

Value-adding for captured fish products by documenting sustainability

Senior scientist Petter Olsen
Nofima, Tromsøe, Norway

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About Nofima

Nofima is a private, non-profit research institute owned by the Norwegian government with head office in Tromsø and over 400 employees in six different locations around Norway.

Nofima was founded in 2008 when four former public food research institutes merged:

- Norconserv – canned and preserved foods, Stavanger
- Matforsk – food from agriculture, Ås
- Akvaforsk – aquaculture related research, Sunndalsøra
- Fiskeriforskning – seafood and processing, Tromsø

Main areas of work:

- Aquaculture and fisheries – raw materials
- Food from agriculture and aquaculture – processes and products
- Consumer and market research
- - Consumer research, buying behaviour, food and context
- **Industrial economics and strategic management:**
- - Economics, corporate strategy
- - **Traceability, sustainability, environmental accounting**

Turnover in 2011 was 60 Million Euros



This presentation

1. The NE Atlantic cod and haddock industry is facing increased competition, especially from imported farmed whitefish species
2. A portfolio of R&D projects was generated, where the objectives were all related to product value-adding
3. Examples of outputs from three such products, with focus on generic and reusable results, also relevant in other sectors
4. Conclusions on value-adding as a possible outcome of R&D projects

**Captured cod /
haddock from
the NE Atlantic**



**Farmed tilapia /
pangasius from
Africa / Mekong**

- Sold as frozen, but also fresh whitefish
- Direct competitors in the market
- Labels do not clearly differentiate
- Many consumers do not have a clear preference
- Interchangeable in many seafood recipes
- Large degree of mislabeling, especially of Atlantic cod (28% in US¹)

Captured cod / haddock from the NE Atlantic

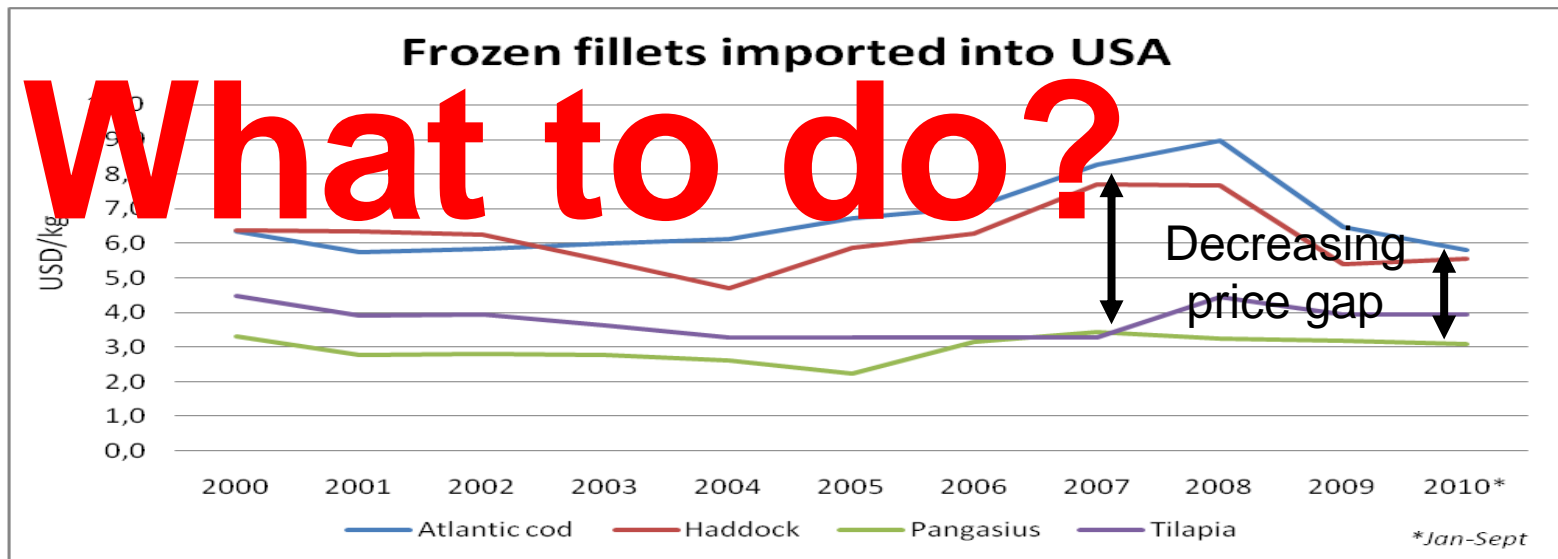
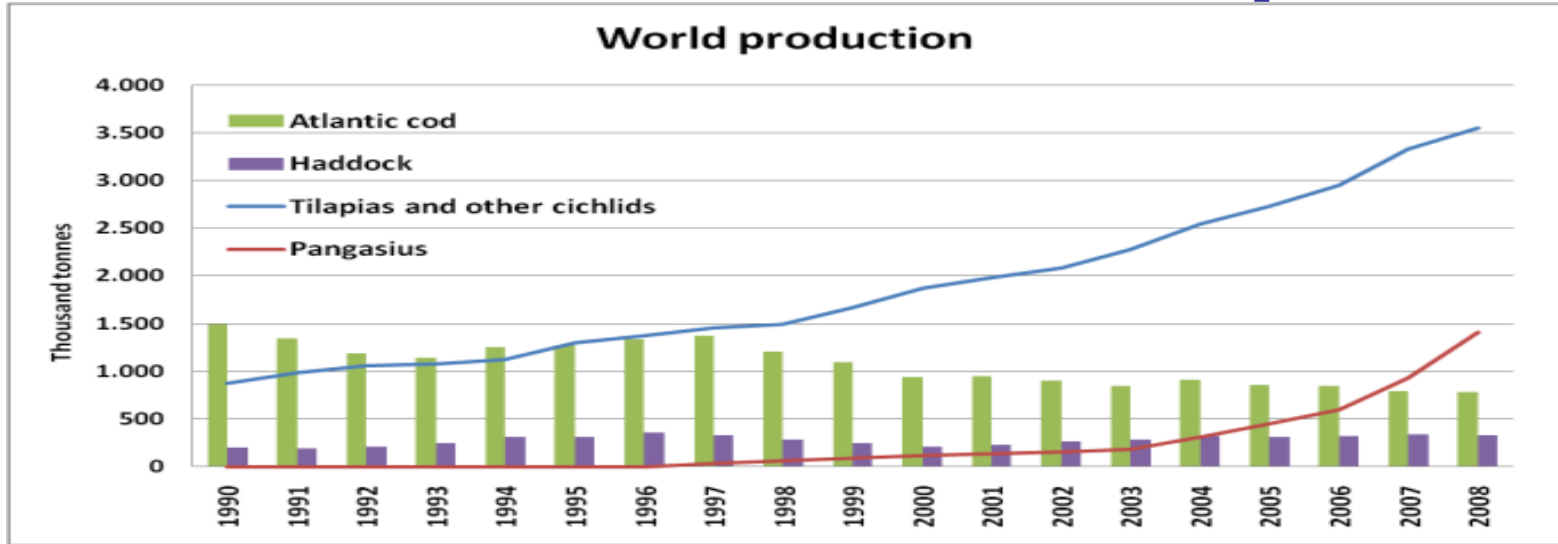


Farmed tilapia / pangasius from Africa / Mekong

- Stock sustainability issues worldwide
- NE Atlantic stocks sustainable²
- Despite this fact, on many “red lists”
- Low negative environmental impact³
- High nutritional value⁴
- Regulative requirements

- Environmental sustainability issues
- Long transport distances (to Europe)
- Social sustainability issues
- Lower nutritional value⁴
- Few regulative requirements

Production volume and price



Need for R&D projects

- Document sustainability of cod and haddock products from the NE Atlantic
- Investigate consumer preferences, in particular in relation to desirable product characteristics
- Make pilot implementation of consumer-facing communication of relevant product attributes
- Develop tools, methods and standards to detect and reduce seafood product fraud and mislabelling

P1 - EU project WhiteFish

- 36 month duration, 01/2012 – 12/2014
- 2.9 MEUR total, 2 MEUR EU contribution
- 13 participants from 5 countries



WhiteFish objectives:

- To strengthen the competitiveness of the European cod and haddock industry by documenting and disseminating the relevant and desirable characteristics the products have, in particular in relation to sustainability, environmental impact and transparency.
- Specifically, to develop a methodology called Batch-based Calculation of Sustainability Impact (BCSI) that SMEs can use for self-assessment and documentation. BCSI will be developed as a European standard supported by simple software tools.

www.whitefishproject.org



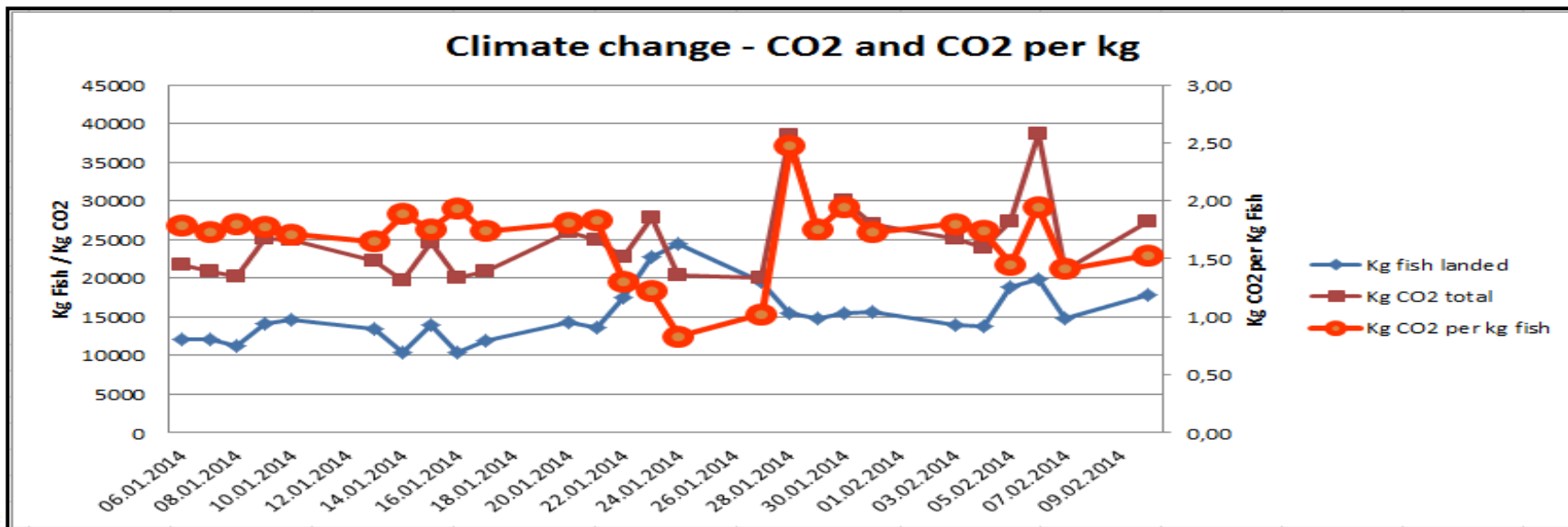
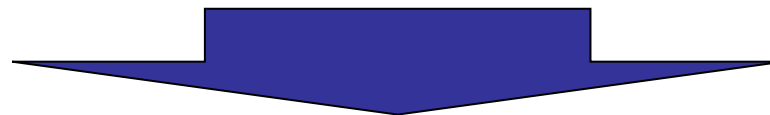
Environmental sustainability

Vessel and gear data

Vessel info - Vessel lifetime	
Reinforcing steel	12560 kg total
Chromium steel	868 kg total
Other / New	0 kg total
Sum	13428 kg total
Estimated tons fish caught in vessel lifetime	
	100000 tons
Gear info - Gear lifetime	
Various rubber parts	225 kg
Chain and iron parts	333 kg
Sweeper wire	266 kg

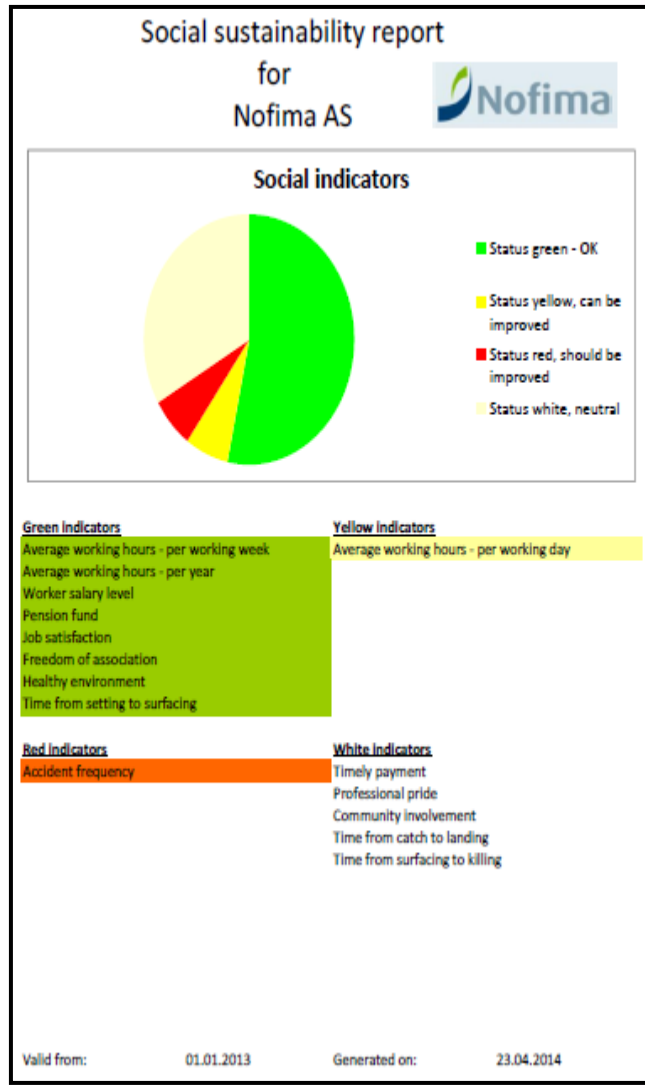
Catch data

Batch	Landed kg	MSD	MGO	Lubr	Ammo	R22	Profit
06.01.2014	12116	5682	77	34	0,27	0,03	16426
07.01.2014	12091	5419	128	34	0,27	0,03	6887
08.01.2014	11220	5236	133	31	0,25	0,02	13412
09.01.2014	14129	6546	123	39	0,31	0,03	14221
10.01.2014	14539	6509	97	40	0,32	0,03	17632
12.01.2014	12500	5788	118	38	0,30	0,03	6556



Social and economic sustainability

Social impact categories	Obligatory	Recommended
Worker safety	X	
Companies salary levels		X
Healthy working environment		X
Employees' job satisfaction		X
Employees' professional pride		X
Community involvement of cod and haddock fishing companies		X
Companies' timely payment of salaries	X	
Pension fund contributions of companies for their employees		X
Freedom of association and collective bargaining	X	
Employees' working hours		X
Economic impact categories	Obligatory	Recommended
Profitability per trip		X
Production risk		X



P2 - Nordic project WhiteFishMaLL

- 36 month duration, 01/2012 – 12/2014
- 0.8 MEUR total, 0.6 MEUR Nordic contribution
- 9 participants from 4 countries

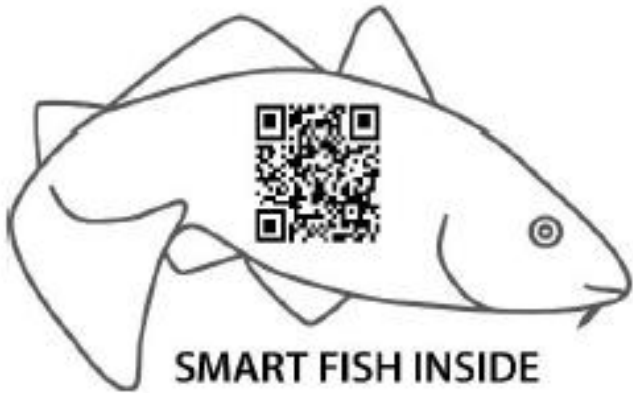
WhiteFishMaLL objective:

To build a branding platform for whitefish from the North Atlantic that differentiates in terms of outstanding quality, sustainable production and superior consumer benefits. It consists of:

- Branding strategy (mission, attributes)
- Industry guideline for how to collect, process and communicate relevant product information
- Demonstration and evaluation of a specific innovative whitefish product

www.whitefishmall.com

Consumer communication



**Batch-specific
labelling and product
documentation**

What kind of fish is this? Atlantic Cod



Common name Atlantic Cod
Scientific name Gadus morhua

Atlantic cod has a mild and sweet flavor with firm and flaky texture.

Facts and habitat

whitefishtest.herokuapp.com/2

What kind of fish is this? Atlantic Cod

Who caught it? Kristin PH 157

How was it caught? LineCaught

When was it caught? February 6, 2013

What's in it? Nutritional info

How can it be prepared? Recipes

Is it at sustainable levels? Yes

Questions or comments? Contact us!

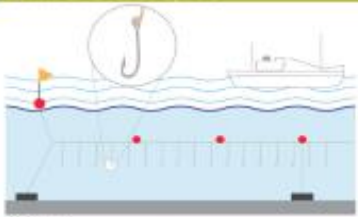
Who caught it? Kristin PH 157



Captain Njáll Kolbeinsson
Owned by Vísir HF
Landing Harbour Húsavík
Type of ship Multi-Purpose
Size of crew 14

Batch-specific

How was it caught? LineCaught



Long-lining is one of the most fuel-efficient methods. A line is set out from a few hundred meters to possibly over 50km. It is set with short lines with baited hooks attached at intervals. The line is set horizontally along the bottom. The size of fish and species is determined with hook size and type of bait used.

How can it be prepared? Recipes

The positive health effects of eating cod can easily be lost if it is not properly prepared in a healthy way. We recommend baking, broiling or grilling in cod preparation for optimum results.



Heat the oil in a frying pan, add the onion, then fry for 5-6 mins until lightly browned. Stir in the tomatoes, sugar, thyme and soy, then bring to the boil. Simmer 5 mins, then slip the cod into the sauce. Cover and gently cook for 8-10 mins until the cod flakes easily. Serve with baked or steamed potatoes.

Is it at sustainable levels? Yes

Caught at sea Longline
Capture Area North East Atlantic
Stock Area Iceland
F&O 2/1
Stock Detail 1/4
Size of crew 14

The Icelandic cod stock is assessed by ICES as being at sustainable levels or healthy and is being harvested sustainably.

Fishing is prohibited in areas where numbers of small cod (less than 35cm) within the catch exceed 25%. Discarding is prohibited in Iceland as the whole catch must be landed.

Reference links

1. Location of Catch

It was Linecaught at the depth of 123 meters on February 6, 2013 at 03:11. The temperature was 2° and winds were up to 13 m/s. The bait used for this fish was herring.

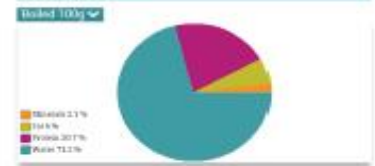


What's in it? Nutritional info

Cod is high in protein and low in saturated fat.

It is a lean white fish, provides 17.6 g of protein, zero carbohydrates and only a modest amount of fat per 100 grams. It is also a source of healthy omega-3 oils.

Cod is only 76 kcal per 100 grams so it's difficult to find a healthier choice out there.



Nutrition Facts for Raw Cod

Serving Size (100g)		Amount Per Serving	Calories 76
			% DV
Total Fat	6.0g		
Saturated Fat	0g		
Monounsaturated Fat	0g		

From WhiteFishMaLL WEFTA poster⁵

P3 - EU project FoodIntegrity

- 60 month duration, 01/2014 – 12/2018
- 11.5 MEUR total, 9 MEUR EU contribution
- 38 participants from 20 countries



FoodIntegrity objectives:

- To provide Europe with state of the art integrated capability for detecting fraud and assuring the integrity of the food chain
- For seafood: To design, create and begin to populate a database suitable for documenting the degree and scope of seafood misdescription in Europe
- For seafood: To do spot checks for selected products and analyse to what degree analytically verifiable claims about seafood products are true
- For seafood: To develop a coherent and integrated toolbox, linking seafood product claims to analytical and paper-trail methods, to facilitate verification and validation

www.foodintegrity.eu



Seafood misdescription

- Seafood is traded internationally more than any other foodstuff, most often seafood is processed and then traded
- More than 1700 species of fish are traded internationally
- For many species of fish, there is no internationally agreed upon commercial name, the same name is used in different countries to refer to completely different species
- Seafood is a valuable commodity with great potential for differentiation between species and products
- A particular challenge in the seafood industry is distinguishing between a seafood product that has farmed origin as opposed to wild caught origin
- There is a great concern relating to sustainability of many fish stocks, a sustainability claim is valuable
- Challenge in proving that the fish was legally caught and landed
- **Seafood is among top #3 misdescribed foodstuffs**

Anything useful come out of this?

- Recommended set of indicators for companies who want to carry out their own sustainability assessment
- European voluntary industry standard for self-assessment of sustainability impact: CEN Workshop Agreement (CWA) 76 - Batch-based Calculation of Sustainability Impact for Captured White Fish Products
- WhiteFish self-assessment calculator freely distributed as interlinked spreadsheets
- WhiteFishMaLL QR-code application to be commercialized
- Seafood sampling and analysis report – prevalence of seafood fraud and misdescription in Europe
- Seafood misdescription database – how, why, what species and products, what volume and value, etc.
- Toolbox linking seafood claims to analytical and paper trail methods – given a seafood product property claim, how can it be verified?

Conclusions on value-adding - 1

- **This sort of value-adding is a bottom-up process. Companies must (already) be motivated and see the opportunities.**
- **To go beyond individual already motivated companies and self-assessment is a large undertaking that must be industry driven if it is to succeed.**
- **For motivated companies R&D and standardization initiatives of this type are very relevant. It provides them with a scientific basis for what they want to do, and it harmonises and reduces the work involved.**

Conclusions on value-adding - 2

- **Self-assessment does not support inter-company benchmarking and it can only to a limited degree be used to substantiate consumer-facing claims.**
- **The companies report that the competitive advantage is mainly gained through carrying out the self-assessment (and telling their customers about it); not through the results that come out of it.**
- **Good data recording practice and traceability systems (both internal and external) is a prerequisite for companies who want to do this.**

Thank you for your attention

Petter Olsen

petter.olsen@nofima.no

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Selected references

1. Oceana Study Reveals Seafood Fraud Nationwide, Oceana (2013).
2. ICES Report of the Arctic Fisheries Working Group (2014).
3. Winther, U., Ziegler, F., Skontorp Hognes, E., Emanuelsson, A., Sund, V., and H. Ellingsen (2009). Carbon footprint and energy use of Norwegian seafood products. SINTEF Fisheries and Aquaculture, International projects and consulting, Trondheim, Norway.
4. Weaver et al (2008). The content of favorable and unfavorable polyunsaturated fatty acids found in commonly eaten fish. Journal of the American Dietetic Association, vol. 108, issue 7, pp 1178-1185.
5. Gunnlaugsson, V., Viðarsson, J., Gregersen, O., Djurhuus, D., and Olsen, P. (2014). Product information at your fingertips. Poster at WEFTA 2014.