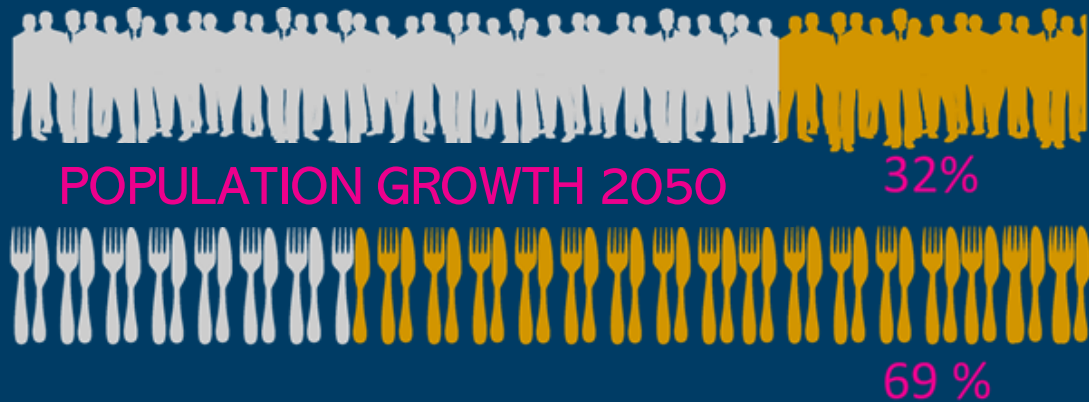




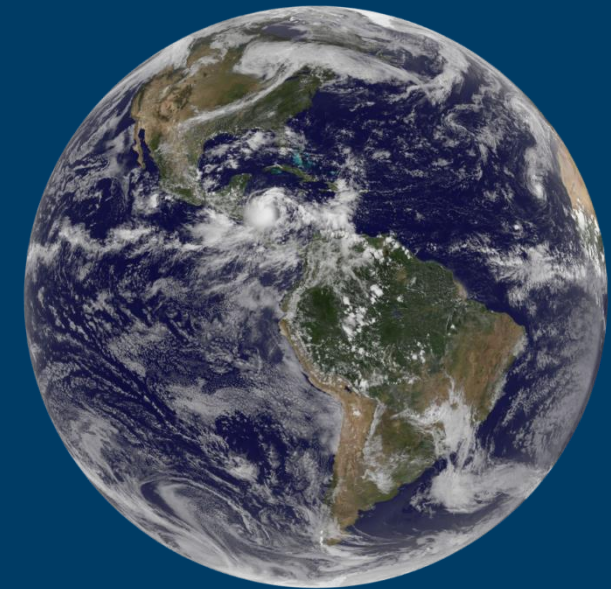
INCREASED UTILIZATION AND VALUE CREATION FROM WHITEFISH REST RAW MATERIALS

Ana Carvajal, Jannicke Remme and Guro M.Tveit

Food gap



71 % of the earth is water...




... but only 2 % of the world food production comes from the ocean



When discards prior to landing are included, 35 percent of global catches are lost or wasted and therefore not utilized.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



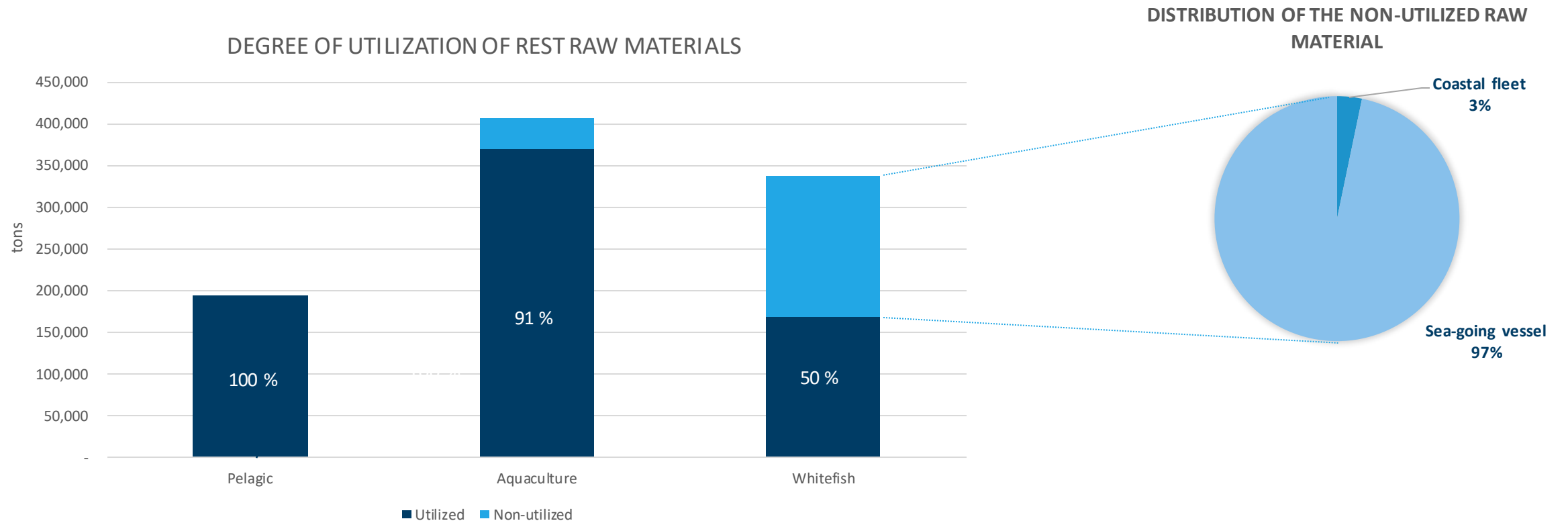
Food and Agriculture Organization of the United Nations

2018



THE STATE OF
**WORLD FISHERIES
AND AQUACULTURE**

MARINE REST RAW MATERIAL IN NORWAY (2017)



The potential in the non-utilized raw material



Non-utilized whitefish rest
raw materials
174 000 ton
(2017)



8 700 ton lipids



~ 18 million people could get
their daily recommende intake
(250 mg EPA + DHA) for a whole
year



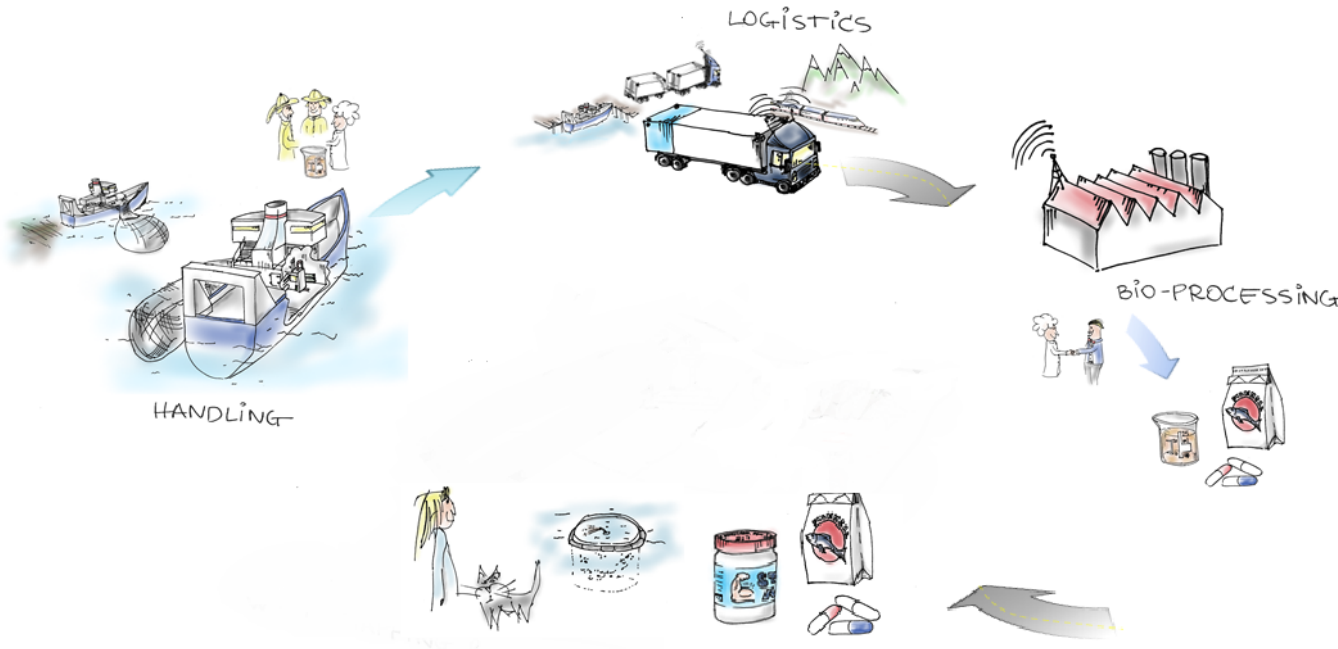
24 400 ton protein



~ 1.1 million people could get
their daily requirement of
proteins for a whole year

The sea-going vessels discard 86 % of the rest raw material

- Quality loss during storage
- Storage capacity
- Technological solutions for handling



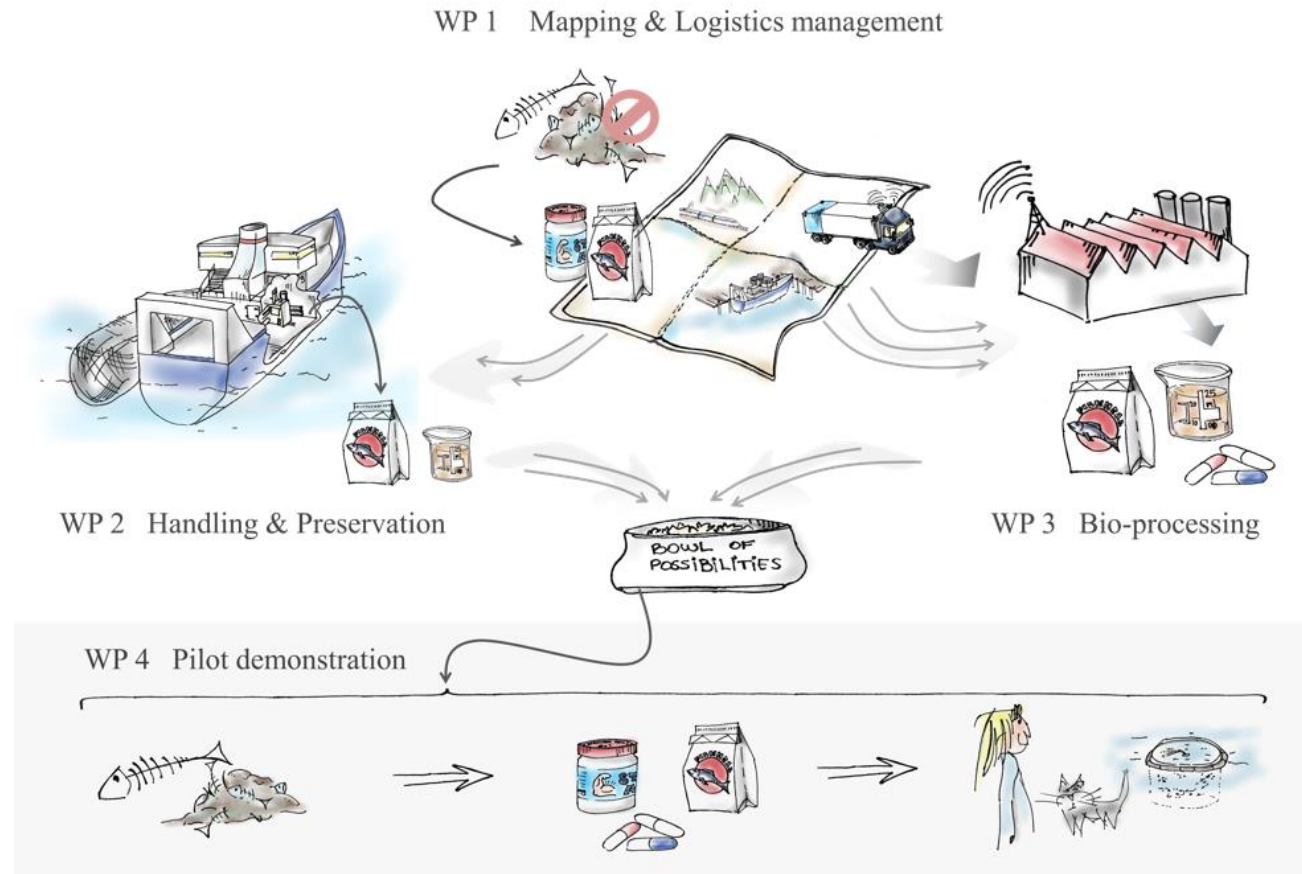
- Preservation during storage and transportation
- Logistics solutions

- Flexible processing technology for on-board processing of value-added products

- Economic and regulatory constraints
- Market demand and possibilities

SUPREME: Sustainable production of ingredients from whitefish rest raw materials (2019 – 2022)

Project coordinator: PhD Ana Carvajal, Research manager, SINTEF Ocean, 9.9 MNOK



HEADS UP

High quality proteins
from cod heads

Cod heads

- Traditionally dried
- Unstable markets
- Can we make high quality proteins?





Activities

- Screening of processing conditions in lab scale
- Pilot trials with fresh cod heads at Tufjordbruket (Rolsøy – 71° North) by using SINTEF's mobile production unit.
- Evaluated the product in food model systems
- Identify and solve technical challenges



Cod protein hydrolysates

- Yield – 10 % (depending of enzyme)
- Water content can be reduced – not affecting the yield
- Protein content: 80 – 87 %.
After filtration: 93 % protein
- Water soluble
- Neutral taste and smell

Industrial scale testing in May 2019





VS.



Yield
10%

Yield
20%

Protein hydrolysates

- (-) Higher technological investments
- (-) Needs technical staff
- (+) Stable market for fish proteins
- (+) Added products, bones and meal
- (+) Great potential
- (+) Demand for proteins
- (\$) 2-60 Euro/kg

Dried cod heads

- (+) Low technological investment
- (-) Really hard work
- (-) Unstable markets
- (-) Low value creation
- (\$) 1,4 Euro/kg (2016)



THANK YOU FOR YOUR ATTENTION!

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