



Progress Report 2007 and Application for Continuation in 2008

for research funding under the research programme:

Research in Organic Food and Farming
International Research Co-operation and Organic Integrity
(DARCOF III 2005-2010)

Funded by the Ministry of Food, Agriculture and Fisheries
under the Finance and Appropriation Act, Sections 24.33.02.10

1. **Project title and acronym:** Content, Bioavailability and Health Effects of Trace Elements and Bioactive Components of Food Products Cultivated in Organic Agricultural Systems (OrgTrace)

2. **Project journal number** 3304-FOJO-05-45-01

3. **Project period (month, year)**

Start of project: 01-01-2007

End of project: 31-12-2010

4. **Head of project:** Associate Professor, Ph.D. Søren Husted, LIFE, KU

5. **Participating institutes**

KU-LIFE (PSSL): University of Copenhagen, Faculty of Life Sciences, Plant and Soil Science Laboratory, Department of Agricultural Sciences, Thorvaldsensvej 40, DK-1871 Frederiksberg C. +4535333498, Fax: +4535283460, shu@life.ku.dk

KU-LIFE (HumNut): University of Copenhagen, Faculty of Life Sciences, Department of Human Nutrition, Rolighedsvej 30, 1958 Frederiksberg C, Denmark +4535332490, Fax: +4535332483, shb@life.ku.dk

DTU-FOOD (Chem): Technical University of Denmark, The National Food Institute, Mørkhøj Bygade 19, DK-2860 Søborg, Mørkhøj Bygade 19, +45 72 34 7631 Fax: 72 34 7448, ehl@food.dtu.dk

AU-DJF (DAH): Aarhus University, Faculty of Agricultural Sciences, Department of Animal Health, Welfare and Nutrition, Research Centre Foulum, P.O. Box 50, 8830 Tjele.

Charlotte.Lauridsen@agrsci.dk

AU-DJF (GBI): Kristian Kristensen, Senior Scientist, Department of Genetics and Biotechnology, Statistics and Decision Analysis, Danish Institute of Agricultural Sciences, P.O.Box 50, 8830 Tjele. +4589991209; fax: +4589991300 e-mail: Kristian.kristensen@agrsci.dk

6. Project staff

KU-LIFE (PSSL):

Assoc. Prof. Søren Husted: +4535333498, Fax: +4535283460, shu@life.ku.dk
 Ph.D. stud. Kristian Holst Laursen +4535333728, holst@life.ku.dk
 Ph.D stud. Daniel Persson +4535283498, dap@life.ku.dk
 Post Doc. Thomas Hesselhøj Hansen +4535333598, thh@life.ku.dk
 Lab. Techn. Bente Broeng +4535333489, bbr@life.ku.dk
 Res. Ass. Sidsel Birkelund Schmidt

KU-LIFE (HuNut):

Assoc. Prof. Susanne Bugel: +4535332490, Fax: +4533332483, shb@life.ku.dk
 Assistant professor, Alicja Budek: +4535332623, Fax: +4533332483, alzb@life.ku.dk
 Nutritionist, Hanne Jensen: +4535332475, Fax: +4533332483, hje@life.ku.dk
 Kitchen Technician, Berit Hoielt: +4535332478, Fax: +4533332483, bhh@life.ku.dk
 Kitchen technician, Karina G. Rossen: +4535332478, Fax 4533332483, kgr@life.ku.dk
 Lab Technician, Ümmühan Celik: +4535332467, Fax 4533332483, celik@life.ku.dk
 Lab. Technician, NN

DTU-FOOD (Chem1)

Senior Scientist Pia Knuthsen: +4572347432, Fax: 72347448, pk@food.dtu.dk
 Ph. D. Stud. Malene Søltoft +4572347219, masol@food.dtu.dk
 Senior Scientist Jette Jakobsen +4572347415, jja@food.dtu.dk
 Lab. Tech. Kirsten Pinndal +4572347434, kipi@food.dtu.dk

DTU-FOOD (Chem2)

Erik Huusfeldt Larsen: +4572347631, Fax: +4572347448, ehl@food.dtu.dk
 Post Doc. Emese Kápolna +4572347107, emeka@food.dtu.dk
 Senior Scientist Jens J. Sloth +4572347625, jjs@food.dtu.dk
 Lab. Tech. Marianne Hansen +4572347492, mh@food.dtu.dk
 Lab. Tech. Birgitte Koch Herbst +4572347479, bkh@food.dtu.dk

AU-DJF (DAH) :

Charlotte Lauridsen, 4589991238, Fax: 45 89 99 11 66, Charlotte.Lauridsen@agrsci.dk
 Helle Risdahl Juul-Madsen, 4589991515, Fax: 4589991166, Helle.JuulMadsen@agrsci.dk
 Henry Jørgensen, 4589991130, Fax: 4589991166, Henry.Jorgensen@agrsci.dk
 Laboratory Assistant Kathrine Hoirup, 45891123, Fax: 4589991166, Kathrine.Hoirup@agrsci.dk

Laboratory Assistant Inger Marie Jepsen, 45891288, Fax: 4589991166, IngerM.Jepsen@agrsci.dk
 Senior Laboratory Assistant Elsebeth Lyng, 45891116, Fax: 4589991166,
ElsebethL.Pedersen@agrsci.dk
 Laboratory Assistant Mette Würtz, 45891116, fax: +45 89 99 11 66, Würtz@agrsci.dk
 1 Ph.D student, NN

AU-DJF (GBI):

Sen. Scient. Kristian Kristensen, +4589991209; fax: +4589991300 Kristian.kristensen@agrsci.dk
 Scientist, Ulrich Halekoh +4589991825; fax: +4589991300, Ulrich.halekoh@agrsci.dk

AU-DJF (Field stations):

DJF Jyndvad, Flensborgvej 22, St. Jyndevad, 6360 Jyndevad, Henning.Thomsen@agrsci.dk
 DJF Foulumgård, Forskningscenter Foulum, Postboks 50, 8830 Tjele, Erling.Nielsen@agrsci.dk
 DJF Flakkebjerg, Forskningscenter Flakkebjerg, 4200 Slagelse, Eugene.Driessen@agrsci.dk
 DJF Årsløv, Kirstinebjergvej 10, 5792 Årsløv, Jorgen.Villebro@agrsci.dk

7. Midterm description of the project, its results and progress, and application for continuation in 2008

A. Project summary

WP No.	WP title	Responsible scientist	Budget DKK	Start	End	Deliverable No.
1	Multielemental analysis of plant and soil, multivariate data analysis and project coordination	Søren Husted	2301	01-2007	12-2010	D1.1-D1.5
2	Identification of major bioactive plant constituents	Pia Knuthsen	1969	01-2007	12-2009	D2.1-D2.8
3	Sample pre-treatment and analysis of crops	Erik H. Larsen	2380	06-2007	12-2009	D3.1-D3.6
4	Health and immunity elucidated by a rat model	Charlotte Lauridsen	4000	08-2007	12-2010	D4.1-D4.4
5	Human bioavailability	Susanne Bügel	3737	05-2007	12-2010	D5.1-D5.5
Total			14.387			

Objectives and expected achievements

The main objective of OrgTrace is to study the impact of relevant organic agricultural practises on the ability of plants to assimilate trace elements from the soil and to synthesise bioactive secondary metabolites and antioxidant vitamins with health promoting effects. Moreover, the possible improved bioactivity and health in humans and animal models from complete diets will be studied.

The specific main objectives are:

1. To characterise and optimise the content of trace elements and bioactive compounds in crop plants harvested from a well-defined organic cultivation system including realistic combinations of plant species, soil type, crop rotations and fertilizers.

2. To assess the bioavailability of the bioactive compounds in human intervention studies employing prepared diets based on the crops produced within the systems.
3. To characterise how biomarkers for health and well-being are affected by the dietary treatments using a rat-model and to study the development of the immune defence system according to the dietary treatments.

The overall scope of the proposal is to improve the fundamental knowledge of organically grown foods in order to further document their quality in relation to agricultural practice. This will be achieved in the present project by investigating the influence of a variety of rigidly controlled cultivation methods on the content of bioactive compounds of importance in human nutrition as well as for promotion of human health.

The underlying hypothesis is that a careful choice of crop rotation and cultivation practice will allow for an organic crop production system characterised by crops of superior nutritional quality with respect to trace elements, bioactive metabolites and vitamins. Phytate, being a potential counteracting substance will also be analysed. Such an optimised cultivation system will respect and ensure the integrity and efficiency of the organic cultivation practice in all links of the chain from the consumer to the primary production.

Midterm results and progress

The midterm results achieved in OrgTrace from the period 01-2007 to 08-2007 is broken down by the individual WP's and listed below:

WP1 Multielemental analysis of plant and soil (Søren Husted):

From all geographical locations (Årslev, Flakkebjerg, Jyndevad and Foulum) soil and plant samples have been collected at two occasions during the spring 07. The sampling methodology has been optimised to minimize variation. Harvest of cereals and potatoes has been concluded whereas the remaining plant products are expected during the following two months. The sample logistics within the WP's have been detailed and planned.

An ICP-MS based semi-quantitative (Semi-Q) analytical method has been developed which enables simultaneous determination of 60 elements in soil and plant samples. Data from the Semi-Q analysis have been mined with chemometrics and encouraging preliminary data have been obtained, which shows that multivariate techniques are able to discriminate organic and conventional soils from each other despite the heterogeneity induced by the 4 different geographical locations. This indicates that organic agricultural systems might induce a unique multi-elemental fingerprint with major classification power. These findings will during the autumn 2007 be further explored by including harvested plant products. In addition isotope ratio analysis of N and C will be initiated to complete the multi-elemental dataset for 2007. A paper is in preparation with the working title: "An ICP-MS based semi-quantitative analytical method to classify organic and conventional plant products using chemometrics"

WP2 Bioactive plant constituents (Pia Knuthsen):

The development of LC, LC-MS and LC-MSMS methods has been started with the aim of developing and optimizing methods tailored for determination of selected bioactive metabolites in crops. The work is presently focusing on polyphenols in relevant crops. The identification and characterization of unknown bioactive metabolites is ongoing and will continue further when the crops are harvested during autumn 2007.

An ICP-MS analytical method has been developed and validated for quantitative (FullQuant) element determination. For compound identification on the molecular level an ESI-MSMS method has been developed, which enable determination of Se and S containing species in the plant samples growing on the four different geographical locations.

WP3 Analysis of Crops (Erik H. Larsen):

A pilot study has been initiated to define the Se species and its safe concentration used for isotopically labelling of some plant materials that will be further used in the human intervention study. In the frame of this experiment two plants (onion and carrot) have been cultivated in a growth chamber and have been sprayed with different selenium solutions.

Analysis of crops is awaiting harvest and will start during autumn 2007.

WP4 Health and immunity (Charlotte Lauridsen):

The options for pressing the oil from the rape seeds are being considered and pressing are awaiting harvest.

WP5 Human Bioavailability (Susanne Bugel):

The human bioavailability study has been planned in details and an application for the Ethical Committees for Frederiksberg and Copenhagen has been prepared and send.

C.1 Description (summary) of main results and conclusions for each year

2007: The project was started in January 2007 and the time until then has mostly been used to develop and optimize analytical methodologies to be used in OrgTrace (WP1, WP2, WP3). Plants are being harvested from august-november and gradually they will be analysed and used to compose diets – no results are planned and expected until 2008.

According to the research plan the intervention trials in WP4 and WP5 will be undertaken in 2008 and consequently no results should be expected from these WP's until then.

C.2 Fulfilment of deliverables and milestones

(To be completed for each work package)

Deliverables list (from application)

Workpackage 1						
Deliverable No	Deliverable title	Lead scientist	Delivery date	Allocated scientific person months	Type of deliverable	Fulfilled (ok) or deviations (d)*
D1.1	Multi-elemental classification of organic and conventional agricultural systems	SHu	12–2010	12	S	Ongoing
D1.2	Mobilization of Se and S by green manures and catch crops in organic agriculture	SHu	12–2010	6	S	Ongoing (d)
D1.3	“Er der forskel på økologisk og konventionelt dyrkede planter i Danmark” Popular scientific contribution in Danish	SHu	12-2010	0	P	
D1.4	Presentation of primary data at a suitable international congress	SHu	08-2010	0	C	
D1.5	Ph.D thesis - Multi-elemental classification of crops from organic and conventional agricultural systems using inorganic mass spectrometry and multivariate statistics	SHu	12–2010	4	O	Ongoing

* Deviations are to be further discussed in D

Milestones list (from application)

Workpackage 1			
Milestone No	Milestone title	Delivery date	Fulfilled (ok) or deviations (d)*
M1.1	Classification of soil based on data from sequential extraction (year 1)	07-2007	OK
M1.2	Classification of multi-elemental data from plant samples (year 1)	03-2008	Awaiting harvest
M1.3	Classification of soil based on data from sequential extraction (year2)	07-2008	
M1.4	Classification of multi-elemental data from plant samples (year 2)	03-2009	
M1.5	Multivariate data analysis	12-2010	Ongoing

* Deviations are to be further discussed in D

(The nature of the deliverables must be indicated by S = publication in scientific journal with peer review; P = publication in journals without peer review; R = reports; C = presentation at meetings and congresses or O = other types of deliverables, e.g., prototypes, models, websites, etc.).

Deliverables list (from application)

Workpackage 2						
Deliverable No	Deliverable title	Lead scientist	Delivery date	Allocated scientific person moths	Type of deliverable	Fulfilled (ok) or deviations (d)*
D2.1	Presentation of results on identification/characterization of selected unknown bioactive trace elements at international symposium	EHL	02-2008	2	C	
D2.2	Presentation of results on identification/characterization of selected unknown bioactive secondary metabolites at international symposium	PK	12-2008	3	C	
D2.3	Paper on S and Se speciation in crops	EHL	06-2008	8	S	
D2.4	Paper on characterization of selected bioactive metabolites in crop plants	PK	10-2008	9	S	
D2.5	Ph. D thesis on S and Se in crops and diets, and their bioavailability	EHL	12-2009	3	O	
D2.6	Ph. D thesis on bioactive metabolites in crops and diets, and their bioavailability	PK	01-2010	3	O	
D2.7	Identification of key Fe and Zn species in cereal grains grown in different agricultural systems	SHu	12–2010	8	S	Awaiting harvest
D2.8	Ph.D thesis – Speciation and bioavailability of Fe and Zn in the cereal grain (see also D3.6)	SHu	12-2010	4	O	Ongoing

* Deviations are to be further discussed in D

Milestones list (from application)

Workpackage 2			
Milestone No	Milestone title	Delivery date	Fulfilled (ok) or deviations (d)*
M2.1	HPLC and ICP-MS systems optimised for simultaneous determination of Se and S species	09-2007	
M2.2	LC, LC-MS and LC-MS-MS methods tailored for determination of selected bioactive metabolites in crops	12-2007	
M2.3	Selected unknown trace element species characterized or identified	12-2007	
M2.4	Selected unknown bioactive metabolites characterized or identified	01-2008	
M2.5	Key Fe and Zn species identified	01-2008	Awaiting harvest

* Deviations are to be further discussed in D

Workpackage 3						
Deliverable No	Deliverable title	Lead scientist	Delivery date	Allocated scientific person moths	Type of deliverable	Fulfilled (ok) or deviations (d)*
D3.1	Paper on ⁷⁴ Se enrichment of crop plants via foliar application	EHL	04-2009	7	S	
D3.2	Paper on composition of bioactive metabolites and vitamins in organic and conventional crops	PK	07-2009	11	S	
D3.3	Presentation of results on D3.2 at international conference	PK	08-2009	3	C	
D3.4	Paper on results for Se and S species in con-	EHL	12-2009	12	S	

	ventional and organic crops					
D3.5	Speciation of Fe and Zn in cereal grains grown in different agricultural systems	SHu	12–2010	8	S	Awaiting harvest
D3.6	Ph.D thesis – Speciation and bioavailability of Fe and Zn in the cereal grain (se also D2.8)	SHu	12-2010	7	O	Ongoing

** Deviations are to be further discussed in D*

Milestones list (from application)

Workpackage 3					
Milestone No	Milestone title			Delivery date	Fulfilled (ok) or deviations (d)*
M3.1	Crops 2007 analysed for S and Se molecular species			04-2008	
M3.2	Crops 2007 analysed for selected bioactive metabolites and vitamins			04-2008	
M3.3	Speciation analysis of Fe and Zn in cereal grains (year 1)			08-2008	Awaiting harvest
M3.4	Crops 2008 analysed for S and Se molecular species			04-2009	
M3.5	Crops 2008 analysed for selected bioactive metabolites and vitamins			04-2009	
M3.6	Speciation analysis of Fe and Zn in cereal grains (year 2)			08-2009	

Workpackage 4						
Deliverable No	Deliverable title	Lead scientist	Delivery date	Allocated scientific person moths	Type of deliverable	Fulfilled (ok) or deviations (d)*
D4.1	Differences among cultivation systems with respect to the development of the immune function	CLA	12-2010	18	S	
D4.2.	The effect of cultivation systems with respect to health, antioxidant and nutritional status, and physical activity	CLA	12-2010	18	S	
D4.3.	Preference test between diets of different cultivation systems	CLA	12-2010	10	S	
D4.4	Ph.D. –thesis with the suggested title: “Influence of organic food on health using the rat as a model for humans”	CLA	10-2010	4	O	

** Deviations are to be further discussed in D*

Milestones list (from application)

Workpackage 4					
Milestone No	Milestone title			Delivery date	Fulfilled (ok) or deviations (d)*
M4.1	Complete diets of ingredients from Cropsys of cultivation year 1 are prepared			01-2008	
M4.2	Analytical methods regarding the development of the immune function of rats are available			02-2008	
M4.3	Rat experiments including chemical analyses of cultivation year 1 is performed			01-2008	
M4.4	Complete diets of ingredients from Cropsys of cultivation year 2 are prepared			01-2009	
M4.5	Rat experiments including chemical analyses of cultivation year 2 are performed			01-2010	
M4.6	Overall data-analyses are performed			07-2010	

Workpackage 5						
Deliverable	Deliverable title	Lead scientist	Delivery date	Allocated scientific	Type of deliver-	Fulfilled (ok) or

No		tist		person moths	able	deviations (d)*
D5.1	Presentation of results at international conference	SHB	12-2010	0	C	
D5.2	Draft Scientific publication "Bioavailability of micronutrients from different organic production systems in humans"	SHB	12-2010	14	S	
D5.3	Draft Scientific publication "Bioavailability of bioactive metabolites from different organic production systems in humans"	SHB	12-2010	14	S	
D5.4	Draft Scientific publication: Interaction between micronutrients and bioactive metabolites from different production systems in humans	SHB	12-2010	14	S	
D5.5	Ph.D thesis	SHB	12-2010	4	O	D

* Deviations are to be further discussed in D

Milestones list (from application)

Workpackage 5			
Milestone No	Milestone title	Delivery date	Fulfilled (ok) or devia- tions (d)*
M5.1	Ethical approval obtained	05-2007	D
M5.2	Production of diets for the intervention study, year 1, including the stable isotope labelled diet	10-2007	
M5.3	Recruitment of study population for the 1.year intervention study	10-2007	
M5.4	Complete diets for human and rats of 2007 analysed for Fe, Zn, Se and S	02-2008	
M5.5	Complete diets for human and rats of 2007 analysed for bioactive metabolites and vitamins	04-2008	
M5.6	Diet (2007) analysed for phytates	05-2008	
M5.7	Completion of dietary intervention study year 1	06-2008	
M5.8	Collection and distribution of human samples from 1.year intervention study	09-2008	
M5.9	Analyses of human samples from 1.year intervention study	02-2009	
M5.10	Production of diets for the intervention study, year 2	10-2008	
M5.11	Recruitment of study population for the 2.year intervention study	10-2008	
M5.12	Urine, plasma and faeces (2007 harvest) analysed for Fe, Zn and Se and enriched stable isotopes	02-2009	
M5.13	Urine and plasma (2007 harvest) analysed for bioactive metabolites and vitamins	02-2009	
M5.14	Complete diets for human and rats of 2008 analysed for Fe, Zn, Se and S	02-2009	
M5.15	Complete diets for human and rats of 2008 analysed for bioactive metabolites and vitamins	04-2009	
M5.16	Diet (2008) analysed for phytates	05-2009	
M5.17	Dietary intervention study year 2 completed, J	06-2009	
M5.18	Collection and distribution of human samples from 2.year intervention study,	09-2009	
M5.19	Analyses of human samples from 2.year intervention study	02-2010	
M5.20	Estimation of absorption of trace elements	06-2010	
M5.21	Urine, plasma and faeces (2008 harvest) analysed for Fe, Zn and Se and enriched stable isotopes	02-2010	
M5.22	Urine and plasma (2008 harvest) analysed for bioactive metabolites and vitamins	02-2010	
M5.23	Estimation of absorption of bioactive metabolites	06-2010	
M5.24	Multivariate data analysis of data	12-2010	

D. Description of deviations and subsequent adjustments of plans

WP1,D1.2: Corporation with Kristian Thorup-Kristensen (coordinator of VeqCure) has been initiated in order to further strengthen the scientific aspects of crop rotation on mobilization of micronutrients with potentially interesting human health effects. Results from the first growing season 2007-08 are expected to be available in the spring 2008.

In the budgets from the CropSys field stations (Jyndvad, Foulumgaard, Flakkebjerg), the CropSys coordinator Jørgen E. Olesen have recently stated that OrgTrace is expected to cover sorting and storage costs, which apparently were not included in the current budgets for these field stations. This extra cost was unexpected to the members of OrgTrace who believed that all costs were included to provide market quality products. In order to solve this issue of misunderstanding, it has been agreed that a joint application will be send to the FØJOIII board in order to have these unaccounted costs covered. Jørgen E. Olsen has agreed to initiate and submit this application and Søren Husted has agreed to co-sign it. No further action has been taken to this date.

WP2, D2.5: A Post Doc. has been employed instead of a PhD student.

WP2, D2.6: PhD project was started on February 2007 (originally planned January 2007) – due to delay of grant.

WP5, D5.1: Application for the ethical approval has been sent in the first week of September and acceptance of the ethical approval is awaited within 4-6 weeks from the date of submission.

WP5, D5.5: Ph.D thesis. This deliverable has been changed as we have decided to apply for a post.doc/ assistant professor instead of a Ph.d student. It is expected that post.doc Alicja Budek will be appointed assistant professor and will be the daily responsible for the project.

Project publications and other products

1. Products from Organic Eprints archive

2. Other products (oral presentations, public meetings, field days, etc.)

SHu and KHL (KU-LIFE) participated in steering meetings organised by “sister projects” VeqCure (Odense Kongres Center Jan 30, 2007) and CropSys (Sandbjerg Gods, Feb. 28, 2007). At these meetings oral presentations were given by SHu.

Scientific education

Nordtest Workshop on Uncertainty in Sampling. 12-13 April, 2007, Hillerød (Søren Husted, Kristian Holst Laursen)

PhD kursus: Representative sampling of solids-characterization and analysis, 27-31 august 2007, DTU (Kristian Holst Laursen)

PhD-course in mass spectrometry at University of Southern Denmark passed by Malene Søltøft.

G. National and international cooperation

Critical reflection on the project

8. Budget

A. Account for any change in budgets

The OrgTrace project was initiated in January 2007 and most personnel have been recruited for the individual WP's by now. However, in one WP contract with the scientific personnel have not been signed yet (postponed to 2008) and in other cases they have been delayed for some months relative to the original proposal and budgets herein. Specific details about these deviations are commented below each budget. It should be noted that the deviations in all cases are of minor importance and that the overall grant budget is not changed and also the overall co-financing budget has only been adjusted insignificantly.

B. Total budget for the whole project (1.000 DKK)

Total consumption of funds from DARCOF and expected consumption this year and coming years

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months							
Scientific personnel	58		47	72	59	18	196
Technical personnel	10		6	34	27	2	69

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel	1810		1568	2452	1970	688	6678
Technical personnel	274		169	925	643	58	1795
Other operational costs	757		757	1231	846	174	3008
Equipment	0		0	2	0	0	2
Others (please specify)	229		227	180	53	47	507
Direct costs	3069		2720	4791	3512	967	11989
Indirect costs (20% of direct costs)	614		544	958	702	193	2398
Total	3683		3263	5749	4214	1160	14387

9. Signatures and stamps

Name	Institute	Date	Signature
Head of project Søren Husted, Ph.D, Assoc. Professor	KU-LIFE-PSSL	23/9-2007	

Appendix I. Detailed budget

A. Budget for each participating institute (1.000 DKr)

Name of Institute and department: **KU-LIFE (PSSL)**

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months							
Scientific personnel	16		16	16	16	4	52
Technical personnel							

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel	497		497	510	523	157	1687
Technical personnel							
Other operational costs	349		349	293	116	56	814
Equipment							
Others (please specify)	42		42	43	51	47	183
Direct costs	888		888	846	690	260	2684
Indirect costs (20% of direct costs)	178		178	169	138	52	537
Total	1066		1066	1015	828	312	3221

Comments:

Name of Institute and department: **DTU-Food (Chem1)**

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months							
Scientific personnel	13		12	13	13	1	39
Technical personnel	2		2	4	3		9

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries			426	527	510	31	1494
Scientific personnel	399		368	409	419	31	1227
Technical personnel	58		58	118	91		267
Other operational costs	139		139	126	106	28	399
Equipment							
Others (please specify)							
Direct costs	596		565	653	616	59	1893
Indirect costs (20% of direct costs)	119		113	131	123	12	379
Total	715		678	784	739	71	2272

Comments:

One scientific man-month has been moved from 2007 to 2010.

Name of Institute and department: **DTU-FOOD (CHEM2)**

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months							
Scientific personnel	13		10	12.3	12	2.8	37.1
Technical personnel	2		2	1.2	1	1.9	6.1

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel	399*		349*	424	370	139	1282
Technical personnel	58		58	35	29	58	180
Other operational costs	124		124	103	106	37	370
Equipment	0		0	0	0	0	0
Others (please specify)	0		0	0	0	0	0
Direct costs	581		531	562	505	234	1832
Indirect costs (20% of direct costs)	116		116	102	101	47	366
Total	697		647	664	606	281	2198

Comments:

A Post Doc. has been employed instead of a PhD student who started in the middle of April. The residual funding has been transferred to 2008.

Name of Institute and department: **IHE-LIFE-KU (HumNut)**

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months	10						
Scientific personnel	6		5	10	2		
Technical personnel	4		0	20	9		

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel	154		195	390	78		663
Technical personnel	104,8		0	528,3	243		771,3
Other operational costs	57		57	247,7	69	25	398,7
Equipment							
Others (please specify)							
Direct costs	315,8		252	1166	390	25	1833
Indirect costs (20% of direct costs)	63,16		50,4	233,2	78	5	366,6
Total	379		302	1399	468	30	2199

Comments:

Originally it was planned that a phd student should be appointed to the study, but it has been decided that a more experienced researcher was needed. However, assistant professors are more expensive and therefore we have changed the numbers of man months according to the available resources.

Name of Institute and department: **AU-DJF (DAH)**

Year:	Original budget	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months							
Scientific personnel	9	-	4	20	15	10	49
Technical personnel	2	-	2	9	10	0	21

Year:	Original budget	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel	301	-	159	659	518	361	1.696
Technical personnel	53	-	53	244	280	0	577
Other operational costs	88	-	88	464	449	28	1.029
Equipment	-	-	-	-	-	-	-
Others (please specify)	-	-	-	-	-	-	-
Direct costs	442	-	299	1.367	1.247	389	3.302
Indirect costs (20% of direct costs)	88	-	60	273	249	78	660
Total	530	-	359	1.641	1.496	466	3.963

Comments:

One of the participants in WP 4 has been on maternity leave in 2007, and the employment of the ph.d.-student has been postponed to 2008. Therefore 5 scientific months (2007) are transferred to 2008.

Name of Institute and department: **AU-DJF-GBI**

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months							
Scientific personnel	0			1,14	1,14		2,28
Technical personnel	0						

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel				59,8	62,2		
Technical personnel							
Other operational costs				1,5	1,5		
Equipment							
Others (please specify)							
Direct costs				61,3	63,7		
Indirect costs (20% of direct costs)				12,3	12,7		
Total	0		0	73,6	76,4		150

Comments:

Name of Institute and department: **AU-DJF-Jynde vad**

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months							
Scientific personnel							
Technical personnel							

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel							
Technical personnel							
Other operational costs							
Equipment							
Others (please specify)	54,375		54,375	37,700			
Direct costs	54,375		54,375	37,700			
Indirect costs (20% of direct costs)	10,875		10,875	7,540			
Total	65,250		65,250	45,240			110,490

Comments:

Name of Institute and department: **AU-DJF-Foulumgård**

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months							
Scientific personnel							
Technical personnel							

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel							
Technical personnel							
Other operational costs							
Equipment							
Others (please specify)	54,375		54,375	37,700			
Direct costs	54,375		54,375	37,700			
Indirect costs (20% of direct costs)	10,875		10,875	7,540			
Total	65,250		65,250	45,240			110,490

Comments:

Name of Institute and department: **AU-DJF-Flakkebjerg**

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months							
Scientific personnel							
Technical personnel							

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel							
Technical personnel							
Other operational costs							
Equipment							
Others (please specify)	54,375		54,375	37,700			
Direct costs	54,375		54,375	37,700			
Indirect costs (20% of direct costs)	10,875		10,875	7,540			
Total	65,250		65,250	45,240			110,490

Comments:

Name of Institute and department: **AU-DJF-Årslev**

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months							
Scientific personnel							
Technical personnel							

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel							
Technical personnel							
Other operational costs	21,916		21,916	22,750			
Equipment							
Others (please specify)							
Direct costs	21,916		21,916	22,750			
Indirect costs (20% of direct costs)	4,384		4,384	4,550			
Total	26,300		26,300	27,300			53,600

Comments:

Co-financing by institutions:**Total-contribution all participants**

Year:	Original budget	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months							
Scientific personnel	18		12	9	14	15	50
Technical personnel	9		7	5	6	6	24

Year:	Original budget	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel	804		457	433	565	662	2117
Technical personnel	262		201	145	148	152	646
Other operational costs	105		59	193	189	51	492
Equipment							
Others (please specify)							
Direct costs	1171		717	771	902	865	3255
Indirect costs (20% of direct costs)	234		143	154	199	192	689
Total	1405		860	925	1101	1057	3944

Name of Institute and department: IHE-LIFE-KU (HumNut)

Year:	Original budget	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months	2		4	2	1	1	
Scientific personnel	2		2	1	1	1	
Technical personnel			2	1			

Year:	Original budget	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel	90		90	45	45	45	225
Technical personnel	60		60	30			90
Other operational costs	30		30	50	40	11	131
Equipment							
Others (please specify)							
Direct costs	180		180	125	85	56	446
Indirect costs (20% of direct costs)	36		36	25	17	11	89,2
Total	216		216	150	102	67	535

Comments:

Co-financingName of Institute and department: **DTU-Food (Chem1)**

Year:	Original budget	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months	10		2	2	3	3	10
Scientific personnel	8		2	2	2	2	8
Technical personnel	2				1	1	2

Year:	Original budget	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries	450		94	96	128	132	450
Scientific personnel	389		94	96	98	101	389
Technical personnel	61				30	31	61
Other operational costs	46		10	10	13	13	46
Equipment							
Others (please specify)							
Direct costs	496		104	106	141	145	496
Indirect costs (20% of direct costs)	99		21	21	28	29	99
Total	595		125	127	169	174	595

Comments:

Co-financingName of Institute and department: **DTU-FOOD (CHEM2)**

Year:	Original budget	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months							
Scientific personnel	2		2	2	3	2	9
Technical personnel	1		1	0	0	0	1

Year:	Original budget	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel	109		109	125	142	117	493
Technical personnel	29		29	0	0	0	29
Other operational costs	14		14	13	15	12	54
Equipment	0		0	0	0	0	0
Others (please specify)	0		0	0	0	0	0
Direct costs	152		152	138	157	129	576
Indirect costs (20% of direct costs)	31		31	28	32	26	116
Total	183		183	166	189	155	692

Comments:

Co-financingName of Institute and department: **KU-LIFE-PSSL**

Year:	Original budget	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months							
Scientific personnel	4		4	4	4	4	16
Technical personnel	4		4	4	4	4	16

Year:	Original budget	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel	164		164	167	171	174	676
Technical personnel	112		112	115	118	121	466
Other operational costs							
Equipment							
Others (please specify)							
Direct costs	276		276	282	289	295	1142
Indirect costs (20% of direct costs)	55		55	56	58	59	228
Total	331		331	338	347	354	1370

Comments:

Co-financingName of Institute and department: **AU-DJF-DAH**

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months	2	-	0	0	4	8	12
Scientific personnel	2	-	0	0	4	8	12
Technical personnel	0	-	0	0	0	0	0

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel	52	-	0	0	109	225	334
Technical personnel		-					
Other operational costs	15	-	5	120	121	15	260
Equipment		-					
Others (please specify)		-					
Direct costs	67	-	5	120	230	240	594
Indirect costs (20% of direct costs)	13	-	1	24	46	48	119
Total	80	-	6	143	276	288	713

Comments:

The employment of a ph.d.-student is postponed to 2008. The co-financing of the ph.d.-grant will be initiated in 2009.

Co-financing

Name of Institute and department: AU-DJF-GBI

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Man-months							
Scientific personnel							
Technical personnel							

Year:	Original budget 2007	Consumption 2005/2006	Expected consumption 2007	2008	2009	2010	Total
Salaries							
Scientific personnel							
Technical personnel							
Other operational costs							
Equipment							
Others (please specify)							
Direct costs							
Indirect costs (20% of direct costs)				18,4	19,1		
Total				18,4	19,1		