Healthy Eating Workshop

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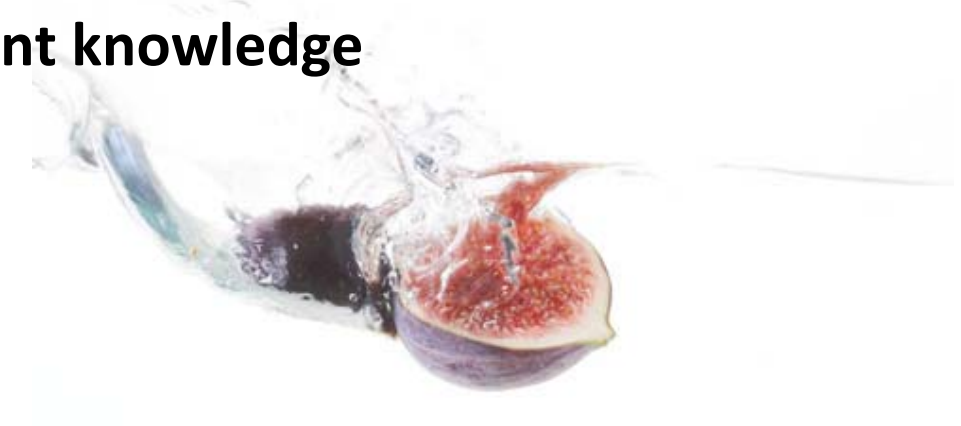
Healthy eating – Healthy food

- **Are adequate technologies, products and tools available?**
  Advanced processing technologies
- **Are framework conditions suitable for SMEs ?**
  Difficulties and opportunities of SMEs in the food sector
- **Is knowledge transfer target-oriented?**
  New routes to implement knowledge



Framework conditions
European food industry

Turnover: **965 billon Euro** — **SMEs: 48,7 %**

EU market share of global export market: **17,5%**

Number of companies: **310,000** — **SMEs: 99,1%**

Employment: **4,4 million people** — **SME: 63 %**

Consumption: **13% of household expenditures**

R&D expenditure: **0.37 % of food and drink output**

Source: CIAA Data & trends of the European Food and Drink Industry 2009

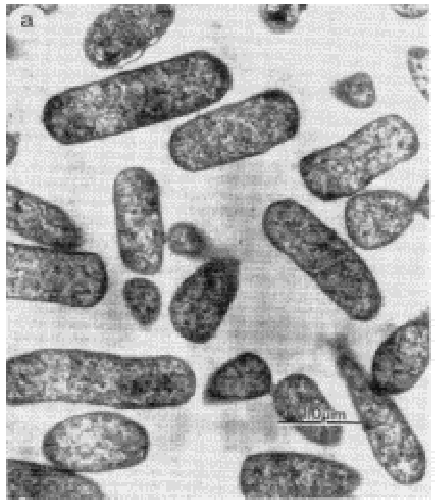
Challenges, expectations and potential

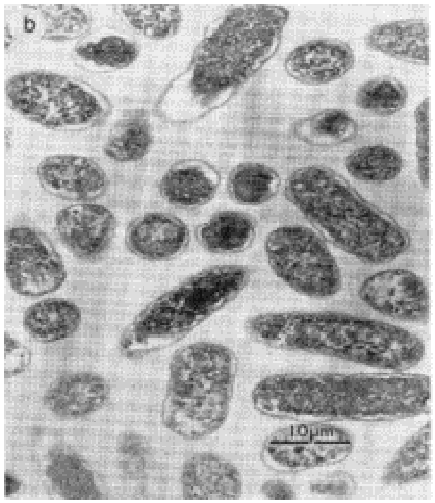
Challenges: How to combat obesity and malnutrition with limited resources (raw materials, energy, water) of an aging and highly individual society considering sustainable legislation & regulations (ecology, society, economy).

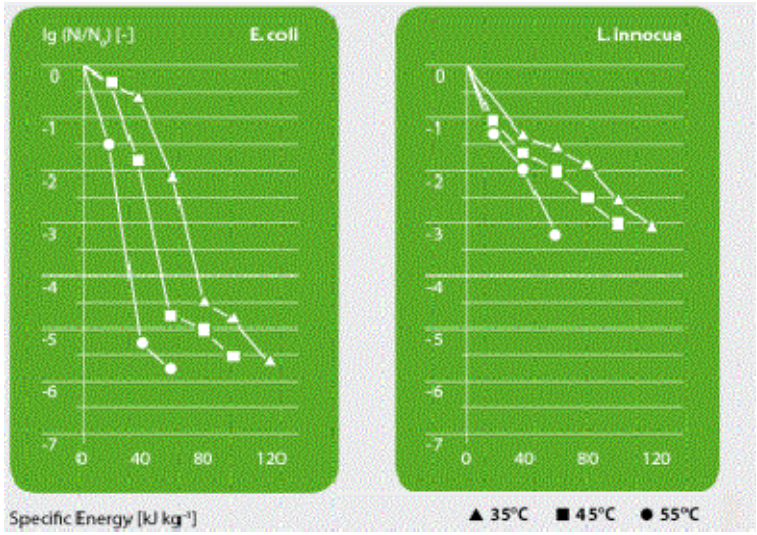
Potential of food industry:
Advanced processing technologies

Expectations: Consumer wanted food that is safe, healthy, affordable, of high quality, convenience, fresh, functional, organically produced, with a low CO_2 footprint, low-salt / low-fat / low-sugar, transparent traceability, etc.

Pulsed electric field processing







Principle

Cell membranes of micoorganism can be made permeable by using a pulsed electric field (electroporation).

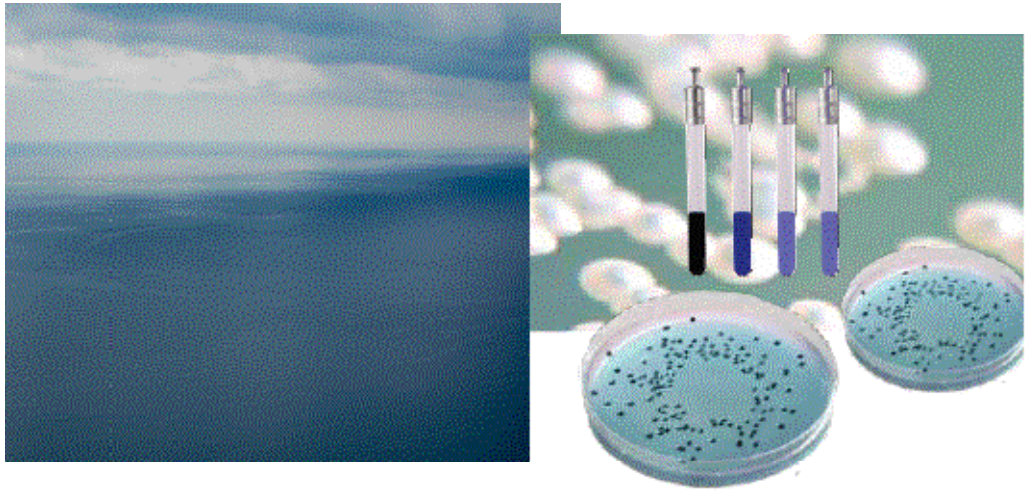
Advantages

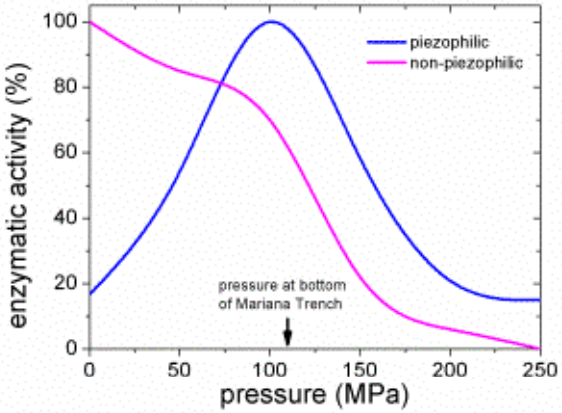
- Safety & quality: Microbial decontamination of liquids without heat or additives, content of nutrient is retained
- energy-efficient, waste free and commercially viable

R&D needs

- Structure modification
- Increase yield of functional substances
- Accelerate fermentation processes

Blue biotechnology





Principle

- Metabolism of aquatic organisms are adapted to extreme conditions ➔ unique enzymes for food or bio-processes at low temperature
- Use of by-products of fish industry

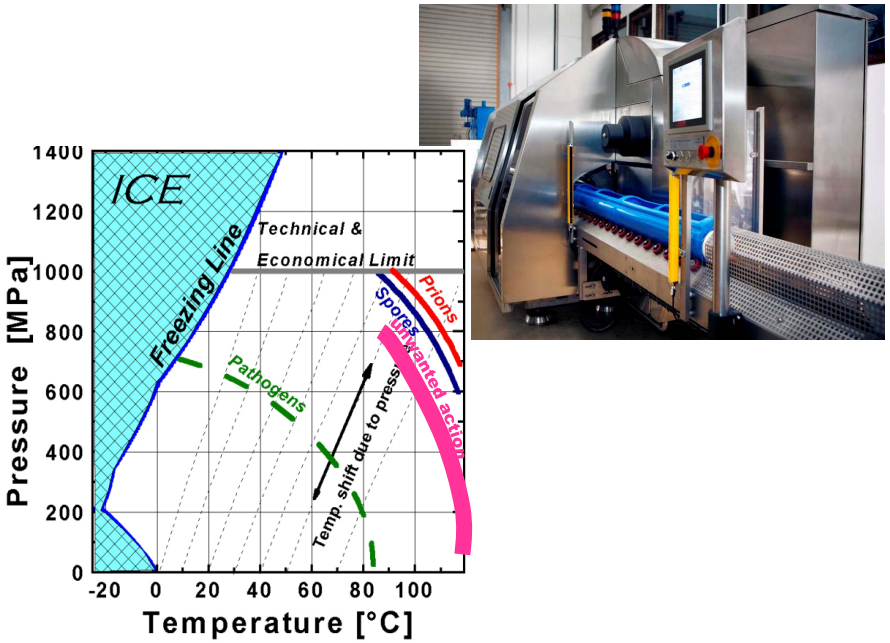
Advantages

- Save of energy
- retain labile and volatile compounds in products
- Avoid growth of mesophilic contaminants
- Optimize use of natural resources

R&D needs

- Identification and investigation of the enzymatic potential of aquatic organisms

High Pressure Procedure



Principle

- treatment of packed food for few minutes under high pressure (100-600 MPa)
- Cold processing

Advantages

- inactivation of microorganisms, viruses and spores
- modification of proteins, enzymes and polysaccharides
- Extended shelf life of products
- energy efficient, safe and waste-free

R&D needs

- Impact on structure forming
- Opportunity for new product development

Varieties of techniques available …

Ethical, legal and social aspects

Objectives: safety, quality, healthy, eco-friendly, convenient

Different working principles & food matrixes

- *Application of multi-layer interfaces*
- *Biotechnology*
- *Emulsification*
- *Extrusion*
- *Dispersing and homogenization technologies*
- *Blue biotechnology*
- *Electrochemical tongue*
- *Electronic nose*
- *Food irradiation*
- *High pressure processing*
- *Microwave*
- *Robotic*
- *ICT for Sensory analysis and consumer tests*
- *Immunostaining*
- *(Nano)Encapsulation*
- *Shockwaves application*
- *PCR-RFLP technique*
- *Sub- and supercritical fluids*
- *Pulse electric field application*
- *Simulation and modelling*
- *Temperature time indicator*
- *Nanoparticulation*
- *Nanomaterials for active and intelligent packaging*
- *… etc.*

Weaknesses and opportunities of food SMEs

Weakness

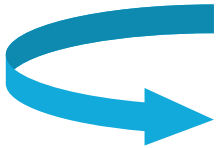
- Different languages, thinking and expectations of industry and science
- R&D private and public resources (facilities, staff, knowledge)
- Dependency on commodity market
- European and national policy and legislative measures
- Access to venture capital

Opportunity

- Knowledge transfer: Answering quick and target-oriented industrial needs
- Explore new resources for food & feed
- Involvement in (European) research projects, cross-sector approaches
- Appropriate research funding programme (project size, administrative procedure, application time)

New routes to implement knowledge

- Identify “new” knowledge for potential innovations (biotechnology, nanotechnology, ICT, automation, etc.) to be use by food industry/SMEs
- Achieve a long-lasting integration of the European R&D activities into high-tech food processing



- Interactive Technology Portal linking industrial needs with scientific knowledge
- Screening, selecting, evaluating and implementing knowledge for potential innovations
- Striving for a European Institute of Food Process

HIGHTECH EUROPE

FIRST EUROPEAN FOOD PROCESSING

NETWORK OF EXCELLENCE

GERMAN INSTITUTE OF FOOD TECHNOLOGIES

KNOWLEDGE FOR SUPERIOR FOODS

DIL - MISSION INNOVATION

DIL

Thank you for your attention!