Oversikt over utvikling av biråstoffsektoren på Island

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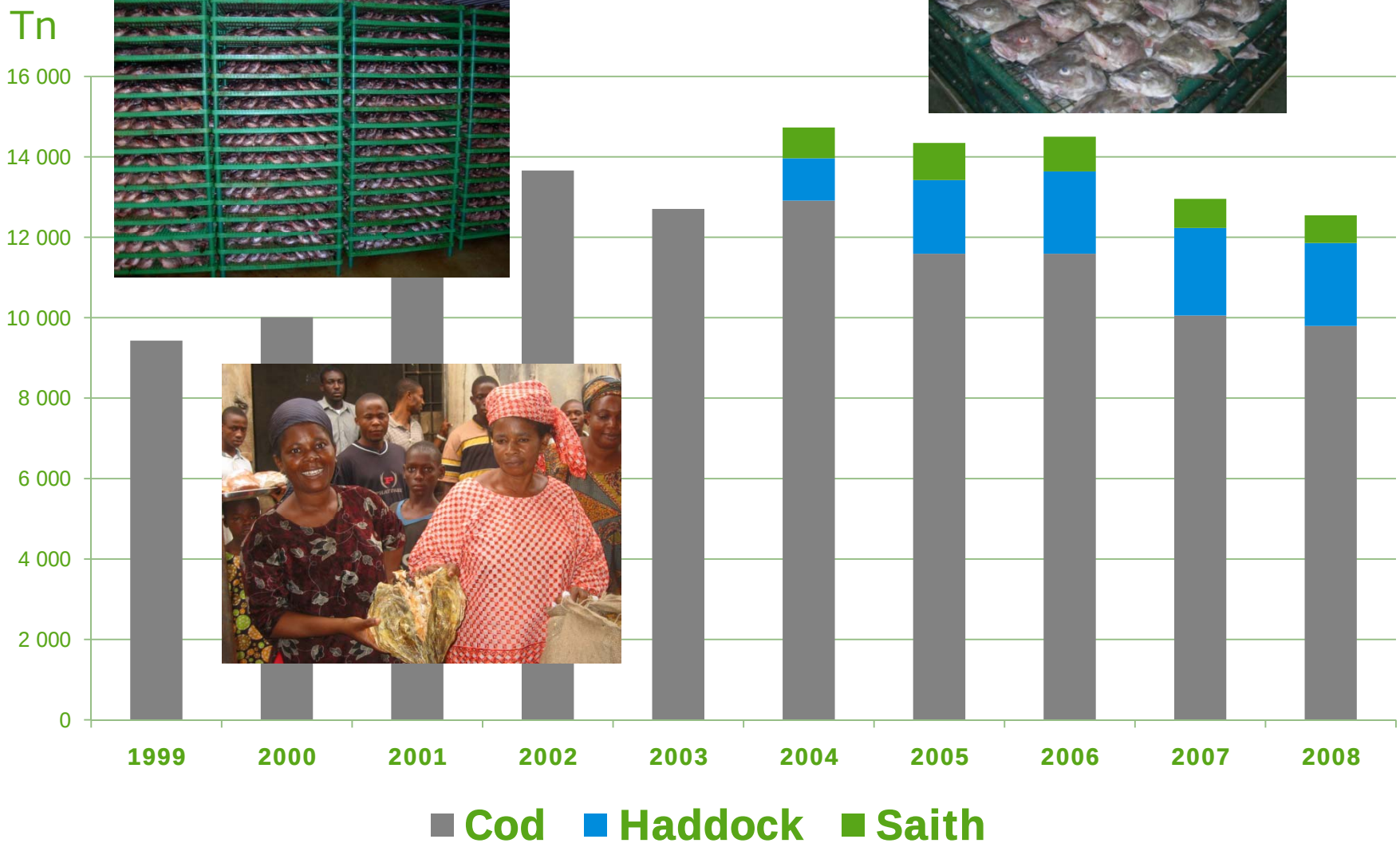
Waste or.....

Opportunities

Export of dried fish heads from Iceland



Export of canned liver from Iceland

Products from cod heads - tongues and cheeks etc.

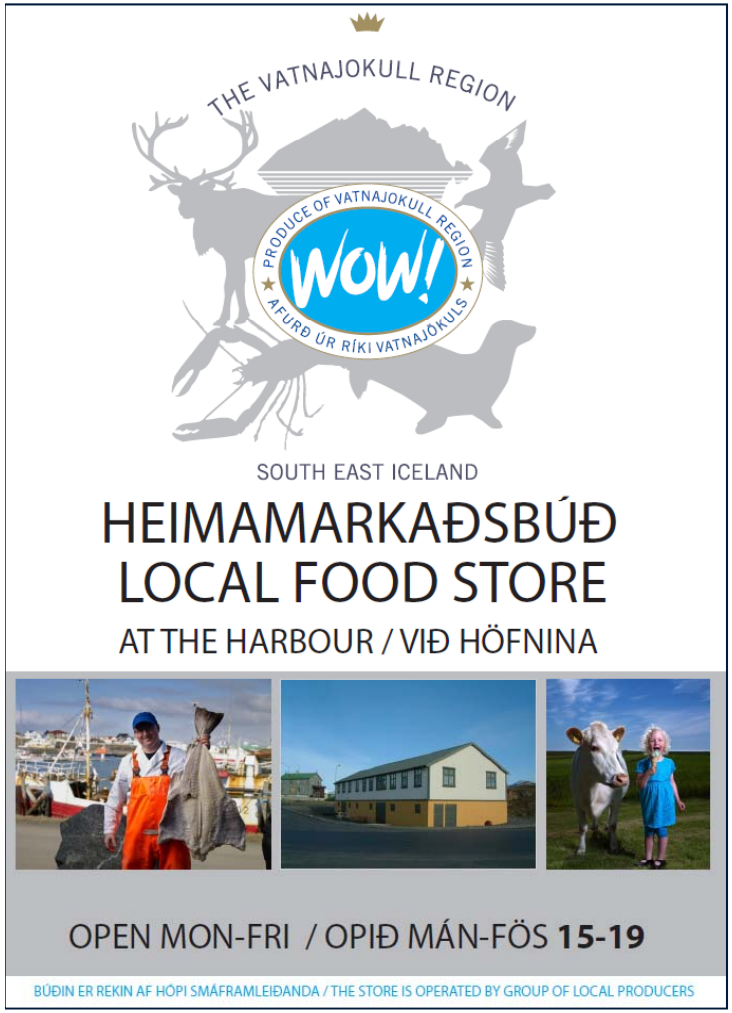
New products from Dulse and other seaweads

- **Dulse *(Palmaria palmata)* has been used as food or snack for centuries in Iceland**
- **Dulse is dried**
- **Estimated market is 500 tn or 125 tn dried weight**
- **Other types og seaweed**
  - **Irish moss**
  - **Dabberlocks**
  - **Icelandic kelp**
  - **Sea belt**

Local foods and tourims related initiatives

Sole is a traditional food in Iceland now available for tourism in a new form

Local foods and tourims related initiatives



Surimi and isolated proteins by new processing methods

iceprotein

MPF Inc.

MPF Iceland Fish Protein

Raw material

SURIMI

Isolated proteins

Dried surimi → dried products

Freeze-dried saithe surimi

Spray-dried saithe surimi

New products →

Popcorn- coated with fish proteins

Corn-fish snacks with 7% fish protein powder

Significant value addition

Example 1: Fish proteins/peptides

Fishmeal

0,13 ISK/g protein

SeaCure

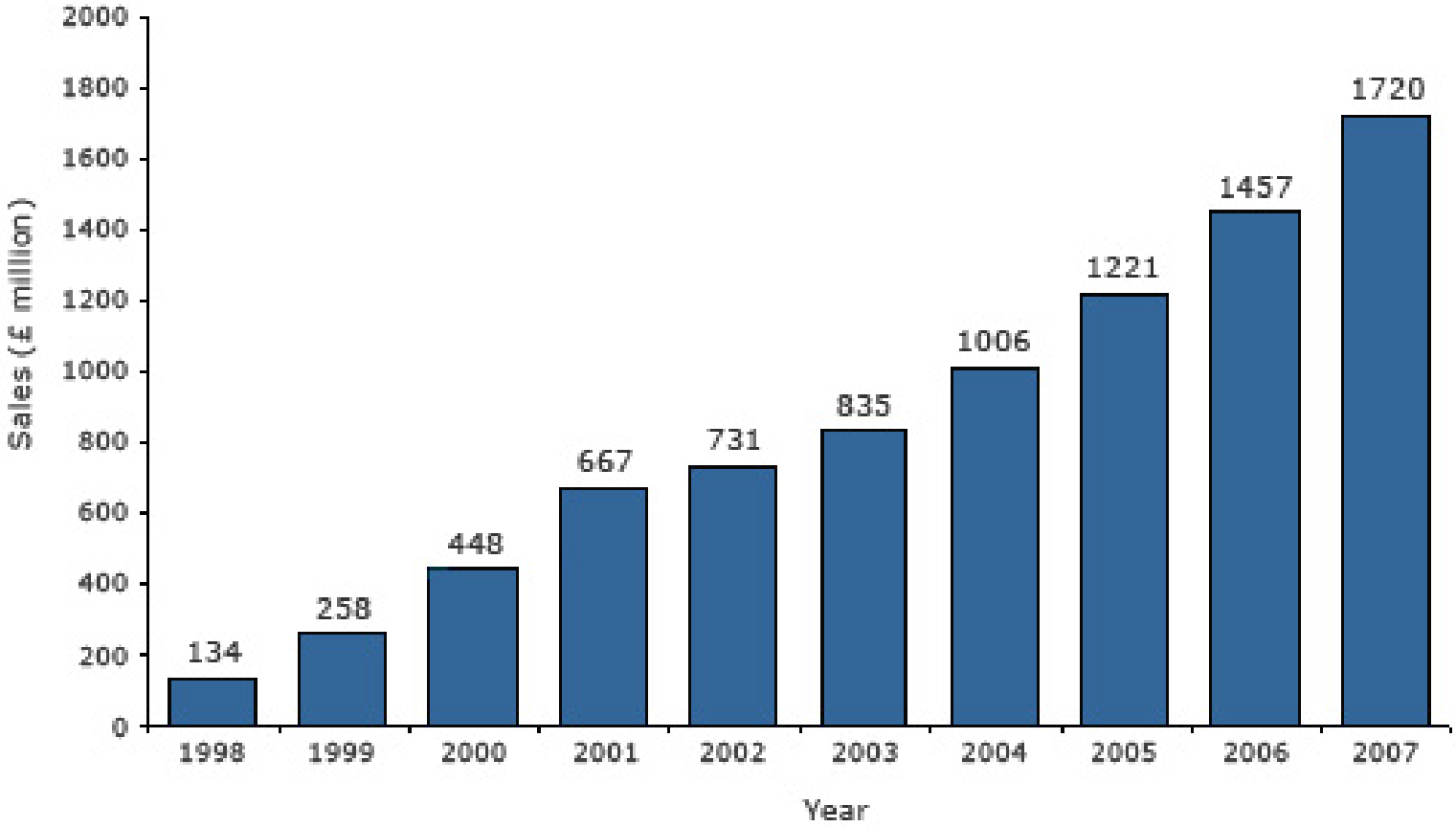
81,33 ISK/g protein

Vita Springs

79,90 ISK/g protein

625 fold difference!

UK – functional foods



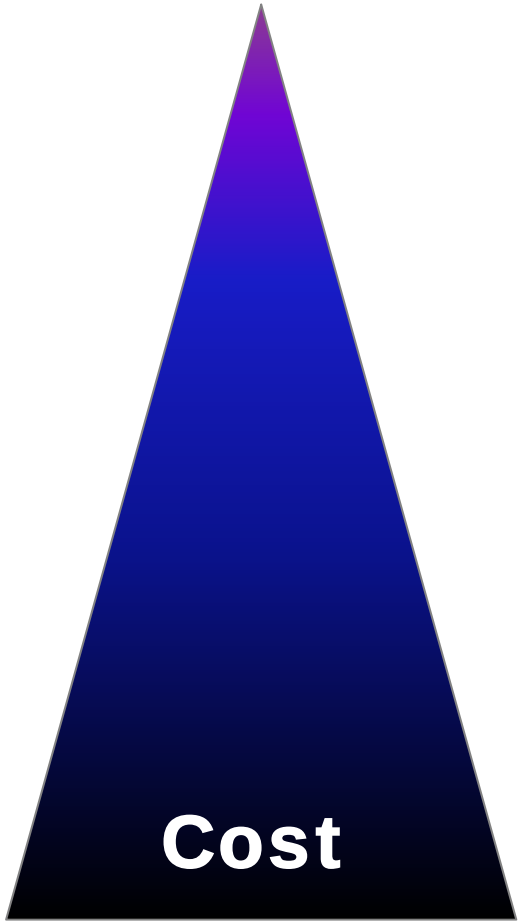
Important to document and verify bioactivity

In-vitro
Test tubes

In-vitro
Cell cultures

In-vivo
Animals

In-vivo
Clinical trials



Peptides with blood pressure lowering effect

Fish proteins hydrolyzed with different enzymes

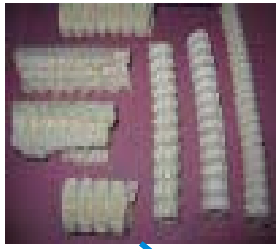
- **Icelandic enzyme blend gave the most promising results**
  - **Processed from fish viscera**
  - **Works at low temperature**
  - **Gives high degree of hydrolysis**

- **Products fractionated and ACE inhibition measured *in vitro***
  - **High inhibition in specific fractions**
  - **Peptide identified with high inhibition properties**
- **Next steps**
  - ***In vivo* blood pressure lowering measurements in rats and humans**

Significant value addition

- **Example 2: Bioactive sugars from seafoods**

Shark cartilage

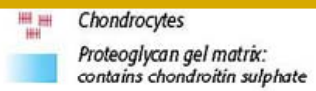


Sea cucumber

Shrimp shells

Yield from shells: 0,002-3%

Value: 100-9250 USD/Kg



Chondroitin sulphate

Glucosamine

Algal polyphenols as novel natural antioxidants

Growing trend toward application of natural antioxidants as functional and bioactive ingredients

- enhance oxidative stability
- maintain/improve the intrinsic quality, nutritional value
- health promoting benefits

Bioactive ingredients in seaweeds

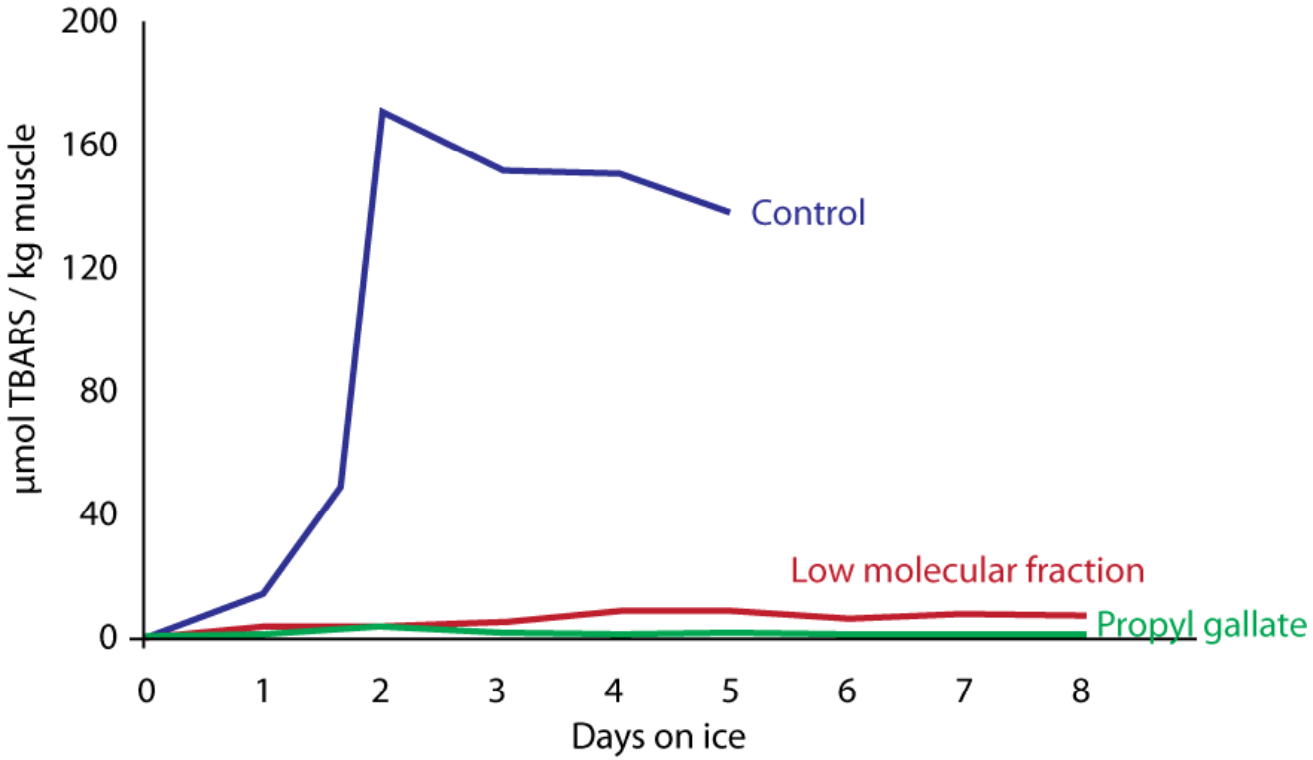
- underutilized marine sources
- **phlorotannins**
- few studies in food systems

Fucus vesiculosus (e. Bladder wrack)

Novel natural antioxidants

Model studies (washed cod model and alkali-solubilized cod protein isolates) showed that

- phlorotannins are **promising natural antioxidants** in fish and fish products



Significant value addition

Example 3: Seaweed polyphenols

Seaweed meal

Fibronol

46 ISK/kg

91.170 ISK/kg

1980 fold difference!

Icelandic companies

LYSI

NorthTaste

iceprotein

MPF Iceland Fish Protein

ZYMETECH

marine enzyme products

primex

ChitoClear
The Purest Chitosan

LipoSan ULTRA

KERECIS

Matis in action – platform for innovation