



# Iceland's Use of Captured Seafood By-Products

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**Jónas R. Viðarsson**

**Director of Division of Value Creation at Matis**



# Introducing Jónas R. Viðarsson

## Jónas R. Viðarsson

Director of Division of Value Creation at Matís

### Education:

- Fisheries Science,
- Environmental Science
- Resource Management

### Experience:

- At Matís for 15 years working on improving quality and value of food & feed.
- Fisherman on Icelandic trawlers for 13
- Fish processing plants, net making & other service to the seafood industry



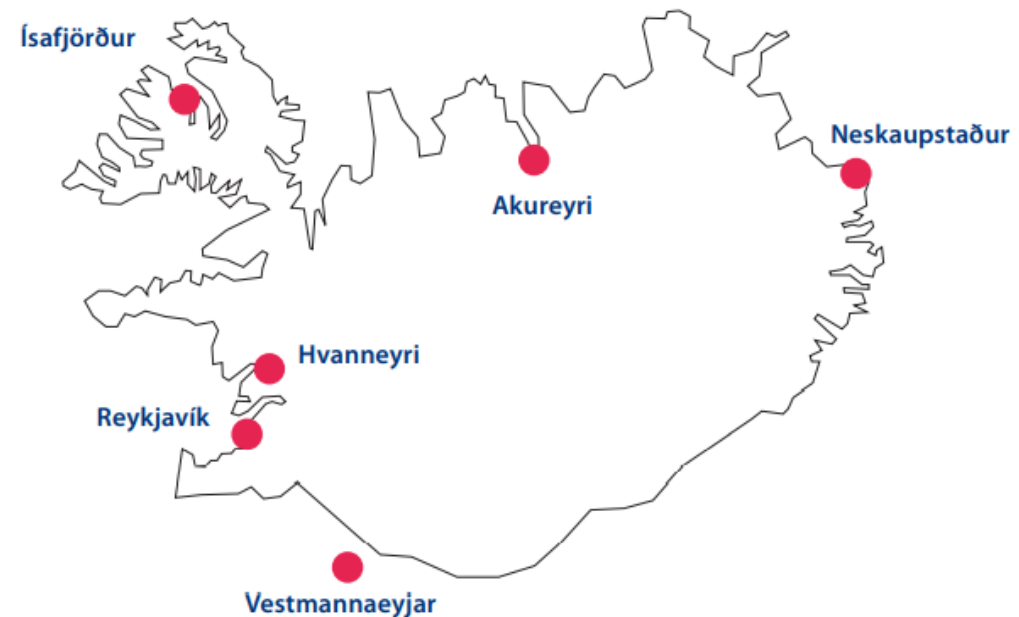
# Matís

Matís is a governmentally owned Ltd. Non-profit food & biotech R&D company

Matís has obligations to safeguard **food safety**, contribute to improved **public health** and increased **value creation** in the Icelandic food & biotech sectors

93 employees in 6 locations

- 23% PhD, 54% MSc



# Content of presentation

## Iceland is among world leaders in Use of Captured Seafood By-Products

- **Why?**  
Why is such priority placed on fully utilizing the catches?
- **How?**  
How has Iceland advanced in fully utilizing their catches?
- **What?**  
What are the products and processes that have instigated the improved utilization?

### What next?



# Why?

**Iceland was a very primitive seafood raw material supplier for centuries**

**Along the way have been events that have had impact on how marine resources are perceived and utilised:**

- The herring collapse in 1968 → Herring represented 40% of all export values in 1965/66
- EEZ moved to 50 NM in 1972 and to 200 NM in 1975 → We alone are responsible for the resources
- Discard ban introduced in 1977
- 1983/84 The black report on the cod stock → Moved from effort to catch quota management (IQ system)
  - IQ introduced in the herring fishery in 1975
- 1991 the quota becomes transferable (ITQ) → Optimisation, specialisation and consolidation
  - It is not possible to increase the volume fished → Let's create more value from what we have
  - Now we have 10 largest quota holders owning 60% of the ITQ (50 largest owning 90% of the ITQ)
  - Strong companies that can invest in technology & research to improve utilisation
  - Good governmental & academic support for companies and start-ups that want to create value from RRM



# Why?

## Marine products represented 75% of Iceland's export values in 1990

- 41% in 2000
- 27% in 2020

We cannot increase our catches.....but we can increase the value

.....and we cannot afford to fail



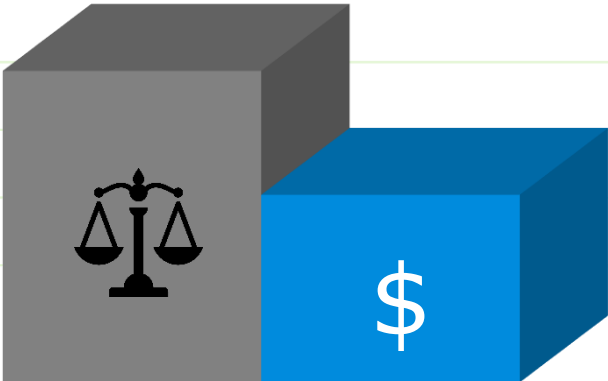
# How?

## Volume vs Value



**2020**  
277,000 t.  
975 M. USD

**1981**  
460,000 t.  
340 M. USD

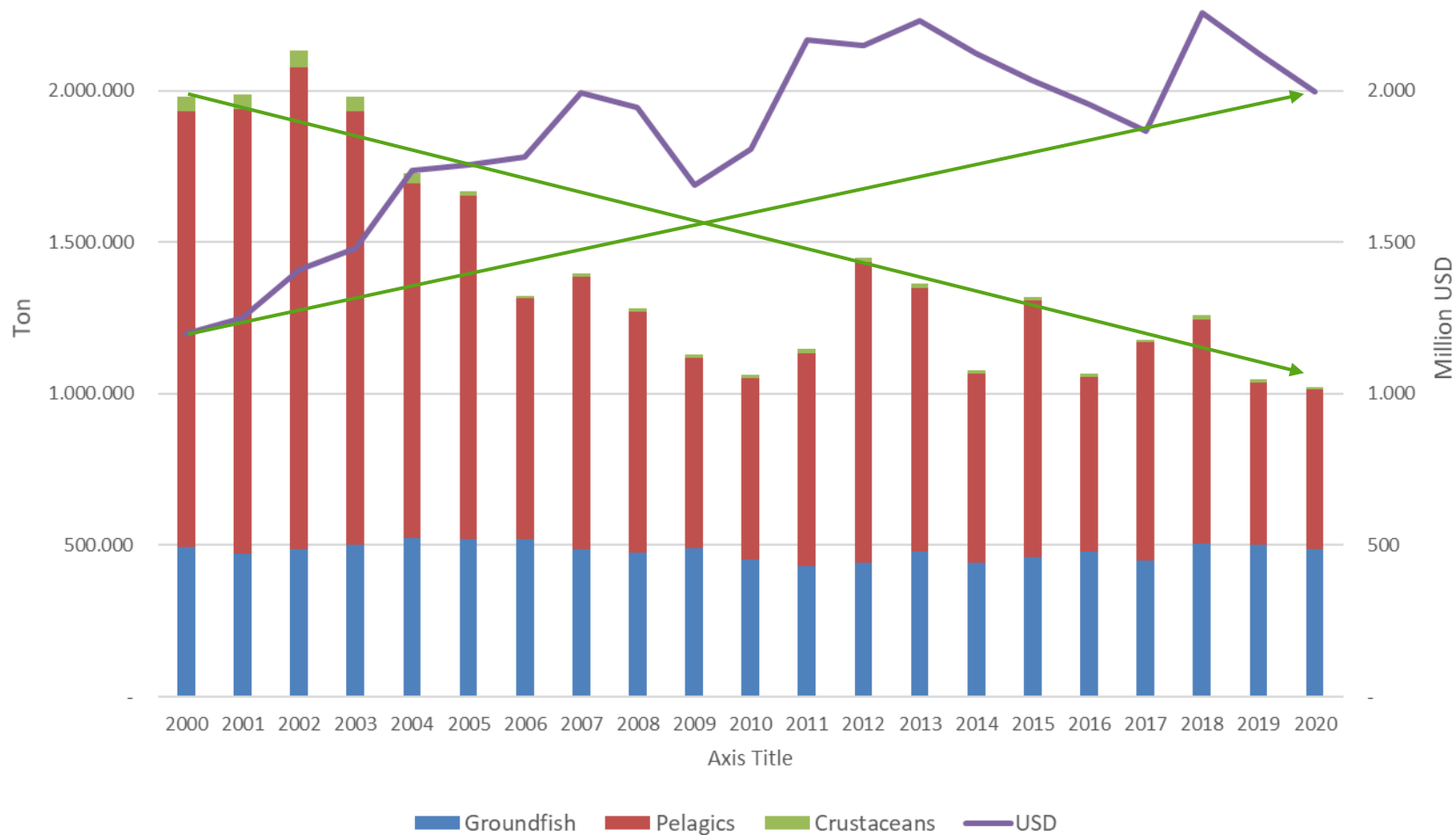


# How?

## Volume vs Value

Volume reduced by 50%  
Value increased by 67%\*

*\*in USD using yearly average exchange rates*





# How?

## Investment in education and R&D

**In the 90s the education of those running seafood companies and service companies was mostly earned by hands-on experience.**

**The seafood sector then started to become more interesting to the universities and young people that have revolutionaries the industry.**

- Fisheries science (UiT & UNAK), Food science, Biotech, engineering

**The government followed by funding R&D in seafood sector e.g. AVS was founded in 2003**

**There is a tight cooperation now between the industry, academia & government**



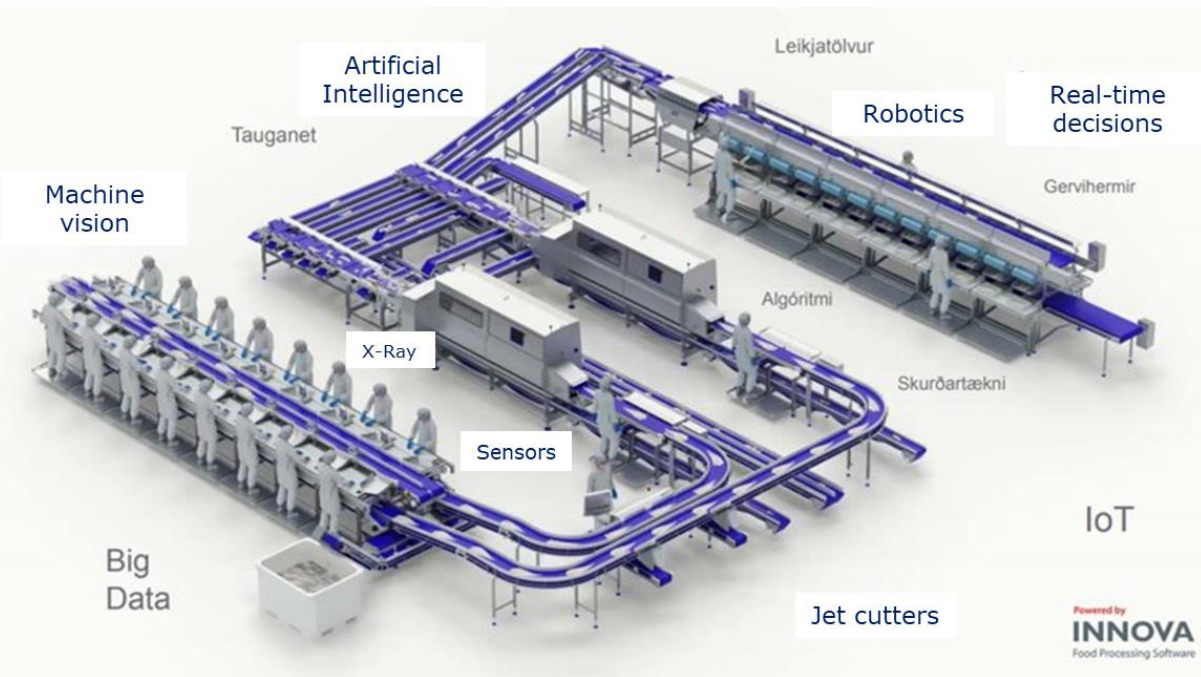
# How?

## Investment in vessels



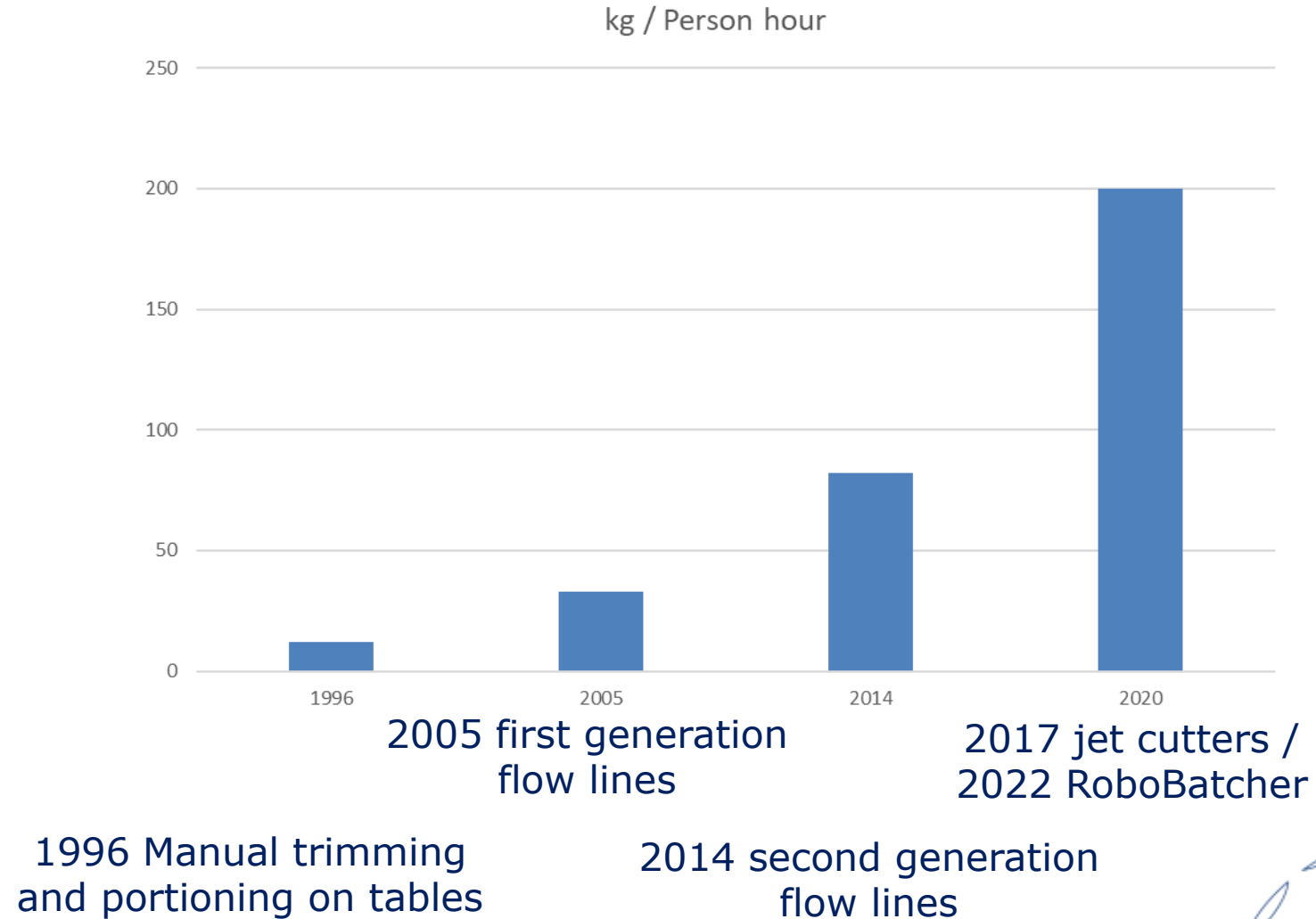
# How?

## Investment in processing



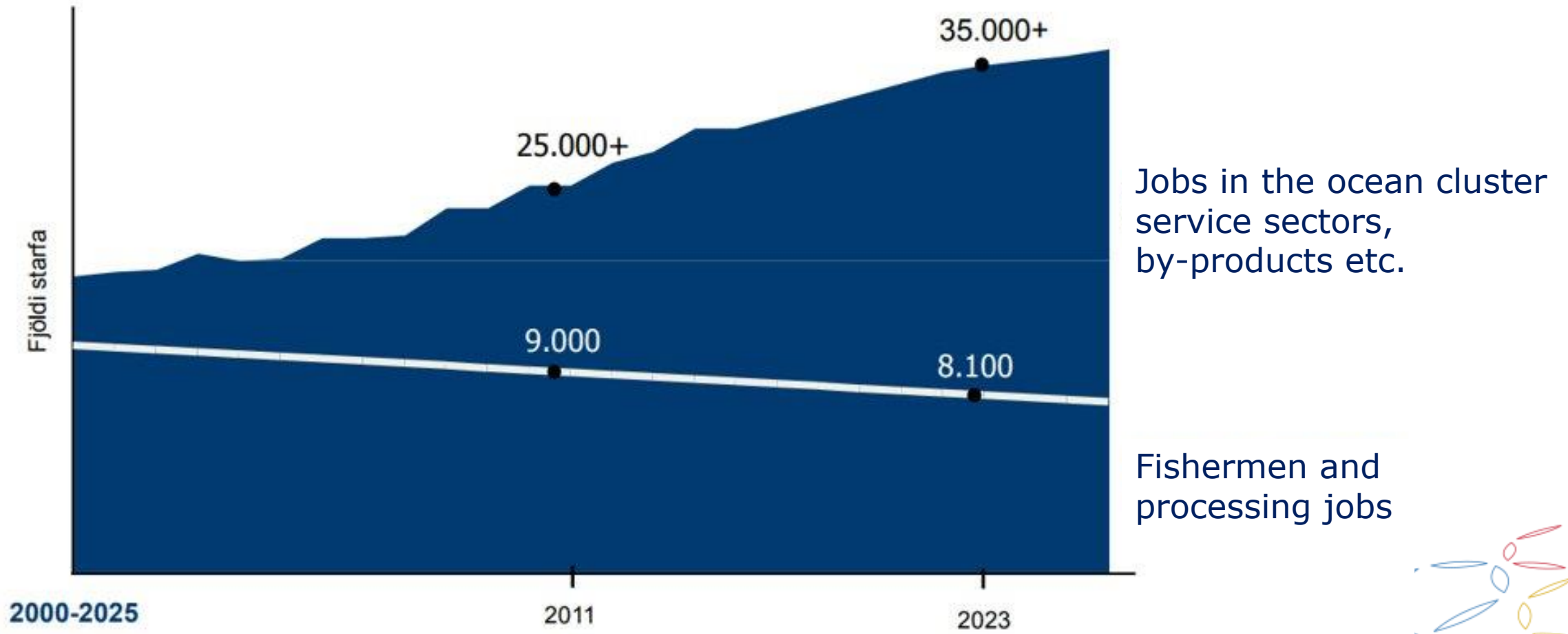
# How?

## Automation - increased throughput



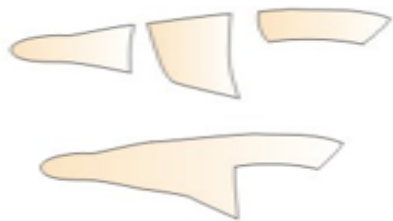
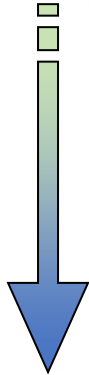
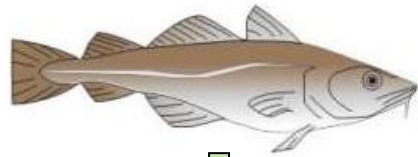
# How?

## Shift in nature of jobs in the “ocean cluster”



# How?

## Increased utilisation of side streams



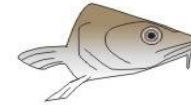
Fillet skin- & boneless 38%



## Side streams



Viscera 16%



Head with collar 24%



Back bone 13%



Skin 3%



Belly flap 3%

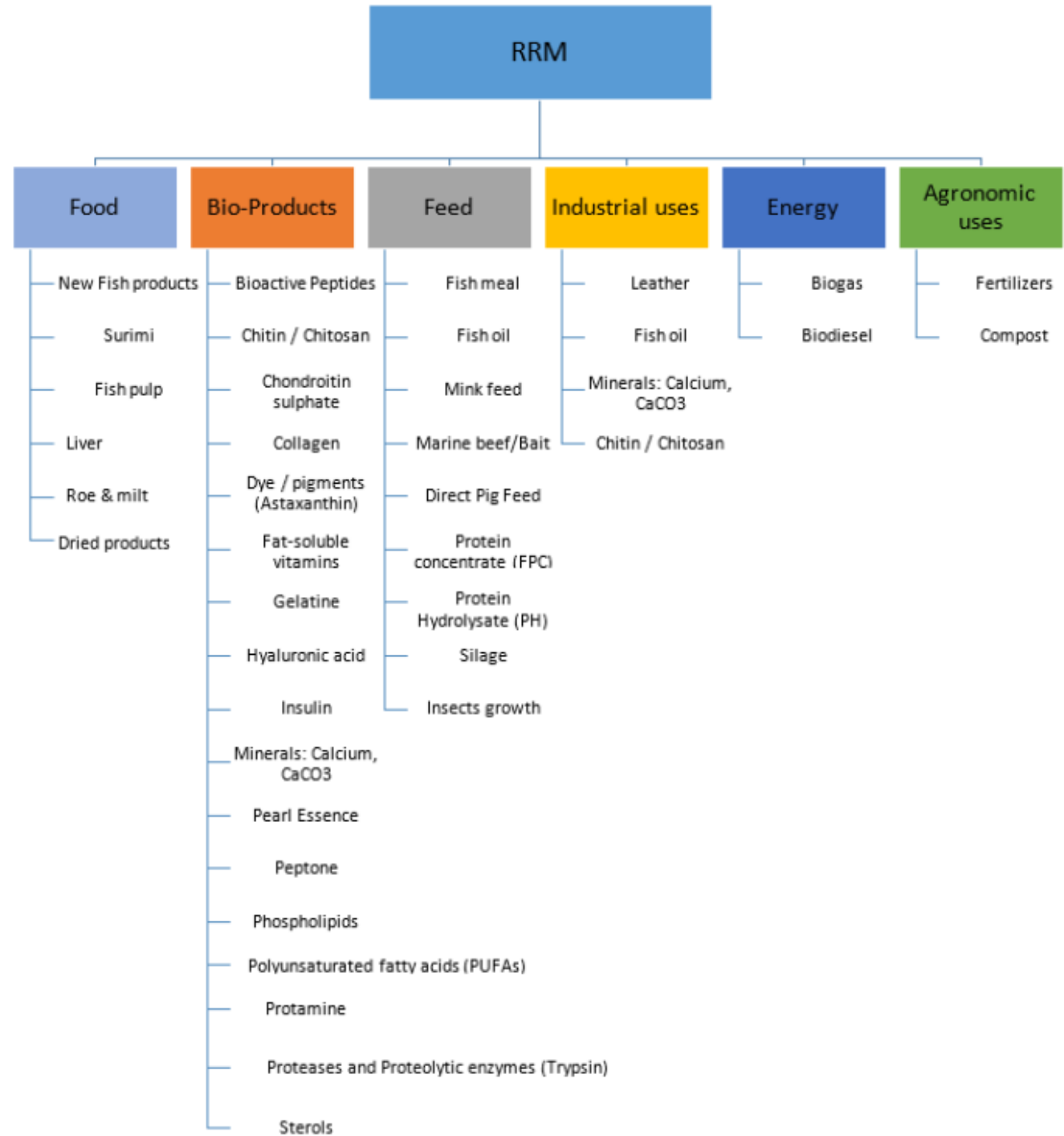


Cut-offs 3%

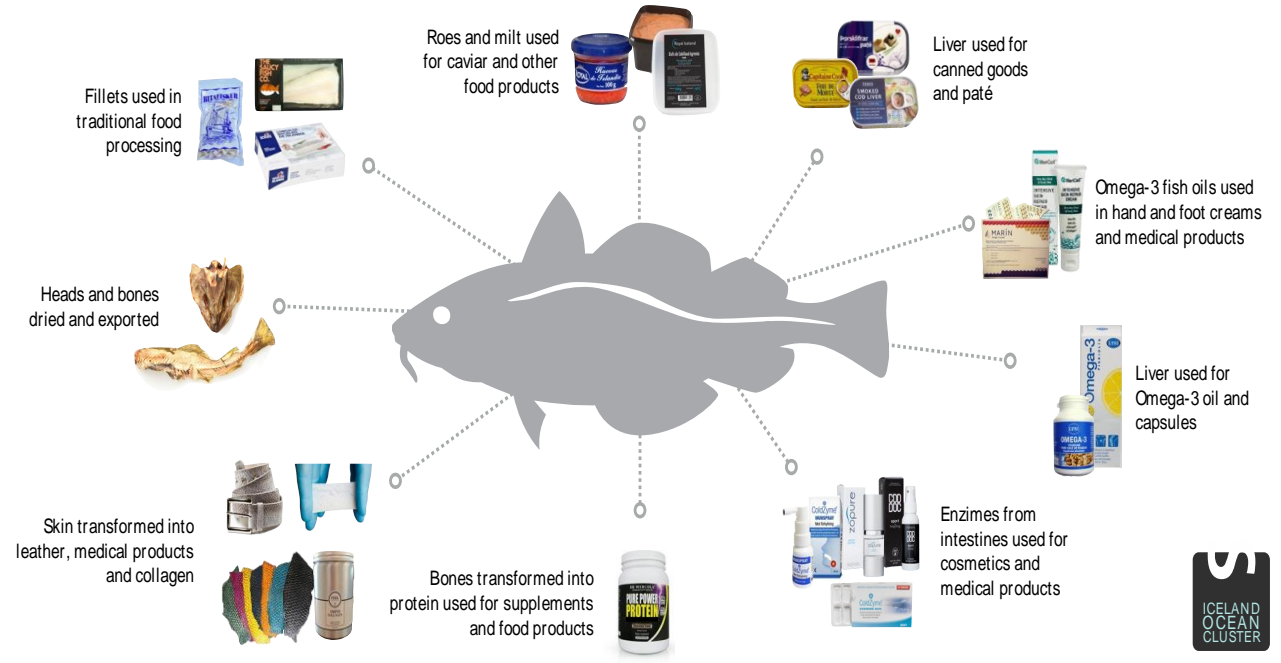
62%

# What?

A vast variety of products can be made from side streams or Rest Raw Materials (RRM)



# What?

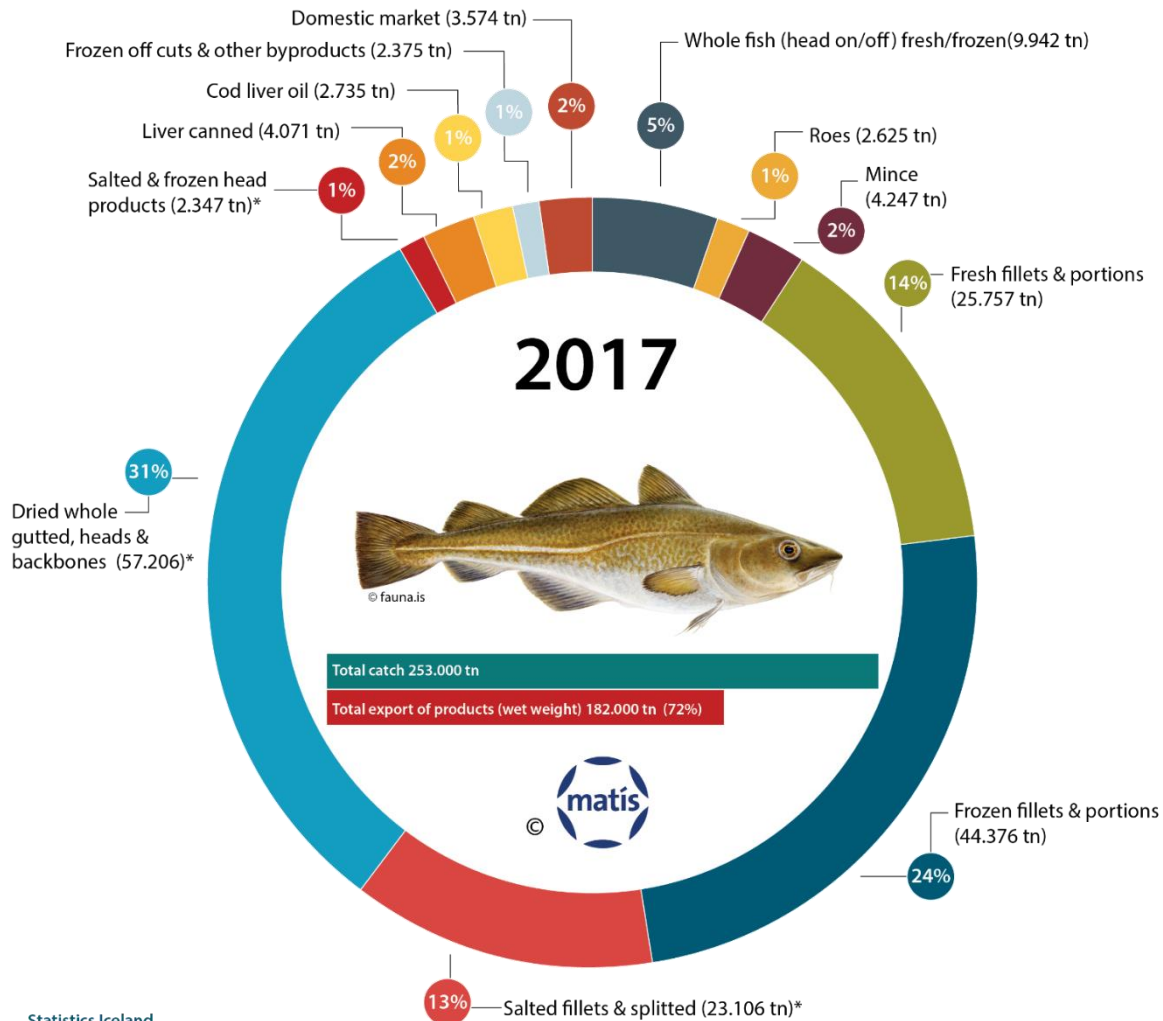


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# What?



Statistics Iceland



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## 90% nýting á þorski hérlandis

### Nýting sem er á heimsmælikvarða en þó má gera betur

Íslenskur sjávarútvegur hefur um árabil verið í forystu í nýtingu hliðarafurða á hvítfiski í heiminum. Verulega hallar á þau lönd sem við berum okkur saman við þegar kemur að nýtingu hliðarafurða. Þó má merkja vaxandi áhuga margra erlendra fyrirtækja á vinnslu hliðarafurða og mörg þeirra sýna áhuga á að læra af Íslendingum í þessum efnum.

Sjávarklasinn hefur gert úttekt á því hversu mikinn hluti þorskafurða er nýttur hérlandis en nýjar tölur hafa ekki legið fyrir um nokkur skeið. Athuginin leiðir í ljós að Íslendingar halda enn forystu í þessum efnum og nýtingarhlutfallið er rúmlega 90% sem er töluvert umfram það sem fyrri tölur gáfu til kynna. Enn eru þó veruleg tækifæri til að vinna meira úr hliðarafurðum og skapa verðmæti og ný störf.

In 2017 Matis estimated that 72% of the cod catch was used to produce „conventional“ seafood products.

In 2021 the Icelandic Ocean Cluster estimated that 90% of cod catches were used to produce products in one form or another (including silage, meal, feed, cosmetics, food supplements etc.)



# What?

## Utilization % is not necessarily the best measure of success

Redfish is an example where approximately 35% is used for human consumption and the rest is mainly used for fishmeal or bait.....still 100% utilization

Shrimp shells used to be a major problem to dispose off → but is now very valuable resource which Primex used to create 4.5 Million USD in 2020



Skin-substitute products made from fish skin does not contribute significantly to increasing overall utilization of seafood by-products, as the volumes are low.....but the value created by Kerecicis was around 30 Million USD in 2020



# What?

## Utilization % is not necessarily the best measure of success

You can use 5 kg of cut-offs to make 5 kg of minced fish valued at 14 USD.....or you can use these same 5 kg to make 300 gr. of Marine collagen valued at 63 USD

Both are 100% utilization

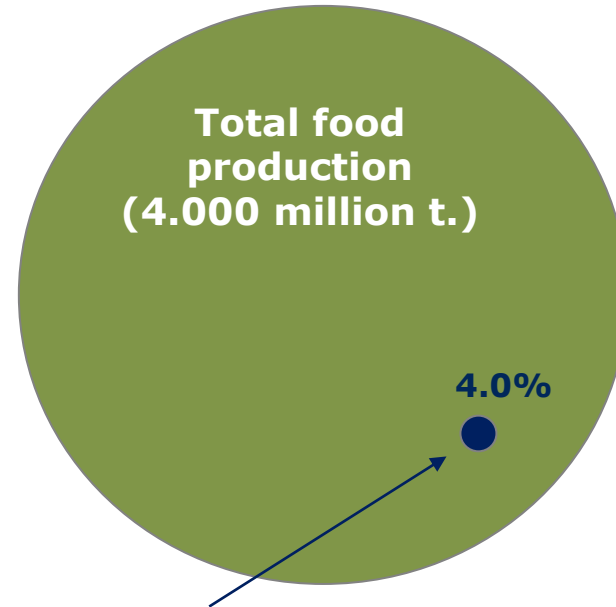


# What next?

## The Big Picture



71% of the world's is covered by water



Total fish production  
for human consumption  
(158 million t.)

We cannot feed 10 billion people without using all the resources we have been given.....and utilizing all bioresources 100 %



# What next?

## What of this actually becomes human food?

### **Biomass lost as discards at sea 10% on average globally**

- EU finfish discards 20-60% prior to LO

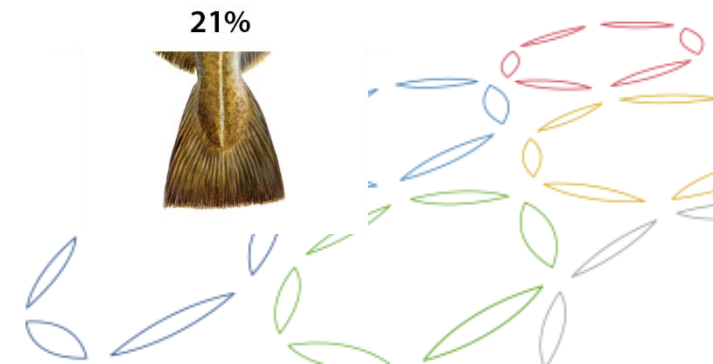
### *Utilization in processing of finfish 30-75%*

- Common to have 40% utilization for finfish

### *Biomass wasted in retail & distribution 7%*

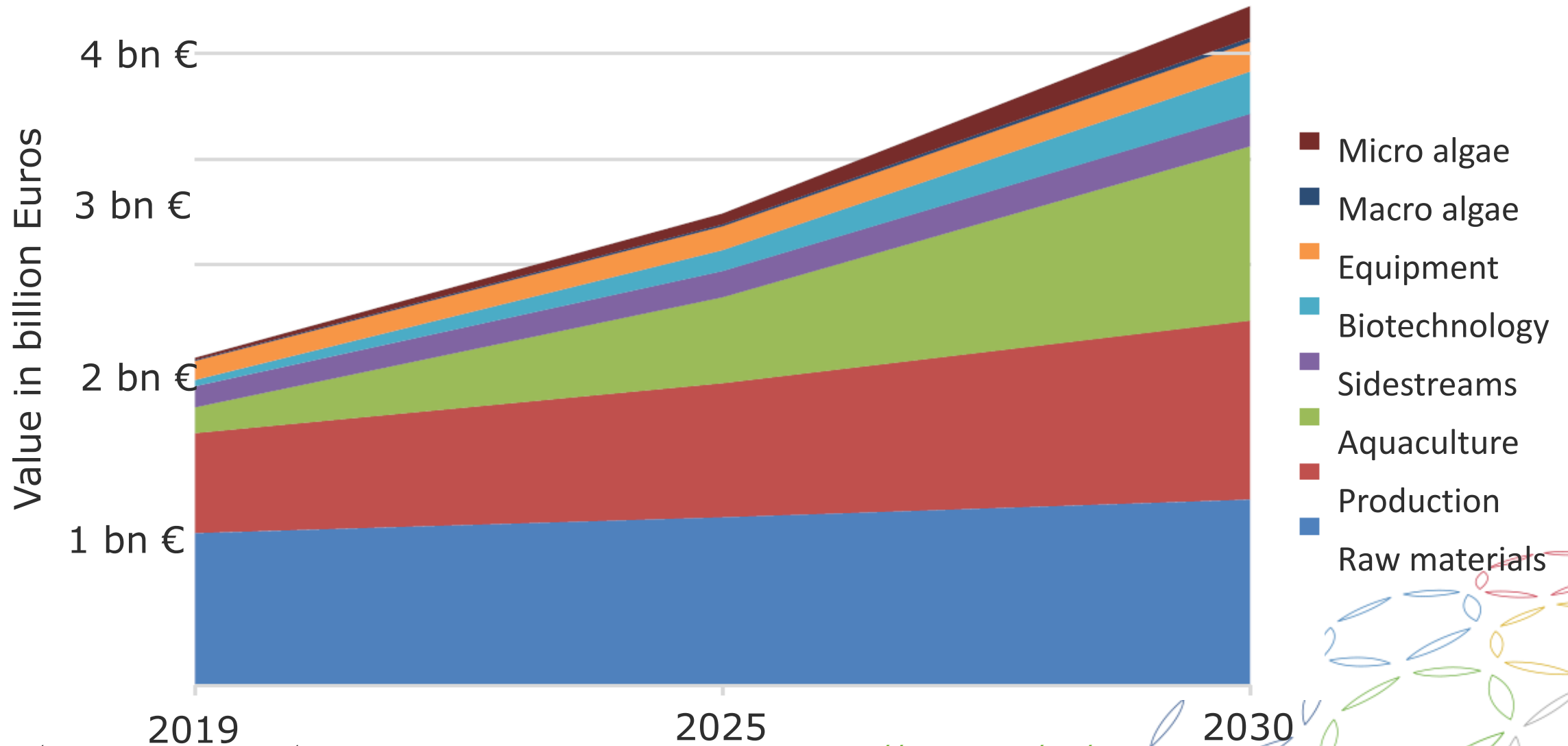
### *Biomass wasted at consumer level 28%*

In the end it is only 21% of the catch that is actually consumed



# What next?

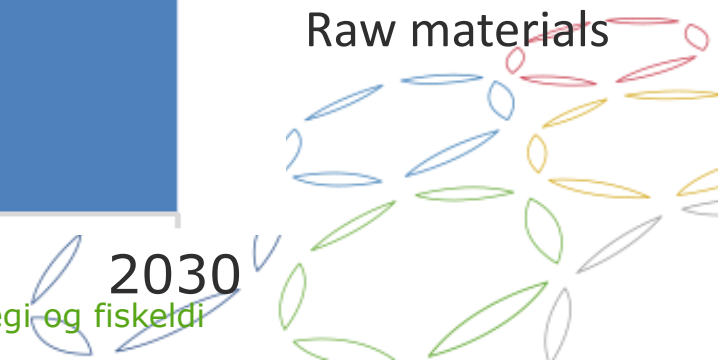
## Where is Iceland heading in the next 10 years



Jónas R. Viðarsson

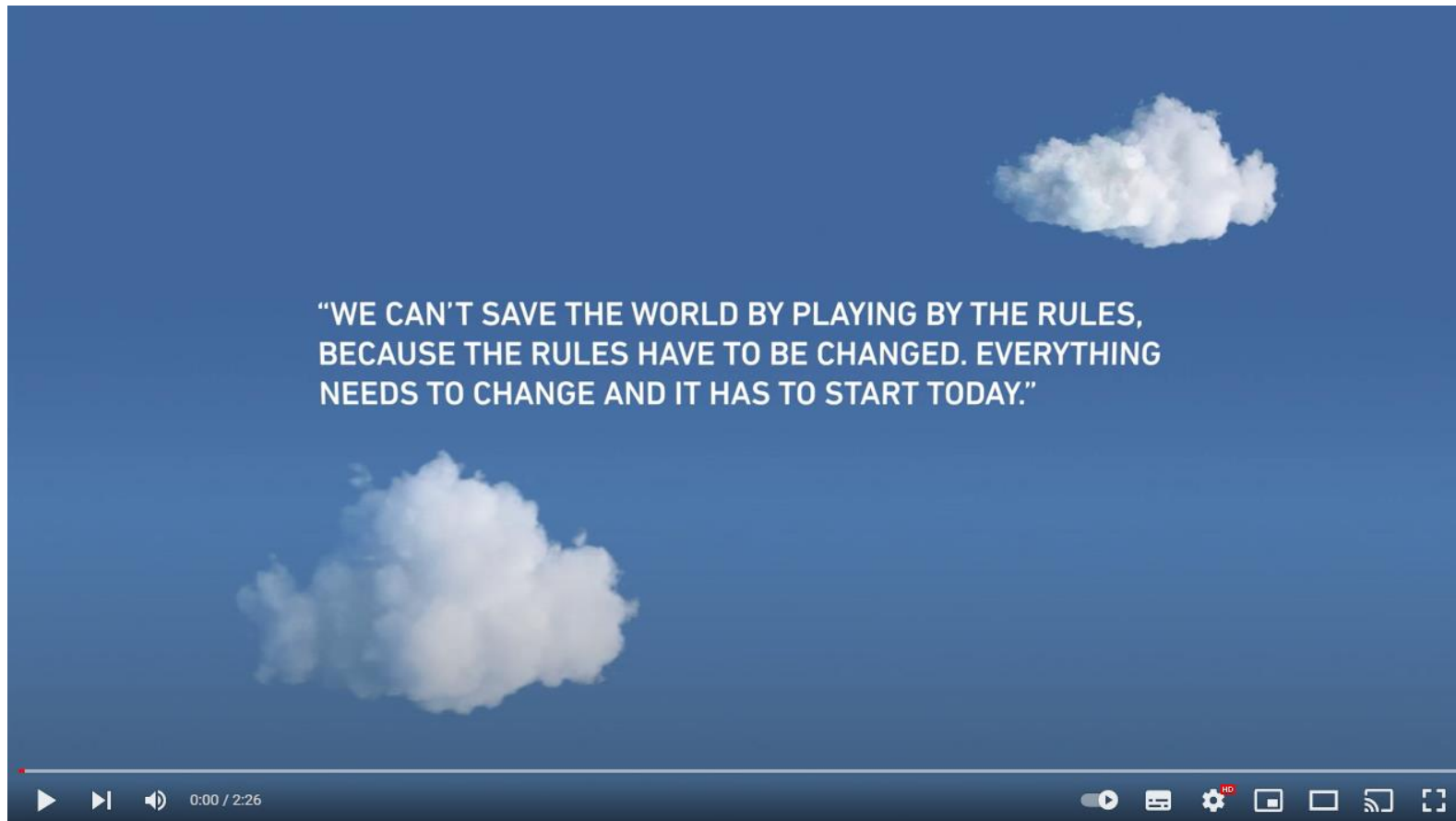
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Source: Sveinn Agnarsson et al 2021 - Staða og horfur í íslenskum sjávarútvegi og fiskeldi



# What next?

<https://www.youtube.com/watch?v=y2oqaepmCPA&t=83s>



# Takk fyrir – Thank you



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