AGRIFOOD AND BIOSCIENCE

# Technical report: Seafood LCI database

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RISE Research Institutes of Sweden

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# Innehåll

# Sammanfattning

Behovet av representative data av hög kvalitet kring resursåtgång och miljöpåverkan av sjömatsprodukter inklusive biomassa som direkt eller indirekt används till foder. Detta behov baseras i en växande insikt om betydelsen av livsmedel, särskilt animaliska livsmedel inklusive sjömat, för global miljöpåverkan. Målet av det här projektet var att påbörja skapandet av en databas för LCI data för sjömat genom att definiera en rekommenderad metod och struktur för datainsamling samt att använda denna metodik för att samla in tillgängliga data för ett antal pilotfall som görs publika och kan integreras i befintliga databaser. Metodiken och pilotdataseten kan användas av sjömats-industrin för att samla in data bredare och fylla databasen och på så sätt göra mer sjömats-LCI data tillgängliga.

# Summary

There is an increasing need for high-quality, representative data on the resource use and environmental impacts caused by seafood products including biomass used directly or indirectly for feed. This need stems from an increasing awareness about the important role of food, in particular animal based foods including seafood, for global environmental impacts. The aim of this project was to facilitate the creation of a database for seafood LCI data by defining a recommended method and structure for the collection of data as well as using this method to collect a number of available datasets which are made public and can be integrated into existing LCI databases. The methodology and pilot datasets can be used by the seafood industry to collect data to more broadly populate the database and make more seafood LCI data available.

# 1 Introduction

The growing need for high-quality and representative data on the resource use and environmental impacts of seafood products, in part stemming from the Product Environmental Footprint (PEF) Product Category Rules of the EU and requirements related to Aquaculture Stewardship Council (ASC) certification, led to the initiation of this project. This need stems from the increasing awareness about the important role of food, in particular animal-based foods such as seafood, for global environmental impacts in combination with increasing demand for animal-based foods driven by economic growth and a growing world population. A first step towards reducing food-related impacts is to understand its current environmental performance and hotspots and for this, data is needed.

The project was initiated by Sjømat Norge (The Norwegian Seafood Federation) and funded by the Fisheries and Aquaculture Research Fund (FHF). It was undertaken between January 2017 to January 2018 as a collaboration between Blonk Consultants (the Netherlands), Dalhousie University (Canada), SINTEF Ocean/Asplan Viak (Norway) and coordinated by RISE Research Institutes of Sweden (Sweden). The three research organisations SINTEF, Dalhouise and RISE have broad experience of undertaking seafood LCA studies individually and in collaboration and Blonk Consultants host one of the leading LCI databases integrated into the LCA software SimaPro, AgriFootprint (Table 1)

**Table 1.** The project team

| Name | Organization | Expertise |
|---|---|---|
| **Christoffer Krewer** | Research Institutes of Sweden (RISE) | LCI data and databases |
| **Erik Skontorp Hognes** | SINTEF Ocean (current affiliation: Asplan Viak) | Fisheries and aquaculture, seafood LCA |
| **Jasper Scholten** | Blonk Consultants | LCI data and databases |
| **Friederike Ziegler** | Research Institutes of Sweden (RISE) | Fisheries and aquaculture, seafood LCA |
| **Peter Tyedmers** | Dalhousie University | Fisheries and aquaculture, seafood LCA |

The project had a reference group which was consulted regularly throughout the project (Table 2)

**Table 2.** The reference group

| Name | Organization | Type of activity |
|---|---|---|
| **Erik Gracey** | BioMar AS | Aquafeed production |
| **Trygve Berg Lea** | Skretting Group | Aquafeed production |
| **Dave Robb** | Cargill Aqua Nutrition | Aquafeed production |
| **Neil Auchterlonie** | IFFO | Marine meal and oil producer organisation |
| **Courtney Hough** | FEAP | European aquaculture producer federation |
| **Nicolas Martin** | FEFAC | European feed producer federation and representing GFLI |
| **Henrik Stenwig** | Norwegian Seafood Federation | Norwegian organisation including marine meal and –oil producers, fish feed producers, aquaculture producers and seafood processors. |
| **Berit Anna Hanssen** | FHF | Fisheries and Aquaculture Research Fund |

# 2 Goals and research questions

The overall and long-term goal beyond completion of the project, which is more a development than a research project, is to make more seafood LCI data available for users in industry, research, policy and certification to facilitate a transition towards more sustainable practices.

The specific objectives of the project were to:

• Develop a methodology and structure for LCI data collection for seafood products

• Test this methodology by making existing seafood LCI data available using this method

• Make a plan for extension of the database

Deliverables from the project are listed in section 7.

# 3 Method and implementation

The project was undertaken during 2017, starting in January with a kickoff meeting in which the different tasks were discussed and a work plan was prepared. A reference group was composed with representatives from the feed and seafood producer organisations as well as the larger aquafeed industries. Dates for the physical meeting were set to March 2-3 at RISE offices in Gothenburg, Sweden. In the first day of this meeting, the project team discussed the overall structure of the methodology and which datasets would be most relevant to make available in the database, using the methodology. Also, work and responsibilities were split up and a more specific time plan prepared. On the second day, the project team met with the reference group and presented overall objectives of the project, the plan developed on the day before. In the discussion that followed, also on the relation between different initiatives, the reference group provided important input to the project.

After this initial meeting, the reference group had three more virtual meetings in which various drafts of the methodology, which had been circulated in advance, were discussed and led to revisions being made afterwards. The reference group was also asked for advice on which marine feed inputs they would like to see in a full database and on how an extension of the seafood LCI database can be organized (in terms of hosting, funding etc.). Members with direct relations to producers of marine feed ingredients even volunteered (this was not a task in the project) to test the data collection template developed in the project and in this way collected new data from 10-20 companies, data which in the next phase will be used to extend the database. This test also led to changes being made to the template.

The development of the methodology was the main responsibility of SINTEF, RISE and Dalhousie, as was the collection of existing data. Data was provided to Blonk Consultants who processed it to be able to integrate it into their database AgriFootprint. The processed LCI datasets were also published online for use in other databases.

# 4 Results

The developed methodology will serve as guidelines for anyone who wants to collect and contribute data for seafood to LCI databases. It describes relevant data to collect for each step in the supply chain specifically for seafood production up until preparation (defined as cutting and cooling in accordance with EU regulations, sometimes termed primary processing, to distinguish from processing which transforms the product through e.g. canning, smoking, marinating, salting, drying or mixing with other ingredients), Figure 1. No minimum quality level is defined, but requirements to document quality and representativity are described and data entries are classified as shall or may, depending on importance. The importance obviously also depends on the impacts studied in a study using the data, therefore it has to be decided from case to case whether data is of sufficient quality for the purpose of the study and to be able to do this, proper documentation is critical. A suggested nomenclature is also provided that is easy to use and makes sense from a production point of view.

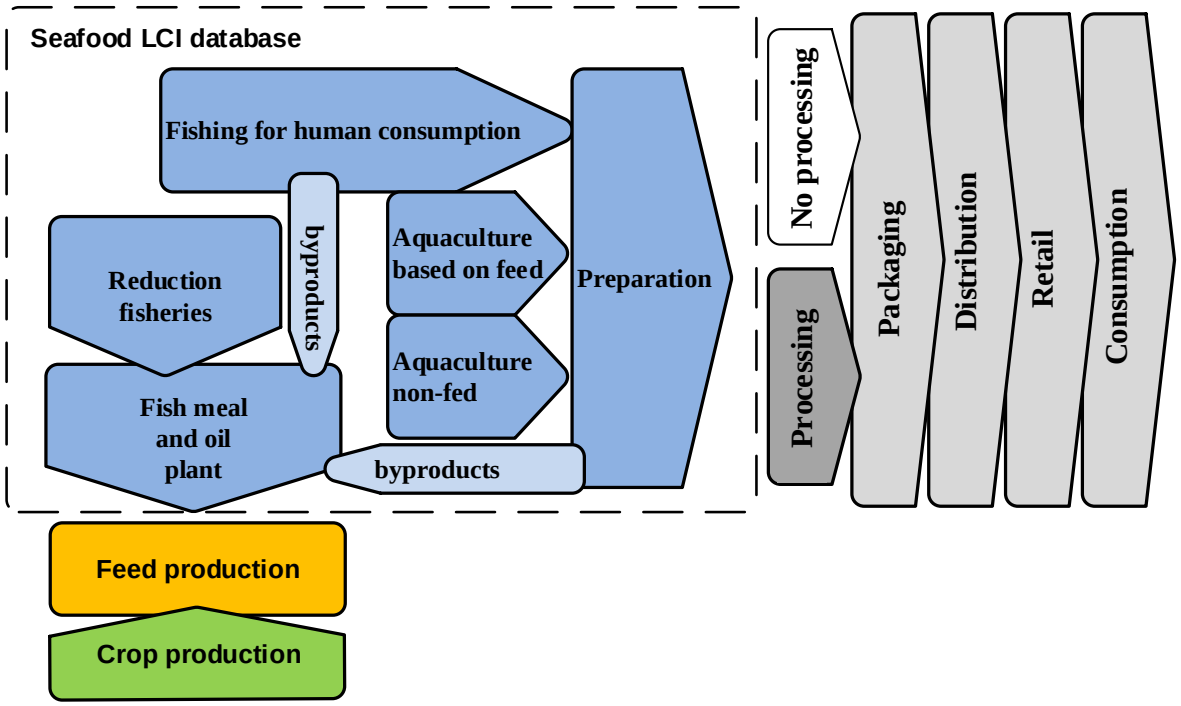


**Figure 1.** The boundaries of the seafood LCI database (other supply chain steps are part of existing databases or other initiatives)

The datasets now provided are presented in Table 3, they represent both major targeted reduction fisheries (Anchoveta and Gulf menhaden) and fisheries for human consumption where trimmings are used to produce fish meal and oil or silage (herring, mackerel and cod).

**Table 3**. Products for which existing data was assembled

| **Species** | **Product** | **Origin** |
|---|---|---|
| Anchoveta | Fish meal and oil | Peru |
| Gulf menhaden | Fish meal and oil | US |
| Atlantic herring | Landed fish | Norway |
| Atlantic mackerel | Landed fish | Norway |
| Atlantic cod | Landed fish | Norway |
| n/a | Fish meal and oil | Norway |
| n/a | Fish silage | Norway |
| n/a | Fish fillets | Norway |

The outlined methodology together with the pilot datasets provide a very useful starting ground and guideline for the industry to initiate a more widespread collection of datasets. The alignment and integration with initiatives such as the GFLI and EU PEF-CR will be critical. Other issues to solve will be the hosting and strategy for continuous update of seafood LCI data.

# 5 Main findings

• A methodology for collecting data for a seafood LCI database has been developed – this method includes what data that is needed to model seafood related processes in a LCA

• A number of existing pilot datasets have been collected using this methodology and published for integration in existing databases

• A plan for how the industry can extend the database to cover the most important types of seafood including feed inputs has been developed

# 6 Deliverables

Project deliverables are listed in Table 4.

**Table 4.** Project deliverables

| **Deliverable** |
|---|
| **D1** Specification of database methodology and data quality guidelines |
| **D2** Specification of workflows and processes |
| **D3** Specification of how datasets will be developed, i.e. how to produce datasets using existing ones |
| **D4** LCI datasets for at least six marine inputs collected according to specification, available online for database providers and LCA practitioners in the ILCD and ecospold formats |
| **D5** Specification of software needed in phase 2, e.g. data editors, database management systems, database servers etc. |
| **D6** Datasets integrated into Agri-Footprint |
| **D7** Meeting- containing a final presentation |
| **D8** Administrative final project report |
| **D9** Project plan/proposal for phase two |
| **D10** Technical final project report that summarizes the project deliverables |

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