



# Oversikt over utvikling av biråstoffsektoren på Island

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# Waste or.....

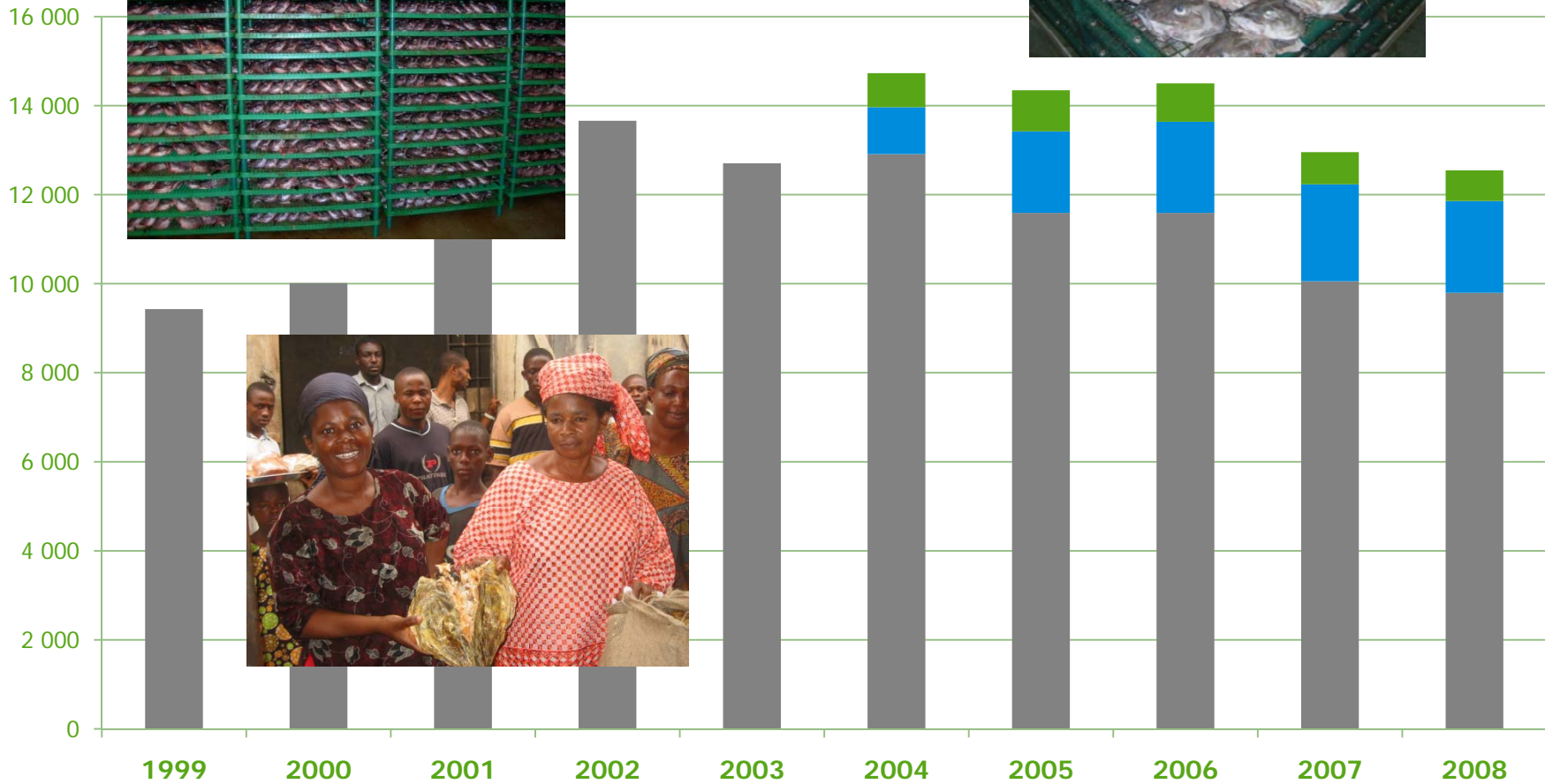


# Opportunities

# Export of dried fish heads from Iceland



Tn



■ Cod ■ Haddock ■ Saith

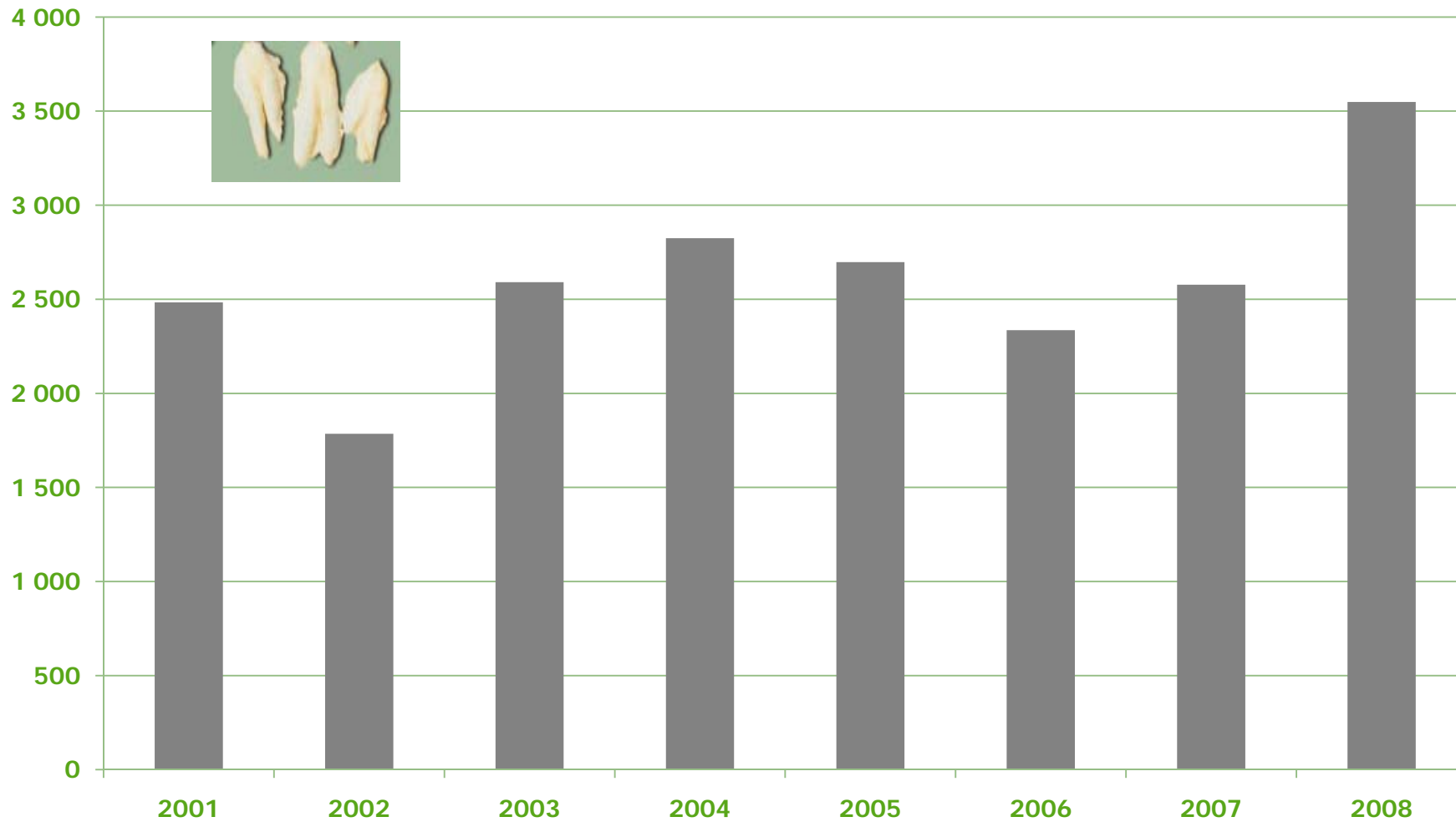
# Export of canned liver from Iceland



# Products from cod heads - tongues and cheeks etc.



Tn





- 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 of seaweed
  - Irish moss
  - Dabberlocks
  - Icelandic kelp
  - Sea belt

# Local foods and tourism related initiatives

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



# Local foods and tourims related initiatives

THE VATNAJOKULL REGION

PRODUCE OF VATNAJOKULL REGION

**WOW!**

AFURÐ ÚR RÍKI VATNAJOKULLS

SOUTH EAST ICELAND

## HEIMAMARKAÐSBÚÐ

### LOCAL FOOD STORE

AT THE HARBOUR / VIÐ HÖFNINA

OPEN MON-FRI / OPIÐ MÁN-FÖS **15-19**

BÚÐIN ER REKIN AF HÓPI SMAFRAMLÉIÐANDA / THE STORE IS OPERATED BY GROUP OF LOCAL PRODUCERS





# Surimi and isolated proteins by new processing methods



iceprotein  
**MPF Inc.**



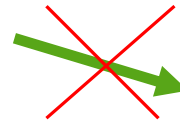
**Raw material**



**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

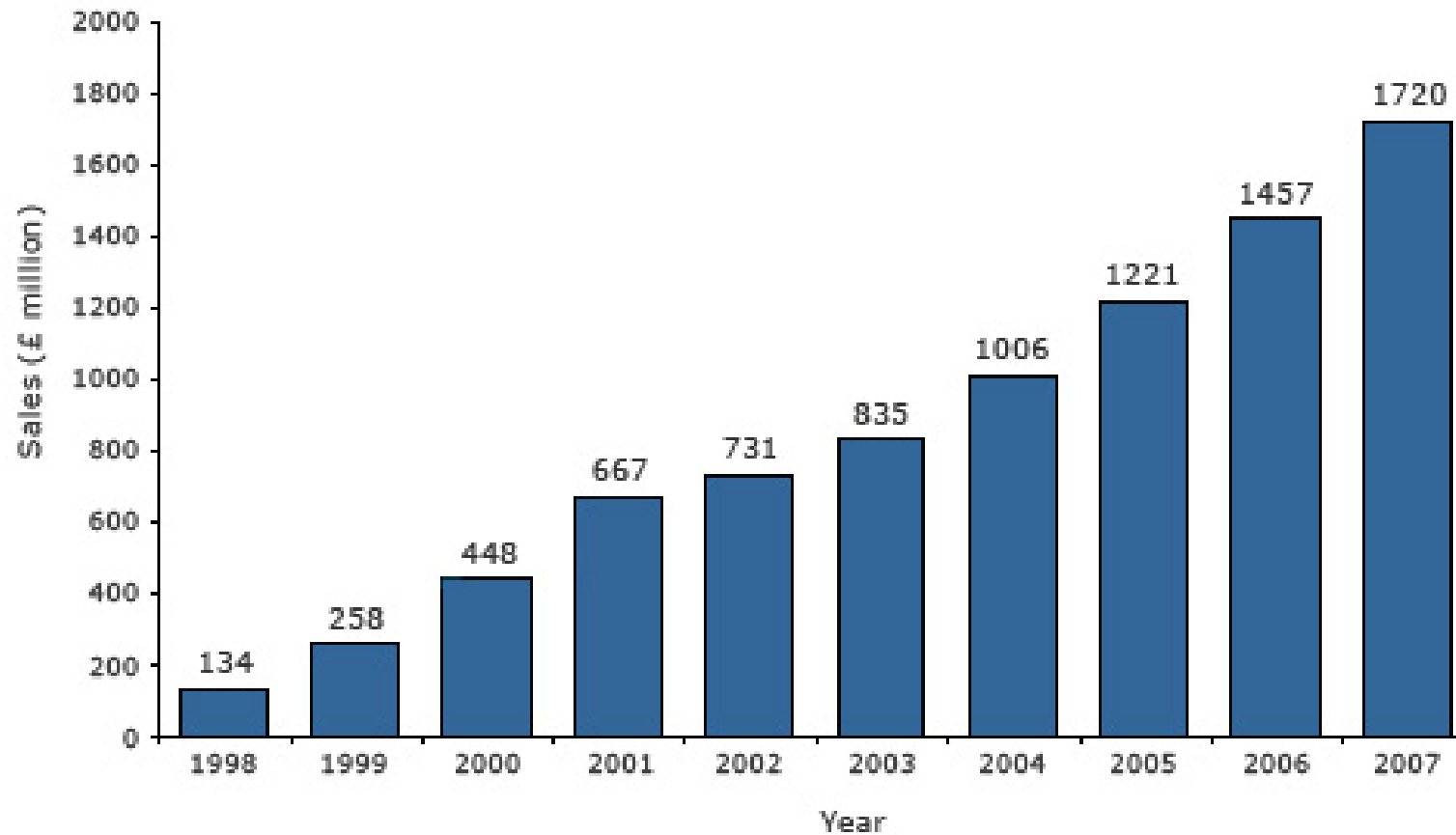
Vita Springs



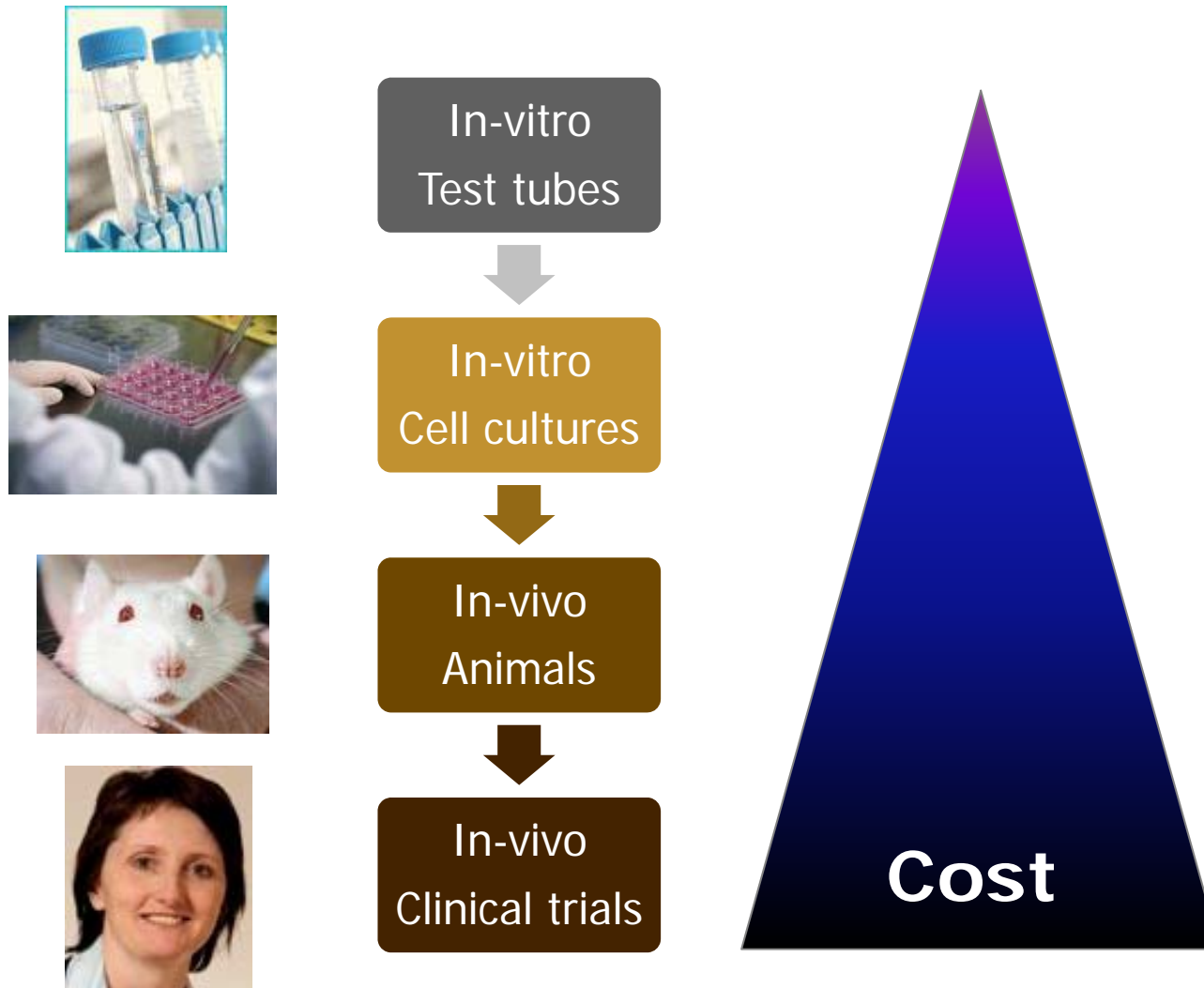
79,90 ISK/g protein

**625 fold difference!**

# UK – functional foods



# Important to document and verify bioactivity



## 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

 Chondrocytes  
 Proteoglycan gel matrix:  
contains chondroitin sulphate

Glucosamine

## 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

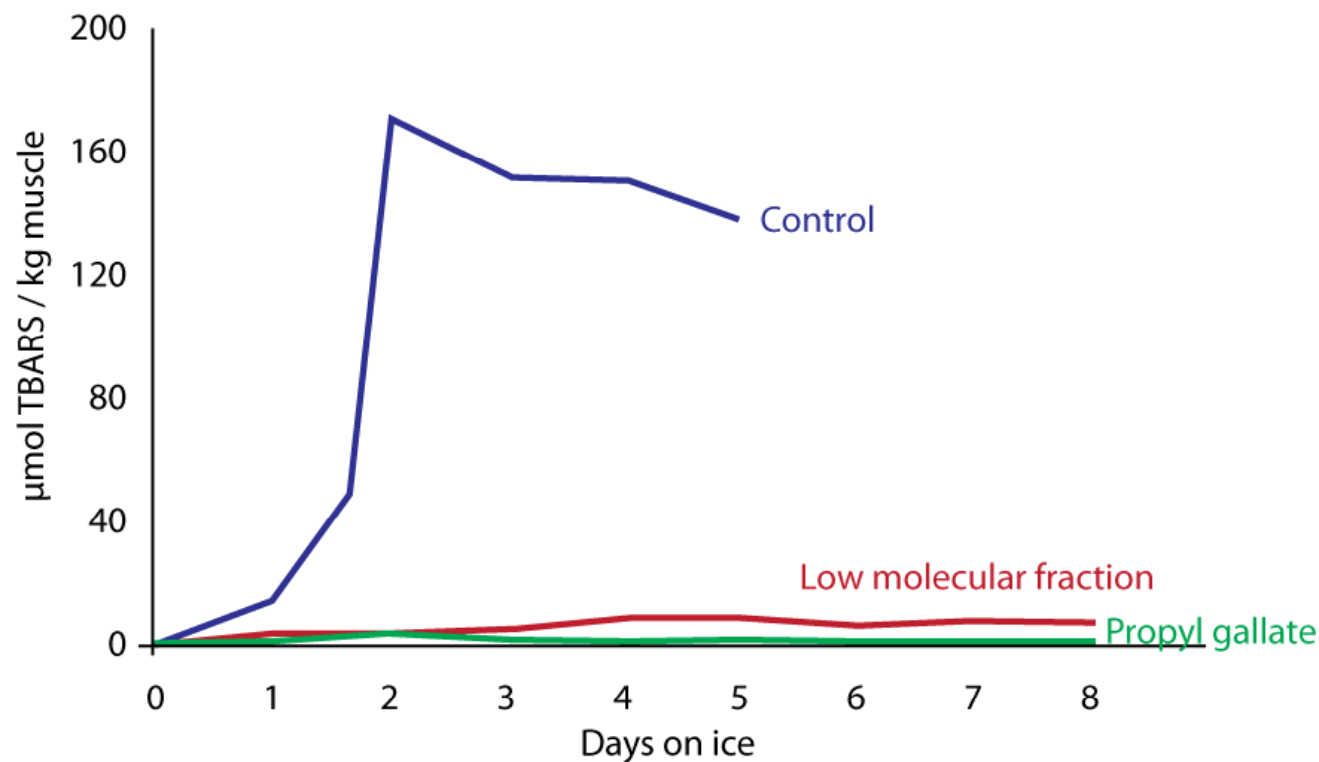


*Fucus vesiculosus* (e. Bladder wrack)



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



46 ISK/kg

Fibronol



91.170 ISK/kg

**1980 fold difference!**

# Icelandic companies



ZYMETECH

marine enzyme products



KERACIS



# Matis in action – platform for innovation

