



XA0100373

INIS-XA--330



Animal Production and Health Newsletter

JOINT FAO/IAEA DIVISION OF ISOTOPE AND RADIATION APPLICATIONS
OF ATOMIC ENERGY FOR FOOD AND AGRICULTURAL DEVELOPMENT
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA

No.5

January 1987

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Dear Colleague,

1986 has been a year in which 4 Research Coordination Meetings, an International Symposium and 2 Training Courses have been held under the auspices of the Joint FAO/IAEA Division. These events have brought together around 300 scientists from developing and developed countries each with a basic interest in problems related to animal nutrition, reproduction and/or health. When it is considered that in addition to these meetings, our normal day-to-day operation of Coordinated Research and Technical Cooperation programmes brings us into regular contact with some 150 scientists working in over 50 different Member States of FAO and IAEA, then it can readily be appreciated that our network is both large and truly international. More important than the scale, however, is the quality of the work being supported by the Division and its potential for improving animal productivity. One measure of the output of the research we support is the number of reports from FAO/IAEA programmes published in the international scientific press and in national journals. We are now collecting data on this aspect of our programme and hope to provide accurate information in due course. However, what we and many others have noted, is that the quality of the material prepared for publication by our collaborators from developing countries at the termination of Coordinated Research Programmes and for our Symposium last March was extremely high, and naturally we hope this trend will continue. We have also noted that institutes which have been strengthened through their participation in the research, training and development programmes of the Section are themselves providing training for scientists and technical support for those from other institutions in the same or different countries. This we feel is a very solid achievement which we hope to be able to expand upon in the future.

One of the biggest problems we face in our efforts to support animal production and health research in developing countries is the "turnover" of people with whom we collaborate. This turnover arises not so much because our collaborators leave or change their institutes or country of work, but because we ourselves do not have funds to support indefinitely particular institutes, scientists or lines of research. In fact, the vast majority of our programmes run for periods of 3-5 years, after which they are terminated and we seek new proposals for work under new programmes provided we have the funds. In many cases these "new" programmes seek to continue work along a particular theme which was initiated under a previous programme, while in other cases they embody a completely different type of effort, e.g. the programmes which have now begun on disease diagnostics with Swedish and Dutch funding. In 1987, for instance, there will be a substantial turnover of participants in Coordinated Research Programmes, in that support to some 35 Contract holders working on animal parasitology and on animal nutrition/reproduction in the Mediterranean and North African regions will be discontinued. At the same time, however, about 50 institutes will start to receive financial and other support under new programmes for work on disease diagnostics and animal reproduction, and provided funds can be found from the Agency's own budget, support for up to a further 15 institutes will be provided to work in the field of animal nutrition under our feeding strategies programme. We are, of course, sorry that we are not in a position to continue the CRPs on parasitology and Mediterranean/North African animal production. Nevertheless, we know that through other activities we will continue to be closely associated with many of the institutes/scientists involved in these programmes, and in any case we firmly believe in trying to assist different people working in other disciplines and institutes, and who are trying to develop and apply new methods for problem solving.

On the staff side, 1987 will be quite a bit different from 1986. First of all, Wyn Richards has moved over to the job of Technical Officer held for the last 3 years by Lars Edqvist, and Wyn's former position of Regional Expert for Latin America has been filled by Dr. Edward Mather, who is Professor of Large Animal Clinical Sciences at Michigan State University. We

are particularly pleased to announce Ed's arrival in the Section, not only because of his technical talents and experience but because the Government of the United States kindly agreed to support this position. We in the Section would like to acknowledge this generous support, which will allow us to continue in 1987 the strong technical back-stopping of our projects in Central and South America which was possible during 1985 and 1986. There are 3 other newcomers to the Section. To strengthen and expand our disease diagnostics activities, Martyn Jeggo will be assisted by Ms. Doris Rothauer who is a veterinarian from the University of Milan in Italy and has worked extensively on the development of ELISA tests for viral diseases, and by Mr. C. Ooijen who is also a veterinarian (from the Netherlands) and who has been doing field diagnostic work in Zambia for the past 5 years. We are also being joined by Mr. J. Plaizier who has a degree in agricultural science from the University of Wageningen in the Netherlands and has worked on the use of RIA and ELISA methods for measuring reproductive hormones.

With the establishment of new programmes in the Section on disease diagnostics, and the focus of many of our activities in 1987 and thereafter being on Africa, these new staff members (not to mention the "old hands"), are sure to have plenty to do in the months and years ahead! However, despite these developments and the growth which has taken place in the Section over the past few months, we are determined in 1987 to keep you as up-to-date with our activities as is humanly possible. If, however, we slip up from time to time, let us know, because it's only through constant feedback from our readers and collaborators that we can provide an efficient and meaningful service.

From all of us in the Section, all the best for 1987.

James D. Dargie
Noble Jayasuriya
Martyn Jeggo
Stefan Oschmann
Wyn Richards

(A) PAST EVENTS

- (1) Second Research Coordination Meeting on "Regional Network for Improving the Reproductive Management of Meat and Milk Producing Livestock in Latin America with the Aid of Radioimmunoassay Techniques", San José, Costa Rica, 3-7 November 1986.

Eighteen research contractors and two research agreement holders as well as a representative from FAO, a consultant from the University of Michigan and six observers from the University of Costa Rica attended the meeting. The quality of research work pursued during the last two years was generally of a very high standard as was that of the verbal and written presentations. Individual work plans for the next 18 months were drawn up, discussed and agreed upon as were the requirements of individual research workers within the group for equipment, RIA kits, etc. for 1987. Local administrative organisation by members of staff of CATIE, Turrialba and the Faculty of Veterinary Medicine, National University of Costa Rica, Heredia was excellent and we would like to take this opportunity to express our appreciation. The third and final RCM will be held in 1988 although the venue has yet to be decided. Provisional plans were made as to the form of the final publication and individuals, divided into groups according to animal production system, were asked to write literature surveys on the information available in their respective fields in Latin America.

Interim Programme Achievements

The programme is now well established and working satisfactorily. In the majority of cases contract holders have been able to work effectively and those with initiative and drive have made considerable progress. All contracts now have at least a minimum laboratory set-up and equipment to pursue RIA; in 1987, all contractors will be in receipt of FAO/IAEA kits for blood/milk progesterone assay - over 120,000 assay units have already been ordered. It is also encouraging that the majority of contractors now perform their research work on typical farms or in the field situation; most have now defined the reproductive efficiency of livestock maintained on the farms and many have identified the factors responsible for the poor fertility: nutrition (especially lack of dry season feed) and poor livestock management (especially inability to detect oestrus) are the major constraints reported to date. The influence of disease is generally not as important, and where it occurs is exacerbated by poor nutrition and the environment.

Recommendations

(i) To accommodate the five new members of the CRP who joined subsequent to the 1st RCM in November 1984, the general goal and guidelines outlined then are reiterated. Briefly, the goal of the project is to develop practical management systems based primarily on locally available resources, and the adaptation of technology to suit local conditions, to improve the reproductive efficiency of milk, meat and fibre producing livestock belonging to small holders in the region. It is suggested that these objectives should be achieved by identifying typical animal production units, preferably on commercial farms in two or more topographical regions within the country. The research work should be performed in three phases: (i) definition of the current reproductive efficiency of the livestock; (ii) determination of the major causes of reproductive failure or inefficiency, and (iii) on-farm testing of practical solutions.

(ii) Contractors should be encouraged to concentrate their effort on defining and resolving the field problem and not on designing/developing their own assay techniques in RIA. The basic reason for designing the FAO/IAEA

progesterone kits was to supply Agency-supported research scientists with an appropriate modern technology which could be used immediately in research studies on animal reproduction, and which would give research workers confidence in their analytical work by providing a quality control service.

(iii) Now that a number of research contractors are planning experiments to resolve on-farm fertility problems, consideration should be given to the economic benefit, technical requirements and extra managerial inputs required to achieve those aims using tentative solutions. Whereas it is important that these new techniques should be performed on farms, it cannot be expected that farmers will allow their herds to be divided into several treatment groups; comparison of treatment effect within herds between years should therefore be accepted despite the weak statistical basis. Excepting vast changes in environmental/disease effects between years, a positive or other influence of treatment should nevertheless be detectable.

(iv) Attention is drawn to three aspects of radiation protection which concern research workers within the programme: protection of personnel, control of radioactive contamination and waste disposal. Specific advice relating to these aspects appears on pp. 42-56 of the Laboratory Training Manual on Radioimmunoassay in Animal Reproduction, Technical Reports Series No. 233 published by the IAEA. Research workers are reminded that they should comply with the advice given as far as feasible; they are also advised to contact their National Atomic Energy Commission on specific national regulations in radiation protection and/or the national coordinator of the ARCAL I project.

(2) FAO/IAEA (ARCAL III*) Training Course on the Use of Radioimmunoassay Techniques in Animal Reproduction, Universidad Central de Venezuela (UCV), Maracay, Venezuela, 15 September - 3 October 1986.

The purpose of this course, which was held at the Institute of Animal Reproduction and Artificial Insemination, Faculty of Veterinary Medicine, UCV, was to provide basic training for research scientists in radioimmunoassay and its application for improving the reproductive efficiency of ruminant livestock in the region. Forty-six applications were received by the closing date and sixteen participants from thirteen countries were selected.

A feature of this course was its heavy reliance on cost-free regional personnel to act as course tutors; four such experienced scientists from four Latin American countries were selected to work with two FAO/IAEA staff members. Class work was conducted in Spanish and consisted of lectures in radiological protection, nuclear instrumentation, reproductive physiology and the influence of management, nutrition, the environment and disease on reproduction. However, over half of the course time was spent on practical "hands-on" work in the laboratory where effort was concentrated on learning the FAO/IAEA-developed solid-phase (coated-tube) assay for progesterone in milk and blood and on collection, processing and storage techniques. The course work was supplemented by evening seminars on the research results of local and visiting research scientists, field trips to the livestock experimental stations of the Faculties of Agronomy and Veterinary Science of UCV, a poster session on the factors affecting the measurement of progesterone in milk and blood, and, most popular of all, a display of recent (1985/1986) publications in animal reproduction to which the participants were given access to read and/or photocopy. The course was both technically and socially

*) ARCAL - Arreglos Regionales Cooperativos - para la Promoción de la Ciencia y la Tecnología Nucleares en América Latina - Proyecto III (Regional Cooperative Arrangements for the Promotion of Nuclear Science & Technology in Latin America - Project III)

successful, largely because of the blend of participants (8 men and 8 women) all of whom are actively involved in existing Research Contract or Technical Cooperation Projects and who maintained their interest and enthusiasm throughout the 3-week course. A further reason was the stimulating atmosphere created by the teaching staff. Moreover, the ability of the FAO/IAEA kit to produce rapid and reliable results enabled the participants to investigate the influence of variations in collection and processing techniques on progesterone concentration, and present, interpret and discuss the results.

Finally, although the participants returned home exhausted, we are satisfied that they did so having fully understood RIA coated-tube technology, stimulated to pursue further research work in animal reproduction and happy to have made many friends of common interest and understanding (both on and off the dance floor!).

We are grateful to the local coordinators from UCV for their help in making the course such a happy and successful one.

Participants

<u>Name</u>	<u>Country</u>
J. Mestre	Argentina
O. Ohashi	Brazil
E. Hoffman	Brazil
J.F. Cox	Chile
J.A. Montoya	Colombia
M. de Garcia	Colombia
E. Perez	Cuba
M. de Artiga	El Salvador
J. Miranda	Guatemala
C. Murcia	Mexico
O. Calderón	Panama
C. Jimenez	Paraguay
H. Cardenas	Peru
T. Alonso	Uruguay
G. de Sosa	Venezuela
B. Quintero	Venezuela

Lecturers

<u>Lecturers</u>	<u>Country/Organisation</u>
W. Richards	FAO/IAEA (Course-Director)
A. Sebastianelli	FAO/IAEA
S. Lopez-Barbella	Venezuela (local Coordinator)
J. Correa	Chile
R. Taylor	Costa Rica
N. Carou	Argentina
M. de Reyes	Venezuela (Demonstrator)
T. Diaz	Venezuela (- " -)
N. Martinez	Venezuela (- " -)

(3) FAO/IAEA Regional Training Course on the Use of Radio- and Enzyme Immunoassay Techniques for Studies on Animal Reproduction and Disease Diagnosis, Nairobi, Kenya, 3-28 November 1986.

The Course attracted 108 applications from the African Region of which regrettably only 30 were successful due to restrictions of space (and finance!). In fact, such was the demand for the training being offered, that the Agency has already decided to fund another in 1987 on the same topics for the African region and we are currently negotiating on the place and time. These will be announced in the next edition of the Newsletter. The Nairobi Course was unique in two respects - firstly, it was the first ever organized by the Joint Division on animal disease diagnosis; and secondly, it was the first time we have run a Course at three locations, i.e. at the University of Nairobi for those following the reproduction component and at the Kenya Agricultural Research Institute (KARI) and the International Laboratory for Research on Animal Diseases (ILRAD) for those being trained on diagnostic methods. Both "experiments" proved to be successful in that it appears from the two Co-Directors from FAO/IAEA (Drs. Oschmann and Jeggo), that not only did each disciplinary component run smoothly, but the two groups somehow also managed to develop a strong sense of interaction. Of course, at the end of the day, the success or otherwise of all such events depends on the trainees themselves, the instructors, and the local staff who help with the organisation. In this case, the trainees worked hard, developed an excellent rapport with the instructors, and most important of all - we had quite outstanding counterparts in Prof. S. Gombe and Drs. D. Kariuki, J. Lenahan and V. Nantulya. To these people as well as the other instructors and the students listed below, the staff of the IAEA and FAO offer their sincere thanks. Let's hope the next one is as good!

Participants

<u>Name</u>	<u>Country/Organisation</u>
G. Boukambou-Bemba	Congo
A.N. Elias	Egypt
T. Kassa	Ethiopia
S. A. Osei	Ghana
G. Cecchini	ILCA
J.Ogaa	Kenya
M. Mariuki	Kenya
J.D. Fannieh	Liberia
L.A. Kamwanja	Malawi
O. Adeyomo	Nigeria
P.M. Dawuda	Nigeria
M. Mbaye	Senegal
A.E. Khalafalla	Sudan
N.T. Mekki	Sudan
N.L. Kanuya	Tanzania
D.B. Akplogan	Benin
A. Kanwe	Burkina Faso
G. Ntahompagaze	Burundi
C.J. Ooijen	FAO, Zambia
Mr. G.A. Opoku-Pare	Ghana
R.M. Rumbera	Kenya
I. Onyagno	Kenya
O. Diall	Mali
J.C. Plaizier	FAO/IAEA
R.A. Joshua	Nigeria
T.K. Adenowo	Nigeria
A.H. Dini	Somalia
E.A. Elamin	Sudan

W.D. Semuguruka
J. Nyangi
P.M. Muyoyeta
L. Ng'ambi

Tanzania
Tanzania
Zambia
Zambia

Lecturers/Demonstrators

J.R. Crowther	United Kingdom
L.-E. Edqvist	Sweden
R.E. Eley	Kenya
S. Gombe	Kenya
I. Gumm	Kenya (ODA)
B. Hurvell	Sweden
M.H. Jeggo	FAO/IAEA
B. Klingeborn	Sweden
J.M. Maclean	United Kingdom
D. Makawati	Kenya
H. Meyer	Federal Republic of Germany
J. Moreno-Lopez	Sweden
M. Munya	Kenya
V.M. Nantulya	ILRAD
S. Oschmann	FAO/IAEA
E.O. Oyedipe	Nigeria
P. Rossiter	Kenya (ODA)
H. Schwarz	Federal Republic of Germany
H. Smith	United Kingdom
W.P. Taylor	FAO
J. Wafula	Kenya
H. Wagner	FAO

(B) STATUS OF COORDINATED RESEARCH PROGRAMMES

(1) Use of Nuclear Techniques in the Study and Control of Parasitic Diseases of Farm Animals.

We plan to hold the final RCM of this programme in Vienna from 11-15 May 1987 and subsequently to publish the results.

(2) Application of Radioimmunoassay to Improving the Reproductive Efficiency and Productivity of Large Ruminants.

This programme has 13 Contractors and 4 Agreement holders and therefore no further awards can be considered. The final RCM will be held in 1988.

(3) Improving the Productivity of Sheep and Goats with the Aid of Nuclear Techniques.

No further awards can be considered for this programme which has 12 Contractors and 5 Agreement holders. The 2nd RCM is being arranged for 23-27 February 1987 at the Universiti Pertanian, Selangor, Malaysia, and all participants have been informed.

(4) Optimizing Grazing Animal Productivity in the Mediterranean and North African Regions with the Aid of Nuclear Techniques.

This programme also has a full complement of Contract and Agreement holders; the final RCM will be held from 23-27 March 1987 at King Hassan II University, Rabat, Morocco. Thereafter, the results will be published.

(5) Regional Network for Improving the Reproductive Management of Meat and Milk-producing Livestock in Latin America with the Aid of Radioimmunoassay Techniques.

This programme currently has 20 Contractors and 4 Agreement holders, and we are not seeking further proposals. The final RCM will be held in 1988.

(6) Use of Nuclear Techniques to Improve Domestic Buffalo Production in Asia - Phase II.

In this programme 15 Contracts and 6 Agreements have been awarded and we are not seeking any further proposals. The 2nd RCM will be held in September or October 1987, probably in Sri Lanka. All participants will be informed in due course of the detailed arrangements.

(7) Improving the Diagnosis and Control of Infectious and Parasitic Diseases of Livestock in Developing Countries with the Aid of Radioimmunoassay and Related Techniques.

As mentioned in the previous edition of the Newsletter, the establishment of this programme has been made possible by funds generously provided by the Swedish International Development Authority (SIDA). We have now awarded Research Contracts to some 20 institutes in developing countries and Research Agreements to 5 institutes in developed countries. Since we hope to be in a position to award a further 5 Contracts specifically to African institutes represented at the disease component of the FAO/IAEA Training Course in Nairobi, we are not seeking any further proposals. The First RCM, which will be followed by a Training Workshop, will be held in Uppsala, Sweden, in May 1987.

PARTICIPANTS IN SIDA/FAO/IAEA COORDINATED RESEARCH PROGRAMME ON ANIMAL DISEASE DIAGNOSIS USING IMMUNOASSAY TECHNIQUES.

<u>Investigator's Name and Institute</u>	<u>Disease/ Title of Project</u>
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RESEARCH CONTRACTS

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|--|---|
| 1. Dr. A. Düzgün
Lalahan Nuclear Research
Institute in Animal Health
Dept. of Parasitology
Ankara,
TURKEY | <u>Babesia</u>
Comparative diagnostic
studies of <u>Babesia bovis</u>
and <u>B. ovis</u> by ELISA and IFA
in cattle and sheep in
Anatolia. |
| 2. Dr. S.D. Waghela
Veterinary Research Laboratory
Dept. of Bacteriology
P.O. Kabete,
KENYA | <u>CCPP</u>
Development of an ELISA for
the diagnosis of contagious
caprine pleuropneumonia
(CCPP) and its use in sero-
epidemiological surveys. |

Investigator's Name and Institute	Disease/ Title of Project
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RESEARCH CONTRACTS

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| <p>3. Dr. J.S. Wafula
Kenya Agricultural Research
Institute
Veterinary Research Dept.
P.O.Box 32
Kikuyu,
KENYA</p> | <p><u>Rinderpest</u>
Assessment of the suitability of solid-phase enzyme immunoassay tests for the diagnosis of rinderpest and peste des petits ruminants.</p> |
| <p>4. Dr. G. Opoku-Pare
Ministry of Agriculture
Dept. of Veterinary Services
Veterinary Laboratory
Accra,
P.O.Box M. 161
GHANA</p> | <p><u>Rinderpest</u>
Use of enzyme immunoassay (EIA) for monitoring effectiveness of rinderpest vaccination and comparative evaluation with immunodiffusion test.</p> |
| <p>5. Dr. U. Minga
Faculty of Veterinary Medicine
Sokoine University of
Agriculture
Dept. of Veterinary Microbiology & Parasitology
P.O.Box 3019
Morogoro,
TANZANIA</p> | <p><u>Salmonella</u>
Study of the prevalence of Salmonella infection in cattle and chickens in Morogoro using culture and ELISA methods.</p> |
| <p>6. Dr. P. Muyoyeta
Central Veterinary Research
Institute (C.V.R.I.)
P.O.Box 33980
Lusaka,
ZAMBIA</p> | <p><u>Brucellosis</u>
Serological survey and epidemiology of brucellosis in Zambia.</p> |
| <p>7. Dr. G.D. Ezeokoli
Ahmadu Bello University
Dept. Veterinary Surgery &
Medicine
Zaria,
NIGERIA</p> | <p><u>Rinderpest</u>
Surveillance and seromonitoring for rinderpest virus in Nigerian cattle.</p> |
| <p>8. Dr. T.U. Obi
University of Ibadan
Dept. of Veterinary Medicine
Ibadan,
NIGERIA</p> | <p><u>Rinderpest</u>
The application of the enzyme-linked immunosorbent assay to the diagnosis and post-vaccination surveillance of rinderpest and peste des petits ruminant virus infections in Nigeria.</p> |
| <p>9. Dr. I. Sendow
Balai Penelitian Veteriner
(Balivet)
Virology Department
P.O.Box 52
Bogor,
INDONESIA</p> | <p><u>Arbovirus</u>
An epidemiological study of Arbovirus infections of Indonesian livestock using enzyme immunoassay (EIA) techniques.</p> |

Investigator's Name and Institute	Disease/ Title of Project
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RESEARCH CONTRACTS

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| <p>10. Dr. A. Kunavongkrit
Faculty of Veterinary Science
Chulalongkorn University
Bangkok, 10500
THAILAND</p> | <p><u>Aujeszky</u>
Diagnosis of Aujeszky's
disease in swine: Comparison
of specific DNA probe and
ELISA methods.</p> |
| <p>11. Dr. J.N. Gomez
Centro Nacional de Sanidad
Agropecuaria
Carretera de Papaste y Auto-
pista
Nacional Apartado 10, San José
La Habana,
CUBA</p> | <p><u>Leucosis</u>
Investigation and
diagnosis of bovine
leucosis.</p> |
| <p>12. Dr. J.A. Pérez-Martinez
Facultad de Medicina
Veterinaria y Zootecnia
Departamento de Bacteriologia
Universidad Nacional Autonoma
Mexico, 04510, D.F.
MEXICO</p> | <p><u>Chlamydia</u>
Prevalence of Chlamy-
dia-specific antibodies in
cattle experiencing infer-
tility and abortion, deter-
mined by an indirect ELISA.</p> |
| <p>13. Dr. O.C. Marino
Instituto Colombiano Agrope-
cuario (ICA)
Laboratorio de Investigaciones
Medicas Veterinarias (LIMV)
Division de Disciplinas
Pecuarias
Bogota,
COLOMBIA</p> | <p><u>Brucella</u>
The use of ELISA (enzyme-
linked immunosorbent assay)
for evaluating antibodies to
the outer membrane proteins
(OMP) of <u>B. abortus</u> in
naturally infected bovines.</p> |
| <p>14. Dr. E. Nosetto
Institute of Virology
Faculty of Veterinary Sciences
CC 296 - 60 y 118
1900 La Plata,
ARGENTINA</p> | <p><u>Aujeszky</u>
Aujeszky's disease in Argen-
tinian swine: a study of
enzyme-linked immunosorbent
assay (ELISA) and immuno-
peroxidase techniques.</p> |
| <p>15. Dr. J. Gonzalez Tome
Instituto Nacional de Tecno-
logia Agropecuaria
Dept. of Bacteriology
C.C. 77 Moron - Buenos Aires,
ARGENTINA</p> | <p><u>Brucella</u>
Enzyme immunoassay: Appli-
cation to the detection of
bovine antibody to <u>Brucella</u>
<u>abortus</u>.</p> |
| <p>16. Dr. I. N. de Kantor
Pan American Zoonoses Center
(CEPANZO)
Casilla 3092 - Correo Central
1000 Buenos Aires,
ARGENTINA</p> | <p><u>Tuberculosis</u>
The enzyme-linked immuno-
sorbent assay for IgG anti-
body to <u>M. bovis</u> antigens in
cattle sera as a diagnostic
test for tuberculosis
infection.</p> |

Investigator's Name and Institute	Disease/ Title of Project
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RESEARCH CONTRACTS

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|---|--|
| <p>17. Dr. R.M. Martins,
Instituto de Pesquisas
Veterinarias "Desiderio
Finamor"
Caixa Postal, 2076
90.000 Porto Alegre/R.S
BRAZIL</p> | <p><u>IBR</u>
Infectious bovine rhino-
tracheitis: application of
ELISA for improved diagnosis
and control of disease.</p> |
| <p>18. Dr. C. Jimenez
Escuela de Medicina Veteri-
naria
Universidad Nacional
Apartado 86
Heredia,
COSTA RICA</p> | <p><u>Leucosis</u>
Serological diagnosis of
enzootic bovine leucosis
in Costa Rica using RIA and
ELISA methods.</p> |
| <p>19. J.A.M. Hammer
Departamento de Clinicas
Facultad de Medicina Veterin-
aria y Zootecnia
Universidad de San Carlos
Guatemala,
GUATEMALA</p> | <p><u>Leptospirosis</u>
Investigations on the
usefulness of ELISA
for the serodiagnosis of
leptospirosis in dual-
purpose cattle.</p> |
| <p>20. Dr. H. Cardoza
Centro de Investigaciones
Veterinarias
"Miguel C. Rubino"
Departamento de Parasitologia
Casilla de Correo No. 6577
Pando,
URUGUAY</p> | <p><u>Babesia</u>
Evaluation of new
techniques for the dia-
gnosis of haemoparasitic
infections transmitted by
<u>Boophilus microplus</u>.</p> |

Investigator's Name and Institute	Disease/ Title of Project
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RESEARCH AGREEMENTS

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| <p>Dr. J. R. Crowther
Animal Virus Research Institute
Dept. of Virus Diagnosis
Ash Road
Pirbright, Woking, Surrey GU24 0NF,
UNITED KINGDOM</p> | <p>Application of immuno-
assay techniques for im-
proved diagnosis and control
of infectious diseases of
livestock.</p> |
| <p>Dr. J. Moreno-Lopez
Biomedical Center
Dept. of Veterinary Medicine
Section of Virology
Box 585
S-751 23 Uppsala,
SWEDEN</p> | <p>Development of rapid
methods for the diagnosis
of animal viral diseases.</p> |

RESEARCH AGREEMENTS

Dr. B. Hurvell
National Veterinary Institute
Department of Bacteriology
Box 7073
S-750 07 Uppsala,
Sweden

Development of diagnostic methods
(ELISA and related techniques) for
bacterial and mycoplasmal infections.

Dr. R.H. Jacobson
130 Diagnostic Laboratory
N.Y.S. College of Veterinary
Medicine
Cornell University
Ithaca, New York 14853,
USA

Evaluation of enzyme-immunoassays
for serodiagnosis of infectious
diseases.

(8) Development of Feeding Strategies for Improving Ruminant Productivity
in Areas of Fluctuating Nutrient Supply through the Use of Nuclear and
Related Techniques.

The background, aims and scope of this programme were announced in the previous edition of the Newsletter. We have already received many applications for Contracts but since a final decision on the suitability of these will not be made until May 1987, further proposals may be sent up until that time. For new readers, the scope and goals of this programme are as follows:

(a) Nutritive Value of forages and crop residues

In many areas of the world the nutritive value of locally available roughages and other feedstuffs is still inadequately known. An important component of the evaluation of nutritive value of forages is the animal production response. This may be examined initially by determining forage digestibility but ultimately it is related to the quantity and type of nutrients released upon digestion. This applies both to the rate and extent of degradation of fibre and protein in the rumen, the supply of protein, lipids and carbohydrates to the small intestine and to the mineral content of the forage. There is also evidence to show that straw from different varieties of cereals varies greatly in nutritive value and that such characteristics are not related to quality and yield of grain. Under this category work should focus particularly on:

- the determination of the rate and extent of degradation of locally available feeds and by-products together with crude protein and mineral content;
- the development of new methods of evaluating nutritive value of fibrous roughages;
- the investigation of the extent to which straw or stover from different varieties vary in nutritive value and the causes of such variation e.g. leaf/stem ratio.

(b) Feeding strategies:

In many areas of the world with fluctuating nutrient supplies (wet or dry seasons) animals are offered for sale at the end of the good seasons when prices are depressed and meat storage facilities inadequate. Similarly milk yields in lactating cows are depressed when nutrient supplies are decreasing.

Manipulation of the use of body reserves and level of nutrition by supplementation are management tools that could be used for achieving production targets. Recent work also suggests that it may^f be possible to use internal fat stores for maintenance, growth and lactation. Within this framework particular emphasis should therefore be given to studies aimed at:

- utilizing body tissue reserves for meeting production requirements (e.g. reproduction, draught power) during times of nutritional inadequacy. (Survival during times of drought is a particular case of this more general need).

Under this category likely areas of research would be:

- to investigate whether milk yield and reproductive rate can be maintained when lactating animals are given low quality roughages only but supplemented with undegraded protein. Quantifying the protein degradability characteristics of locally available plant proteins (eg. leguminous forages and tree leaves) and by-products as defined in 8(a) may need to be done in conjunction with supplementation trials.
- to determine whether by supplementation with undegraded protein, fat cattle at the end of the rainy season can be made to maintain weight or gain weight under conditions of feeding which supply considerably less than maintenance.
- to investigate the possible interactions between draught power, milk yield and reproduction in animals given low quality roughages.

and

- supplementation (e.g. rumen soluble N and S, protein, carbohydrates, lipid, macro and trace minerals) of basal roughage diets at the ruminal and post ruminal level and to increase nutrient supply for targeted production improvements.

Under this category the following are recommended as priority areas for attention:

Assessment of the importance of mineral deficiencies/toxicities as determinants of existing levels of production through diagnostic procedures and responses in the components of productivity in supplementation trials.

Establishment of comparative differences between species/breeds/strains of ruminants in the intake and digestibility of feeds and responsiveness to different supplementation and other dietary treatments. It may be important to study factors such as rumen fill, motility and turnover rates of solid digesta components and their metabolic consequences in the host animal.

Development of methods of efficiently and effectively supplying protein, carbohydrate and lipid through the processing of existing sources and identification of new alternative sources, and evaluating the response in terms of a relevant component of productivity.

(9) Immunoassay Techniques to Improve Reproductive Efficiency and Health Status of Indigenous African Livestock.

As mentioned in the previous edition of the Newsletter, the implementation of this programme has been made possible through the generous support of the Directorate General for International Cooperation of the Ministry of Foreign Affairs in the Netherlands. The current situation with respect to this programme is that we have already received a large number of good proposals for contracts and expect more subsequent to the FAO/IAEA Regional Training Course on reproduction and disease diagnostics in Nairobi. We will however consider further proposals up until the beginning of May and hope to have the programme fully operational by mid 1987. For new readers a brief description of this programme is given below.

Scientific Scope and Proposed Programme Goals:

The programme will be of a multidisciplinary nature, directed towards obtaining the basic technical information which can subsequently be used to institute low-cost management changes which will increase the productivity of livestock in the African Region. Particular emphasis will be placed on the application of immunoassay techniques (RIA and ELISA), to monitor reproductive efficiency of indigenous breeds of livestock and the role of vector-borne diseases as constraints on such efficiency.

The following topics will have priority for study:

- (i) Documentation of the reproductive performance of indigenous breeds of livestock at the small farm level.
- (ii) Examination of management practices aiming at reducing the age to puberty and the interval between parturition and onset of sexual function.
- (iii) Conducting comparative studies on the usefulness of modern immunoassay methods and longer established methods for diagnosing vector-borne diseases of livestock, particularly trypanosomiasis.
- (iv) Application of clinical and laboratory diagnostic methods to determine the impact of disease on the reproductive efficiency of livestock.

(C) PUBLICATIONS

(1) Nuclear and Related Techniques in Animal Production and Health

This publication represents the contributions made by the invited speakers and those who presented posters at the FAO/IAEA Symposium held in Vienna in March 1986 on the Use of Nuclear and Related Techniques in Studies of Animal Production and Health in Different Environments. It is available from the Division of Publications, IAEA; price: Austrian Shillings 1,420.-- or equivalent paid in convertible currency or UNESCO coupons. Full details of the content of this book were given in a previous edition of the Newsletter.

(2) World Animal Review

We are pleased to announce that all our Research Contractors and counterparts of Technical Cooperation projects are now being sent this journal free of charge. World Animal Review is published quarterly by FAO and reviews developments in animal production and health and animal products. It contains interesting and invariably practical articles written by staff of the Animal Production and Health Division of FAO, specialized FAO field staff and

scientists working in research institutes. It also contains a valuable "Publications Section" which gives brief descriptions of new publications by FAO and others in the area of animal production and health, and a "News and Notes" Section describing forthcoming training courses, meetings, etc. The Editor of World Animal Review is Dr. C.B. Coulson who has indicated his interest in receiving potential articles for publication from readers of our Newsletter. Dr. Coulson can be contacted at: Animal Production and Health Division, FAO, Via delle Terme di Caracalla, I-00100 Rome, Italy.

(3) How to Obtain Support for Animal Science Projects in Developing Countries from the Joint FAO/IAEA Division.

The original edition of this popular brochure went out of print some months ago and an up-dated version has been prepared. We have therefore included a copy of the new version with this edition of the Newsletter.

(4) Isotope-aided Studies on Non-Protein Nitrogen and Agro-industrial By-products Utilization by Ruminants with Particular Reference to Developing Countries, V.I.C., Vienna, 25-26 March 1986. (in press)

The results conducted under a 5-year Coordinated Research Programme of the same name are now being prepared for publication and hopefully this publication will be available for distribution by the time the next edition of the Newsletter is distributed.

(D) DEVELOPMENTS AT THE SECTION'S LABORATORY UNIT, SEIBERSDORF

The Nutrition Laboratory continued the evaluation of fibrous agricultural residues for their fermentation characteristics using the Rumen Simulation Technique. Four more new evaluations have been completed bringing the total number of evaluations to 25 residue samples.

One major emphasis during the last six months, however, has been on feed formulation using high fibre base material. The successful demonstration of the value of Rusitec as a technique for evaluating fibrous residues led us in to this new venture of formulating and testing new diets for the benefit of our research contractors in developing countries. As an example, we can briefly cite a series of experiments carried out with the tree fodder Erythrina lithosperma for a contractor in Sri Lanka, whereby attempts were made to incorporate these leaves into a rice straw based diet. From data obtained using Rusitec and the simulated nylon bag technique, it appears that optimum rumen function is possible when Erythrina is incorporated into a 4% urea-ammonia treated straw diet. Supply of fermentable nitrogen in the form of urea (to provide a rumen ammonia concentration of up to 200 mg/l) had little effect on improving the utilization of the straw/Erythrina (80:20) diet. Similarly attempts were also made to optimize the utilization of barley straw by supplementing with Azolla sp. (A. caroliniana in this case) as a source of nitrogen. Detailed information on these and other feed evaluations is now available from the Section and those interested are requested to write to Dr. Jayasuriya.

We would welcome the supply of new feed materials/potential supplements for initial screening and for formulating new diets. Screening diets in the Rusitec can reduce research time significantly while enabling the researcher to gather additional data on rumen fermentation patterns and end products of fermentation.

In the Animal Reproduction laboratory, work has continued on the production, supply and further refinement of the FAO/IAEA RIA kit for progesterone in milk and blood. During the course of the year over 700,000 assay units were sent to FAO/IAEA-supported research projects; close to 2 million assay units have already been ordered for 1987. These kits will be available in three forms: (i) a standard 100-tube kit containing all the components necessary to analyse 42 samples in duplicate and which will be available to scientists embarking on their research work; (ii) a "Jumbo Kit" containing all liquid and lyophilised reagents (but excluding the ^{125}I progesterone), necessary for 1,000 assay tubes; and (iii) a "Bulk Supply" of solid and lyophilised reagents (buffers, detergent, antibody, standards and internal QC's) and tubes which will be sufficient for approximately one year's work. The radioactive progesterone will be supplied directly in minimum quantities of $10/\mu\text{Ci}$. If you have not already given us your requirements for progesterone kits for 1987, please do so immediately by telex using the code system indicated on page 17 of the June 1986 Newsletter. Development of the assay technique has concentrated on simplification and time reduction. We have achieved this largely by modifying the tube coating procedure and updated assay protocols are now available in English and Spanish. Those scientists who have been in regular receipt of FAO/IAEA kits, will also be supplied with external QC samples in early 1987. They will be expected to place the QC samples in a normal assay run and report the results back to Vienna on the forms provided. The results obtained by individual laboratories will be relayed back to them as a specific point on a normal distribution curve so that they may be able to see how their results compare with the average.

The laboratory has completed most of its studies on the influence of milk and blood collection procedures, processing and preservation techniques on measurement of the progesterone content of samples using the FAO/IAEA kit. This information is available on request. Finally, it may be of interest to note that we are about to embark on a collaborative research project on the development of an ELISA kit for progesterone assay in collaboration with Drs. D. van de Wiel (Netherlands), H. Meyer (FRG) and E. Bamberg (Austria).

In the Disease Diagnostic Laboratory most effort is currently going into procuring the necessary equipment, chemicals, etc., and in contacting various laboratories world-wide about their willingness to provide us with antigens, and positive and negative sera. We are also in the process of procuring commercially-available kits for diagnosing a number of infections and hope in the future to be able to conduct comparisons of the suitability of such kits for use under the conditions existing in developing countries.

As far as training is concerned, in 1986 we had 4 trainees (from Brazil, Ghana (2) and Indonesia) to learn nutritional and RIA methods and in general these trainees were with us for periods ranging from 3-6 months. However, on the basis of current information, 1987 promises to be somewhat more busy.

(E) FORTHCOMING EVENTS

- (1) Second FAO/IAEA Research Coordination Meeting on "Improving Sheep and Goat Productivity with the Aid of Nuclear Techniques", Serdang, Selangor, Malaysia, 23-27 February 1987.
- (2) FAO/IAEA (ARCAL III) Seminar for Latin America for Improving the Reproductive Efficiency and Health of Livestock through Radioimmunoassay & Related Techniques, Maracay, Venezuela, 2-6 March 1987.

This seminar will provide a forum to review the various ways by which nuclear and related methods can be used to study and improve animal reproduction and disease control under the different ecological conditions prevailing in Latin America. The seminar will enable animal scientists with no or limited experience of nuclear and closely related techniques to benefit from the experience gained by researchers within and outside the region in using such techniques.

The main session will be on radioisotopic and related techniques in animal reproduction and disease diagnostics. Arrangements are being made for a number of leading scientists from within and outside the region to present lectures in Spanish and lead the discussions. In addition, a number of relevant contributed papers from researchers in the region will be included in the programme.

- (3) Final FAO/IAEA Research Coordination Meeting on "Optimizing Grazing Animal Productivity in the Mediterranean and North African Regions with the Aid of Nuclear Techniques", Rabat, Morocco, 23-27 March 1987.
- (4) FAO/IAEA Interregional Training Course on "Use of Isotope-aided Techniques in Ruminant Nutrition", IAEA Laboratory, Seibersdorf near Vienna, Austria, 7 April - 8 May 1987.

This training course is open to 20 participants from developing countries of all geographical regions and the language of instruction will be English. The objective of the course is to give scientists from developing countries a good working knowledge of current nuclear techniques in ruminant nutrition and research. The course will deal briefly with the principles of radioactive isotope decay and procedures for counting beta and gamma emissions. Safety aspects of handling radioactive isotopes will be considered. An advanced lecture course on rumen functions and manipulation will be given with particular reference to the biochemistry and microbiology of the rumen, lignocellulose and protein digestion and principles of energy supply and transfer. In addition, tutorials and discussions will be held on the use of radioactive and stable isotopes in nutritional studies particularly emphasizing the use of tracers in the measurement of end products of digestion, such as volatile fatty acids and microbial biomass. Practical classes will involve work with fistulated sheep and a rumen simulator. The exercises will focus on methods of feed evaluation and the uses of radioactive and stable isotopes in assessing rumen function. Students will also have the opportunity of learning analytical techniques for feed evaluation and for measuring the end products of rumen fermentation. All participants are expected to present their data at the end of the training course as a short scientific paper.

Applicants should have at least an M.Sc. or an equivalent degree in agriculture/animal science or veterinary science and be currently involved in ruminant nutrition research. Although desirable, no previous experience in the use of radioactive isotopes is required. After the course, participants

will be expected to continue their research investigations and to use their newly acquired knowledge in the future conduct of their research programmes. As the course will be conducted in English, participants should have no difficulty in following lectures and expressing themselves in this language.

Nominations should be submitted in duplicate on the standard (yellow) IAEA application form for training courses. Completed forms should be endorsed by and returned through the official channels established (the Ministry of Foreign Affairs, the national Atomic Energy Authority, the office of the United Nations Development Programme or the Ministry of Agriculture); they should have been received by the International Atomic Energy Agency, P.O.Box 100, A-1400 Vienna, Austria, by 31 December 1986 but we can still consider nominations received up until the end of January 1987. Please note, however, that applications sent direct by individuals or by private institutions cannot be considered.

- (5) First FAO/IAEA Research Coordination Meeting and Training Workshop on "Improving the Diagnosis and Control of Infectious and Parasitic Diseases of Livestock in Developing Countries with the Aid of Radioimmunoassay and Related Techniques", Uppsala, Sweden, 4-15 May 1987.

- (6) Final FAO/IAEA Research Coordination Meeting on "Use of Nuclear Techniques in the Study and Control of Parasitic Diseases of Farm Animals", V.I.C., Vienna, Austria, 11-15 May 1987.

Animal Production and Health Newsletter

**Joint FAO/IAEA Division of Isotope and Radiation Applications
of Atomic Energy for Food and Agricultural Development
International Atomic Energy Agency
P.O.Box 100, A-1400 Vienna, Austria**

**Printed by the IAEA in Austria
January 1987**

86-06419