



Midterm Status Report 2003 and Application for Continuation in 2004

For research projects financed by grants from
The Directorate for Food, Fisheries and Agro Business
under the Danish Ministry of Food, Agriculture and Fisheries

1. Research program

Research in organic farming 2000-2005 (DARCOF II)

2. Project title and number

II.4 Improvement of animal health and welfare in organic dairy production with special focus on the calves

3. Head of project

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4. Participating institutes

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The Royal Veterinary and Agricultural University, Bülowsvej 13, DK - 1870 Frederiksberg C (Stig Milan Thamsborg, Danish Research Centre for Experimental Parasitology; Torben W. Bennedsgaard has moved from The Royal Danish Veterinary and Agricultural College to Research Centre Foulum)

5. Other project staff

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6. Project period (month, year)

Start of project: 1st Nov 2000

End of project: 1st Nov 2004

7. Midterm description of the project, its results and progress, and application for continuation in 2004

A. Project summary

Table A.1: Work package list

No.	Work package title	Participants*	Budget (1.000 DKK)	Start	End	Deliverable and milestone no(s):
1	Animal welfare assessment: development of a theoretical and practical framework under organic production conditions	<u>Mette Vaarst</u> , Torben W. Bennedsgaard, Stig M. Thamsborg, Christine Fossing	1.200.000	1 st Nov 2000	1 st March 2003	D1, D4, D7, D8, D9, D10 M1, M2, M3
2	Prevention of coccidiosis among dairy calves	<u>Klaus Lønne</u> <u>Ingvartsen</u> , Charlotte Maddox-Hyttel, Ellen-Margrethe Vestergaard	1.300.000	1 st September 2001	1 st March 2004	D6, D12, D13 M4, M5, M6, M7
3	Veterinary homeopathy: development of research model and in-practice pilot studies	<u>Mette Vaarst</u> , Christine Fossing,	500.000	1 st May 2001	1 st Jan. 2003	D2, D3, D11, D13 M8, M9, M10, M11

* Responsible participants are underlined

B. Objectives and expected achievements

The overall objective of the project is to form basis for an improved health and welfare in organic dairy herds with special focus on calves. Two characteristics are regarded as core qualities for the research results:

- a) Theory and practice must be consistently and closely linked together
- b) The flexibility and possibility to apply the knowledge in a wide spectrum of different organic herds must be present.

The following goals are linked to the overall objectives:

- 1) To form a relevant theoretical and practical framework, within which animal welfare can be discussed and assessed under organic production conditions. From this framework, suggestions to improvements can be given on animal, herd and production system level.
- 2) To characterise and analyse the health status and the production conditions including management routines and potential health risks connected to calves 0-6 months of age.
- 3) To develop strategies for preventing coccidiosis in calves on straw and deep litter areas through epidemiological studies and in-practice trials.
- 4) To develop a model for clinical trials in veterinary homeopathic treatments and

other holistic treatment methods by carrying through pilot-studies.

Results and progress

WP 1: Animal welfare

Based on theoretical considerations (described in Vaarst et al. 2001 & Alrøe, H.F., Vaarst, M. & Kristensen, E.S. 2001. Does Organic Farming Face Distinctive Livestock Welfare Issues? – A Conceptual Analysis. (Journal of Agricultural and Environmental Ethics)), the first parameters in the animal welfare recordings were identified within the four terms 'Naturalness', 'Harmony', 'Human care-taking' and 'Freedom of choice'. Recordings were made and herd visits took place over the summer 2002. Based on this, a manual was developed for a graphical animal welfare assessment scheme, showing herd strengths and weaknesses within the four organic key-areas mentioned. This manual was presented at and changed during and following an international expert panel workshop in May 2003, where three new key areas were identified for the assessment: 'Naturalness', 'Animal Integrity', and 'Health and management'. The contents of these three areas are covering the key points within the four previous terms, but relating them in a new way, using a graphical wheel model. The project is close to completion, and we are now giving much priority to the dissemination of knowledge among Danish organic dairy farmers and advisors within the project. In collaboration with the Danish Association of Organic Farmers ('Økologisk Landsforening'), we have arranged a workshop with participation of 17 Danish organic dairy farming advisors. In this group, we will also have the presence of two participants from the Plant Directory, both of whom are in charge of the Danish control of organic farms. These workshops are taking place in order to practically improve and implement the final product of this assessment concept. These workshops will take place in November 2003.

WP2: Coccidiosis

An initial literature review including results from the initial survey in 25 organic Danish herds is currently being analysed together with data from 30 dairy calf herds, which have been carried out in relation to a master study at the Danish Veterinary Institute. Coccidia were found in all herds in various numbers and of various species. During winter and early spring 2002, recordings and samples were collected fortnightly in 6 selected herds with a total of eight faecal samples and clinical recordings per calf from all calves born in the interim period. Focus was on coccidiosis, but included aspects of calf diseases on a broader basis and, in particular, the living conditions of the calves. Results from this study is analysed. The results confirm the idea of coccidiosis being mainly an infection following poor living conditions. A small case-control study on calf rearing and coccidiosis (small because of a relatively small fundings for analyses) is planned to be made during the winter 2003-2004 in order to identify associations between living conditions of the calves, other diseases, and the presence of coccidiosis. The exact outline of this is still to be discussed and may be replaced by further analysis of collected data.

WP3: Veterinary homoeopathy

Ph.D. student Christine Fossing started her Ph.D. study 1st November 2001 (see status report on her project). Nine homoeopathically educated veterinarians formed a Danish panel for the discussions of the research methods and the approach. Follow-up recordings of homoeopathic mastitis treatments were initiated from the spring 2002 in 15 dairy herds, including 4 veterinarians in the study.

A literature study is carried out as a part of the Ph.D.thesis, which is currently being written. This literature study focuses on two different aspects of veterinary homoeopathy: 1) possibilities for clinical trials and efficacy testing, and 2) possibilities for evaluation of clinical practice (clinical audit and likewise). Human homoeopathic studies are in focus in both publications. Contact has been made to the Danish authorities administering clinical trials, and the project team still faces considerable work in order to gain permission for the proposed clinical trial.

In November 2001 (in connection to the 5th meeting of the international Network on Animal Health and Welfare (NAHWOA)), research methodology was discussed (Vaarst et al., 2002). In January 2002, practising veterinary homoeopaths and practising cattle veterinarians carried out a free choice profiling study of mastitis cows in order to describe terms of health and disease in practice. The results of this is described in Fossing et al. (2003), and was used in the design of the follow-up-recordings of homoeopathically treated cows. In August 2002, an expert panel discussion took place. During the spring 2003, a clinical randomised pilot trial was carried out in United Kingdom (restricted in Denmark because of legislation). The findings are primarily focused on research methodology development and is under analysis and writing at the moment.

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

A graphical model of animal welfare assessment systems has been under development and is expected to be implemented as a part of the Danish advisory tools connected to organic herds. In November 2003, two workshops are being held as described above. Several management factors are - based on the initial animal welfare assessments and the descriptive analyses in the wp2 about coccidiosis - identified to be crucial for calf welfare. Management is generally described as very poor in most herds involved in any activity of this study. Calf rearing systems in organic herds in practice generally contains several identified well-known risk-factors for calf diseases, among others coccidiosis. All species of coccidia are identified in the majority of herds. The variation in amount and consequences of the presence of coccidia seems closely connected to basic management factors (human care-taking and hygiene) in the herd. In preliminary analyses, calving areas are identified to be a major risk-factor for disease among small calves.

Methods of follow-up of homoeopathically treated mastitis have been identified. It is confirmed that homoeopathically practicing veterinarians can identify common key parametres describing the health status of cows, which are in accordance with the homoeopathic concepts of health and disease. A longitudinal observational study design for following up on homoeopathic treatments is described, and a design for clinical randomised trials have been tested on pilot basis and is very critically evalu-

ated. It is confirmed that it is very difficult to combine two disease paradigms, but several guidelines and preconditions are being formulated.

C.2 Fulfilment of deliverables and milestones

WP1: Animal welfare assessment: development of a theoretical and practical framework under organic production conditions	Time schedule according to application	Deviations, if any*
Deliverables		
D1 Workshop 1: development of theoretical framework for the understanding of animal welfare.	May 2001	Moved to a later phase of the project.
D4 'Aspects of animal welfare under organic production condition'	Sep. 2001	Current activity; integrated into report on international expert panel report
D7 International expert panel: the understanding of animal welfare in organic agriculture	Jan. 2002	Spring 2003, after results of animal welfare assessment system are known.
D8 Manual for welfare assessment	Oct. 2002	None
D9 'Welfare assessment: theoretical and practical framework'	Dec. 2002	None; see titles of publications
D10 Workshop: Welfare assessment among dairy calves; presentation of welfare assessment model and evaluation of different organic herds	Jan. 2003	Arranged in collaboration with Danish Organisation of Organic Farmers.
Milestones		
M1. Identification of central conditions and patterns of disease and behaviour among calves	(nothing mentioned in application)	Fulfilled
M2 A profound understanding of the concepts of animal welfare within the organic production has been reached through national and international workshops, working groups and reviews.	(nothing mentioned in application)	Fulfilled. Organised workshops within the project are being planned.
M3 A framework for animal welfare assessment based on the fundamental goals for organic production combined with concepts of animal welfare, and based on a continuous dialectic relationship between theoretical research and practical implementation, has been developed.	(nothing mentioned in application)	Current activities

* Deviations are to be further discussed in D. In appendix 2, an adjusted list of deliverables from 2001 is provided.

WP 2: Prevention of coccidiosis among dairy calves	Time schedule according to application	Deviations, if any*
Deliverables		
D6 Coccidiosis – a review on causal factors of potential importance for the development of coccidiosis in organic farms.	Oct. 2001	January 2004 – combined with publication of two first phases of the project.
D12 Prevention of coccidiosis in organic farms	Sep 2004	None
D13 Meeting for organic farmers and advisors	Oct. 2004	None

Milestones		
M4 Conclusion of results of initial survey on prevalence, characterisation of patterns of coccidia species, housing condition and management routines in organic calf herds. Danish report based on this survey.	(nothing mentioned in application)	Fulfilled. Danish report under completion.
M5 Conclusion and adjustment of study plan in on-farm experimental set-ups on causal factors for coccidiosis including sampling procedures (faeces and blood).	(nothing mentioned in application)	Fulfilled. Observational study completed.
M6 Conclusion and evaluation of laboratory analyses of collected faecal and bloodsamples, and collected data (clinical examinations etc.).	(nothing mentioned in application)	Current activities
M7 Publication and presentation of results.	(nothing mentioned in application)	Current activities

**) Deviations are to be further discussed in D. In appendix 2, an adjusted list of deliverables from 2001 is provided.*

WP 3: Veterinary homeopathy: development of research model and in-practice pilot studies	Time schedule according to application	Deviations, if any*
Deliverables		
D2: 'Up-dating role and status of veterinary homeopathy in Danish dairy farming'	June 2001	Two publications; current activity.
D3: Workshop, homeopathy experts panel. Models for clinical research in veterinary homeopathy.	Aug. 2001	August 2002; report under publication and main results will appear in Ph.D.thesis
D11: Homeopathic treatment: pilot studies presented and published	Feb. 2003	When Ph.D. study is finished, winter 2003-2004.
Milestones		
M8: Updating knowledge and status of alternative treatments in organic farming with focus on homeopathy.	(nothing mentioned in application)	Under completion
M9: An international expert team is established to critically evaluate pilot study design, journals and follow-up procedure after treatment.	(nothing mentioned in application)	Fulfilled
M10: A team of veterinarians who are well experienced in homeopathic treatments of dairy cattle is established	(nothing mentioned in application)	Fulfilled
M11: Journals and follow-up procedure is described in details, as well as the design of the pilot studies.	(nothing mentioned in application)	Follow-up procedure described
M12: Data collection is completed and discussed among the international experts	(nothing mentioned in application)	Expected autumn 2003
M13: A manual with one or more models suitable for clinical trials and research in veterinary homeopathy is completed.	(nothing mentioned in application)	A part of Ph.D. thesis

M14: Publication of pilot studies and the suggestion of a concept of research in homeopathy.	(nothing mentioned in application)	A part of Ph.D. thesis
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* *Deviations are to be further discussed in D. In appendix 2, an adjusted list of deliverables from 2001 is provided.*

C. Description of deviations and subsequent adjustments of plans

Initiation of the whole project

The project started in the end of 2000, and the first project meeting was held in April 2001, which was the first time possible by all project participants. No herd activities made by project participants were possible in the period early March till June, 2001, due to the foot & mouth disease outbreak in UK and NL, followed by restrictions in Denmark. (Samples were mainly collected by local veterinarians, since they had access to the herds in this period).

Project activities

No activities are cancelled. Re-organisation (D1) is due to the original fulfilment of the aim of D1 in other meetings etc., and an increasing need for reflection from many different sources on the actual developed animal welfare assessment system. Delays are due to practical circumstances (and personal circumstances in relation to the project leaders personal situation summer 2002 and winter 2002-2003) and not regarded as having substantial impact on the course or the results of the project.

The list of publications is extended significantly from the original plan. This is due to the discovery of several aspects of the animal welfare discussion and research methodology in veterinary homeopathy, which are relevant, but not foreseen at the time of the application.

WP1: Animal welfare assessment

The most essential deviation last year was the combination of Deliverables 1 and 7. This was explained and accepted last year, and the expert panel workshop took place in May this year and must be regarded as a successful workshop with much input from both Danish and international experts. Collaboration with a group in UK (through Dr. Steve Roderick, Cornwall Agricultural College and Tina Leeb, Bristol University), has emphasised the importance of combining practice and theory. Two colleagues from NORSOEK and Norwegian Veterinary University (Britt Henriksen and Paul Steinar Valle) participated in practical exercises in the herd development of the assessment system.

WP2: Coccidiosis among calves

In work package 2, more emphasis was directed towards the observational approach. Describing health status and risk factors were included more coherently. Focus is still on coccidiosis (during winter seasons), but the spectrum is slightly enlarged, and in collaboration with work package 1, an emphasis is put on describing perspectives of

'calf health' on a more general basis. This is found to be highly relevant, based on results from the initial survey in 25 herds. Six herds were included in the second phase of the study. The preliminary results of the analyses of this data seem to confirm this conclusion. Because the results of this analysis was not completed during winter 2002-2003, herd activities were post-poned to the winter 2003-2004, where a case-control study is suggested on basis of the preliminary results of the part project, but needs to be planned in further details.

WP3: Veterinary homoeopathy

The Ph.D. study on veterinary homoeopathy was originally planned earlier, which was not possible due to administration and the current job of the applicant, which should be finished first. All activities connected to homoeopathy were therefore accepted as postponed. An expert panel in veterinary homoeopathy was held in August 2002, after initiation of the first practical study within the Ph.D. study. This enabled the discussions of expert panels to be based on concrete experience from Denmark as well as in the institutions of some of the other participating experts, hence creating a more consistent practice-theory-iterative process. A report is made from this meeting, where several research approaches are described and discussed.

D. Description of plans and future work in the project as a whole and in the work package (including plans for publication and communication)

WP1. Animal welfare assessment

Winter recordings through 15 Danish advisors are planned for the early winter 2003. Based on the results of this, the final adjustment of the assessment model will be reported. Farmers have been included in the discussion of the developments of this assessment plans, and will be invited to a final meeting about the assessment. An expert panel discussion (animal welfare experts) took place in May 2003. The report on this is under completion and is expected to be published in the spring 2004.

WP2. Coccidiosis

Recordings, possibilities for interventions and identification of associations between living conditions, other diseases and coccidiosis is planned to be carried out during this last winter of the project period.

WP3. Veterinary homoeopathy

Veterinary homoeopathy

The follow-up study involving 15 farmers and their veterinarians was completed in winter 2002-2003. The Ph.D. student was involved in studies in UK from February to May 2003. Based on experiences from all studies, a final study design will be suggested. Reflections from an expert panel, practical experience and theoretical knowledge will be combined in the final publications and Ph.D. thesis.

Publications will be integrated in Organic Eprints data base before the end of the project.

Deviations in relation to deliverables and milestones

All deliverables are delivered, but not in time, due to re-organisation of some of the wps and plans. Deliverable D6 has been postponed for a long time, mostly due to an unexpected long referee-procedure (external reviewers), and a post-poned contribution from the project leader, which is integrated into the text now. This failed earlier due to personal circumstances. A copy of this deliverable at the stage it is at at the moment, is enclosed. Likewise with D4, which is integrated into a collected report about the development of the calf welfare assessment system, which includes both theoretical aspects and the reasoning behind the practical design of the assessment system. A copy of this report – which is expected to be finished during December – is enclosed.

E. Project publications and other products

1. Articles in international, scientific journals with review procedures

Vaarst, M., Alban, L., Mogensen, L., Thamsborg, S.M., Kristensen, E.S. 2001. Animal Health and welfare during transition to organic dairy production: problems, priorities and perspectives. *Journal of Agricultural and Environmental Ethics*, 14, 367-390.

Fossing, C., Wemelsfelder, F., Vaarst, M. & Thamsborg, S.M. 2003. Evaluation of Free Choice Profiling as a Method for Judging Health Status in Dairy Cattle after a Previous Case of Clinical Mastitis (will be submitted in December 2003).

[Two articles about homoeopathic research designs including results from the observational longitudinal study and the trial in collaboration with Bristol University, respectively, are expected to be completed and submitted during the winter 2003-2004].

[One article based on the development of the calf life welfare assessment is expected to be written after having completed the more extended report. It is planned to be submitted during Summer 2004]

2. Papers presented at congresses, symposiums, etc.

Fossing, C., 2002. Research in homoeopathy – venturing into dangerous waters? (RAPH Ph.D.course, essay in 'Ethics in Science, RVAU, February 2002)

Fossing, C., 2002. Using qualitative assessment to examine the language of veterinary homoeopaths (Research seminar held at Faculty of Homoeopathy, London, July 2002).

Fossing, C. 2002. Using FCP as a tool to evaluate udder health. Oral presentation, 1st international FCP Workshop, Scottish Agricultural College, Edinburgh, July 2002.

Fossing, C., Klaas, I., Vaarst, M. 2003. Identification of clinical parameters for making a more accurate prognosis for mastitis in lactating dairy cows. What information can be gathered from clinical examination of the mastitic udder. (Abstract submitted and paper to be written in December: SVEPM conference March 2003).

Fossing, C. 2002. Quantitative aspects of research in homoeopathy. NKJ meeting, Oslo, March, 2002.

Fossing, C., Vaarst, M. & Thamsborg, S.M. 2003. Clinical follow-up of dairy cows being treated with homoeopathy. Poster presentation accepted at the ISVEE, Chile, November 2003.

3. Reports, articles in agricultural journals, etc.

Maddox-Hyttel, C. & Vestergaard, E.-M., 2002: Staldcoccidiose hos økologiske kalve: gennemgang af forskellige coccidiearter og konsekvenserne af infektion. Økologisk Jordbrug (fall 2002).

Vestergaard, E.-M., Maddox-Hyttel, C. & Autzen, S. 2002: Økologiske kalve og risici for coccidiose i deres omgivelser. Økologisk Jordbrug (fall 2002).

Vaarst, M. & Alrøe, H. F. 2003: Velfærd i økologiske besætninger - mål, vægt og praktisk etik (winter 2003-2004).

Vestergaard, E.-M., Maddox-Hyttel, C., Ingvartsen, K.L. 2002. Coccidiose hos kvæg. En oversigt over coccidiearter, patogenese, epidemiologi og forebyggelse i økologiske besætninger. Litteraturreview og rapport fra undersøgelser i økologiske besætninger. (Under completion; Danish Report; to be submitted late autumn 2002).

4. Oral presentations, public meetings, field days, etc.

Vaarst, M. 2002. Målsætning og praksis - er der overensstemmelse? Økologikongres 2002, session C7.

Expert panel and workshop reports as described in connection with the deliverables and milestones.

Farmers meetings in WP3 (veterinary homoeopathy) for farmers and homoeopathic veterinarians take place every half year. In addition to this, a couple of field days (evenings) in dairy herds are planned, where farmers and veterinarians train homoeopathic diagnostics.

Two group meetings have been performed for veterinary homoeopaths who participated in free choice profiling activities.

In connection to research schools, Christine Fossing has presented her study plans and discuss results to a wide audience of Ph.D. students and supervisors and received feed-back.

Vaarst, M., Fossing, C., Thamsborg, S.M. 2002. Discussion report: Alternative treatment methods. In: Hovi, M. & Vaarst, M. (eds.) Positive health: preventive measures and alternative strategies. Proceedings of the 5th NAHWOA Workshop, Rødding, Denmark, November 2001, 52-56.

Fossing, C. 2001: Using clinical methodology as an assessment criteria in evaluating success of mastitis treatment. Poster-presentation, NAHWOA workshop, Nov. 2001.

Two presentations in May 2003 in Iceland in connection with meeting in Nordic Network for Research in Veterinary Homoeopathy (NKJ funded), presenting background and results from the study about homoeopathic treatments in Danish dairy herds.

Three presentations in Stockholm, 4th December 2003 in connection with meeting in Nordic Network for Research in Veterinary Homoeopathy (NKJ funded), presenting background and results from the study about homoeopathic treatments in Danish dairy herds.

Two workshops in November 2003 implementing calf welfare assessment in a group of 17 Danish advisors and stakeholders within the organic sector.

F. Scientific education

A Ph.D. study is initiated in November 2001 including scientific investigation and practical application of veterinary homoeopathy. The work package 3 in this project is a part of this Ph.D. study.

G. National and international cooperation

The project was initially carried out with close contact to two projects, which are now being completed: one study about development of health advisory service in Danish organic dairy herds, and projects about animal welfare assessment (these projects are taking place at the Department of Animal Health and Welfare).

The project team had beneficial connections to the international EU-network: 'Network on Animal health and Welfare in Organic Agriculture' (NAHWOA), in which Mette Vaarst and Stig Milan Thamsborg were partners. This network had participants from all over Europe.

Close contact is established to national as well as international groups of veterinary homoeopaths, through former project activities. A Scandinavian Network on research in veterinary homoeopathy includes discussions about possibilities for clinical trials in dairy cattle, from which this project benefits. The Ph.D. student connected to WP3 is expected to collaborate with two different research environments on setting up clinical trials for test of homoeopathy: Bristol University, UK, and Louis Bolck Institute, NL.

Parts of the activities and publications in work package 1 will be carried out in close contact with Hugo Fjelsted Alrøe from Research Centre for Organic Farming (DARCOF).

Critical reflection on the project:

This point is very much the same as was given in the status report of 2002. The project was formed from three original project applications on three different topics. The project group is very diverse, and the aims of the constituent projects are very far from each other with regard to methodology, discipline and focus areas. What possibly can keep the projects together is the challenge of making them suitable for the goals and ways of thinking in organic farming. All project participants were active in the expert panel session in May regarding animal welfare among organic calves, which is also improving the common understanding. This gives an impression of three different work packages not being well integrated into each other and rather disconnected. The fact that one of the work packages practically is the content of a Ph.D.study makes this part belonging to one specific person and her supervisors.

We could have chosen to run the three different projects as three separate entities, only kept together by the common source of finances. In the project group, however, we originally chose the opposite: to try and link things, focus primarily on calves in two of the projects, and to use the project meetings for mutual inspiration to the different activities. One initiative we have taken in the project group in order to build bridges over the gap, is to have project meetings with much weight on the research methods and results, and less on practical details and administration. These meetings have taken place last year, and were held with relevant persons, who were invited to the discussions about research approach and results from outside.

The project budget is absolutely cut down to the minimum. This means that project administration and meetings – despite the statement above – have been given relatively low priority, compared to research activities and recordings. In projects of this kind – very diverse – there should be given separate budget for project management in order to ensure that constituent projects are linked properly together. An important part of the process in a project such as this. As a result of this low budget, we have not had project meetings since the calf welfare expert panel meeting, but plan to have one for specifically planning the details of the winter's activities in more detail. With regard to research methodology, completely new initiatives and development of research approaches are in focus. This is particularly the case with work package 3 (veterinary homoeopathy), and to some extent with work package 1 (animal welfare assessment). This is very resource demanding (especially with regard to personnel and time resources). It must be recommended to give more time (man-months) to projects, where not only new topics, but also research paradigms are explored and evaluated. The time for completing publications is also very limited, since practical and research oriented activities, and communication with stake holders and Danish as well as international experts in the field of animal welfare and veterinary homoeopathy is taking much time and personal.

8. Budget

A. Account for any change in budgets

Slightly postponed Ph.D. study, which is financed partly by HEWDAICA (acceptance of this following midterm status report 2002). Expert panel discussions to be held together with workshop was also accepted following status report 2002.

B. Budget for the whole project (1.000 DKK)

Year:	Consumption before 2000	2000	2001	2002	2003	2004	Total
Man-months							
Scientific personnel		1	6,5	11,5	8,5	3	30,5
Technical personnel		0	7	2	3	0	12

Year:	Consumption before 2000	2000	2001	2002	2003	2004	Total
Salaries							
Scientific personnel		38	230.2	474.2	368.6	138.7	1249.7
Technical personnel		0	179	60	84	0	423.5
Other operational costs		20.4	203.8	492	201.2	10.5	927.9
Equipment		0	0	0	0	0	0
Others (please specify)		0	0	0	0	0	0
Direct costs		58.4	613	1026.2	653.8	149.2	2500.6
Indirect costs (20% of direct costs)		11.6	122.4	204	131.6	29.8	499.4
Total		70	735.4	1230.2	785.4	179	3000

C. Budget for each participating institute (1.000 DKr)

Name of Institute: DIAS (project participants from 2 sections at the Department for Animal Health and Welfare participate in this project)

Year:	Consumption before 2000	2000	2001	2002	2003	2004	Total
Man-months							
Scientific personnel		1	5	7	7	0	20
Technical personnel		0	7	2	3	0	12

Year:	Consumption before 2000	2000	2001	2002	2003	2004	Total
Salaries							
Scientific personnel		38	170.2	284	333	0	825.2
Technical personnel		0	178	60	0	0	238
Other operational costs ¹		20.3	165	364	216	134	899.3
Equipment		0	0	0	0	0	0
Others (please specify)		0	0	0	0	0	0
Direct costs		58.3	514	708	549	134	1962.5
Indirect costs (20% of direct costs)		11.7	103	142	108	27	392.5
Total		70	617	850	657	161	2355

Comments: ¹The project contributes to the phd-project described in WP 3. The PhD-costs are specified as operational costs.

Name of Institute and department: Danish Veterinary Institute, Section for Parasitology

Year:	Consumption before 2000	2000	2001	2002	2003	2004	Total
Man-months							
Scientific personnel		0	1	1	0	1	3
Technical personnel		0	0	0	0	0	0

Year:	Consumption before 2000	2000	2001	2002	2003	2004	Total
Salaries							
Scientific personnel	0	0	40	41.8	0	46.2	128
Technical personnel	0	0	0	0	0	0	0
Other operational costs	0	0	36.7	89.9	36.7	10.5	173.8
Equipment	0	0	0	0	0	0	0
Others (please specify)	0	0	0	0	0	0	0
Direct costs	0	0	76.7	131.7	36.7	56.7	301.8
Indirect costs (20% of direct costs)	0	0	15.3	26.3	7.3	11.3	60.2
Total	0	0	92	158	44	68	362

Comments:

Name of Institute and department: The Royal Veterinary and Agricultural University

Year:	2001	2002	2003	2004	2005	Total
Man-months						
Scientific personnel	0.5	2.0	3.5	0		5.5
Technical personnel	0	0	0	0		0

Year:	2001	2002	2003	2004	2005	Total
Salaries						
Scientific personnel	16	76,2	114	0		205.6
Technical personnel	0	0	0	0		0
Other operational costs	1	1	28	0		30.2
Equipment	0	0	0	0		0
Others (please specify)	0	0	0	0		0
Direct costs	17	77.2	141.7	0		235.9
Indirect costs (20% of direct costs)	3.4	15.4	28.3	0		47.1
Total	20.4	92.6	170	0		283

9. Signatures and stamps

Name	Institute	Date	Signature
Head of project Mette Vaarst	Danish Institute of Agricultural Sciences	3 rd October 2002	

Appendix 1: work package description, wp 1-3

WP1: Animal welfare assessment: development of a theoretical and practical framework under organic production conditions

Work package number: 1

Starting date or starting event: 1st Nov 2000

Responsible persons: Mette Vaarst

Contributing persons: Mette Vaarst, Christine Fossing, Stig Milan Thamsborg, persons from WP2 (Charlotte Maddox-Hyttel, Klaus Lønne Ingvarsten, Ellen-Margrethe Vestergaard,)

National and international expert groups. Working groups (project participants and selected partners, with whom co-work is established).

Person-months: Scientific: 14 months; technical: 5 months

Objectives:

- 1) To reach a theoretical foundation for understanding and defining animal welfare in organic dairy herds, actively combining goals of organic farming with concepts of animal welfare
- 2) To develop a practically oriented framework for animal welfare assessment based on and in a continuous dialectic process with objective 1). This should be used as a dialogue tool for the organic farmers to improve welfare among cows and calves in the organic dairy herd.

Description of work:

The basic principle of this project is to keep a close relationship between theoretical development and practical implementation. Both theoretical and practical results will be evaluated, compared and discussed together.

The elements of this work package is as follows:

- 1) Identification of relevant problems and production conditions
- 2) Theoretical discussions in teams of experts
- 3) Development of practical guide lines in working groups
- 4) Reviewing and writing
- 5) Practical evaluation and development of welfare assessment in different types of systems
- 6) Development of a manual for welfare assessment as a dialogue tool between the organic farmer and his partners.

Each activity will be shortly described in the following:

- 1) Identification of relevant problems and production conditions. An initial survey will be carried through in 20 organic dairy herds. Special focus will be offered to the calves, and the activity should form basis for theoretical discussions about understanding and assessment of animal welfare, as well as for the activities in work packages 2 and 3. Herds are chosen among these to continue with recordings in animal welfare and participation in work packages 2 or 3.
- 2) Theoretical discussions in teams of experts. Two expert groups are collected: a) A national expert group of 8-10 persons with knowledge about animal welfare, calves and /or organic dairy production. b) An international expert group of 4-6 persons, primarily chosen through the EU network project 'Network on Animal Health and Welfare in Organic Animal Husbandry' (NAHWOA). Besides, temporary working groups or expert panels can be formed and participate in project group meetings. The project group will participate in all these workshops, as well as a number of invited persons. The choice of these

persons – who are national or international experts in the field – will be based on the topic of each workshop.

- 3) Development of practical guidelines in working groups. Smaller working groups will be formed within the project. Persons from the project group as well as partners from relevant activities, with whom close co-work is established, will develop practical guidelines for data collection and analysis of data.
- 4) Reviewing and writing. Mette Vaarst will be the primary person to synthesise and describe the theoretical understanding of animal welfare as well as the practical implementation process of welfare assessment in the herds. This is expected to be carried through in close co-work with Hugo Fjelsted Alrøe from Research Centre for Organic Farming (DARCOF).
- 5) Practical trying-off and development of welfare assessment in different types of systems. Data collections in the herds participating in the whole project (all work packages) will continuously be carried out. This data will form a practical overall framework for the whole project. Welfare assessment will be done on the basis of a recording manual, which will be continuously adjusted in accordance with the guide-lines given and developed by project participants and connected experts, and feed-back to these persons will be ensured through a practical implementation and data analysis.
- 6) Development of a manual for welfare assessment as a dialogue tool between the organic farmer and his partners. Mette Vaarst will be the primary persons to synthesise and describe the final product of this process. This is expected to be carried out in close co-work with Hugo Fjelsted Alrøe from DARCOF. All project participants and national as well as international experts, who have been included in the process will be offered the opportunity to review and influence the results through a final workshop.

Deliverables:

D1, D4, D7, D8, D9, D10

Milestones:

M1: Identification of central conditions and patterns of disease and behaviour among calves (relevant production conditions, disease problems and behavioural patterns in the organic calf herds with special focus on inter-suckling and coccidiosis). The details of the designs of WP2 will in part be based on these results.

M2: A profound understanding of the concepts of animal welfare within the organic production has been reached through national and international workshops, working groups and reviews.

M3: A framework for animal welfare assessment based on the fundamental goals for organic production combined with concepts of animal welfare, and based on a continuous dialectic relationship between theoretical research and practical implementation, has been developed.

WP2: Prevention of coccidiosis among dairy calves

Workpackage number:	2
Start date or starting event:	1 st Sep. 2001
Responsible person:	K.L. Ingvarsen
Contributing persons:	E.M.Vestergaard, C.Maddox-Hyttel, B.M. Damgaard, persons from other work packages in this project (Mette Vaarst, Stig Milan Thamsborg, Christine Fossing)
Person-months:	14 (scientific) 8 (technical)

Objectives:

The overall objective is to describe the incidence of *Eimeria* coccidiosis in organic farms and how to prevent the disease in calves.

Specific goals are:

- To identify causal factors important for the development of *Eimeria* coccidiosis and their potential importance in organic farming systems
- To investigate the influence of selected nutritional, management and/or environmental factors on susceptibility to *Eimeria* coccidiosis.
- To develop methods for non-medical prevention and control of *Eimeria* coccidiosis in calves.

Description of work:

The line of attack includes the following:

- 1) Identification of causal factors of potential importance for the development of coccidiosis
- 2) Planning and co-ordination of experimental work
- 3) Execution of the experimental work and laboratory analyses
- 4) Development of methods for non-medical prevention and control of coccidiosis

To identify causal factors of potential importance for the development of coccidiosis. A process like the described "synthesis of knowledge" (Kristensen & Thamsborg, 2000) will be carried out. The work will focus on reviewing causal factors for coccidiosis and relating these to organic farming systems based mainly on results from the screening carried out in WP1. The work will include a description of clinical and diagnostic methods for the identification of coccidiosis.

Planning and co-ordination of experimental work. Based on the above knowledge synthesis we will initiate detailed planning of experimental treatments in selected organic farms. We will select organic farms that have been identified to have problems with coccidiosis (WP1). We expect to focus on risk factors related to nutrition, management and/or the environment. The number of farms included in the study is expected to be 5-6 but will depend on the research strategy decided on the basis of the above synthesis of knowledge.

- 1) The execution of the experimental work and analysis. Coccidiosis during the winter period is expected to be in focus but sampling 8-10 days post turn out on pasture will be considered (de-

pending on recommendations given in the synthesis of knowledge process described above). Each herd of calves will randomly be split in two halves - one group being controls (C) and one group being alternative (A). The controls will receive the nutrition/management/environment previously used. Group A will be an alternative nutrition, management or environmental factor. The age group will be from 0 to 24 weeks. Registration/sampling will be carried out regularly and is expected to include: 1) calves: live weight and daily gain, blood samples, faecal samples, clinical status, cleanness of calves; others 2) environment: temperature, condition of bedding, oocysts in bedding, cleanness of water bowls and troughs, other factors. If calves have had diarrhoea for more than 4 days a faecal sample will be taken for determination of oocysts. Registrations and sampling will be repeated during the experimental period (3 times) and focused around potentially stressful events for the calves (e.g. feed changes, moving). Expected total number of calves included in these intensive studies is approximately 400 calves.

- 2) Development of methods for non-medical prevention and control of coccidiosis. The work carried out in the knowledge synthesis will be continued. The results from the performed experimental studies (Ad 3) will be integrated and different strategies for prevention of coccidiosis will be suggested.

Deliverables:

D6, D12, D13

Milestones:

- M4:** Conclusion of results of initial survey (work package 1; M1) on prevalence, characterisation of pattern of coccidia species, housing condition and management routines in organic calf herds at work shop within the framework of work package 1. Danish report based on this survey.
- M5:** Conclusion and adjustment of study plan in on-farm experimental set-ups on causal factors for coccidiosis including sampling procedures (faeces and blood)
- M6:** Conclusion and evaluation of laboratory analyses of collected faecal and blood samples, and collected data (clinical examinations etc.).
- M7:** Publication and presentation of results.

WP3: Alternative treatments of dairy cows and calves: development of research model and in-practice pilot studies with focus on veterinary homeopathy

Work package number: 3

Starting date or starting event: 1st May 2001

Responsible persons: Mette Vaarst

Contributing persons: Christine Fossing (Ph.D. student), International expert panel; a team of Danish practising veterinarians, contributors from other work packages in this project.

Person-months: Scientific: 7; technical: 3:

Objectives:

- 1) To update the status and obtain an overview of the possibilities for alternative treatments in organic dairy farming with focus on veterinary homeopathy
- 2) To develop one or more models for clinical research in veterinary homeopathy, which meets the demands for documentation from the tradition of natural sciences, and - simultaneously - provides new and useful knowledge for veterinary homeopathy.

Description of work:

One fundamental red line in this work package is to evaluate the methods and steps in the practical clinical trials continuously on a theoretical level, and to implement theoretical results into practice through adjusted journals and designs of pilot studies.

The elements of this work package is as follows:

- 1) To update knowledge and obtain an overview of the possibilities for treatment of production diseases with so-called alternative treatment methods with focus on homoeopathy
- 2) Establish a team of international experts in veterinary homoeopathy
- 3) Establish a team of Danish practising veterinarians who can carry out the treatments in clinical trials
- 4) To develop a system of journals for anamnesis and clinical findings in a case of disease
- 5) Develop an appropriate follow-up matching the demand for documentation of the development of a disease course.

Each of these activities will be shortly described in the following:

- 1) An updating and overview of the possibilities for treatment of production diseases with so-called alternative treatment methods under Danish organic production condition will be obtained. This will be an update based on the reviewed report from the Danish Institute of Agricultural Sciences (no. 731) from 1996.
- 2) International experts will be pointed out and asked to contribute to the development of this method, partly as critical reviewers of the results and steps in the process of this project, and partly in a workshop to be held half way through the project. The team is expected to be the size of 6-10 people, and veterinary epidemiologists, toxicologists as well as classical veterinary homoeopaths will be included.
- 3) A small number of Danish veterinarians have completed an internationally certified post-graduate education in veterinary homoeopathy, and a small number have carried out homeopathic treatments through a long time period (more than 10 years). Three or four of these veterinarians, who treat homoeopathically in production animal herds will be picked out and included in this study as the ones carrying out the practical treatments. Standardised journals and procedures for follow-up on cases will be worked out in collaboration with these veterinarians (see below).
- 4) Journals will be developed throughout the whole project. The treatment cases will be limited to mastitis among dairy cows and diarrhoea among calves. Mastitis is chosen because that is a classical single cow treatment, and the disease most often treated in Danish dairy farming, including organic farming. Homoeopathy is claimed to be a treatment method very much oriented towards the single individual. The literature review mentioned above nevertheless suggested homeopathic treatments to be used in-groups of animals in cases, where the situation of this group allows one to treat them as 'one individual'. Therefore, diarrhoea among calves is chosen, because it is a condition often found in a group of calves, and calves within the same herd very often react in the same way.

Deliverables:

D2, D3, D11, D13

Milestones:

M8: Updating knowledge and status of alternative treatments in organic farming with focus on homoeopathy.

M9: An international expert team is established to critically evaluate pilot study design, journals and follow-up procedure after treatment.

M10: A team of veterinarians who are well experienced in homoeopathic treatments of dairy cattle is established.

M11: Journals and follow-up procedure is described in details, as well as the design of the pilot studies.

M12: Data collection is completed and discussed among the international experts as well as at a national workshop meeting within the framework of work package 1.

M13: A manual with one or more models suitable for clinical trials and research in veterinary homeopathy is completed.

M14: Publication of pilot studies and the suggestion of a concept of research in homoeopathy.