

# **Food and Agriculture (FA) Domain Committee**

## **COST 928**

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**ESEGP'05 Norwich**

## **COST Action 928**

**Domain Food and Agriculture (FA)**

# **Control and exploitation of enzymes for added-value food products**

**CSO approval date 14.6.2005**

**Entry into force 14.10.2005**

**End date 25.1.2010**

**Web-page: <http://virtual.vtt.fi/virtual/cost928>**

# OBJECTIVES OF THE ACTION

- To create a multidisciplinary network of European scientist workings in enzymes and food processing
- Accelerate the development of tailored bioprocessing technologies for different food materials
  - Cereal
  - Berry, fruit, vegetables
  - Proteinaceous food

## Scientific objectives

- To increase basic knowledge on the mode of action of hydrolytic and non-hydrolytic enzymes in food matrices using advanced analytical techniques and model substrates as tools.
- To develop and understand means to systematically control the activity of exogenous and endogenous enzymes during processing
- To develop targeted methods for boosting or inhibiting endogenous enzymes present in the food raw materials
- To develop novel bioprocesses for the berry, vegetable, meat, fish, dairy and cereal industry to improve the functionality and quality of the products

# Enzymes are natural biotools for food processing

Nature is full of enzymes



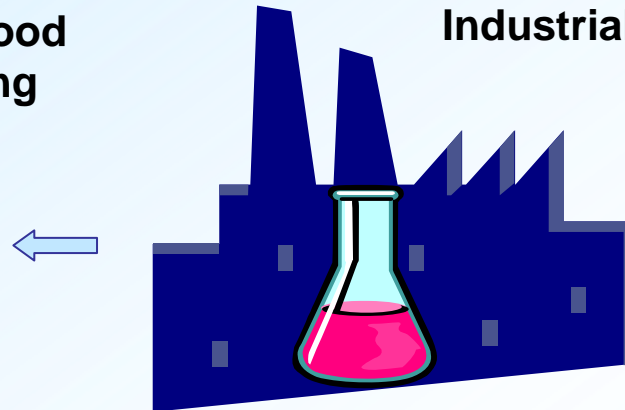
Enzyme discovery  
- mode of action  
- technological benefits



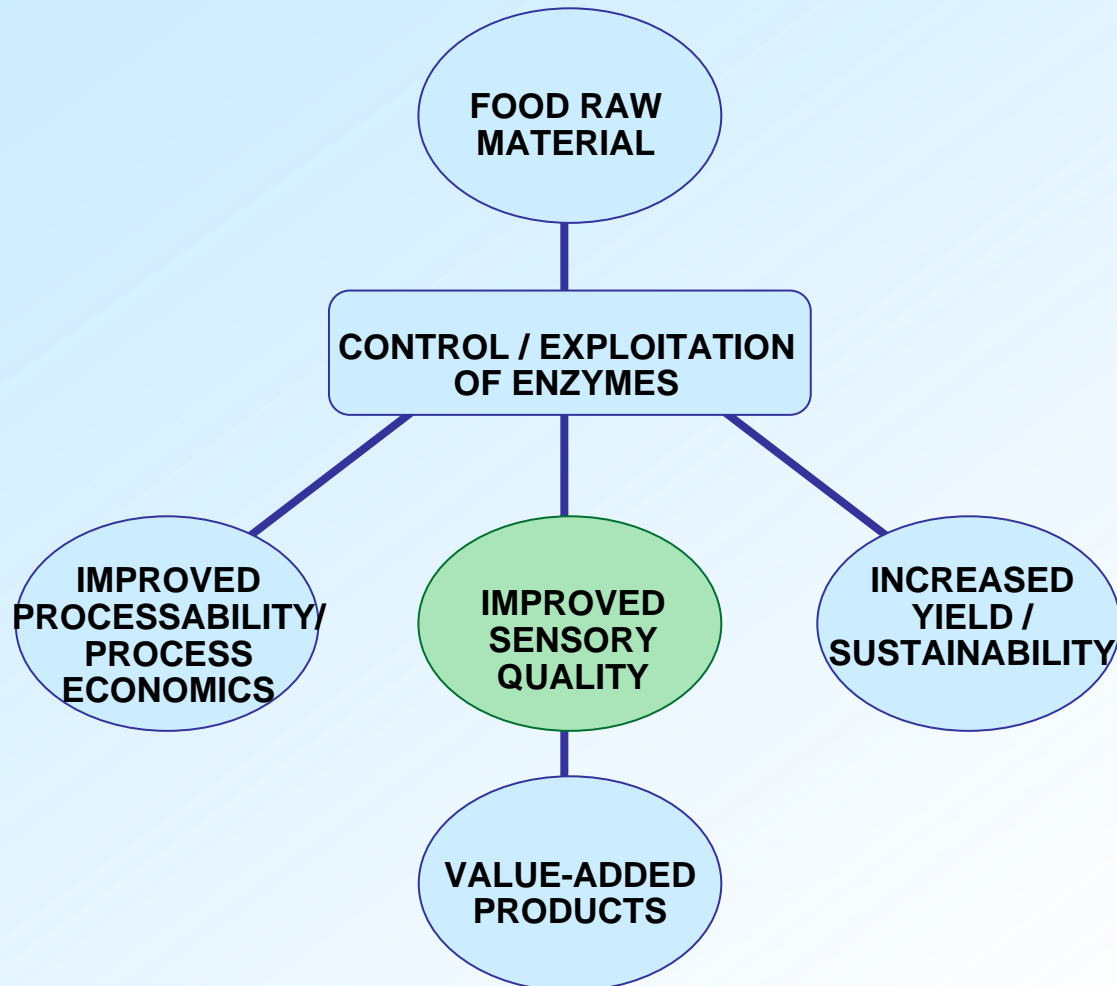
Enzymes as tailored tools in food processing



Industrial enzyme production



# BENEFITS OF FOOD BIOPROCESSES

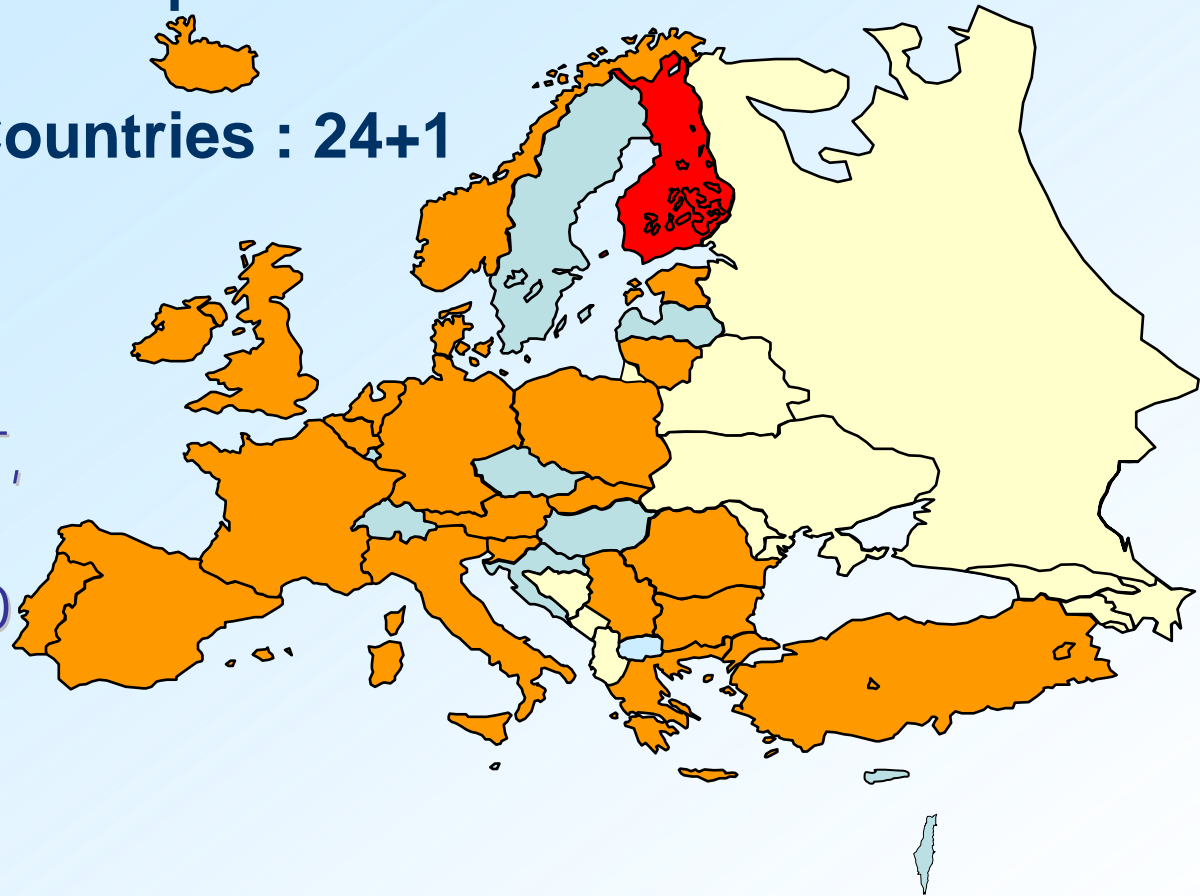


## COST 928: Control and exploitation of enzymes for added-value food products

**Participating Countries : 24+1**

Chair : **FI**

AT, BE, BU, DE,  
DK, GR, IE, IS, IT,  
LT, NL, NO, PL, PT,  
GB, EE, FR, LT,  
RS, SK, SI, TR, RO



**Economic Dimension: 15-20 Million €**

**Duration: 4 years**

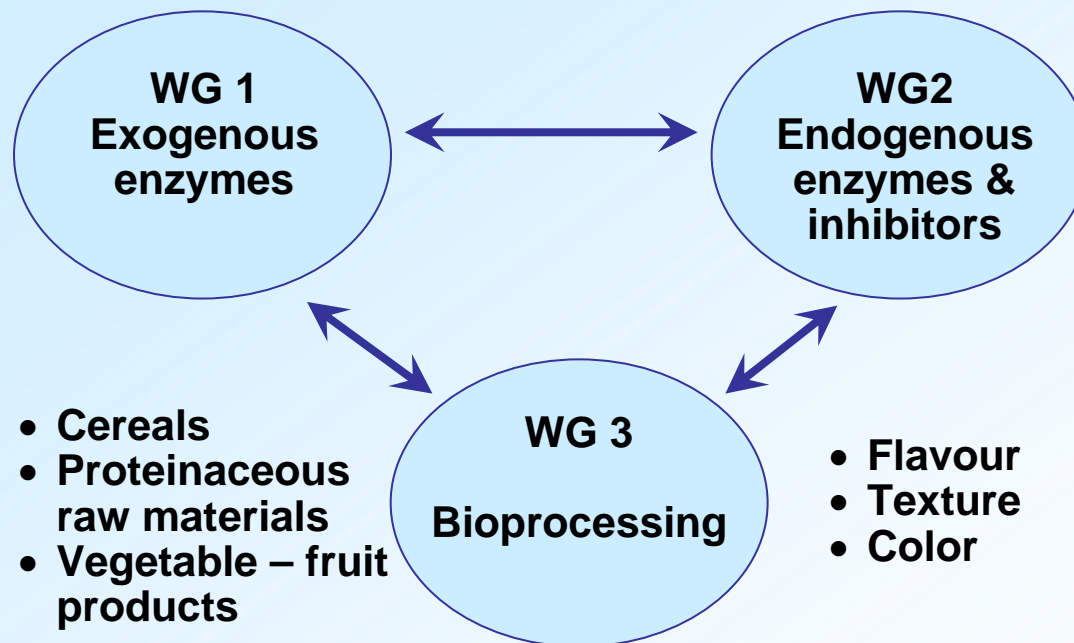
## STRUCTURE OF THE ACTION

Chair-person. Prof. Johanna Buchert, VTT, FI

Vice-chair: Dr. Craig Faulds, IFR, UK

Leader: Dr. Henk Schols, WU, NL

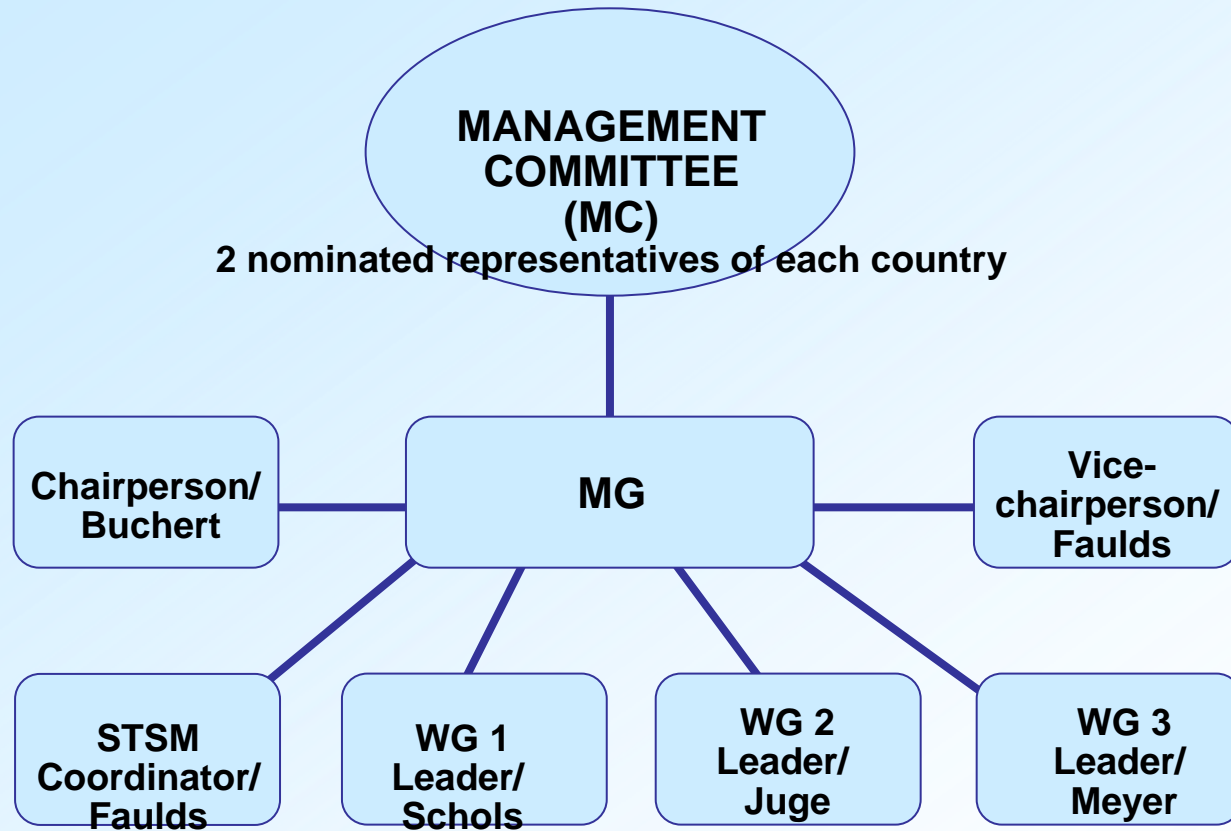
Leader: Dr. Natalie Juge, IFR; GB



Leader: Prof. Anne Meyer, DTU, DK

# ORGANISATIONAL STRUCTURE OF COST

## 928



## **WG 1. DEVELOPMENT AND MODE OF ACTION OF NOVEL BIOTOOLS (EXOGENOUS ENZYMES)**

### **■ Objectives**

- To develop novel exogenous enzyme tools from microbial or plant sources
- To investigate the mode of action of the enzymes using model substrates.

### **■ Deliverables**

- Novel hydrolytic enzymes (glycosidases, proteases, peptidases) being able to alter the flavour characteristics of food raw materials
- Novel crosslinking enzymes (oxidative and transferase type enzymes) affecting the rheology of food biopolymers
- Understanding the mode of action of the enzymes on simple and complex substrates
- Understanding the mechanisms involved in synergistic enzyme activities

## WG 2. TAILORING AND CONTROL OF THE ENDOGENOUS ENZYME MACHINERY IN FOOD MATRIX (ENDOGENOUS ENZYMES)

### ■ Objectives

- To develop methods for tailored activation or inhibition of the endogenous enzymes present in the food matrix.
- To understand the chemistry of endogenous enzyme inhibitors and their role in enzyme catalysis.

### ■ Deliverables

- Prevention of action of endogenous enzymes negatively affecting food quality
- Activation of beneficial endogenous enzymes to improve processability, flavour and texture
- Understanding of the role of proteinaceous inhibitors on the action of microbial and endogenous enzymes
- Investigating the effect of selective binding of inhibitors on simple and complex substrates

## WG 3. IMPROVED FOOD QUALITY VIA BIOPROCESSING (BIOPROCESSING)

### ■ Objectives

- To exploit the developed biotools for manufacture of food products with improved quality:
- To improve the raw material utilization
- To decrease the need for added chemical ingredients in the processes by tailored bioprocesses
- To develop bio-based by-product valorisation processes.

### ■ Deliverables

- Novel enzymatic structure engineering concepts
- Novel methods to boost food flavour or colour
- Novel fruit and vegetable bioprocessing concepts
- Enzyme-aided cereal processing methods
- New enzyme-aided processes for by-product valorization

# Way of working

- WG meetings
  - Annually
  - Informal sharing of results
  - Planning of new EU-projects
- Annual Workshop
  - Wider audience
  - Industrial/ academic networking
- STSM
  - Annually up to 10
  - Call for applications for STSMs
  - Instructions, see web-page
- Collaborations with other COST Actions

- Target to realize the networking in FP7 projects
  - FP6 ongoing projects (REPRO, Health Grain ...)
  - FP7 project applied (Bio-Value etc.)

# Future annual workshops

- 2008 September/ October Istanbul, Turkey
- 2009 September Krakova, Poland
- 2010 Open