EU's forskningsprogram SEAFOODplus

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Key project information

- **Type of Project: EU Integrated Project**
- **Project title: Health promoting, safe seafood of high eating quality in a consumer driven fork-to-farm concept**
- **Coordinator: Professor Torger Børresen, Ph.D.**
- **Total budget: 26 million euro**
- **EU contribution: 14.4 million euro**
- **Number of partners: 68**
- **Number of countries involved: 17**
- **Main research areas: 6**
- **Number of sub-projects: 20**
- **Project start: 1. January 2004**
- **www.seafoodplus.org**

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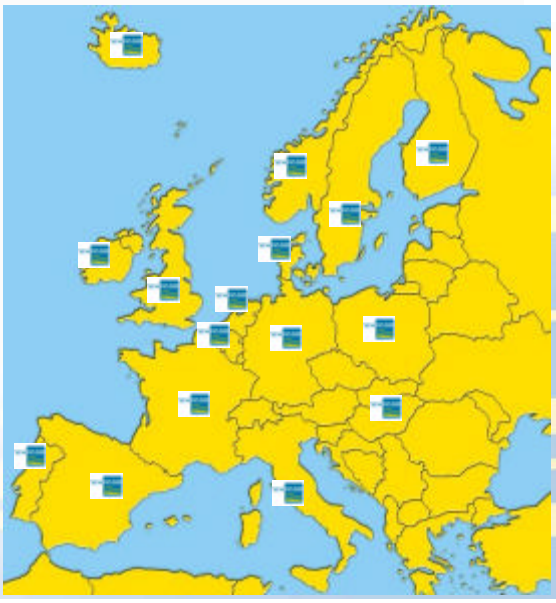
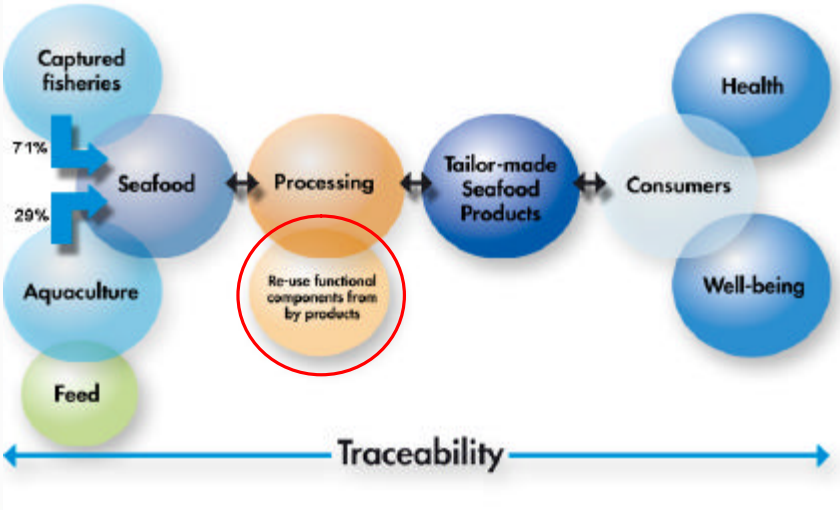
Partners in SEAFOODplus

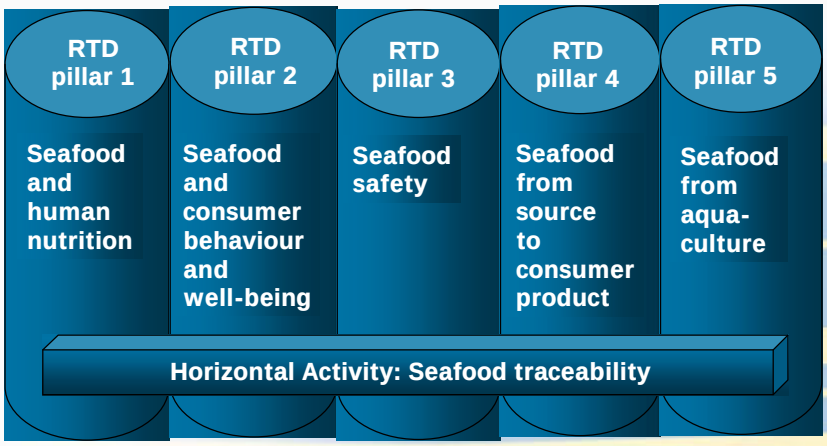


68 partners in 17 countries

The Total Food Chain approach



Organising the research



The new approach: Integrating different research disciplines covering the total seafood chain

RTD 1 Coordinator: Gertjan Schaafsma, WUR, NL

RTD pillar 1

Seafood and human nutrition

Overall objective:

Reduce incidences of nutrition related chronic diseases (cardiovascular, cancer and inflammatory), treat weight problems and prevent osteoporosis and postpartum depression

- 1.1 FISHGASTRO

Liz Lund, IFR, UK

Inga Thorsdottir, LSH, IS

- 1.2 YOUNG

- 1.3 METAHEART

Ingeborg Brouwer, WCFS. NL

RTD 2 Coordinator: Karen Brunsø, MAPP, DK

RTD pillar 2

Seafood and consumer behaviour and well-being

Overall objective:
Provide improved and better balanced health-related communication strategies to consumers

- 2.1 CONSUMERSURVEY — Karen Brunsø, MAPP, DK
- 2.2 SEAFOODSENSE — Emilia Martinsdottir, IFL, IS
- 2.3 SEA-INFOCOM — Wim Verbeke, UGENT, BE
- 2.4 CONSUMEREVALUATE — Svein Ottar Olsen, NIFA, NO

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RTD 3 Coordinator: Bill Doré, MI, IE

RTD pillar 3

Seafood safety

Overall objective:
Avoiding risks caused by viral and bacterial contamination, and prevent occurrence of biogenic amines in seafood

- 3.1 REFHEPA — Albert Bosch, UB, ES
- 3.2 REDRISK — Monique Pommepuy, IFREMER, FR
- 3.3 SEABAC — Ron Lee, CEFAS, UK
- 3.4 BIOCOM — Paw Dalgaard, DIFRES, DK




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RTD 4 Coordinator:
Joop Luten, Fiskeriforskning, NO

RTD pillar 4

Seafood from source to consumer product

Overall objective:
Develop consumer driven tailor-made, functional seafood products in a concept of full utilisation of raw materials

- 4.1 PROPEPHEALTH

Gudjon Thorkelson, IFL, IS

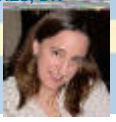
- 4.2 HURDLETECH

Francoise Leroi, IFREMER, FR

- 4.3 LIPIDTEXT

Charlotte Jacobsen, DIFRES, DK

- 4.4 CONSUMERPRODUCTS



Mercedes Careche, CSIC, ES

RTD 5 Coordinator:
Børge Damsgård, Fiskeriforskning, NO

RTD pillar 5

Seafood from aqua-culture

Overall objective:
Provide farmed seafood from sustainable and environmentally friendly production systems through dietary modulation and modern genetic selection

- 5.1 BIOQUAL

Björn Thrandur Björnsson, UGOT, SE

- 5.2 ETHIQUAL

Hilde Toften, NIFA, NO

RTD 6 Coordinator:
Erling Larsen, DIFRES, DK

Horizontal Activity: Seafood traceability

Overall objective:
Implementation of validated traceability systems spanning the total production chain

- **6.1 METHODOLOGY**

Marco Frederiksen, DIFRES, DK

- **6.2 IMPLEMENTATION**

Jostein Storøy, SINTEF, NO

- **6.3 VALIDATION**

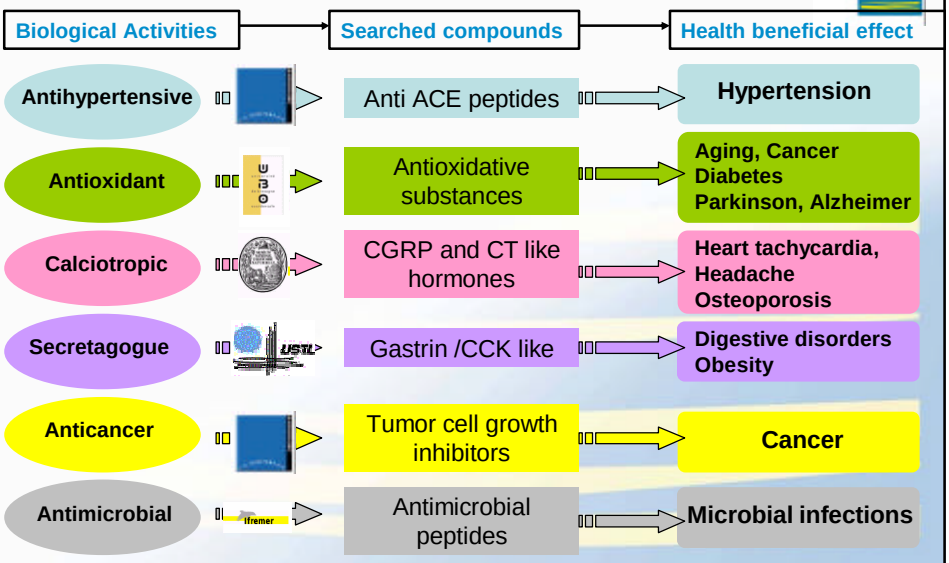
Begoña Perez-Villarreal, AZTI, ES

- **Utnyttelse av biprodukter**
  - Technology push
  - Market pull
- **Hva gjør SEAFOODplus?**
  - Utnytter funksjonelle ingredienser med sunnhetsmæssig potensiale
  - Dokumenterer helse-effekter
  - Forbedrer grunnlaget for fremstilling av produkter med god funksjonalitet og høy verdi

Project PROPEPHEALTH

- **Focus on peptides, protein hydrolysates for**
  - **the production of bioactive peptides**
  - **testing of their influence on the regulation of gut function, glychemia, blood pressure, and immune function**
- **Partners: 7 European R&D Institutes and 3 SMEs**
- **Results presented from**
  - *Laurent Picot, Laboratory of Biochemistry and Bio-organic Chemistry, University of La Rochelle, France*

Health beneficial compounds from FPH



Fish protein hydrolysate preparation

3 SME'S → 7 SPECIES → More than 20 hydrolysates

- Cod (*G. morhua*)
- Plaice (*P. platessa*)
- Salmon (*S. salar*)
- Blue whiting (*M. poutassou*)
- Salmon (*S. salar*)
- Red bream (*B. decadactylus*)
- Saithe (*P. virens*)
- Dogfish (*C. squamosus*)

Each sample in triplicate

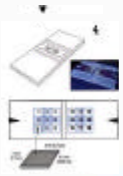
To control reproducibility

Antiproliferative activity of fish hydrolysates on cancer cell lines

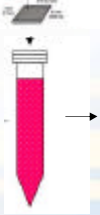
Human cancer cell lines (breast adenocarcinoma)
Growth until confluence in optimal conditions

Fish hydrolysate

Trypsine
Count



Stock solution
in PBS pH 7.4 100 mM
to avoid pH variation
Sterile filtration
(0.2 µm)



Dilution in cancer cell culture medium

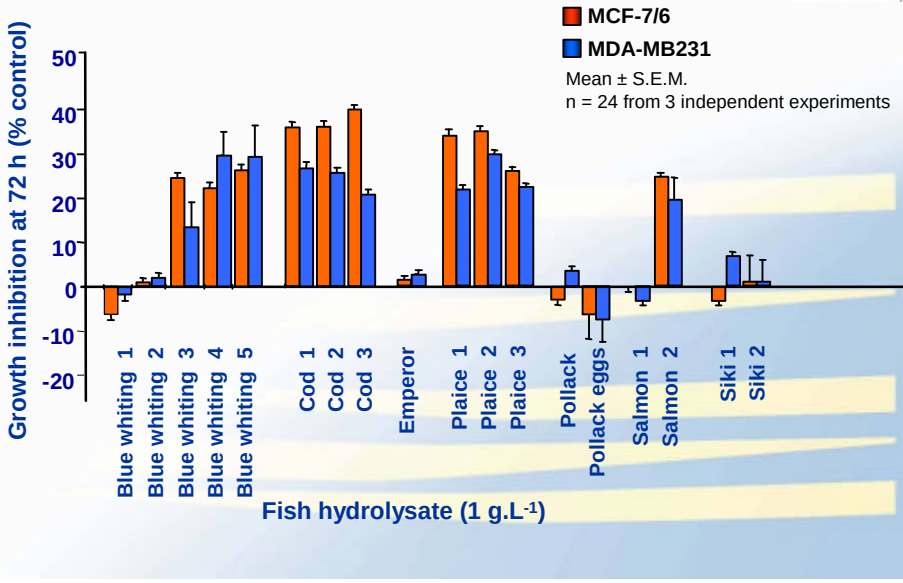
Control containing equivalent amount of PBS

Cell suspension
in cell culture medium
10^5 cells . mL^{-1}

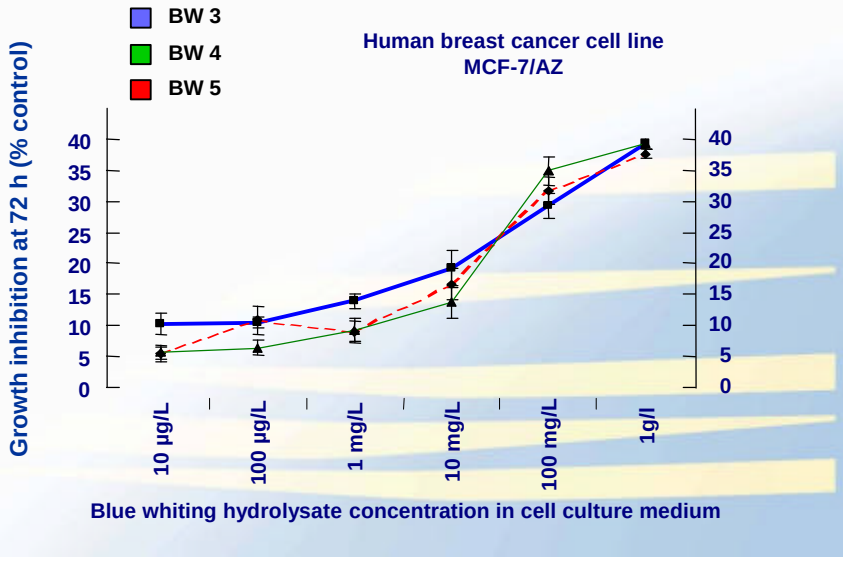
5000 cells, 1 g. L^{-1}
Growth for 72h
Cell proliferation assay
(colorimetric - viability)

→ **Growth inhibition**

Antiproliferative activity of fish hydrolysates on cancer cell lines



Dose dependent growth inhibition



Summary antiproliferative activities of FPH

- Growth inhibition by 3 blue whiting, 3 plaice and 1 salmon hydrolysates
- Antiproliferative activity of Blue Whiting hydrolysates is dose-dependent and growth inhibition is measured with Blue whiting hydrolysate concentrations as low as 10 µg. L-1
- Effect NaCl (tested in Blue whiting hydrolysate)
  - Although NaCl can clearly contribute to cancer cells growth inhibition, NaCl content is not the only parameter explaining antiproliferative activity of fish hydrolysates
- Effect lipids
  - No clear correlation between the lipid content and activity. The lipid content is not a pertinent indicator of antiproliferative activity although the presence of specific anticancer lipids is not excluded

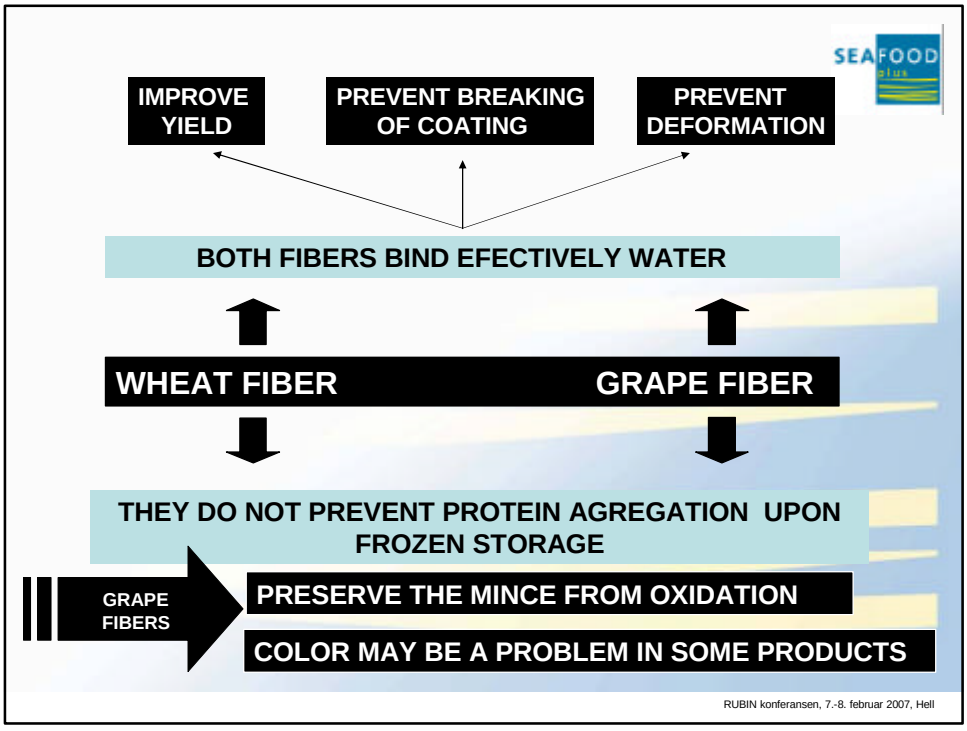
Health promoting components from other foods may be added to seafood

- Antioxidant dietary fibers
- 'A product containing significant amounts of natural antioxidants associated with the fiber matrix'
  - Mango
  - Guava
  - Pineapple
  - Seaweed Fucus
  - Grapes

Project CONSUMERPRODUCTS

Restructured seafood products

- Carriers of functional components
- Image
- Different matrices
- Maximal use of existing resources



Results of the SEAFOODplus project

Adding taurine increases the health value of seafood products

No one seriously doubts that seafood products are healthy, valuable foods. Nearly everybody knows that they contain Omega 3 fatty acids (EPA 20:5, DHA 22:6), numerous vitamins, plus minerals and trace elements. In contrast, hardly anyone knows that seafood also contains other important substances: taurine, for example, whose significance was for a long time disputed. New findings from the SEAFOODplus project have now revealed, however, just how important taurine is for our health.

The body of an adult contains about 70 g of the amino acid taurine. It is mainly found in the muscles and the brain, in the heart and in the blood. White blood cells, too, have high concentrations of taurine. It is particularly important for the development of the brain, the retina of the eye, and the liver of the newly born.

It is only a few years since scientists began re-evaluating the

In the face of the immense significance of taurine it is not surprising that various SEAFOODplus subprojects involve taurine. The first results were presented at the 3rd open conference in Tromsø.

Reduction of serum cholesterol

Edel O. Elvevoll (University of Tromsø) presented the results of a study on the influence of processing on the nutritional and health value of seafood which she had conducted together with Bjarne Østrend and other scientists. Due to the general trend towards

hand, processing can contribute

From EUROFISH Magazine

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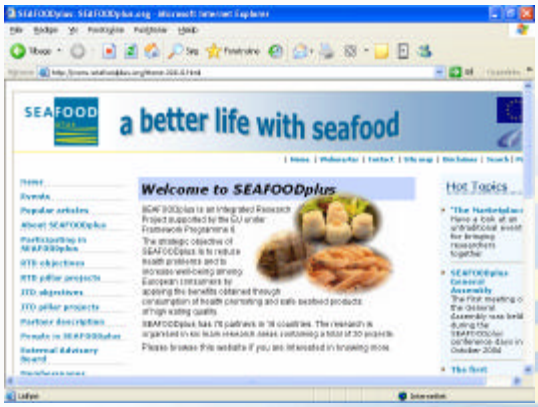
For more information:
www.seafoodplus.org



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A better life with seafood…

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