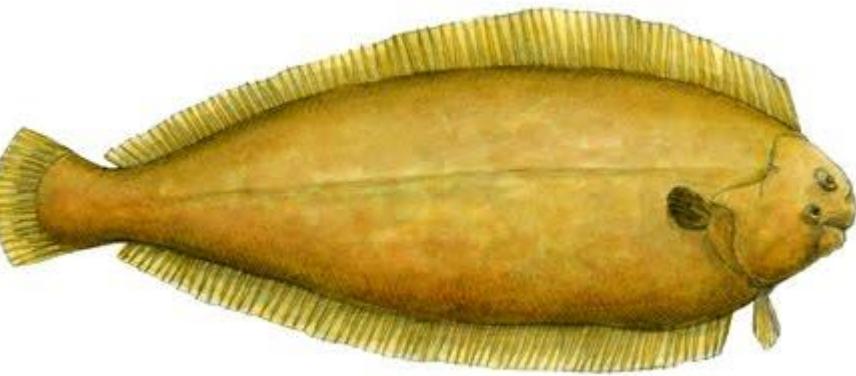




# WELFARE OF FARMED FISH



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## SCOPE

Under the scope of the implementation of OIE welfare standards in Portugal, I came across a broad range of subject options I could choose from. I decided to further investigate the application of welfare standards of farmed fish due to the small expression this topic has.

In order to provide an accurate description, I visited 2 aquaculture facilities in northern Portugal. I went to Quinta do Salmão, in Pisões, where rainbow trout - *Oncorhynchus mykiss* is raised in outdoor floating cages. I also went to Aquacria in Torreira, part of Sea8 group, where Senegalese sole - *Solea senegalensis* is raised in an indoor intensive system.

## WELFARE ASPECTS OF STUNNING AND KILLING OF FARMED FISH FOR HUMAN CONSUMPTION

I came across two different procedures regarding stunning and killing.

At Quinta do Salmão, trouts are caught using a mechanical net basket and then dropped in an empty container, whose environment is saturated in CO<sub>2</sub>. The fish is transported to land, where the unloading takes place. It is placed in a large container, where an electric shock is applied, most of the times, after unloading. Their installations were not purpose built, but the adaptations work efficiently in terms of creating a well-organized production line. The handling personnel are very experienced, since they have worked there for over a decade. The water quality parameters are thoroughly controlled – each of the clients requires their set of analysis and since there are at least three clients of great dimension, the water is constantly being object of testing in terms of temperature, pH, O<sub>2</sub>, CO<sub>2</sub>, ammonia, heavy metals residues, antimicrobial residues, etc.



Picture 1. Catching procedure at Quinta do Salmão

At Aquacria, all the buildings were planned and built accordingly to their purpose, so their facilities are outstanding. At first, soles are crowded using a moving fence, they are then caught using a manual net. After catching, they are gathered in dry plastic containers that are piled, weighed and unloaded into a tin containing a mixture of ice and water. The fish hold in the tin until the fishing procedure is complete and the



Picture 2. Fishing procedure at Aquacria

packaging begins. All the handlers have prior training and they have worked there for long time.

Neither of the procedures offers a guarantee of unconsciousness of all fish. The CO<sub>2</sub> represents a reversible method and its concentration depends on the density inside the container, leaving the responsibility to the efficiency of the electric stunning. The chilled water method

offers a state of transitory unconsciousness, due to low metabolic basal rate, allowing the death by apnea.



Picture 3. Holding in freezing water at Aquacria

However, the application of recommended methods (mechanical and electrical) is not yet feasible in flatfish, due to their anatomic specifications – the quality of the muscle is compromised after the electric stunning. Also, there is not available appropriate machinery for the mechanical slaughter of these fish.



Picture 4. Unloading procedure at Quinta do Salmão

## MY PERSPECTIVE ON THIS TOPIC

In my opinion, the welfare during the productive cycle of these fish is assured. The producers are the main interested in welfare issues, due to their repercussion on product quality. So, there were different studies taking place in these companies regarding stress factors that may affect the feed intake.

I think the main critical points of the producing cycle are grading and crowding. These procedures take place more than once during the life time of the fish and are far more stress inducing than any of the pre killing procedures.

## SOURCES

### Cover illustrations

- Top: <http://www.fishweb.com/recreation/fishing/fishfacts/fish/rainbow/>
- Bottom: [http://taxonomys.blogspot.pt/2011\\_05\\_01\\_archive.html](http://taxonomys.blogspot.pt/2011_05_01_archive.html)

### Publications

- Aquatic Animal Health Code, OIE, 2015
- Hans van de Vis, Marc Bracke, Ainhoa Blanco, Renata Serradeiro, Mercedes Mulet, Sander Visch, Adri Bout and Jose Antonio Gonzalez Iglesias, FWAS: a manual to monitor and safeguard welfare of turbot and sole during rearing and the process of slaughter, 2015