

Quoted from Diskuszucht-Piwowski FAQ

I keep my fish in tap water from Siegerland. It comes from the line with values between 180 and 200 microsiemens and a pH of around 8.3. The total hardness is about 5.5 ° and the carbonate hardness is about 3.5 °. In the aquarium, the nitrification reduces the pH to between 6.0 and 7.0. At the same time, the conductivity increases to around 200-250 microsiemens due to the nitrate that forms. The nitrate content is between 25 and 150 mg / liter. In the breeding tanks I try to keep the nitrate content between 25 and 50 mg / liter. The water temperature for breeding is around 28 ° C and for rearing between 28 and 30 ° C. But my fish can also be kept in slightly harder water without any problems. I don't want to give any limit values because I think that there is no scientifically based information. But from the experience of my customers, who have different water values all over the world and from conversations with professionals from aquaculture, the conductance does not seem to play a major role as long as it is fresh water. Even fish from soft water areas seem to be very adaptable. I heard the most extreme values from Israel, where an acquaintance raised hundreds of thousands of discus fish with conductance values between 800 and 1200 microsiemens and they were very healthy. So before you try to lower your tap water from 550 microsiemens to 200, just leave it at that. It is cheaper, easier and does not run the risk of getting bacteria into the aquarium from contaminated osmosis systems, demineralizers or from activated carbon filters and cartridge filters. This is much more dangerous for the fish than a few hundred microsiemens more.

Frequently asked questions and some of my experiences with discus

At which water values do you keep your fish and do I have to adjust my water?

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How much water should I change?

That depends on the stocking density of the aquarium and thus on the amount of feed that is fed daily. In a show aquarium with only one large fish on 50 liters of water, a 30% water change every 1-2 weeks is sufficient. But if you

want to raise a lot of fish in a small space, you have to change a lot more water to dilute the metabolites. I change about 20-25% a day in rearing. You can change up to 80% a day, which benefits the growth of the fish. But then it becomes very expensive and, in my view, does not necessarily have to be.

What type of filter system should I use?

It does not matter! It doesn't matter at all whether you operate a pot filter, a multi-chamber biofilter, a trickle filter or a Hamburg mat filter. Basically, the same thing happens biologically in all filters. It is crucial for every filter that it is designed in such a way that it can reduce the amount of excretions that regularly accrue. Therefore, there is a lower limit for the volume (and thus the amount of microorganisms, fungi and bacteria) and also for the flow. A living room aquarium with few fish can be operated without problems with a pot filter with a volume of about 1-2% of the tank volume at 1.5 to 2 times the circulation rate. A heavily populated rearing aquarium, on the other hand, requires 5-15% filter volume at 3-4 times the circulation rate. The degradation performance even increases up to 6 times the circulation rate. This is also logical, since the metabolic products are created in the aquarium and accumulate there. If the filter runs very slowly (e.g. with only a single circulation per hour), it takes a long time until all excretions are removed. Assuming that a filter would degrade 100% of the degradation products in a single pass, then after an hour not around 100% of the toxins in the aquarium have been degraded, but only about 65%, because the clean water from the filter keeps flowing through the current mixed with the contaminated water. On the other hand, if the filter runs at three times the circulating capacity, about 97% of the contaminants have already been broken down after an hour. In my opinion, this is very important for the health of the fish. There is also something fundamental to consider when designing the filter: feed must never get into the filter. No matter how good a filter, this cannot be broken

down easily. The feed would rot and produce unnecessarily many bacteria and toxic substances. Feces, on the other hand, are much easier to dismantle for a filter because a large part of the feed has already been broken down in the intestine of the fish by enzymes and bacteria. The rest is done by water mites, worms, unicellular organisms, fungi and bacteria in the filter. To ensure that no food can get into the filter, it is important to have a good pre-filter that stops the coarse dirt and is cleaned regularly. I do this every day in my rearing aquariums. In sparsely populated systems only about every 3-4 days.

What do they feed and how often should the fish be fed?

Our smallest fish up to about 6 cm are fed 6-8 times a day. Then they are transferred from the breeding facility, which is in my house, to my breeding facility in the basement of my optics store, where they are only fed three times a day from Monday to Friday, twice on Saturdays and Sundays. The types of food change from time to time. I have had the best experience with beef heart mixtures and with granulate feed. The brand doesn't seem to be that decisive. I regularly feed red mosquito larvae and brine shrimp to my breeding animals on natural food types. Every now and then my little fish get daphnia, salt water cocepodes and moina.

Are your fish free of parasites?

Yes, my fish have no real parasites. They only have a harmless type of flagellate that cannot be classified as parasite.

Can I socialize your discus fish with other fish?

Of course you can socialize my fish with other fish, provided that they have the same requirements as discus fish and are not aggressive to them. Since there are hardly any other parasite-free fish, my discus fish will of course no longer be parasite-free after socialization. But from 20 years of experience with parasite-free fish, I can only say that this is not a problem for my fish. They are particularly robust. There is a small limitation, however, and these can be bacteria with which the "newcomers" cannot cope. In the 80s and 90s this happened a lot. Nowadays I hardly hear anything about it anymore. The probability of something happening is very low.

Should I use a UVC clarifier or ozone?

There is nothing to be said against a UVC clarifier. I also run a lot of them. But I have the feeling that I am only heating the water with it. At the end of 2018, I built a new system that consists of two identical circuits. There I raised a lot of fish to beautiful, big and healthy fish. It was only after more than a year that I realized that the UVC clarifier in a circuit was not switched on. Despite the high stocking density in the two circuits, I could see absolutely no difference in the fish.

Another example also speaks against the effect of UVC clarifiers. In the many years in which I have been dealing intensively with discus fish, I have also had problems with incorrectly constructed filter systems in which many (especially anaerobic) bacteria had formed. Despite these strong UVC clarifiers, the fish do not feel well in these systems and have even died in some cases. Changing the filter immediately brought resounding success. But not the UVC clarifier.

While UV light is generally not harmful to fish because it does not get into the aquarium, the use of ozone can lead to very big problems. I have tried ozone several times in the last 20-25 years and every time I have had great success (super clear, very low-germ water and also better growth of the fish). But every time it tipped over and damaged the fish, me and plastic parts in the aquarium and fish room. At some point the fish got holes in the forehead area and almost overnight. Too much ozone had been released into the air twice and I was unable to speak for almost a day after an hour working in the system. And a few times after a few months, many plastic parts in the breeding room broke (lamp housing, cable insulation, etc.) and once a filter sponge that was blown by ozone-containing water dissolved. From today's perspective, I think that the use of ozone is a delicate undertaking, which is not absolutely calculable, even when controlled by a redox control device. Change water more often. It is safer.

My fish are scary. What can that be? And: "What can fish make so sick?"

It happens again and again that discus fish become frightened. However, the reasons for this can be very different and it is not always easy to find the exact reason.

The common cause of frightening fish is the wrong location of the aquarium, where shadows fall into the aquarium and rooms where there is too little activity. If the fish are alone for 10 hours and then suddenly someone enters the room, they can shoot wildly through the aquarium. Fish in aquariums, which are set up in highly frequented rooms, never really react frighteningly. They are used to the movements and they do not let them get upset.

But there are also many other reasons that make discus fish frightening and they almost always have to do with the water. It's chemical or biological poisoning. I can give some examples from my own experience and from the experience of friend discus breeders to give you an impression of what can lead to problems.

About 20 years ago I wanted to do something good for my fish and connected an additional pot filter with a 2 meter hose from the hardware store to a 2000 liter system. The next day the fish shot wildly through the aquariums. The problem was immediately clear. The hose was exchanged for a much more expensive PVC hose from the aquarium trade and almost all of the water was changed. The next day everything was fine again. The hose from the hardware store smelled strongly of chemistry. The two-meter 1-inch hose had been enough to poison the water. I should have smelled the hose before, then I would have saved the stress and the fish the toxins.

About 15 years ago I wanted to increase the filter volume in a 10,000 liter circuit and installed 700 liters of blue filter foam. Here, too, the fish shot wildly through the aquariums the next day. I had the water examined in the laboratory and a toxin was found that is not actually found in the sponge. There were only two causes for the "origin" of this substance. Either it was formed from the sponge by the ozone that I was using at the time, or the sponges brought this material with them because it adhered to them (e.g. insecticides in a warehouse). After the sponges were removed and the water changed, the spook was over.

A good friend also had problems with insect boilers who put a large amount of Moorkin roots in the aquariums as decoration. With old roots, there are often problems with the rotting of the roots (which you can clearly see if you

smell the damp roots), but in this case the roots were new. The research then brought the insecticides to light.

A year ago I put a 5000 liter aquarium into operation and wanted to “decorate” it a bit and covered the bottom about 4-5 cm high with fine sand. As long as the fish were still small and needed little food, the aquarium worked very well. Suddenly the fish became more frightened and ate less. I started to "burrow" the bed every day with a broom to remove food residues "buried" from the fish when eating in the bed. All without success. I then removed half of the sand (it stank terribly). Still, there was no improvement. Only when all the sand was removed did the fish start to behave normally again.

Three other examples go in the same direction of bacterial problems, which did not lead to increased fright, but to cracks in the dorsal and anal fins. It was always anaerobic bacteria. Once they were created in a 1400 liter biological nitrate filter that I operated with vodka. The effect of the filter on the water values was phenomenal. It ran in within 10-14 days and reduced the nitrate content in a 10,000 liter system to below 10 mg / liter. Unfortunately, the back and anal fins of over 1000 juveniles tore within a few days. After switching off the filter, this no longer happened.

I had the same phenomenon again years later. I used a filter to remove iron from the water. Such a filter consists of an approximately 150 cm high pressure tank made of GRP with a diameter of 25 cm. It is filled with mineral granules (similar to sand) that hold the iron in place. Such filters should be backwashed regularly in order to remove the deposits. This requires enormous water pressure and a large amount of water, which loosens and cleans the filter bed. Unfortunately, I did not have the right ratio of pressure and amount of water, which caused channels to form in the filter bed, which

in some areas led to anaerobic zones. Here, too, the fins of the fish tore through the anaerobic bacteria.

A third example with exactly the same symptoms happened to a friend through a water softening system, as is often used in areas with hard tap water to protect the pipes. Instead of the mineral granulate, a cation exchanger is used to exchange calcium and magnesium ions for sodium. Here too there was channel formation due to insufficient backwashing and thus to anaerobic zones.

To clarify the dangerousness of anaerobic bacteria, I have a fourth example, which I could hardly believe myself. I have always made a lot and once I built an incredibly large moving bead filter. It was a wooden box measuring 320 x 100 x 100 cm, which was lined with pond liner on the inside. The pond liner had overlapped on the narrow ends, like a package that you pack for Christmas (just the other way around; from the inside, not from the outside; I hope you understand what I mean). For months I had problems with my fish. They were more frightening, they ate worse and the colors weren't as bright as usual. At some point I went into the filter to see if there was anything wrong. I found about 6-8 liters of the filter material behind the folded pond liner. There was hardly any water circulation here (the filter material also stank a bit). After venting these problem areas to water circulation, the problem was resolved immediately.

And I got another interesting insight by using the Moving Bead Filter in combination with a drum filter with 40 micron filter fineness as a pre-filter.

This combination provided sensational water values. Unfortunately, my fish did not feel comfortable in this circuit, although it was so professionally

constructed. I didn't know my fish again. I thought it was the stainless steel of the drum filter, which maybe releases some metallic toxins into the water. But that was not the problem. A friend visited me at a meeting of our discus club and immediately after entering the fish cellar said, "Something is wrong here. It doesn't smell right. And I had been unhappy with this system for months. My friend advised me to install a sponge filter in addition to the moving bead filter. I did that and within a few weeks the plant smelled like nature again, like damp forest floor. It no longer smelled and the fish showed beautiful colors and behaved normally again.

My insight from this event (and a few more similar ones, which I cannot write all of them down here) is: it is not the bacteria that make up a good filter, but the multitude of different microorganisms that have to be in a certain balance with each other the system works. With the drum filter I had removed all water mites, worms and unicellular organisms from the circuit. This led to a shift in the balance in favor of the bacteria and / or fungi. This is also logical, if I filter out the predators at the top of the "Destruents" food chain from the system, the smaller ones can multiply more. Unfortunately, this only seems to be good for the water, but not for the fish. The predators of bacteria and fungi keep their amount within a certain range. If they are missing, the balance shifts in a biologically unfavorable direction.

I hope you have been able to gain some knowledge from the events described that will help to offer your fish the best possible environment. With a little care, that's not a problem.

In summary, the following things are very important:

Under no circumstances may any substances be installed in the aquarium (equipment, hoses, adhesives, substrate, metals, etc.) that could only bring the smallest amounts of toxins into the aquarium. You can rely on your nose.

If something smells unpleasant, do not install it in your aquarium. The predicate, "suitable for aquaristics", or even "food-safe", should not be trusted "unruly". I recently ordered around 40 wide-neck drums for the construction of trickle filters. When I opened the first barrel and stuck my nose in it, I almost fell over. The barrels stank so much. The smell was unbearable. At first the seller said he had an opinion confirming the food authenticity of the barrels. After I told him that I would sue him for several hundred thousand euros in damages if my fish would die, he immediately wrote back that I should under no circumstances use the barrels on my aquariums. They would not be suitable for this. Unfortunately, a lot of "junk" is sold today because customers are too stingy and sellers are too greedy.

There must also be no "dead water zones" in the filter, in the aquarium or in upstream water treatment systems such as softening systems, carbon filters, candle filters and osmosis systems. The bacteria that arise in my opinion make almost the biggest problems in discus keeping.

The two above "Problem areas" probably cause significantly more problems than parasitic diseases. Therefore, before treating your fish without diagnosis of suspected parasites, you should first consider whether something is wrong with the system. Almost always, when discus holders call me and complain about supposed illnesses of their fish, it is a question of poor husbandry conditions, which arise from ignorance or inattention because the holder is not sufficiently concerned with the aquarium system.

If you have any questions about the actual parasitic diseases of your fish, please do not hesitate to contact me. But because my fish have been free from parasites for over twenty years, I have no personal experience in this area and would have to refer to the relevant literature myself. Therefore, it makes more sense to contact a specialist in fish diseases directly. I am happy to help with the mediation.