



JOINT FAO/IAEA DIVISION
OF NUCLEAR TECHNIQUES IN FOOD AND
AGRICULTURE
INTERNATIONAL ATOMIC ENERGY AGENCY
FOOD AND AGRICULTURE ORGANIZATION OF THE
UNITED NATIONS



**Co-ordinated Research Project on “Integrated Approach for Improving
Small Scale Market Oriented Dairy Systems”
(D3.10.23)**

**REPORT ON
FOURTH RESEARCH CO-ORDINATION MEETING**

4-8 December 2006

Edinburgh, United Kingdom

Introduction

The FAO/IAEA Co-ordinated Research Project (CRP) on “Integrated Approach for Improving Small Scale Market Oriented Dairy Systems” (D3.10.23) was initiated in October 2001, with the award of ten Research Contracts, four Research Agreements and one Technical Contract. The first Research Co-ordination Meeting (RCM) was held at IAEA, Vienna, Austria from 8 to 12 April 2002, the second RCM in Asunción, Paraguay from 21 to 25 July 2003 and the third RCM at the Kwalata Game Ranch in Pretoria, South Africa.

Fourth Research Co-ordination Meeting

The fourth RCM The meeting was organized and hosted by the Easter Bush Veterinary Centre of the University of Edinburgh in Roslin, Midlothian, United Kingdom and held from 4 to 8 December 2006. It was attended by nine of the ten Research Contract (RC) holders (the RC holder from Venezuela had suffered an illness immediately prior to the meeting), all four Research Agreement (RA) holders and two IAEA consultants holder. The local organizer was Dr. David Whitaker, the RA holder from the UK. The meeting was conducted by the IAEA Project Officer (PO, Dr. Paul Boettcher). The meeting agenda is given in **Annex 1** and the list of participants in **Annex 2**.

The objectives of the meeting were to:

- (a) review recent results of interventions performed by each contract holder since the last RCM,
- (b) assess the economic impact of the interventions applied,
- (c) summarize major achievements,
- (d) develop individual work plans for the long-term sustainability of the project activities,
- (e) to begin preparation of final manuscripts, and
- (f) make conclusions and recommendations.

Before the meeting, the RC holders were requested to prepare a written report and an oral presentation containing the results from their work. The RA and the consultants were requested to prepare a review or technical paper, in line with the specific expertise for which they were invited to participate in the CRP, to serve as resource materials and guidelines for specific activities in the work plans of RC holders.

The opening address was presented by the Chief Guest, Professor Ronnie Soutar, Head of the school’s Veterinary Clinical Sciences Division. Paul Boettcher presented the background of the CRP and the IAEA’s activities in animal production in general and then the objectives of the meeting.

The scientific programme of the meeting included presentations, discussion, group work, and a field visit. This was followed by presentations by each of the attending RC, summarizing the work done since the third RCM in South Africa in 2005 and, in particular, giving estimates of the economic impacts of the interventions applied by their cooperating farmers. Then the RA and consultants presented reports on a topic of their choice relevant to the CRP. A general discussion of the different presentations was then undertaken and the final programme for the rest of the meeting was defined. The next stage of the meeting consisted of individual consultation sessions between each AC and their two RC.

A field visit was made at the halfway point of the meeting. All participants were taken to three local farms: a small-holder breeder of the indigenous Scottish Highland cattle, the Langhill Dairy and Veterinary Research Farm and a mid-sized commercial dairy.

The meeting recommenced on the fourth day with presentations by RA that summarized the main achievements of their respective RC. Based on the progress made by the various RC, a set of conclusions and recommendations was drafted. Among the issues considered were the focus and schedule for future work and sustainability of activities, including potential sources of future funding; a plan for publication of results and possible topics for future CRP. The remainder of the day was occupied with discussions between RC and RA about future plans and preparation of final reports.

To open the final day of the meeting each RC was required to present their plans (formulated with the consultation of RA) for activities beyond the close of the CRP. Time was available for the discussion of each plan, to help insure that the work planned by each RC will be achievable. In addition, general plans for evaluating the impact of interventions made and for ensuring sustainability of the interventions after the conclusion of the CRP were discussed. Following these discussions, a set of overall conclusions was drawn up and recommendations were finalized. Possible topics for a new CRP were discussed and a general recommendation to support similar CRP was agreed upon. The meeting was closed with thanks to the local organizer.

Finally, the conclusions and recommendations given below were presented and adopted. The meeting was closed with Drs. Paul Boettcher and Oswin Perera thanking the host institute, local organizer and all participants.

Conclusions

1. The holistic principles of the CRP have resulted in increased interdisciplinary participation and cooperation. This led to greater capacity for integrated research on dairy production systems.
1. The CRP has resulted in the application of economically sound and socially acceptable approaches and guidelines for better livestock management. No negative impacts on animal welfare or the environment were observed.
1. All counterparts completed a Participatory Rural Appraisal and an Economic Opportunity Survey to determine the constraints and to set goals and targets to achieve greater economic returns in their respective farming systems.
1. The counterparts tested selected interventions designed to address some of the most economically important constraints and evaluated their biological and financial effectiveness.
1. The project activities created new opportunities for interaction between scientists and stakeholders, increasing the uptake and sustained application of results, improving farm productivity and the livelihood of small scale dairy farmers.
1. The project enabled the development and dissemination of methodologies and knowledge through farmer education, demonstrations, group discussions, exchange visits, publications and related information sources.
1. A particular benefit of the participatory aspect of the project was enhanced farmer empowerment, which should result in greater sustainability.
1. The project has developed tools for field managers and development agencies to: (a) determine production constraints of market oriented dairy systems; (b) identify appropriate enabling technologies; and (c) monitor the outcome through partial budget analyses.
1. Increasing milk production per cow was recognized by all counterparts as the greatest opportunity for improvement of farm income. Low production was observed to be due to the combined effects of deficiencies in nutrition, management, health, and reproduction.

Recommendations

1. The project activities should continue within the respective countries and should be expanded to other farmers.
1. Funding from local sources should be explored and mechanisms for full or partial cost recovery from farmers should be introduced.
1. Education on effective farming skills and management should be part of outreach programmes in each country.
1. Participatory approaches should be implemented in Agency-supported projects designed to improve farm productivity.

1. Holistic and multi-disciplinary approaches should be applied to address issues in dairy production systems and agriculture in general.
1. The EOS and partial budgeting should be used as simple, robust, and easy-to-understand approaches for economic analysis of dairy production systems.
1. The LIMA database software was identified as a valuable tool for management of dairy production data and is recommended for use by scientists and farmers in other member States. The software should be translated into other languages, depending on demand from project counterparts. The Animal Production and Health Section should promote on their website the use of LIMA and distribute the software and manual to interested parties.
1. It is strongly recommended that, based on the success of this CRP, the Agency initiate a new CRP on further methods to improve market-oriented dairy systems in developing countries.
1. The following issues have been identified through this CRP and should be considered for incorporation in such a CRP:
 - the interaction between nutrition and reproduction
 - appropriate forage production, conservation and utilization
 - improved methods for animal identification and recording
 - improvement of milk and meat quality
 - measurement of and monitoring of various metabolites and hormones involved in animal production
 - efficient utilization of reproductive technologies
1. Manuscripts regarding the final phase of the CRP should be prepared with the goal of presenting them for publication as a special issue of a scientific journal.
1. The drafts of manuscripts should be submitted to Agreement Holders by March 1st 2007. The approved manuscripts should be forwarded to the IAEA by May 1st 2007.

Follow-up

The meeting report is also available on the Website of the Animal Production and Health Section of the Joint FAO/IAEA Division at:
(<http://www.iaea.org/programmes/nafa/d3/index.html>)

Annex 1

JOINT FAO/IAEA DIVISION
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**Co-ordinated Research Project on “Integrated Approach for
Improving Small Scale Market Oriented Dairy Systems”
(D3.10.23)**

Fourth Research Co-ordination Meeting

4-8 December 2006

Edinburgh, Scotland

PROGRAMME

Monday, 4 December

- 09.15 - 10.00 **Opening:**
- Welcome: *Prof. David Whitaker, RCM Organizer*
 - Overview of the Co-ordinated Research Project, objectives of the meeting and expected outputs - *Dr. Paul Boettcher, IAEA Technical Officer, Vienna and Dr. B.M.A.O. Perera, Consultant, Kandy, Sri Lanka*
 - Opening Address by Chief Guest: *Dr. Ronnie Soutar, Head of Veterinary Clinical Sciences, Easter Bush Veterinary Centre*
- 10.00 - 11.00 Coffee/Tea
- Session I: Presentations by Contract Holders**
Chairperson: Dr. C. Devendra
- 11.00 - 12.00 An on farm productivity veterinary service for small holders' dairy farmers in Bangladesh – *M. Shamsuddin, J. Bhattacharjee, W. J. Goodger, H. Momont, M.M.U. Bhuyian, T. Bennett, M. Shahjalal, J. Reed, G. Frank, M. Akhteruzzaman*
- 12.00 - 13.30 Lunch
- 13.30 - 14.00 On farm investigation and on farm testing of proven technologies with selected smallholder dairy farms in Sri Lanka - *H. Abeygunawardena, P.G.A. Pushpakumara, I.S. Abeygunawardena, R. Kaluphana, I. Perera, W. Gamage*
- 14.00 - 14.30 Improving Productivity in Small Scale Dairy Systems in Paraguay - *N. Ferreira, J. Cattoni, M. T. Benitez, C. Caceres*
- 14.30 - 15.00 Improvement Of Small Dairy Producers In The Central Coast Of Peru - *Carlos A. Gómez, I. Salazar, E. Heredia, I. Saldaña, M. Fernández*
- 15.00 - 15.30 An integrated approach for improving small-scale market orientated dairy systems in the North West Province of South Africa - *L. Prozesky, C.M.E.*

McCrinkle, P.J. Sebei

- 15.30 - 16.00 Coffee/Tea
Session I: Presentations by Contract Holders
(Contd.) *Chairperson: Dr. D. Cavestany*
- 16.00 - 16.30 Interventions and partial budgeting on small-holder market oriented dairy farms in peri-urban areas in north eastern coast region of Tanzania. *B.M. Kessy; R. Nkya; Z.C.Lyimo; B.S.J. Msangi; F.Turuka; and K. Mtenga*
- 16.30 – 17.00 Small scale dairy systems in Cameroon: Characterization and impact of interventions - *P.H. Bayemi, M.J. Bryant, D. Cavestany, B.M.A.O. Perera, J. Mbanya, V. Munji, D Pingpoh, H Imele, D Whitaker, V Tanya, M Ngo Lihep, P Naoussi, J Awoh, H Njakoi, A Ngoucheme*
- 17.00 – 17.30 Improving small scale market oriented dairy systems in Tunisia - *J. Rekhis, N. Slimane, A. Ben Younes, A. Mzah, F. Saaidani, M. Laamour, K. Khlif, S. Jelliti*
- 17.30 – 18.00 Integrated Overview - *C. Devendra*

Tuesday, 5 December

Session I: Presentations by Contract Holders
(Contd.) *Chairperson: Dr. D. Cavestany*

- 09.00 – 09.30 Integrated Approach for Improving Small Scale Market Oriented Dairy Systems in Pakistan: Economic impact of interventions - *Abdul Ghaffar*

Session II: Presentations by Agreement Holders
Chairperson: Dr. B.M.A.O. Perera

- 09.30 - 10.30 The Use of Metabolic Profiles in Dairy Cows in the UK - *D. Whitaker*
- 10:30 – 11:00 Coffee/Tea
- 11.00 – 12.15 Using Partial Budgets to assess if the interventions you implemented make more money than they cost - *W.J.Goodger, G. Frank, C. Eisele, M. Shamsuddin and T. Bennett*
- 12.15 - 13.30 Lunch

Session II: Presentations by Agreement Holders
(Contd.) *Chairperson: Dr. D. Whitaker*

- 13.30 - 14.15 Database applications in livestock research - *M. Garcia*
- 14.15 – 15.00 Evaluating Reproductive Efficiency. What is going wrong, and why? - *D. Cavestany*
- 15.00 - 15.30 General Discussion and Update on Revised Meeting Programme
- 15.30 - 16.00 Coffee/Tea

- 16.00 - 17.30 Individual discussions between Contract Holders and Agreement Holders
- 20.30 – 22.30 Individual discussions continued...

Wednesday, 6 December

- 08.00 - 18.00 **Field Visits:**
- Visits to three farms
 - Local sites of general interest
- 19.30 – 23.00 Dinner at local restaurant

Thursday, 7 December

Session III: Review of Plans for Future Sustainability of Project Activities

Chairperson: Dr. M. Garcia

- 09.00 - 10.30 Review of progress and summary of achievements – Agreement Holders
(approx. 15 minutes each)
- 10.30 - 10.50 Coffee/Tea
- 10.50 - 12.00 Formulation of Conclusions and Recommendations
- Current status
 - Focus and schedule for future work
 - Publication (s)
 - Potential sources of future funding
- 12.00 - 13.30 Lunch
- 13.30 - 15.30 Individual consultations between Contract and Agreement Holders to edit final reports
- 15.30 - 16.00 Coffee/Tea
- 16.00 - 17.30 Individual Consultations continued
- 20.30 – 22.30 Individual discussions continued

Friday, 8 December

Session IV: Presentation of Work Plans, Conclusions and Recommendations

Chairperson: Dr. W. Goodger

- 09.00 - 10.30 Presentations by Contract Holders (each of 5 min + 5 min discussion)
- 10.30 - 10.50 Coffee/Tea

10.50 – 11.30	Presentation and finalization of conclusions and recommendations
11.30 – 12.00	Continuation of Individual discussion
12.00 – 13.30	Lunch
13.30 to 14.30	Continuation of Individual discussion
14.30 – 15.00	Submission of electronic documents to Scientific Secretary
15.00	Closure of meeting

Annex 2

FAO/IAEA Co-ordinated Research Project on “Integrated Approach for Improving Small Scale Market Oriented Dairy Systems”

Fourth Research Coordination Meeting

List of Participants

	Name	Address	Contact Info	RC Number
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Annex 3

FAO/IAEA Co-ordinated Research Project on “Integrated Approach for Improving Small Scale Market Oriented Dairy Systems”

Fourth Research Coordination Meeting

Summary of Progress and Achievements

Country	Investigations	Interventions	Economics	Linkages	Other
BGD	Feed, production, nutritional balance, mastitis, vet service delivery	Training, reproductive management (Field Fertility Clinic), udder health, nutrition, vet services, training	Yes	BGD Milk co-op, Dept Livestock Services, AI service, banks, in-campus project	Database, farmer training manual, breeding calendar, Veterinarian association
CMR	Recording system, nutrition, progesterone monitoring	Training, feeding package, Health and AI service	Yes	Dairy farmers Co-op, veterinarians, NGOs	Review of dairying in CMR, publications
PAR	Ovarian activity in heifers, return to estrus in cows	Training, nutritional supplementation and sanitation, hormone treatments an timed AI	Yes	JICA Dairy Project, Vet Faculty, Extension Service, Dairy Association	LIMA (LF), recording on notebook (SF)
PAK	Trace mineral supplementation, progesterone monitoring	Vaccination, de-worming, teat dipping, reproductive management (33)	Yes	Livestock Department, field veterinarians, NGOs	Recording on notebook

Country	Investigations	Interventions	Economics	Linkages	Other
PER	Testing for diseases, nutrition, record keeping	Training, concentrate feed supplementation, mastitis control	Yes	Ministry of Agriculture, NGOs	Student projects, extension leaflets, identification of farmer leaders
SAF	Feeding, mastitis control	Training, record keeping, business plan, nutrition, mentoring by commercial farmers	Yes	NW Province Farmers, Regional Laboratory, Veterinary Services	Milk quality improved, student research, identified Japanese radish as good forage resource
SRL	Uterine infections and mastitis, incidence of pathogens, ABST	Training, treatment protocols for uterine infections, teat dip and dry cow therapy, fertility clinics, record keeping	No	National Livestock Development Board, Dept Animal Prod & Health, field veterinarians, NGO	LIMA (Large farms), conference presentations, training in yogurt production
TUN	Nutrition, training on reproduction, management, CMT, record keeping	Nutrition, reproductive management, health control (mastitis and vaccinations), milk marketing	Yes	Govt Extension Service, field veterinarians, milk collecting centre	Recording form, student research, follow-up PRA after the CRP
URT	Nutrition, testing for diseases	Training, record keeping, mastitis concentrate feeding, vaccination	Yes	Govt extension services, Livestock Research Institute	Training leaflets, publications