

VTT TAILORED TECHNOLOGIES FOR FUTURE FOODS

RESEARCH PROGRAMME



Some examples of the results of the programme:

- *The perceived difficulties in eating foods that require a lot of chewing or are hard, tough or crunchy are greater for the elderly than they are for young people. Although young people enjoy more difficult texture characteristics, elderly people also like food textures that require some effort.*
- *Different β -glucan preparations change the mouthfeel of juice and soup in different ways depending on their molecular weight, concentration and other factors present in the preparation. Microstructure and mechanical properties correlate well with the perceived mouthfeel.*
- *Laccase catalyses in a dose dependent manner the crosslinking of sugar beet pectin, offering an efficient way to produce gels from sugar beet pectin.*
- *Porosity and rigidity of the continuous phase of cereal products are decisive factors in determining the insulin responses in healthy humans.*
- *A number of bioactivity assays which predict the behaviour of plant-derived bioactive compounds in human body have been developed. The assays have been applied to different plant material e.g. cereals, berries, vegetables and cultivated plant cells in various projects.*
- *Germination improves the bioactivity and structure of rye, flax, rape and lupine seeds. In rye, the levels of folate and easily extractable phenolic compounds increased during germination with negligible changes in the levels of sterols, lignans and alkylresorcinols. Germination proved to be an effective method of adjusting the flavour of rye.*
- *A food-grade (edible) non-milk based general medium was developed for producing probiotic cultures. Stable cultures are produced using this medium and downstream processing with a protective agent in the lyophilisation step. The viability of probiotic cultures can be further improved by suitable stress treatments.*

VTT TAILORED TECHNOLOGIES



VTT's research programme (2001–2004) gathers research activities aiming at tailored food quality attributes into a single, cohesive group.

Our objectives:

- Innovative bioprocessing
- Engineering of food structure
- Specific physiological functionalities
- Improvement and stabilisation of taste

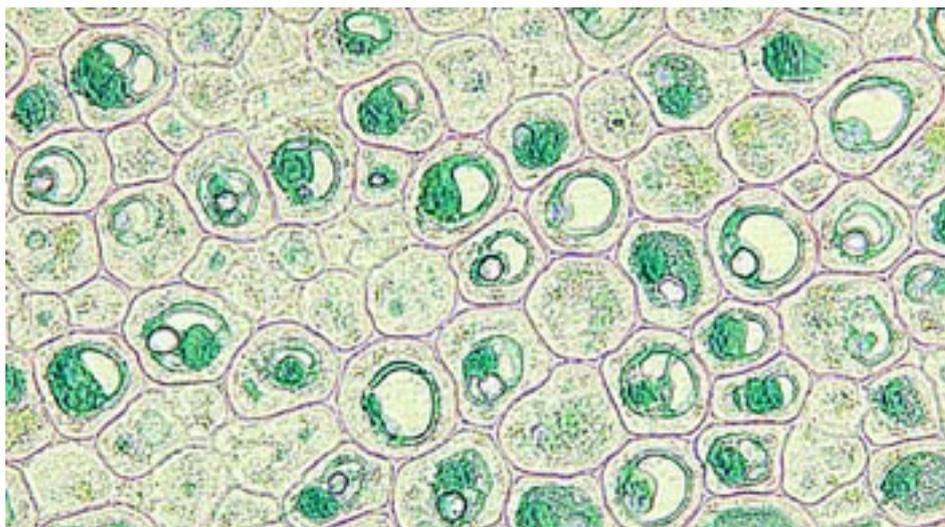
In order to reach these targets, we are developing:

- Enzymatic, microbial and plant biotechnology-based technologies
- New instrumental tools for the physical characteristics of foods
- Bioactivity assays for predicting physiological effects
- Methods for predicting consumer food choice

To make this happen, we have about 50 people working in different projects with a total annual budget of EUR 3.5 Million. In addition to VTT, the main public funding sources are the National Technology Agency Tekes and the European Union.

We also have a comprehensive domestic and international collaborative research network. With respect to health effects and clinical trials, our major collaborator is the Food and Health Research Institute at University of Kuopio (<http://www.uku.fi/ettk>).

FOR FUTURE FOODS

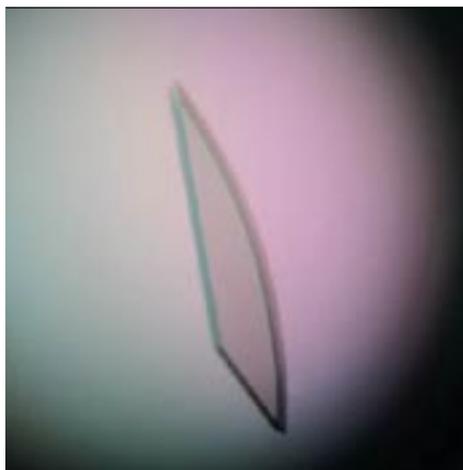


SEED FACTORY

The Seed Factory team develops knowledge in using germination for new applications. Furthermore, the biosynthetic capacity of seeds is modified for novel products. Research is focused on two main themes: controlling germination for improved bioactivity and structure and genetically engineering seeds and plant cells for new products.

STRUCTURE ENGINEERING

The Structure Engineering team aims at understanding the structure generated by processing and crosslinking enzymes and how it is related to stability, the sensorial perception of texture and structure breakdown during digestion. This knowledge will be used to develop foods with new structures that have good mouthfeel, stability and nutritional properties.



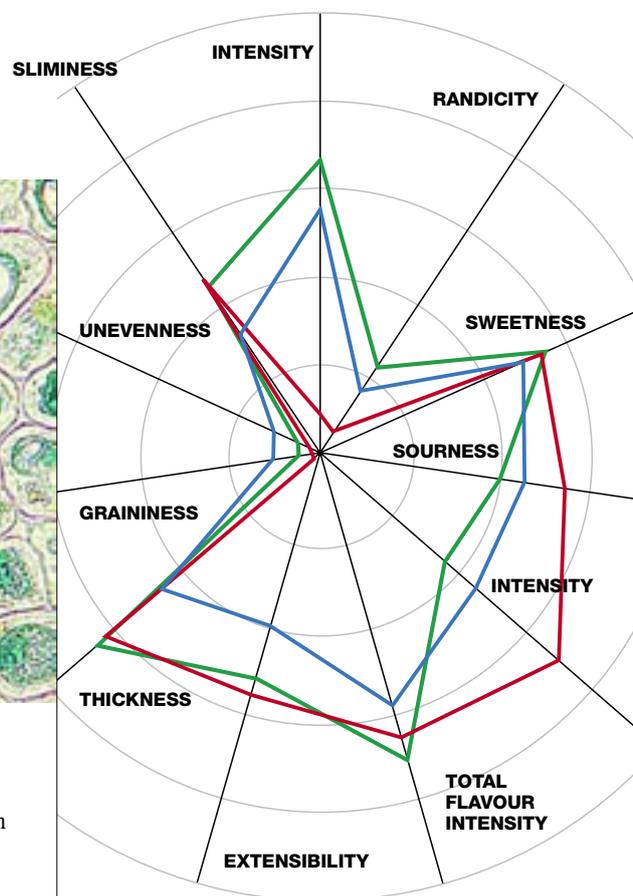
ENZYMATIC MODIFICATION OF FOOD MATERIALS

Tailored enzymatic processing steps for the food industry are developed in the Enzymatic Modification of Food Materials team, which focuses on developing enzymatic structure engineering concepts and on using cell-wall degrading enzymes as plant material processing aids.



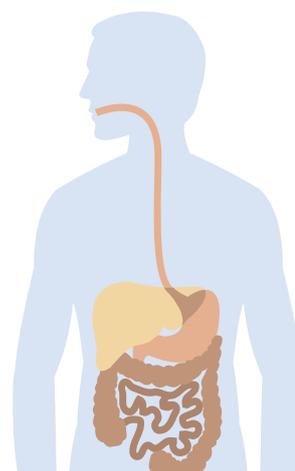
MICROBIAL VIABILITY

Molecular and technological tools are developed and applied in the Microbial Viability team for controlling the viability and stability of both beneficial (probiotics) and harmful bacteria.



CONSUMERS AND SENSORY QUALITY

The Consumers and Sensory Quality team develops tools for translating consumer expectations into product attributes and for understanding how flavour compounds and micro-structure create the desired sensory characteristics.



PHYSIOLOGICAL FUNCTIONALITY

Developing the knowledge of how to control the behaviour of food in the gastrointestinal tract is the focus of the Physiological Functionality team, which perfects its skills on *in vitro* bioassays for predicting the physiological functions of foods as well as assisting in the development of technologies and innovations of foods for health benefits.

VTT is an impartial and multidisciplinary expert organisation. It provides a wide range of technology and applied research services for its clients and co-operation partners in industrial enterprises, other companies and businesses, universities and research institutes.

VTT Biotechnology is one of the six research institutes of VTT. Its main target is to develop processes and product innovations based on biological materials. Research and development is carried out in joint interdisciplinary projects with industry and universities or in confidential contract work with industrial customers.

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From left: Johanna Buchert, Anu Kaukovirta-Norja, Kirsi-Marja Oksman-Caldentey, Kaisa Poutanen, Anna Maria Nuutila, Liisa Lähteenmäki, Karin Autio and Liisa Nohynek.

Welcome to the VTT Food Technology Platform

The VTT Food Technology Platform is an easy way of following our programme.

Special membership benefits include:

- Electronic newsletter for an unlimited number of corporate employees.
- Access to the membership extranet, including posters, presentations and abstracts.
- Members receive information about reports and publications, which can be easily ordered by return mail.
- Participation in the annual seminar, a copy of the annual report.

Further information and the membership application can be found at <http://ttff.vtt.fi>.