



Idea of a project on quality of organic food – health and safety within CORE organic

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DARCOFIII: OrgTrace



- Title: “Content, bioavailability and health effects of trace elements and bioactive components of food products cultivated in organic agricultural systems”
- Participants from: RVAU-Plant and Soil Sciences Laboratories (Søren Husted), RVAU-Human Nutrition (Susanne Bügel), DFVF-Food Chemistry (Erik H. Larsen), DIAS-Genetics and Biotechnology (Kristian Kristensen), DIAS-Animal Health, Welfare and Nutrition (Charlotte Lauridsen)

OrgTrace: Objectives



- To study the impact of relevant organic agricultural practices on the ability of plants to assimilate trace elements from the soil and to synthesize bioactive secondary metabolites and antioxidant vitamins with health-promoting effects
- - and the possible improved bioactivity and health in humans and animal models from complete diets

Soil-/plant content & bioavailability and health



- *) Carrot
Onion
White cabbage
- ***) Barley
Wheat
Rapeseed
Potatoe
Bean

2007

2008

Locations

*) 1

**) 3

Diet 1

Diet 2

Diet 9

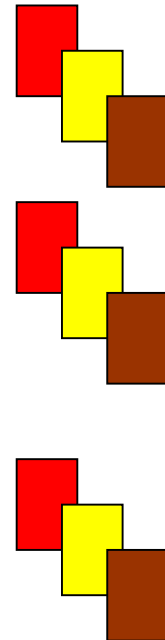
Humans/rats

N =

N =

N =

Human
Blod, Urin
Faeces



Health evaluation of rats

Fingerprints



Minerals in Soil

- Climate
- Fertilization
- Rotation

Bioactive metabolites in plants

- Polyphenols
- Carotenoids
- Vitamins
- Elements, other micronutrients

Health-potential effects?

Complete diets

- Immunity
- Bioavailability
- Antioxidant status
- Nutritional status

Effect on health?





Crop rotations in OrgTrace

Diet	Agricultural system	Cropsys	VegCure	Notes
1	Organic A	04; -CC/+M	01; slurry	Slurry application
2	Organic B	04; +CC/-M	02; green manure	Green manure and catch crops
3	Conv. With NPK fertilizer and pesticide application	C4; -CC/+M	C1; NPK	Inorganic Fertilizers

OrgTrace-overall



- WP1: Classification of soil and multielemental data from plant samples
- WP2-3: Bioactive secondary metabolites, vitamins, identification/bioavailability of S and Se, and Fe and Zn species in crops
- WP4: Development of immune function, health, antioxidant and nutritional status, physical activity of complete diets using a rat model
- WP5: Bioavailability of micronutrients and bioactive metabolites of complete diets in humans

The CORE organic project



- Thematic area: Food Quality
- Raw and processed food
- Focused on the analysis of carrot and baby food based on carrot, may be wheat
- Design and application of a QACCP (quality analysis of critical control points)
- Partners: Germany, Switzerland and others (France, Italy, Austria, Netherlands Denmark, Finland)

Brief overview of listed topics in the CORE organic



- Organic quality – identification and definition of critical and essential parameters useful to optimise organic food quality
- Nutritional benefits and safety of organic food
- Impact of the food chain on product quality

Contribution to the CORE organic project



- Many analyses have been done on the composition of the crops and the health-promoting potentials – however, little emphasis has been given on the actual health responses
- Definition of what we are searching for!
- The strength of the OrgTrace is a well-controlled cultivation-experiment; the source of variation is controlled at each step of the chain. In CORE, many farms are included (characterisation of the cultivation system?)

Benefits from the CORE project



- Processed foods are included
- Good idea with QACCP-princip
- Working with farms/SME (Small- and Medium- sized Enterprises)
- Transnational collaboration
- Further perspectives and development of the OrgTrace project