

Towards higher resource utilization in fisheries

Policy Brief
September 2024

Key Messages

Profitability, available technology on board vessels and regulatory limitations are some of the key drivers of food loss and waste in the whitefish sector

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The majority of the food losses in the whitefish industry originates through discards at sea.

Introduction

While Norway and Iceland are key exporters of whitefish globally, they face various challenges regarding food loss and waste (FLW), including utilization of the rest raw materials like heads, liver and roe both in the supply chain and in the consumer market. This is due to various reasons, including market prices, product quality value-chain infrastructure and regulations. In this study, the degree of resource utilization in both Norway and Iceland has been reviewed to identify critical points FLW and to recommend improvement measures. Although the fisheries in both countries vary in terms of catch patterns and fleet structure, there may be common challenges in achieving a 100% resource utilization. Current drivers of FLW and barriers in achieving higher degree of resource utilization have been identified in this work.

Main findings from the project

The majority of food loss in the whitefish industry in Norway and Iceland originates through discards of rest raw materials (RRM) from the sea-going fleet due to lack of storage space on board and low profitability. In Iceland the majority of the catch is landed by larger vessels with freezing equipment on board and longer trip duration, while in Norway whitefish is landed both by coastal fleet with shorter trip durations and sea-going fleet with even longer trip duration than in Iceland.

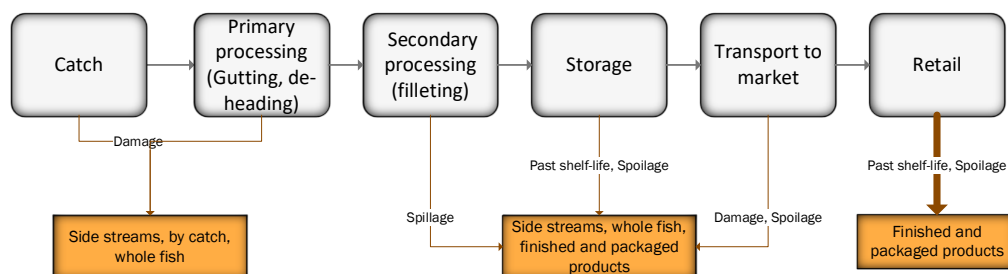


Figure 1: The generic whitefish supply chain with critical points where losses occur.

Iceland has a higher rate of resource utilization of RRM from whitefish than Norway, however, still has discards of viscera at sea due to its low market value. While Iceland is utilizing a significant share of RRM from whitefish into high value products, Norway utilizes either silage/acid hydrolysis technology to process the RRM available or dry it and export it for human consumption purposes (i.e. fish heads and backs). Both the silage technology and the natural drying process is cheap and easy to use, but the

revenue per product produced is also low. When using formic acid the protein concentrate produced from the silage processing is regulated as a by-product, commonly category 2 (for biogas) or 3 (fish feed, animal feed, pet feed) depending on the state of the product. The reasoning why this application is highly prioritized is economical figures and a high demand from the feed markets.

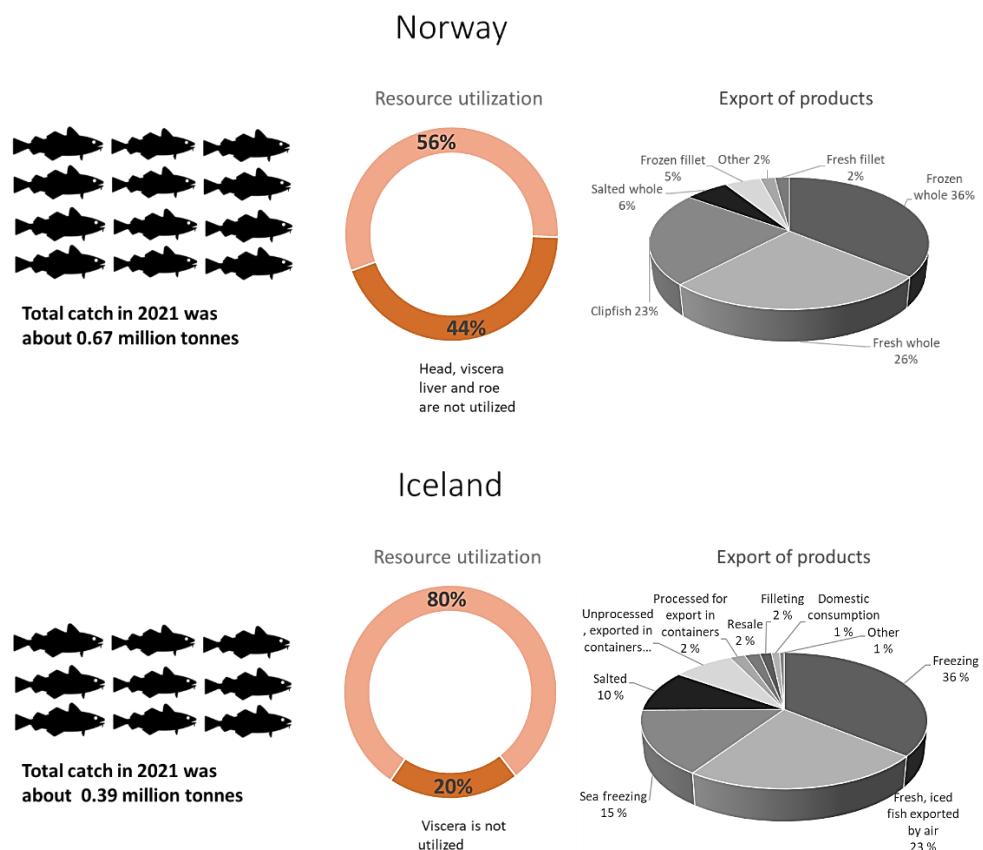


Figure 2: Catch, rest raw material utilization and export in Norway and Iceland (2021)

Opposite to Norway, Iceland has certain regulations, but also economic incentives to facilitate a higher utilization of the catch, in addition to being a more vertically integrated value chain. The vertically integrated companies allow for a better information flow and production planning in comparison where the majority of actors are non-integrated and have limited information flow. Optimal production planning is key to avoid any losses during processing due to quality degradation and to regulate the supply and demand. Both in the EU, Norway and Iceland, the general requirement of traceability is limited to one-step up one step down¹. For seafood products, some elements of chain traceability are required, such as labelling all products with catch area or country of origin, production method and slaughter/harvest date². These requirements are however not mandatory for some types of processed seafood and RRM.

Norway has historically moved away from the vertically integrated structure and first-hand sales by fishermen are done either by auction, contract or takeover of catch. A contract between fishermen and processing company allows for information sharing regarding the catch however other sales methods do not have the information regarding volume and quality of the catch. Lack of information on the quality has been identified as a driver for losses of RRM.

¹ Regulation (EC) No 178/2002

² Regulation (EU) No 931/2011

Key Messages

Iceland has come further than Norway in resource utilization and processing into high value-added products.

Current bottlenecks/barriers in underutilization of marine rest raw materials

- Technology for processing of fish and RRM on board fishing fleet
- Limited storage capacity in the sea-going fleet
- Low profitability and willingness to pay for RRM
- Regulations on use of by-products for human consumption
- Lack of data and monitoring of bycatch, discards etc.
- Lack of monitoring and documenting temperature and quality of RRM
- Traceability limited to only one step upstream and one step downstream
- Low predictability in terms of supply and demand

Recommendations

- *Data and information sharing*
 - Improving the information sharing between the fishing fleet, seafood processors and the marine ingredient sector will allow improved resource utilization through better management of supply and demand
 - Having mandatory requirements for reporting of loss and waste throughout the whole chain and quantification of FLW due to each driver or cause will help understand more where and why large losses occur.
- *Technology development in the fishing fleet*
 - Focusing on cost effective technology for high value products from RRM and loss fractions can enhance quality and in turn increase profitability
 - Transition to better storage on board fishing vessels and improved processing technology can go hand in hand with transition towards alternative energy sources for the fishing fleet and facilitate resource efficiency and reduce emissions.
- *Increased profitability*
 - EU, being one of the important markets for RRM products, the government can facilitate the market access by working towards reducing toll-tariffs on processed marine products from Norway to the EU.
 - Incentives for landing RRM to increase the overall availability and value creation in the whitefish sector in Norway

Further work

- Investigate and quantify the benefits of FLW reduction in frozen seafood supply chains to evaluate how they perform in comparison to fresh supply chains
- A more comprehensive analysis of value chain structure and first-hand sales methods to evaluate if these have a more significant role in achieving close to a 100% resource utilization.

Key sources for further information

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Mehta, S., Myhre, M. S., Ólafsdóttir, G., Jordan, C., and Thakur, M. (2022). **Resource utilisation in seafood supply chains: Food loss, food waste and rest raw materials**. Report. SINTEF OCEAN.

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Strand, A.V., Olafsdóttir, G., Saviolidis, N. M., Myhre, M. S. and Thakur, M. (2023). **Data capture and information flows in seafood supply chains in Norway and Iceland**. Report. SINTEF OCEAN.

Note: external references added as footnotes

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SMARTCHAIN – Smart solutions for advancing supply systems in blue bioeconomy value chains

<https://bluebioeconomy.eu/smart-solutions-for-advancing-supply-systems-in-blue-bioeconomy-value-chains/>
<https://www.sintef.no/en/projects/2021/smartchain/>



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