



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. 8

June 1988

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Dear Colleague,

As you can see from this edition of the Newsletter, the Section currently has 10 Coordinated Research Programmes involving something in the order of 160 research groups in different parts of the world. This year, two of these programmes will be completed and in 1989 a further two will terminate, each having been operational for 5 years. The completion of these programmes, all of which have a heavy bias towards studies on the reproductive efficiency of indigenous livestock, means that about half of the Research Contracts and Agreements we are currently operating will come to an end over a relatively short period. Although this may seem a precarious state of affairs, when one considers things more deeply, it is clear that the situation is not all gloom and doom!! In fact, and as we hope is also clear from the Newsletter, the Research Contract programme operated by the Section remains in a very healthy state. In the past two years for instance, and largely through funds that have been obtained from outside organisations, we have been able to start 6 new programmes and thereby provide support to over 70 developing country institutes. We have moreover been able to attract some of the best institutes in developed countries as well as established international laboratories (e.g. ILRAD) to assist with these programmes, thereby strengthening existing or opening up new international linkages. We are also actively seeking funds for new programmes and are confident that at least some of these applications will be supported in the coming year thereby enhancing further our efforts to provide research funds for scientists and institutes in developing countries. All-in-all therefore, whilst many of our programmes are now coming up to completion, even more have been recently initiated and there are good prospects that others will come on stream.

Apart from promoting turnover, the completion of a number of CRP's covering one general area of activity, provides an ideal opportunity to "take stock" - both of what has been achieved and of what should be done in the future. Participants in each of the programmes coming up for completion are now preparing the results of their work for publication and while this is never an easy (or particularly enjoyable!) task at the best of times, it does have two merits. Firstly, it stimulates the individual researcher to analyse and interpret his/her data; and secondly, it stimulates us as a Section to assess the extent to which our CRP's have attained their original goals, and equally important, to identify the gaps in knowledge which still exist. This in turn provides us with the information basis to justify continued funding of a particular activity and how this funding should be channelled. Therefore, with four of our CRP's in animal reproduction coming to a close by the middle of 1989, and having strongly supported this area of activity for the past 7 years, we now have to ask: what's been achieved?; should we continue supporting this area of activity and if so, what should be the objectives and how should we go about attaining them? In the same vein, we must review the role of our laboratory operation in supplying kits for hormone determinations and ask whether this is still appropriate and what changes if any are required to make the service more in tune with requirements and perhaps more efficient. These are substantial tasks and it's important to us that they are done both critically and objectively. With this in mind, we are bringing together a group of Consultants in September of this year to review the Joint FAO/IAEA programme in livestock reproduction and make recommendations as to its future direction.

The main points to come out of this particular review will appear in the next edition of the Newsletter. It's perhaps also worth pointing out at this juncture that a similar review will take place of our nutrition programme early in 1989 and the results of this will be made available in due course.

In conducting these reviews, and indeed in considering our programme as a whole over say the next 5 years and beyond, one topic for consideration

is so-called "biotechnology" and its possible application to and impact within developing countries. Although this Section has been promoting biotechnological research and the use of its end-products for many years, we are very aware of the fact that some of the more recent advances in molecular biology have opened up new opportunities for potential development and/or utilisation within developing countries. We are therefore examining closely the potential role of such technologies and the materials derived from them (e.g. monoclonal antibodies, DNA probes, hormones) in problem-oriented research in animal production and health in developing countries, and where appropriate, incorporating such techniques into our training and newer Coordinated Research Programmes (see description given later).

On the staff front, there have been only three changes since the last edition of the Newsletter. Bruce Murphy has now returned to his position as Head of the Reproductive Biology Unit of the University of Saskatchewan after a period of 6 months in which he assisted our laboratory programme and our collaborators in Latin America. We will certainly miss Bruce - not only because of his tremendous contribution to these activities but because of his outgoing and stimulating personality, and we both wish him well and hope that the collaboration he established between Saskatchewan and Seibersdorf will continue. Another change is that Dr. Oswin Perera joined us in March from the University of Peradeniya in Sri Lanka. Oswin will be looking after our reproduction programmes in the Asian region, and already we are seeing the benefits of his presence in the Section. Another newcomer is Marina Nadj who has joined the staff at our laboratory unit at Seibersdorf from Yugoslavia. Marina will be largely responsible for our kit supply service and for a new external quality control scheme for hormone assays which we hope to start operating later this year.

With best wishes for now,

James Dargie, Francesco Castrignanò, Noble Jayasuriya,
Martyn Jeggo, Bruce Murphy, Camille Ooijen, Kees Plaizier,
Wyn Richards, Hermann Unger

(A) PAST EVENTS

- (i) First FAO/IAEA Research Coordination Meeting on "Improving the Productivity of Indigenous African Livestock with the Aid of Radioimmunoassay and Related Techniques", Addis Ababa, Ethiopia, 7-19 March 1988.

The first Research Coordination Meeting of this programme was held at the headquarters of the International Livestock Centre for Africa (ILCA). The meeting was held jointly with an FAO/Government of Italy regional project on the "Improvement, multiplication and conservation of trypanotolerant livestock in West Africa". Twenty-five scientists from 17 African and 3 European countries together with FAO and IAEA staff attended the meeting during which work plans for the forthcoming 18 months were detailed. In a number of cases the final work plans differed significantly from the preliminary ones which testifies to the learning process that occurs during an RCM and the critical importance of experienced research agreement holders and FAO/IAEA staff in defining fully the scope of projects. Of direct relevance to livestock reproduction in Africa were the presentations of results of research completed to date by the FAO/Italy programme scientists. Both the work plans and research results emanating from this meeting have been compiled into bound reports and these have been forwarded to the participating scientists and other interested parties. A limited number of these reports is still available and may be obtained by writing to the Animal Production and Health Section.

Among the recommendations and conclusions drawn up at the meeting was the importance of ensuring that regular contact be maintained between Agreement holders and Research Contractors.

At the training workshop held during the second week of the meeting, lectures and demonstrations in French and English were given on: a systematic approach to livestock research; biostatistics; the IDEAS computer programme for data management; RIA and EIA methods for progesterone determinations; ILCA's activities; and library support.

The convening of this joint meeting at ILCA was highly successful and further conjoint meetings are planned.

- (ii) FAO/IAEA Consultants Meeting on Serosurveillance of Livestock Diseases, Vienna, 14-16 March 1988.

This meeting on epidemiological approaches to serum sampling with particular reference to the Pan African Rinderpest Campaign was held at the IAEA's headquarters. The meeting was primarily concerned with laying down serum sampling procedures for the Pan African Rinderpest Campaign although the underlying principles would be applicable to most epidemiological studies.

The main objects and aims of the meeting were:

- to establish basic principles of epidemiology which are applicable in developing countries and with particular reference to Africa;
- to establish guidelines for sampling procedures allowing for the constraints existing in developing countries;
- to establish procedures for creating serum banks and the collection and storage of data relating to this;
- to identify a suitable range of statistical tests which can be utilised for data processing within limitations of data collection in developing countries;

- to establish exact guidelines for sampling approaches for the FAO/IAEA/SIDA Coordinated Research Programme on sero-monitoring of antibodies to rinderpest to be conducted under PARC.

Consultant epidemiologists, immunologist and virologists along with representatives from FAO, EEC and SIDA attended the meeting and the end result is a booklet giving guidelines on how to carry out serum sampling, what data to collect with the samples and how to analyse the results obtained using an ELISA. This booklet is highly practical in its approach and although directed towards procedures for serum sampling to be carried out under PARC, should be of use to those scientists in developing countries carrying out epidemiological studies involving other animal diseases.

The booklet will shortly be available to those scientist receiving support through the FAO and IAEA activities and to other interested parties. The Joint Division wishes to record its appreciation to the following for their invaluable help during and subsequent to the meeting:

E. Anderson, Virologist, Pirbright Laboratory, UK; J. Anderson, Immunologist, Pirbright Laboratory, UK; B. Halpin, Epidemiologist, ODA and IBAR; B. Hurvell, National Veterinary Institute, Sweden; M. Kadomira, Rinderpest Epidemiologist, FAO; B. Klingeborn, Biomedicum Institute, Sweden; P. Lefevre, Institut d'Elevage et de Médecine Vétérinaire des Pays Tropicaux, France; P. Moorhouse, Epidemiologist, FAO; P. Rossiter, Virologist, ODA and Kenya Agricultural Research Institute; W.P. Taylor, Rinderpest Consultant, EEC; L. Tyler, Epidemiologist, Reading University, UK.

(B) STATUS OF EXISTING COORDINATED RESEARCH PROGRAMMES

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

This programme, which has 13 Contractors and 4 Agreement holders will terminate following the final RCM which will be held in Vienna from 5-9 September 1988. During this meeting the results of the 5-year programme will be presented and discussed prior to publication. A small Consultants Group meeting will be held following the meeting to draw up recommendations for the future direction of FAO/IAEA programmes in animal reproduction.

(ii) 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. We expect to hold the final RCM of this programme during the first half of 1989 and are currently negotiating a venue.

(iii) 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 3 Agreement holders, and will terminate with the final RCM which will be held in Bogota, Colombia, in September 1988. The results of the 5-year programme will be presented and discussed at this meeting and then published.

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

This programme, which currently has 14 Research Contract holders and 6 Agreement holders, will terminate at the final RCM which we hope to hold in

Australia during February 1989 in conjunction with a meeting on buffaloes being sponsored by the Australian Council for International Agricultural Research (ACIAR).

- (v) FAO/IAEA/SIDA Regional Network for Sero-Surveillance of Rinderpest in Africa.

The participants in this new programme are all staff members of the institutes which will be responsible for the sero-monitoring of Rinderpest in Africa under the EEC-funded Pan Africa Rinderpest Campaign (PARC). The programme is being operated in close liaison with FAO in Rome, and with EEC and IBAR officials in Nairobi. It is expected that the first RCM will be held in Debre Zeit, Ethiopia, in late September, 1988 and that it will include a training workshop. Full details will be made available to contract and agreement holders in due course.

- (vi) FAO/IAEA/SIDA Regional Network for Latin America on the Use of Immunoassay and Labelled DNA Probe Methods for the Diagnosis of Livestock Diseases.

This programme currently has 12 Research Contract and 2 Research Agreement holders and we are not seeking any further participants. The first Research Coordination Meeting will be held in Argentina in November 1988.

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

This programme has 16 Research Contracts and 4 Research Agreements and no further awards can be considered. The first RCM is being planned for Vienna from 13-17 March 1989 in conjunction with a Consultants Meeting on ruminant nutrition.

- (viii) Improving the Productivity of Indigenous African Livestock Using Radioimmunoassay and Related Techniques.

This Coordinated Research Programme, which is funded by the Ministry of Foreign Affairs of the Government of the Netherlands, has 16 Contracts and 2 Agreements and we are therefore not seeking any further proposals. Arrangements are being made to hold the 2nd Research Coordination Meeting during the latter half of 1989 and further details will be given in the next edition of the Newsletter.

- (ix) Improving the Diagnosis and Control of Trypanosomiasis and other Vector-borne Diseases of African Livestock Using Immunoassay Methods.

Under this programme, which is also funded by the Dutch Government and supported by the International Laboratory for Research on Animal Diseases (ILRAD), Nairobi, and the Centre for Tropical Veterinary Medicine (CTVM), Edinburgh, (UK) there are 13 Research Contracts and 2 Research Agreements. We are not seeking any further proposals.

The first RCM of the programme will be held at ILRAD from 18-23 July 1988 and will include a short Training Workshop on the handling of the reagents (e.g. monoclonal antibodies) being provided.

Below is a list of the participants:

<u>Contract Holders</u>	<u>Title of Research Project</u>
1. Dr. E.K. Adom Veterinary Laboratory Tamale, GHANA	To introduce an ELISA system for detecting trypanosomiasis in the Northern region of Ghana.
2. Dr. H. Chitambo School of Veterinary Medicine Lusaka, ZAMBIA	A diagnostic survey of trypanosomiasis in the belt of Zambia comparing ELISA, blood smear and clinical findings.
3. Dr. O. Diall Laboratory Central Vet. Bamako, MALI	The use of the ELISA test for animal trypanosomiasis diagnosis.
4. Dr. A. Diaite L.N.E.R.V. Dakar, SENEGAL	The use of the ELISA technique to determine animal trypanosomiasis prevalence in the Djakore (cross Zebu-N'dama) cattle.
5. Dr. E.G.A. Elamin Faculty of Vet. Science Khartoum North, SUDAN	<u>Trypanosoma evansi</u> infection in camels and goats: sera diagnosis by ELISA and impact on reproductive performance.
6. Dr. M.A. Farah T.T.C.P. Mogadishu, SOMALIA	Validation of the trypanosomiasis antigen detection ELISA system and application of this technique in Somalia.
7. Dr. J. Faye I.T.C. Sololo, THE GAMBIA	Development and use of an ELISA in comparative studies of trypanosomal infections in N'dama and Zebu cattle.
8. Dr. M. Kachani Institut Agronomique Vétérinaire Hassan II Rabat, MOROCCO	Development of the ELISA technique for the diagnosis of <u>T. annulata</u> theileriosis.
9. Dr. H.A. Mbwambo Animal Disease Research Laboratory Dar-es-Salaam, TANZANIA	The enzyme-linked immunosorbent (ELISA) technique as an aid to quick and accurate diagnosis of animal trypanosomiasis in Tanzania.
10. Dr. W.O. Mukani Kenya Trypanosomiasis Research Kikuyu, KENYA	Development and application of enzyme immunoassay for the diagnosis of trypanosomiasis in camels, bovines and small ruminants.
11. Dr. F.C. Munatswa Dept. of Veterinary Services Harare, ZIMBABWE	The validation of an enzyme-linked immunosorbent assay system to detect circulating trypanosomal antigen in naturally infected cattle.

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| <p>12. Dr. R.Z. Omwero-Wafula
U.T.R.O.
Tororo,
UGANDA</p> | <p>Studies on animal trypanosomiasis in areas infected with tsetse flies using enzyme-linked immunosorbent assay.</p> |
| <p>13. Dr. M.A. Samir
Animal Health Research
Institute
Cairo,
EGYPT</p> | <p>Serological diagnosis of camel trypanosomiasis: introduction of ELISA technique for diagnosis and epidemiological studies in Egypt.</p> |

Agreement holders

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| <p>1. Dr. A.G. Luckins
C.T.V.M.
Edinburgh,
UNITED KINGDOM</p> | <p>Diagnosis of trypanosome infections in livestock using immunoassay techniques.</p> |
| <p>2. Dr. V.M. Nantulya
ILRAD
Nairobi,
KENYA</p> | <p>Evaluation of antigen-detection enzyme immunoassays for the diagnosis of bovine trypanosomiasis.</p> |

(x) Strengthening Animal Reproduction Research and Disease Diagnosis in Asia through the Application of Immunoassay Techniques.

This programme has attracted a considerable number of proposals on both reproduction and diseases from many countries within the region. These are currently being evaluated and some have already been selected for funding from October 1988. The programme will be filled by the end of this year, and it is hoped to have the First Research Coordination Meeting together with a short Training Course towards the middle of 1989.

We can still consider applications in certain specific areas of high priority as outlined below, provided of course that a contract has not been already awarded in that particular field to an institute in the same country.

In the area of reproduction, emphasis will be given to evaluating reproductive performance of indigenous breeds of livestock (especially large ruminants), under traditional or village systems of management. Studies aimed at determining the effects of climate, management, nutrition and disease on reproduction in general, and the postpartum period in particular, using clinical observations combined with progesterone measurement will have high priority within the programme. The disease component of the programme will involve studies on ruminants and pigs, with emphasis on use of ELISA and DNA probe techniques for diagnostic and epidemiological studies of common diseases within Asia. Priority will be given to foot-and-mouth disease, brucellosis, haemorrhagic septicaemia, rinderpest and trypanosomiasis in large ruminants, and to swine fever and Aujeszky's disease in pigs.

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

(i) Reproduction

One of the major service functions of the RIA laboratory continues to be the production and supply of standards and quality control samples for the FAO/IAEA progesterone RIA kits. Marina Nagj has recently joined the staff and she will work exclusively on the progesterone kit supply and service scheme, viz preparation of standards and quality control samples, the implementation and evaluation of an external QC service, packaging and shipping of kits etc.

Kees Plaizier in collaboration with the Institute for Animal Production "Schoonoord" in Zeist, the Netherlands has continued his work on the validation of an RIA kit for progesterone measurement. It is envisaged that a number of selected laboratories will be asked to test out the FAO/IAEA RIA kits for milk progesterone towards the latter half of this year. Beata Rogovic recently travelled to "Schoonoord" to attend a training course in RIA and to discuss details related to kit validation.

Recent R+D efforts have concentrated on the development of a solid phase assay (RIA and EIA) based on the use of monoclonal antibodies against progesterone. One of the antibodies tested shows tremendous potential; the results of the present studies on the antibody's stability are of critical importance. Apart from the regular staff members involved in this work, two Fellowship Trainees - Maria de Carreira (Portugal) and Alex Yiga (Uganda) have made very useful contributions.

Future directions proposed for the laboratory are to initiate the external QC service (end of July 1988), maintain the supply of RIA kits for progesterone and validate progesterone kits for other species, including equids and camelids. An initiative to establish and validate protein hormone assays is anticipated, but this will not be decided before discussion with Consultants in September.

(ii) Disease Diagnosis

The last six months has seen the development of the disease diagnosis component of our laboratory activities into a number of new areas and a consolidation of previous activities.

The main thrust still continues to be the development and distribution of ELISA kits for support of work in disease diagnosis. We produce kits at present for five diseases; Rinderpest, Infectious Bovine Rhinotracheitis (IBR), Brucellosis, Babesiosis, Aujeszky's disease; we also produce a general antiovine kit. All these kits have been distributed to various scientists in developing countries and we are getting feed back on their performance in the field. We would like to thank all those scientists who have written to us with information on the kits and how they have performed. This information is invaluable to us and based on this we are now in the process of amending and up-dating the kits and their protocols.

In the case of the rinderpest ELISA kit which is to be used throughout the Pan African Rinderpest Campaign a major update has been completed with a new manual and several major alterations. This kit is issued at present to some 17 countries and a further review of the kit's performance will be undertaken in 12 months time.

The IBR, Babesiosis and Aujeszky's disease kits all have up-dated manuals although no major changes have been made to the kits themselves. The Brucellosis kit is at present being carefully evaluated. This kit will be used in several national Brucella eradication campaigns and we have not yet decided on its final composition. Major evaluations are being carried out in

Egypt, Argentina and Indonesia. Based on the results of these we will be issuing an updated version of the kit in the coming months.

We are also now collaborating with LLRAD and the CTVM (UK) on kits for detecting trypanosome antigens and we intend to evaluate these kits in the coming years in various African institutes being supported through the Dutch funded CRP on animal disease diagnosis.

It has become obvious to us recently that difficulties exist in obtaining standardised microtitre plates. To overcome this and to guarantee standardisation and reproducibility we have arranged to bulk purchase a large consignment of plates which will then be held at the Seibersdorf laboratory. These can then be supplied directly from the laboratory to projects and contract holders; prior to placing this order we requested a small number of the large batch for testing.

Work has continued on the development of radio-labelled DNA probes for use in detection of disease agents. Doris Rothauer spent two weeks in January at the Biomedicum Centre in Uppsala, Sweden learning techniques for probe development and use and the end result is that we now have available a DNA probe for Aujeszky's disease, which is currently being evaluated in the field. It is hoped in the coming year that probes for use in Rinderpest, Foot and Mouth disease and Babesiosis projects will become available through our collaboration with the Pirbright Laboratory (UK) and with CSIRO's Division of Tropical Animal Production, Long Pocket Laboratories in Australia. As with the ELISA kits it is hoped to supply these probes in a kit form that can be easily used in the laboratory conditions found in developing countries.

We have started to develop the ability to produce monoclonal antibodies. Most of the equipment has now been obtained and routine tissue culture procedures have been established. We hope to occupy a new laboratory in the near future where this work will be conducted. Francisco Castrignano, has recently spent one month at Saskatchewan University learning monoclonal antibody techniques and we hope to begin producing monoclonals in the next 6 months.

To support this work a small animal colony has been established at Seibersdorf, with facilities for mice, rats and rabbits. We will also use this animal colony to produce some of our own conjugates eg. rabbit anti-camel, for support of specific requests from projects or contract holders and where suitable commercial products are not available.

Once again we would like to thank all of you who have passed on information regarding the performance of the kits and reagents we are producing - this information is invaluable to us and in the long run helps us to help you; please therefore do not hesitate to get in touch with us regarding any aspect of our activities in disease diagnosis.

(iii) Nutrition

In addition to the preparation of standardised samples for Detergent Fibre Analyses, in vitro digestibility determinations and VFA fractionation by GLC using an Internal Standard Method, the nutrition laboratory continued with its feed evaluation and formulation testing programme using the Rumen Simulation Technique. Our efforts were concentrated on testing some dietary formulations based on untreated and urea-ammonia treated wheat straw and two sources of concentrate supplements from Tunisia. The data are now being analysed for onward transmission to the institute concerned for use in field studies.

Two scientific publications from the nutrition laboratory, "The Fermentation of Straw-based Diets containing Azolla (A. caroliniana Willd.) using the Rumen Simulation Technique (Rusitec)" and "The Fermentation Characteristics of Botanical Fractions of Rice Straw in an Artificial Rumen" are expected to appear in a forthcoming edition of Biological Wastes.

Dr. Emyr Owen from the Department of Agriculture and Horticulture, University of Reading, UK, will be joining us in September on Sabbatical Study leave, to assist in the activities of the Nutrition group. His experience and knowledge on feed evaluation and by-product utilization will be a great boost to the activities of this group, and we eagerly look forward to having him with us.

(iv) Training

As far as training is concerned, Ms. Maria Carreira from Portugal completed training during the last six months in RIA and EIA techniques. Presently, Mr. Clarence Lakpini from Nigeria is undergoing training in feed evaluation and isotopic techniques in nutrition while Mr. Alex Yiga from Uganda is undergoing training in RIA and EIA techniques.

(D) PUBLICATIONS

(i) Isotope-aided Studies on Livestock Productivity in Mediterranean and North African Countries

This book was published in January 1988 and contains the results of a 5-year Coordinated Research Programme of the same name which was funded by the Italian Government. The publication is available from the Division of Publications, IAEA; price Austrian Shillings 780,- or equivalent paid in convertible currency or UNESCO coupons. Details of the contents of this book were given in the previous edition of the Newsletter.

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

The results of this Coordinated Research Programme have now been edited and the Proceedings will be published around the middle of 1988. In addition to a general description of the achievements of the programme and recommendations for future research, the book contains the following articles:

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<u>Title of Paper</u>	<u>Authors</u>
Use of ionising radiation in the development of vaccines against <u>Fasciola gigantica</u> and <u>Schistosoma bovis</u> in Sudanese cattle, sheep and goats.	E.M. Haroun, A.I. Yagi, S.A. Younis, A.A. El Sanhoury, H.A. Gadir, A.A. Gameel, H.O. Bushara, M.G. Taylor (Sudan)
Studies on the epidemiology, diagnosis and control of <u>E. granulosus</u> infections.	R. Lalic, M. Petrovic, M. Movsesijan, B. Jovanovic, S. Radulovic (Yugoslavia)
Genetic control of acquired resistance against gastro-intestinal nematode parasites in sheep.	R.G. Windon, B.M. Wagland, J.K. Dineen (Australia)

- Dictyocaulus filaria in Ethiopia: studies on vaccination and pathogenesis. G. Tilahun (Ethiopia)
- Epidemiology and control of dictyocauliasis and the epidemiology of parasitic gastro-enteritis in ruminants. C.S. Eddi, R.P. Dughetti, C.M. Carcagno, J. Dorsi, J. Pereira (Argentina)
- Some factors influencing the immunisation of sheep with irradiated Haemonchus contortus larvae. S. Sivanathan, J.L. Duncan, G.M. Urquhart, W.D. Smith (United Kingdom)
- An epidemiological study on the gastro-intestinal parasites of beef cattle in Uruguay. J. Berdie, J. Genovese, C. Zunini, C. Molinari, A. Charlone, E. Castro, J.L. Duncan (Uruguay)
- Effect of host nutrition on immunity and local immune responses of rabbits to O. cuniculi. E. Sinski, B. Bezubik, H. Wedrychowicz, J. Szklarczyk, N. Doligalska (Poland)
- Ovine haemonchosis: digestive pathophysiology and vaccination trials. A. Dakkak (Morocco)
- Further observations on the pathogenesis of anaemia in fascioliasis and on immunoglobulin metabolism. A.F. Ogunrinade, M.O. Makinde (Nigeria)
- Mineral transactions along the digestive tract of lambs exposed to mixed nematode infection (Trichostrongylus colubriformis and Ostertagia circumcincta). M.D. Bown, D.P. Poppi, A.R. Sykes (New Zealand)
- Use of nuclear techniques in the study of some tick-borne haemoparasitic diseases. I.G. Wright, B.V. Goodger, C.A. Schunter, D.J. Waltisbuhl, A. Düzgün (Australia)
- Irradiated vaccines against bovine babesiosis. D.J. Weilgama, H.M.C. Weerasinghe, P.S.G. Perera, J.M.R. Perera (Sri Lanka)
- Anaplasma marginale attenuated by irradiation: kinetics of immunity and protection. L.A. Gil, B.O. Higuera, J. Castro, M. Chavez, O. Ruiz (Colombia)
- East coast fever immunisation: effect of chronic trypanosomiasis on the development of immunity. E.L.N. Taracha, A.D. Irvin, S.P. Morzaria, S.K. Moloo, J.M. Katende, J.N. Kiarie (Kenya)

(E) FORTHCOMING EVENTS

- (i) FAO/IAEA First Research Coordination Meeting on "Improving the Diagnosis and Control of Trypanosomiasis and other Vector-borne Diseases of African Livestock Using Immunoassay Methods", ILRAD, Nairobi, Kenya, 18-23 July 1988.
- (ii) FAO/IAEA Final Research Coordination Meeting on "The Application of Radioimmunoassay to Improving the Reproductive Efficiency and Productivity of Large Ruminants", Vienna, Austria, 5-9 September 1988.
- (iii) FAO/IAEA Consultants Meeting on Animal Reproduction, 7-9 September 1988

This meeting will be held in conjunction with the Final Research Coordination Programme on the "Application of RIA to Improving the Reproductive Efficiency and Productivity of Large Ruminants" at the Joint FAO/IAEA Division, Vienna International Centre. In addition to the principal investigators and Research Agreement holders in the CRP, invitations to attend have been accepted by specialists in the physiology of reproduction, in the interaction between reproduction, disease, nutrition and the environment and in field reproductive management strategies. They have been asked to contribute to a discussion on priority areas in applied research which may lead to an improvement in the reproductive efficiency of livestock in developing countries. The conclusions and recommendations of this meeting will constitute the basis of a strategic plan in livestock reproduction to which the Animal Production and Health Section's activities should be geared over the forthcoming five years. Inherent in this overall strategy will be the need to define the role of the Agency's Laboratory in providing technical support services for FAO/IAEA projects in developing countries. Thus consideration will be given to the type of training which should be offered, the nature of the analytical and quality control services, the possibility of conducting research work in support of counterpart scientists, alternative immunoassay systems and the 'kitability' of other steroid, gonadotrophic or metabolic hormone assays. A summary of the recommendations and conclusions of this meeting will appear in the next issue of the Newsletter.

- (iv) FAO/IAEA Final Research Coordination Meeting and Training Workshop on "Regional Network for Improving the Reproductive Management of Meat and Milk-Producing Livestock in Latin America with the Aid of Radioimmunoassay Techniques", Bogota, Colombia, 19-23 September 1988.
- (v) FAO/IAEA Regional Training Course on "Use of Immunoassay Techniques in the Seromonitoring of Rinderpest in Connection with the Pan Africa Rinderpest Campaign (PARC), Debre Zeit, Ethiopia, September 1988.

This training course will take place at the National Veterinary Institute, Debre Zeit, Ethiopia and is open to 20 participants from FAO and IAEA Member States in the African region. The course will be given both in English and in French.

The purpose of the course is to provide theoretical and practical knowledge of the use of ELISA and radio-labelled DNA probes in the diagnosis of rinderpest. Particular emphasis will be placed on the use of the ELISA in the sero-monitoring of rinderpest to be carried out in conjunction with the Pan African Rinderpest Campaign (PARC).

The course will last for three weeks. During the first week emphasis will be placed on theoretical aspects of immunoassay techniques and the use of DNA probes in detection of disease agents. Demonstrations will be given on the use of the FAO/IAEA ELISA kit for the detection of rinderpest antibodies and the use of a radio-labelled DNA probe for the detection of rinderpest virus in tissues. Lectures will also be given on important aspects of

handling and disposal of radioisotopes, epidemiology, data collection and data reduction relevant to a sero-monitoring programme for rinderpest.

In the second week the course will be primarily practical with all the participants carrying out ELISA procedures. These practicals will concentrate on the use of the ELISA in detecting antibodies to rinderpest although much of the training will be applicable to other diseases.

In the third week, the course will involve further practicals but include consideration of the problems facing participants in their own countries carrying out rinderpest sero-monitoring. An opportunity will be given for participants to present data relating to their own efforts in this direction. Representatives from PARC will give details of the campaign to date and will outline the role of rinderpest sero-monitoring within PARC.

The course will be carried out in both English and French and is therefore open to African scientists speaking either language with a veterinary or equivalent degree and who are actively involved in animal disease diagnosis and research. Preference will be given to those African scientists identified as responsible for carrying out rinderpest sero-monitoring in their own countries.

Nominations should be submitted in duplicate on the standard IAEA nomination forms 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 must be received not later than the 15 July 1988. Nominations received after that date or applications sent directly by individuals or by private institutions cannot be considered.

- (vi) FAO/IAEA/SIDA First Research Coordination Meeting on "Regional Network for Latin America on Animal Disease Diagnosis using Immunoassay and Labelled DNA Probe Techniques", Buenos Aires, Argentina, 7-11 November 1988.
- (vii) FAO/IAEA Regional Training Course for Latin America on "Immunoassay and DNA probe Techniques in Animal Disease Diagnosis", Buenos Aires, Argentina, 14 November - 2 December 1988.

This course will be held at the Instituto Nacional de Tecnologia Agropecuaria, Buenos Aires. The purpose of the course is to provide theoretical and practical knowledge on the application of ELISA and DNA probe methodology for measuring both antibody and antigen in disease diagnosis. Particular emphasis will be placed on foot-and-mouth disease, brucellosis and babesiosis although other disease will be covered. The course will consist of both lectures and practicals closely linked together to provide not only a theoretical background to the techniques employed but also a working knowledge and hands-on experience of these procedures. The working languages will be English and Spanish.

The lecture and practical sessions will cover the following topics:-

- Principles of enzyme immunoassays
- Principles of radio- and enzyme-labelled DNA probes
- Handling of radioisotopes
- Radiation detection and assay of radioactivity
- Antibody and antigen detection systems
- Measurement of antibodies and antigens relating to Foot-and-Mouth Disease diagnosis
- Measurement of antibodies and antigens relating to Babesiosis
- Use of immunoassay methods in serodiagnostics and sero-epidemiological studies

- Equipment and reagents
- Principles of epidemiology
- Data collection, storage and processing

Nominations should be submitted in duplicate on the standard IAEA nomination forms for training courses. Completed forms should be endorsed by and returned through established official channels (the Ministry of Foreign Affairs, the National Atomic Energy Authority, the local office of the United Nations Development Programme or the Ministry of Agriculture); they must be received by the International Atomic Energy Agency, PO Box 100, A-1400 Vienna, Austria not later than 30 September 1988.

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
June 1988

88-03928