Animal Production and Health Newsletter

JOINT FAO/IAEA DIVISION OF NUCLEAR TECHNIQUES IN FOOD AND AGRICULTURE
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Dear Colleague,

In the past 6 months, staff of the Section and of the Animal Production Unit at Seibersdorf have been engaged in the usual mix of activities, including the planning and implementation of Coordinated Research Programmes, Training Courses, Consultants Meetings and Workshops, not to mention evaluating the many proposals for Technical Cooperation projects which the IAEA received from Member States for funding in the 1995-6 biennium. The outcome of some of these activities is described in this edition of the Newsletter, but what is not highlighted is that in 1995, the Section and Unit will be responsible for providing technical backstopping and services to around 80 Technical Cooperation projects in some 65 Member States. Add to this the organisation of Training Courses, Workshops and Research Coordination Meetings, and the operation of 6 Regional and Inter-Regional Coordinated Research Programmes (CRPs) involving over 90 participating institutes, and it's clear that we're in for the busy time!

In the previous edition of the Newsletter, a new CRP was advertised involving the use of progesterone RIA to monitor and improve artificial insemination services for dairy animals in developing countries. In the edition before that, we brought to your attention a new CRP to introduce ELISA methods for monitoring foot-and-mouth disease vaccination programmes in Asia; and between these two editions we contacted institutes in Latin America with a view to establishing a CRP for monitoring FMD and brucellosis control programmes using ELISA. As you can see from this particular Newsletter, all of these programmes are essentially full and we cannot consider any further proposals. If nothing else, this shows that our programmes are popular. Let's hope they are also meaningful! I think there is good evidence that this is the case. Firstly, apart from their obvious appeal to institutes and scientists in developing countries, they are strongly supported by many of the leading institutes and scientists in developed countries, who often contribute much more than their time. And secondly, they are very well supported by the donor community and by other international organisations. In fact, just in the last weeks I heard that the Government of the Netherlands had very generously agreed to support our activities on trypanosomiasis over the next 4 years, and I believe that the EU will shortly show a similar commitment to our rinderpest activities. These developments will help to keep the Animal Production and Health programme of the Division strong in the years to come.

Of course, running a relevant and dynamic programme can only be done with good staff (as well as good counterparts!), and unfortunately, two people who contributed greatly to the development of the programme left or are leaving Vienna and returning to their home institutes. Firstly, Jorge Moreno-Lopez, who has been in the Section for the past 5 years as Regional Expert for Latin America and who did so much to build up a strong FAO/IAEA disease diagnostic research and development programme in that Region returned to the Biomedical Center of Uppsala University, Sweden, at the end of 1994. And secondly, Oswin Perera who joined the Section in 1988 as a Technical Officer for Asia in animal production and who did a great job in furthering animal reproduction and RIA research in this Region, will leave at the end of February 1995 and return to a position at the University of Peradeniya, Sri Lanka. They will both be greatly missed, not only for their high levels of competence and dedication and their hard work but also for all they put into the "spirit" of the Section. I wish them all the best on their return home.

1995 will see many other staff changes, but since none of these has yet been finalised, you must wait for the June edition of the Newsletter for the details!

I wish you every success in 1995!

With best wishes,

James D. Dargie
Head, Animal Production
and Health Section

(A) STAFF

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(B) PAST EVENTS

(1) FAO/IAEA Consultants Meeting on Establishment of External Quality Assurance Procedures for Use with FAO/IAEA ELISA Kits, Vienna International Centre, Austria, 12 - 16 September 1994

As part of the programme of support to scientists in developing countries, the Section has developed and distributed ELISA kits for detecting both the causative agent and the immune response of animals to a number of the major diseases affecting livestock. In many cases these kits are now being used as part of national and international control and/or eradication programmes (e.g. for rinderpest, trypanosomiasis, foot-and-mouth disease, brucellosis) and are likely to form the basis for countries establishing internationally freedom from particular diseases (e.g. rinderpest).

To further encourage international trade in livestock and livestock products, and to assist in the regional or global control and eradication of a number of the major diseases affecting livestock, there has been a strong move towards international standardization of animal disease diagnostic methods. Central to this is the need for internal and external quality assurance procedures to ensure that a standardized approach is being adhered to and that the results can be relied upon as correct.

In 1992, an FAO/IAEA consultants meeting was convened to define and establish for the ELISA, standards for internal quality control reagents and procedures and the expression of results. The recommendations of that meeting have now been incorporated in all FAO/IAEA ELISA kits and have been adopted by the OIE (Office International des Epizooties). The primary function of the internal quality controls is to ensure that the assay is performing within defined limits. Equally important, is an assurance to outside interested bodies (national veterinary authorities, international organizations, donor organizations, trading partners) that the results being provided by a laboratory are valid. The procedures for ascertaining this assurance would form the basis of an external quality assurance programme (EQAP). Between 1990 and 1993, as part of establishing an EQAP, laboratories using the FAO/IAEA ELISA kits for rinderpest sero-monitoring in Africa were sent a panel of 40 sera to test each year. The results were compiled to indicate to managers of the Pan African Rinderpest Campaign that results from these laboratories could be relied upon.

This particular consultants meeting was convened with the aim of further improving this EQAP for veterinary laboratories in developing countries utilizing FAO/IAEA ELISA kits. The meeting focused on establishing procedures that would recognize veterinary laboratories as competent in utilizing FAO/IAEA ELISA kits for specific diseases and tasks. In adopting the approach that is detailed below it is hoped that the system can be expanded to form the basis of a wider system that can encompass a variety of diagnostic procedures and laboratories. It is intended to seek OIE endorsement for this EQAP and it is anticipated that such an approach should improve the quality of reports being submitted to OIE.

Conclusions of the meeting

It is important for the liberalization of international trade in animals and animal products as well as for effective national and international disease control programmes that diagnostic laboratory tests are carried out to defined standards.

- External quality assurance programmes (EQAP) for veterinary laboratories supplement internal control systems and provide an assessment of uniformity between laboratories. EQAP should be coordinated by a third party organization.

- The authority of the third party coordinator should be endorsed by the OIE.

- An EQAP should lead to **recognition** of individual laboratories for their competence in defined assays for specific diseases. The criteria and procedures for **recognition** have been defined.

- An EQAP must include a number of components by which a laboratory's capability and performance can be evaluated. These will include an evaluation of laboratory information management, the training and experience of staff, maintenance of equipment and the nature and volume of diagnostic activities. A key component of the programme is proficiency testing.

- Proficiency testing is conducted by the distribution to all participants on a regular basis of external quality control (EQC) panels. Such panels should include as a minimum 5 samples comprising suitable negative and positive samples. It is appropriate for most types of assays that proficiency testing is conducted twice a year.

- Before providing a certificate of **recognition,** the third party organization should be satisfied that a laboratory has fulfilled all the requirements of the EQAP. The criteria for provisional and full recognition are defined within the EQAP.

Recommendations to the Joint FAO/IAEA Division

The Joint FAO/IAEA Joint Division is in a position to start an EQAP, based around its own ELISA kits, for those veterinary diagnostic laboratories which participate in the programmes of the Joint FAO/IAEA Division and in IAEA Technical Cooperation activities. As such the EQAP will focus on developing countries; however it is recommended that wherever possible internationally recognized Reference Laboratories for the particular disease should also participate in order to provide additional assurance.

The EQAP should not place unreasonable demands on participating laboratories bearing in mind the particular operational problems encountered in developing countries. Nevertheless it should provide sufficient assurance for national and international bodies to have confidence in the performance of individual recognized laboratories.

The Joint FAO/IAEA Division's EQAP should initially be restricted to those laboratories using the FAO/IAEA ELISA kits. Later, expansion may be considered to include other laboratories using alternative methodologies, but only where such methods have been standardized against recognized international standard reagents.

The EQAP should include an element of data gathering and analysis to facilitate the Joint FAO/IAEA Division's role in technical support and troubleshooting for participating laboratories.

The EQAP should comprise four key elements:

- Information on laboratory management and staff provided by means of a questionnaire. This will be updated twice yearly and supplemented by information from the Joint Division's Technical Officers.

- Information on consistency of performance provided by the internal control sample data from ELISA tests. This will require some additional computer programming and will not therefore be available at the start of the EQAP. A planned development of such a monitoring system should be incorporated into the EQAP and should include a training element to enable participating laboratories to make use of the data in day- to-day laboratory management.

- Proficiency testing by means of an external quality control sample panel (EQCP) issued to all participants twice yearly for each assay.

- Accreditation of laboratories by the issue of certificates of **recognition** to individual laboratories for specific assays, according to procedures outlined in this report.

It is hoped that the Section will begin to operate such an EQAP in 1995 in conjunction with the use of FAO/IAEA ELISA kits, and we thank Drs. F. Biancifiori (Italy), S. Edwards (United Kingdom), C.A. Gibson (Australia), R. Reichard (OIE, France), T. Spencer (Australia) and H. Zeichhardt (Germany) for their advice in preparing the guidelines for the programme.

(2) FAO/IAEA Workshop on Supplementation Strategies for Milk-producing Animals in Asia, Manila, Philippines, 12-16 September 1994

This workshop was organised under the framework of the CRP on "Development of Supplementation Strategies for Milk-producing Animals in Tropical and Subtropical Environments". It was attended by the Asian scientists participating in this CRP, together with four of the Agreement holders and a consultant. The Contract holders were assisted in the organisation, analysis and interpretation of the large volume of data being collected during the survey phase of this programme. It also provided the opportunity for fine-tuning of the study protocols, and for critical evaluation of results from laboratory and field studies. Guidelines were established for preparation of papers for presentation at the second RCM, scheduled for April 1995 in Uruguay.

(3) First Research Coordination Meeting of FAO/IAEA Coordinated Research Programme on Development of Feed Supplementation Strategies for Improving the Productivity of Dairy Cattle in Smallholder Farms in Africa, Morogoro, Tanzania, 19-23 September 1994

This meeting was held at the Faculty of Veterinary Medicine, Sokoine Agriculture University, Morogoro, Tanzania, and was attended by 14 Contract holders and 4 Agreement

holders, a representative of the Animal Production and Health Division, FAO, Rome and numerous staff of the Departments of Animal Science and Production and of Veterinary Surgery, Obstetrics and Reproduction of the Sokoine Agriculture University. The RCM was officially opened by the Director of Research, Sokoine Agriculture University and the keynote address was delivered by Dr. P. L. Pugliese, Animal Production Officer of the Animal Production and Health Division, FAO, Rome, who also represented FAO at the meeting.

The principal objectives of the meeting were to assist Contract holders to develop individual workplans for the coming 12-18 months and to ensure that the work to be carried is in line with the aims and objectives of the CRP. After each Contract holder described the country situation in relation to dairy production and facilities and infrastructure available for the study, detailed discussions were held with the Agreement holders on the design of each study, including observations and records to be kept, entry of data and sampling schedules. It was agreed that the first phase of the study should be devoted to a comprehensive survey of the production system selected, to establish baseline data on feeding and management practices that are being adopted by the smallholder dairy farmers and the productivity of the animals such as body weight, body condition, milk yield and reproduction. A field visit provided the opportunity for the participants to visit a few smallholder farmers in the peri-urban areas of Morogoro and familiarize themselves with the feeding and management practices that are being adopted, as well as the constraints to smallholder dairy farming in Tanzania.

Local arrangements including meeting facilities were excellent. We would like thank the host institute and Dr. Nkya and his colleagues for their support before and during the meeting.

(4) **FAO/IAEA/ARCAL Regional Training Course on Immunoassay, Epidemiology and Data Analysis in Diagnosis of Animal Diseases in Latin America, Asuncion, Paraguay, 26 September - 7 October 1994**

This training course was held at the University of Asunción and was attended by 14 of the 15 invited participants from 12 countries in the region. The course provided basic training in computer programs for data analysis and basic concepts on epidemiology. Experts from Costa Rica, Canada and Chile assisted at the course. They were Dr. Teresa Bernardo, an epidemiologist and expert on information systems from IICA Costa Rica, Dr. Santiago Ernst an epidemiologist from Chile and Dr. Klaus Nielsen, from Canada. Two local experts (Dr. Luis Acuña and Dr. de Gatto) also contributed to the success of the training course.

This course was extremely important as a further step in consolidating the objectives of the FAO/IAEA Coordinate Research Programme and IAEA Technical Cooperation Projects on animal health, i.e., to establish ELISA technology, to validate FAO/IAEA ELISA kits, and to apply this technology in support to national animal disease control and eradication programmes.

The training facilities offered by SENACSA, the University of Asunción and the Atomic Energy Commission were excellent and the support given by all staff was superb and highly appreciated. Eight computers and printers and extensive didactic materials such as literature, books, software, etc. were available. Although modifications had to be made to the

scheduled programme to fit the requirements of the participants, the objectives of the course were fully achieved. Future workshops whose purposes are to teach computing skills, data analysis, epidemiology etc. should be encouraged to strengthen the ELISA capability at the diagnostic laboratories in Latin America.

(5) FAO/IAEA Inter-regional Training Course on The Use of Immunoassay and Molecular Methods for Animal Disease Diagnosis and Control, FAO/IAEA Central Laboratory for ELISA Molecular Techniques in Animal Disease Diagnosis, Seibersdorf, Austria, 24 October - 25 November 1994

Over 250 applications were received for participation in this course which is one of the largest responses ever for an FAO/IAEA training course and a clear reflection of the needs of many scientists in developing countries. After a long and often difficult selection procedure, 25 scientists were chosen from 22 countries. They were: Ms. A.R. Pedemonte (Argentina), Ms. H.S. Hovhannessian (Armenia), Ms. J.Ch. Roach (Barbados), Ms. H. Diaz de Arce Landa (Cuba), Mr. T. Anaxagorou (Cyprus), Ms. Z. Cermakova (Czech Republic), Ms. L. Duval Perez de Pou (Dominican Republic), Mr. K. Atrif (Ethiopia), Mr. S.S. Kumar Rana (India), Ms. L. Muslimin (Indonesia), Ms. L.W. Ndungu (Kenya), Mr. M. Phouaravanh (Lao P.D.R.), Mr. D.O. Chinombo (Malawi), Mr. A.A. Hussin (Malaysia), Mr. U Nyunt Swe (Myanmar), Mr. S.S.A. Al-Habsy (Oman), Mr. M. Saeed (Pakistan), Ms. I. Sanchez-Soto (Paraguay), Ms. E.A. Felipe (Philippines), Mr.A.I. Al-Afaleq (Saudi Arabia), Mr. G.E. Joshua (Tanzania), Ms. B. Srisopar (Thailand), Ms. O. Kabakli (Turkey), Ms. J. Murekeraho-Kantengwa (Uganda) and Ms. Z. Wutaunashe (Zimbabwe).

The course, lasting five weeks, covered general immunology and ELISA, PCR (polymerase chain reaction) and DNA probes and general epidemiology. A large number of practicals were held and participants worked with FAO/IAEA ELISA kits for brucellosis, enzootic bovine leucosis and trypanosomiasis as well as gaining hands-on experience with PCR and DNA probe technologies. Each week, specialist lecturers were bought in to provide a high level of expertise in individual subjects and this approach was greatly appreciated by the participants.

The course was certainly a resounding success not only because of the very high calibre of the participants but because of all the hard work put in by all concerned. In this regard, we would particularly like to thank Dr. T. Barrett (UK), Dr. J. Crowther (UK), Ms. M. Diop (Senegal), Dr. R. Masake (Kenya), Dr. K. Nielsen (Canada), Dr. E. Nilsson (Sweden) and Dr. D. Pfeiffer (New Zealand). To all those involved we owe a debt of gratitude and we certainly hope to be able to repeat the course in the not too distant future.

(6) Regional FAO/IAEA ARCAL Workshop on Procedures for the Validation of the PANAFTOSA/FAO/IAEA FMD Antibody ELISA in Latin America at the Centre for Nuclear Energy, Buenos Aires, Argentina, from 7-11 November 1994

This workshop was attended by the five Contract holders and the two Agreement holders (from PANAFTOSA and the World Reference Laboratory) dealing with FMD under the new FAO/IAEA Coordinated Research Programme in Latin America entitled "The Use ELISA for Epidemiology and Control of Foot-and-Mouth Disease and Bovine Brucellosis in Latin America" (see Section C for further details). Staff from both PANAFTOSA, Rio de

Janero, Brazil and the World Reference Laboratory for Foot and Mouth Disease, Pirbright, UK also attended the meeting. A detailed protocol was developed for the international validation of the PANAFTOSA/FAO/IAEA FMD antibody ELISA kit in the five participating countries (Argentina, Brazil, Paraguay, Venezuela and Colombia) and a rigid time-frame for the completion of tasks set for 1995 was agreed.

At this meeting PANAFTOSA provided the Contract holders with all the necessary biologicals for the FMD ELISA kit and it was agreed that the remaining reagents and consumables would be dispatched to PANAFTOSA from the FAO/IAEA Central Laboratory by the end of 1994. PANAFTOSA would then ensure onward transmission of these items to the Contract holders. Contract holders were also supplied with the PANAFTOSA/FAO/IAEA FMD kit manuals and the FAO/IAEA ELISA Data Interchange computer program (EDI) and its accompanying manual along with training in the use of EDI.

It was recommended that the first FAO/IAEA Research Coordination Meeting of this programme take place at PANAFTOSA (Brazil) in September 1995. This will provide an ideal opportunity to assess progress on the validation procedures for both FMD and brucellosis and ensure that in the second and final year of this CRP all remaining aspects of the validation can be completed and a report prepared for submission to the OIE.

(7) FAO/IAEA Consultants Meeting to plan the Research and Development Module of FAO's Global Programme for the Control and Eradication of Tsetse and Trypanosomiasis in Africa, Vienna International Centre, 22-25 November 1994

In December 1994, FAO convened a panel of experts meeting to advise on the future direction of its programme on African animal trypanosomiasis. One of the major recommendations from this meeting was that FAO's programme should encompass three basic issues, i.e. research and development, planning and management of control or eradication programmes, and policy and that it would be appropriate to tackle each of these within the framework of interconnected Modules whose activities would be closely coordinated. In order to plan the Research and Development Module and discuss its relationship with the other two proposed Modules, a Consultants Meeting was held at IAEA Headquarters to which representatives of national and international research institutes, donors and international organisations were invited. Apart from obtaining an up-to-date picture of activities and future objectives of programmes directed towards the control of tsetse/trypanosomiasis, the consultants assisted FAO in defining the objectives and structures of the R & D Module and the roles and responsibilities of participating partners. A report on the meeting has been drafted, containing results of discussions on various aspects of the disease complex (epidemiology, risk, transmission, diagnosis, genetics) and its impact; interventions (parasite and vector control) and their planning; and the objectives, structure, function and coordination of the R & D Module. This report will be published by FAO early in 1995. In the meantime, we would like to thank the following for their many constructive contributions to this meeting: Dr. R. Allsopp (United Kingdom), Dr. D. Cuisance (France), Dr. A. Teale (ILRAD), Dr. R. Connor (Zimbabwe), Dr. K. Katondo (OAU/IBAR), Dr. I. Maudlin (United Kingdom), Dr. M. Dale (EU), Dr. P. Nagel (Germany), Dr. L. Otieno (Kenya), Dr. G. d'Ieteren (ILCA), Dr. D.G. Rogers (United Kingdom), Dr. A.E. Sidahmed (IFAD), Dr. W. Snow (ITC), Dr. R. De Deken (Belgium), Dr. B. Bauer (Burkina Faso), Dr. A.G. Luckins (United Kingdom), Dr. P.H. Holmes (United Kingdom), Dr. G. Freeland (United Kingdom),

Prof. D. Mehlitz (Germany), Dr. J. Schrecke (Germany), Dr. P. Guerin (Switzerland), Dr. C.J.P.G. Ooijen (Zambia), Dr. V.A. Dyck (Canada), Dr. J. Wendell Snow (USA), Dr. S. Aksoy (USA). Drs. B. Hursey and J. Slingenbergh represented FAO at the meeting which was also attended by staff of the Joint FAO/IAEA Division's Insect & Pest Control, Agrochemicals & Residues and Animal Production & Health Sections and their corresponding Laboratory Units at Seibersdorf.

(C) STATUS OF EXISTING COORDINATED RESEARCH PROGRAMMES

(1) Development of Supplementation Strategies for Milk-producing Animals in Tropical and sub-Tropical Environments through the Use of Nuclear and Related Techniques

The Programme has 17 Research Contracts and 6 Agreements. The 2nd RCM will be held in Montevideo, Uruguay, from 24 - 28 April 1995.

(2) Use of Immunoassay Methods for Improved Diagnosis of Trypanosomiasis and Monitoring Tsetse and Trypanosomiasis Control Programmes in Africa

This Programme has 14 Research Contracts and 4 Research Agreements and no further awards can be considered. The 2nd RCM is being planned for April 1995 in Addis Ababa, Ethiopia.

(3) Development of Feed Supplementation Strategies for Improving the Productivity of Dairy Cattle on Smallholder Farms in Africa

This programme has 14 Research Contracts and 5 Research Agreements and no further awards can be considered. The 2nd RCM is scheduled to take place early in 1996.

(4) Improving the Diagnosis and Control of Foot-and-Mouth Disease in South East Asia Using ELISA-based Technologies

This programme was advertised in the previous edition of the Newsletter and as a result of the technical evaluation of the proposals received 8 Research Contracts and 3 Agreements were awarded. It is anticipated that 2 - 3 more Research Contracts will be awarded in the coming months. The first RCM of the programme is being planned for Bangkok, Thailand, from 13-17 February 1995 in conjunction with the OIE Regional Commission Meeting on Foot-and-Mouth Disease vaccines.

(5) The Use ELISA for Epidemiology and Control of Foot-and-Mouth Disease and Bovine Brucellosis in Latin America

This programme is restricted to foot-and-mouth disease (FMD) and brucellosis. For brucellosis the aim is to validate a new Competitive ELISA or C-ELISA for the diagnosis of brucellosis. This new ELISA allows differentiation between vaccinated and naturally infected animals. The results obtained by this C-ELISA will be compared with existing conventional methods e.g. Complement Fixation Test (CFT), Indirect ELISA (I-ELISA), Rose

Bengal Test (RBT) and Buffered Plate Agglutination Test (BPAT). For FMD the aim is to validate a liquid phase blocking ELISA to detect the presence of antibodies in infected or vaccinated animals, thus allowing for assessment of FMD vaccines and the effectiveness of vaccination programmes.

In both cases after the validation of the ELISAs, the tests will be introduced to other laboratories in the region and subsequently used routinely for the conduct of serological surveys to determine the true prevalence of the disease under consideration, and to monitor the effectiveness of national programmes aimed at their control e.g. vaccination schemes against FMD and brucellosis. This CRP would aim to generate sufficient data to enable international acceptance by the Office International des Epizooties of test reagents and protocols in order that they may subsequently be used in other countries and regions of the world.

LIST OF PARTICIPANTS

Research Contract Holders for FMD Studies	Project Title
Dr. T. Bianchi GELAB - GERENCIA DE LABORATORIO Servicio Nacional Sanidad Animal,SENASA Av. Fleming, 1653, 1640 Martinez Provincia de Buenos Aires, Argentina	Validation of the FAO/IAEA/PANAFTOSA ELISA kit for determination of antibodies against foot-and-mouth disease virus.
Dr. J.A. Ravison LARA/ PORTO ALEGRE (MAARA) Estrada da Ponta Grossa, 3036 91785-340 Porto Alegre, Rio Grande do Sul, Brazil	Detection of antibodies against foot-and-mouth disease under field conditions.
Dr. C. Sanchez Instituto Colombiano Agroopecuario ICA-CEISA Ap. aereo 7984 El Dorado Casilla Correos 1110 Calle 37, N° 843 Bogotá, Colombia	Use of immunoassay techniques for the evaluation of antibodies against foot-and-mouth disease virus.

Dr. N. de Vergara Servicio Nacional de Sanidad Animal SENACSA Km 10½ Ruta II "Mcal. Estigarribia" San Lorenzo Asunción, Paraguay	Incorporation of ELISA technique to study antibody levels against foot-and-mouth disease.
Dr. M. J. Novell Instituto Investigaciones Veterinarias IIV Av. Principal Las Delicias. Ap. 70 2101 Maracay Estado de Aragua, Venezuela	Validation of the FAO/IAEA/PANAFTOSA ELISA kit for the determination of antibodies against foot-and-mouth disease virus.

Research Agreement Holders for FMD Studies

Dr. N. Ferris Institute for Animal Health Pirbright Laboratories Ash Road Pirbright, Woking, Surrey GU24 ONF, United Kingdom	Immunoassay methods for the diagnosis and epidemiology of animal diseases in Latin America.

Research Contract Holders for Brucellosis

Dr. L.E. Samartino Instituto de Bacteriologia Instituto Nacional de Tecnologia Agropecuaria INTA C.C.77 1708 Moron, Buenos Aires, Argentina	Field trial of Brucellosis competitive ELISA.
Dr. B.E. Perez Ramos Servicios Agricolas y Ganaderos SAG Laboratorio Regional,Osorno, Santiago, Chile	Field trial of Brucellosis C-ELISA in Latin America.
Dr. O.C. Mariño Jannaut Immunology Laboratory ICA-CEISA Apartado Aereo 29743 Bogotá, Colombia	Comparative evaluation of competitve ELISA test in Colombian cattle.

Dr. E. Moreno Universidad Nacional Campus "Omar Dengo" P.O. Box 304-3000 Heredia, Costa Rica	Evaluation of diagnostic tests for animal Brucellosis.
Dr. C. Peraza Perez Laboratorio Central de Diagnostico Veterinario Ave. 51 Nr. 33212 Arroyo Arenas, La Lisa, Ciudad Habana, Cuba	Use of the competitve ELISA for studies on *Brucella abortus.*

Research Agreement Holders for Brucellosis

Dr. K. Nielsen Agriculture Canada Animal Diseases Research Institute P.O. Box 11300, Station H Nepean, Ontario, Canada K2H 8P9	Competitive enzyme immunoassay for differentiating the antibody response to vaccine and infectious strains of *Brucella abortus* in cattle.
Dr. F. Biancifiori Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise Via Campo Boario Teramo, Italy	Establishment and validation of ELISA and other biotechnologies for the diagnosis and epidemiology of diseases of livestock with special emphasis on Brucellosis and CBPP.

(6) Improvement of Ruminant Livestock Productivity in Developing Countries through the use of Progesterone RIA to Increase the Efficiency and Quality of Artificial Insemination Services

This programme was announced in the previous edition of the Newsletter and a large number of proposals for Research Contracts were received. The following awards have been made so far and it is expected that the programme will be filled by early 1995.

LIST OF PARTICIPANTS

Research Contract Holders	Title of Project
Dr. María-Elena Mongiardino Centro de Investigaciones en Ciencias Veterinarias Instituto Nacional de Tecnología Agropecuaria - INTA C.C. 77, 1708 Morón Buenos Aires, Argentina	An integrated approach for the identification and correction of the causes of artificial insemination failures in Argentine dairy herds.
Dr. Néstor Sepúlveda Facultad de Ciencias Agropecuarias Departamento de Producción Agropecuaria Universidad de la Frontera Av. Francisco Salazar 01145 Casilla 54-D, Temuco Chile	Studies of reproductive efficiency in dairy herds through progesterone radioimmunoassay.
Dr. Sandra Estrada Universidad Nacional Posgrado Ciencias Veterinarias Escuela Medicina Veterinaria P.O. Box 30 - 3000 Heredia Costa Rica	Improving productivity through the use of artificial insemination in dual-purpose farms in Costa Rica.
Dr. Rodolfo Pedroso Centro de Investigación para el Mejoramiento Animal CIMA La Habana, Cuba	Improving the quality of artificial insemination through the use of progesterone radioimmunoassay.
Mr. U. Than Hla Livestock Breeding and Veterinary Department Artificial Insemination Division Insein, Yangon, Myanmar	Improvement of cattle production in Myanmar through the use of progesterone RIA to increase efficiency and quality of artificial insemination services.
Dr. Naeem Iqbal Pakistan Agricultural Research Council Animal Sciences Institute P.O. Box 1031, Park Road Islamabad 45500, Pakistan	Improvement of cattle productivity in the Punjab region through the use of progesterone RIA to increase efficiency and quality of artificial insemination services.

Dr. Luisa Echevarría Centro de Investigación IVITA Universidad Nacional Mayor de San Marcos Ap. 41-0068 Lima, Peru	Identification of constraints and implementation of corrective measures for improving the efficiency of artificial insemination services in dairy cattle through the use of RIA progesterone.
Dr. Harischandra Abeygunawardena Dept. of Veterinary Clinical Studies University of Peradeniya Peradeniya, Sri Lanka	Multivariate analysis of factors affecting the productivity of cattle in small holder operations in wet zone of Sri Lanka.
Dr. Daniel Cavestany Instituto Nacional de Investigación Agropecuaria INIA La Estanzuela C.Correos 39173 70.000 Colonia Uruguay	Evaluation of the efficiency of the artificial insemination service in dairy cattle in Uruguay through progesterone
Prof. Le Yuan Cuong Institute of Agricultural Sciences of South Vietnam 121 Nguyen Bingh Khiem Street District 1 Ho Chi Minh City, Vietnam	Improvement of efficiency and quality of artificial insemination services in dairy smallholder farms through the use of milk progesterone RIA.

Technical Contract

Dr. William Goodger Department of Medical Sciences School of Veterinary Medicine University of Wisconsin-Madison 2015 Linden Drive West Madison, WI 53706 - 1102 USA	Development of computerized recording and analysis of data which relates the efficiency and quality of artificial insemination services.

(D) DEVELOPMENTS AT THE ANIMAL PRODUCTION UNIT, SEIBERSDORF

(1) Disease Diagnosis

1.1 ELISA Software Update

The 'beta' test version of our new ELISA software was completed in October and has since then been sent out to five selected laboratories for testing. Feedback has just now

started to come back. From all reports thus far, the 'technical' aspects of the programme are working well (i.e. the data acquisition, processing, storage and report generating modules). We have received a number of constructive comments about the user interface (i.e. menus, short-cut and accelerator keys, etc.) which is quite different from the previous version of our ELISA software. Changes resulting from these comments will be incorporated into the new version early in the new year. We hope to have a final version ready for distribution by the end of the second quarter of 1995.

1.2 Brucellosis Indirect ELISA Field Trial

The FAO/IAEA/WHO/OIE field trial of the indirect ELISA for the detection of bovine antibody to *Brucella abortus* is now complete. An addendum to the original report submitted to the OIE Standards Commission in February of this year was presented to the Commission at its September meeting. The addendum summarized all data received from six of the seven participating laboratories. Data from the seventh laboratory was omitted as test procedures had been modified somewhat from the original, standardized format.

Based on this second report, the Standards Commission agreed "that the ELISA test was now sufficiently validated to be designated a prescribed test for *Brucella abortus* in cattle". This means that the indirect ELISA now joins the buffered *Brucella* antigen tests (i.e. the Rose Bengal agglutination and the buffered plate agglutination tests) and the complement fixation test as 'official' prescribed tests for the diagnosis of bovine brucellosis for the purposes of international trade.

1.3 Brucellosis Competitive ELISA Field Trial

The field trial of the competitive ELISA for the differentiation of *Brucella*-infected from *Brucella*-vaccinated cattle got off to an 'unofficial' start this autumn. Dr. Nielsen of the Animal Diseases Research Institute (Nepean), Canada has already visited each of the participants from the five Latin American countries and has established the assay technology. This field trial will be supported through an FAO/IAEA-sponsored, Coordinated Research Programme (see earlier). The participating laboratories are now collecting sera from vaccinated and non-vaccinated cattle from both infected and brucellosis-free areas.

1.4 Foot-and-Mouth Disease Antibody ELISA Field Trial

As part of the same Coordinated Research Programme indicated above, the liquid phase blocking ELISA for detection of antibody to FMDV will be field validated in five Latin American countries. The standardization of this assay and its validation is a collaborative effort involving the Joint Division, the Institute for Animal Health (Pirbright) and the Pan-American Foot-and-Mouth Disease Center (Rio de Janeiro). Our laboratory Unit will be responsible, as with the FMDV antigen ELISA, for the provision of all but the biological reagents which we cannot handle here in Austria. Unlike the antigen ELISA, the new antibody ELISA is supported in our new ELISA software.

1.5 Trypanosomiasis Antigen Capture ELISA

As mentioned in the previous edition of the Newsletter, several improvements were made to this ELISA kit. The kit has been taken out to several African laboratories and it is performing well in all cases. A field validation is now underway to establish its diagnostic performance characteristics (i.e. sensitivity and specificity).

The current ELISA kit utilizes monoclonal antibodies for both capture and detection of antigen. For two of the trypanosome species, these monoclonal antibodies are IgM class. ILRAD has now provided us with samples of IgG class monoclonal antibodies of the same specificity. In the new year, these antibodies will be evaluated with an eye to replacing the IgM's in current use. If this is possible, it should improve the stability of our biological reagents and allow us to employ freeze-drying as a method of preservation for the storage and transportation of these reagents.

(2) Animal Production

2.1 'Self-coating' RIA Kit for P4 in Milk

Both the development and the field validation of this monoclonal antibody-based RIA kit are now complete. The assay has been validated in four different counterpart laboratories. In this validation, our kit was tested in parallel with the currently supplied, commercial kit from DPC Inc. in California. In all cases, our assay was found to be just as robust and reliable and from an analytical standpoint, it performed to expected international standards.

Now that the prototype kit has been given the 'green light', we will now begin a production run of reagents. The kit will be phased into selected laboratories by the second quarter of next year. This is an important step forward in terms of cost effectiveness and reducing the reliance on commercial products. The kit employs standard chemicals and disposables with no 'proprietary' secrets. Although the kit format itself is very convenient, the majority of counterpart laboratories could in fact reproduce the assay if provided with the monoclonal antibody itself.

(E) PUBLICATIONS

The following publications can be obtained free-of-charge by writing to the Section:

1. **The Sero-monitoring of Rinderpest Throughout Africa: Phase II. Results for 1993. IAEA-TECDOC-772.**

   Full details of this publication were given in the previous edition of the Newsletter.

2. **Animal Health: Supporting African Campaign against rinderpest. IAEA Bulletin 36 (1994) No. 3. 48-55, (Jeggo, M.H, Geiger, R. and Dargie, J.D.)**

(F) FORTHCOMING EVENTS

(1) First FAO/IAEA Research Coordination Meeting on Improving the Diagnosis and Control of Foot-and-Mouth-Disease in South East Asia Using ELISA-based Technologies, Bangkok, Thailand 13 -17 February 1995

(2) FAO/IAEA Regional Training Workshop on Use of Immunoassay and Related Techniques for Studies on Animal Production in Africa, Veterinary Research Administration, Khartoum, Sudan, 11-29 March 1995

This training workshop is being organized under the framework of the African Regional Co-operative Agreement for Research, Development and Training related to Nuclear Science and Technology (AFRA). The objectives are to train scientists from AFRA Member States in the use of radioimmunoassay and related techniques on animal reproduction and nutrition. During the course, particular emphasis will be placed on the review of recent developments in reproductive physiology and nutrition in ruminants; collection, processing and storage of samples; radioimmunoassay for measuring progesterone in blood and milk; and computerized recording and analysis of farm and experimental data.

(3) Second FAO/IAEA Research Coordination Meeting and Training Workshop on Use of Immunoassay Methods for Improved Diagnosis of Trypanosomiasis and Monitoring Tsetse and Trypanosomiasis Control Programmes in Africa, Addis Ababa, Ethiopia, April 1995

(4) Second FAO/IAEA Research Coordination Meeting on the Development of Supplementation Strategies for Milk-producing Animals in Tropical and Sub-Tropical Environments through the Use of Nuclear and Related Techniques, Montevideo, Uruguay, 24-28 April 1995

(5) IAEA/FAO Interregional Training Course on Improving the Productivity of Ruminant Livestock through "On-farm" Assessment of Nutrition - Reproduction Interactions Using Nuclear and Related Techniques, IAEA Laboratories, Austria, 11 September - 21 October 1995

Participation: The course is open to 20 participants from developing IAEA and FAO Member States, who work with national livestock research organizations or universities, and are .engaged in research or development activities in animal production. Preference will be given to those from tropical and subtropical regions.

Background to the course: Many research scientists in developing countries work in isolation and have few opportunities to remain up-to-date and learn new concepts and techniques. The majority have been trained in a "traditional" single discipline approach to resolving problems and concentrate their work in experimental research stations under conditions which often do not reflect those prevailing at the farm level. Current thinking emphasizes an inter-disciplinary approach to problem solving and a

greater involvement of the farmer in 'on-farm' trials. This will lead to the development of rational, sustainable practices for improving livestock productivity which are acceptable to the average farmer. Also, experimental and survey data are frequently collected but are poorly handled or not statistically analyzed, with the result that much valuable information never reaches the local or international scientific community. There is a clear need to strengthen capabilities for data handling and analysis.

Purpose of the course:

The objective of the course is to familiarize scientists from developing countries in the planning and execution of projects for assessing the impact of nutrition-reproduction interactions and interventions on the productivity of livestock 'on-farm'. The course is aimed at scientific staff presently involved in or proposing to initiate national projects aimed at improving the productivity of ruminant livestock. It is not aimed at those in managerial or administrative positions. Participants will be trained in the appropriate use and quality assurance of nuclear and related techniques to monitor livestock nutritional and reproductive indices. The theoretical background to, and hands-on experience will be provided for monitoring nutritional and reproductive events. Particular emphasis will be placed on the analysis and interpretation of research data.

Participants' qualifications:

Candidates must have a degree at Bachelor level in agriculture or in animal, veterinary or a biological science and at least two years' post graduate qualification experience in research or teaching in animal production.

As the course will be conducted in English, **participants must have a good knowledge of working English** to follow the lectures, to conduct the practical activities and to actively interact in group discussions.

Nature of the course:

The course will cover the following topics: perspectives of 'on-farm' research; project planning, execution and evaluation; production data; sampling strategy collection, preparation and storage procedures; body weight and body condition scoring; feeds and feeding evaluation; analysis of nutritional metabolites and reproductive hormones though the use of colorimetric and radioimmunoassay techniques; evaluation of assay performance and quality assurance; data storage, analysis and interpretation; use of computer databases and statistical applications; equipment maintenance; reporting procedures.

Emphasis will be placed on the application of the above topics in the identification and resolution of problems affecting cattle productivity; however, buffalo, sheep and goats will also be covered. Participants will be required to present an in-depth review of livestock production in their home countries and a research proposal based on their own experiences which will provide the opportunity to apply the techniques and concepts learnt during the course to solve practical 'on-farm' problems.

Application procedures:

Nominations should be submitted on the standard 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, or the office of the United Nations Development Programme). they must be received by the International Atomic Energy Agency, P.O. Box 100, A-1400 Vienna, Austria, not later than 15 May 1995. Nominations received after that date or applications which have not been routed through one of the aforementioned channels cannot be considered.

Language certificate:

In the case of countries in which English is not an official or customary language, nominations must be accompanied by a separate certificate of the candidate's proficiency in English. This certificate must be issued by a language school, a cultural institution or an embassy of a country in which the language of the course is spoken.

Administrative and financial arrangements:

Nominating governments will be informed in due course of the names of the candidates who have been selected and at that time will be given full details of the procedure to be followed with regard to administrative and financial matters.

During their attendance at the course, participants will receive from the IAEA a stipend sufficient to cover the cost of their accommodation, food and incidental expenses. The IAEA will also pay the full cost of their air travel, economy class, from their home countries to Vienna and return.

Bus transport will be provided by the IAEA from the hotel in Vienna to the Seibersdorf Laboratory, located approximately 40 km from the city of Vienna.

The organizers of the course do no accept liability for the payment of any costs or compensation that may arise from damage to or loss of private property, or from illness, injury, disability or death of a participant while he/she is travelling to and from or attending the course, and it is clearly understood that each Government, in nominating candidates, undertakes responsibility for such coverage. Governments would be well advised to take out insurance against these risks.

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