



Annual Status Report 2001 and Application for Continuation in 2002

For research projects financed by grants from
The Directorate for Food, Fisheries and Agro Business
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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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5. Contact persons

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7. Start of project: 1. November 2000

End of project: 1. November 2004

8. Annual report/Application for continuation in 2002

A. Objectives and expected achievements (from application)

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.

B. Project summary (from application)

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 num-

ber 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.

Table 1: Work package list (from application)

(for additional information: see enclosed English appendix to application)

Work package no.	Work package title	Project participants*)	Budget	Start	End**)
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
2	Prevention of coccidiosis among dairy calves	<u>Klaus Lønne Ingvarsen</u> , Charlotte Maddox-Hyttel, Ellen-Margrethe Vestergaard, Birthe Marie Damgaard	1.300.000	1 st September 2001	1 st March 2004
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

*)Responsible participants are underlined. All project participants take part in decisions and discussions within all work packages through regular project meetings.

***) Publication and dissemination of results during autumn 2004. Project activities are expected to be conducted until the dates given in this overview.

Progress

C.1 Annual description (resume) of main results and conclusions

WP 1: Animal welfare assessment

A theoretical framework for initial recordings has been elaborated and published.

WP 2: Coccidiosis

An initial survey has been made in late housing season 2001 with regard to coccidiosis. Coccidia are found in all herds in various numbers and of various species. Based on these results it is found relevant and necessary to have a phase with intensified observational recordings on calf disease and housing conditions. New criteria for the choice of herds for detailed recordings and later intervention have been made.

WP 3: Veterinary homoeopathy

No results to report so far.

C.2 Fulfilment of tasks and deadlines in individual work packages

(To be completed for each work package)

WP number and title	Time schedule according to application	Deviations, if any*
Tasks connected to WP1 & WP 2 Animal welfare assessment studies will be carried out in 16-20 herds. The herds participating in coccidiosis studies will be included in this group in order to create a common project herd basis for both work packages. Recordings in dairy herds with focus on the group of calves was coordinated and initiated in November 2000 in collaboration with Lisbeth Mogensen (Department of Agricultural Systems, DIAS) and Bea Nielsen (RVAU) in order to investigate the spectrum of different housing systems and management factors. The initial herd visit to a number of herds participating in this project was made in February 2001.	To be initiated Nov. 2001	No.
Tasks specifically connected to WP1: Theoretical framework for understanding animal welfare in calves has been discussed in a publication, which is accepted for publication 2001 (Vaarst et al 2001). Participation in a publication with Hugo Fjelsted Alrøe as main author is also supporting the theoretical development of animal welfare understanding (Alrøe et al. 2001). A new publication is currently being made on the link between practical animal welfare assessment and theoretical understanding of animal welfare (see D). Recordings on animal welfare based on the four categories 'Naturalness', 'Harmony', 'Human care-taking' and 'Freedom of choice' is being planned, focusing on milk-fed calves.	To be initiated Nov. 2001.	No.
Tasks specifically connected to WP2: An initial survey in 25 Danish dairy herds (calf group) is completed, and the results will be published nationally and together with a literature review about coccidiosis in calves. The project activities in this work package were originally planned to start in September 2001, which was done by literature survey and description of results from the initial survey	To be initiated Sep. 2001	No.

Tasks specifically connected to WP3: An initial literature up-date on research possibilities for veterinary homoeopathy is currently being elaborated. A Ph.D. student, Christine Fossing, is engaged and expected to start November 2001. First meeting with panel of Danish veterinarians has taken place.	To be initiated May 2001	Ph.D. study will be initiated Nov. 2001
Deliverables		
(see enclosed list of deliverables including new dates; deviations are discussed in C.3)		
Milestones		
(see enclosed work package descriptions. No deviations are expected, compared to application)		

* *Deviations are to be further discussed at C3*

C.3 Discussion on the progress, incl. deviations and achievements in the project as a whole and in the individual work packages

The project started in the end of year 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 relevant in the period early March till June 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).

The Ph.D. study was originally planned earlier, which was not possible due to administration and the current job of the applicant, which should be finished first.

Expert panels in veterinary homoeopathy and animal welfare are found to be more relevant to convene in spring and early summer 2002 instead of originally 2001. This is because the discussions of expert panels should be based on concrete data in order to create a more consistent practice-theory-iterative process.

In work package 2, more weight will be put on initiating the collaboration with the herds with observational activities, in order to describe health status and risk factors more coherently. Focus is still on coccidiosis, 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.

No activities are cancelled, and delays are due to practical circumstances and not regarded as having substantial impact on the course of the project. An up-dated version of the list of deliverables is enclosed as appendix 2.

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

WP 1: Animal welfare

Based on theoretical considerations, which are described in publications (Vaarst et al. 2001 (see E1) & Alrøe, H.F., Vaarst, M. & Kristensen, E.S. 2001. Does Organic Farming Face Distinctive Livestock Welfare Issues? – A Conceptual Analysis. (In press. Journal of Agricultural and Environmental Ethics), which were finished during 2001, the first parameters in the animal welfare recordings are identified. Based on these initial recordings on animal welfare (within the four categories 'Naturalness', 'Harmony', 'Human care-taking' and 'Freedom of choice'), an expert panel discussion is expected to take place in late spring 2002. It is regarded as most convenient to combine practical recordings with theoretical elaboration of the animal welfare understanding. Based on this + results from recordings carried through until then, summer recordings are planned for the summer 2002.

WP2: Coccidiosis

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

An initial literature review including results from the initial survey in 25 organic Danish herds is under completion. During winter and early spring 2002, recordings and samples will be collected in 5-6 selected herds. Focus will be primarily on coccidiosis, but it is regarded as relevant and necessary to describe aspects of calf diseases on a broader basis. During the summer 2002, results will be analysed, and intervention will be planned in collaboration with the farmers.

WP3: Veterinary homoeopathy

Ph.D. student Christine Fossing will start her Ph.D. study from 1st November 2001. Contact has been made to a number of veterinarians, and the first meeting among these veterinarians will be late November 2001, where clinical descriptions of mastitis will be practically exercised, discussed and coordinated based on the results of this meeting.

A literature update is initiated. It focuses primarily on research methodology, which means that human homoeopathic studies are very much in focus. Contact has been made to the Danish authorities administering clinical trials, and a considerable work with regard to have a clinical trial registered is foreseen.

In November – connected to the 5th meeting of the international Network on Animal Health and Welfare – a group discussion on research methodology will take place. Based on this, the expert panel discussion will be coordinated.

E. Project publications

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. (Accepted for publication, Journal of Agricultural and Environmental Ethics).

F. Scientific education (ph.d. and post doc.), including visiting scientists and visits abroad

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 planned to be a part of this Ph.D. study.

G. National and international co-operation

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 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. A Scandinavian Network on research in veterinary homoeopathy includes discussions about possibilities for clinical trials in dairy cattle, from which this project benefits.

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

H. Possible elaboration of project and achieved results

(see enclosed application including English appendix)

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 Ingvartsen, 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 st Sep. 2001
Responsible person:	K.L. Ingvarsten
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.
 - 4) 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: 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 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.

Appendix 2: Adjusted list of deliverables

Deliverable no.	Deliverable title	Delivery date	Nature
D1	Workshop 1: development of theoretical framework for the understanding of animal welfare.	March 2002	Re
D2	'Up-dating role and status of veterinary homeopathy in Danish dairy farming'	February 2002	Pro-na
D3	Workshop, homeopathy experts panel. Models for clinical research in veterinary homeopathy (initial group discussion Nov. 2001, where key points are formulated).	Nov. 2001 + May 2002	Pro-in
D4	'Aspects of animal welfare under organic production condition'	Dec. 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.	Dec. 2001	Re + Pu
D7	International expert panel: the understanding of animal welfare in organic agriculture	June 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; presentation of welfare assessment model and evaluation of different organic herds	Jan 2003	Re + pu + pro-na + pro-in
D11	Homeopathic treatment: pilot studies presented and published	Oct. 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

