

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

**Acronym:** HEWDAICA

**Motivation:** Animal welfare is an important issue in organic farming. The discussion about how to theoretically understand and practically implement animal welfare specifically in accordance with the goals of organic agriculture is needed. One group of animals, which has not been so much in focus in organic agriculture is the calf group. Due to new regulations and new practice, some serious health and welfare problems connected to group housing routines have arisen. It seems relevant to focus on these problems, and to look at calves as one important part of the theoretical and practical development of a framework for understanding and assessing animal welfare in organic herds. Disease treatment is continuously under debate, and veterinary homeopathy is an area of strong interest in many organic herds. Due to new EU-regulations, veterinary homeopathy should be preferred if the remedies are efficient. It is of major importance to open this discussion in a qualified way and suggest models for research, which can meet both bio-medical demands for proving an effect, and homeopathic demands for development of new knowledge in the field.

### 1. Summary

Animal welfare is an explicit goal for organic production. However, the recommendations on better animal welfare conditions in organic agriculture have been given on a relatively inconsistent background. There is a strong need to combine an effort to obtain good animal welfare with the fundamental goals of organic agriculture. We will do so in this project which consists of three work packages with the following main themes: 1) Animal welfare assessment, 2) Bovine coccidiosis, and, 3) Veterinary homeopathy.

It is an ambition of this project to link theory and practice consistently. This will be effected by a number of workshops during the whole project period. Another criteria for success is that the knowledge developed from this project can be used in a wide spectrum of different organic herds.

One main objective for the project is to form a theoretical and practical framework for evaluation and assessment of animal welfare under organic production conditions. This will be done with help from a national as well as an international expert team. From this framework, suggestions to improvements can be given on animal, herd and production system level. The definition and assessment of animal welfare will cover the whole herd, but with particular emphasis on the calves.

Calves (primarily 0-6 months of age) will be in focus. Main problems among calves in organic herds relate to group-housed calves and coccidiosis. These subjects will be particular in focus in work package 2. Experimental designs in private herds, which are motivated for carrying out these experiments, will be a main part of these activities. The main aim of the research in inter-suckling is to reduce inter-suckling behaviour. The main aim of the research on coccidiosis is to create optimised housing conditions and this way to better control the disease.

There is a strong interest in alternative treatments, especially homeopathy, among Danish organic farmers. Due to the new EU-regulations, homeopathy is one of the treatment methods, which should be preferred to antibiotic treatments. There is a strong need for stimulating communication between the traditional bio-medical veterinary environment (research as well as practice) and the farmers and veterinarians interested in homeopathy. One way of doing this is to develop suggestions to one

or more models for clinical trials in veterinary homeopathic treatments. This is the goal of work package 4, and this is expected to be carried out by combining theoretical discussions (national and international experts) and practical clinical pilot studies.

## **2. Research group:**

The research group consist of scientists from 3 different institutions: the Danish Institute of Agricultural Sciences, the Danish Veterinary Laboratory, and the Royal Veterinary and Agricultural University.

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## **3. Introduction:**

Danish organic dairy farming is a field in dynamic development, in which animal welfare is still a topic under discussion and in need of future development. Animal welfare is an explicit goal for organic production. Despite this, the recommendations on better animal welfare conditions in organic agriculture have been given on a relatively inconsistent background. There is a strong need to combine an effort to obtain good animal welfare with the fundamental goals of organic agriculture. A research setting should form a more consistent basis for combining theory and practice to evaluate and improve, and to give applicable recommendations on farm level.

The main focus in this project will be calves (primarily 0-6 months of age). Main problems among calves in organic herds relate to inter-suckling in group-housed calves and coccidiosis. These subjects in particular will be focus. The definition and assessment of animal welfare will cover the whole herd, but with special emphasis on the calves.

In this project we have the ambition to develop one or more models for animal welfare assessment, based on theory and practice in the organic production concept. Contact to national as well as international experts in the field is a fundamental idea of the project.

Bovine coccidiosis is contagious enteritis in young animals, and this infection is claimed to be another significant problem of organic dairy calves. So far, the distribution between different species of coccidia is unknown in organic herds, and in most cases the presence of this infection is not clearly verified. General suggestions for improvement of the situation are available, but it is a goal of one work package to more specifically describe the infection pattern in a number of organic

herds. This should lead to an optimisation of the management routines, and to proposals of appropriate precautions aimed at reducing the risk for outbreak of coccidiosis among calves.

The overall link between topics chosen is a serious effort to improve balance between animals, environment and caretakers, and to focus on promotion of health and welfare of the animals. There is continuously a major interest in applying 'alternative treatment', homeopathy, in organic herds. The treatment method homeopathy is founded on this view of health and balance, which is the main topic of this project, and one of the work packages focuses on homeopathic treatment methods, which have their own theoretical school, practice and drugs. This stresses the need for developing a way of research and performance of clinical trials using homeopathy—so that demands are met both regarding development of new knowledge relevant and valuable for the field of homeopathy, as well as the need for natural scientific acceptance. The aims of this activity is, through theory, contact to treatment environments and pilot studies, to develop a full manual including one or more research designs, which are suited for clinical trials of treatment methods based on holistic rather than disease oriented principles.

To secure a holistic approach the entire project will be linked together, through a number of workshop events and work group meetings.

#### **4. State of the art**

##### ***4.1 Background and motivation for choice of subjects for research***

###### *4.1.1 Animal welfare assessment*

Animal health and welfare has played a relatively minor role in the organic whole farm context, the advisory service, research and discussions about organic farming, although the consumers focus relatively much on the animal welfare aspects. A profound understanding of the idea of animal welfare under organic production conditions, and the practical implementation of animal welfare friendly systems and management routines in Denmark, have been based on relatively unstructured and inconsistent grounds through the past decade. There has been a very limited attempt to associate the fundamental values of organic production to the ideas of animal welfare and the understanding of the animals' needs and nature. However, this combination is necessary in order to develop a consistent and profound foundation for animal welfare improvements in a wide spectrum of organic herds.

The traditional definition of "animal welfare" has given rise to some methodological problems, as different welfare schools have claimed that animal welfare should be defined in different terms. Based on the ideas of Duncan (1996) animal welfare should be defined in terms of feelings, where a feeling is defined as a specific activity of the sensory system of which an animal is aware. Only such states should contribute positively or negatively to its welfare. Dawkins (1990) claimed that the absence of animal suffering and involvement of the animal's subjective feelings should define the term welfare. Broom (1996) claimed that animal welfare should be defined in broader terms, as he wanted to include that the welfare was impaired if the animal was not able to cope successfully with its environment. According to the animals rights theory the welfare should be defined as the protection of an individual against the potential abuse in the name of "greater good" for humans (Fraser, 1988; Hurnik, 1993). There is no simple way to decide who is right and who is wrong regarding the definition, as it is not a statement of facts, which can be tested empirically. Lately, questions about animal welfare definitions have been raised, among others in the EU-project

‘Network on Animal Health and Welfare in Organic Agriculture (NAHWOA), and in a Danish synthesis of knowledge project on animal health and welfare in organic dairy herds. These are questions whether it can be justified to discuss the term animal welfare in connection with the basic goals of organic agriculture. In our project we want to explore and question the various definitions and the possibilities to define animal welfare on the basis of values for organic agriculture. Terms, which are regarded as relevant and central to discuss in relation to animal welfare in organic herd – linking together the concepts of organic farming and the concepts of animal welfare - are e.g. ‘harmony’, ‘a natural life’, ‘human care-taking’, and freedom of choice. They will be central areas to explore in relation to a profound theoretical discussion about animal welfare and organic farming, including fundamental values of this farming system. Thus, there is a need for a fundamental theoretical understanding of the ideas of animal welfare on animal, group, herd, and system level. This basic and strongly theoretical understanding of animal welfare must then be linked together with a practical implementation of the principles.

The calf herd has not been in focus when discussing and developing the organic herds. Until two years ago, calves were raised in organic herds under conditions very similar to conventional production conditions (1 m<sup>2</sup> single boxes, milk feeding twice per day from ordinary buckets etc.). In 1998, the legislation prescribed that calves should be group housed preferably from an age of 4 weeks, to facilitate social development and they should have access to suckling (artificial teats, nurse cows or teat buckets) to satisfy their need to suckle, and they should stay outdoor through the summer from an age of 3 months.

#### 4.1.2 *Coccidiosis*

Calves from some organic herds have been found to be in poor condition or underweight, when they are sold on to producers for fattening (Priesholm, 1999a). Furthermore, the calf mortality is higher in organic herds than in traditionally managed herds, especially among calves of heifers (Priesholm, 1999b). There may be several reasons for this, but one prominent disease problem among calves in organic herds is thought to be coccidiosis. Coccidia are intracellular protozoan parasites, which cause enteritis and a consequential loss of liquids due to profuse diarrhoea. This may lead to inacceptance, weakness and, in some cases, death. In addition, coccidiosis may have long-term effects whereby heifers, which have had the disease, fail to reach their full potential for growth and milk production. In general, the species of coccidia causing the disease belong to the genus *Eimeria*, among which 3 species are supposedly the most detrimental, namely *Eimeria bovis*, *E. zuernii* and *E. alabamensis*. Whether this prevails also in organic herds should be examined in order to provide optimal advice regarding prevention and control.

Some of the reasons for the coccidiosis problem in organic herds may be related to the specific rules concerning management, i.e. housing, feeding and care taking of both heifers and calves. Thus, the potentially most stressful events in the life of the calves should be scrutinised in relation to coccidiosis outbreaks, as well as factors in their environment which may predispose for the disease by providing optimal conditions for maintenance of contamination.

#### 4.1.3 *Veterinary homeopathy*

Homeopathy is a treatment method based on individual treatment, where the symptoms and the individual characteristics of the sick animal guide the choice of drug. Traditional clinical trials are therefore inappropriate. The same ‘disease’ in two different individuals may require two different drugs, depending on the signs and way of reaction of each individual (Hahnemann, 1810; Vithoulkas, 1980; Sankaran, 1991). The aim of the treatment is to stimulate the individual to regain

balance. It is a treatment method, which is based on another view on health and disease than this of biomedicine. This, together with the use of potencies drugs makes the traditional Danish veterinary environment sceptical to the treatment method, and consequently also reluctant to make an effort to meet the wish from many organic farmers (including the recommendations in the recent EU-regulations) to apply homeopathy (Vaarst, 1997 & 1998). Proved efficiency of the drugs are called for by the traditional, bio-medical, veterinary environment, and more relevant knowledge about homeopathy is called for by the group of veterinary homeopaths (Schütte, 1997). There is reason to believe that compromises can be made between different treatment and research traditions (Bellavite & Signorini, 1995; Hsu, 1996; Vaarst, 1996; Coulter, 1980; Resch & Gutmann, 1987). Development and descriptions of research methods and models for research, which can form basis for communication across the treatment traditions, are strongly needed.

#### ***4.2 Former and ongoing projects***

The need for evaluation and assessment of animal welfare in organic dairy production is prominent, and various attempts have been made throughout Europe. In a number of Danish herds, animal welfare evaluations have been carried through using the TGI-system (described and used by Sundrum et al. (1994)). Other approaches – e.g. the so-called ethical account – have been used under Danish organic production conditions, and have been met with great interest among farmers and their advisors. The need for a practical means of assessing animal welfare is further supported by the results of a newly written DARCOF report on synthesis of knowledge with regard to animal health and welfare and the use of medication during conversion and in converted organic production (Kristensen & Thamsborg, 2000).

At the Research Centre Foulum on-going projects in private organic herds have been carried out since 1988. A practical framework and tradition for on-farm research in organic herds is well established. An actual project working with the development of health advisory service models in organic herds is one relevant possibility to carry through a practical implementation and evaluation of a given welfare assessment model.

The first steps in this direction are taken partly in the synthesis of knowledge project mentioned before, as well as in an EU Network for Animal Health and Welfare in organic Animal Husbandry (NAHWOA).

### **5. 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 fundamental 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.

#### 6. Description of workpackages including methods:

The goals of the project will be met in the following work packages:

<b>Work package no.</b>	<b>Work package title</b>	<b>Responsible participants</b>	<b>Budget</b>	<b>Start</b>	<b>End</b>	<b>Deliverable no.</b>
1	Animal welfare assessment: development of a theoretical and practical framework under organic production conditions	Mette Vaarst	1.200.000	1 <sup>st</sup> Nov 2000	1 <sup>st</sup> March 2003	
2	Prevention of coccidiosis among dairy calves	Klaus Lønne Ingvarsen	1.300.000	1 <sup>st</sup> September 2001	1 <sup>st</sup> March 2004	
3	Veterinary homeopathy: development of research model and in-practice pilot studies	Mette Vaarst	500.000	1 <sup>st</sup> May 2001	1 <sup>st</sup> Jan. 2003	

**Table 2: Description of work packages**

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

Work package number: 1

Starting date or starting event: 1<sup>st</sup> Nov 2000

Responsible persons: Mette Vaarst

Contributing persons: Mette Vaarst, Christine Fossing, Stig Milan Thamsborg, persons from WP2 (Charlotte Maddox Christensen, Klaus Lønne Ingvarsen, 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 guide lines 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 <sup>st</sup> Sep. 2001
Responsible person:	K.L. Ingvarsen
Contributing persons:	E.M.Vestergaard, C.M.Christensen, 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 Eimerial coccidiosis in organic farms and how to prevent the disease in calves.

Specific goals are:

- To identify causal factors important for the development of Eimerial coccidiosis and their potential importance in organic farming systems
- To investigate the influence of selected nutritional, management and/or environmental factors on susceptibility to Eimerial coccidiosis.
- To develop methods for non-medical prevention and control of Eimerial 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
- 1) 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.
  - 2) 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.
  - 3) 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 (depending 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.

- 1) 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 bloodsamples, 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: 1<sup>st</sup> May 2001

Responsible persons: Mette Vaarst

Contributing persons: Christine Fossing, 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 homeopathy
- 2) Establish a team of international experts in veterinary homeopathy
- 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 homeopaths will be included.
- 3) A small number of Danish veterinarians have completed an internationally certified post-graduate education in veterinary homeopathy, 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 homeopathically 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. Homeopathy 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 homeopathy.  
**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 homeopathic 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 to a concept of research in homeopathy.

## 7. Implementation and time schedule

**Table 3: Deliverables list**

Deliverable no.	Deliverable title	Delivery date	Meeting	Nature
D1	Workshop 1: development of theoretical framework for the understanding of animal welfare.	May 2001		Re
D2	'Up-dating role and status of veterinary homeopathy in Danish dairy farming'	June 2001		Pro-na
D3	Workshop, homeopathy experts panel. Models for clinical research in veterinary homeopathy	Aug 2001		Pro-in
D4	'Aspects of animal welfare under organic production condition'	Sep 2001		Pu
D6	Coccidiosis – a review on causal factors of potential importance for the development of coccidiosis in organic farms. Discussions in a calf expert panel ('synthesis of knowledge' process): focus on how coccidiosis is affected by nutrition, housing and management. Confirming project plans in wp 2 & 3. Contributing to welfare assessment manual.	Oct. 2001		Re + Pu
D7	International expert panel: the understanding of animal welfare in organic agriculture	Jan 2002		Re + pu + pro-in
D8	Manual for welfare assessment	Oct. 2002		Re
D9	'Welfare assessment: theoretical and practical framework' (based on workshop mentioned above)	Dec. 2002		Pu
D10	Workshop: Welfare assessment among dairy calves;	Jan 2003		Re + pu +

	presentation of welfare assessment model and evaluation of different organic herds			pro-na + pro-in
D11	Homeopathic treatment: pilot studies presented and published	Feb. 2003		Re + pu + pup
D12	Prevention of coccidiosis in organic farms	Sep 2004		Pro-in + Pu + pup
D13	Meeting for organic farmers and advisors	Oct. 2004		Pro-na

Pu: International publication in books and journals

Re: Reports

Pro-na: Proceedings at national conferences

Pro-in: Proceedings or abstract at international meeting or conference

Pup: Popular paper

## 8. Collaborative partners

The project is expected to be carried out with close contact to two on-going projects about 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 expects beneficial co-work and connections to the international EU-network: 'Network on Animal health and Welfare in Organic Agriculture' (NAHWOA), in which Mette Vaarst and Stig Milan Thamsborg are partners. This network has participants from all over Europe.

Close contact is established to national as well as international groups of veterinary homoeopaths, through former project activities.

Activities in work package 1 are expected to be carried out in close contact with Hugo Fjelsted Alrøe from Research Centre for Organic Farming (DARCOF).

## 9. Budget for participating institutions

The budget for the whole project: 3.000.000 D.kr.

### TOTAL FOR THE WHOLE PROJECT:

<b>Year:</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Total</b>
Months:						
Scientific:	<b>1</b>	<b>11</b>	<b>17</b>	<b>5</b>	<b>3</b>	<b>37</b>
Technical:	<b>0</b>	<b>7</b>	<b>6</b>	<b>3</b>	<b>0</b>	<b>16</b>

<b>Year:</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Total</b>
Salary:						
Scientific:	<b>38000</b>	<b>438900</b>	<b>712215</b>	<b>219948</b>	<b>138568</b>	<b>1543640</b>
Technical:	<b>0</b>	<b>178605</b>	<b>160745</b>	<b>84391</b>	<b>0</b>	<b>423740</b>
Operation	<b>20000</b>	<b>163870</b>	<b>239890</b>	<b>94870</b>	<b>10000</b>	<b>532620</b>
Equipment	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Other (specified)	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<i>Direct costs</i>	<b>58000</b>	<b>781375</b>	<b>1112846</b>	<b>399210</b>	<b>148568</b>	<b>2500000</b>
<b>Overhead</b> (20% of direct costs)	<b>11600</b>	<b>156275</b>	<b>222570</b>	<b>79842</b>	<b>29714</b>	<b>500000</b>
<b>Total</b>	<b>69600</b>	<b>937650</b>	<b>1335419</b>	<b>479052</b>	<b>178281</b>	<b>3000000</b>

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### PART BUDGETS FOR EACH PARTICIPATING INSTITUTION

**Institution: DIAS, Department for Animal Health and Welfare, Section for Immunology and Production Disease, focus ruminants**

<b>Year:</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Total</b>
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Months:						
Scientific:	0	3	4	3	2	11
Technical:	0	3	2	3	0	8

<b>Year:</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Total</b>
Salary:						
Scientific:	0	119700	167580	131969	92378	469733
Technical:	0	76545	53582	84391	0	214517
Operation	0	32000	59400	37000	0	138400
Equipment	0	0	0	0	0	0
Other (specified)	0	0	0	0	0	0
<i>Direct costs</i>	0	228245	290562	253360	92378	864545
<b>Overhead</b> (20% of direct costs)	0	45649	58112	50672	18476	172909
<b>Total</b>	0	273894	348674	304032	110854	1037454

**Institution: DIAS, Department for Animal Health and Welfare, Section for Animal Welfare  
Evaluation, Disease Control and Health Economics**

<b>Year:</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Total</b>
Months:						
Scientific:	<b>1</b>	<b>5</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>17</b>
Technical:	<b>0</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>8</b>

<b>Year:</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Total</b>
Salary:						
Scientific:	<b>38000</b>	<b>199500</b>	<b>418950</b>	<b>43990</b>	<b>0</b>	<b>700440</b>
Technical:	<b>0</b>	<b>102060</b>	<b>107163</b>	<b>0</b>	<b>0</b>	<b>209223</b>
Operation	<b>20000</b>	<b>80000</b>	<b>66010</b>	<b>21000</b>	<b>0</b>	<b>187010</b>
Equipment	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Other (specified)	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<i>Direct costs</i>	<b>58000</b>	<b>381556</b>	<b>592123</b>	<b>64990</b>	<b>0</b>	<b>1096673</b>
<b>Overhead</b> (20% of direct costs)	<b>11600</b>	<b>76316</b>	<b>118425</b>	<b>12998</b>	<b>0</b>	<b>219335</b>
<b>Total</b>	<b>69600</b>	<b>457872</b>	<b>710548</b>	<b>77988</b>	<b>0</b>	<b>1316007</b>

**Institution: Danish Veterinary Laboratory**

<b>Year:</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Total</b>
Months:						
Scientific:	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>3</b>
Technical:	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

<b>Year:</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Total</b>
Salary:						
Scientific:	<b>0</b>	<b>39900</b>	<b>41895</b>	<b>0</b>	<b>46189</b>	<b>127984</b>
Technical:	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Operation	<b>0</b>	<b>36870</b>	<b>89480</b>	<b>36870</b>	<b>10000</b>	<b>173220</b>
Equipment	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Other (specified)	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<i>Direct costs</i>	<b>0</b>	<b>76770</b>	<b>131375</b>	<b>36870</b>	<b>56189</b>	<b>301204</b>
<b>Overhead</b> (20% of direct costs)	<b>0</b>	<b>15354</b>	<b>26275</b>	<b>7374</b>	<b>11238</b>	<b>60241</b>
<b>Total</b>	<b>0</b>	<b>92124</b>	<b>157650</b>	<b>44244</b>	<b>67427</b>	<b>361445</b>

**Institution: The Royal Veterinary and Agricultural University**

<b>År:</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Total</b>
Månedsværk						
VIP:	<b>0</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>5</b>
TAP:	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

<b>Year:</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Total</b>
Salary:						
Scientific:	<b>0</b>	<b>79800</b>	<b>125685</b>	<b>0</b>	<b>0</b>	<b>205485</b>
Technical:	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Operation	<b>0</b>	<b>15000</b>	<b>15000</b>	<b>0</b>	<b>0</b>	<b>30000</b>
Equipment	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Other (specified)	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<i>Direct costs</i>	<b>0</b>	<b>94800</b>	<b>140685</b>	<b>0</b>	<b>0</b>	<b>235485</b>
<b>Overhead</b> (20% of direct costs)	<b>0</b>	<b>18960</b>	<b>28137</b>	<b>0</b>	<b>0</b>	<b>47097</b>
<b>Total</b>	<b>0</b>	<b>113760</b>	<b>168822</b>	<b>0</b>	<b>0</b>	<b>282582</b>

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