

A close-up photograph of a fish's head, likely a salmon, against a teal background. The fish's eye is visible, and there is a white, textured bandage or dressing applied to the area around the eye and the side of the head. The fish's scales are detailed, and its mouth is slightly open.

# Ten measures for increased fish welfare

  
Djurens Rätt.

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## Summary

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As society leaves old and incorrect ideas about fish behind, immediate measures need to be taken so that newly acquired knowledge is reflected in practice. Listed below are ten of the most important measures that need to be implemented in order to improve the situation for fish:

1. Fish must increasingly begin to be seen and treated as the living, sentient individuals they are.
2. A strengthened animal welfare legislation for fish at EU level.
3. A strengthened animal welfare legislation for fish at national level.
4. A ban on carbon dioxide stunning at fish slaughter.
5. More resources for research on fish welfare at slaughter.
6. Fish caught in wild capture fisheries must be subject to animal welfare legislation.
7. Certifications of fish products must include relevant fish welfare criteria.
8. A ban on bottom trawling and beam trawling.
9. The National Agency for Public Procurement must add animal welfare criteria to their fish standard, for example regarding stunning and slaughter.
10. The EU Commission must establish a European Fish Welfare Reference Centre.

### **FISH ARE SENTIENT INDIVIDUALS**

**Measure 1. Fish must increasingly begin to be seen and treated as the living, sentient individuals they are.**

Today it is well established that fish can feel pain and suffer<sup>1,2,3</sup>, yet they are often treated as if they were emotionless beings. Maybe it is because they lack soft fur and the facial expressions that we are used to seeing. Perhaps we find it harder to understand and empathise with fish because we rarely see or hear them, since they live underwater. There is also a notion that fish are "lower standing" animals, which is incorrect. Evolution is not a staircase. No animal or species stands above or below another. There are more known species of fish, over 30,000, than all other vertebrates

combined. The different fish species have both common and species-specific behaviours, needs and incredible abilities. One of the most important senses in fish is the lateral line organ, which senses currents in the water. The lateral line organ is perhaps to fish what the eyes are to us humans. A study published in 2019<sup>4</sup> showed that cleaner wrasse fish pass the so-called mirror test. The mirror test is used to assess whether an animal is self-aware. A dot of colour was put on the fish, which then had to see itself in a mirror. The fish examined the dot on itself instead of the one in the mirror, which is seen as a sign of understanding that it is the fish itself that is visible in the mirror. Examples of other animals that passed the mirror test are primates, elephants, killer whales, dolphins and magpies.

## **FISH IN AQUACULTURE**

Just like terrestrial animals in factory farms, fish are raised and slaughtered to become food. Since fish in the industry and statistics are counted in tons, not individuals, we do not know the number of fish raised and slaughtered in aquaculture each year. Globally, it is estimated to be 50-150 billion fish per year<sup>5</sup>, compared to around 70 billion chickens, pigs, and other terrestrial animals slaughtered worldwide each year. In Sweden, an estimated 5-10 million fish are raised and slaughtered annually.<sup>6</sup>

The dominant fish species in Swedish aquaculture is rainbow trout.<sup>7</sup> Other fish species reared include char, eel, salmon, trout, tilapia, clarias and sturgeon.<sup>7</sup> Farming in open cage systems is the most common, but farming in ponds, basins or tanks on land also occurs. Tank or basin farming on land in closed recirculating systems (RAS) is becoming more common. Several large salmon farms in such systems are at the moment planned or in the start-up phase in Sweden. Aquaculture is seen by policy makers as an industry of the future that can contribute to a higher degree of self-sufficiency.

There are roughly 50 so-called food fish farms in Sweden (where fish are kept until slaughter) and an equal number of hatcheries.<sup>7</sup> At the hatcheries, the young fish are raised and then either released into the wild to, for example, compensate for the negative impact on the fish habitat caused by hydropower, or to increase the number of fish to be caught in a certain location, or transported to a farm where the fish are reared until slaughter.

Globally, almost half of all fish consumed comes from fish farms.<sup>8</sup> One reason why fish farming is growing is that the oceans are becoming increasingly overfished. Furthermore, fish farming contributes to the overfishing of the oceans because most fish that are farmed receive animal feed that is partly made from wild-caught fish.<sup>9,10</sup> Fishing and fish farming are therefore closely connected. The fish species consumed the most for human consumption in Sweden are salmon, herring and cod.<sup>11</sup> Almost all salmon consumed in Sweden currently comes from Norwegian salmon farms.<sup>11</sup>

In fish farms, the needs and welfare of the fish are compromised in terms of:

- opportunities for natural behaviour (such as the design of the rearing environment, feeding, space and consideration of the social behavioural needs of the fish species)
- risk of injuries and diseases
- stress and pain associated with handling and transport
- absent or painful and ineffective stunning at slaughter.



## WILD CAPTURE FISHERIES

**Measure 6: Fish caught in wild capture fisheries must be subject to animal welfare legislation.**

**Measure 8: A ban on bottom trawling and beam trawling.**

As in aquaculture, the fish in wild capture fisheries are counted in tonnes and not in numbers, so we do not know exactly how many fish are involved. It is estimated that around one to two thousand billion (one to two trillion) fish are caught and killed each year globally in fishing.<sup>12</sup> Approximately 150,000–200,000 tonnes of fish are killed each year in Swedish commercial fishing, corresponding to several billion individuals.<sup>13</sup>

Of the fish caught in the Swedish fishery, most of the fish are used for the production of fishmeal and fish oil, of which a large part is used as feed in fish farming<sup>14</sup> but also to some extent for chickens, pigs, dogs and cats.<sup>14</sup> The fish used for animal feed is mainly of the species sandeel, sprat and herring.<sup>14</sup> These are the fish species most common in Swedish wild capture fisheries.<sup>14</sup> Examples of other species are cod, grayling, mackerel, haddock, whiting and salmon.<sup>15</sup>

The fishing methods, as well as the handling of the fish after the catch and at slaughter, cause the fish great suffering. Catching fish with hooks, nets, trawls and other gear, injures and stresses the fish and can result in a very prolonged death.<sup>12, 16, 17</sup> Also for those fish that survive the catch itself, death is prolonged and painful. The most common way fish die in fishing is by suffocation in the air after being caught or by being throat-cut or gutted while still conscious.<sup>18, 19, 20</sup>

In an ongoing research project,<sup>21</sup> herring are studied during expeditions with trawlers in the North Sea, where herring live in large schools in the open sea. The condition of the fish, such as injuries sustained during capture, is being studied, as well as how and when the fish die. The project is a collaboration between the Swedish University of Agricultural Sciences (SLU), Danish researchers, the organisation Animal Protection Denmark and a Danish pelagic producers organisation. The purpose of the project is to shed light on how fish die in conjunction with trawling in open water (so-called pelagic fishing, which is the capture of fish that live in open water and not at the bottom) and to investigate whether catching methods can be developed so that the killing is performed in a better way from an animal welfare perspective.

Although uncommon today, stunning of fish on board vessels does occur in commercial fisheries, for example in the Netherlands.<sup>22</sup>

The following aspects are important to consider regarding the catching method and handling of the fish once caught:

- No live bait shall be used for capture.
- Fish should be exposed to catch for as short time as possible.

- The number of fish (the stocking density) caught in nets shall be limited by checking the nets sufficiently often. Lines should also be inspected frequently to limit the time fish are forced to stay there.
- Methods and tools that cause the least possible suffering to the animals shall be used.
- The gear used must be adapted to the species to be caught.
- Towing and boarding speeds, and towing times, must be reduced, to reduce the risk of injury and stress.
- Target depth must be limited.
- The use of gaff hooks should not be accepted. A gaff is a hand-held rod with a sharp hook on the end that is inserted into the fish's body to pull the fish up.
- Fish should be pumped onto the vessel instead of being lifted with nets.
- All live fish must be kept in water.
- Beam trawling and bottom trawling shall not be accepted.
- Any risk of by-catch shall be minimised.
- The risk of ghost gear (lost or discarded gear) should be minimised. Measures such as tagging, reporting and GPS should be taken to make it easier to find lost gear.
- The fish shall be stunned after capture using validated stunning and slaughter methods that ensure that the fish lose consciousness immediately and do not regain it during the slaughter process.

For fisheries, it is essential to switch to fishing methods that cause the least possible suffering, and to ensure that fish are rendered unconscious quickly and painlessly once they are taken on board the vessels and that consciousness is not allowed to return.

Today, the fish caught in Swedish wild capture fisheries are not covered by the Animal Welfare Act. This is an inconsistent procedure that needs to be changed to include these fish, at least when caught, which would include a requirement for stunning so that they quickly lose consciousness and do not regain it during the slaughter process.





## **STRENGTHENED ANIMAL WELFARE LEGISLATION FOR FISH IN AQUACULTURE AT THE EU AND NATIONAL LEVEL**

**Measure 2: A strengthened animal welfare legislation for fish at EU level.**

**Measure 3: A strengthened animal welfare legislation for fish at national level.**

At EU level, the European Commission is working on the development of revised and new animal welfare legislation. Extensive work is being done to ensure the European Commission to include fish in its work and propose an ambitious proposal for new animal welfare legislation for fish in 2023. It is mainly about fish in aquaculture and it concerns the whole life cycle of the fish, including transport and slaughter.

Today, fish in aquaculture are covered by Swedish animal welfare legislation. The Swedish Board of Agriculture has regulations regarding the farming of fish in aquaculture, but not on fish slaughter. Regulations for farming must be extended and rules for slaughter must be drawn up. At present, only the more general writings in law and regulation apply to slaughter, which state that animals should be spared unnecessary discomfort and suffering. Stunning before slaughter must take place so that the animals quickly become unconscious and consciousness must not return. The fish in aquaculture are covered by animal welfare legislation at EU level, but there are no detailed rules, only general statements.

For a long time, in animal welfare contexts, "The Five Freedoms" have often been referred to as a way of describing the different parts of what animal welfare is. However, there has been a shift, with science now increasingly referring to the model of "The Five Domains" instead. This is positive and the new EU animal welfare legislation should be based precisely on these domains. The model is based on current science and focuses more on the needs of animals, rather than on what humans see as acceptable suffering. The domain model takes into account animals as sentient individuals, their mental states and needs, and what constitutes a good life for the animal.

Djurens Rätt has submitted to the Swedish Board of Agriculture and the Ministry of Enterprise and Innovation that it is important for Sweden to push for ambitious animal welfare legislation on fish. In brief, the following are elements that Djurens Rätt believes need to be included and considered in animal welfare legislation on the keeping and handling of fish in aquaculture, based on the five domains:

### **Domain 1: Nutrition/Hydration**

– Feeding and feed source

### **Domain 2: Physical Environment**

– Water quality

– Space and stocking density

– Enclosures and buildings



### **Domain 3: Health**

- Breeding
- Pain management
- Emergency killing

### **Domain 4: Behavioural interactions**

- Behavioural indicators
- Enrichment
- Handling
- Equipment

### **Domain 5: Mental experiences**

- The mental state of animals is largely dependent on how well their needs are met in the other four domains. Positive mental experiences are essential for a good life for fish.

### **Horizontal management measures**

- Competence and training
- Animal welfare management plan
- Record keeping
- Inspections

Legislation must be species-specific and cover the entire life of the fish, including transport and slaughter.

### **An end to painful carbon dioxide stunning**

**Measure 4: A ban on carbon dioxide stunning at fish slaughter.**

**Measure 5: More resources for research on fish welfare at slaughter.**

It is essential that all stunning and slaughtering equipment, as well as the handling, is scientifically validated and adapted to the species and size of the fish, regarding the fact that the fish should lose consciousness quickly, within a second, and not regain it. It is not enough to inspect visually whether the fish is conscious or not, the method must be evaluated by measuring the brain activity of the fish.<sup>5,23</sup> The time between stunning and slaughter must be minimised.

At national level in Sweden, Djurens Rätt has highlighted the need for strengthened animal welfare legislation for fish. Legislation needs to be species-specific and cover the entire life of the fish, including slaughter. An end date on carbon dioxide stunning of fish and more resources for research on better stunning methods is needed. Among other things, Djurens Rätt is in dialogue with the Swedish Board of Agriculture, which has begun a process on revising the slaughter regulations.<sup>24</sup>

In Sweden, carbon dioxide stunning is still a common stunning method at fish slaughter in aquaculture. A few years ago, the majority of fish (calculated by weight) in Swedish aquaculture were stunned with carbon dioxide and just over a third were stunned with electricity.<sup>23</sup> In Norway, carbon dioxide stunning at fish slaughter has been banned since 2012. The method is cheap and many fish can be processed at the same time, but it has serious shortcomings as carbon dioxide causes the fish a high level of discomfort and stress.<sup>25,26</sup> The method can also immobilise the fish so that they appear to be stunned when in fact they are conscious.<sup>27</sup> Since the stunning is ineffective, there is a risk that the fish will be subjected to bleeding and evisceration while fully conscious.<sup>27</sup> In December 2019, it was stated by the Scientific Council for Animal Welfare of SLU, in their opinion on stunning at fish slaughter,<sup>23</sup> that the use of carbon dioxide gas is not an ethically acceptable method for stunning or killing of fish. They argue that to ensure that fish are stunned at slaughter in an acceptable and sustainable manner in terms of animal welfare, species-specific scientific studies are required, which in collaboration between researchers and companies lead to the development of suitable equipment and methodology. Research on the subject is ongoing, including by researchers in Sweden within FRESH, a project between SLU and the University of Gothenburg. In a doctoral thesis from SLU, it is stated that carbon dioxide stunning is a prolonged process in which the fish show signs of severe stress before losing consciousness, while both percussive and electrical stunning can induce immediate and long-lasting unconsciousness if performed correctly.<sup>5</sup>

Both an end date for the use of carbon dioxide stunning and resources for research on how fish can be stunned in acceptable ways are needed.

In May 2020, Djurens Rätt organised the seminar "Animal welfare at fish slaughter - problems and possible solutions"<sup>28</sup> where researchers and experts in animal welfare for fish and animal ethics at SLU and the Norwegian research institute SINTEF participated, as well as representatives of the industry organisation Matfiskodlarna, the Swedish Board of Agriculture and the Norwegian Food Safety Authority (the Norwegian equivalent of the Swedish Board of Agriculture). In November 2021, Djurens Rätt organised the webinar "A discussion about strengthened animal welfare at slaughter - why, how and would it be beneficial for more than the animals?"<sup>29</sup> which also included fish.

## **FISH CERTIFICATION THAT TAKES ANIMAL WELFARE INTO ACCOUNT**

**Measure 7: Certifications of fish products must include relevant fish welfare criteria.**

Animal welfare is an important part of the concept of sustainability.<sup>30</sup> Unfortunately this is not reflected in sustainability labels for fish products. When it comes to certification and labelling, it is important that they take into account more than they do today, in particular:

- Enrichment in the rearing environment
- Feed composition and feeding
- Space and stocking density
- Water quality
- Stunning and slaughter (relevant for both farming and fisheries)
- Method of capture and the post-capture keeping and handling (relevant for fisheries)

Djurens Rätt cooperates with organisations within the Aquatic Animal Alliance<sup>31</sup> to ensure that certifications and labels incorporate animal welfare for fish in their criteria.

## **PROCUREMENT CRITERIA WITH ANIMAL WELFARE REQUIREMENTS**

**Measure 9: The National Agency for Public Procurement must add criteria on animal welfare to their fish standard, for example regarding stunning and slaughter.**

Municipalities and other procurers can, when procuring products from animals such as meat, milk and eggs, set certain animal welfare requirements, using the The National Agency for Public Procurement's sustainability criteria. According to the authority, animal welfare is an important aspect of sustainability for many who procure food for public kitchens.<sup>32</sup> The work of Djurens Rätt has shown that the interest in setting prominent animal welfare requirements is high among the municipalities.<sup>33</sup> According to the national food strategy, the procurement of food should be guided by and correspond to society's ambitions in terms of animal welfare and the environment. The National Agency for Public Procurement develops and manages sustainability criteria. The criteria can then be used by municipalities and other procurers to set animal welfare requirements when they procure animal products. The criteria consist of requirements with associated information. For food of animal origin, there are sustainability criteria for animal welfare, such as the criterion "Method of slaughter - meat", which states that the meat must come from animals that have been fully stunned when bleeding occurs and completely unconscious until death.

In The National Agency for Public Procurement's criteria, in the "Fish and shellfish" criteria group, fish health is currently mentioned, but wording and requirements concerning animal welfare are missing. Djurens Rätt believes that animal welfare criteria should be added for fish, for example with regard to stunning and slaughter, as exists for other animals. The National Agency for Public Procurement's criteria refer to the sustainability labels MSC, ASC and the Swedish organic label KRAV. MSC and ASC are labels that primarily focus on the environment, sustainable fish stocks and social aspects. Wild-caught fish can be MSC-labelled and farmed fish can be ASC-labelled. Since The National Agency for Public Procurement refers to those labels in its sustainability criteria, the work Djurens Rätt is doing to influence the criteria of the certification companies (the labels) is also important for the procurement issue.





## **A EUROPEAN FISH WELFARE REFERENCE CENTRE**

**Measure 10: The EU Commission must establish a European Fish Welfare Reference Centre.**

EU Reference Centres for animal welfare is initiated by the EU Commission. The aim of reference centres is to contribute to improved compliance and control of animal welfare legislation.

Today, there are several European reference centres for animal welfare, one of which focuses on ruminants and equines that was established in 2021 and is led by the Swedish Centre for Animal Welfare (SCAW) at SLU. The European reference centres for animal welfare exists today with the following specialisations:

- Pigs
- Poultry and other small farmed animals
- Ruminants and equines

The Aquaculture Advisory Council (AAC) wants the European Commission to initiate the establishment of a reference centre for animal welfare with a focus on fish.<sup>34</sup> In a response to AAC, the EU Commission wrote in April 2022 that they "*may consider the possibility of establishing in the future an EU Reference Center on animal welfare for aquatic animals*".<sup>35</sup> Djurens Rätt and other animal rights and animal welfare organisations support such a proposal and, from a national perspective, the Swedish Centre for Animal Welfare (SCAW) at SLU is a suitable candidate to play an active role in the centre.

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### ABOUT DJURENS RÄTT

Since 1882, Djurens Rätt has been one of the world's leading animal rights and animal welfare organisations, with more than 50,000 members in Sweden.

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