

Aquaculture in the EU: welfare in fish farming

Aquaculture is the farming of aquatic organisms including fish, molluscs, and crustaceans (the main species concerned by the EU aquaculture are salmon, trout, carp, eels, seabass and seabream, turbot, mussels, oysters and clams). In the European Union (EU-25), the aquaculture industry produces a total of 1.3 million tonnes of fishery products a year for a value of about €3 billion. Around 40 per cent of all fish directly consumed by humans worldwide are farmed.

Aquaculture is a relatively recent farming method but also a field which is rapidly developing, both in terms of techniques (which differ according to regions and species involved) and levels of production (to fit an increasing demand and fill the gap of reduced resources in the oceans).

While EU consumers are increasingly sensitive to animal welfare in general, fish do not evoke compassion as easily as other, warm-blooded animals. They have seldom been perceived as sentient beings, and have therefore received less attention from consumers, legislators and producers in terms of animal welfare. Yet, recent research results have demonstrated that fishes have the necessary anatomical, physiological and behavioural requirements in order to perceive pain and to suffer¹.

This briefing aims to summarise the main welfare issues connected to aquaculture, and to present what Eurogroup believes should be done for improvement.

Aquaculture: welfare, health and environmental issues

The need to develop welfare indicators

Eurogroup believes it is crucial to develop welfare indicators for each farmed fish species. They should enable to characterise the welfare of fish in terms of:

- Behavioural indicators: changes in colour, breathing frequencies and swimming behaviour and feeding, etc, which show changes occurring in response to stress and changes in the environment.
- Physical welfare indicators: changes in the appearance (damaged fins, scale loss, etc), which show the general condition of the fish regarding growth, reproduction, health status, etc.
- Biochemical welfare indicators: measurable physiological stress responses of the organism, which show the consequences of husbandry activities (like transport, vaccination) and adverse environmental conditions.

The development of those indicators is necessary in order to enable proper on farm assessment of the welfare status of animals.

Preventing risks of diseases

Intensive fish farming involves raising fish in densely packed unnatural conditions that provide favourable circumstances for the growth and spread of diseases and parasites. Outbreaks of disease can occur if fish are weakened by stress resulting from increased population densities, changes in food availability, or other sudden changes in environmental conditions. Eurogroup believes emphasis should be placed on disease management by good practice rather than reliance on medication.

¹ See for example: Lynne U. Sneddon, Victoria A. Braithwaite and Michael J. Gentle: *Do fishes have nociceptors? Evidence for the evolution of a vertebrate sensory system*, Proc Biol Sci. 2003 June 7; 270(1520): 1115–1121. doi: 10.1098/rspb.2003.2349. <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1691351>

Efforts needed to render aquaculture more sustainable

The renewed EU Sustainable Development Strategy adopted in June 2006 aims among other objectives to “Continuing to promote high animal health and welfare standards in the EU and internationally”.

The effects of aquaculture on the environment are mostly negative. Especially during intensive farming on sea, the nets and cages are in constant exchange with the surrounding environment, which might have negative impact on the local ecosystem. Aquaculture can have a negative impact on:

- The environment: depletion of the number of species (as a consequence of organic deposition from fish farms, which can affect the seabed underneath); pollution of the water by chemicals (anti-foulant substances used to coat the nets, therapeutants used for the treatment of diseases); habitat degradation (fish farming destroying the natural habitats of the coast).
- Wild fish populations: Some aquaculture methods require the capture of juvenile fish in the wild, with the consequence that natural populations decrease drastically, both among the targeted fishes and other species (because the practice is accompanied by large by-catch). In addition, aquaculture multiplies the risks of diseases transmission. Fish escaping from cages in to open waters lead to competition for food and habitat.

Improvements needed in the care of fish

Handling fish

Intensive farming involves a lot of handling, which multiplies the risks of damaging the outer layers of the skin. According to Eurogroup, handling should always be carried out with the greatest care, taking into account the welfare needs of the fish, and only when unavoidable. Invasive practices such as tagging, marking should be rejected. Extraction of the semen of the male fishes should be avoided as much as possible or practiced under anaesthesia.

Transport

Transport can be an important factor of stress for fishes. Therefore, transport should be avoided whenever possible and its length reduced. Transport in dark tanks with high oxygen concentrations and good water quality helps reduce unnecessary stress to the fishes.

Housing

Increased stocking densities leads to an increase in the number of interactions among fishes, with such consequences as the facilitation of disease transmission, the multiplication of physical injuries, increased stress, reduced growth, etc. On the other hand, it has been observed that lower densities produce benefits in terms of better performance, better feed conversion, better quality, better health and less disease, reduced fin damage, less size variation and improved survivability. Water quality plays a major role in the good health and welfare condition of fishes. It should therefore be constantly and carefully monitored.

The life cycle in aquaculture

Breeding

In aquaculture, the ability to control the entire reproductive cycle, and to both stimulate and inhibit maturation in fish is important. The question is whether any of these breeding processes have an impact upon the welfare of the fish. For some techniques, side effects and welfare impairments have already been described, for other techniques data on the impact on the fish are still poor or missing. Eurogroup encourages further research in order to establish whether breeding techniques are detrimental to the welfare of the fish.

Genetic manipulation in Fish

Genetic engineering by inserting or removing genes is used to alter the characteristics of fish, notably to increase growth rate and size, or to obtain fish with higher food conversion rates, needing less feed in relation to maintenance and growth. Some potential impacts on the health and welfare of fishes include: a huge impact on body size compared to its wild relatives; several morphological deformities; higher than normal early mortalities. In addition, the genetic modification of fish leads to abnormal behaviours such as higher appetite or increased aggression, which - in the case of escape - has consequences in terms of competition with the wild population

for food and mates. Eurogroup believes that genetic manipulation and modification of farmed fish should be forbidden.

Feed

The formulation of fish feed can have positive and negative effects on health and welfare aspects of animals. Further research is needed to develop sustainable feeding formulations. In addition, the feeding method should be designed in order to minimise competition and hence aggression.

Slaughter

Before slaughter, farmed fish are normally deprived of food for about 7-10 days to empty the gut. Depriving fish from food during non-natural periods might lead to reduced welfare. It has been shown that 24-72 hours, dependent on temperature, are needed to achieve gut clearance. Eurogroup therefore believes that starvation periods of longer than 72 hours should not be permitted.

Concerning slaughter as such, a humane slaughter method should incorporate a stunning procedure that renders the animal immediately insensitive and unconscious until death. Stunning/killing by asphyxia, thermal shock, salt/ammonia and carbon dioxide are not acceptable from an animal welfare point of view and should be banned.

Electrical stunning can be considered to be a humane slaughter method, as it can potentially kill large numbers of fish humanely without exposing them to long periods of stress and without removing them from water. However, attention should be borne to using correct voltage. Appropriately performed percussive stunning can also be considered an efficient and humane way of slaughtering fish.

Improvement of aquaculture production systems

Welfare standards for farmed fish

Eurogroup for Animals believes that EU animal welfare standards must be adopted as a priority for aquaculture and organic aquaculture. The basis of these standards should be thorough scientific research documenting effects of production methods on health and welfare of the animals. Training of personnel should be included. Essential research has to be carried out before novel species are exploited. Welfare issues are to be taken into consideration while doing research on alternative protein sources in feed.

The Common Fisheries Policy

The Common Fisheries Policy (CFP) was introduced by the European Commission in 1970 and a completely reformed CFP is in place since 2003. In the reformed CFP, aquaculture is promoted as a means to lessen the pressure on wild stocks. In general, animal welfare references remain vague within the CFP and the respect of animal welfare is not a pre-condition to receiving fisheries subsidies.

Eurogroup believes that the granting of subsidies to fish farmers under the CFP must be conditional to the respect of good animal welfare standards. Pending the adoption of detailed EU standards for the welfare of fish kept for farming purposes, cross-compliance requirements should include the provisions of Council Directive 98/58/EC concerning the protection of animals kept for farming purposes, and those of the Council of Europe's recommendation on the welfare of farmed fish.