



MØREFORSKING

Optimized catch processing of ling (*Molva molva*) for use in salt cured and dried fish industry

WEFTA TROMSØ 2013

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Content:

- Short presentation of the project
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Short presentation of the project:

The aim in the study was, sustainability through higher resource utilization and improved quality of the raw material on board long liners and during processing of salt cured and dried fish.

Overall goal statement in this project:

- develop a bleeding method to ensure good quality on catches from long liners, and find the impacts on quality when produced to salt cured and dried fish.

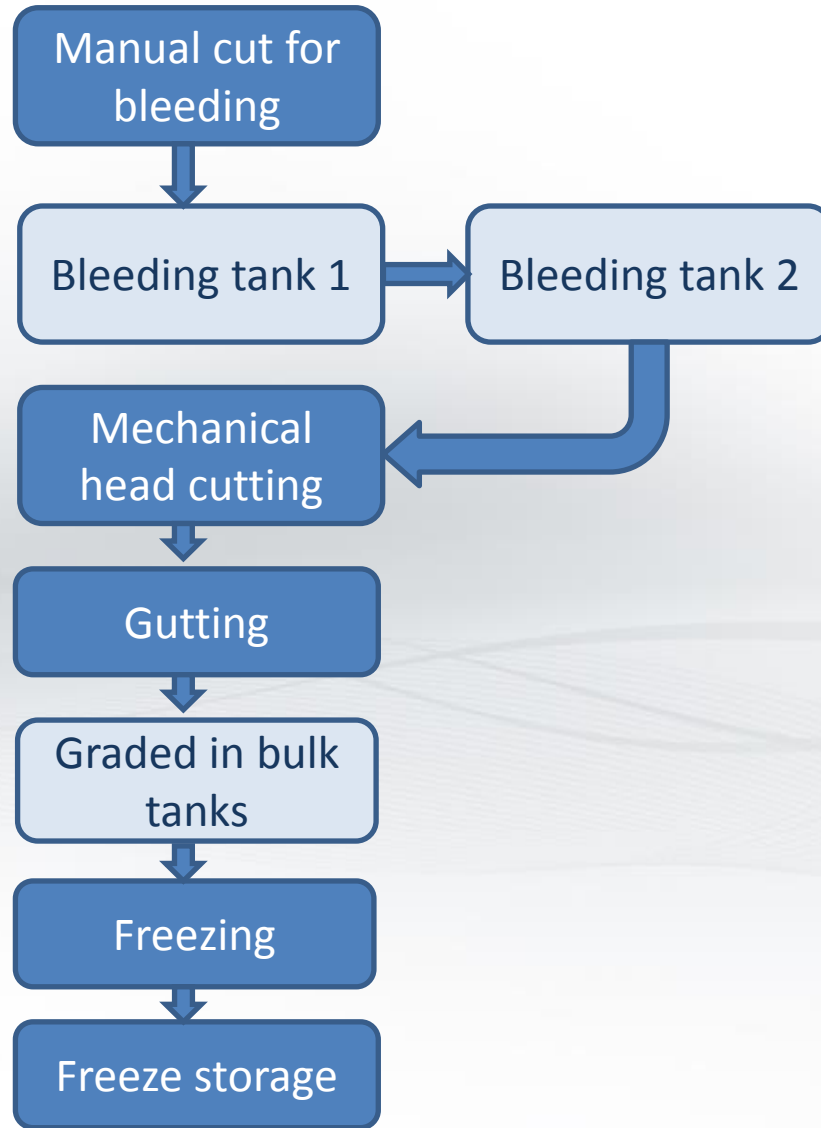


Figure 1: Ice slurry in the production line on board the long liner

Results from processing on board

Small scale trials:

- Raw material, 2-4 kg ling (*Molva molva*)
- Different bleeding times
- Temperature measurements
- With or without ice slurry
- pH measures
- Sensory valuation
- Select the conditions for bleeding in large scale trials.



Logging temperature in individual fish



Logging temperature in bleeding tank



Measuring pH in fish meat



Logging temperature in bleeding tank with fish

Temperature measurements

Temperature during trials with ice slurry

Temperature in bleeding tanks	0-1 °C
Temperature fish going in bulk tank	4-5 °C
Temperature water in bulk tank	-1 - +1 °C
Temperature in fish out of bulk tank	0-2 °C
Temperature in fish before freezing	1.4 – 6 °C



Measuring temperature in bleeding tank with ice slurry

Different bleeding times and sensory assessments

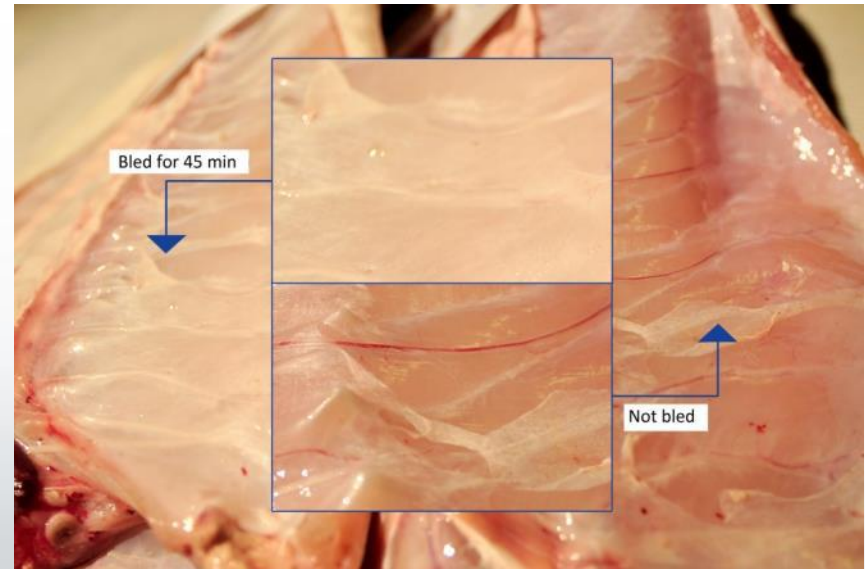
Large scale production on board long liner:

Production with ice slurry:

- Bleeding 30 minute
- Temperature in bleeding tank 5-6 °C

Production with seawater:

- Ordinary production (control)
- Temperature in bleeding tank 13-15 °C



Belly flaps from ling bled for 45 min and not bled.



Skipper and scientists c considering the degree of bleeding for headed and gutted ling (*Molva molva*).

Results from producing salt cured and dried fish

Conduction

- Raw material stored at freezing temperature in 2 mounts
- Thawed at appr. 8°C (seawater temp.) in appr. 18 hours.
- Pickle salted in 14 days at $8 \pm 1,0$ °C
- Matured in 14 days at $4,7 \pm 1,6$ °C
- Dried
- Stored at 3°C



Raw Material Description

Weight gutted and headed (thawed)

- Ice slurry group $3,1 \pm 0,7$ kg (n=156)
- Seawater group $3,2 \pm 0,6$ kg (n=120)

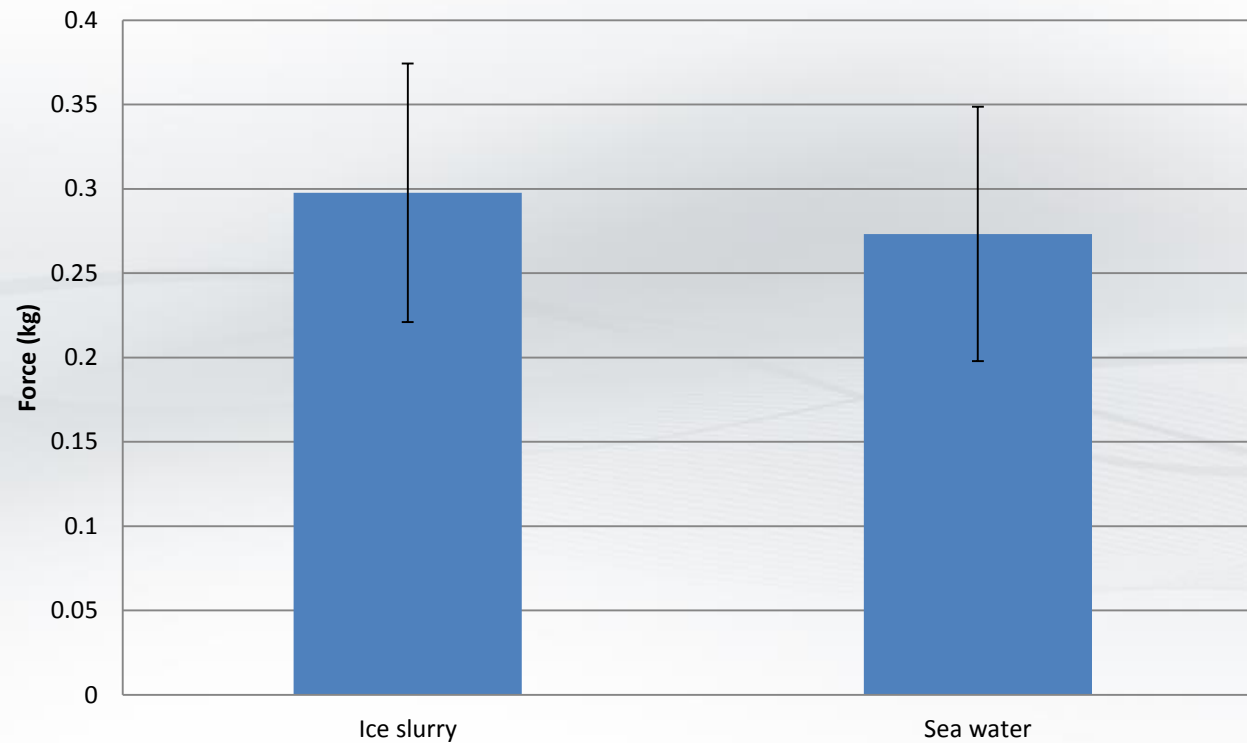


Seawater



Ice slurry

Texture measurements of raw material



Quality of salted and dried fish

Sensory assessments

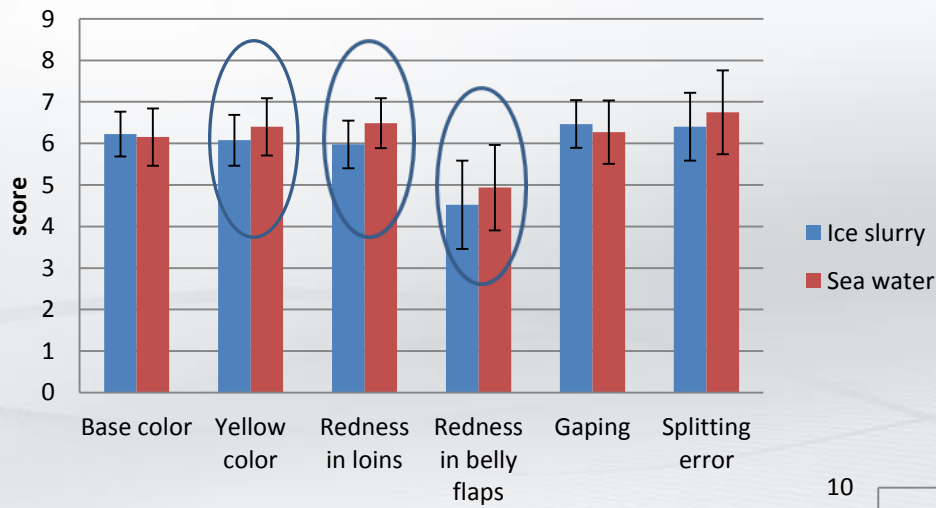
Seawater



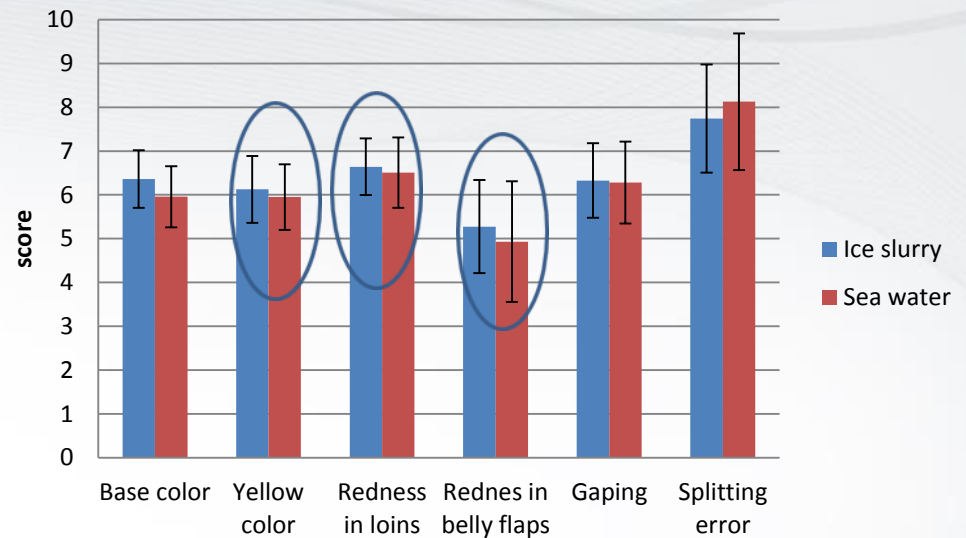
Ice slurry

Sensory assessments

Salt cured and dried



Salt cured and dried stored for 3 mounts



Sensory assessments

	Salted and dried fish		Stored salted and dried fish	
	Seawater	Ice slurry	Seawater	Ice slurry
Share of Superior %	71	80	81	86
Blood errors %	24	15	13	5
Gaping/tearing %	10	7	8	2



Summary

Production onboard

- Low temperature are essentially for good quality
- Ice slurry have effect on quality
- Need to optimize the use of ice slurry on board
- Optimal temperature and bleeding time for large scale trials:
 - Bleeding temperature 5 – 6 °C
 - Bleeding time 30 min.

Finished product of salted and dried fish

- Greater share of superior quality using ice slurry, 9 %
- No major difference in color
- Reduced errors using ice slurry
- Positive effects from lowering temperatures
- Firmer texture using ice slurry

A photograph showing a man in silhouette on the right side of the frame, looking out over a blue ocean under a clear sky. A dark cable or rope runs diagonally across the upper part of the image. The man is wearing a light-colored shirt. The ocean has some white foam from a wake.

Thank you for listening

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