

EXECUTIVE SUMMARY

SLP LINK Project LK0663

Humane electric stunning of farmed sea-fish

Start Date: 01/07/2005

End Date: 30/06/2006



Fish welfare assessment, by the Humane Slaughter Association, of the commercial halibut stunner resulting from this project.

Introduction

Improvements in the way many species of farmed fish are killed are needed to meet the high welfare standards increasingly required by society. Electric stunning and percussive stunning are both methods that can result in immediate insensibility. Automatic percussive stunning is widely used for salmon and cod, however it is not suitable for many other farmed species. Flat fish are difficult to percussively stun reliably, due to their shape, while many other farmed species are too small to make percussion a commercially viable option.

This research is built on the successful LINK-funded development of an electric stunning system for portion sized trout, which has significantly improved the way farmed trout are killed in the UK. The emphasis in this new project was to move from stunning fish in fresh water, to sea water and to explore the possibility of humanely stunning farmed halibut.

The current system for killing halibut is a powerful manual blow to the head, followed by cutting of the gill arches and bleeding in ice. When a suitably heavy, fast and well aimed blow is achieved this is probably a very humane system killing system. It is however not easily achieved due to boat movement, escape behaviour by the fish and operator fatigue. Improvements in halibut welfare at harvest using electric stunning could therefore be achieved through electric stunning. Other flat fish, such as turbot in Mediterranean farms are killed using less humane means – such as immersion in ice without stunning or bleeding. Such fish could also directly benefit from the developments made in this project.

Objective

The objectives of the research were to extend understanding of methods for electrically stunning farmed sea fish in a humane and commercially acceptable way, and to investigate specifically the application of electric stunning to farmed halibut.

Experimental results

Farmed halibut of harvest size (4-10 kg) were placed in a trial stunning tank with sea water. Initially they were exposed to the electric field for only 1 second and signs of the initiation and recover from the stun were monitored. This was to determine the electric field that is needed to cause a rapid loss of consciousness. Following this, the fish were exposed to the electric field for longer durations to explore how insensibility duration increases with exposure duration. Results showed that insensibility was reliably and rapidly induced with an electric field of 1 V/cm or greater and that exposure to this electric field for 5 seconds resulted irrecoverable insensibility in 9 out of 10 fish while exposure for 10s resulted in irrecoverable insensibility in 10 out of ten fish tested. Initial investigations into carcass quality indicated no quality problems however experience with other species has indicated that that this can be very dependant of the way the fish is handled prior to stunning, so a true quality assessment is only reliable when it is made using prototype equipment under normal operating conditions.

Potential commercial application

Based on discussions with the farms involved, and with other farmers growing turbot, prototype equipment was designed and built by the collaborating equipment manufacturer, Ace Aquatec. The equipment comprises a chute down which the halibut slide into an electrified water bath where they become immediately insensible. A conveyor belt in the water bath moves the fish to the exit point over a period of 10 seconds, at which point they are bled. The equipment is capable of working at a rate of 12 tonnes of fish per hour. The operation of the equipment with both Turbot and Halibut has been evaluated by the Humane Slaughter Association.

CONTACT

Jeff Lines
Silsoe Livestock Systems Ltd
81 Church Road
Pulloxhill
Bedford
MK45 4HD
Jeff.Lines@SilsoeResearch.org.uk

PARTNERS

Ace Aquatec
Kames Fish Farming Ltd
Silsoe Livestock Systems Ltd
The Co-Operative Group (CWS) Ltd
The Humane Slaughter Association
The Shetland Halibut Co. Ltd
University of Bristol
Waitrose Ltd

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