

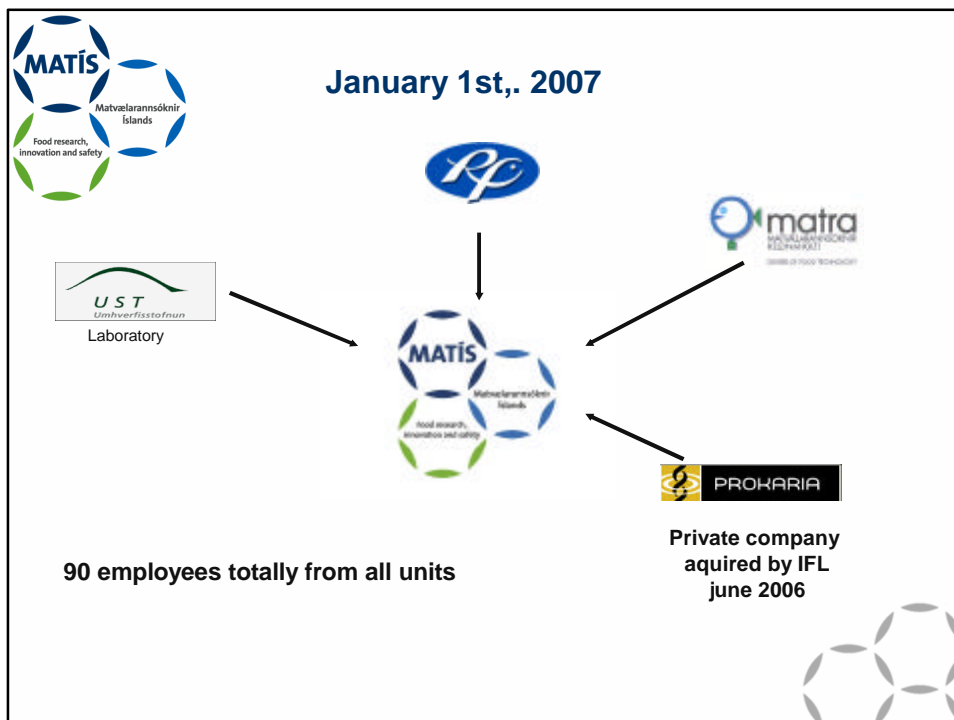


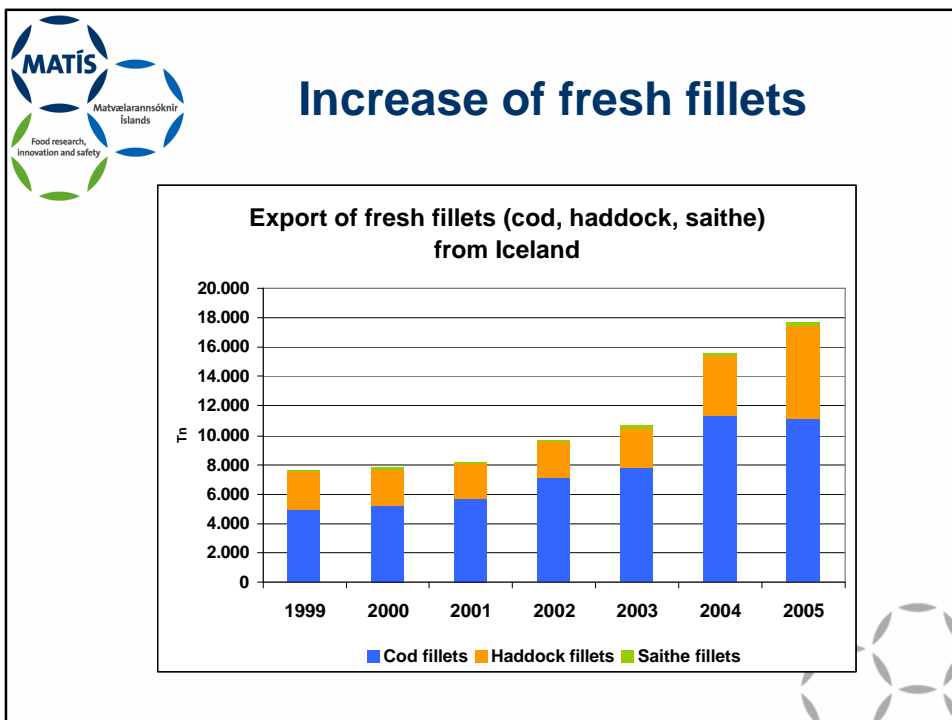
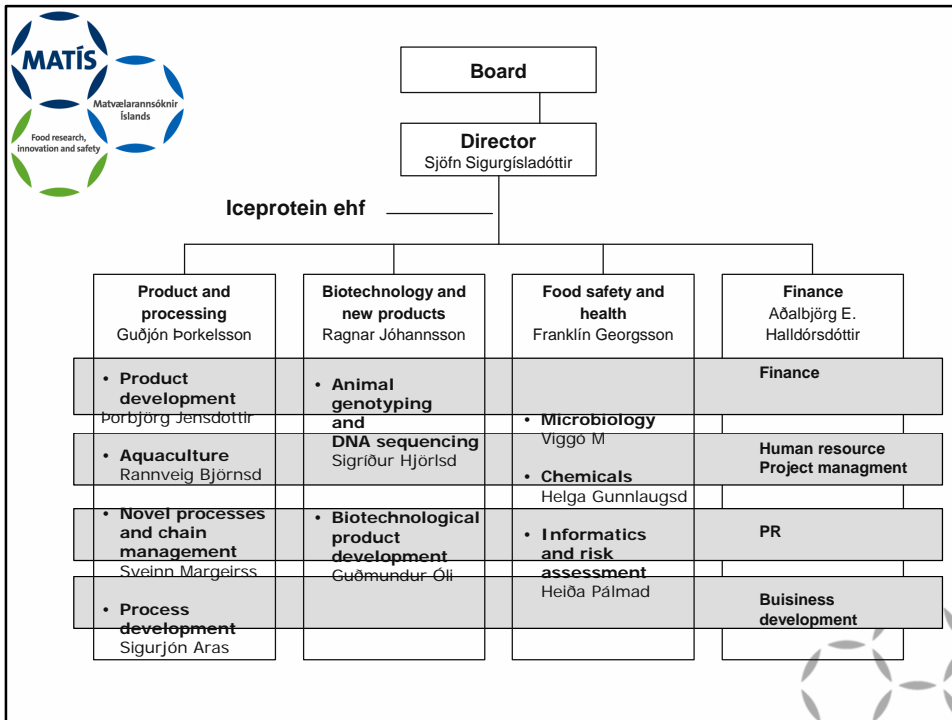
## Hvordan går utviklingen på Island?

Hannes Hafsteinsson, Ph.D.  
EU Business Developer

Sjöfn Sigurgísladóttir, Ph.D.  
Director

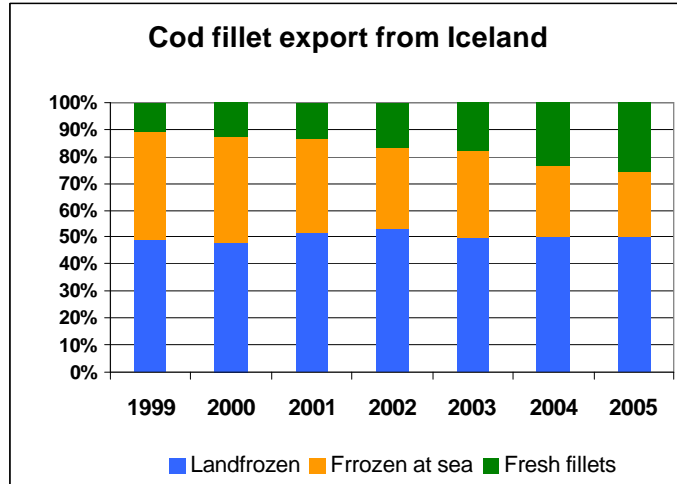
Matis ohf, Reykjavik, Iceland



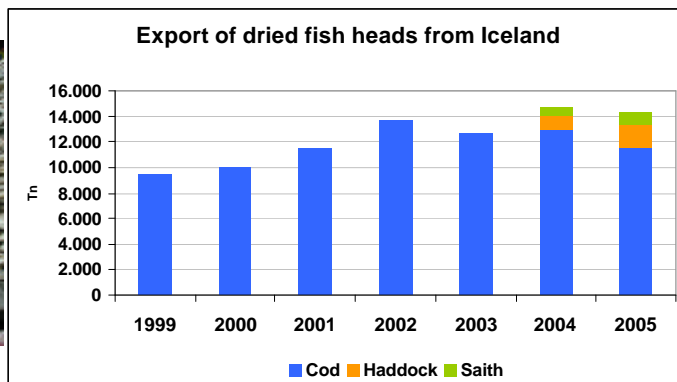




## Production of cod fillets Increase of fresh, decrease of FAS



## Dried fish heads



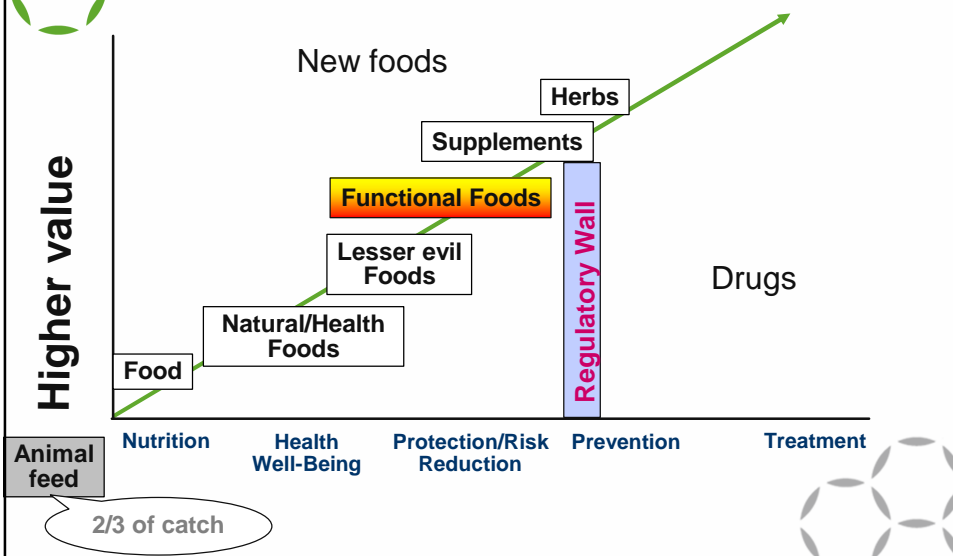


## New opportunities - aquaculture

- Aquaculture – fresh, high quality byproducts
  - ✍ Export of fresh cod milt
  - ✍ Canning of cod liver
  - ✍ Freezing of cod stomach
  - ✍ Freezing of cod roes



## Foods to Drugs.... From conventional to new products





People prefer to get their health from..

**the kitchen cabinet**

rather than....

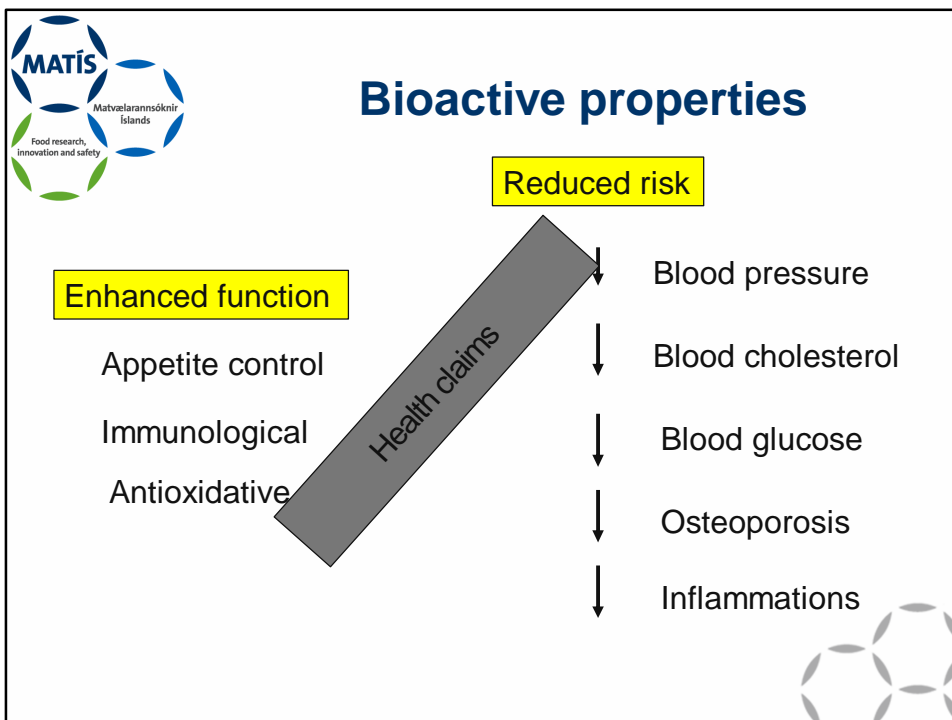
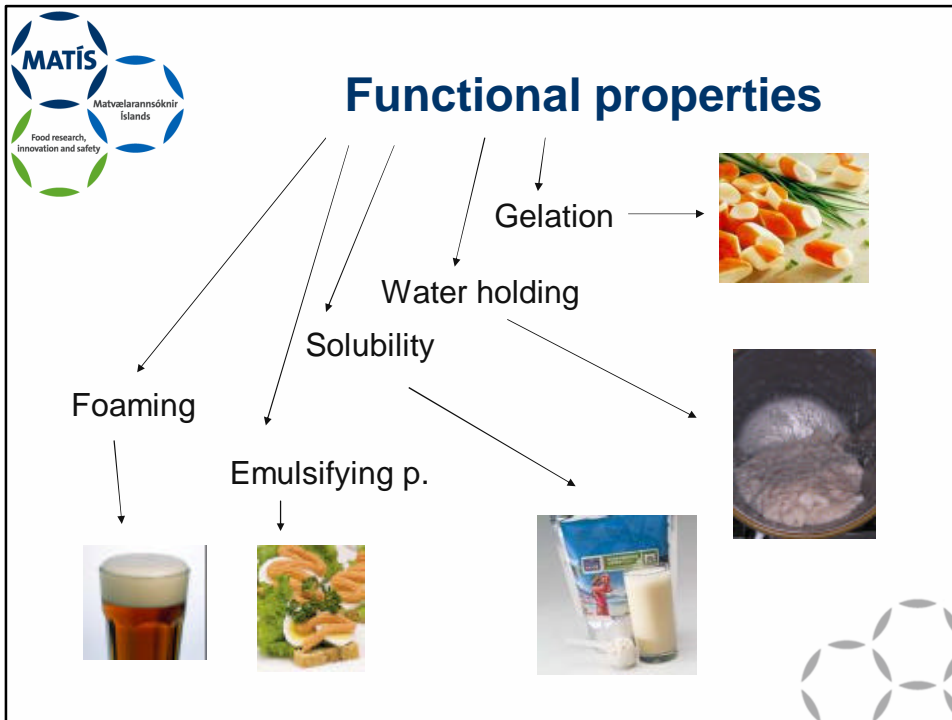
**the medicine cabinet**

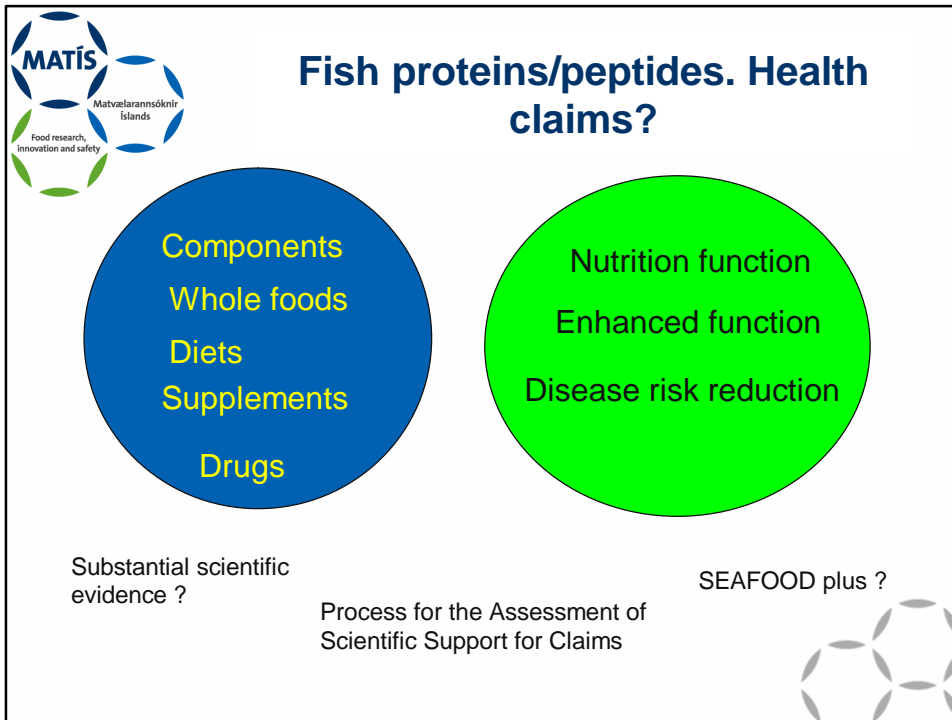


## Dairy – Seafood

- Milk proteins marketing concepts:
  - ✍ Weight management solution
  - ✍ Improves bone health
  - ✍ Helps stimulate immune system
  - ✍ Improves intestinal cell growth
  - ✍ Improves health and well-being
  - ✍ Effect on blood pressure
- Fish proteins
  - ✍ Weight ..... ?
  - ✍ Improves .....?
  - ✍ Helps .....?
  - ✍ Protects .....?
  - ✍ Effect on .....?
  - ✍ New opportunities (FP7 ?)







### ACE inhibitors (lower blood pressure)

Suetsuna K, Osajima K.  
The inhibitory activities against angiotensin I converting enzyme of basic peptides originating from **sardine** and hair tail meat. Nippon suisangakkaishi. **1986**;52:1981-1984

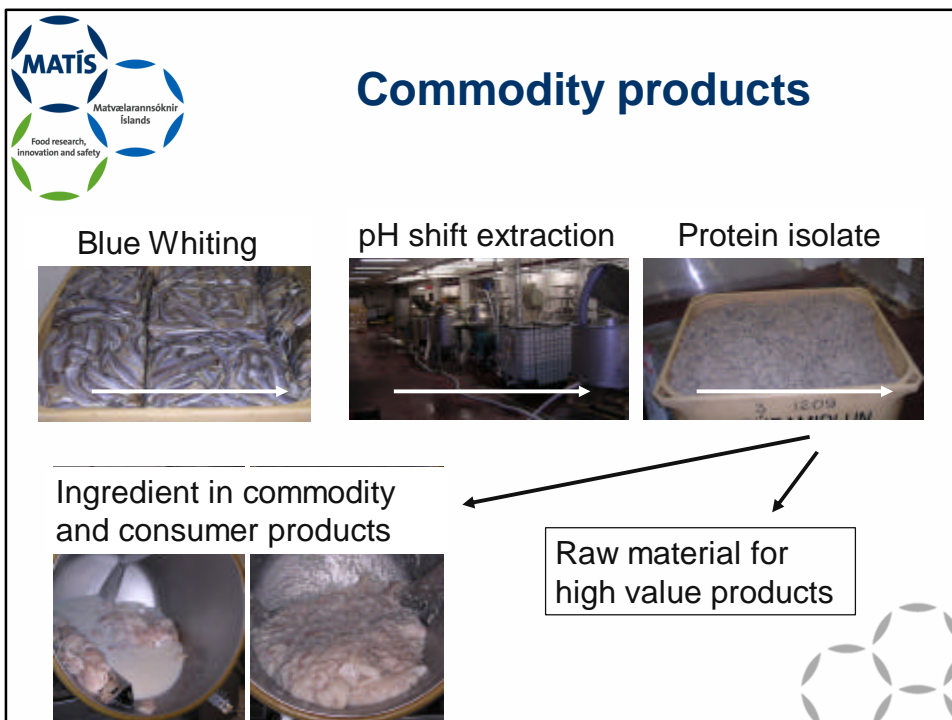
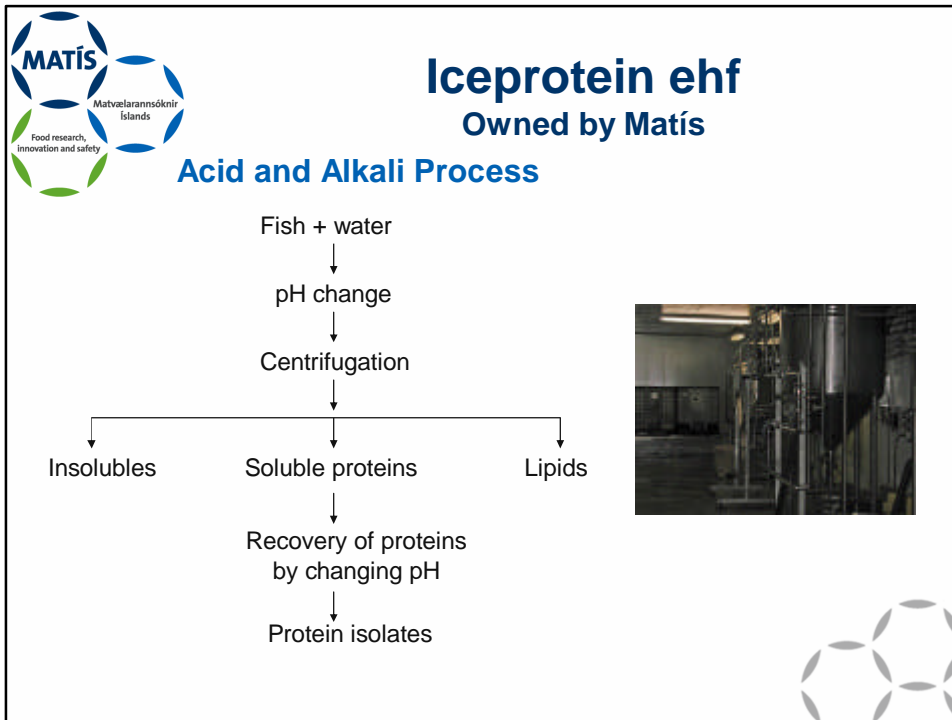
Kohama Y, Matsumoto S, Oka H, Teramoto T, Okabe M, Mimura T.  
Isolation of angiotensin I converting enzyme inhibitor from **tuna** muscle. Biochem biophys rescommun. **1988**;155:332-337.

Kawamura Y, Sugimoto T, Takane T, Satake M.  
Biologically active peptide from foodproteins (I) Angiotensin I-converting enzyme inhibiting peptides from water solublenprotein of **sardine** muscle. Biryō eiyōso kenkyū. **1989**;6:117-121.

Fujii M, Matsumura N, Mito, K, Shimizu T, Kuwahara M, Sugano S, Karaki H.  
Antihypertensive peptides in autolysate of **bonito bowels** on spontaneously hypertensive rats. Biosci. Biotechnol Biochem. 1993;57(12):2186-2188.

HSIS symposium 6th. October 2005

14







## Iceprotein ehf Owned by Matis ohf

- Surimi like products
- Dried proteins
- Protein isolates



Cod Surimi  
Fresh Fish Cake



## Icelandic Biotech Companies

- Sero
  - ✍ Producers of flavour enhancers
- Northice
  - ✍ Producers of flavour enhancers
- Genis
  - ✍ Kitosan and oligosaccharides
- Prokaria
  - ✍ Genetic research and enzymatic development
- Zymetech
  - ✍ Age Management Formulation





## Dr. Bragi

### Dr Bragi Age Management Formulation

DrBRAGI

From the clear and pure waters off Iceland

- Marine Enzymes
- Penzyme: Trypsin and Chymotrypsin
- SOD for oxidation protection
- Simple Formulations
- Non-Allergic



## Conclusions

- Risk/benefit analysis recommends more fish consumption
- Focus on your fish
- Focus on freshness
- Focus on the “function of your products”
- Collaborate with others in “health claims verification”

The fish should be from a sustainable source and free of contaminants. The supply should be steady and in amounts justifying the great and expensive effort needed to develop and market proteins and peptides.