

# COST Exploratory Workshop

## Low Input/Organic Agriculture: The Farm of Tomorrow?

Brussels, November 30 2009

Experience with transnational coordination of  
research in Organic Food and Farming and  
ideas for a future agenda

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CORE organic



# International Centre for Research in Organic Food Systems (ICROFS)

- A centre without walls
- Promoting and coordinating organic research internationally
- Collaboration with international funding bodies and research organisations
- Disseminating organic research results and knowledge: *Organic E-prints*
- International board:  
(*Asia, Africa, America, Europe, IFOAM*)
- Coordinator of ERA-net: Core Organic II



Organic  
eprints

[www.orgprints.org](http://www.orgprints.org)

[www.icrofs.org](http://www.icrofs.org)



# CORE Organic: European Research Area Organic Agriculture and Food systems

## 2004-2007 CORE Organic ERA-NET

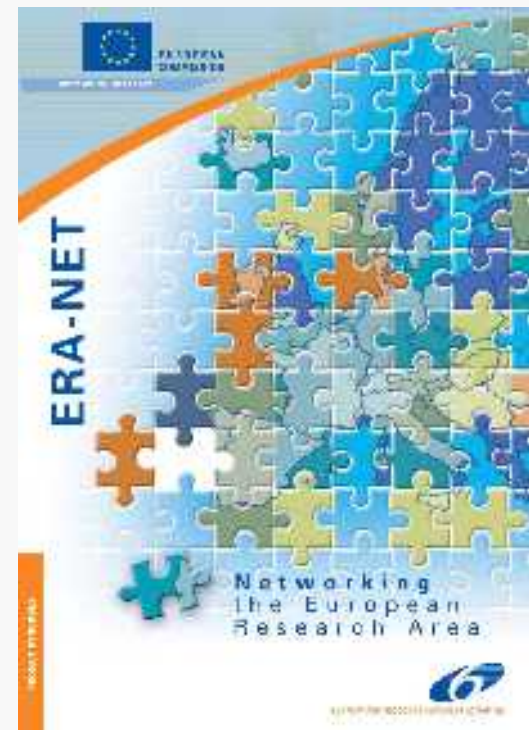
11 countries, 1 call with 3 themes,  
8 research projects (running 2007-2010)

## 2007-2009 Collaboration continued:

- **Network** extended → now 22 countries
- Developed strategy with long term component

## 2010-20

- EU funds for a second ERA-NET:
- CORE Organic II** (ICROFS coordinator)



# CORE Organic network

## 22 countries/27 partners

### 11 new countries

**Belgium** (ILVO & LV)

**Czech Rep.** (Ministry)

**Estonia** (Ministry)

**Spain** (INIA)

**Ireland** (Ministry)

**Latvia** (LSIAE)

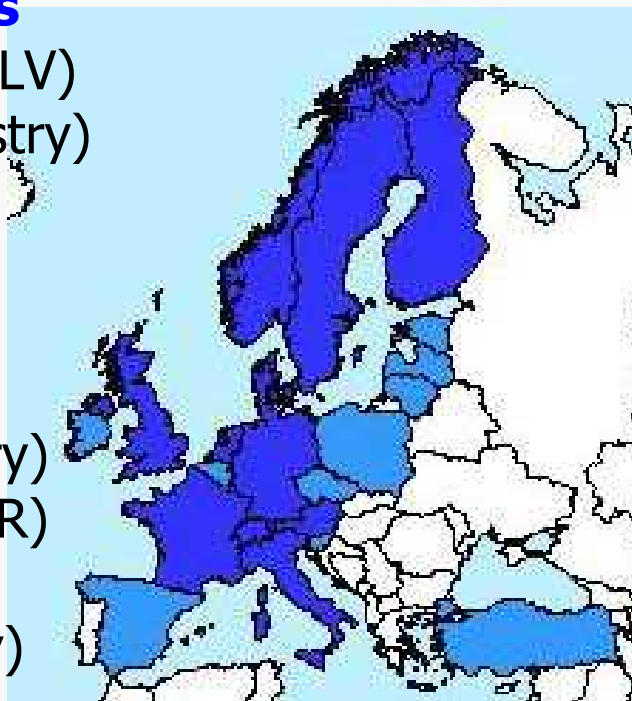
**Lithuania** (Ministry)

**Luxembourg** (FNR)

**Poland** (Ministry)

**Slovenia** (Ministry)

**Turkey** (Ministry)



### 11 countries of CORE Organic I

**Austria** (Ministry)

**Denmark** (ICROFS & DFIA)

**Finland** (Ministry)

**France** (Ministry & INRA)

**Germany** (Ministry & BLE)

**Italy** (Ministry)

**Netherlands** (Ministry)

**Norway** (RCN)

**Sweden** (Formas)

**Switzerland** (Min. & FiBL)

**UK** (Ministry)

# Network's strategy

## A vision for long term collaboration



“enlarge and improve organic agriculture’s role in fulfilling European public demands in terms of high quality products delivered by farming and food systems which combine sustainability with animal welfare and rural development.” **and....**

## ....a strategic objective for transnational coordination

“To enhance the quality, relevance and utilisation of resources in research in organic farming and food systems and its contribution to the development and integrity of the organic sector “



# CORE Organic Pilot projects (2007-2010)

- Minimising medicine use in organic dairy herds through animal health & welfare
- Prevention of selected diseases & parasites in organic pig herds by means of a HACCP based management & surveillance programme
- Potential improvement of the salutary effects of organic milk by forage species & by supplementation
- Quality analysis of critical control points within the whole food chain & their impact on food quality, safety & health
- Agronomical & technological methods to improve organic wheat quality
- Innovative Public Organic food Procurement for Youth
- Farmer consumer partnerships





# **Agronomical & technological methods to improve organic wheat quality (AGTEC-Org)**

Objective: to identify agronomical and food processing technologies that enhance the baking quality and the nutritional value of organic wheat and reduce mycotoxin contamination.

### Long term experiments

- DOK Trial (FiBL-FAL) 1978-
- CROPSYST Trial (AU) 1997-
- MUBIL Trial (BOKU) 2003-
- SoilMan Trial (ISARA-ESA) 2004-

### Transnational Field experiments

N management and crop rotation

N fertilization (AU, FiBL, FAL, ISARA)

Green manure (AU, BOKU)

Intercropping (ESA, ISARA, FAL)

Soil tillage management (ISARA, ESA, FiBL)

**Baking properties**  
(INRA, INRAN)

**Nutritional properties**  
(INRAN)

**Mycotoxin contamination**  
(AU)

### Post-harvest treatments

(INRA, INRAN, Goëmar)

- Milling process –stone vs roller
- Ozonation and heat treatments

### Intercropping or undersowing system wheat-pea / wheat-clover mixtures

3 experimental factors – 24 treatments  
1 site

Wheat / Pea ratio : 50/50 - 70/30 – 100/0 – 0/100

N fertilization strategies

Time of N application (3 dates)  
N amount (2 levels)

3 experimental factors – 5 sites

Seed rate of clovers grass (3 levels)

### N fertilization

2 experimental factors 4 sites

Crop rotation with high vs low proportion of N-fixing crops

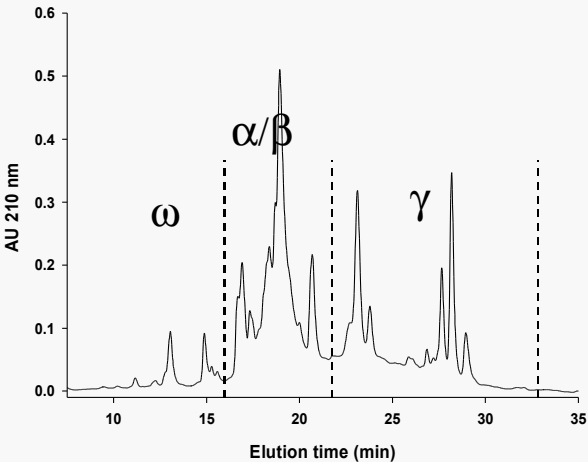
N fertilization with vs without fertilization with animal slurry or farmyard manure

### Green manure

2 experimental factors 4 treatments – 3 sites

Type of green manure

Time of incorporation in the rotation



## Bread making properties

- Dough reological analysis
- Redox status
- Zeleny sedimentation index
- Gluten index
- Flour reological properties
- Baking test



## Mycotoxin contamination

- Fusarium sp. Detection
- Ridascreen Test kit

DON concentration

## Nutritional values

- Dietary fibre
- Bound Hydrophilic antioxidants
- Hardness
- Mineral content
- Total protein

## RISKS AND RECOMMENDATIONS REGARDING HUMAN PATHOGENS IN ORGANIC VEGETABLE PRODUCTION CHAINS

# PATH ORGANIC



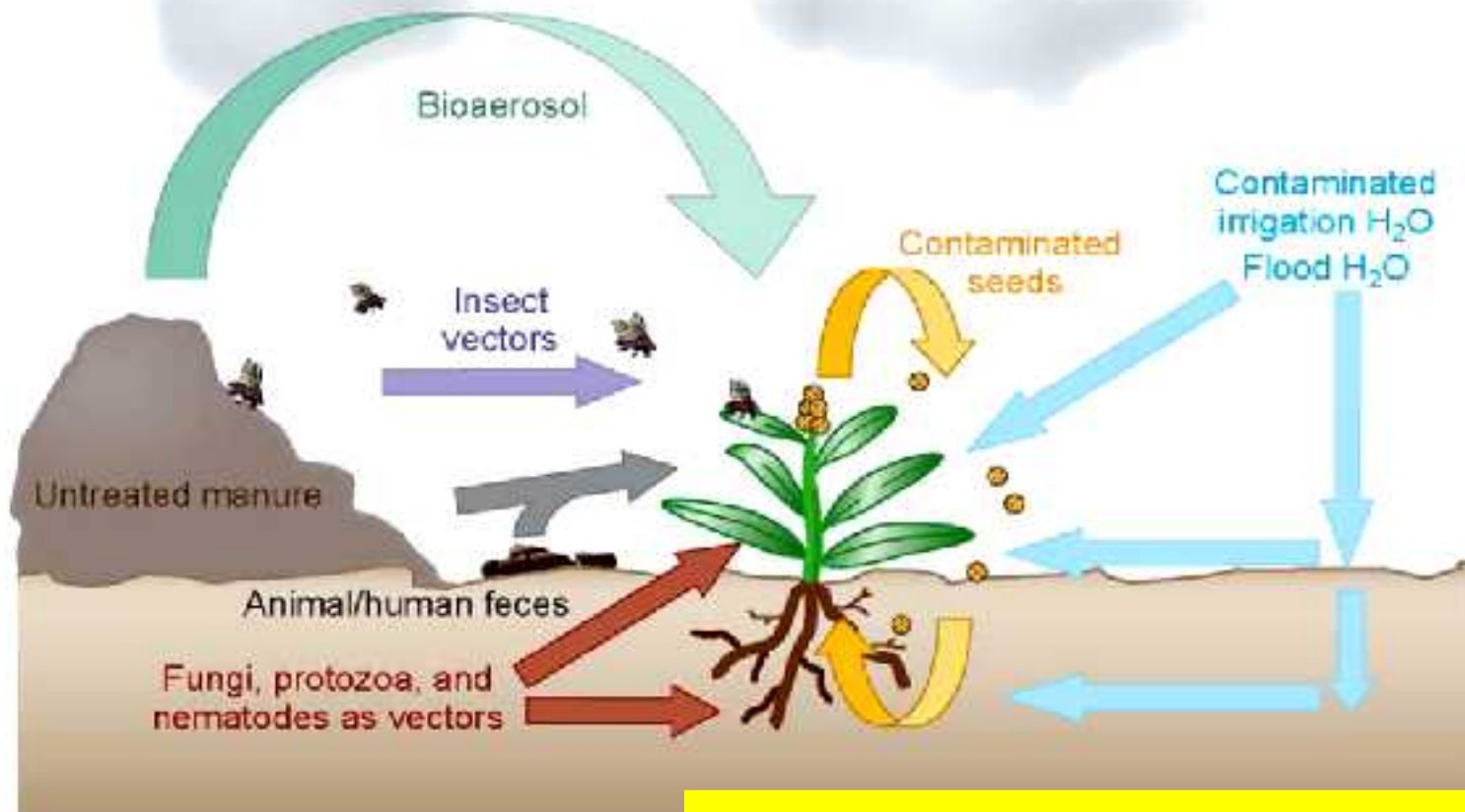
## BACKGROUND

Increase in outbreaks of human diseases associated with the consumption of vegetables



- September 2006                      *E. coli* outbreak related to **spinach** (USA)
- Two foodborne outbreaks in the EU related to **alfalfa sprouts** in 2007:  
    Outbreak in Sweden: 51 cases with *Salmonella* Stanley  
    Outbreak in Norway, Denmark and Finland: 4/ 18/ 8 cases with *Salmonella* Weltevreden
- STEC 2007 outbreaks in Iceland and Netherlands related to pre-packaged shredded **iceberg lettuce**

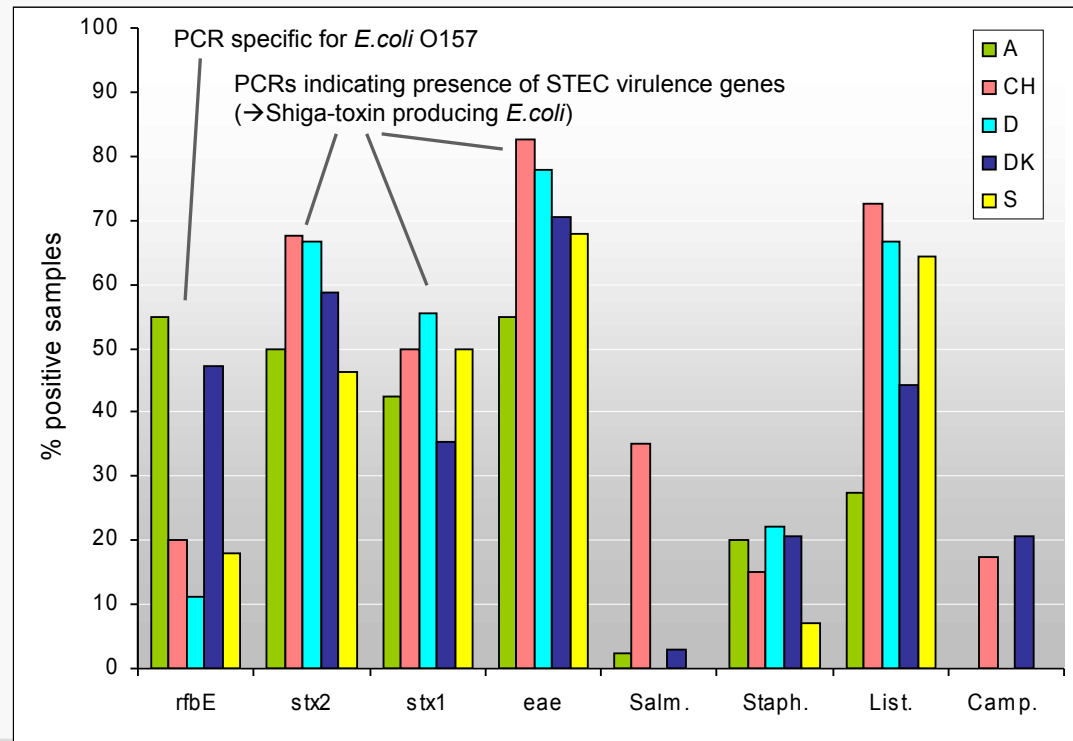
## PATHWAYS OF INFESTATION IN THE FIELD



→ Organically grown produce more at risk?

Factors that can contribute to the contamination of fruit and vegetables with human enteric pathogens in the field. Brandl 2006.

# Surveys of food-borne pathogens: manure samples



- 141 manure samples analyzed in total
- High level of pathogen infestation, including *E. coli* O:157 (all countries!)
- Differences among countries
  - Campylobacter* only CH and DK
- Differences manure vs. slurry
  - O157:H7, virulence genes, *Salmonella*, *Campylobacter* mainly in slurry

## Strategy for vegetable screening

- **2 to 3 fields** per country selected
- **500 plants** of spinach / lettuce collected from each field
- Pooling of 25 g of outer and inner leaves from 10 plants each
- **50 samples per field processed for enrichment cultures**

**Analysis for pathogen prevalence** in five different labs



## ANIPLAN:

Minimising medicine use in organic dairy farms through animal health and welfare planning

**Denmark, Austria, UK, Netherlands, Norway  
Switzerland, Germany**

Objective: To minimise medicine use in organic dairy herds through active and well planned animal health and welfare promotion and disease prevention.

# On-farm studies in 150 European dairy herds in 7 countries



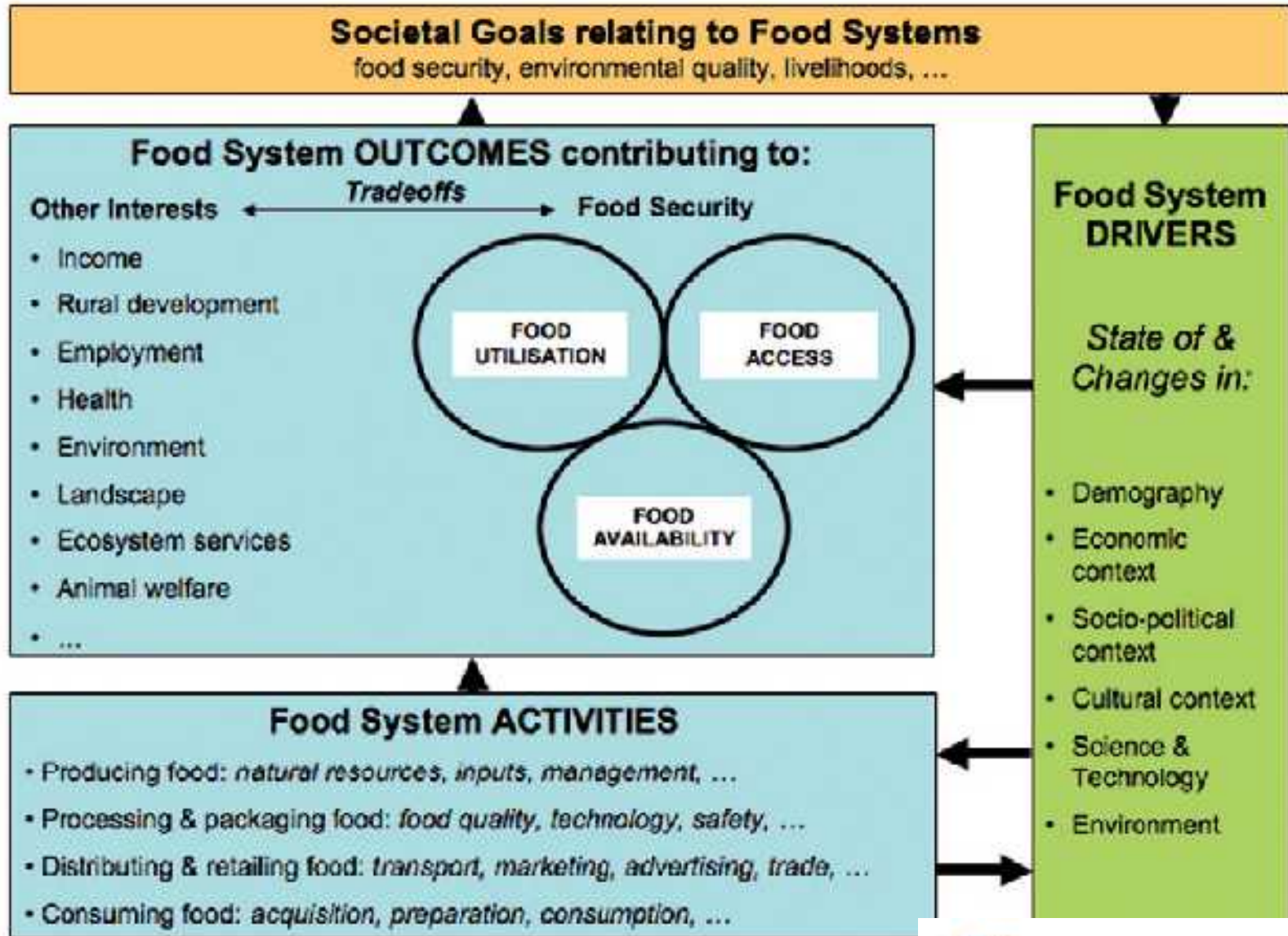
- Focus on assessment, communication and evaluation in a continuous process
- Quantitative and qualitative research methods
- Relatively strong link to end user environments: farmers, organisations, advisors

# Main results so far

- **Animal health and welfare**  
**PLANNING PROCESS** →  
the important focus – not the plan itself!
- **Principles** for animal health planning developed and being researched
- **Guide lines** to the 'only right approach' to medicine reduction: better animal health and welfare
- **Understanding** of different European contexts will guide to practice use



# EUROPEAN FOOD SYSTEMS IN A CHANGING WORLD



# Examples of research topics / ideas of transnational relevance for CORE Organic II and beyond

- improved agro-ecological cultivation practices
- soil fertility & carbon sequestration
- plant & livestock breeding
- livestock husbandry: feeding, health and welfare
- energy use & greenhouse gas emissions
- ICT, automation & robotics
- Socio-economics: sector, market and rural development
- organoleptical qualities of organic foods
- health effects and nutrition
- reduction of additives
- technologies for organic food processing
- wrapping material & packaging
- environmental impact
- New types of mixed farms through innovative collaboration

# Crop production/soil

Sub-Topics	Content (Keywords)
Plant protection	<u>Copper replacement</u> , <u>functional biodiversity</u> , <u>soil/plant health</u> , climate change/plant health, <u>plant protection/local resources</u> , fruit/berries, new fungicides
Breeding, varieties	<u>Breeding methods/goals</u> , robust varieties, availability of vegetable seeds, leguminous plants, CERTIFICATION SEEDS
Plant nutrition	soil management, crop rotation, manure/plant health, SOM, green manure, fertiliser/local resources ( specify nature of resources), nutrient recycling (focus on N and P)
Weed control	robot technology, rumex

# Animal husbandry

Aquaculture, dairy sheeps and goats, pigs, poultry

Sub-Topics	Content (Keywords)
Animal health	Sanitary management
Feeding	Protein gap, reduction or suppression of concentrates, pasture, mono-gastric animals
Animal welfare	Transportation, slaughtering methods, housing systems, access to pastures, castration (pigs)
Robust breeds	Dairy cattle able to deal with rough forage and grazing (less concentrate), better use of animal diversity

# Food quality

<b>Sub-Topics</b>	<b>Content (Keywords)</b>
Processing	Gentle processing and environmental dimension of processes, Sensory quality, Authenticity and sustainability, Reduction of preservatives in processed foods
Health & nutrition	Comparison, baby-food; impact of organic food on health and well-being (evidence added value, possible contribution of indicators of health)
Safety	Prevention of fraud, finger-printing (related with traceability)
Influencing factors	Fruit/vegetables, animal welfare, values/emotions

# Socioeconomics

Sub-Topics	Content (Keywords)
Sector development	Influencing factors (policy, consumer promotion), institutional changes, forms of cooperation, innovation, support, performance based indicators ( <i>possible link with era Net Ruragri: to be clarified</i> ), transition to OF
Market development	Marketing, new forms of consumer dialogue, functionality of markets, social exclusion
Rural development	Employment, land use, values, small farmers,

# Farming systems & Environment

- Innovative mixed farms
- New forms of cooperation between specialised farmers
- Develop organic farms with conservation objectives/  
environmental issues
- Resource use, reduced input dependency
- Resilient crop production systems
- Use of agro-ecological indicators to assess environmental  
quality and sustainability of farming systems
- Bio-energy
- Climate change:
  - Potential for adaptation/mitigation,
  - carbon sequestration,
  - GHG-emission, energy, carbon cycles
  - Network of low-carbon organic farms



**More on CORE Organic pilot projects:**  
[www.coreorganic.org/research](http://www.coreorganic.org/research)

Thank you!

CORE organic



# Opportunities and barriers for a market-based growth in production, processing and sale of organic products

## Development, growth, and integrity in the Danish organic sector



A knowledge synthesis on the opportunities and barriers for a continued development and market-based growth in production, processing, and sale of organic products

November 2008



More details in english:  
Whitepaper  
Newsletter

[www.icrofs.org](http://www.icrofs.org)



# The favourable conditions for the Organic sector in Denmark

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- The value based market is growing
- Interest from retail stimulates innovation and product development
- Good farm economy in organic
- Space for more organic farms and good environmental performance:
- Biodiversity, nitrate leaching, pesticides free



# Overall motive for buying Organic food?

*Niklas Luhman (1979):*

*Trust is a mechanism of reducing complexity*



My sustainable diet??

Healthy food  
Climate  
Environment  
Animal  
Welfare  
.....



Organic agriculture needs to preserve its Integrity and improve praxis in relation to the principles