4th International Conference and Exhibition on **Food Processing & Technology** – August 11th 2015



Multiple benefits of Food Technology collaboration in Fish Processing

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Resources and Products
Matis, Iceland www.matis.is

Food and Agriculture Organization of the United Nations

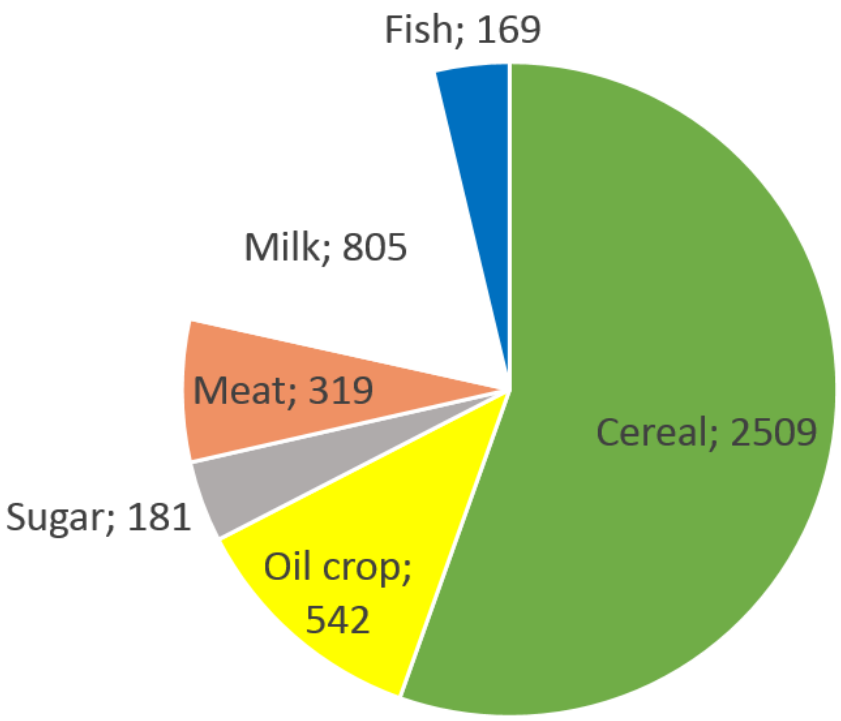
Food Outlook

BIANNUAL REPORT ON GLOBAL FOOD MARKETS

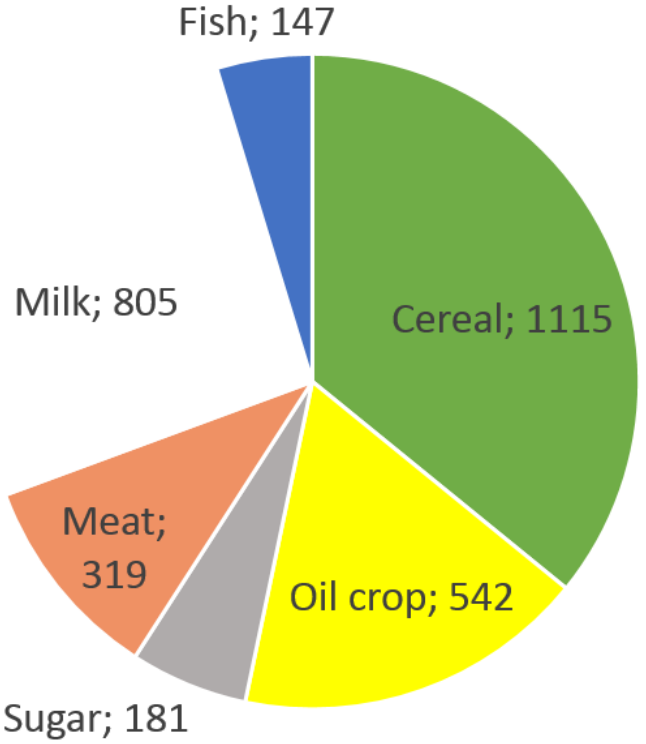
World food production
Forecast 2015

matís

Total Production
4.5 billion tons



For food consumption
3.1 billion tons



Growing world population

Need to feed the world population

Fierce competition between food products

Seafood minor part on the worlds dining table

91 million tons captured, 67 million tons cultivated in 2012

91 million tons captured, 78 million tons cultivated in 2015 - Forecast

169 million out of 4.5 billion tons

3 million of 4.3 million tons of Atlantic demersal catches, from North East Atlantic

Even more pressure to obtain high prices for what is harvested and produced

Precision and efficiency in high demand

Post harvest losses - food waste (up to 30% of produced foods)

Increase in aquatic products demand, anticipated

European Fish Market - FinFish Study 2014

Total market supply 14.2 million t up 1.7 %

Imported share slightly down to 63 % (8.9 million t)

Whitefish dependency unchanged at 89 % for wild capture species

EU catches for whitefish species have increased marginally (+1 %) but quota utilization continues to deteriorate

Exports slip back by 5 %

Tuna, salmon and cod are more or less equal in consumption at WFE of around 1.1 million t each

Supply for per capita consumption is up by 0.6 kg at WFE

Competition is intensifying from other countries and regions

EU fisheries account for 27% of consumption

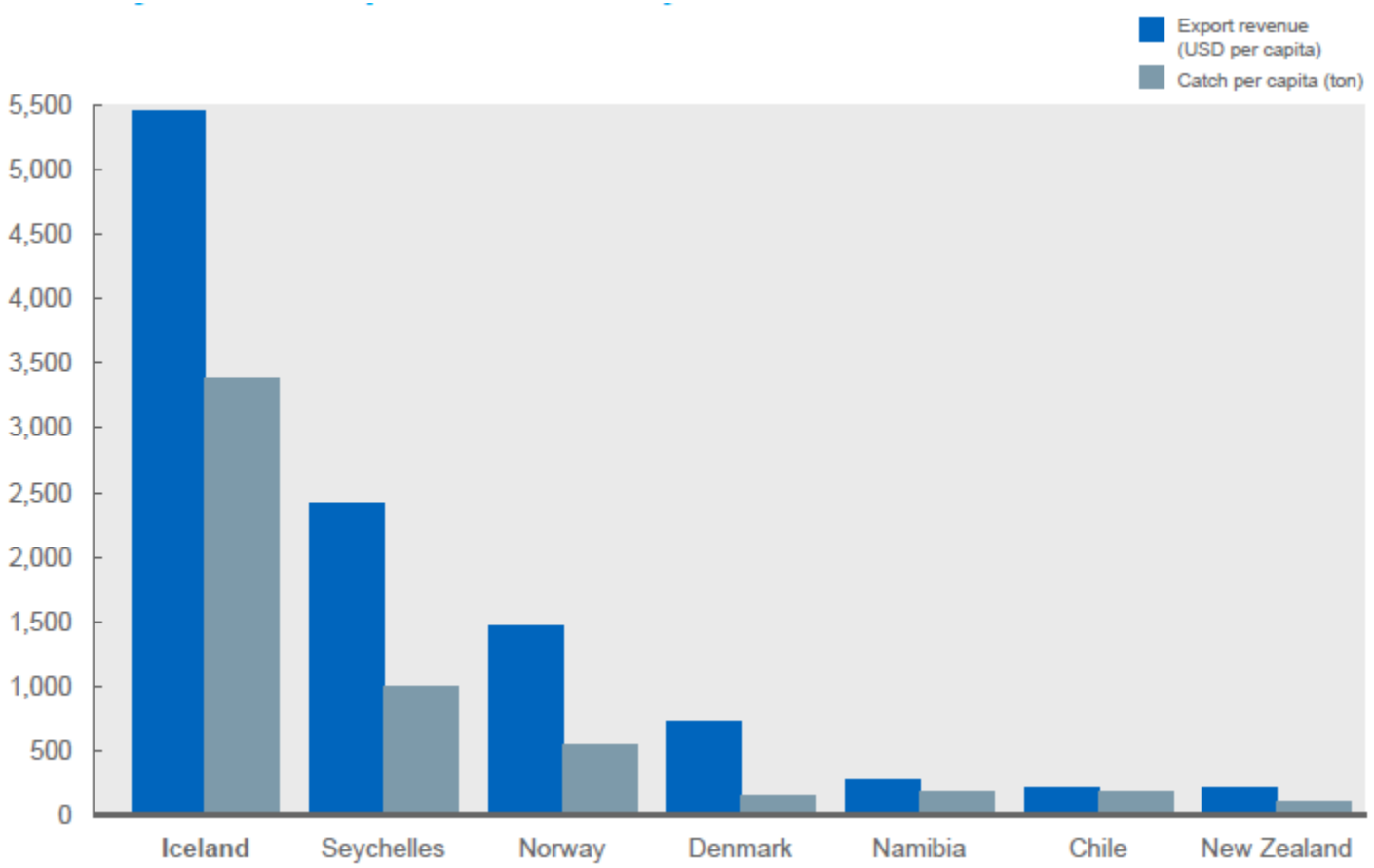
European Fish Processors Association

European Federation of National Organisations of Importers and Exporters of Fish

Whole Fish Equivalent (WFE)

Mr. Guus Pastoor AIPCE-CEP

Supreme importance of fisheries to Iceland



Source FAO; McKinsey analysis. McKinsey *Charting a Growth Path for Iceland*

Iceland's Fisheries

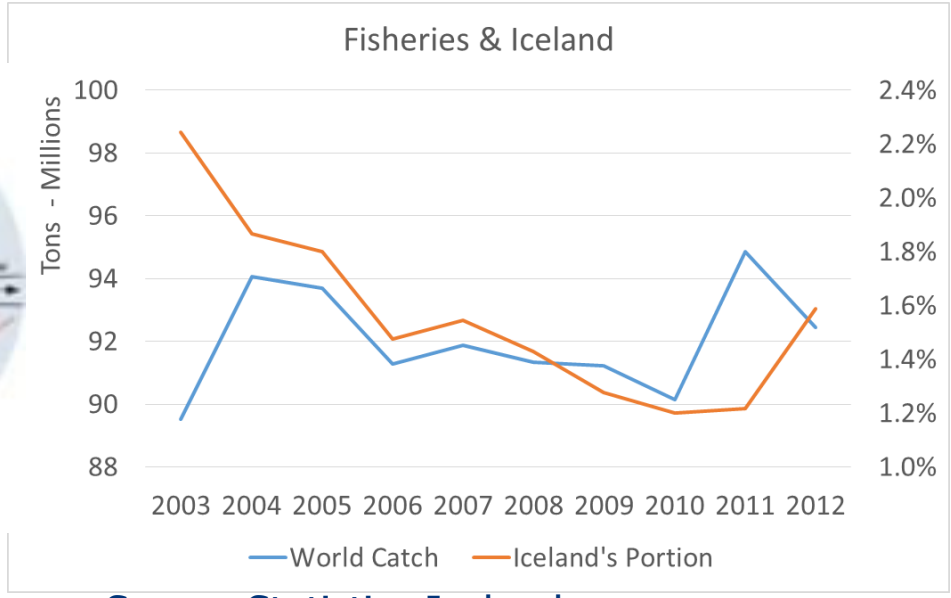
Iceland 103,000 km^2 landmass 753,000 km^2 EEZ (0.16%)
330,000 inhabitants

Harvest ≥ 1.1 million ton/year Export ≈660 thousand tons seafood products in 2014
Export Value of Icelandic Seafood Products 1.9 billion GBP 2014 42.5%

Ocean Currents

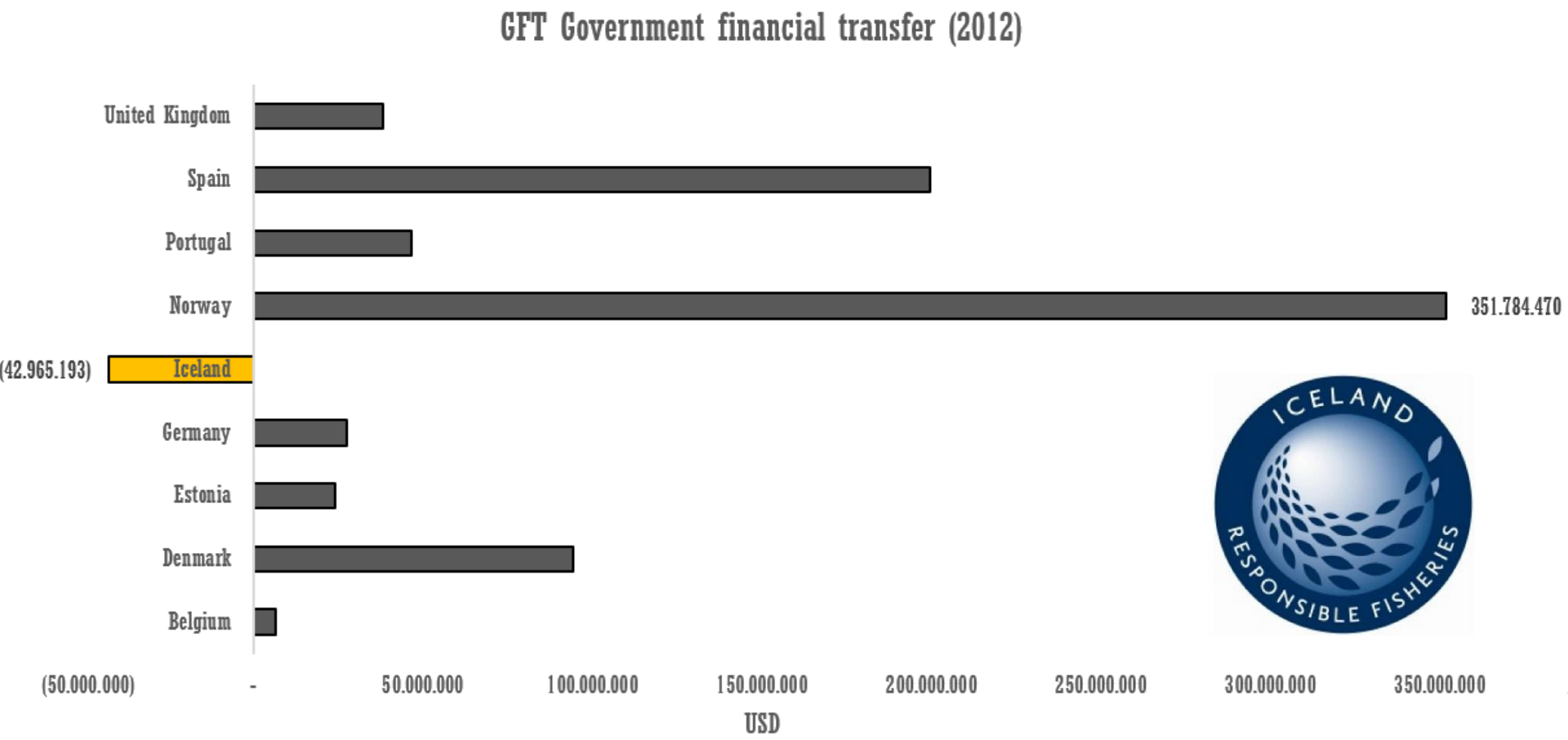


Source Wikipedia



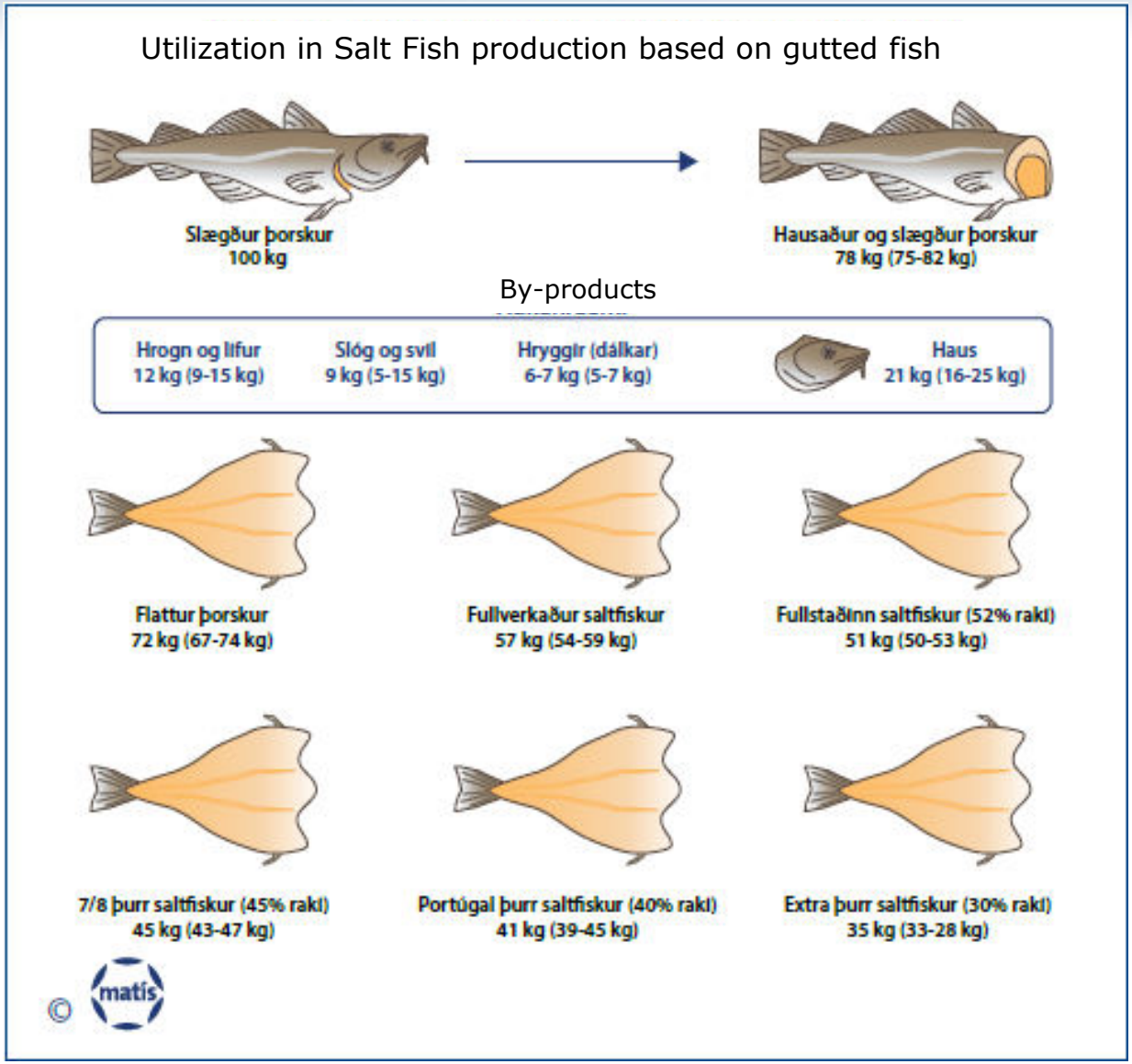
Source Statistics Iceland

Economic independence
International comparison

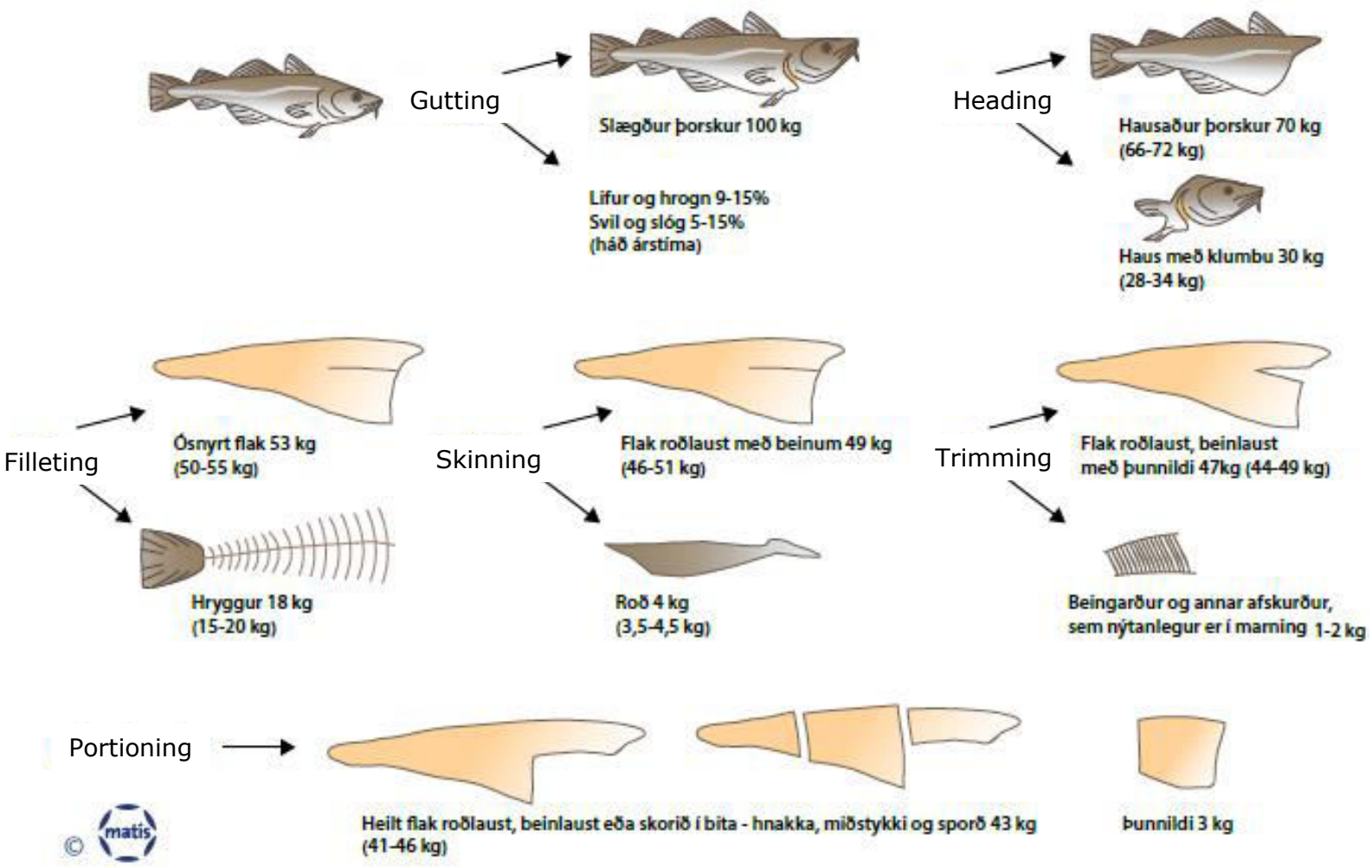


Kolbeinn Árnason, CEO of Fisheries Iceland 2014
Source: OECD

Processing Salted fish



Processing Fish fillets, frozen or fresh



Ever-changing challenges in Icelandic Fisheries

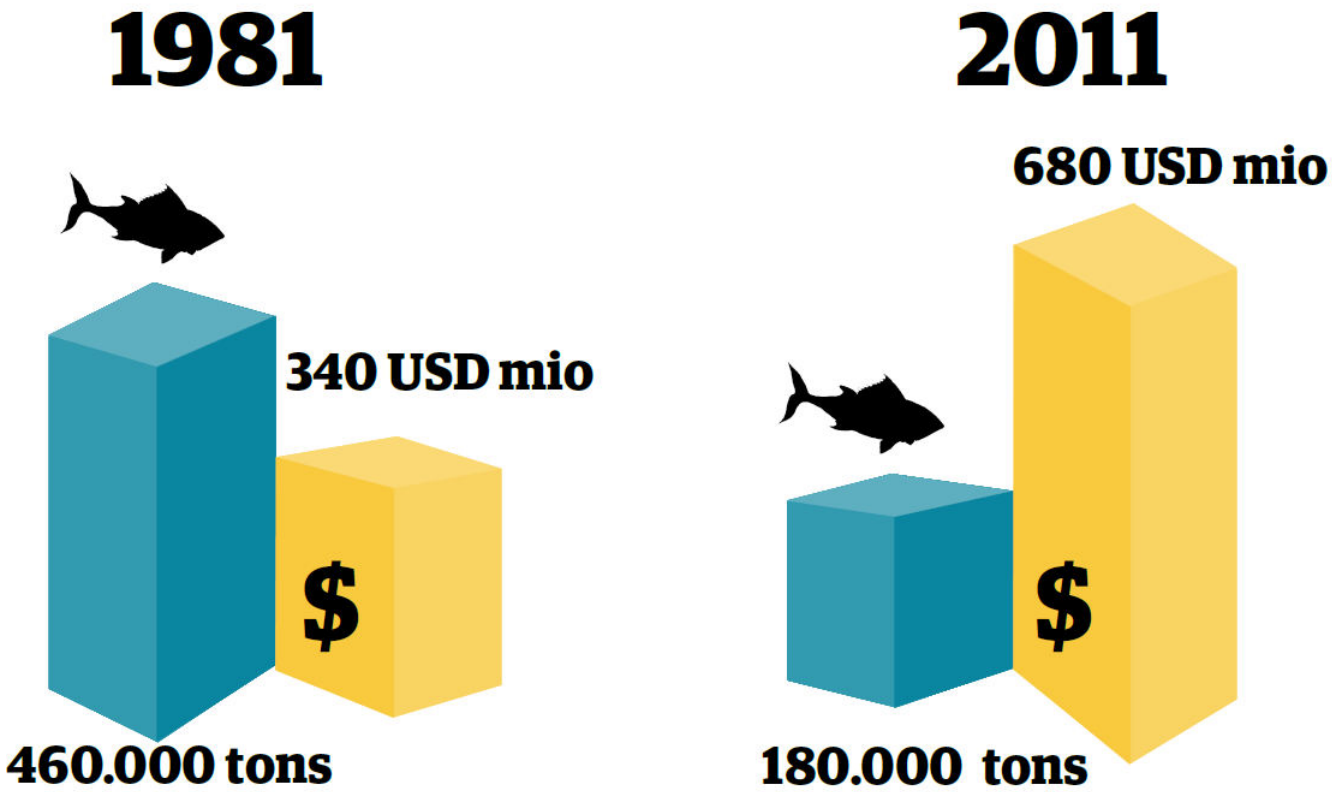
70´s	80's	90's	00's	10's
save valuables	solve problems		develop solutions	implement processes
fishingboats sail and land the cacth in EU		*whole fish by containers*	*fresh fillets by flight*	*fresh fillets by containers*
plastic boxes	tubs	Styrofoam boxes		improved Styrofoambox
conveyor	electronic scales	ICT in fish processing & selection grading	super chilling	modeling forecasts
USA market predominant		EEA market opens & takes over *retail oriented trials*		
stern (wet fish) trawlers	Freezing trawlers	*rigor mortis*	bleeding fish alive onboard trawlers	transformation of trawlers
block-frozen filletes	IQF filletes & fillet portions	lightly salted	salted fish process development	fresh fillets
secondary education fish processing	Food Science University of Iceland	Fisheries Science University of Akureyri	University graduate level	outsourcing of Food Science Education
Extension of EEZ	TAC => Quotasystem	ITQ - long term	Increased Value of Seafood products R&D Fund	

raw material dominated / production pushed Value Chain — market pull value chain

improved handling => increased utilization of main products & production of by products = increased utilization => increased value of cacth

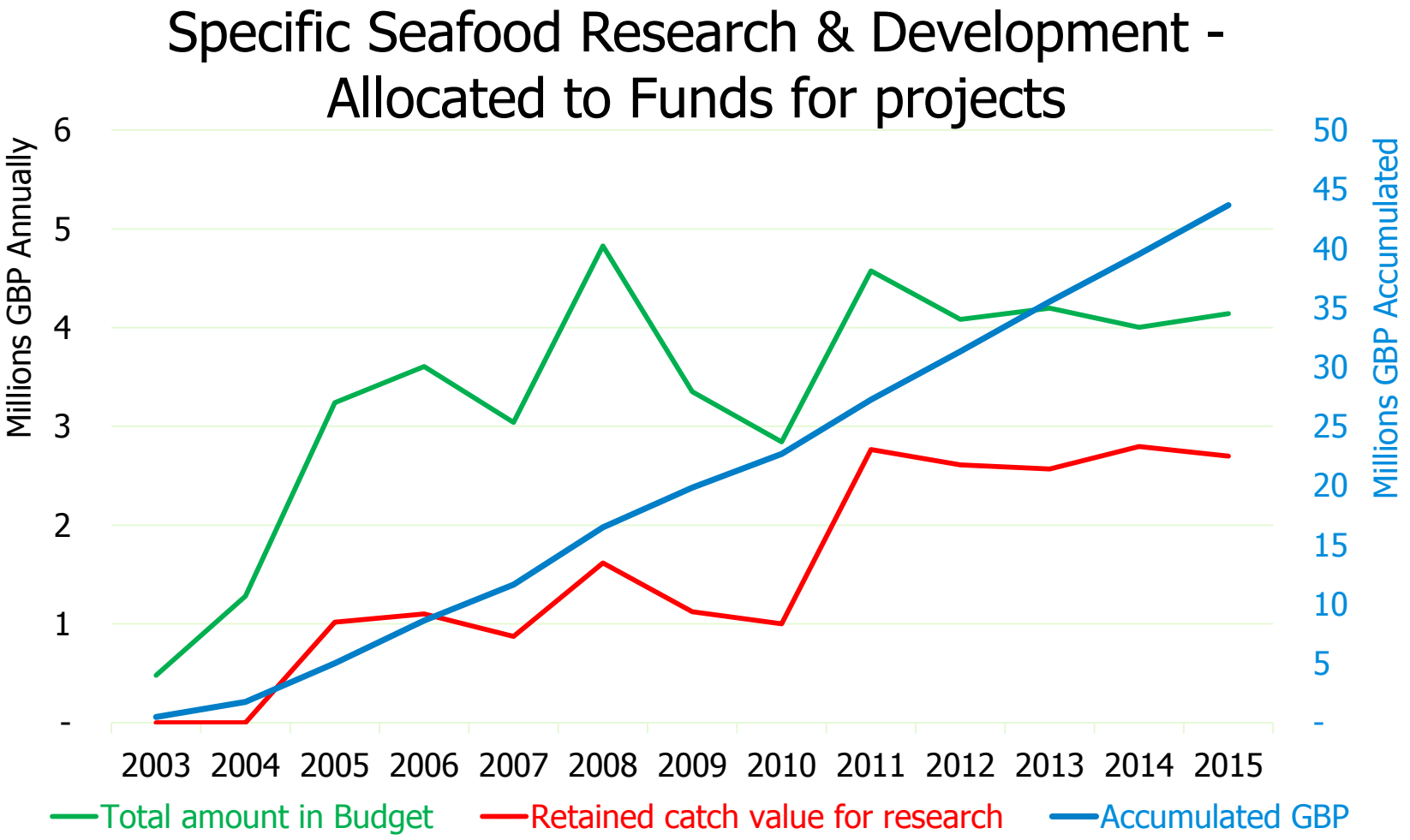
Matis - youtu.be/8gWo_rhOiWE

Value creation
Economical impact of cod



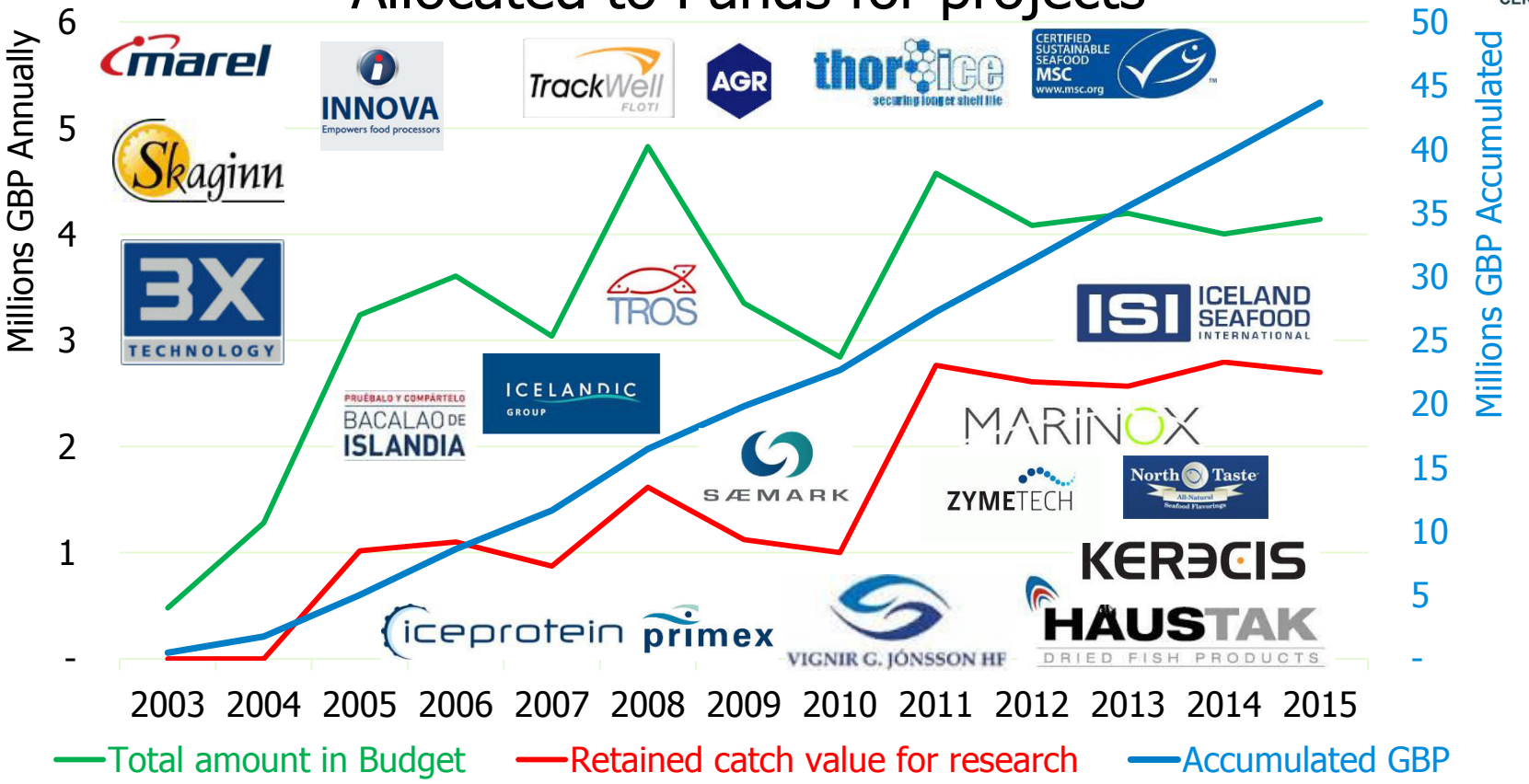
Kolbeinn Árnason, CEO of Fisheries Iceland 2014

Collaboration to sole the challenges

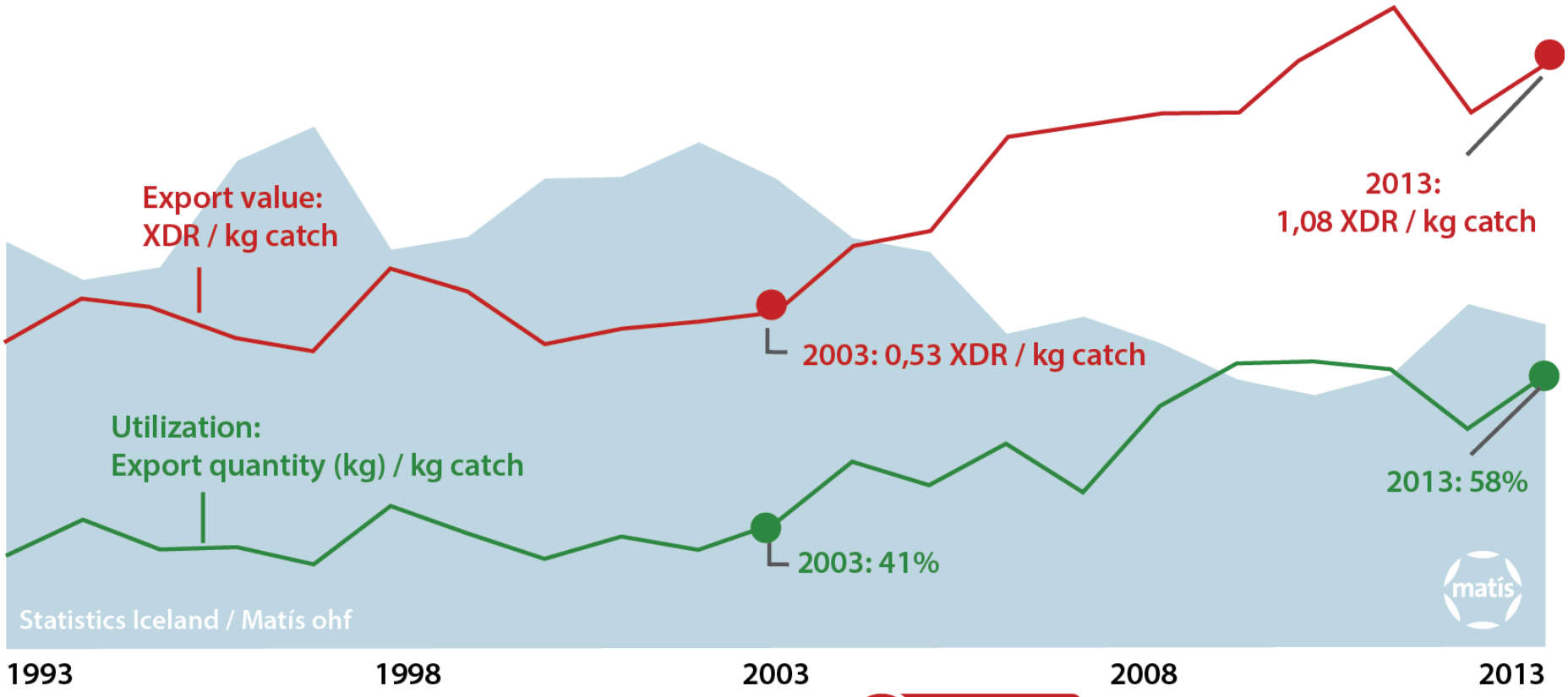


Collaboration to solve the challenges

Specific Seafood Research & Development - Allocated to Funds for projects



Value creation from catch through processing to markets



AVS rannsóknasjóður í sjávarútvegi

Tæknipróunar-sjóður

norden Nordic Innovation

COOPERATION

HORIZON 2020

Volatile Food

Best practices

=> Better material quality

=> More utilization

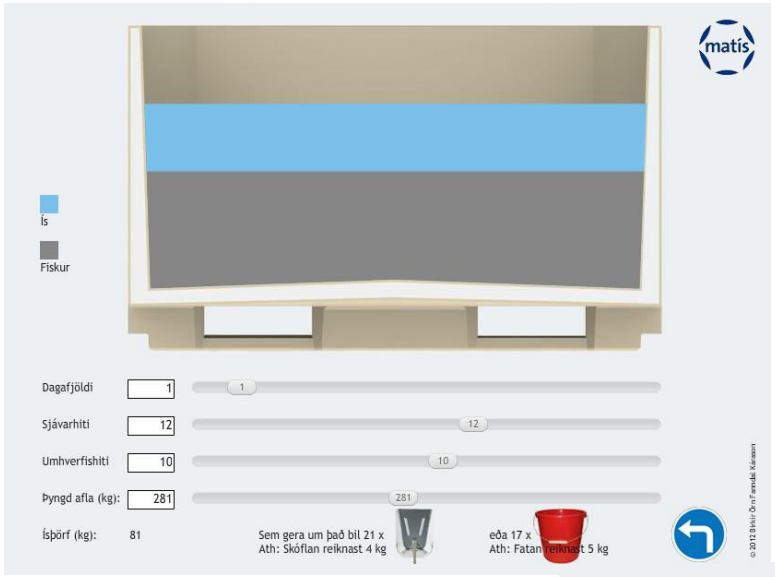
=> New processing possibilities

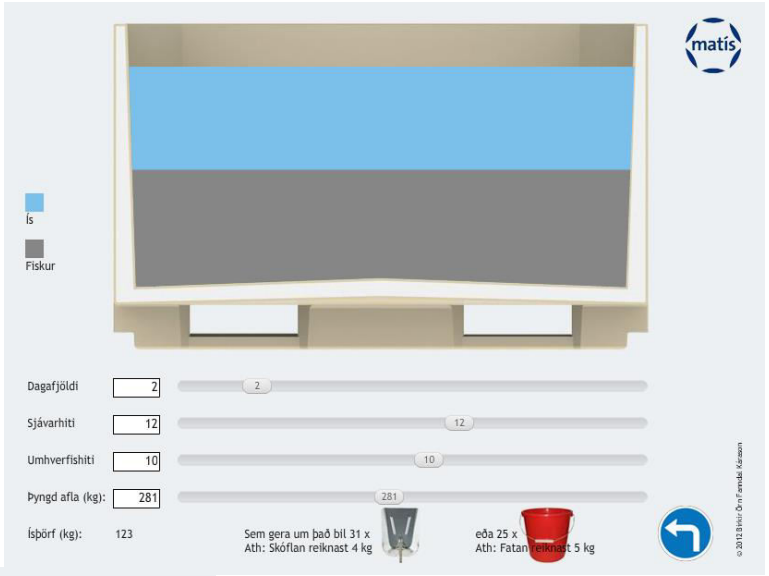
=> Value creation

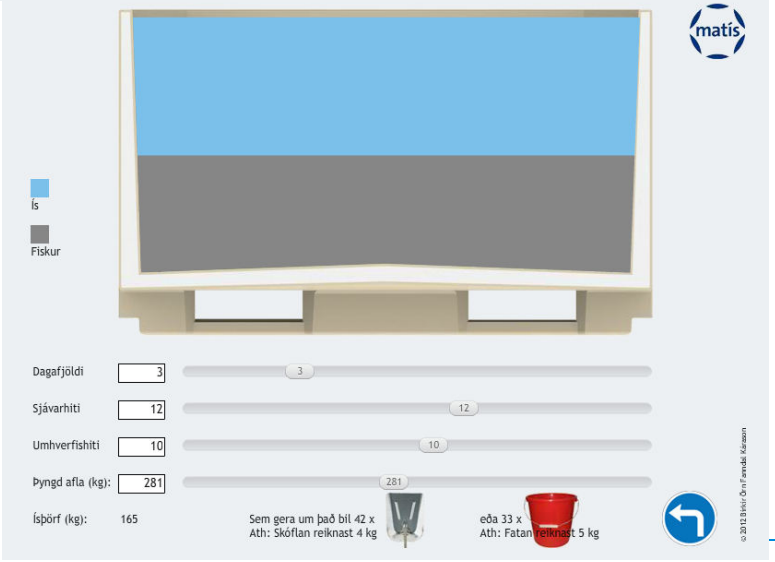
Safe – Sustainable – Traceable – Nutritious – Responsible – Tasty

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Requirements for cooling media too chill catch





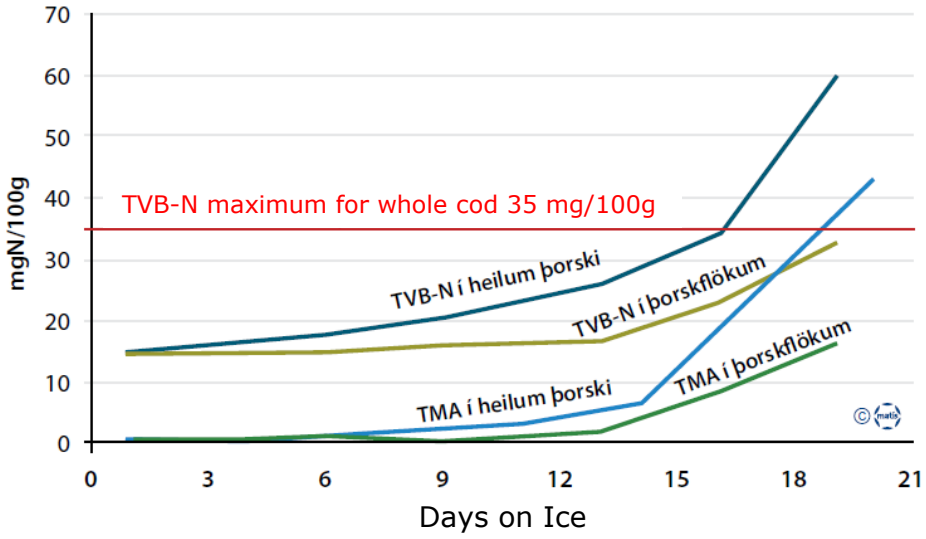


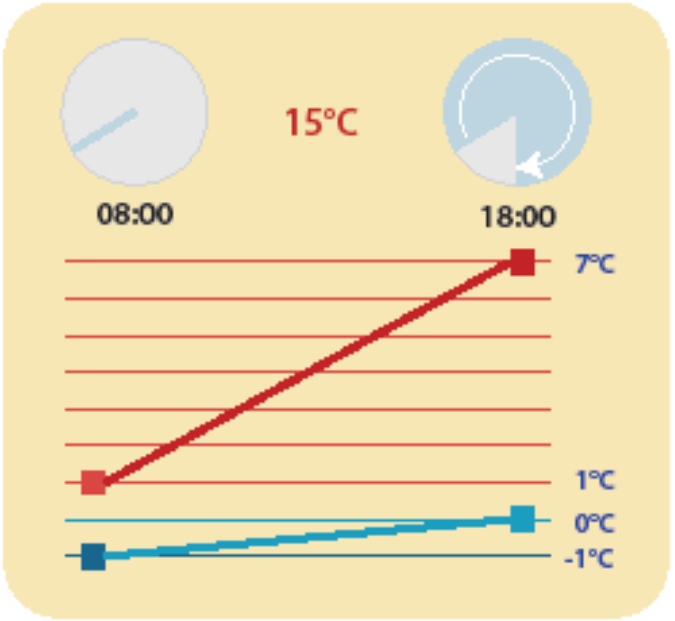
Shelf life

Temperature is crucial

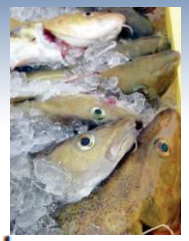
Temperature at packaging matters

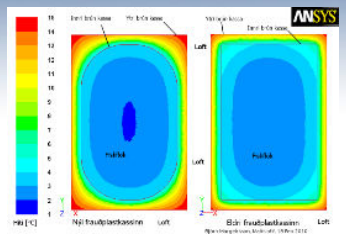
Better to pack cold fresh fish products than warm



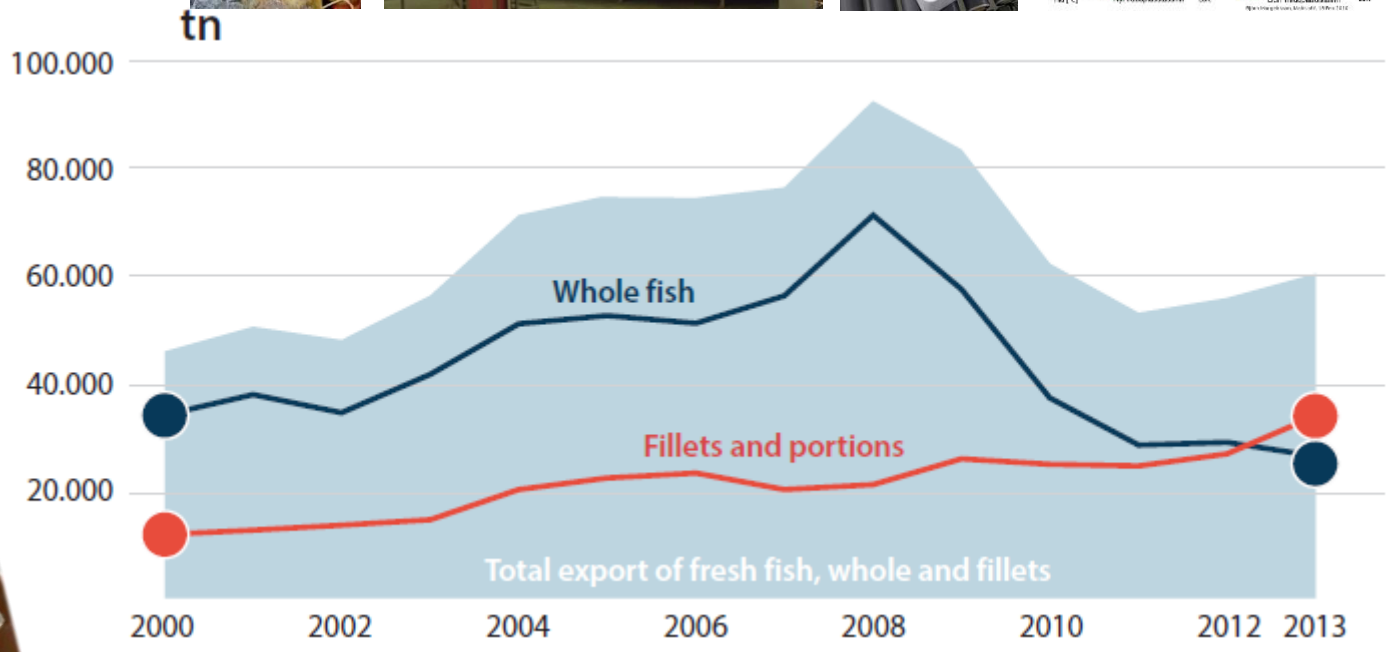


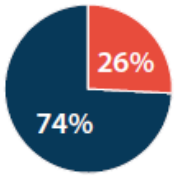
Seafood export from Iceland - Quantity



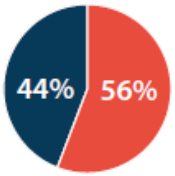



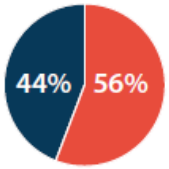




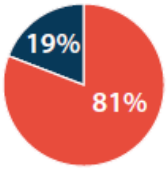


Quantity (tn)

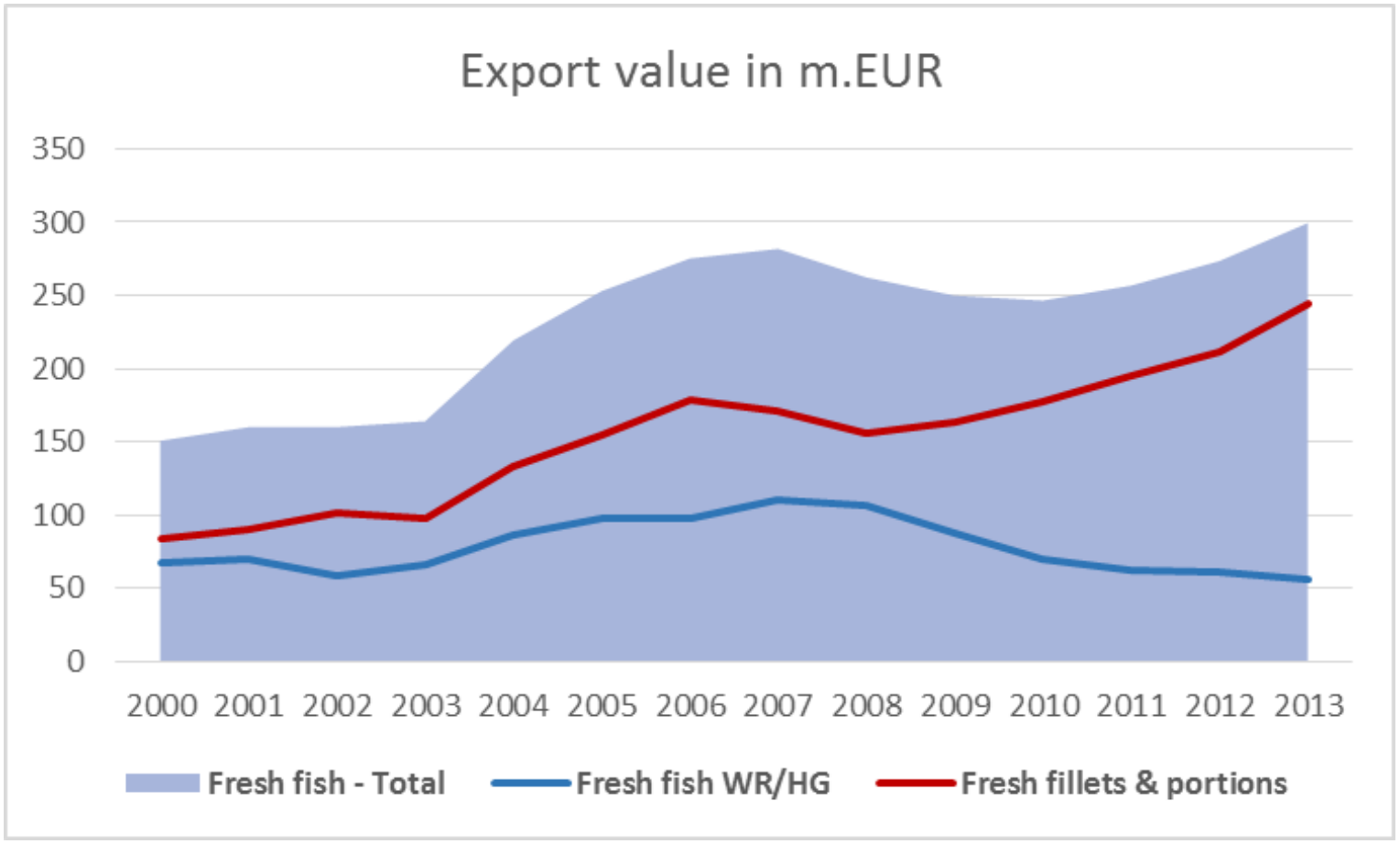




Value (ISK)



Value of fresh Icelandic Fish Products



Industrial PhDs

1. S Margeirsson	Processing forecast of cod	2008	
2. K Sveinsdottir	Improved seafood sensory quality	2009	
3. W Tao	Preservation techniques & seaweed Algalpoluphenols as antioxidants	2009	
4. T Brenner	Aggreation behavior of cod muscle proteins	2009	
5. E Reynisson	Fresh view in fish microbiology	2010	
6. GR Shaviklo	Properties & applications of Fish proteins in value added convenience foods	2010	
7. HL Lauzon	Preventive Measures in Aquaculture: […] Probiotics on cod at Early Stages	2010	
8. KA Thorarinsdottir	Influence of salting procedures on the characteristics of heavy salted cod	2010	Lund
9. MTT Nga	Enhancing quality management: fresh fish supply chains, logistics & traceability	2010	
10. R Bjornsdottir	Bacterial community during early production stages of intensively reared halibut	2010	
11. S Bjornsdottir	Genetical motification of *Rhodothermus marinus* bacteria	2010	
12. M Gudjonsdottir	Quality changes during seafood processing studied with NMR & NIR	2011	NTNU
13. MV Nguyen	Effects of processes on physiochemical attributes of salted cod	2011	
14. JSRE Jensen	Bioactive compounds from Icelandic liverworts	2012	
15. B Margeirsson	Modeling temperature changes during transport of fresh fish products	2012	
16. SM Halldorsdottir	New & improved methods for production of hydrolyzed fish proteins	2013	
17. E Sturludottir	Statistical methods to identify changes in time series of monitoring data	2013	
18. AH Petursdottir	Inorganic and lipophilic arsenic in food commodities with emphasis on seafood	2014	Aberdeen
19. MG Karlsdottir	Oxidation and stability of frozen seafood products	2014	
20. VA Kale	Bioactive sulfated polysaccharides from the sea cucumber	2014	

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International Collaboration

Nordic Marine Innovation 2.0

CapMafi

ProffAqua

SuperChilling

Improved quality and value of Nordic mackerel products for the Global market

European Research and Development Collaboration

The way forward?

Struggling health care systems

Burden of Lifestyle diseases

Seafood might ease the pain as its consumption has been linked to health benefits

Intake through fortified portions or balanced diet

Utilization of marine compounds contribute to more than food

Fisheries - Important section of the BioEconomy





Our Goals
We are committed to sustainable value creation in the food and biotech industries, food safety and public health

Our mission
We provide research, consultancy and solutions to companies in the food industry with emphasis on marine opportunities

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Our values
We value long term **integrity** above short term profit

We take **initiative** in turning good ideas into profitable solutions through science and **innovation**

We are **intent** on achieving the ambitious goals of our customers and employees