



Progress Report 2008 and Application for Continuation in 2009

for research funding under the research programme:

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

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1. Project title and acronym:

Quality and Integrity of Organic Eggs, Chicken Meat and Pork (QEMP)

2. Project journal number:

3304-FOJO-05-36-01

3. Project period (month, year):

Start of project: 1/1-2007

End of project: 31/12-2009

4. Head of project:

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

A. Project summary

Table A.1: Work package list (from application)

WP No.	WP title	Responsible scientist	Budget DKK	Start	End	Deliverable No.
1	Coordination and stakeholder contact	Anne Grete Kongsted	200.000	01.01.07	31.12.09	D1.1-D1.2
2	Improvement of organic eggs	Marianne Hammershøj	3.050.000	01.01.07	31.12.09	D2.1-D2.11
3	Integrated chicken meat and apple production	Klaus Horsted	2.692.708	01.01.07	31.12.09	D3.1-D3.9
4	Strategies for a diversified organic pork production	Anne Grete Kongsted	3.107.900	01.01.07	31.12.09	D4.1-D4.11
5	Effect of FRF on intestinal pathogens in post-weaned pigs	Allan Roepstorff	1.521.656	01.01.07	31.12.08	D5.1-D5.4
6	Meat quality and food safety in organic production systems utilising FRF	Laurits Lydehøj Hansen	1.449.847	01.01.07	01.07.08	D6.1-D6.5
Total			12.022.111			

B. Objectives and expected achievements

The overall objective is to establish new methods of production of organic eggs, chicken meat and pork which support the health of the animals and which can form the basis for new high quality products differing in characteristics from conventional products. The specific objectives are to investigate:

- which feeding stuff and feeding strategies that may be used in order to obtain specific quality characteristics in eggs and pork as well as covering the nutritional needs of the livestock in a situation with 100% organic feed,
- how integrated chicken meat and fruit productions can be established with the aim to lower the risks of pests in apple plantations,
- which strategies for slaughtering age of pigs and chickens of different genotypes that can be introduced in order to obtain new high quality products as basis for convenience food,
- how an improved health of the intestine in piglets can be supported under free range condition through use of fructan rich feedstuffs and how this can influence the occurrence of parasite and zoonotic infections and post-weaning diarrhoea caused by *E. coli* and *L. intracellularis*,
- how final feeding – 1 and 2 weeks before slaughter - with fructan rich feedstuffs (dried chicory and lupine) decrease boar taint and improve sensory eating quality of both female and entire male pigs and influences *Campylobacter* populations.

These activities are expected to give the basis for proposing new production strategies for organic pig and poultry, which at the same time comply with the organic ideals of integrated production strategies and the consumers' expectations and demands to organic products.

C. Midterm results and progress

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

Regarding WP's 1-4. This is the second year of the project starting 1/1 2007, and so the main actions here have been a successful continuation of the experimental activities implemented in 2007.

WP1. Coordination and stakeholder contact

In June 2008 a project/stakeholder meeting was held. The project group and four members from the established stakeholder group participated. Status, plans and preliminary results were presented for each WP. The stakeholder group contributed with recommendations for the respective WP's and gave an update on latest news within organic production systems as well as in the consumption of organic egg and meat products.

In 2008 it has been necessary to make some changes in the project management of QEMP. John E. Hermansen had to take over the project management of another ICROFS project, GlobalOrg, why Anne Grete Kongsted (responsible for WP4) took over the project management of QEMP and Klaus Horsted (participant in WP3) became responsible for WP3. John E. Hermansen is still a member of the project staff. These changes occurred in September 2008 and have been approved by ICROFS.

WP2. Improvement of organic eggs

In 2008, the WP2 started with rearing of two hen lines; Lohmann Silver (LS) and New Hampshire (NH), which were randomised into the experimental facilities for organic egg production at "Skovvang". These facilities are designed to fulfil the requirements given by the national regulations for organic egg production.

The main experiment was designed to include two hen lines (LS, NH), three feeds (A = organic with imported ingredients, B = organic with nationally grown ingredients, and C = like B but with lower protein and methionine content), and two roughages (Alfalfa silage, and corn silage + carrots). In total 12 treatments in 4 replicates giving 48 houses of each 25 hens i.e. in total 1200 hens.

The experiment started at 1st April 2008 and will end in mid September 2008. During the experimental period recordings of egg production (number and weight of eggs), forage consumption, feed consumption, plumage score, frequency of floor eggs and cracked eggs, mortality and hen body weight is recorded. Feed samples have been collected for analysis throughout the period. In order to evaluate the nutritional value of the experimental diets a digestibility/balance experiment will be performed at the end of the main experiment as planned. Two hens from each replicate per treatment will be moved to special designed battery cages for collection of excreta, which will be analysed for the same nutrients as in the feed. In total 9 times 144 eggs have been collected for individual analysis of egg quality parameters, which includes shell strength, yolk colour, yolk composition of carotenoids, egg albumen dry matter and pH, heat treatment of egg albumen to form gels for textural analysis. Eggs have been collected twice during the main experiment for analysis of volatile aroma compounds analysed by GCMS, where in the first sampling a total of 18 compounds were found by GC. Further identification by MS will be done together with statistical analysis of the effect of the treatment parameters. Parallel to the aroma component analysis, sensory

evaluation by training a sensory panel followed by analysing the eggs resulted in scoring for 21 different descriptors of flavour, colour, texture and taste. All the data are collected, and detailed statistical analysis will be done in 2009. The analysis of carotenoid composition was planned to start in 2008 but will be postponed to the beginning of 2009, because the lab. technician that was going to perform the analysis has resigned.

From the beginning of October 2008 some of the hens from the main experiment will be distributed into sub-experiments. Three sub-experiments was planned according to the project description and two of these experiments; choice feeding including 12 houses and feeding with herbs (basil and thyme) and green cabbage including 15 houses will be carried out in the fall 2008. During the experiment recordings of feed intake and egg production will be made, and eggs will be analysed for the parameters described in the main-experiment.

An opportunity to perform the third sub-experiment with usage of coloured carrots as forage occurred earlier and was conducted with 112 Hy-Line hens distributed into 4 treatments of 4 replicates of control (no carrots), yellow, orange, and purple carrot varieties, respectively. Briefly, the conclusions hereof were that the total concentration of carotenoids in the egg yolk is increased by 25-75% compared with eggs from hens without carrots. Especially the content of lutein increases by up to 50% and β -carotene showed a 100-fold increase. The purple carrot variety had the highest concentration of lutein and β -carotene and had the significantly highest impact on the carotenoid composition of the egg yolk. The yolk colour was significantly affected by the carotenoid content and in particular the red hue and the yellow hue correlated to the composition of yolk carotenoids. The feed intake was significantly reduced for hens receiving carrots compared with the control, and the egg weight and yolk weights were for all carrot-receiving groups lower than for the control groups, whereas the yolk-% was unaffected. By supplementing the forage in organic egg production with especially the yellow and the purple carrot varieties can fortify the nutritional value of the eggs produced. A manuscript of the results of this sub-experiment has been submitted for publication in British Poultry Science.

The planned activities have been followed and no significant delays or changes besides the postponed analysis of carotenoids from the main-experiment have occurred so far.

WP3. Integrated chicken meat and apple production

The activities in 2008 have included interpretation of the experiment carried out in 2007 including two different broiler genotypes (JA757 and New Hampshire) and to different broiler diets where the main ingredients were maize or wheat (Feed A and Feed B). Further a new experiment has been carried out in 2008.

The results on the sensory assessment of the breast meat showed a very different sensory profile of the two breeds. JA757 obtained higher scores for some smell and flavour attributes, whereas New Hampshire had better scores in most of the texture attributes such as tenderness and juiciness. It was notable that the meat became more tender and juicy at 110 days of age in the New Hampshire, whereas the opposite development was found in JA757. Further, an interaction with feed type was found. Thus, the attributes 'hardness' flavour of 'neck of pork' and 'umami' were negatively affected when JA757 was fed 'Feed B', but positively affected when the New Hampshire breed was fed this feed. In general higher age of slaughter had a negative effect on some flavour and smell attributes for both genotypes.

Besides sensory assessment of the breast meat, some measurements on meat quality have been made on the drumsticks. Meat from the drumsticks was evaluated in relation to colour

(lightness, redness and yellowness), toughness (Warner-Bratzler), and water holding capacity and cooking loss. Significant effects were found in relation to breed and age, whereas feed type had no significant effect on meat quality. The drumsticks from the New Hampshire breed were found to be significantly lighter, less red, but more yellow than the meat from JA757. Further the New Hampshire drumsticks were found to be tougher, but with significant less cooking loss. In relation to age the meat from the drumsticks were found to be significantly more red, but less yellow at 110 days of age compared with 82 days of age. Further meat was tougher and with more cooking loss at 110 days of age.

The results on growth in 2007 show that JA757 had a very fast growth and a very low activity level in the apple plantation, whereas New Hampshire had a high activity level, but produced to little meat. Therefore other genotypes, with expected growth rates between these genotypes, were chosen for the experiment in 2008. As 'genotype' was the most significant factor affecting the sensory attributes and the meat quality in 2007, it was decided to include three genotypes for the experiment in 2008. The genotypes chosen were 'Kosmos 8 red' from the breeding company 'Pureline Genetics', 'I657' from the 'Hubbard Breeders' company and an experimental line of the pure breed 'White Bresse' from Research Centre Foulum. Since the same experimental facilities was used in 2008 only the 'I657' hybrid was divided into two different feeding strategies, i.e. half were fed a commercial produced broiler diet, and the other half were given free choice between this broiler diet and whole wheat. Three replications were used.

The experiment 2008 has just finished and the broilers were slaughtered at same ages as in 2007. The carcasses have been transferred to the sensory laboratory at the University of Copenhagen and sensory assessment will take place during January and February 2009. For this assessment it has been decided to include a commercial produced non-organic broiler delivered by poultry dressing station 'Rose Poultry'.

Regarding the effects in the plantation, the tree growth has been measured as stem diameter, the trees have been evaluated for infections of Fruit tree canker, the density of sawflies was monitored weekly in May leaf samples have been taken and apples cultivar 'Discovery' have been harvested and the quality have been assessed. The cultivar Topaz is being harvested in week 39 and the fruit quality is assessed in October 2008. The catch of apple saw fly did not show any differences between the treatments in 2007 and 2008. The total growth for 2007 did not show any differences between the treatments in 2007. However; the content of nitrogen in the leaf samples for 2007 showed a higher content of nitrogen in the trees grown in chicken runs.

The yield of the cultivar 'Topaz' was higher for trees grown in chicken runs and the fruit size was smaller and the fruit surface more green in 2007. No differences occurred between the treatments for the cultivar 'Discovery'. No differences occurred for any of the cultivars concerning internal quality determined as fruit firmness and sugar content in 2007. Data for leaf samples, yield, fruit quality and growth for 2008 still have to be calculated.

WP4. Strategies for a diversified organic pork production

In WP 4, the first part of the experiment with three different breed combinations and three different slaughter weights ended ultimo 2007. The results have been analysed and presented at international conferences in 2008. Preliminary results showed a significantly slower growth rate (e.g. 37% for female pigs) and a significant higher level of back fat (e.g. 30 % for female pigs) for the traditional pure breed, Danish Black-Spotted, compared to the modern breed

combination of Landrace, Yorkshire and Duroc. In opposite, there were no large differences in performances between this modern breed combination and the crossbreed between the traditional breed and Duroc. The meat quality assessments showed that the traditional breed had significantly redder and darker meat. This is generally considered as positive characteristics with regards to meat quality. A sensory panel further described the fat from the traditional breed as having a nuttier and sweeter taste compared to the modern genotype. Regarding the small entire male pigs, the preliminary results indicate that pure black spotted entire male pigs have a higher content of skatole in the backfat and that it causes more intense piggy odour and flavour and maybe boar odour.

In 2008, the replicate of the experiment has been established with some small adjustments. This year we have chosen to focus further on feed consumption and feed conversion. As feed assessments are difficult to perform accurately on a private farm, we established the experiment at the organic research station of Aarhus University, Rugballegård. This increased the experimental costs per sow, why two breed combinations are compared instead of the original planned three. Twelve sows (six Black-Spotted and six Landrace crossed with Yorkshire) farrowed outdoors in May 2008 in individual paddocks. The pigs were weaned in July. Twelve first parity sows and 17 entire male pigs were slaughtered in August. Samples from these animals have been transferred to DMRI for meat quality assessment. Meat colour and sensory profile of cuttings from the neck and the ham will be performed. The female pigs stay litterwise in the paddocks until they are slaughtered in November. Preliminary results indicate large breed effects on feed consumption, and as last year, on growth performance.

WP5. Effect of FRF on intestinal pathogens in post-weaned pigs

In 2006, the pasture experiment with FRF feeding of sows and piglets was carried out and the samples were prepared and stored as planned. The parasitological samples were analysed in 2007 and the statistics have been finished in 2008. The results show that parasitized piglets tended to have a lower weight gain until weaning, when compared to the non-infected piglets ($p=0.059$). Post-weaning diarrhoea (soft faeces) was most pronounced in groups infected with parasites, but overall no severe outbreak of diarrhoea was observed. No helminth eggs were found in faecal samples at any time, and practically no large worms were found in the piglets at slaughter, indicating that both experimental groups had eliminated the large worms before slaughter. The number of migrating *Ascaris* larvae was significantly reduced when the piglets had got chicory. *Trichuris* was, in contrast, significantly more numerous in the chicory group compared to control group. The positive effect on *Ascaris* fits with observations in experimentally infected pigs, while the latter observation on *Trichuris* is unexpected and does not fit with previous results. Overall, the worm numbers were generally low, which may reflect an unexpectedly high level of immune responsiveness (unexpected, when compared to previous observations in outdoor piglets).

Regarding the effect of FRF on post weaning diarrhoea, culturing and typing of *E. coli* from faecal samples were finished in 2007. No *E. coli* were isolated from any of the weaned pigs, despite all pigs were inoculated daily. Additionally a Real-Time PCR which is specific in detecting the infectious *E. coli* type was run on samples from the small intestine and this very sensitive detection technique verified the results from the plating. On one hand, this result is very interesting as it indicates that the outdoor environment and/or the late weaning age may reduce the risk of having *E. coli* weaning diarrhoea. On the other hand, this promising result made it impossible to test the effect of FRF on post weaning diarrhoea caused by *E. coli*.

The *Campylobacter* spp. excretion level in faeces has been estimated for the piglets at 4, 7

and 9 weeks of age and the statistics have been conducted in 2008. The results showed that the *Campylobacter* excretion level decreased significantly in pigs that had been fed with chicory for two weeks (from 5 to 7 weeks of age) compared to a control diet ($p < 0.001$). At 9 weeks of age, the *Campylobacter* excretion level had returned to the level prior to inclusion of chicory in the diet. Thus it seems that the reducing effect of FRF on *Campylobacter* spp. is transitory. Interestingly, the presence of parasites was significantly associated with a higher excretion of *Campylobacter* spp. ($p = 0.015$).

DNA has been extracted for the microbial community analyses of the ileum contents. The Terminal restriction fragment analysis (T-RFLP) has been conducted in 2008 (delayed because of implementation of a new instrument). The results demonstrate that both chicory and parasites have highly significant effects on several bacterial groups, but we are still in the progress to do the final analysis. Real-Time PCR was used instead of in situ hybridization to evaluate the infective potential of the *E. coli* isolate and to test for the amount of *Bifidobacteria* in the small intestine (M5). The total number of bacteria in the small intestine of the sampled pigs showed that the amount of bacteria was not significantly different in distal ileum between the different groups, but that there was a clear bifidogenic effect of feeding the chicory ($p = 0.0012$) and that pigs with parasites tend to have more bifidobacteria than pigs without but this result was not significant ($p = 0.09$).

WP6. Meat quality and food safety in organic production systems utilising FRF

The practical part of the experiment was completed ultimo 2006 according to the research plan. The *Campylobacter* spp. level in faeces (rectal, ileum, caecum, and colon) was estimated after 1 or 2 weeks of feeding with the control, lupine or chicory diet. In general, *Campylobacter* could be found in nearly all samples, but the excretion level was approximately 1 log lower in pigs fed lupine for one week (mean 3 log CFU/ g faeces) as compared to the level at start and after two weeks (mean 4 log CFU/ g faeces). No *Campylobacter* reducing effect was apparent in pigs on the control or chicory diet. The highest level of *Campylobacter* was found in the content of caecum.

Furthermore, a sample bank of intestinal content and intestinal tissue (ileum, cecum and colon) from a total of 48 pigs was established. Molecular analysis (T-RFLP) of intestinal bacterial communities has been completed and data analysis has been initiated. In addition, a new real-time PCR method for detection of *Bifidobacteria* has been implemented as a supplementary tool for evaluation of the intestinal bacterial communities.

Also, samples for assessing meat and eating quality have been sampled according to plans and all results published in reports, oral speeches at conferences and published in the journal Meat Science. The results showed that feeding slaughter pigs with lupine or chicory diets for either 1 or 2 weeks prior to slaughter was suitable as a basis for a strategy to control boar taint. The overall sensory quality was improved since odour and flavour of manure related to skatole and urine associated to androstenone were minimized. In respect to entire male pigs, 2 weeks of feeding with chicory or lupine reduced the level of boar taint more efficiently than 1 week of feeding. “Boar” taint reduction in the female pigs was mainly reduced by lupine feeding.

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	Mandatory yearly reporting to FOEJO	John Hermansen Anne Grete Kongsted	10/2007	0.5	R	OK
			10/2008		R	OK
D1.2	National conference	John Hermansen	12/2009	1	O	

* *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	Kick-off meeting including all participants accomplished	01/2007	OK
M1.2	Project co-ordination meetings	06/2007	OK
		04/2008	OK (06-2008)
		04/2009	
M1.3	Stakeholder meetings arranged	06/2007	OK
		04/2008	OK (06-2008)
M1.4	Synthesis work prepared for the national conference	08/2009	

* *Deviations are to be further discussed in D*

Deliverables list (from application)

Workpackage 2						
Deliverable No	Deliverable title	Lead scientist	Delivery date	Allocated scientific person months	Type of deliverable	Fulfilled (ok) or deviations (d)*
D 2.1	Newsletter on background for the project issues on organic egg production	Marianne Hammershøj	10/2007	0.5	O	OK
D. 2.2	Newsletter on preliminary results of the main experiment of organic egg production	Sanna Steinfeldt	10/2008	0.5	O	OK
D 2.3	Presentation of organic egg quality and sensory evaluation at WPSA Poultry Congress	Marianne Hammershøj	08/2009	2	C	
D 2.4	Newsletter on organic egg production affected by forage material	Sanna Steinfeldt	06/2009	1	O	
D2.5	Paper on feed conversion, egg production & quality related to diets, genotypes & forage material	Marianne Hammer-shøj	12/2009	6	S	
D2.6	Paper on nutritional value of experimental diets	Sanna Steinfeldt	12/2009	5	S	
D2.7	Report giving recommendations for organic egg production based on the project	Marianne Hammershøj	09/2009	3	R	
D2.8	Paper on choice feeding	Sanna Steinfeldt	12/2009	5	S	
D2.9	Paper on egg yolk colour related to carotenoids in different carrot varieties used as forage material	Marianne Hammer-shøj	12/2009	4	S	
D2.10	Newsletter on overall project results to increase the quality and integrity of organic eggs	Marianne Hammershøj	10/2009	1	O	
D2.11	Presentation at national conference on organic production of eggs, chicken meat and pork	Marianne Hammershøj	12/2009	2	C	

* 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)*
M 2.1	Crops and forage material for organic diets are harvested and/or bought	10/2007	OK
M2.2	Hen genotypes for experiment are selected	04/2007	OK
M2.3	The analysis methods are set up	12/2007	OK
M2.4	Chemical analysis of feed ingredients and experimental diet formulation is ready	02/2008	OK
M2.5	Two different hen genotypes are reared and ready for egg production	03/2008	OK
M2.6	The main experiment on organic egg production is finished	10/2008	OK
M2.7	The sub-experiments with forage materials for egg laying hens are finished	12/2008	
M2.8	Analysis of feed, diets and eggs are done	08/2009	
M2.9	All data are collected, statistics are evaluated and reports are ready	12/2009	

* 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	Newsletter regarding broiler results	Klaus Horsted	02/2008	1	O	OK
D3.2	Newsletter regarding pests infestation	Hanne Lindhard Petersen	03/2008	1	O	OK (10/2008)
D3.3	Paper on broiler results (growth ect.)	Klaus Horsted	01/2009	6	S	
D3.4	Newsletter sensory results for broilers	Judith Henning	05/2009	1	O	
D3.5	Paper on meat quality	Anders Hans Karlsson	08/2009	4	S	
D3.6	Newsletter on fruit quality	Hanne Lindhard Petersen	05/2009	0.5	O	
D3.7	Paper on effects of broilers on insects and fruit quality	Hanne Lindhard Petersen	12/2009	4	S	
D3.8	Report proposing strategies for integrated production	John Hermansen	12/2009	3	R	
D3.9	National conference	John Hermansen	10/2009	3	C	

Workpackage 3			
Milestone No	Milestone title	Delivery date	Fulfilled (ok) or deviations (d)*
M3.1	Poultry genotypes selected and reared and exp started at Fejø	02/2007	OK
M3.2	Protocol for slaughter procedure and quality assessment	06/2007	OK
M3.3	Broiler production results 1. year interpreted (preliminary)	01/2008	OK
M3.4	Sensory results 1. year interpreted (preliminary)	02/2008	OK
M3.5	Infestation data 1. year interpreted (preliminary)	02/2008	OK
M3.6	WP group meeting to reflect on findings and plan for year 2	03/2008	OK
M3.7	Trees and fruit quality assessed	10/2008	OK
M3.8	Carcasses for quality assessment ready	10/2008	OK
M3.9	Broiler production results 2. year interpreted (preliminary)	01/2009	
M3.10	Sensory results 1. year interpreted (preliminary)	02/2009	
M3.11	Infestation data 1. year interpreted (preliminary)	02/2009	
M3.12	Muscle characteristics assessed	02/2009	
M3.13	WP group meeting for exchange of results prior to reporting	03/2009	
M3.14	Final assessment of trees and fruit quality	08/2009	
M3.15	WP group meeting for integrative evaluation of results	10/2009	

Workpackage 4						
Deliverable No	Deliverable title	Lead scientist	Delivery date	Allocated scientific person moths	Type of deliverable	Fulfilled (ok) or deviations (d)*
D4.1	Newsletter presenting preliminary results of the main experimental activities with emphasis on the effect of genotype on the meat quality of entire male pigs, female pigs and first parity sows	Chris Claudi-Magnussen	10/2008	1	O/R	OK
D4.2	Newsletter presenting the preliminary results of the main experimental activities with emphasis on the effect of genotype and feeding strategy on daily gain and feed conversion in female pigs and first parity sows	Anne Grete Kongsted	10/2008	1	O	OK
D4.3	Paper on the effect of genotype and feeding strategy on daily gain and feed conversion in female slaughter pigs integrated in an organic cropping system	Anne Grete Kongsted	12/2009	4	S	
D4.4	Paper on the effect of genotype on daily gain and feed conversion in first parity sows integrated in an organic cropping system	Anne Grete Kongsted	12/2009	4	S	
D4.5	Paper on the effect of genotype on meat quality of entire male pigs slaughtered at a low weight	Chris Claudi-Magnussen	12/2009	4	S	
D4.6	Paper on the effect of genotype, feeding strategy and slaughter weight on meat quality of female slaughter pigs integrated in an organic cropping system	Chris Claudi-Magnussen	12/2009	4	S	
D4.7	Paper on the effect of genotype on meat quality of first parity sows integrated in an organic cropping system	Chris Claudi-Magnussen	12/2009	3	S	
D4.8	Paper concerning nutrient and energy efficiency in integrated organic pig production systems	Anne Grete Kongsted	12/2009	4	S	
D4.9	Report giving recommendations for a diversified organic pork production based on the results of the project and the experiences learned	Bent Hindrup Andersen	12/2009	3	R	
D4.10	Presentation at national conference on organic egg, poultry meat and pork production	Anne Grete Kongsted	12/2009	3	C	
D4.11	Newsletter presenting overall results of WP4	Anne Grete Kongsted	12/2009	2	O	

Workpackage 4			
Milestone No	Milestone title	Delivery date	Fulfilled (ok) or deviations (d)*
M4.1	Recruitment of the traditional genotype is carried out	02/2007	OK
M4.2	Experimental paddock (crops) established	04/2007	OK
M4.3	Pigs from the 1 st replicate are slaughtered	12/2007	OK
M4.4	Production data from the 1 st replicate is analysed and interpreted (preliminary)	03/2008	OK
M4.5	Assessment of the meat quality from the 1 st replicate is carried out and results are interpreted (preliminary)	04/2008	OK
M4.6	Pigs from the 2 nd replicate are slaughtered and assessments of meat quality are carried out	04/2009	
M4.7	All data are collected, analysed and interpreted	06/2009	
M4.8	WP group meeting for discussion of results prior to reporting	06/2009	
M4.9	Reports are ready	12/2009	

Workpackage 5						
Deliverable No	Deliverable title	Lead scientist	Delivery date	Allocated scientific person moths	Type of deliverable	Fulfilled (ok) or deviations (d)*
D5.1	Newsletter with preliminary results of the effect of FRF on helminth infections and post-weaning diarrhoea	Maria Langkjær	06/2007	1	O	OK
D5.2	International publication on the potential use of FRF to decrease helminth infections at weaning	Maria Langkjær	09/2007	3	S	(d) (11/2008)
D5.3	International publication on the effect of FRF on <i>Campylobacter</i>	Annette Nygaard Jensen	09/2007	4	S	(d) (11/2008)
D5.4	International publication on the effect of FRF on post-weaning diarrhoea	Tim K. Jensen	12/2007	5	S	(d) (11/2008)

Workpackage 5			
Milestone No	Milestone title	Delivery date	Fulfilled (ok) or deviations (d)*
M5.1	Completion and evaluation of parasitological analyses	05/2007	OK
M5.2	Completion and evaluation of <i>Campylobacter</i> analyses	05/2007	OK
M5.3	Completion and evaluation of bacteriological and pathological analyses	12/2007	OK
M5.4	Completion and evaluation of intestinal bacterial communities	12/2007	OK
M5.5	Completion and evaluation of in situ hybridization of key organisms in tissue samples	12/2007	OK

Workpackage 6						
Deliverable No	Deliverable title	Lead scientist	Delivery date	Allocated scientific person moths	Type of deliverable	Fulfilled (ok) or deviations (d)*
D6.1	Report on the effect of final feeding FRF on boar taint and meat quality in entire and female pigs	Laurits Lydehøj Hansen	06/2007	1	R C O O	OK OK OK OK
D6.2	Report on the impact of feeding treatments on odour, flavour, taste and after-taste characteristics in the meat samples is elucidated	Derek Byrne	12/2007	3	R	OK
D6.3	International publication on the effect of final feeding FRF on boar taint and meat quality in entire and female pigs	Laurits Lydehøj Hansen	03/2008	5	S	OK
D.6.4	International publication on the effect of FRF on <i>Campylobacter</i> populations in pre-slaughter pigs	Dorte Lau Baggesen	06/2007	3	S	(d) 04/2009
D.6.5	International publication on the effect of FRF on intestinal bacterial community in pre-slaughter pigs	Dorte Lau Baggesen	12/2007	3	S	(d) 04/2009

Workpackage 6			
Milestone No	Milestone title	Delivery date	Fulfilled (ok) or deviations (d)*
M6.1	Sensory profiling of meat samples	03/2007	OK
M6.2	Analysis of chemical measurements in relation to sensory	08/2007	OK
M.6.3	Completion and evaluation of <i>Campylobacter</i> analyses	02/2007	OK
M.6.4	Completion and evaluation of the T-RFLP analyses	06/2007	(d) 12/2008

(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, web-sites, etc.).

D. Description of deviations and subsequent adjustments of plans

D5.2, D5.3, and D5.4 have been postponed due to the delay of appropriate statistical analyses, which were finished in 09/2008. The deliverables are expected to be fulfilled by 11/2008. As mentioned in the previous report, D5.2 is combined with D5.3 within one solid peer-reviewed paper. Furthermore, the complete lack of post-weaning diarrhoea makes it impossible to have an independent D5.4 and the *E. coli* results will therefore also be included in the above-mentioned paper. M5.3, M5.4, and M5.5 have all been fulfilled with some delay, partly because the Terminal restriction fragment analysis (T-RFLP) has been delayed due to implementation of a new instrument.

D 6.4-5 /M.6.4: The publication “The pathogen-reducing effect (*Campylobacter* spp.) of feeding fermentable fibre-rich lupines or chicory (prebiotics) to finisher pigs for one or two weeks prior to slaughter” was submitted to J. Appl. Microbiol., but the paper was rejected due to too low impact. Therefore, it has been decided to make a joint paper on *Campylobacter* and the T-RFLP analysis of the intestinal bacterial communities as soon as the T-RFLP data analysis has been completed. This is expected to be reached 04/2009.

E. Project publications and other products

1. Products from Organic Eprint

Claudi-Magnussen, C. (2008) [Økologiske sæsongrise - kødkvalitet for sæson 2007](#). Report, Slagteriernes Forskningsinstitut, Danish Meat Association.

Claudi-Magnussen, C. and Kongsted, A.G. (2008) [Boar taint in very small organic entire male pigs - preliminary results](#). Poster presented at IRTA, 26-27th March 2008.

Hammershoj, Marianne (2007) [På sporet af økologisk ægkvalitet](#) [Tracing the quality of organic eggs]. In *Økologisk Jordbrug*, 19. October, Volume 27, No 394, page 12. Økologisk Landsforening, Aarhus.

Hansen, L.L.; Stolzenbach, S.; Jensen, J.A.; Henckel, P.; Hansen-Møller, J.; Syriopoulos, K. and Byrne, D.V. (2008) [Effect of feeding fermentable fibrerich feedstuffs on meat quality with emphasis on chemical and sensory boar taint in entire male and female pigs](#). *Meat Science* 80:pp. 1165-1173.

Hansen, Laurits Lydehøj (2007) [Lupin i svinefoder mindsker ornelugt](#). In *Økologisk Jordbrug*, 7. September, No 391, page 16. Økologisk Landsforening.

Hansen, Laurits Lydehøj; Jensen, Jens Askov; Henckel, Poul; Hansen-Møller, Jens; Byrne, Derek V. and Syriopoulos, Kostas (2007) [Pork quality related to the diet content of fermentable fibre-rich feedstuffs \(chicory and lupine\) with special emphasis on the effect on boar taint and meat quality](#) [Korttidsindflydelsen af fodring med fermenterbare fiberrige fodermidler (lupiner og cikorie) før slagtning med særligt henblik på indflydelsen på kemisk ornelugt

og teknologisk kødkvalitet]. [oral] Presentation at *23rd NJF congress 2007, Trends and Perspectives in Agriculture*, Copenhagen, June 26-29, 2007.

Hansen, Laurits Lydehøj; Jensen, Jens Askov; Henckel, Poul; Hansen-Møller, Jens and Syriopoulos, Kostas (2007) [Effect of feeding fermentable fiber-rich feedstuffs lupin and chicory prior to slaughter with special emphasis on the effect on chemical boar taint in organic entire male and female pigs and technological meat quality](#) [Korttidsindflydelsen af fodring med fermenterbare fiberrige fodermidler (lupiner og chikorie) før slagtning med særligt henblik på indflydelsen på kemisk ornelugt og teknologisk kødkvalitet]. Report, Department of Food Science, Faculty of Agricultural Sciences, University of Aarhus.

Hermansen, John E. and Horsted, Klaus (2007) [Økologisk kvalitet skal retfærdiggøre merpris](#). *Landbrugsavisen* 31:pp. 41-41.

Horsted, K.; Hermansen, J.E. and Allesen-Holm, B.H. (2008) [Produktion af kyllinger i frugt-plantage kan give større spiseoplevelse](#). Online at http://www.foejo.dk/publikation/ICROFSnyt/1_2008.pdf. September 2008

Jensen, A.N.; Hansen, L.L. and Baggesen, D.L. (2008) [Reducing the risk of food borne pathogens \(Campylobacter\) in pre-slaughter pigs via short-time feeding with prebiotics](#). Poster presented at Food Micro 2008, Aberdeen, Scotland, 1 - 4 September.

Kongsted, A.G. (2008) [Sortbrogede grise i økologi](#). *Økologisk Jordbrug* 416:pp. 12-12.

Kongsted, A.G., Hermansen, J.E., Claudi-Magnussen, C., Andersen, B.H. 2008. A diversified organic pork production – presentation of a concept based on seasonal outdoor rearing of very small entire males. In: Book of abstracts - EAAP Annual Meeting 24-27th August 2008 pp. 100.

Kongsted, A.G.; Claudi-Magnussen, C.; Hermansen, J.E. and Andersen, B.H. (2008) [Strategies for a diversified organic pork production](#), in Neuhoff, D.; Halberg, N.; Alföldi, T.; Lockeretz, W.; Thommen, A.; Rasmussen, I.; Hermansen, J.; Waarst, M.; Lueck, L.; Caporali, F.; Jensen, H.H.; Migliorini, and Willer, H., Eds. *Cultivating the future based on science*, page pp. 190-193. Proceedings of the Second Scientific Conference of the International Society of Organic Agriculture Research ((ISO FAR), held at the 16th IFOAM Organic World Congress - in Cooperation with the International Federation of Organic Agriculture Movements (IFOAM).

Kongsted, Anne Grete; Hermansen, John E.; Claudi-Magnussen, Chris; Andersen, Bent Hindrup and Jensen, Helle Frank (2007) [Strategies for a diversified organic pork production – an upcoming project](#). *NJF Report* 3(2):pp. 1-445.

Nielsen, Sandra Stolzenbach; Hansen, Laurits Lydehøj and Byrne, Derek Victor (2007) [Sensory emphasis on pork quality related to the diet content of fermentable fibre-rich feedstuffs \(chicory and lupine\) with special emphasis on the effect on boar taint](#). Report, Faculty of Life Sciences, University of Copenhagen.

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

DR P4, 2008. Fede høns i frugtplantagen. Udsendelse d. 24. juli på DR P4, Region Sjælland. http://www.dr.dk/Regioner/Sjaelland/P4+Morgen/2008/07/24073147.htm#wbc_purpose=update+-+81k+ (Accessed 15. sep. 2008). WP3.

Hansen, L.L., Nielsen, S.S., Jensen, J.A., Henckel, P., Hansen-Møller, J, Syriopoulos, K. and Byrne, D.V. 2008. Effect of feeding fermentable fibre-rich feedstuffs on chemical and sensory boar taint in entire male and female pigs. The meeting in the EAAP working group "Production and Utilisation of Meat from Entire Male Pigs". Abstract No. 18. and oral presentation.

Horsted, K & Pedersen, H.L. Rose-kylling er ikke til frugt. Citeret i Økologisk Jordbrug nr. 416, sept. 2008., p. 8.

Hønsforsøg er håndarbejde, af journalist Karen Munk Nielsen. Økologisk Jordbrug, vol. 28, 410, pp 16-17, 30. Maj 2008 (WP2: Hammershøj, M. & Steinfeldt, S.)

Jensen, A.N., Hansen, L.L. and Baggesen, D.L. 2008. Reducing the risk of food borne pathogens (*Campylobacter*) in pre-slaughter piglets via short-time feeding with prebiotics. Food Micro 2008, Aberdeen, Scotland, Sept 1-4, 2008. Abstract L18 and poster).

Langkjær, M., Baggesen, D.L., Nygaard Jensen, A., Jensen, T.K., Mølbak, L., Roepstorff, A., Thamsborg, S.M. 2007. Effekt af cikorieødder på fravænningsdiarré, tarmparasitter og zoonotiske parasitter hos svin. Nyhedsbrev på projekthjemmeside

Pedersen, H.L. 2008. Hvordan påvirker kyllingeproduktion i æbleplantagen udbyttet og frugtkvaliteten? Artikel sendt til Økologisk Jordbrug oktober 2008.

F. Scientific education

Student Kostas Syriopoulos from University of Wageningen has made his Master thesis within this project and has finished this summer 2007 at the University of Wageningen.

Bachelor student Line P. Ahrendt from University of Copenhagen, Faculty of Life Science has made her Bachelor study within the WP2, and defended her report on 30th September 2008.

Student in Animal Science Jayme Jeffries from University of Illinois, USA, has been allocated with WP2 working with the hens and eggs for 2 months in 2008. Jayme participated in the ANSC-USDA Learning Abroad program, which was established to give American students research experience in animal science.

G. National and international cooperation

The research group is attached to the project group around the company DanCikorie ApS, which produces dried chicory products (www.cikorie.com) as feed ingredient and carry out related concept and product development. I.e. Tim Kåre Jensen co-operates in investigating the effect of dried chicory on Lawsonia infections in pigs and he has already found a positive effect in a pilot study. Thus, this contact ensures an immediate dissemination of the research results.

H. Critical reflection on the project

Basically we found no reason to make large changes in the project. The stakeholder meeting in June 2008 confirmed that the project on the whole follows the original plans and produces a lot of very interesting results.

WP4 has a close cooperation with the Innovation project "New organic pork products based on

seasonal production”. The marketing possibilities for the diversified pork products are investigated together with the carcass quality of the traditional genotypes at normal slaughter weight in this project.

8. Budget

A. Account for any change in budgets

B. 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	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Man-months							
Scientific personnel	118,9	0	53,4	47,55	23,16	0	124,11
Technical personnel	70,56	0	37,35	32,85	11,36	0	81,56

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	5320	0	2255	2041	1175	0	5471
Technical personnel	2074	0	937	957	356	0	2250
Other operational costs	2131	0	1006	774	185	0	1965
Equipment	44	0	5	0	0	0	5
Others (please specify)	449	0	174	152	0	0	326
Direct costs	10018	0	4377	3924	1716	0	10018
Indirect costs (20% of direct costs)	2004	0	875	786	344	0	2004
Total	12022	0	5252	4710	2060	0	12022

Comments:

9. Signatures and stamps

Name	Institute	Date	Signature
Head of project Anne Grete Kongsted		6/10-2008	

Appendix I. Detailed budget

A. Budget for each participating institute (1.000 DKr)

Name of Institute and department:

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

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

Comments:

B. Budget for each participating department (1.000 DKK)

Name of Institute and department: Faculty of Agricultural Sciences
Department of Agroecology and Environment

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Man-months							
Scientific personnel	33,5	0	9	13,75	10,75	0	33,5
Technical personnel	12,46	0	4,75	5,75	1,96	0	12,46

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	1539	0	401	611	527	0	1539
Technical personnel	390	0	145	181	64	0	390
Other operational costs	404	0	181	173	60	0	414
Equipment	15	0	5	0	0	0	5
Others (please specify)	154	0	75	79	0	0	154
Direct costs	2502	0	807	1044	651	0	2502
Indirect costs (20% of direct costs)	500	0	161	209	130	0	500
Total	3002	0	968	1253	781	0	3002

Comments:

Name of Institute and department: Faculty of Agricultural Sciences
Department of Food Science

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Man-months							
Scientific personnel	23	0	11	7	5	0	23
Technical personnel	8	0	3	2	3	0	8

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected Consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	1092	0	511	335	246	0	1092
Technical personnel	257	0	106	65	86	0	257
Other operational costs	214	0	34	131	49	0	214
Equipment	0	0	0	0	0	0	0
Others (please specify)	10	0	2	8	0	0	10
Direct costs	1573	0	653	539	381	0	1573
Indirect costs (20% of direct costs)	315	0	131	108	76	0	315
Total	1888	0	784	647	457	0	1888

Comments:

One man-month of technical personnel has been post-poned from 2008 to 2009, due to the fact that the lab. technician, who was performing the carotenoid analysis has left the department, and it will not be possible to replace this person and do the analysis until beginning of 2009. The chemicals and laboratory expenditures for the analysis are correspondingly moved to 2009., i.e. transferred from "other operational costs" in 2008 to 2009.

Name of Institute and department: Faculty of Agricultural Sciences
Department of Animal Health, Welfare and Nutrition

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Man-months							
Scientific personnel	12	0	4	4	4	0	12
Technical personnel	7	0	2	3	2	0	7

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	576	0	190	192	201	0	576
Technical personnel	229	0	65	98	69	0	229
Other operational costs	312	0	81	185	36	0	312
Equipment	0	0	0	0	0	0	0
Others (please specify)	0	0	0	0	0	0	0
Direct costs	1117	0	336	475	306	0	1117
Indirect costs (20% of direct costs)	223	0	67	95	61	0	223
Total	1340	0	403	570	367	0	1340

Comments:

Name of Institute and department: Faculty of Agricultural Sciences
Department of Agricultural Engineering

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Man-months							
Scientific personnel	12,5	0	4	7	1,5	0	12,5
Technical personnel	0	0	0	0	0	0	0

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	470	0	150	250	70	0	470
Technical personnel	0	0	0	0	0	0	0
Other operational costs	140	0	60	60	20	0	140
Equipment	0	0	0	0	0	0	0
Others (please specify)	140	0	75	65	0	0	140
Direct costs	750	0	285	375	90	0	750
Indirect costs (20% of direct costs)	150	0	57	75	18	0	150
Total	900	0	342	450	108	0	900

Comments:

Name of Institute and department: Faculty of Agricultural Sciences
Department of Horticulture

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Man-months							
Scientific personnel	4,7	0	1,5	2,2	1,0	0	4,7
Technical personnel	9,9	0	2,9	4,2	2,8	0	9,9

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	259*	0	77	211	91	0	379
Technical personnel	308	0	87	132	89	0	308
Other operational costs	145	0	82	57	6	0	145
Equipment	0	0	0	0	0	0	0
Others (please specify)	120*	0	0	0	0	0	0
Direct costs	832	0	247	400	185	0	832
Indirect costs (20% of direct costs)	167	0	49	80	38	0	167
Total	999	0	296	480	223	0	999

Comments:

*We request permission to transfer 120,000 dkr planned for consultancy contribution (within Others) to salary (scientific personnel). We have found out that it is most efficient if the personnel from the Institute carry out the planned assessments.

Name of Institute and department: University of Copenhagen, Faculty of Life Sciences
Department of Food Science

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Man-months							
Scientific personnel	9,5	0	4	7	0	0	11
Technical personnel	7	0	7	10,5	0	0	17,5

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	459	0	80	180	0	0	260
Technical personnel	215	0	26	355	0	0	381
Other operational costs	173	0	163	75	0	0	238
Equipment	30	0	0	0	0	0	0
Others (please specify)	10	0	7	0	0	0	7
Direct costs	887	0	276	611	0	0	887
Indirect costs (20% of direct costs)	178	0	55	122	0	0	178
Total	1065	0	332	733	0	0	1065

Comments:

Name of Institute and department: University of Copenhagen, Faculty of Life Sciences
Danish Centre for Experimental Parasitology

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Man-months							
Scientific personnel	6	0	6	1	0	0	7
Technical personnel	5	0	6	0	0	0	6

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	180	0	207	37	0	0	244
Technical personnel	169	0	151	0	0	0	151
Other operational costs	236	0	173	17	0	0	193
Equipment	0	0	0	0	0	0	0
Others (please specify)	15	0	15*	0	0	0	15
Direct costs	600	0	546	54	0	0	600
Indirect costs (20% of direct costs)	120	0	109	11	0	0	120
Total	720	0	655	65	0	0	720

* see comments

Comments:

* In the accounting form for 2007 expenses for travelling were entered as operational costs and not as travel by mistake although it was registered separately in the accompanying print from the central university administration.

Name of Institute and department: Danish Meat Research Institute

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Man-months							
Scientific personnel	4,7	0	2,9	1,6	0,91	0	5,4
Technical personnel	8,4	0	3,7	3,4	1,6	0	8,7

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	218	0	105	73	40	0	218
Technical personnel	185	0	91	102	48	0	241
Other operational costs	180	0	50	60	14	0	124
Equipment	0	0	0	0	0	0	0
Others (please specify)	0	0	0	0	0	0	0
Direct costs	583	0	246	235	102	0	583
Indirect costs (20% of direct costs)	117	0	49	47	21	0	117
Total	700	0	295	282	123	0	700

Comments:

Name of Institute and department: Technical University of Denmark
National Food Institute and National Veterinary Institute

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Man-months							
Scientific personnel	13	0	11	4	0	0	15
Technical personnel	12,8	0	8	4	0	0	12

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	525	0	413	172	0	0	585
Technical personnel	320	0	200	95	0	0	295
Other operational costs	327	0	150	142	0	0	292
Equipment	0	0	0	0	0	0	0
Others (please specify)	0	0	0	0	0	0	0
Direct costs	1172	0	763	409	0	0	1172
Indirect costs (20% of direct costs)	234	0	153	81	0	0	234
Total	1406	0	916	490	0	0	1406

Comments: Due to changes in organisation the annual number of working hours has been changed from 2007 to 2008 – this made it difficult to calculate the exact number of man-months.

C. Budget for co-financing from each participating institute (1.000 DKK)

Name of Institute and department: Faculty of Agricultural Sciences
Department of Agroecology and Environment

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

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	0	0	0	0	0	0	0
Technical personnel	0	0	0	0	0	0	0
Other operational costs	0	0	0	0	0	0	0
Equipment	0	0	0	0	0	0	0
Others (please specify)	66	0	32	34	0	0	66
Direct costs	66	0	32	34	0	0	66
Indirect costs (20% of direct costs)	689	0	320	261	108	0	689
Total	755	0	352	295	108	0	755

Comments:

Name of Institute and department: Faculty of Agricultural Sciences
Department of Food Science

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

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	0	0	0	0	0	0	0
Technical personnel	0	0	0	0	0	0	0
Other operational costs	253	0	51	203	0	0	253
Equipment	0	0	0	0	0	0	0
Others (please specify)	0	0	0	0	0	0	0
Direct costs	253	0	51	203	0	0	253
Indirect costs (20% of direct costs)	51	0	10	41	0	0	51
Total	304	0	61	243	0	0	304

Comments:

Name of Institute and department: Faculty of Agricultural Sciences
Department of Animal Health, Welfare and Nutrition

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

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	0	0	0	0	0	0	0
Technical personnel	0	0	0	0	0	0	0
Other operational costs	253	0	51	203	0	0	253
Equipment	0	0	0	0	0	0	0
Others (please specify)	0	0	0	0	0	0	0
Direct costs	253	0	51	203	0	0	253
Indirect costs (20% of direct costs)	51	0	10	41	0	0	51
Total	304	0	61	243	0	0	304

Comments:

Name of Institute and department: Faculty of Agricultural Sciences
Department of Agricultural Engineering

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

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	0	0	0	0	0	0	0
Technical personnel	0	0	0	0	0	0	0
Other operational costs	0	0	0	0	0	0	0
Equipment	0	0	0	0	0	0	0
Others (please specify)	72	0	36	36	0	0	72
Direct costs	72	0	36	36	0	0	14
Indirect costs (20% of direct costs)	14	0	7	7	0	0	14
Total	86	0	43	43	0	0	86

Comments:

Name of Institute and department: University of Copenhagen, Faculty of Life Sciences
Department of Food Science

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Man-months							
Scientific personnel							
Technical personnel			1,	0,5			2

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	100		70	30			100
Technical personnel	0						0
Other operational costs	0						0
Equipment	0						0
Others (please specify)	0						0
Direct costs	100						0
Indirect costs (20% of direct costs)	20		14	6			20
Total	120		84	36			120

Comments:

Name of Institute and department: Danish Meat Research Institute

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

Year:	Original budget	Consumption 2005/2006	Consumption 2007	Expected consumption 2008	2009	2010	Total
Salaries							
Scientific personnel	0	0	0	0	0	0	0
Technical personnel	0	0	0	0	0	0	0
Other operational costs	0	0	0	0	0	0	0
Equipment	0	0	0	0	0	0	0
Others (please specify)	0	0	0	0	0	0	0
Direct costs	0	0	0	0	0	0	0
Indirect costs (20% of direct costs)	171	0	193	87	49	0	329
Total	171	0	193	87	49	0	329

Comments:

10. Signatures and stamps

Name	Institute	Date	Signature
Head of project Anne Grete Kongsted		6/10-2008	
