Fish consumption

Fish is one of the most highly traded goods in the world. The term "fish" and data associated with it are used for different marine animals, therefore we include crustaceans and shellfish along with fish.

Since the 70s aquaculture, fish production in fixed farms for breeding and fattening fish, has grown exponentially. It currently makes up 45% of worldwide production (20% in Europe).

90% of the biggest fish species have become extinct in the last 50 years. To date overfishing, or non-sustainable fishing, is responsible for 30% of the species which are caught.

In 2014 93.4 million tonnes of fish were caught: about 1,600 different species, from the sea (87%) as well as from inland waters (13%), and 73,8 million tonnes from aquaculture (about 600 different species).

It is important to keep in mind that in the majority of reports the figures are presented in tonnes, not the number of animals, unlike other sectors. This fact makes it difficult to know the exact number of fish which this sector affects. Nevertheless, a very detailed study managed to calculate the number and it is estimated that about 1 trillion fish are caught and killed per year around the world for human consumption (1,000,000,000,000). In other words more than poultry (57 Bn) or mammals (3 Bn). And this is the figure without taking into account the fish from aquaculture, the discards, the unregistered catches, illegal fishing and the animals which are affected or killed by fishing residues like the ghost nets.

The countries with most fishing activity are China, Indonesia, USA and Russia. Those which produce the most quantity through aquaculture are China (with 55% of the total) and India (9%).

In 2014 1,103,537 tonnes of fish were caught in Spain, and 282,000 tonnes were produced through aquaculture.

For commercial fishing there are about 9,000 boats registered in the country, with an average length of 10 almost metres. The boats are mainly from Galicia (50%), Andalusia (16%), Catalonia (8.5%) and Valencia (6%). It is calculated that in 2015 these boats used 16,200 litres of fuel per day on average.

In Spain there are more than 10,000 aquaculture farms. The main species produced are sturgeon, trout, carp, eel, mullet, sea bream, sole, red tuna, crustaceans like prawns or crabs and molluscs such as clams, octopus or mussels. Most of the salmon in Spain comes from farms in Norway and Scotland.

Per capita consumption of fish in Spain was 25.9kg in 2015 (11.64kg fresh fish, such as hake, sole, sea bream or monkfish; 2.82kg frozen fish such as cod, salmon or hake; 6.96kg shellfish, molluscs and crustaceans, such as mussels, squid, octopus, shrimps, and 4.47kg tinned sardines, tuna, anchovies or cockles). Annually, more than 900,000 tonnes are consumed for food, as well as about 2,500 tonnes for other ends.

CHARACTERISTICS AND TOLERANCE FOR SUFFERING

Fish are the biggest and most diverse group of invertebrates. Some species have very complex cycles, like salmon, which are born in the river, where they spend between 1 and 5 years, before migrating thousands

of miles to the sea and finally go back to exactly the same spot where they were born in order to reproduce. Other species have very sophisticated senses for survival, like electroreceptors or the lateral line system (they detect movements and vibrations, impulses or electric information). There are species which grow to extremely large sizes, such as red tuna, which may reach 3 metres in length and 680kg in weight. Many of them eat plankton and others are carnivorous and eat other fish. There are fish which live far from the bottom of the sea (pelagic), like tuna or sardines, others which live close to the bottom (benthic), like grunt or comber, those which combine both options, like hake or sea bream, and others that live actually on the ocean floor itself, like sole.

The brains of fish are similar to other vertebrates, except smaller and slightly less complex. Although its cortex is small and has no folds, it may be able to generate some emotions. What has been proved is that they have nociceptors and neurotransmitters, which means they are able to have negative feelings, that is to say: fish also feel. Furthermore, chronic stress may cause them to have difficulties adapting: lowering of the immune response, resistance to disease, growth and reproduction, it could even cause death.

As for crustaceans, in the wild lobsters may live up to 100 years. They use complex signals to explore their surroundings, they establish social relationships and migrate more than 100 kilometres each year. Despite not having a brain they do have complex sensorial structures and they avoid painful situations.

As for cephalopods, octopus have great learning ability, great memories and they are able to use tools. In fact, despite being invertebrates, since 2013, for research purposes they are they are regulated under the same directives as vertebrates (Directive 2010/63/EU).

It has been demonstrated that some species, among fish, crustaceans and cephalopods, have brain structures which make them capable of feeling pain and fear. So, in spite of the absence of evidence, it is reasonable to think that in other species if their basic needs are not met, their wellbeing may be reduced. The fact that they grow and develop in fish farms, for example, does not indicate that they enjoy life, there are many factors and handling that is done in aquaculture that also cause fish stress and suffering.

PRODUCTION SYSTEMS AND MAIN CONSEQUENCES

Fishing

There are different techniques of fishing which have developed depending on the species being sold, looking for an easy catch and a greater quantity. Netting, hooks (longline, troll), puncture wounds (harpoon), traps (pots) or drag nets may be used.

The type of fishing is also classified according to the distance to the coast from which they are working, and which determines the time spent on board and the size of the boats: distant-waters fishing (they may be months without going ashore), deep-sea fishing (they spend several days on board) or, most commonly in Spain, inshore fishing (they go out and come back the same day).

As for net fishing, trawling is the most common worldwide. One or two boats trawl a net, shaped like a sock, through the sea, actively taking anything in its path. Depending on the height and the size of the meshing, some species will stay inside and others will escape. It is usually used to catch crustaceans, cephalopods and fish such as cod, hake and monkfish. Nets are also used in purse-seine fishing, although in this case it floats and closes around a shoal of fish which has been drawn to the area by a light source. This system is used to catch anchovies, sardines and tuna. It is common for the tuna fish to be transferred to fattening farms, where they spend some time before being sold. This type of fishing drags and injures other animals

because it is not selective: turtles, sharks, stingrays or dolphins may get caught in the nets and although the fishermen throw them back into the sea, not all survive without injury.

Fishing with hooks, like longline fishing, uses a line parallel to the sea floor with strands attached to a hook which hangs off it. Each hook has its bait to attract the species being fished. These lines may reach up to 15 Km and use up to 4,000 hooks on the seabed, or even 60 Km long and up to 10,000 hooks on the surface. This way is used to catch mackerel, white tuna, hake, codfish or monkfish. The animals which are caught like this either suffocate or bleed to death while they are on the hook. To add to their pain, the process may take all night or even several days.

The pots are a cage trap, with or without bait, which are placed on the seabed to trap octopus or lobsters which once inside cannot leave.

Whatever the method the trapped animals suffer the stress and fear they have been exposed to for hours. They may also get squashed by lack of space, crashing into the nets or other animals, they even suffer the effects of decompression. Many reach the boats alive and still conscious.

27% of the catch is lost during transportation. Furthermore, if the rejects are taken into consideration, those fish thrown away when checking whether or not it is the correct species or that the characteristics are inadequate for sale, the percentage may reach 35%.

In addition to the direct consequences that this activity has on the animals caught, it is estimated that fishing boats leave 640,000 tonnes of material, such as ghost nets, in the oceans each year worldwide. This causes great damage to ecosystems, suffering and death to many animals (about 136,000 individuals of sea lions, seals and whales), amputation of fins of other species and an incalculable number of effects on birds, turtles and other fish.

There are different regulations and prohibitions regarding distance, techniques and places where different fishing activities may be carried out. These may vary depending on the state of vulnerability of the place or the species in question.

Aquaculture

Aquaculture encompasses the techniques of breeding and fattening different aquatic organisms, both animals and seaweed.

The businesses may use seawater or saltwater (marine) or even water from rivers and lakes (inland seas), and they may carry out their activities horizontally, vertically or in cages, depending on the species they are farming.

For the breeding and fattening of carnivorous species, such as tuna, they need to have other fish available to offer as feed, and this means an inefficient conversion index: they require 2.5 - 5 Kg of "caught" fish to obtain 1 Kg of "farmed" fish.

In some facilities the temperature may be adjusted and it is common to use this temperature increase as a means to speed up the growth rate in the animals. This process may provoke spinal deformities in fish, causing a serious problem of wellbeing for the individual affected.

The population density of the fish farms usually fits the production needs of the company and the maximum capacity of the tank, rather that the social characteristics of each species. This means that there may be

occasional problems of territoriality and aggressiveness between individuals. Excessive overcrowding may also provoke fin damage and make them vulnerable to infection.

With the aim of improving food hygiene for humans, the fish bred in this way have to be handled a few times by the personnel of the facility, for example for branding or vaccination, this causes stress to the animals. The presence of predators in the surroundings is also a potential source of stress, as well as the quality of the water in which they are kept.

Aquaculture is regulated by Directive 98/58/EC, on protection of animals in farms and Directive 2006/88/CE on health requirements of aquaculture products.

Both the products from fishing and the products from aquaculture must follow the European Regulation 1379/2013 on labelling products from fishing and agriculture. However, there is still a lot of work to do to protect these animals from the suffering which goes with fishing.

TRANSPORTATION AND SLAUGHTER

The procedure for loading, unloading and transportation of live animals also affects fish in terms of the temperature at which they are stored, density and handling that they receive. It is common to let the animals go without food for several days before being slaughtered.

In the case of fishing the animals are unloaded from the boats and they are left to die as they are, or, more commonly, they are put on ice and die from hypothermia. It may be several hours before this happens, especially when put on ice, which slows down the process and means they suffer more, still conscious of what is happening. Another possibility is that before they suffocate out of water they are stabbed or cut open in order to have their guts ripped out without any kind of anaesthetic or analgesic. Depending on the species they may take between 65 and 250 minutes to die out of water or between 25 and 65 minutes if they are gutted.

In the case of aquaculture there is a legal ruling on the slaughter of the animals, but it refers only to big fish, which recommends prior stunning by knock out (from a blow to the head) or electric shock. This may be a serious problem for their wellbeing if those responsible for carrying it out do not have the correct training or there is an error in the process, meaning the animals remain conscious and the time of killing.

These animals are also sold alive in many establishments. This puts these animals at an even greater risk as they may suffocate slowly, being hungry and end up being boiled alive, as is the case for lobsters.

In spite of the existence of Regulation 1099/2009 relating to the protection of animals at the moment of slaughter, the requirements for fish are not considered. Neither are they considered in Regulation 1/2005 regarding the protection of animals during transportation and related operations.

There is an aquatic animal health code, laid out by the WHO which talks about recommendations for the stunning and slaughter of fish but it is not an obligatory compliance.

FISH PRESENCE IN OTHER PRODUCTS

Although the most common way of consuming fish and the other animals included in this category is in food, it must be kept in mind that parts of these animals are used in the manufacturing of other things: flour, fish oil, animal feed, biodiesel, chitosan, natural dyes, etc.

For example, collagen, which is widely used in the pharmaceutical and cosmetic industry, also in jellies and sauces, comes from skeletal remains. Leather for clothing comes from the skin; shark cartilage is used to make capsules and creams; enzymes are extracted from internal organs and are used in cleaning products and the teeth of some fish are used to make artisan jewellery.

Complementary information

FAADA Report – Information on the fishing industry sector.
Law 3/2001, March 26th, on Maritime Fishing of the State.
Code of conduct for responsible fishing by FAO Department of Fisheries and Aquaculture.
Consumer report by Ministry for Agriculture and Fishing, Food and Environment.
State of world fishing and agriculture by FAO.
Scientific Opinion: General approach to fish welfare and to the concept of sentience in fish by EFSA.
Worse things happen at sea: the welfare of wild-caugth fish by Fish Count.