contribute to the well-being of their host. The most common example is in the gastrointestinal tract, where prebiotics can alter the composition of organisms in the gut microbiome. However, in principle it is a more general term that can refer to other areas of the body as well. As a functional food component, prebiotics, like probiotics, are conceptually intermediate between foods and drugs"

Very common used in aquaculture and our industry are Yeast Extracts (from *Saccharomyces cerevisiae*) with a high content of Beta-glucan as it is effective in all mammals as it is in fish and birds with its immune-enhancing properties established in a number of fish species. It has applications for prophylactic and therapeutic use. Beta-glucan may be used as an alternative to antibiotics and vaccines for protecting farmed fish against microorganisms, or microparasitic disease. It can also be used together with vaccines to improve the effectiveness and it is non-toxic to fish. Beta-glucan products have been in practical use for many years in animal feeds all over the world to improve health of aquaculture species, pets and farm animals. Pretreatment definitely increases survival rates with enhanced phagocytes function and the inhibition of cellular injury. An overall enhancement of immune response can be achieved by the use of beta glucan. This may in turn allow fish the opportunity to effectively combat disease. Using beta glucan as a dietary supplement carries the potential to significantly impact the quality of health as well as longevity.



At the same time administration in the food of bioflavonoids and Vitamin C (from Citrus fruit) with anti-oxidant and anti-inflammatory activity, especially in the intestine (gut)! This works synergistic with the glucans.

We recommend this kind of immune-stimulant food during acclimation, before shipping, after unpacking, after stress situations and during disease/treatment (also during treatment fish should be fed!).

3 Pants and plant extracts

In our experience, with trial and error during my 40 years of working between millions of fish and with exchange of data with experts in the aquaculture, we have used different kind of fresh plant (phyto-) materials, which serve as an 'aid' during treatment or for faster repair/recovery after disease.

Hereby we give you a short overview of some we have used in our work:

- Chlorella: from the freshwater algae *Chlorella*
- Garlic, *Allium sativum*
- *Moringa oliveira*
- Grapefruit Seed Extract
- *Aloe vera*
- Thymus (thyme)

- *Mentha* (peppermint)
- *Artemisia* (mugwort)
- *Stellaris* (chickweed)
- Açai berries from *Euterpe oleracea* (palmtree)
- *Sophora flavescens* (ingredient matrine)
- Lapacho (*Tabebuia*)
- Pumpkin seed extract

What are the benefits of granulated food?

We use granulated food because of different reasons that make the differences to frozen, fresh or flake food:

- 1 Granulated food can be processed in such way that it guarantees no loss of quality of the ingredients. Processing of flake food at 140°C destroys or changes many interesting ingredients.
- 2 The ingredients (fish, shrimp, vegetables, etc.) are selected and prepared without a risk of introducing (transmitting) diseases. A big risk to introduce unnecessary potential harmful bacteria with frozen or live food.
- 3 The process of granulated food allows us to coat each single pellet with natural additives. Their beneficial ingredients are not harmed by temperature and remain fully active.
- 4 Granulated food can be produced in different pellet sizes, well adapted to the different sizes of the mouths of our aquarium fish.



Pellet size S
0.2 - 0.5 mm
for fish < 2 cm



Pellet size M
0.5 - 0.8 mm
for fish > 1 cm



Pellet size L
0.8 - 1.2 mm
for fish > 5 cm



Pellet size XL
1.2 - 1.6 mm
for fish > 10 cm



Pellet size XXL
2.8 - 3.2 mm
for fish > 15 cm



Pellet size 3XL
6.5 mm
for fish > 20 cm

- 5 The granulates remain stable in the water for many hours: not falling apart and still ready to eat for the 'slow' eaters.
- 6 For most fish we prefer a sinking granulated food: slowest sinking smaller granules and faster sinking larger granulates adapted for the different fish ages, sizes and behavior;
- 7 Due to high nutritional content, the quantity of food to be used is much less in comparison with non-granulated fish food.
- 8 The cost of feeding granulate food is lower than most ordinary flake, frozen or live food.

What problems of fish health can be prevented with food?

- 1 Overfeeding is problem number one for many aquarists.

Many people give cheap, inadequate food. Then they have to give large quantity of this poor quality food to make fish somewhat happy.

Some people think that fish are always hungry because they are begging for food. This is a wrong idea. It is conditioning behavior of the fish like Pavlov's dog.

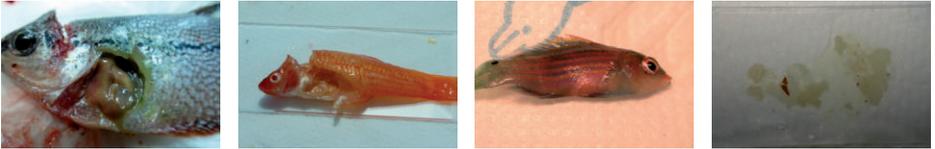
Please just feed one or two times a day with a high quality food. Do not try to save on expenditure of fish food since it is a very small cost for fish with a rather small mouth. As many hobbyists also have a cat or dog they can compare it with the much more expensive bags of cat or dog food they have to buy for them.

- 2 Lack of food / Lack of good feeding practice because of
 - a) competition between the species or mix with other fish e. g. Clown loach mixed with other fast eating fish like Rainbow fish.
 - b) The fish is not able to reach the food (e. g. Plecostomus as "cleaner fish" not getting any food.



This can be prevented by using good granulated food.

3 Poor food quality by poor ingredients, lack of high nutritional value, is a common problem for wild fish that lack good food sources. Many are too skinny. Another problem in farming fish is caused by using very cheap, low grade food. Some use chicken food! These fish are very weak, no cure is possible and wholesalers or shops have daily or weekly losses. See examples in these pictures of Pearl gourami, Swordtail and *Pseudocheilinus hexotaenia* with pale, fatty organs (especially the liver).



All these "bad feeding" leads to bad organs and a failing immune system. The fish becomes weak and gets infections, diseases, which are difficult to cure. Some blame it on a bad medication but it all goes back to a failing nutritional approach and because the fish is too weak to cope with the infection.

Is feeding high quality food expensive?

Our aim: Learn to understand that your investment in fish food is a very small expenditure in comparison with the benefits of more healthy fish and less medications, less diseases, less losses, less spoiled water, etc.

The price of food mainly depends on its ingredients. It is obviously cheaper to produce food with fish-meal, a high content of cereals and a low content of fish oils than producing high quality food which is produced using fresh wild fish as main ingredient, is very rich in healthy, good digestible fish oils with high content of Omega-3 and low content of cereals, just the required quantity to have food consistent enough. But the price of a high quality food does not necessarily mean that feeding fish is more expensive as the amount of food to be used depends on the energy-giving value and digestibility of the food itself. Thus digestibility of carbohydrates is only 40 %, whilst that of proteins and Omega-3 fatty acids from fresh fish is over 90 % (digestibility is the amount of food that is assimilated by the organism and is not eliminated as waste through excrements). On the other hand, fish oils' energy value is more than twice of carbohydrates! All this means that you will save around 50 - 60 % of costs if you use pellets with high energy value and digestibility instead of conventional foods.

Therefore the cost of feeding fish with a high quality food is considerably lower than using other food with a cheaper price. In addition to that higher digestibility and usefulness of this food makes the pollution in the aquarium water produced by excrements is notably reduced and, last but not least, fish will be healthier and stronger, and less prone to catch diseases.

What about food safety? Animal welfare? Environmental and ecological care?

1 Standards of Bio safety & sustainable & animal welfare

The GLOBAL G.A.P. Aquaculture Standard sets strict criteria for Legal compliance, Food safety, Workers' occupational health, safety and welfare, Animal welfare, Environmental and ecological care. (http://www.globalgap.org/uk_en/for-producers/aquaculture)

2 Sustainable marine products supply

IFFO is the international "non profit" organization that represents and promotes the fishmeal, fish oil and wider marine ingredients industry worldwide. We are globally respected and regularly represent the industry at international forums, as well as holding observer status at the UN Food and Agriculture Organization (FAO) and the EU Commission and Parliament. (<http://www.iffonet>)

3 Basic ingredients of DR. BASSLEER BIOFISH FOOD have Certified production: ISO 22000.

4 Food safety controlled by FAVV (= Belgium Food Safety Authority)

(<http://www.favv-afsc.fgov.be/about>)

The FASFC is an executive body and has jurisdiction over the entire territory of Belgium. In accordance with its legal obligations the FASFC is responsible for laying down, implementing and enforcing measures related to food safety, animal health and plant protection.



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DR. BASSLEER BIOFISH FOOD is internationally distributed by Aquarium Münster.

Fish like Aquarium Münster which is no surprise, as the wellbeing of fish is being cared for with great commitment by the third generation.

Efficient remedies against diseases which were not curable for a long

time have been developed and the living conditions for healthy fish have been greatly improved. Foods, remedies and care products are the focus today. With these products we can assist aquarists and garden pond owners all over the world.



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