

fair
fish



fish-
facts



Reduce suffering in fisheries:
first results of our research



(Photo: Sebastian Scholz)

Cover photo: A fisherman on a local boat at Deepor Lake in Assam, India.

(Photo: Jaywithdev/Wikimedia)

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Breakthrough due to fair-fish

After 25 years of lobbying and research, fair-fish is pleased that the EU is now taking fish welfare in aquaculture much more seriously and is establishing a reference centre for fish welfare. With the fair-fish database (formerly FishEtho-Base) and the development of animal welfare criteria, we have helped to prepare the ground for this.

A report¹ that fair-fish contributed to on behalf of the European Union's Advisory Committee on Aquaculture (AAC) was also helpful. The report points to the need to improve animal welfare in aquaculture.

The next big step is to reduce the animal suffering in deep-sea fisheries, a huge global industry, which is not perceived by society. fair-fish is working with project partners to develop the basis for this as well.

Fausta Borsani

Executive director fair-fish

¹ aac-europe.org/en -> Recommendations -> Reports -> "Using ethology to improve farmed fish welfare and production"

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Reduce suffering in fisheries

Overview: Carefish/catch, our research project to reduce animal suffering in fisheries, is making progress.

In cooperation with four project partners, we are investigating the question of animal welfare in fishing, which has received little attention so far.

Expansion of the database

The fair-fish database (once FishEthoBase) is being expanded by a second part that summarises animal suffering in different fishing methods and possible improvements. The structure is already in place, and the first profiles of fish species and fishing methods have been developed (see page 3).

Research in the laboratory and at sea

The Portuguese project partners CCMAR and FishEthoGroup have developed a viability scale and protocols to assess the condition of caught fish. For tram-

mel nets (three-layer gill nets), concrete measures to reduce animal suffering have already been defined. Samples are taken from the catch on board fishing vessels to assess the condition and vitality of different fish species and to measure the level of stress in their blood (see page 4).

Guidelines and feasibility

One of the main objectives of the project is to develop guidelines for the “Friend of the Sea” label, which, as a project partner, first helps to define the fish species and fishing methods to be studied (see page 6).

The DeMoS Institute analyses the economic feasibility of such guidelines. It takes an artistic approach to individual engagement with fish and conducts intensive discussions with interest groups such as fishers and consumers. The results are evaluated with the help of a mathematical model (see page 7).

Andreas Stamer, Billo Heinzpeter Studer

Herring swim in huge schools and end up in large numbers in the net and as biomass on board — here is hardly any time for consideration for the individual animal. (Photo: marneejill/Wikimedia)



How painfully do fishes die?

As part of the Carefish/catch project, CCMAR is conducting experiments to investigate the animal welfare consequences of different fishing methods.

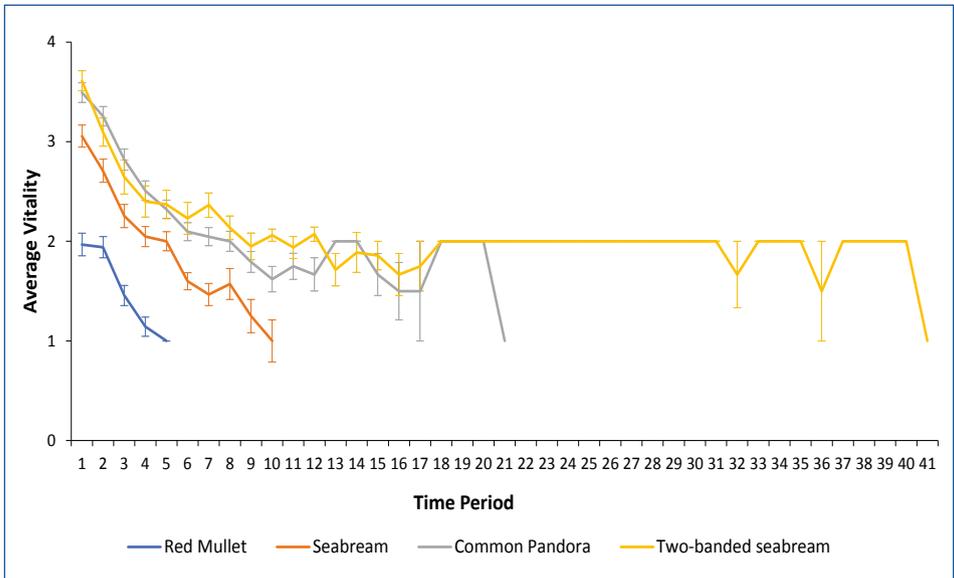
The Centre of Marine Sciences (CCMAR) identifies the potential to mitigate animal suffering and improve product quality in order to propose innovative and alternative methods or recommend other best practices.

Fishing methods under test

We are testing five different fishing methods: gillnets and trammel nets (comparable in terms of performance and

harm to the fish caught), purse seines, angling, longlines and traps. In doing so, we combine two approaches. Firstly, we assess the vitality of the captured fish upon arrival on board using a decreasing scale (e.g. from free movement to death). As such, we document the treatment of the animals until they are killed and stored—for each target species of each fishery. Secondly, we take blood samples at each level of the vitality scale and test them for fast-acting and quantifiable stress indicators (e.g. cortisol, glucose, lactate, osmolality), thus inferring the stress caused by the observed fishing practice. The approach derives from established methods to assess pain, stress

*Figure 1: Average vitality for 4 targeted fish species in a gill net fishery: Red mullet (*Mullus surmuletus*), Common pandora (*Pagellus erythrinus*), Axillary seabream (*Pagellus acarne*), Two-banded seabream (*Diplodus vulgaris*) in 11 sampled trips. Vitality scale: 1 = dead; 2 = lethargic; 3 = less active; 4 = highly active. Time period refers to observations at every minute for red mullet and every 2 minutes for other species. Bars for standard error.*



and negative affective states in aquaculture. However, 1) the methods must be adapted and validated to a much more dynamic environment in fishing boats than in fish farms, and 2) little or nothing is known for many of the species that are caught. By combining our expertise in assessing welfare (or lack thereof) in fish farming with a solid experience in fisheries, we can discover something very new: insights into the suffering of fish while being caught at sea, and possible ways to mitigate such suffering.

Consequences of gill netting

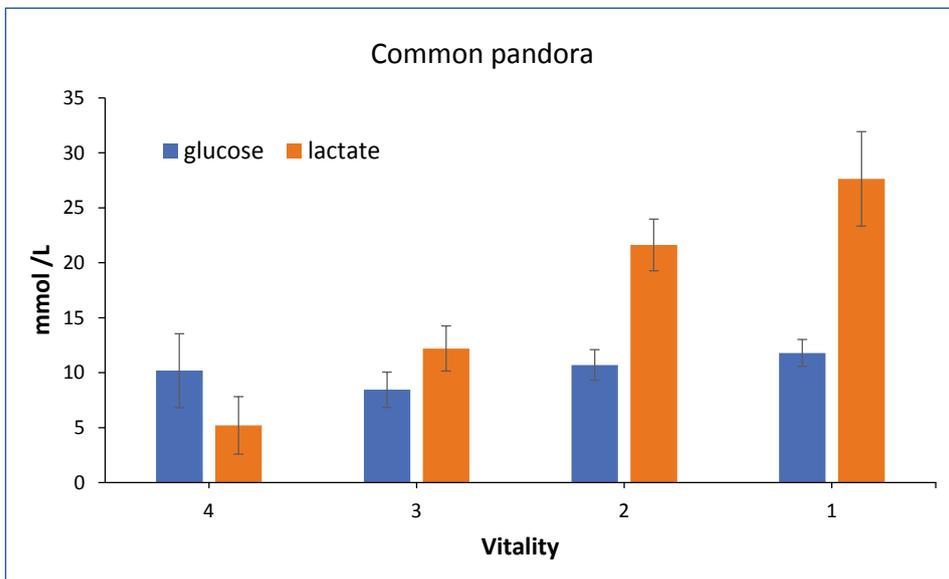
In 2022, we focused on the impacts of gillnet fishing. We assessed the loss of vitality associated with stress measurements in four fish species. This revealed that some species are already dead or

die very quickly when they arrive on deck (e.g. Red mullet, *Mullus surmuletus*), while others take a long time to do so (e.g. Sparids/Sea breams) and therefore suffer the most (Figure 1). Preliminary data suggest that loss of vitality correlates with high glucose levels and increasing plasma lactate (Figure 2). It is therefore crucial for net fisheries to implement procedures to improve welfare on board for fish species that die slowly. Ana Marçalo¹, Rita Costa¹, and João Saraiva^{1,2}

¹ Centre of Marine Sciences (CCMAR), Faro, Portugal

² Fish Ethology and Welfare Group, Olhão, Portugal

Figure 2: Preliminary plasma glucose and lactate values for *Pagellus erythrinus* (Common pandora) sampled onboard of a gill net fishery. Blood samples were collected according to the defined scale of vitality (see figure 1). Bars for standard error.



How to reduce suffering?

In the Carefish/catch project, fair-fish is compiling a database on animal suffering in fisheries and possible improvements in fishing methods.

The new database serves two project goals: We want to assess the global animal welfare impacts in fisheries. And we want to identify the potential of reducing animal suffering in various fishing methods and species.

fair-fish database/catch

To do so, we will extend the framework of the established fair-fish database (once FishEthoBase) for aquaculture with a novel branch to include welfare issues in fisheries. Guided by the question “What is the probability of least stress in fisheries?”, we aim to cover a selection of criteria inherent to the catching process of the most important catching methods.

Under each criterion, we ask two questions: What is the situation for fishes given the standard gear and procedure? And how could this situation and the stress involved be improved, e.g. by changing the gear or the procedure?

Data for versatile use

As one result, the user looking from the perspective of the species will find the catching method that least stresses the species, including the responsible gear details if available. By also assembling all relevant information on the fishing method, the user looking from the perspective of a specific method will find the species least stressed by the method as well as tips on improvements to reduce stress and suffering.

Our consortium partner Friend of the Sea will use these results as a basis to take up welfare-related aspects into their certification scheme.

Jenny Volstorf, fair-fish international

Immediate stunning and killing are measures to reduce animal suffering, but are still the great exception in fishing — for example on a cod cutter in the Baltic Sea (left) and in Senegal (right) by using the fair-fish stick. (Photos: Studer/fair-fish)



From results to guidelines

Leading fish label Friend of the Sea is the practice partner in the Carefish/catch research project.

Friend of the Sea has become a leading certification standard for products and services that respect and protect the marine environment. The certification recognizes sustainable practices in fisheries, aquaculture, fishmeal and omega-3 fish oil. Friend of the Sea also promotes pilot projects in restaurants, sustainable shipping, whale and dolphin watching, aquariums, ornamental fish, sunscreens, etc.

Fish species and fishing methods

Within the Carefish/catch project, our main task is to develop new certification standards for the reduction of animal suffering in fishing. The aim is to translate the scientific results of the partners involved in the project into the language of certification. To this end, we are assisting partners in determining which fish species and fishing methods to study, relying on fisheries that have a valid Friend of the Sea certificate.

To date, we have provided a detailed list of certified species and worked with partners to select the most appropriate species for this project. With a similar analysis, we selected the order of fishing methods to be studied in the project, according to their commercial importance and distribution. In addition, we provide continuous scientific and technical support to all the partners involved.

*Mario Passoni and Andrea Pica
Scientific department, Friend of the Sea*



Bonito, a small tuna species, is often caught with long fishing rods, a particularly environmentally friendly method. The bonitos, fed with small fishes, bite every rod in a feeding frenzy. Catapulted aboard in rapid succession, they die injured and (so far) without anaesthesia. The picture shows FOS-certified fishing in the Azores. (Photo: F. Tavares)



Octopus fishermen in Mauritania. Even artisanal fisheries have so far shown little consideration for the animals, but it seems that they are more likely to comply with animal welfare regulations than industrial fisheries. Our research project will show. More than half of FOS-certified fishing is artisanal. (Photo: Uzabiaga/Wikimedia)

Levers for change in fishing

How can we develop better fishing practices in an economically feasible way? A sensitive approach.

Understanding the economic feasibility of the Carefish/catch project recommendations implies considering a set of complex situations such as the well-being of fishers, the structure of the fish market, the needs and knowledge of consumers, or cultural heritages that have shaped our ways of fishing, selling and consuming fish. We observe that the markets being driven by conservative economic forces, only a change in demand will be an effective push for transformation. We thus focus the first part of our research on consumers who, at one end of the chain, can become effective drivers of change.

Finally, as scientific knowledge is not enough to change our behavior (think of the climate emergency), we create situations that involve us emotionally. Our hypothesis is that the economic value we

give to things is transformed by the story in which the exchange is taken.

A community of affects

Our first experience, *The Wake*, is a talking circle during which each participant shares an emotionally striking encounter with another member of this family-ocean: fish, diver, fishmonger, fisherman... *The Wake* fostered the curiosity of participants towards each other, helping to create a more tightly-knit community. This first exploration guided us in developing a sensitive approach for interactions with consumers.

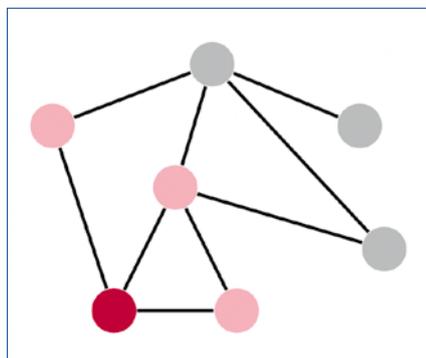
Cooking the ocean family

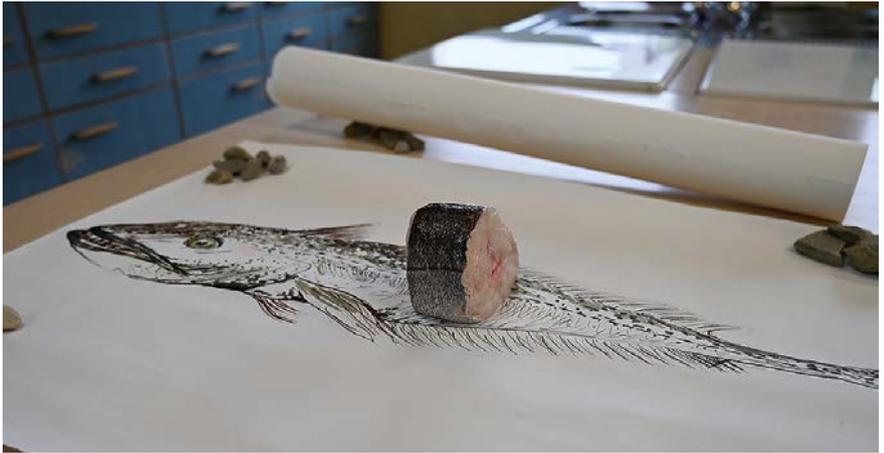
Held over a period of six months, *Cooking the ocean family* is a series of meetings involving consumers. At each meeting, a participant brings a fish recipe which they are emotionally connected to. This could be a recipe passed down by a relative or one that belongs to the participant's cultural identity. During each

The Wake, part of an installation, 14 films testifying to significant encounters within the ocean family, second-hand phones, sea salt. A DeMoS production for Carefish/catch project. (Photo: © H el ene Gugenheim/Adagp 2023)



A social network in which nodes represent consumers, while ties between nodes represent interactions between consumers. The purple node is an infected consumer, and we depict in pink its susceptible neighbors.





Cooking the ocean family, the making of Therese's "Fish bread", November 10, 2022. Hake steak placed on a drawing illustrating the entire body of the fish before being cooked. Centre social de Courteille, Alençon, France. A DeMoS production for Carefish/catch project. (Photo: © H el ene Gugenheim/Adagp 2023)

meeting, cooking ingredients are then mixed with the participant's biographical story as well as with biological, ethological, economical and historical facts that help us in bringing the particular fish closer to us. While preparing the dishes we look for gestures to create awareness in the process of transforming a dead living being into a cooking ingredient.

A mathematical model

In a group of individuals who interact with one another, a small minority that holds a viewpoint different from the majority may cause significant changes in the group's overall opinions. Think for instance of the spread of cultural trends, or the outbreak of political turmoil. Such phenomena can be examined using mathematical models called contagion models on social networks. In such a model individuals are represented by nodes, and two nodes are connected if two individuals interacted over a specified period of time. One then studies how individuals who are "susceptible" at

a given point in time can be influenced by their "infected" neighbors.

Using such a model, we study consumer interactions, based on the *Cooking the ocean family* events: through interviews we analyse how the participants' awareness of fish welfare changes, and in turn the influence that such changes have on the participants' own social network.

*H el ene Gugenheim and Nina Otter,
DeMoS Institute*

Visualising the fair-fish database

In 2021 DeMoS ran a bootcamp involving 12 students from all over the world to develop a new visualisation concept for the scores in the new fair-fish database. A first implementation can be seen at <https://fishethobase.net/db/>.

Can aquaculture deliver?

Fish farming is seen as an alternative to overfishing and a guarantee of enough fish on the dish. Wrong, a study finds.

Farmed fishes account for more than half of all fish meals worldwide, and have done so since 2013. In 1974, the aquaculture share of fish consumption was only seven percent. In 2020, when a total of 177.8 million tonnes of aquatic animals were killed, aquaculture accounted for 87.5 million tonnes and wild-caught for 90.3 million tonnes, of which 20.4 million tonnes were used as feed for animal fattening, mainly in aquaculture.

Fish farming reached its peak

The enormous growth of aquaculture since the 1950s led to the assumption that aquaculture would continue to grow and would be able to cope with the increasing fish consumption per capita in the future, despite stagnating fish catches since the 1990s.

An international research team contradicts this optimism in a study. The growth of aquaculture had already peaked decades ago on all continents and for all fish species. Of all species, growth has declined the most in those that do not require fish in their diet and are most likely to thrive in breeding.

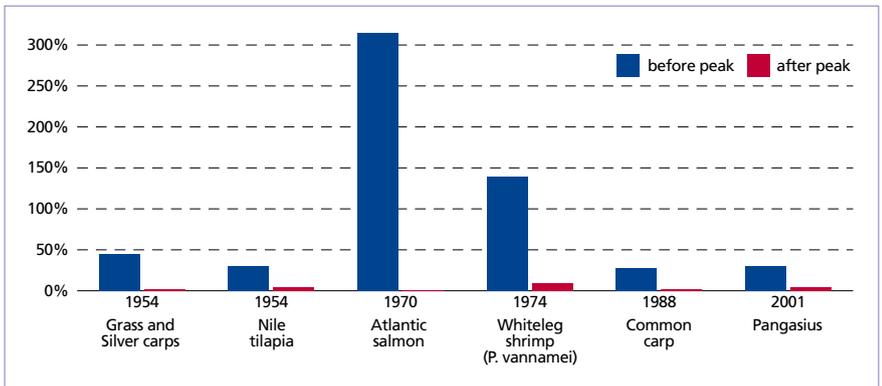
Don't forget the fishery!

In order to meet the expected fish demand of 173 million tonnes in 2030, aquaculture would have to grow by two percent annually — which the study authors consider impossible. On a limited planet, even this growth has its limits. According to the authors, it would be wiser to focus more on fisheries again, which would yield 16 million tonnes more per year if managed sustainably — or even 50 per cent more wild fish on the table if no more fish ended up in animal fattening.

Billo Heinzpeter Studer

More information & sources:
fair-fish.ch/blog/2023/01/23

The decrease in aquaculture growth for six selected species, each averaged over the five years before and the five years after the year with the highest growth (peak).



News from fair-fish

Join forces with us!

Discuss with us — at fair-fish.net/en/ally you will find two surveys.

In the first survey we want to know how we should promote fair trade in fish. First convince the fisheries? Or the retail trade? Or the consumers? Where do we have the best chance?

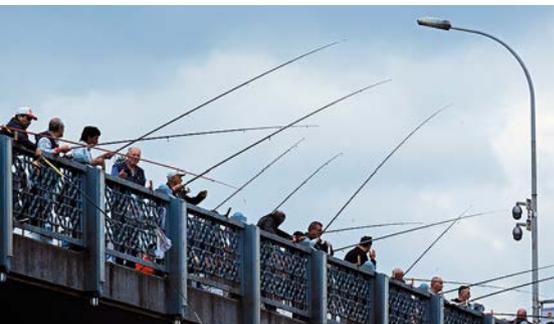
The second survey is about how strict our evaluation in the FishTest should be in order to help you choose the best fish — in terms of animal welfare and ecology. So that fair-fish can work even more successfully for fish and their habitat: Become a fair-fish ALLY to have your say. And as a fair-fish ALLY you make a decisive contribution to swarm intelligence! fair-fish.net/en/ally

fair-fish database

fair-fish international has been operating an internationally known and used database since 2013, so far called FishEtho-

Eat fish? And if so: which one, from where, how was it caught? Our FishTest provides information.

(Photo: Mostafameraji/Wikimedia)
fishtest.net



Base. We changed its name to “fair-fish database” in the intent to make clear that the database represents a pioneering achievement and a core competence of fair-fish.

With fair-fish database we are preparing the ground to establish animal protection criteria in fisheries and fish farming. The database is the backbone of fair-fish. Jenny Volstorf has been involved since the beginning and is now leading the work. She and her colleagues Maria Cabrera and Caroline Marques Maia collect, systematise and evaluate all the knowledge about the behaviour of fishes in the wild, in aquaculture and during capture. And they make this knowledge accessible to everyone.

Whoever wants to find out about the welfare of over 80 species in aquaculture can now find the answers here: fair-fish-database.net

Fausta Borsani

*The rainbow trout (*Oncorhynchus mykiss*) is a popular edible fish from aquaculture. However, the welfare of this fish species scores poorly in the fair-fish database. The same applies to all salmonids.*

(Drawing: Timothy Knepp/U.S. Fish and Wildlife Service)

fair-fish-database.net/db/30



FishTest also for aquaculture

Our shopping guide FishTest assesses fish welfare during catching. Now we also want to assess fish welfare in aquaculture.

The FishTest guides you through a menu that asks for specific criteria for the planned fish purchase and evaluates them step by step. Your own consumption behaviour also influences the final evaluation. So far, the FishTest has been limited to wild catch. Now we are working on expanding it to include fish from aquaculture. We assess three aspects: firstly, the fish welfare potential according to the fair-fish database (formerly FishEthoBase), secondly, the impact on the environment and thirdly, the use of fish meal and fish oil from marine catches.

So far, only the "Friend of the Sea" (FOS) label has included fish welfare criteria in its aquaculture standard, based on re-

search by fair-fish. However, the fish welfare potential of the currently FOS-certified species is below our assessment limit. Even including organic labels, we can only recommend a maximum of four farmed fish species.

Billo Heinzpeter Studer
fishtest.net

FishTest: What do you think?

To assess the welfare of farmed fish, we want to rely on the fish welfare potential of the respective species in the fair-fish database. However, we only know whether a fish farmer is exploiting this potential if he is affiliated to a label with fish welfare guidelines. What is your opinion: Should the "fish test" be strict and insist on a fish welfare label? Or should we also rely on the self-declaration of fish farmers? You can vote here: fair-fish.net/ally

Hauling in a beach seine in the Philippines. The FishTest rates hauling to the beach as potentially harmful and favours hauling away from the beach, towards a boat.
(Photo: Bernard Spragg/Wikimedia)



Successful school project

After the first seven visits in Swiss primary schools, we are pleased to say that our project has met with curiosity, interest and enthusiasm.

From September to December 2022, I visited various classes in grades 4 to 6. I have continuously supplemented the school material with games and illustrations to make the topic even more tangible for the children. Another lesson is planned around the question of how I, as an individual in Switzerland, can help to protect the oceans and their inhabitants. What everyday actions affect the fishes and the oceans? Where is there hope in all the problems that are happening in and on our oceans? The school project will enter its second round in August 2023.

Would you like to support the implementation of many more school visits? Your donation will help. Thank you!

Larissa Puma

Ornamental fish welfare guide

Where can I bring the fishes to when I have to close down my aquarium? The fair-fish run online guide aquarienfish.ch can help here, too.

Anyone who buys an aquarium is making a long-term commitment: some fish species can live for 20 years or more. However, certain life circumstances may force you to give up your aquarium. What to do then is explained by aquarienfish.ch. In the sense of an emergency solution, we also point out existing fish shelters, some of which are supported by fair-fish.

We are constantly working on further content and are adding new species profiles, articles on diseases and more to the website aquarienfish.ch. We depend on donations for this expansion.

Rolf Frischknecht

**Thank you for your donation to fair-fish international:
CH51 0900 0000 9136 2602 9**

A school class at fishing (Photo: Antonella Breglia)



Living beings — not decoration!

(fb) On the morning of 16 December 2022, a catastrophe occurred at the Radisson Blu Hotel in Berlin: Probably due to material fatigue, the tank of the one-million-litre giant aquarium “AquaDom” collapsed. All 1500 animals, 97 different tropical species, were washed down to the third basement level and onto the freezing street. The vast majority of the animals froze to death and suffocated. The agony can last up to two hours, while fishes feel fear and pain.

fair-fish was shocked to hear about the accident in the “AquaDom” and feels sympathy for the dead creatures. fair-fish would like to ban aquariums in public spaces — on the one hand because saltwater fishes, as those kept in the “AquaDom”, are usually caught in the wild, which leads to great damage to the ecosystem and the population; on the other hand because the animals in such show aquariums do not live in a species-appropriate manner; there is a lack of space, retreat possibilities and suitable structures.

fair-fish.ch/blog/2023/01/06



Ornamental fishes belong in the care of people with specialist knowledge — especially fishes from the tropics and the sea. Aquaria have no place in hotel lobbies or restaurants — live fishes are not decoration material! (Tropical aquarium in the Stralsund Marine Museum, photo: Klugschnacker/Wikimedia)



Zebrafishes (drawings: F. Hamilton, 1822/Wikimedia)

Comfortable life has a cost

(hps) To survive, a living being must be able to adapt to its environment. A clever experiment with zebrafishes shows that a comfortable life costs adaptability. The zebrafish (*Danio rerio*) is the laboratory rat of the underwater world. The species has been used for decades for all kinds of research and has reproduced under laboratory conditions for over 150 generations. Researchers have realised that this provides them with the basis for a perfect evolutionary experiment: How has the adaptability (plasticity) of laboratory fishes to changing

environmental conditions evolved compared to their wild counterparts? To test this, they exposed laboratory zebrafishes, which are normally kept at a temperature of 28° C, to fluctuations between 10 and 38° C, which corresponds to the living conditions of zebrafishes in nature. They observed the swimming behaviour, growth and other parameters and compared the results with the values of a control group of wild-caught zebrafishes. In fact, it turned out that the laboratory fishes lost their plasticity because they no longer needed it. However, this also raises the question

of who the laboratory fishes are still a model for, if they are so different from their counterparts in the wild.

fair-fish.ch/blog/2023/01/15

Tunnel poisons fish farm

The almost unbelievable story behind the environmental scandal at the famous Blausee excursion site in the Kandertal, Switzerland: thousands of farmed trout had died and the lake had temporarily lost its famous turquoise colour. However, the authorities of the canton of Bern, with the help of the federal government, want to cover up where the poison came from: It's the improperly disposed of excavated material from the new Lötschberg railway base tunnel dug with poisonous liquid explosives. And the toxic time bomb continues to tick, endangering the groundwater of an entire valley. The Blausee belongs to three Swiss business leaders, but even they have great difficulty in obtaining justice

against allegedly "higher interests" and an apparently hard-boiled and well networked waste mafia. The staged reading of the extensive report on the subject takes your breath away from time to time, and during the subsequent discussion with an environmental geologist you will find your laugh stuck in your throat. Well worth listening to or reading (in German only, though).

fair-fish.ch/blog/2022/12/30

Ban on fisheries subsidies

(hps) It is estimated that global fisheries subsidies amount to 14 to 35 billion US dollars per year — according to the German Foundation for the Protection of the Sea, this is more than one third of global fishing costs. Without subsidies, many fisheries would have to close down because the fishing effort is greater than the economic return as fish stocks become increasingly depleted. Fisheries subsidies are an important driver of progressive overfishing. At

the same time, they promote the consumption of marine diesel, which places an additional burden on the fish habitat and the climate.

Quite apart from the fact that fisheries subsidies — which mainly flow into industrial fisheries — finance the systematic torment of more than a thousand billion animals every year. From a purely economic point of view, these subsidies are also nonsense. They lead to a loss of net benefits amounting to 89 billion US dollars.

For twenty years, the states negotiated a cap on subsidies for their fishing industries. In June 2022, the ministerial conference of the World Trade Organisation (WTO) finally reached an agreement. For it to come into force, two thirds of the WTO member countries must ratify it. The ministers were unable to agree on a general ban. However, the agreement contains a mechanism for further development and gives cause for hope.

fair-fish.ch/blog/2023/01/14

New address, new account

With the new year our address changes:

fair-fish, Talweg 159, CH-8610 Uster, Switzerland

You can reach us by e-mail at: mail@fair-fish.net

and by phone during Swiss office hours: +41 79 255 61 77

For donations in Swiss Francs please use our new bank account:

IBAN: CH68 0900 0000 8503 8259 6

Verein fair-fish international

For donations in Euro please continue to use the account

IBAN: CH51 0900 0000 9136 2602 9

Verein fair-fish international

What can I do?



Not much on my own.
That is why I am joining forces with many other
people and becoming a

FAIR-FISH-ALLY:
www.fair-fish.net/ally

