



SEAFOODplus

RTD 1 – Seafood and Human Nutrition

The Challenge

Fish consumption has several nutritional and health benefits which are mainly due to the presence of proteins, unsaturated essential fatty acids, minerals (calcium, iron, selenium, zinc, etc.), and vitamins including A, B3 (nicotinamide), B6 (pyridoxine), B12 (cobalamine), E (d-tocopherol), and D. Fish is a rich source of most essential nutrients and a valuable source of dietary proteins and lipids. However, in addition to providing essential amino acids and energy required for growth and maintenance, food proteins can also exert physiological benefits which ultimately influence human health.

The major causes of premature morbidity and mortality in Europe are cardiovascular disease and cancer. Diet is recognised to be a major factor in causing these diseases. Recent epidemiological evidence suggests that fish consumption can play a significant part in the dietary control of chronic disease and other inflammatory diseases. However, the mechanisms of the beneficial health effects are not clearly identified.

It is generally accepted that there is a connection between the frequency of seafood consumption and some chronic diseases. But can this be proved scientifically? And if they exist, what substances in fish are responsible for the positive effects? Would it be possible to isolate them and transfer them to other foods so that these would have similar benefits?

Project Objective

The main aim is to illustrate elementary functional mechanisms and physiological processes that proteins and fatty acids found in seafood products bring about in the human body. To assess the importance of seafood in diet in relation to lowering the risk of major nutrition related chronic diseases (cardiovascular disease, colon cancer, inflammatory bowel disease) and to assess the role of seafood consumption in the promotion of health in young European populations, including pregnant women and their children and in the prevention of obesity and osteoporosis.

Key Points

- **Project 1.1 - FISHGASTRO** will examine the influence of seafood consumption, particularly of fish proteins, on gastro-intestinal health.
- **Project 1.2 - YOUNG** will investigate the health effects of omega 3 fatty acids on young people and young families
- **Project 1.3 – METAHEART** is concerned with the metabolism of omega 3 fatty acids and their influence on heart disease.



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EATiP Thematic Area of Relevance

TA1: Product Quality, Consumer Safety and Health

TA2: Technology and Systems

TA3: Managing the Biological Lifecycle

TA4: Sustainable Feed Production

TA5: Integration with the Environment

TA6: Knowledge Management

TA7: Aquatic Animal Health and Welfare

TA8: Socio-Economics and Management

Key Words

Seafood consumption, heart disease, gastro-intestinal health, omega 3, fatty acids

Project Information

Contract number:
506359

Contract type:
Integrated Project

Action line:
FOOD-2002-T2 Total food chain:
Quality seafood for improved consumer health and well-being

Duration:
60 Months (01/01/2004 – 31/12/2008)

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Output Highlights

FISHGASTRO focused on whether seafood consumption has a preventative effect on colon cancer and inflammatory bowel disease. For the first time the health benefits of seafood products were examined as whole products but the fats and proteins that they contain were analysed separately. A remarkable difference was demonstrated between the effects of consumption of fatty fish (salmon) and lean fish (cod) on the expression of genes at the level of the intestine, showing that lean and fatty fish do not have the same effects on the intestinal mucosa. It was also shown that both kinds of fish are capable to reduce the plasma CRP level, a biomarker for inflammation. This possibly links mechanistically fish consumption (protein and fat) to risk reduction of chronic diseases.

In the **YOUNG** project it was demonstrated in a multicentre study that fish consumption helps overweight young people to lose weight while protecting lean body mass. The effect is associated with improvement of the blood lipid profile and insulin and glucose levels.

As part of **YOUNG** an epidemiological study on the effect of fish consumption on the health of mothers and children was undertaken. The researchers hoped to illustrate how omega 3 fats affect the intestine, the development and function of the brain, the heart, bone structure and fat tissue. The findings will contribute towards preventing some metabolic diseases and functional disorders of these organs. Intake of seafood in this study and its effects on self-reported symptoms of post-partum depression was studied and initial analysis indicated some protective effect. Further detailed analysis was needed especially with regard to confounding variables before final results could be recorded.

In the **METAHEART** project researchers analysed the role played by bioactive components in seafood on the health of the heart muscle. The project established that the effect of fish oil on heart health was not as positive as had initially been anticipated and was associated with a lowering of heart frequency. Animal studies gave clearer indications that fish oil may have positive effects in some animals.

The Full Report:

Further information can be obtained from the project website <http://www.seafoodplus.org/> and through the interim reports available for download.

Related Publications/Projects

Publications from the project are available for download on the project website, visit <http://www.seafoodplus.org/>