NORTH ATLANTIC FISHERIES COLLEGE
SHETLAND FISHERIES TRAINING CENTRE TRUST

Improving the Quality of Farmed Salmon by 'Iki Jime' Harvesting

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Introduction

Current methods of salmon harvesting involve either breaking or cutting of the fish gill arches and bleeding in seawater, suffocation with carbon dioxide, or stunning by clubbing. The quality of the fish carcass may be impaired through scale-loss, bruising and stress. To improve this, trials have been carried out using the Japanese 'Ike Jime' (live killing) harvesting method.

The Iki Jime Method

Iki Jime harvesting involves the insertion of a spike quickly and directly into the brain thereby causing immediate brain death. The fish immediately cease all motion. The gill is then cut and the fish placed into seawater to bleed. As the heart of the fish remains pumping for a short time bleeding proceeds as effectively as the standard method.

Results

Significant improvements were observed in a series of trials between salmon harvesting utilising the Iki Jime method and standard method currently employed.

Scale Damage

Field trials revealed the following results:

	Standard	Iki Jime
Number of fish	30	30
Average weight (kg)	6.3	5.6
% Total area scale damaged	1.8%	0.2%

(Scale damage was assessed before gutting and cleaning)

The extent of scale damage is an important factor in quality classification. The Shetland Seafood Quality Control Company (SSQC) do not classify any fish with greater than 10% surface area scale damage as superior quality. Utilisation of the Iki Jime Harvesting method will be important in reducing scale damage and thus increasing output of premium quality grades.

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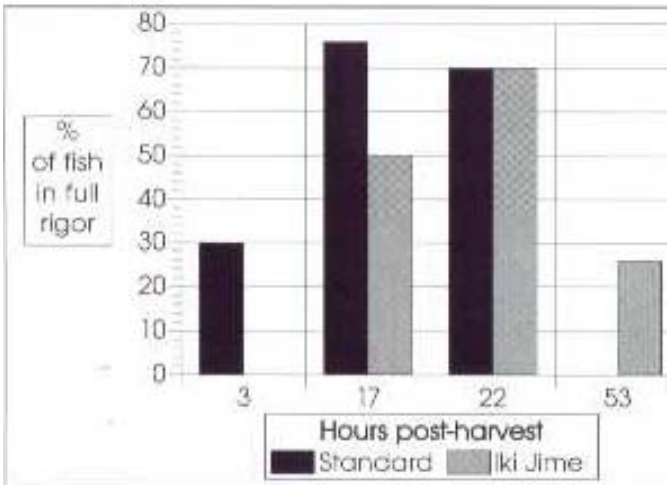
Effect on Post-Harvest Rigor

The quality of salmon gutted and packed prior to the onset of rigor mortis is known to be significantly better in terms of overall shelf life and texture than those processed during rigor mortis. When the standard harvesting method is used, rigor may commence within 3 – 4 hours, thus minimising the time available for processing prior to the onset of rigor. With the Iki Jime method it has been found that time to the onset of rigor is considerably increased, peaking at around 24 hours with some fish showing signs of rigor up to 50 hours.

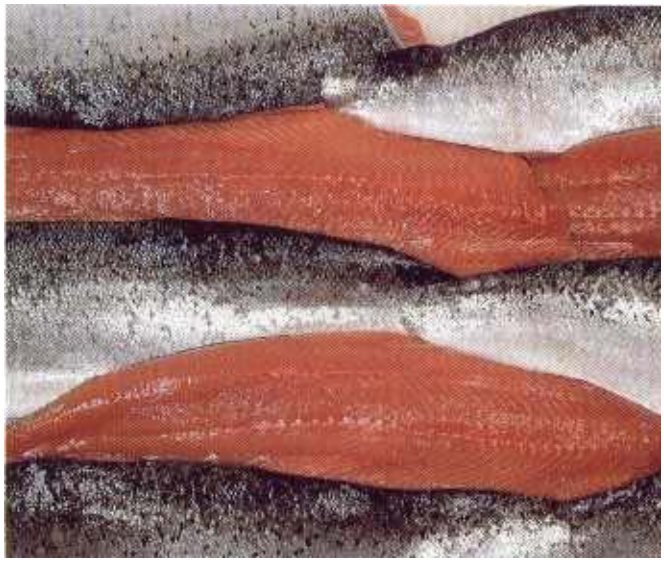


This enables fish to be gutted and packed prior to onset of rigor; thereby minimising the potential for physical damage (e.g. gaping) caused by handling fish in rigor.

Blood spotting in Smoked Fillets

The presence of blood spots in smoked fillets causes problems for processors through reduced yield and increased labour costs during trimming.

Pilot commercial trials undertaken by NAFC, Shetland Smokehouse, SSQC and Food Science Laboratory, Torry, assessed Iki Jime – harvested fish for blood spotting. The results showed no differences in the extent of blood spotting between fish harvested using standard and Iki Jime methods.



Commercial Application

The Shetland Salmon farmers are now actively pursuing the method and are developing mechanised methods for Iki Jime harvest. Shetland Seafood Quality Control Company (SSQC) are preparing assessment and verification methodology to accredit farmers using the technique to enhance the quality of their products.

Acknowledgement

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