

Innovative SEAFOODplus research results of relevance for the industry and consumers

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Key project information

- **Type of Project: Integrated Project**
- **Project title: Health promoting, safe seafood of high eating quality in a consumer driven fork-to-farm concept**
- **Coordinating institute: DIFRES**
- **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**
- **Industry partners: 15 %**
- **www.seafoodplus.org**

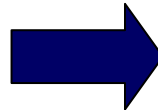
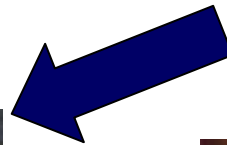
Overview presentation

- **New concepts for improving nutritional value of seafood**
 - Using farmed fish as carrier of nutrients
 - Adding functional components to products
- **New Ingredient Technologies**
 - Extracting functional components from by-products
 - Selenium
 - Taurine
 - Anti-oxidants
 - Supplementing restructured seafood with fibers
 - Avoiding losses of nutrients during processing and cooking
- **Associate of SEAFOODplus?**

Why selenium?

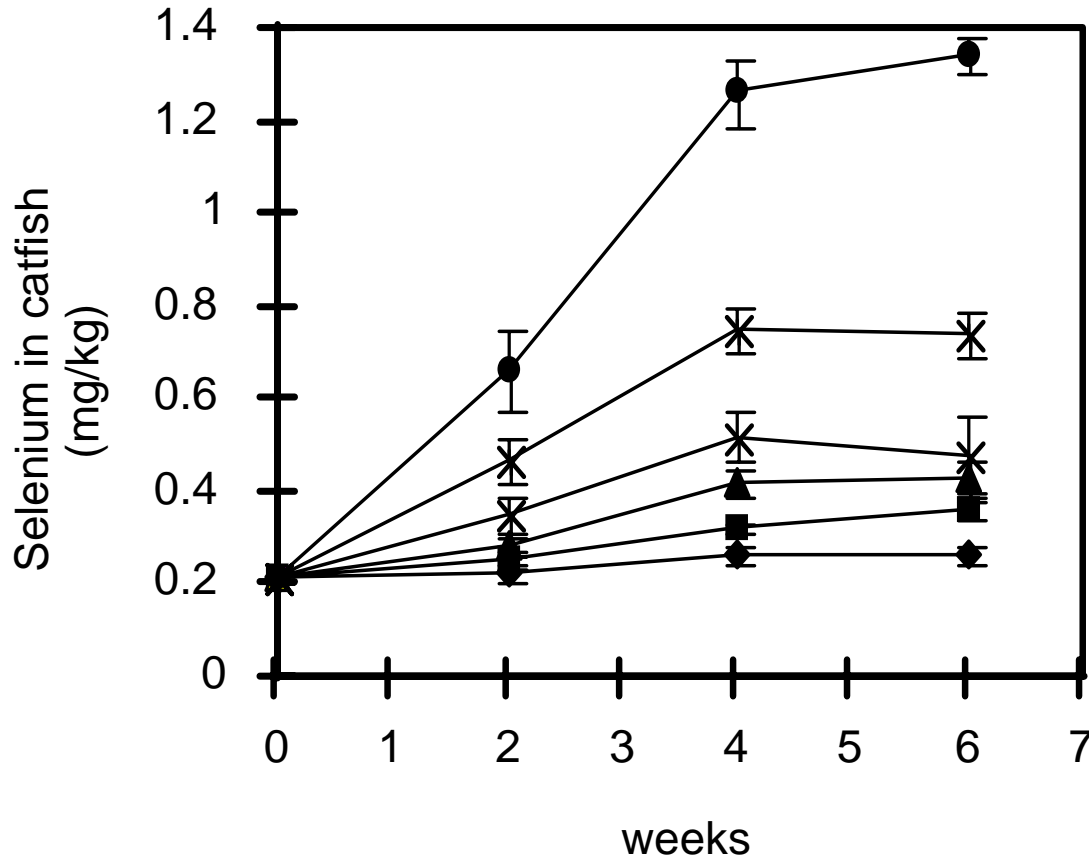
- **Selenium is an essential trace element**
- **Evidence that certain seleno-organic compounds have anti-carcinogenic properties**
- **Selenium content is the highest in cereals and fish (0.2 – 0.5 mg Se/kg fish muscle)**
- **Selenium intake from food or Se status in humans is **marginal** in some countries**

Farmed fish as carrier of nutrients



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Uptake of selenium in catfish muscle from Se-methionine in feed



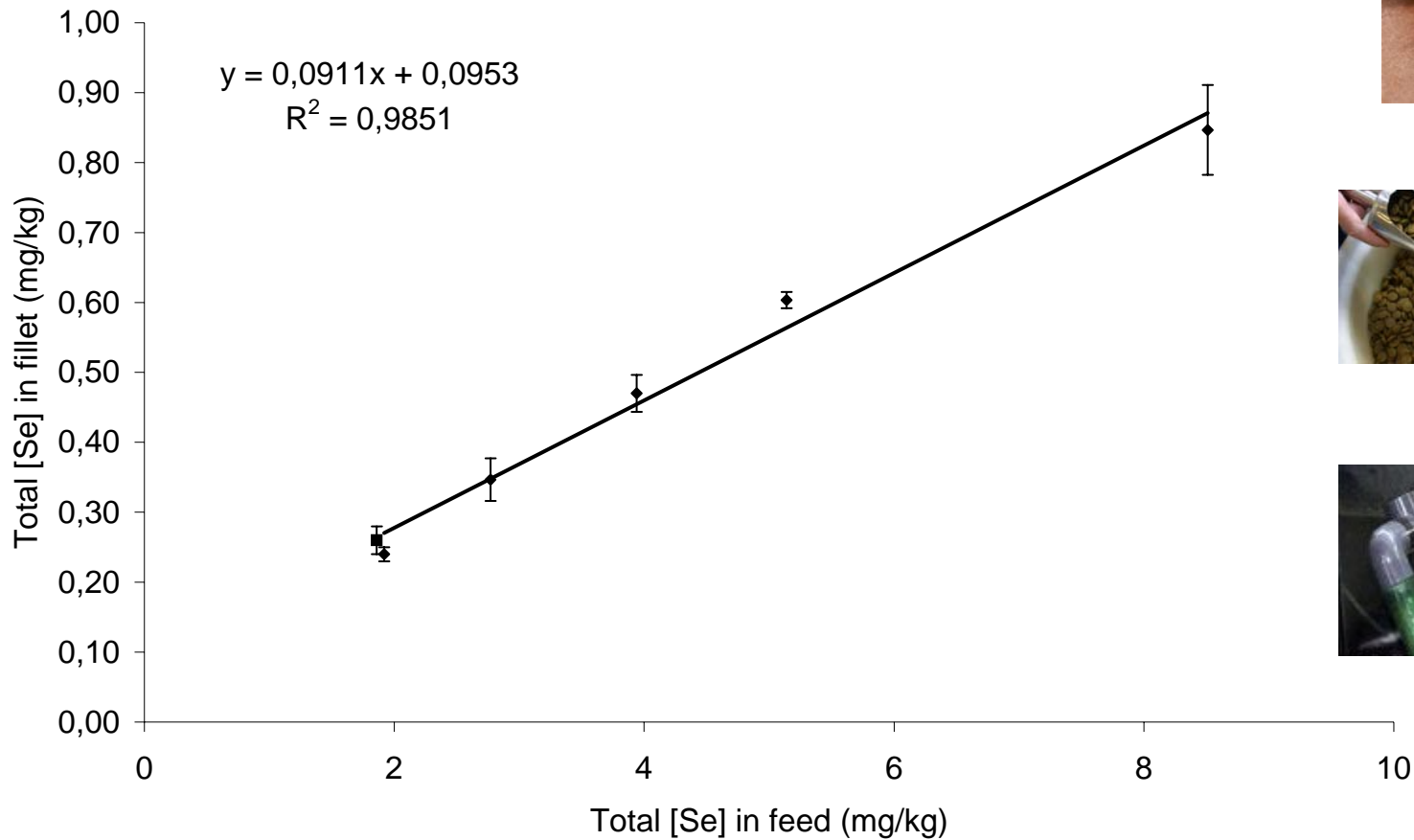
Added Se (mg/kg)

- ◆ 0
- 0.1
- ▲ 0.4
- × 0.7
- ✱ 1.9
- 3.1



From: Lutten and Schram, 2006

Effect of γ -glutamyl-methyl-selenocysteine and methyl-selenocysteine in fish feed on the selenium content of catfish muscle (Schram and Lutten, 2006)



Why taurine?

- **Humans have a limited ability for biosynthesis of taurine and it may be regarded as conditionally essential as its physiological concentration can be partly regulated endogenously**
- **The mean daily intake is mean approximately 60 mg, range 10 - 400mg**
- **Relation between taurine intake and fish consumption**
 - **Taurine content in shellfish and crustaceans (300-800 mg/100g fillet) higher than in fish (60-160 mg/100g fillet)**
- **Studies suggested**
 - **Taurine might protect against oxidative stress, neurodegenerative diseases or atherosclerosis**
 - **Reduced cardiovascular risk through taurine alone or in combination with n-3 polyunsaturated fatty from seafood**

Is it possible to

- **tailor make the level of taurine in farmed fish?**
 - **Taurine in feed of African catfish**

Improving nutritional value of seafood

Adobe Acrobat Professional - [EM5 2006 Splus.pdf]

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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.

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 Østerud and other scientists.

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.



From EUROFISH Magazine

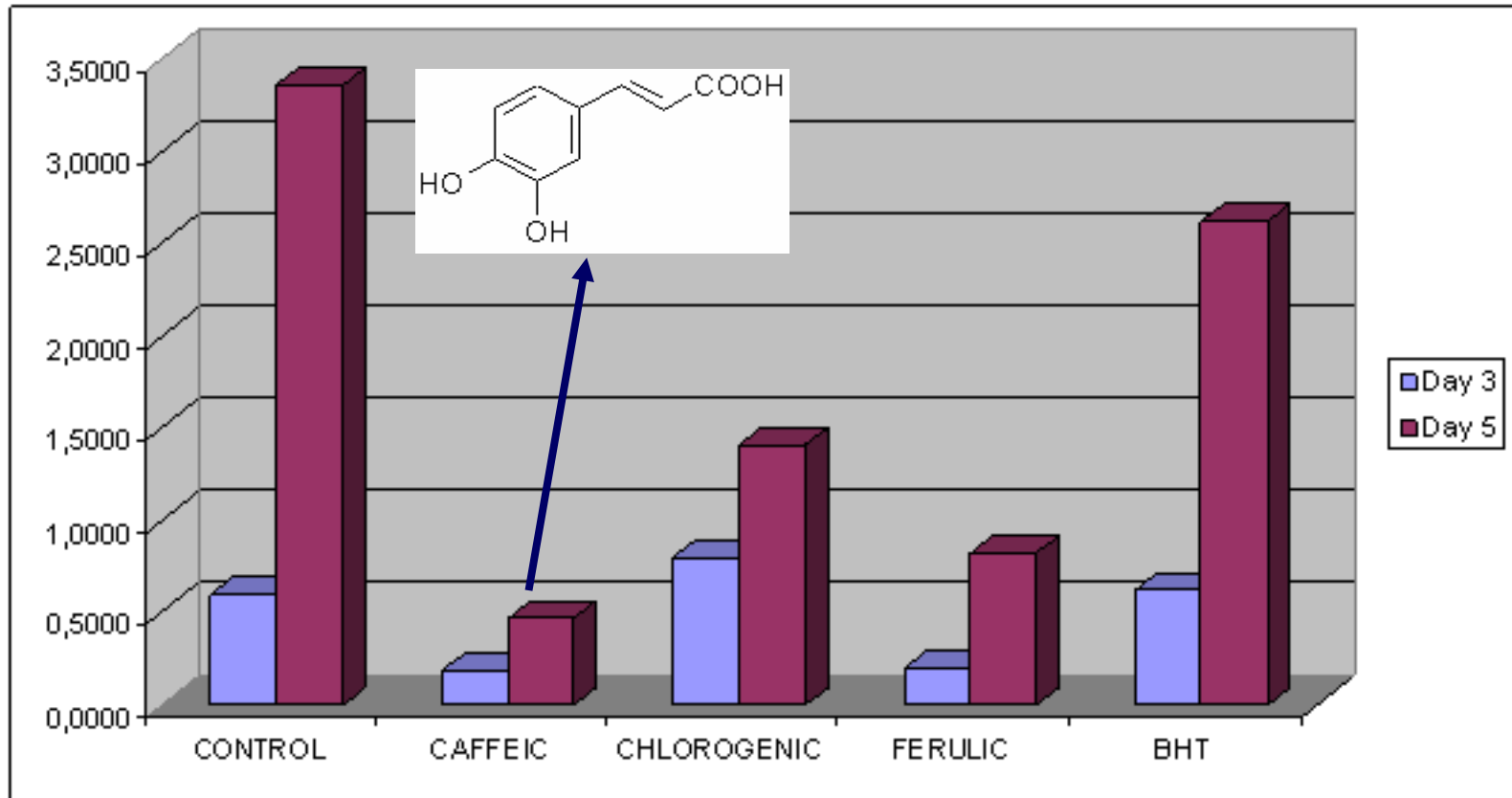
ing methods are becoming increasingly important. On the one hand, processing can contribute

1 of 3

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Functional, value added seafood

Adding natural antioxidants for protecting fatty acids and adding value



TBA-index of chilled minced horse mackerel containing 1.5 % fat, stored at 4°C, and treated with 10 ppm of the various antioxidants

Project LIPIDTEXT

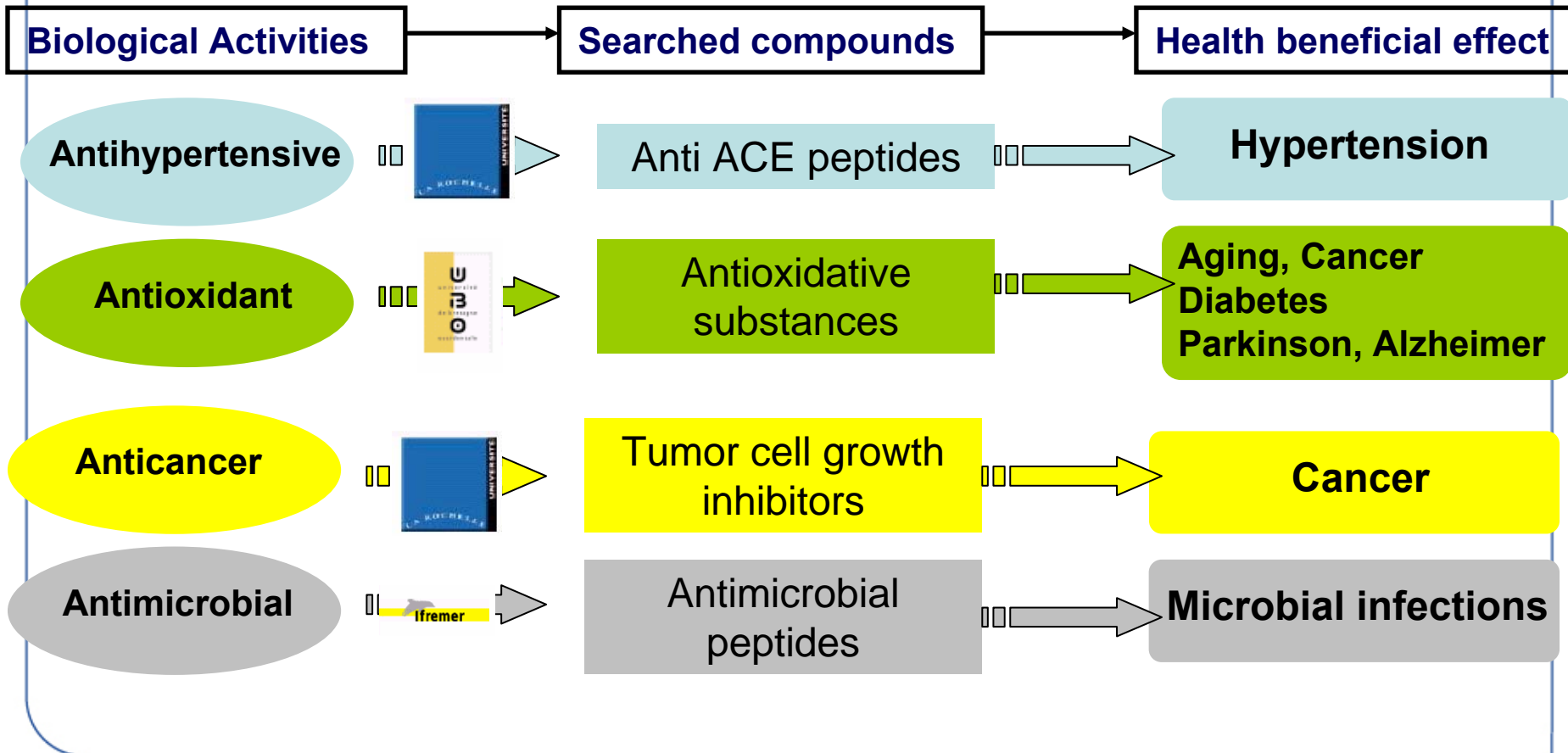
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Overview

- **Background SEAFOODplus**
- **New concepts for improving nutritional value of seafood**
 - Using farmed fish as carrier of nutrients
 - Adding functional components to products
- **New ingredient technologies**
 - **Extracting functional components from by-products**
 - **Supplementing restructured seafood with fibers**
 - **Avoiding losses of nutrients during processing and cooking**

New ingredient technology

Extracting functional components from by-products (Fish Protein Hydrolysates)



Antiproliferative activity of fish hydrolysates on cancer cell lines

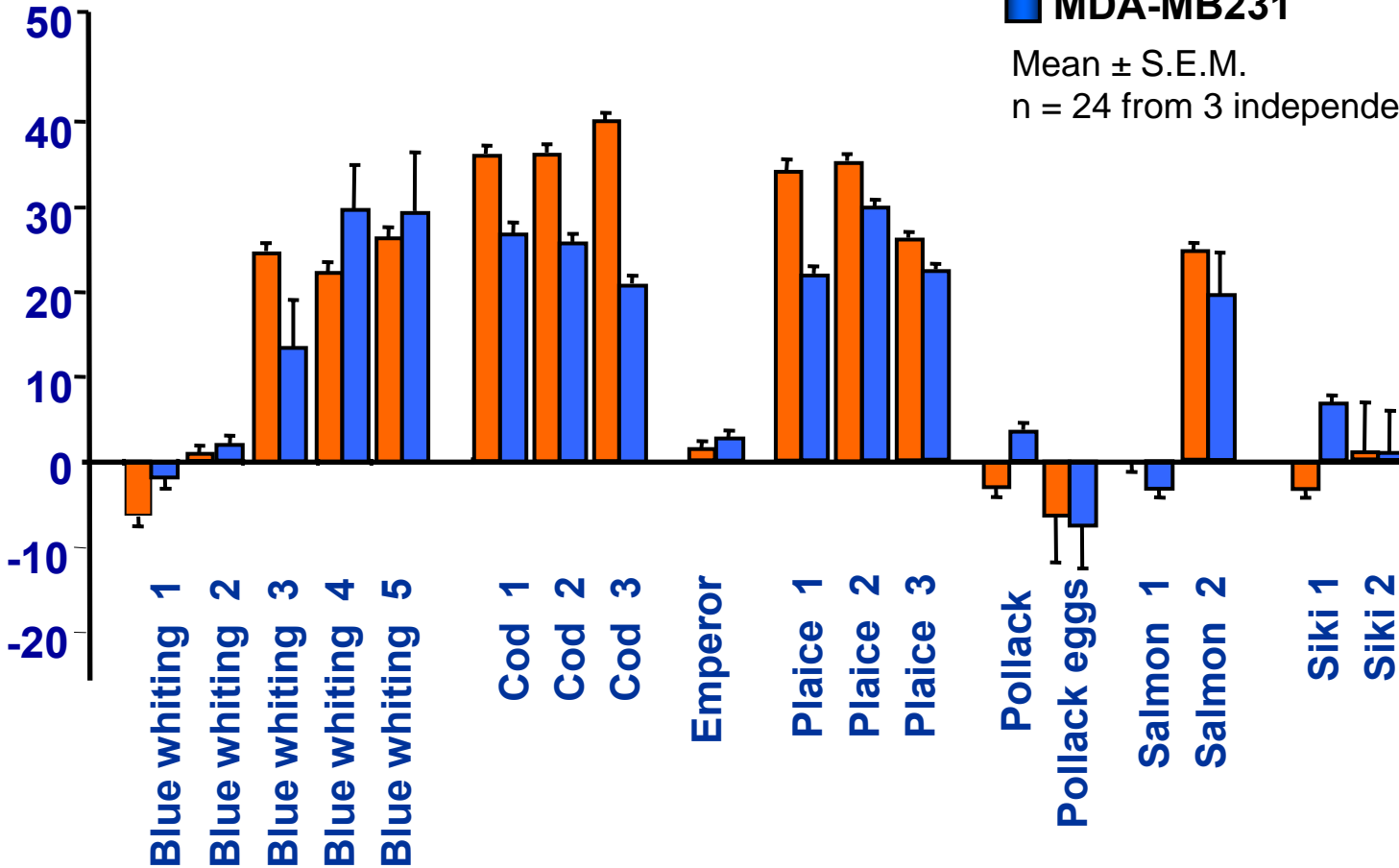
Growth inhibition at 72 h (% control)

■ MCF-7/6

■ MDA-MB231

Mean ± S.E.M.

n = 24 from 3 independent experiments

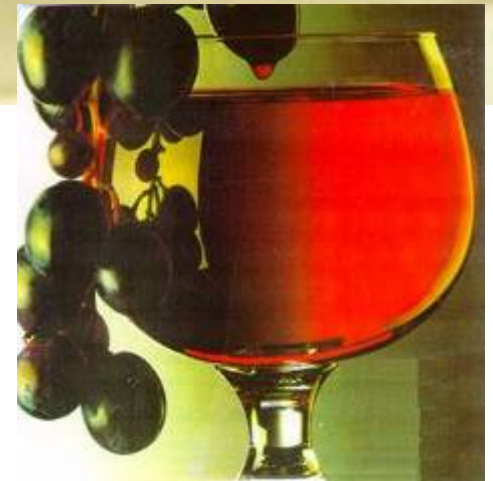


Fish hydrolysate (1 g.L⁻¹)

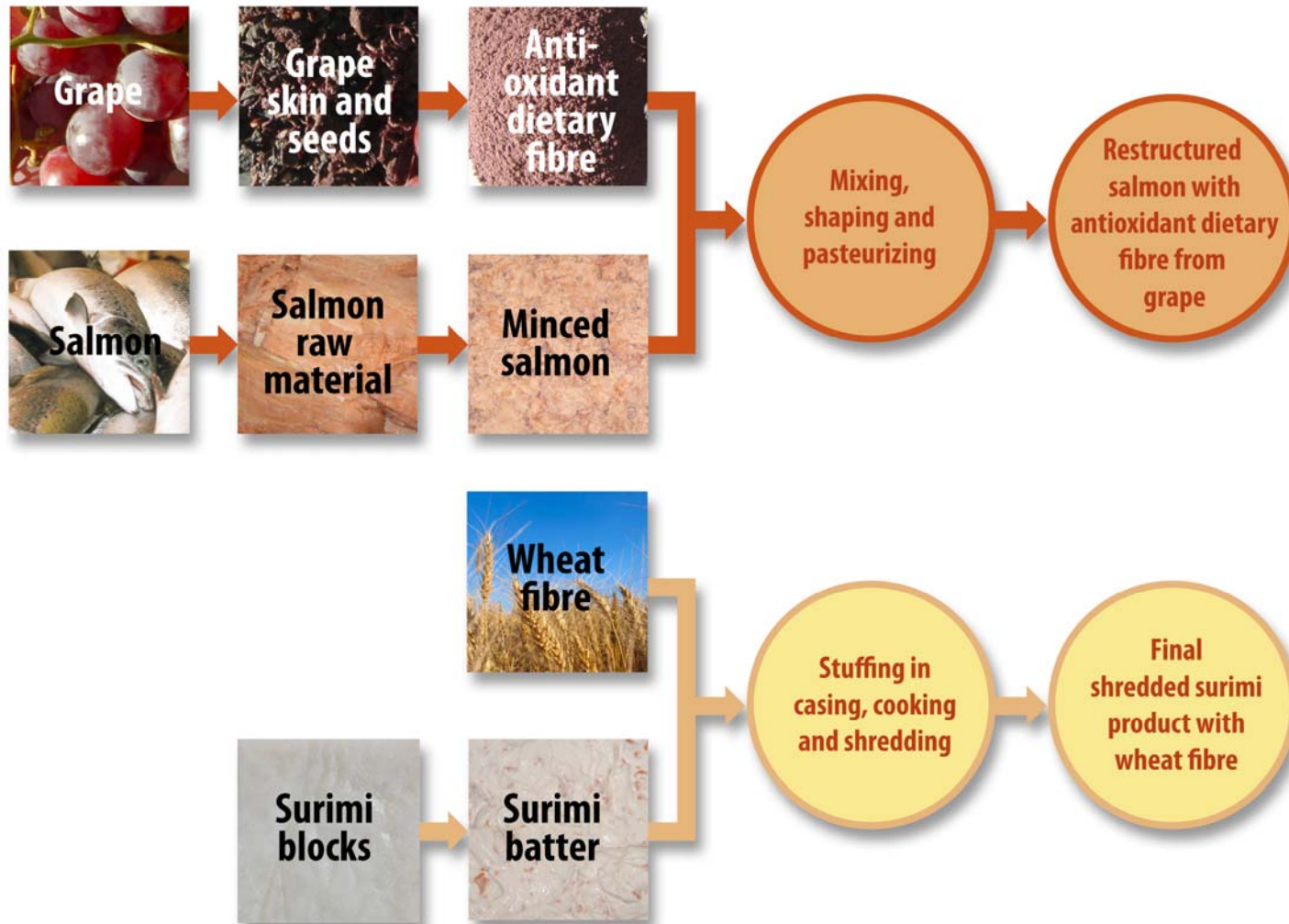
Source: Laurent Picot, Project PROPEPHEALTH

Supplementing restructured seafood with plant fibers

- **Carriers of functional components**
- **Health promoting components from other foods added to seafood**
- **Antioxidant dietary fibers**
- **Higher values from seafood by-products**



Project CONSUMERPRODUCTS



Supplementing restructured seafood with plant fibers

**IMPROVE
YIELD**

**PREVENT BREAKING
OF COATING**

**PREVENT
DEFORMATION**

BOTH FIBERS EFFECTIVELY BIND WATER

WHEAT FIBER

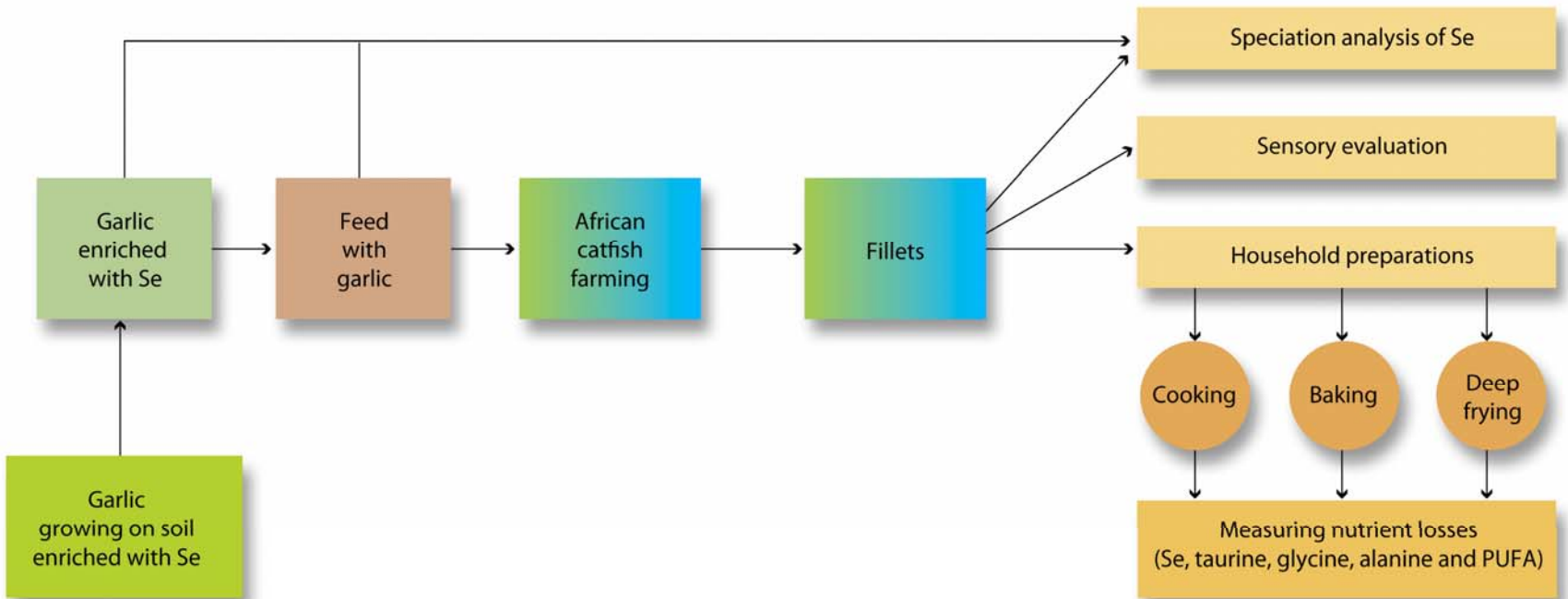
GRAPE FIBER

**THEY DO NOT PREVENT PROTEIN AGGREGATION
UPON FROZEN STORAGE**

**GRAPE
FIBERS**

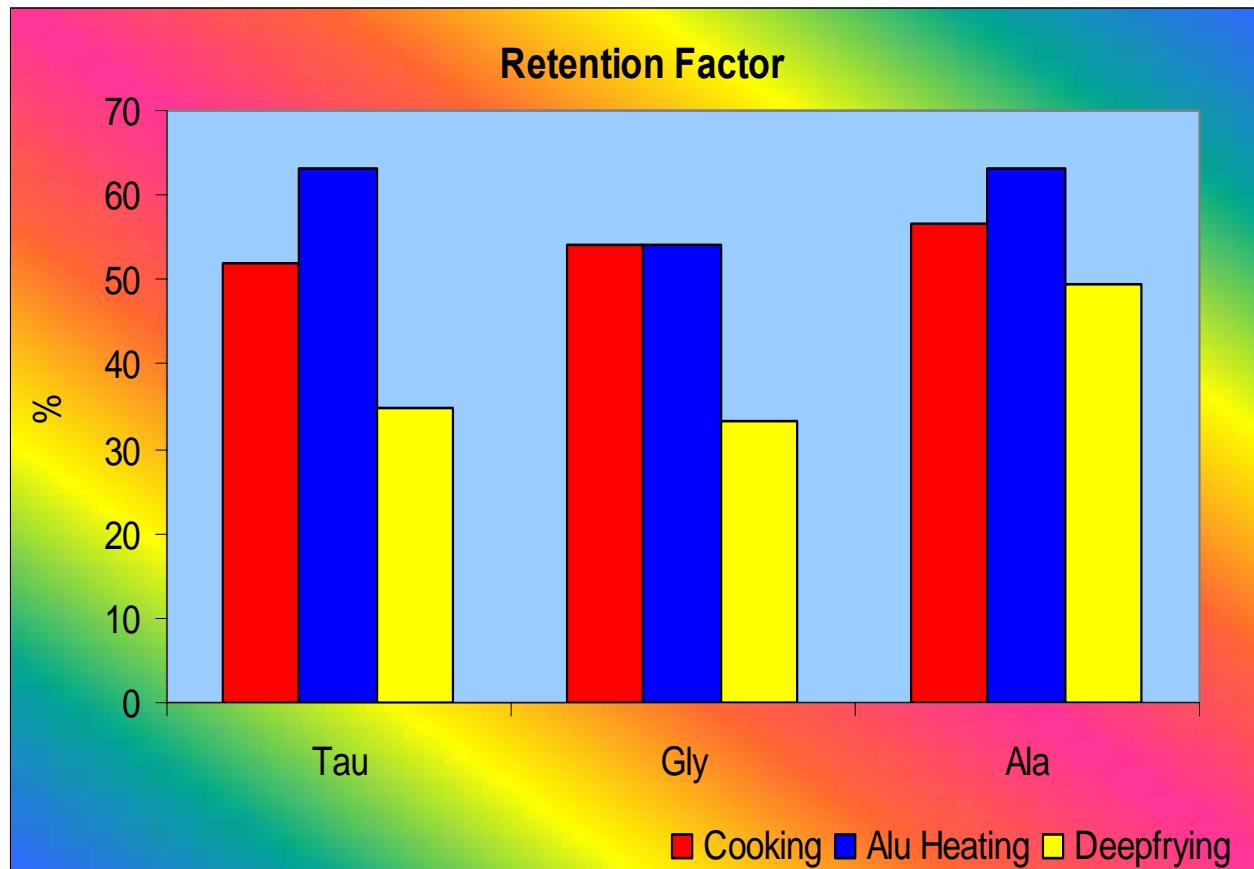
**PRESERVE THE MINCE FROM
OXIDATION**

Project CONSUMERPRODUCTS



Losses of nutrients during cooking

Components: Taurine, Glycine and Alanine



Cooking

(boiled in plastic pouches in water)
T= 90 °C, t=10 min

Aluminium heating

(fish wrapped in aluminium foil)
T= 180 °C, t=27 min

Deep frying

(fried in vegetable oil)
T= 180 °C, t=4 min

Source Bandarra: Changes in nutrients in farmed African catfish during household preparation, SEAFOODplus Conference, Tromsø, 2006

What is an Associate of SEAFOODplus?

- ✓ **An Associate can have a close connection to a defined part of SEAFOODplus**
- ✓ **Has easy access to research results at an early stage**
- ✓ **Can draw on expertise within project network**
- ✓ **Is typically an industrial enterprise, and preferably an SME**
- ✓ **Associates are listed on the homepage of SEAFOODplus and link to own website**



Becoming an Associate step by step

- 1. Identify a project within SEAFOODplus which you find interesting**
- 2. Contact the secretariat and further the project leader for the particular project**
- 3. Internal procedures within SEAFOODplus initiated for adopting a new Associate**
- 4. No conflict of interest with existing partners must occur**



Becoming an Associate step by step

- 5. A fee must be paid**
 - 500 euro for an SME per project
 - 2000 euro for a larger industry per project
- 6. When approved by Council and Letter of Agreement signed, the Associate is activated**
- 7. Procedures for full partnership within following 18 months period may be initiated**



Would you like to join the crowd?

