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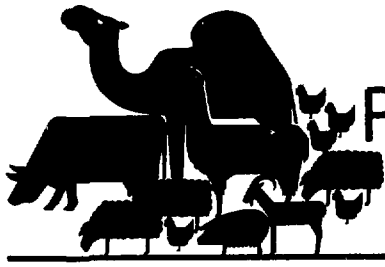

Animal Production and Health Newsletter

JOINT FAO/IAEA DIVISION OF NUCLEAR TECHNIQUES IN FOOD AND AGRICULTURE
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA

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CONTENTS

Dear Colleague,

As you can see from this edition of the Newsletter, we organised 5 training events of one kind or another over the past 6 months, completed two Coordinated Research Programmes (in Latin America and Africa) and began implementing two new ones (both in Africa), and organised a Consultants Group Meeting, the outcome of which has major implications for the global eradication of rinderpest and possibly other diseases. Additionally, it was announced that our Laboratory Unit had been designed by WHO as its Collaborating Centre for ELISA and Molecular Techniques in Zoonoses Diagnosis, thereby bringing coordination of the work of all the international orgabnisations involved in diagnostic methodology for animal diseases (OIE, FAO, IAEA and WHO) under "one roof".

The programme which lies ahead in 1994, will involve plenty of challenges and of course a great deal of work! Probably the greatest challenge is in Africa because of the size of the task involved in strengthening the capabilities of the national agricultural research systems to conduct research which will generate animal feeding, breeding and disease control strategies which are of use for farmers. During 1994, and in addition to assisting with infrastructural development by providing equipment, training, etc. through over 20 national/regional Technical Cooperation projects, around 50 African institutions will benefit from our Coordinated Research Programmes. These institutions are the participants in the new FAO/IAEA Coordinated Research Programmes on "Use of Immunoassay Methods for Improved Diagnosis of Trypanosomiasis and Monitoring Tsetse and Trypanosomiasis Control Programmes in Africa" and "Development of Feed Supplementation Strategies for Improving Productivity of Dairy Cattle of Smallholder Farms in Africa" as well as the participants of the Rinderpest Seromonitoring Network. Whilst the CRPs on dairy cattle and on trypanosomiasis are both being funded through the IAEA's Regular Budget, implementation of the trypanosomiasis programme will be assisted greatly by funding from the Government of the United Kingdom through an associated Regional Technical Cooperation project. As far as rinderpest is concerned, continuation of seromonitoring for antibodies to rinderpest virus and the introduction also of ELISA methods for rinderpest antigen detection (diagnosis) should be possible for at least a further 3 years (1994-1997) through EEC funding. Although the implementation of this Programme should perhaps be somewhat easier than for the other two CRPs since we have been involved with rinderpest in Africa for the past 8 years, the fact that activities will now be initiated in an additional 7 or 8 countries to those presently being supported, means a significantly increased workload than before.

Whilst Africa will benefit most from our CRPs in 1994 and probably beyond, we intend also to strengthen our activities in animal health in the Asian region by initiating a new Programme focussing on foot-and-mouth disease. The prospectus for this Programme is laid out in this edition of the Newsletter, and we encourage those interested to submit their applications before

the end of May when we will review them technically. Implementation of this new Programme will build on the knowledge we have gained and the standardised tests we have developed for FMD in Latin America through collaboration with the FMD World Reference Laboratory at Pirbright, UK, and PANAFTOSA in Rio de Janeiro, Brazil, and further details of how we intend to proceed with this particular Programme will be given in the next edition of the Newsletter.

There have been two changes to staffing since the last edition of the Newsletter. Noble Jayasuriya (Sri Lanka) who was a Technical Officer in the Section between 1984 and 1989 and then went to Malawi to assist with a UNDP/FAO project on animal nutrition, has returned as our Regional Expert for Africa on animal production. In addition to being technically responsible for all our animal production Technical Cooperation projects in this Region, Noble will look after the new FAO/IAEA Coordinated Research Programme on supplementation strategies for improving productivity of dairy cattle on smallholder farms which is described later in the Newsletter. Also, the Laboratory Unit at Seibersdorf has been strengthened by the recent arrival of John Jakupciak (USA). Before joining the Unit, John worked for Immuno-AG.

With best wishes for 1994,

James D. Dargie
Head, Animal Production
and Health Section

(A) STAFF

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Cynthia Hoffmann, Laboratory Technician
Martha Barmasch, Cost-free Assistant
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(B) PAST EVENTS

(1) FAO/IAEA/ARCAL National Training Course on "ELISA Techniques for Animal Disease Diagnosis", Asunción, Paraguay, 2-13 August 1993

This Course was held at the Servicio Nacional de Salud Animal (SENACSA), Asunción, Paraguay. Twelve laboratory-based veterinarians/diagnosticians were introduced to ELISA technology and its epidemiological applications. The Course consisted of theory (basic aspects of ELISA, data expression and acceptance, trouble-shooting and quality assurance) and practicals. The contribution of the Pan American Health Organisation (PAHO), staff members to lectures on animal disease epidemiology is greatly appreciated.

(2) FAO/IAEA Regional Training Course on "Use of Immunoassay and Related Techniques for Studies on Animal Production and Disease Diagnosis in Asia", Peradeniya, Sri Lanka, 16 August-10 September 1993

This Course was organised under the framework of the Regional Cooperative Agreement for Asia and the Pacific, and was held at the Department of Animal Production and Health of the University of Peradeniya, and at the Veterinary Research Institute Sri Lanka.

The objectives of the Course were to train young scientists in the region in two specific fields: (a) the use of radioimmunoassay (RIA) and related techniques for measurement of reproductive hormones and nutrient metabolites, and their application together with conventional methods for studies on improving productivity of livestock; and (b) the use of enzyme-linked immunosorbent assay (ELISA) techniques for diagnosis of animal diseases, and their application together with conventional techniques for studies on epidemiology and disease control. The Course therefore consisted of two parallel streams of training, Animal Production and Animal Disease Diagnosis. Lectures and discussions were supplemented by practical classes in the laboratory, field work on state livestock farms and visits to smallholder farmers.

The Course was opened on 16 August 1993 by the Resident Representative of the UNDP in Sri Lanka. The FAO Country Representative, the Chairman of the Atomic Energy Authority for Sri Lanka, the acting Vice Chancellor of the University of Peradeniya and the Director of the Department of Animal Production and Health also spoke.

Twenty-two participants from Bangladesh, Cambodia, Indonesia, Mongolia, Myanmar, Pakistan, Papua New Guinea, Philippines, People's Democratic Republic of Laos, People's Republic of China, Republic of Korea, Sri Lanka and Thailand attended the course. The lecturers were from Australia, New Zealand, Sri Lanka, UK and the Joint FAO/IAEA Division.

Local arrangements were handled well by the Course Director and his organizing committee, and the facilities at the Institute for Continuing Education of the Department of Animal Production

and Health, where the trainees were accommodated, were excellent. We thank the host institutes, the local staff and expatriate lecturers for their assistance in conducting this Course.

(3) FAO/IAEA/ARCAL Subregional Training Course on "ELISA Techniques for Animal Disease Diagnosis in Central America", San Jose, Costa Rica, 6-17 September 1993

This Course covered immunoassay methods for diagnosing and studying the epidemiology of animal diseases in Central America. It was held at the National University School of Veterinary Medicine, Programa de Investigación en Enfermedades Tropicales (PIET). Two participants from each of the following countries attended the Course: Nicaragua, Guatemala, El Salvador and Costa Rica. An additional five people from PIET participated as observers.

One of the aims was to introduce the use of the FAO/IAEA ELISA kit for the detection of antibodies to bovine leukosis virus (BLV) into the region.

The course was very much appreciated by the participants and an evaluation conducted at the end showed that the knowledge gained would be very useful in the application of ELISA techniques for animal disease diagnosis.

(4) FAO\IAEA Regional Training Course on the "Use of Immunoassay and DNA Probe Methods for Animal Disease Diagnosis and Control", 6-4 September 1993, Accra, Ghana

This Course was attended by 24 participants from Anglophone and Francophone African countries. There were 5 invited lecturers.

The purpose of the Course was to train scientists in the use of the FAO/IAEA ELISA kits for rinderpest, brucellosis and contagious bovine pleuropneumonia (CBPP). The Course was conducted in French and in English with the majority of lectures given in English with French translation. Although some of the French-speaking participants had problems in following the presentations given in English, by the end of the Course the majority of the French speaking group considered it as essential that such Courses are conducted bilingually and not be restricted to French alone.

The first two days were at the Ghana Atomic Energy Commission, Kwabenja, where the theory and basic principles of immunology, epidemiology and the ELISA were taught. The sensitivity and specificity of tests were determined and sample sizes and sampling frames were discussed.

The remaining two and a half weeks were at the Regional Veterinary Laboratory in Accra and were dedicated entirely to practicals involving the introduction to equipment, pipetting exercises and later to the use of the FAO/IAEA rinderpest, CBPP and brucella ELISA kits. Throughout the Course discussions were held on the interpretation of the ELISA results and the problems of the technique. In the final week lectures on DNA probes for rinderpest and PPR were given and their practical use was demonstrated.

(5) **Final Research Coordination Meeting of FAO/IAEA Coordinated Research Programme on "Development of Feed Supplementation Strategies for Improving Ruminant Productivity on Smallholder Farms in Latin America Through the Use of Radioimmunoassay Techniques", Piracicaba, Sao Paulo, 27 September-1 October 1993**

The Centro de Energia Nuclear Na Agricultura (CENA) in Piracicaba, Brazil was the venue for this RCM. The meeting was attended by 15 Research Contract holders (representing 11 Latin American countries), four Agreement holders, one invited lecturer and one FAO representative Mr. Manuel Sánchez, FAO-Animal Production Service, Rome). At the opening ceremony addresses were made by the Director of CENA, Dr. Carlos Clemente Cerri and by the Scientific Secretary. The first two days were dedicated to oral presentations of final results by the Research Contract holders and the agreement holders. Each participant had 20 minutes for his/her presentation followed by 10 minutes' discussion. The work done was reviewed and discussed. Some of the presentations originated useful debates that resulted in 'hot' topics during breaks. A field trip was made on the third day to several livestock farms around Campinas region. A lecture on "Common mistakes when writing scientific papers and tips to avoid them" was given by Dr. Renate Thummler from the Universidad Nacional Autónoma de México and this was followed by an active two-hour discussion on "How to write scientific papers". Thursday afternoon and Friday were spent editing the final reports. Each Agreement holder worked with 3-4 Research Contract holders. About half the manuscripts were considered technically satisfactory for publication, whereas the other half will require major changes.

An award was given to Mr. Carlos Henríquez (Centro de Tecnología Agrícola -CENTA- El Salvador) for a paper entitled "Use of minerals and non-conventional nitrogen sources as strategic supplements for dual purpose cattle" which was judged by the advisory group to be the best at the meeting. The selection of the winner was a difficult task when considering that several papers were of a high scientific quality. Evaluation was based on working conditions, relevance of the research, progress achieved, quality of the oral presentation, written material and audiovisual aids.

The local arrangements including computer rooms, buses, air ticket confirmations and money exchange were well organized. We would like to thank Drs. Cyro Ferreira Meirelles and Adibe Abdalla for their splendid collaboration before and during the meeting.

The main conclusions and recommendations from the programme were as follows:

- Inadequate nutrition remains a major constraint to improved productivity of ruminants in Latin America. Stategic supplementation was shown to be effective to advance puberty, to reduce post-partum intervals and to improve fertility; however, cost/benefit analysis should be considered before recommendations are given to end-users.

- Substantial progress was made in understanding the relationship between the input of nutrients and productive and reproductive functions in domestic animals under indigenous conditions.

- The objectives of the programme in strategic supplementation of nutrients to increase productivity in ruminants were met in the great majority of projects. The sucess rate of projects was very high in the programme.

- There was a great improvement in the development of the abilities of the researchers involved in the programme in terms of planning, executing and analyzing the results obtained in their respective experiments.

- The FAO/IAEA RIA kits proved to be useful tools for evaluation of reproductive functions.

- The programme was very valuable in maintaining momentum in laboratories in the region which have previously developed the resource base to carry out the investigations.

- During the course of the programme there was improvement in a sizeable number of the presentations; however there is a need to further improve the quality of oral presentations. Furthermore, there were examples of inappropriate broad conclusions based on limited data.

Recommendations:

- Future research programmes should have the goal of identifying limiting factors to animal production and developing practical solutions. Suggestions for solutions should always be based on previous identification of the problem.

- Further research on nutrition - reproduction interactions is required. However, the scope of the research should include complete cost/benefit analysis of the evaluated intervention.

- The Joint FAO/IAEA Division should continue to provide encouragement and financial support to scientists that have meaningful results in the current programme to undertake future studies on relevant aspects for improving productivity of domestic animals in Latin America.

- The Joint FAO/IAEA Division should encourage technology transfer to farmers of meaningful results obtained in the present programme and other research programmes.

- Improvements to infrastructure and laboratory resources in research institutes in Latin America are of great importance for carrying out good scientific research. Proper facilities are lacking in many institutions. To reduce the many problems associated with experiments carried out on private farms, national institutes should be assisted in obtaining experimental animals and appropriate husbandry units.

- The First Research Coordination Meeting of further programmes should include a workshop on design of research projects. Future projects should be evaluated and approved on the basis of sound and valid experimental designs.

- Participants are strongly recommended to publish the results of their experiments in international refereed journals.

An IAEA-TECDOC will be published during 1994. It will consist of all final reports and the conclusions and recommendation of the CRP.

(6) FAO/IAEA Consultants Meeting on "Recommended Procedures for Disease and Serological Surveillance as part of the Global Rinderpest Eradication Programme (GREP)", V.I.C., Vienna, 27 September - 1 October 1993

That "global eradication of rinderpest is achievable in the foreseeable future" was a statement issued at the end of an FAO Expert Consultation in October 1992 . To meet this objective by the year 2015, the establishment of the Global Rinderpest Eradication Programme (GREP) was recommended. GREP now seeks to implement coordination between the three current regional rinderpest eradication campaigns; for Africa, the Pan African Rinderpest Campaign or PARC; for West Asia, the West Asian Rinderpest Eradication Campaign or WAREC; and for South Asia, the South Asian Rinderpest Eradication Campaign or SAREC. One aspect of the activities of GREP will be to recommend an internationally acceptable zoosanitary approach for achieving rinderpest eradication and for determining the effectiveness of the achievement.

In 1989 and following an FAO/IAEA Consultants Meeting, the Joint FAO/IAEA Division published a document entitled "Guidelines for the Sero-monitoring of Cattle Conducted by PARC". These guidelines have been used by PARC countries during the past seven years as a basis for their sampling strategies for sero-monitoring. However, with many PARC countries now rapidly moving towards cessation of vaccination and the establishment of SAREC and WAREC there was a need to increase the scope of the original guidelines.

The guidelines produced at this meeting outline the various factors to be taken into account by a country in the process of moving along a zoosanitary pathway culminating in declaration of freedom from rinderpest virus and which has been approved by the 58th General Session of the OIE. Therefore the various aspects covered are: methods for disease surveillance; suspect case investigation; laboratory needs; disease information/reporting systems; needs during each stage of the eradication process.

The document is presently being reviewed by the consultants and once it is finalized it will be made available to all counterparts involved in rinderpest and to those who request it from the Section.

We would like to thank the consultants who contributed to producing the guidelines: Dr. L. Tyler, UK; Dr. W.P. Taylor,

India; Dr. P.C. Lefevre, France; Dr. D. Pfeiffer, New Zealand; Dr. V. Astudillo, Brazil; Dr. J. Domenech, PARC and Dr. M. Rweyemamu, FAO.

(7) **Final Research Coordination Meeting of the SIDA-funded FAO/IAEA/PARC Coordinated Research Programme on the Sero-monitoring of Rinderpest in Africa. Cairo, Egypt, 7-11 November 1993**

This Programme has been generously funded by the Swedish International Development Authority (SIDA) for the past 7 years and the RCM represented the completion of SIDA-funded activities. Under this CRP an FAO/IAEA rinderpest ELISA was successfully developed and used in 19 African countries to monitor national rinderpest vaccination campaigns and results were published in a number of IAEA-TECDOCS entitled "The sero-monitoring of rinderpest in Africa". Continuation by way of a follow-up Programme has been proposed and it was confirmed at this meeting that support for this would be provided to the Joint Division as a component of an FAO/PARC Epidemiology Project funded by the EEC.

The meeting was held in conjunction with the regional meeting of rinderpest national coordinators from East and Central Africa. All 20 Research Contract Holders from 18 African countries attended the meeting and presented papers on their current national rinderpest control programmes and the levels of immunity achieved during the 1992/93 vaccination campaigns.

The results of the FAO/IAEA external quality assurance (QA) programme for the FAO/IAEA competitive rinderpest ELISA which was operated for the second time showed a 99% agreement in testing laboratories. This clearly indicates the high level of technical competence in these laboratories and provides national and international authorities with assurance of the validity of the results being reported.

Based on the sero-monitoring results and field information it was recommended that 8 countries cease vaccination against rinderpest and make the OIE declaration of provisional freedom from rinderpest. After the cessation of vaccination the sero-monitoring network will enter a phase of disease surveillance in these countries to make sure that the virus is no longer circulating.

Egypt provided an ideal venue for the RCM and the Regional PARC Meeting and we would like to thank Dr. A. Moussa and his team most sincerely for their efforts and overwhelming hospitality.

The major conclusions and recommendations from the meeting were:

- Sero-monitoring results linked with information from the field on disease surveillance confirm that rinderpest has been eradicated from West Africa. Routine sero-monitoring results indicate that in most countries good systems for monitoring are now in operation. Although some countries have reached 85% or greater immunity, others have plateaued

and are unlikely in the near future to improve the immunity levels. Considering the above it is recommended that Mali, Senegal, Ghana, Burkina Faso, Côte d'Ivoire, Mauritania, Egypt and Nigeria, consider making an OIE provisional declaration of freedom from disease within the next 12 months; a prerequisite to this must be a cessation of vaccination.

- Central to a provisional declaration of freedom from disease is adequate surveillance, both for disease and for the presence of rinderpest antibodies in non-vaccinated animals. It is therefore recommended that all PARC countries proceed rapidly towards establishing a rinderpest surveillance capability based on the FAO/IAEA/GREP guidelines (see earlier).

- The external QA programme for the FAO/IAEA rinderpest ELISA-based system for sero-monitoring has proved invaluable in providing assurance to both national and international authorities of the reliability of the results obtained. It is recommended that this QA system be continued and that participation in it is an obligation for all GREP laboratories. A similar QA programme should be developed for rinderpest antigen detection systems.

- The RCM and the 5th PARC Regional Meeting are concerned by the poor correlation in some PARC countries between animals that were ear-marked to denote they were vaccinated against rinderpest and sero-conversion. The reason for this could be multifactorial involving vaccine, host and field operational factors (diluent, cold chain, field operation etc). It is recommended that all personnel involved in vaccination programmes be aware of this situation and endeavour to correct it.

- The antigen capture ELISA for differential diagnosis of rinderpest and PPR was introduced and used successfully in a number of laboratories of the sero-monitoring network. It showed a sensitivity superior to the established antigen detection tests (AGIDT, CIE, DOT ELISA). The test needs further evaluation in terms of specificity and standardization in more laboratories before general introduction into the sero-monitoring network is recommended.

- The sero-monitoring network has investigated the possible effect of antibodies to Peste des Petits Ruminants (PPR) in the response of cattle to rinderpest vaccination. Studies over the past year have shown that PPR may be transmitted from sheep and goats to cattle under field conditions and that cattle with antibodies against PPR may not produce a humoral antibody response following rinderpest vaccination. However, in the vast majority of cases, the presence of antibodies against PPR did not compromise sero-monitoring results. Also, endemic PPR may be highly localized in some countries.

Other factors are far more likely to adversely affect vaccination results but in exceptional cases, it may be necessary to retest rinderpest negative cattle sera using the PPR ELISA.

- Some studies under the FAO/IAEA sero-monitoring network have shown that maternal antibodies to rinderpest wane to undetectable levels after 3-8 months. Other studies have shown maternal antibodies being detected up to 10-12 months. Further work is essential to clarify this issue and assist in diagnostic interpretation of the results of serum surveillance in young animals following a cessation of vaccination.

- It is recommended to hold the next FAO/IAEA RCM in Bamako (Mali) in co-ordination with the PARC Regional Meeting for West and Central Africa and that during this meeting training be provided on appropriate antigen detection systems for rinderpest.

(8) FAO/IAEA/ARCAL National Training Course on the Diagnosis of Bovine Brucellosis, Havana, Cuba, 29 November - 10 December 1993

This Course was held at the Central Veterinary Laboratory, Habana, Cuba. It was organized in close collaboration with FAO/IAEA/ARCAL since the Government of Cuba offered 3 fellowships for Latin American countries. These were awarded to two scientists from Mexico and one from the Dominican Republic. Also one scientist from Ecuador was able to participate in the Course. The national and international participants from different laboratories were introduced to different conventional techniques for the diagnosis of B. abortus in cattle as well as to ELISA technology and its epidemiological applications. The Course consisted of theory and practicals and the participation of an FAO/IAEA expert from Colombia contributed to its success.

(C) STATUS OF EXISTING COORDINATED RESEARCH PROGRAMMES

(1) Immunoassay Methods for the Diagnosis and Epidemiology of Animal Diseases in Latin America

This Programme is funded by SIDA and has 22 Contract and 5 Agreement holders. The final RCM of the Programme has been arranged for 13-17 June 1994 in Guadeloupe.

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

The Programme now has a full complement of 17 Research Contracts and 6 Agreements and no further awards can be considered. We intend to hold the 2nd RCM in October 1994, probably in Manila, The Philippines.

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

This Programme was advertised in the previous edition of the Newsletter and as a result of the technical evaluation of the proposals received, 14 Research Contracts and 3 Research Agreements were awarded. The 1st RCM under the Programme will be held at the International Laboratory for Research on Animal Diseases (ILRAD), Kenya, from 7-11 February 1994.

LIST OF PARTICIPANTS

Research Contract/ Agreement holders	Project Title
Dr. Z. BENGALY Centre de Recherches sur les Trypanosomes Animales - CRTA 01 BP 454 Bobo Dioulasso 01, BURKINA FASO	Prévalence des trypanosomoses animales au Burkina Faso et évaluation de l'impact des campagnes de lutte à l'aide d'insecticides pour - on sur la transmission des trypanosomes pathogènes
Dr. C. NDAMKOU Laboratoire National Vétérinaire de Bokle B.P. 503 Garoua, CAMEROON	Sero-survey of bovine trypanosomiasis in Cameroon.
Dr. N. OKUNA Uganda Trypanosomiasis Research Organisation P.O. Box 96 Tororo, UGANDA	Enhancement of animal production in South Eastern Uganda through the treatment of cattle for trypanosomiasis on Ag-Enzyme-linked Immunosorbent Assay (ELISA) positivity.

Dr. R. RIES Veterinary Res. Laboratory Tsetse & Trypanosomiasis Control P.O. Box 8101 Harare, ZIMBABWE	Use of antigen-detection ELISA for surveillance of bovine trypanosomiasis in a tsetse control area of Eastern Zimbabwe.
Dr. O. DIALL Laboratoire Central Vétérinaire du Mali B.P. 2295 Bamako, MALI	The use of antigen ELISA for the evaluation of a small scale tsetse control program in Mali.
Dr. W. OLAHO-MUKANI Kenya Trypanosomiasis Res. Institute P.O. Box 362 Kikuyu, KENYA	Use of antigen ELISA in the evaluation of the trypanosomiasis control programmes in Kenya.
Dr. E. ELAMIN Faculty of Vet. Science University of Khartoum P.O. Box 32 Khartoum North, SUDAN	Application of Ag ELISA and selective chemotherapy in a pilot control program of camel trypanosomiasis in mid-Eastern Sudan.
Dr. A. DIAITE Institut Sénégalais de Recherches Agricoles Laboratoire National de l'Elevage et de Recherches Vétérinaires B.P. 2057 Dakar, SENEGAL	Improving the diagnosis and control of trypanosomiasis and other vector-borne diseases of African livestock using immunoassay methods.
Dr. L. SINYANGWE Central Veterinary Research Institute P.O.B. 33980 Lusaka, ZAMBIA	Application of the Ag-ELISA technique for the detection trypanosomes resistant to the trypanocides currently in use.
Dr. Ch.DOKU Tsetse and Trypanosomiasis Unit Central Veterinary Lab. P.O.B. 97 Tamale, GHANA	The introduction of an ELISA system for the detection of trypanosomiasis in the northern region of Ghana.
Dr. H. MBWAMBO Animal Disease Research Institute P.O.B. 9254 Dar-es-Salaam, UNITED REPUBLIC OF TANZANIA	Trypanosomiasis surveillance on Zanzibar Island, Tanzania, using the trypanosome antigen ELISA technique.

Dr. A. N'DEPO Laboratoire National D'Appui au Développement Agricole Abdijan - LANADA 04 B.P. 612 Abidjan 04 CÔTE D'IVOIRE	Etude comparative des tests immunologiques de dépistage des trypanosomoses par rapport aux méthodes de mise en évidence de l'agent (frottis, gouttes épaisses, woo, culture in vitro)
Dr. S. AJAYI National Veterinary Research Institute Parsitology Division P.M.B. 01 Vom, near Jos Plateau State, NIGERIA	Monitoring of tsetse eradication programme in the Plateau and Bauchi States of Nigeria.
Dr. N. TEWELDE National Tsetse and Trypanosomiasis Control Coordination Office P.O. Box 8595 Addis Ababa, ETHIOPIA	Use of Ag-ELISA to monitor the effectiveness of a tsetse and trypanosomiasis control campaign in the upper Didessa Valley in Western Ethiopia.
Dr. P. LESSARD International Laboratory for Research on Animal Diseases P.O. Box 30709 Nairobi, KENYA	Studies on the epidemiology of trypanosomiasis using Ag-ELISA and other diagnostic methods.
Dr. M. EISLER Dept. of Veterinary Physiology University of Glasgow Veterinary School Bearsden Rd., Glasgow, G61 1QH UNITED KINGDOM	Enzyme immunoassays for the detection of trypanosome infections and for the quantification of trypanocidal drugs.
Dr. A.G. LUCKINS Centre for Tropical Veterinary Medicine Easter Bush, Roslin, Midlothian, EH25 9RG, UNITED KINGDOM	Validation of enzyme linked immunoassays in the diagnosis and control of animal trypanosomiasis.

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

Again, there was an excellent response to the announcement of this Programme in a previous edition of the Newsletter and we are not seeking any further proposals. From the proposals received, we awarded 12 Research Contracts, 1 Technical Contract and 5 Research Agreements and intend to hold the 1st RCM around September/October 1994.

LIST OF PARTICIPANTS

Research Contract/ Agreement holders	Title of Project
Dr. Abdullah Guerouali Institut Agronomique et Vétérinaire Hassan II B.P. 6202 Rabat-Instituts, MOROCCO	Development of indication of heat tolerance and nutritional status of local dairy cattle supplemented with blocks of molasses and fish waste.
Dr. Razik Nkya Sokoine University of Agriculture Dept. of Veterinary Surgery P.O. Box 3020 Morogoro, UNITED REPUBLIC OF TANZANIA	Development of feed supplementation strategies for improving productivity of smallholder, cut-and-carry dairying with cattle in urban and peri-urban Morogoro in Tanzania.
Dr. Ph. Yesso Institut des Savannes (IDESSA) B.P. 633 Bouake, COTE d'IVOIRE	Strategies for improving rural milk production in Côte d'Ivoire.
Dr. Ch. Mutisi Dept. of Animal Science University of Zimbabwe Box MP 167 Mount Pleasant Harare, ZIMBABWE	Development of feed supplementation strategies for improving the productivity of dairy cattle on smallholder farms in Zimbabwe.
Dr. Abdool Ahamad Boodoo Ministry of Agric. Fisheries and Natural Resources Reduit, MAURITIUS	Improving the productivity of cattle on smallholder farms through studies on nutrition and reproduction.
Dr. D. Paulsmeier Roodeplaat Grassland Institute Private Bag XOS 0039 Lynn East Pretoria, REPUBLIC OF SOUTH AFRICA	Comparison of irrigated rye grass, clover and ryegrass-clover mixtures for feeding cattle.
Dr. P. Mbugua Dept. of Animal Production University of Nairobi P.O. Box 30197 Nairobi, KENYA	Development of feed supplementation strategies for improving the productivity of dairy cattle in smallholder farms in Kenya.

Dr. Mohamed-Tahar Benyoucef Centre de Developpement des Techniques Nucléaires (CDTN) Laboratoire de Zootechnie 2, Bd Frantz Fanon B.P. 1017 Alger-Gare, ALGERIA	Development of nutritional strategies for improving the productivity of dairy cattle in Algeria.
Dr. Aboubakar Njoya Institute of Animal and Veterinary Research (IRZV) B.P. 1457 Yaounde,' CAMEROON	Development of feed supplementation strategies for improving the productivity of dairy cattle on smallholder farms in Cameroon.
Dr. Moffat Smally Kumwenda Ministry of Agriculture Department of Agriculture Research P.O. Box 30134 Lilongwe 3, MOROGORO	Use of tree legumes as protein supplements for dairy cattle on smallholder farms in Mzuzu milkshed area in Northern Malawi.
Dr. Olubunmi Akinpelumi National Animal Production Research Institute Ahmadu Bello University PMB 1096 Zaria, NIGERIA	Development of nutritional and reproductive management strategies for the improvement of milk production and reproductive efficiency in agropastoral dairy cattle.
Dr. G. Getachew Institute of Agriculture Research Holetta Station P.O. Box 2003 Addis Ababa, ETHIOPIA	Development of feed supplementation strategies for improving the productivity of dairy cattle on smallholder farms in Ethiopia.
Dr. E.R. Orskov Rowett Research Institute Bucksburn Aberdeen, AB2 9SB, UNITED KINGDOM	Development of a simple method for determination of purine derivatives in urine of ruminants. (Technical Contract)
Dr. M. Marie Ecole Nationale Supérieure d'Agronomie et des Industries Alimentaires B.P. 172 F-54505 Vandoeuvre Cedex, FRANCE	Nutrition-reproduction interactions in cattle. European models.
Dr. D. Whitaker University of Edinburgh Royal (Dick) School of Veterinary Studies Veterinary Field Station Easter Bush, Roslin Midlothian, EH25 9RG, UNITED KINGDOM	Development of feed supplementation strategies for improving the productivity of dairy cattle in smallholder farms in Africa.

Dr. M. Bryant Dept. of Agriculture University of Reading Earley Gate P.O. Box 236 Reading, RG6 2AT Berkshire, UNITED KINGDOM	Development of supplementation strategies for milk-producing animals in Africa.
Dr. D. Poppi Department of Agriculture The University of Queensland Brisbane, Queensland 4072, AUSTRALIA	Nutrient supply from tropical and sub-tropical pastures. Nutrient status and production indices of dairy cattle from various farms in SE Queensland.

(5) Seromonitoring of Rinderpest throughout Africa - Phase II

Although SIDA-funding for this Programme has now ceased, we are confident that it will be continued for a further 3 years through support provided by EEC, thereby allowing the present network of 20 Research Contracts and 4 Research Agreements to be maintained and perhaps expanded to include other PARC countries. Apart from continuing seromonitoring of cattle populations for rinderpest antibodies, a further aim of the Programme will be to introduce an antigen-detection ELISA test for diagnosis of rinderpest.

(D) NEW COORDINATED RESEARCH PROGRAMME

Improved Diagnosis and Control of Foot-and-Mouth Disease in South East Asia Using ELISA-Based Technologies

1. Introduction

Foot-and-mouth disease (FMD) is one of the most important diseases affecting livestock in Asia causing losses directly through reduced production (milk and meat and working time for draft animals) and indirectly through loss of export markets due to the presence of the disease in a country. Although vaccination and animal movement control are central to any FMD control programme, an ability to diagnose the disease and monitor the effectiveness of control measures is crucial. This is complicated by the presence of a number of serotypes of the virus that cause FMD and the need to identify these quickly in an outbreak in order to trace the source of the outbreak and select appropriate vaccines for control.

Until recently the diagnosis and identification of virus types and subtypes and the characterization of the antibody response to infection with FMD involved a number of unreliable, cumbersome and expensive procedures including virus neutralization, complement fixation and gel electrophoresis. A further problem is that all these techniques are difficult to standardize and hence interpretation of results is subjective.

In the past 5 years, however, ELISA technology has been developed to identify and characterize FMD virus types and the host's immune response to them. The use of this technology within the framework of national and regional FMD control programmes has enormous potential to increase the capability of veterinary services to both type FMD viruses and improve the "match" between vaccine and field strains. The protocols for doing this and the reagents needed have now been fully standardized by the World Reference Laboratory for FMD (WRL) in UK. Also, to transfer this technology as well as knowledge of FMD diagnosis, epidemiology and control to developing countries, the Joint FAO/IAEA Division (through the FAO/IAEA Central Laboratory and OIE Collaborating Centre for ELISA and Molecular Techniques in Animal Disease Diagnosis based in Austria) worked with the WRL to develop FMD antigen and antibody detection "kits". In the past 3 years, the antigen (or typing) kit was successfully validated in 9 Latin American countries through collaboration between FAO/IAEA and the Pan American Foot-and-Mouth Disease Centre (PAFMDC) in Brazil, and it is now being used routinely in all countries within the framework of national/regional control and eradication efforts. Soon (1994) the "antibody kit" will be introduced for vaccine testing and for examining relationships between vaccine and field strains of FMD, and by 1996, it is expected that PAFMDC will produce and distribute the reagents required, with the FAO/IAEA/OIE Laboratory and WRL providing only a quality assurance service.

Parallel to the above, the recently completed ACIAR[1]/AAHL[2]/Government of Thailand project on FMD has also shown

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[1]Australian Centre for International Agricultural Research; [2]Australian Animal Health Laboratory, Geelong.

the immense value of ELISA-based systems for the diagnosis and control of FMD within Thailand, and at an ACIAR Workshop in Lampang, Thailand (September 1993) which considered the results of this project and reports from 12 Asian countries of the FMD situation in the region, it was concluded that in the absence of efficient animal movement controls the only realistic way forward to control FMD was to consider a regional approach. It was recommended that an essential component of this was for each country in the region **as a minimum** to have ELISA tests for the detection of FMD virus and for assessing the antibody status of livestock population. The Programme outlined below seeks to establish that capability in Asia, and to use it to clearly define the FMD situation in each country by bringing together the expertise available in the AAHL, WRL and the Joint FAO/IAEA Division to help establish that capability and subsequently develop and monitor soundly-based control/eradication measures.

2. Objectives

(a) The essential objective is to strengthen the capability of the national veterinary services in Asia to contribute effectively to FMD control by establishing the capacity to use ELISA-based systems for FMD diagnosis and monitoring. Emphasis would be placed on transferring FMD typing capability, and subsequently this would be extended to FMD antibody assays for checking vaccines and for monitoring relationships between strains involved in field outbreaks and used in vaccines.

(b) Within the overall objective, the initial aim would be to award Research Contracts to individual institutes in the region to use ELISA tests in conjunction with other epidemiological techniques to determine the prevalence and distribution of FMD in the countries concerned, and hence its economic significance and the effectiveness of current control measures.

(c) Based on the above, to develop improved control and possibly eradication programmes within the national framework of ongoing FMD control programmes, and to monitor the effectiveness of these using ELISA methods.

The control and eradication of FMD in Asia is both a national and regional problem (vaccination alone costs the region US$ 380 million annually). The approach proposed is one which addresses both issues. It involves establishing a Regional Network, through this CRP, of key national FMD control centres in South East Asia which will be supported by FAO/IAEA, and others to help ensure the attainment of its objectives. The activities of the Network will be "coordinated and standardized" through the introduction of a number of key elements in the process of implementation.

3. Programme Implementation

3.1 Research Contracts

On the basis of technically-sound proposals from institutions in south-east Asia, Research Contracts will be awarded for an initial period of one year. Support will only be

given of those laboratories which have a national mandate to investigate or control FMD. Contracts will be renewable on an annual basis for a total period of 5 years subject to satisfactory progress being made during each contract period.

Research Contracts provide modest financial support (*around 2,000 - US$ 12,000 per year with more provided in the first year to cover initial equipment expenditures)* to follow an agreed work plan, and are awarded on a cost-sharing basis, i.e. the institutes concerned also provide support to achieve the project's objectives. It is anticipated that 10-12 Research Contracts will be awarded under the Programme.

In each case the work proposed to be conducted under the each Contract should follow a logical sequence e.g. during the first year:

- establishment of the equipment and the assay(s)
- if appropriate operation of the assay alongside existing assays for comparison
- establishment of initial objectives and preparation of a suitable field sampling frame to achieve these
- collection of sera/tissue samples
- testing of samples
- analysis of data
- preparation of presentation of results at first Research Coordination Meeting

Subsequent workplans would be based on the results and conclusions of this first year of work.

3.2 Research Agreements

Three Research Agreements will be awarded to institutes/ scientists with internationally-recognized expertise in FMD diagnosis, epidemiology and control. It is expected that two of these Agreements will be awarded to AAHL and WRL. Research Agreements do not involve financial remuneration, but a representative of the institute would be invited to attend the Coordination Meetings, etc. related to the Programmme and to provide technical guidance to staff of institutes holding Research Contracts.

3.3 Research Coordination Meetings

Research Coordination Meetings/Training Workshops will be held as soon as practicable after setting up the CRP. It is anticipated that the first of these will be in early 1995 and that meetings thereafter will be on an annual basis. During this first meeting detailed workplans for the coming year will be prepared taking into account both national and regional priorities in FMD diagnosis and control. Training will also be provided on the use of the FAO/IAEA FMD kits. During subsequent meetings, results will be presented by each Research Contract holder followed by the preparation of work plans for the coming year. Further training will be given on approaches to FMD control and epidemiology, computerized software programs, etc.

3.4 Use of Standardized ELISA kits and Data Analysis Programs

An essential component of the proposed Programme is that participating institutes adhere to common test protocols, use fully standardized reagents, conform to a common system of result interpretation and reporting, and participate in an external quality assurance (EQA) programme.

All of the above will be provided through collaboration between AAHL, FAO/IAEA, WRL and a Regional Reference Laboratory in the region (when this develops).

4. Coordination of Technical Work and Inputs

Technical coordination will be achieved through the processes of defining work plans, provision of standardized reagents and protocols and of the EQA, and the implementation of uniform data analysis and reporting procedures. Training and equipment inputs will also be standardized to develop uniformity in the standard of technical work performed.

5. Complementary FAO/IAEA Support

IAEA has an increasing programme of support to veterinary institutes in the Asian region through national IAEA Technical Cooperation Projects (TCP). These are all concerned with introducing and using ELISA technology for diagnosing a range of animal diseases. Through such projects additional support may be provided for the activities planned under the individual research contracts. This would include further equipment, specialized training through IAEA training fellowships and the provision of technical back-stopping through visits by IAEA experts for periods of around one month. Such support would be available to IAEA Member States within the region.

6. Submission of Proposals

Applications are now invited for participation in this Programme. Research Contract Proposal forms can be obtained from local UNDP offices, from National Atomic Energy Commissions or from us in Vienna. Please note that proposals should be countersigned by the Head of the Institution and sent directly to the IAEA; they do not normally need to be routed through other official channels. The **deadline for receipt of such proposals is 31 May 1994.**

(E) DEVELOPMENTS AT THE ANIMAL PRODUCTION UNIT, SEIBERSDORF

(1) Disease Diagnosis

(a) International collaboration

1993 has been a very important year for the Laboratory Unit since the Directors General of FAO and IAEA officially approved the designation of the Unit as the:

FAO/IAEA Central Laboratory for ELISA and Molecular Techniques in Animal Disease Diagnosis

Earlier, the Office International des Epizooties (OIE) designated the Unit as the:

OIE Collaborating Centre for ELISA and Molecular Techniques in Animal Disease Diagnosis

and very recently, the Unit received designation from the World Health Organization (WHO) as the:

WHO Collaborating Centre for ELISA and Molecular Techniques in Zoonoses Diagnosis

These three designations underscore the commitment of the Animal Production Unit to the international development, standardization and validation of ELISA and related molecular techniques for infectious disease diagnosis. Our Unit has and will continue to work closely with all of the above organizations and with major veterinary research centres worldwide to develop international standards for disease diagnosis.

(b) ELISA software

Towards the end of 1993, the first major revision of our ELISA support software was undertaken. In the new version, all raw optical density (OD) and percent positivity (PP) or percent inhibition (PI) values will be printed for both control and test sample results. In addition, the 'blanking' value will also be recorded. The raw data file for each plate will now store the upper and lower control limits (UCL & LCL) and the cut-off value for the particular batch of reagents used in the assay. Raw data files stored under the previous program may also be recalled even though control limits and the cut-off have not been stored. The new program has a provision to verify and/or edit control limit and cut-off values without having to go through a text editor. Whereas the percent coefficient of variation (%CV) had been used in the old program to assess variability between duplicates, the new programme will displace the absolute difference between the duplicates. The new computer program will put the onus of quality control and data acceptance on the user. No longer will the program 'accept' or 'reject' individual plates. Instead, it will provide a warning that certain values are outside of suggested limits. The user will have to decide whether or not the data are acceptable. Lastly, a separate provision has been added whereby raw OD values may be printed in an 8x12 format. This will allow the user to set up experimental plate designs for the titration of reagents and test samples when required.

(c) Brucellosis indirect ELISA field trial

Analysis of data from the WHO/FAO/IAEA international validation of the Brucellosis indirect ELISA is still ongoing. At the time of writing, five of the nine participating laboratories had submitted their data, two more are compiling their results and the last two are unlikely to meet the last deadline. Analysis must be completed before February 1994 so that it may be presented to the OIE Standards Commission and the test considered as a prescribed test for the international movement (import/export) of cattle.

(d) R&D

Standardized protocols have now been written for the liquid phase, blocking assay for titration of anti-FMDV antibody (in collaboration with the Institute of Animal Health, Pirbright) and for the competitive ELISA for differentiation of Brucella infected from Brucella vaccinated cattle (in collaboration with the Animal Diseases Research Institute, Nepean). At this time, large batches of reagents are being prepared and quality tested. Both assays should be ready for international validation by mid 1994, if all goes according to plan. Computer software has been written in support of both these new assays.

(2) **Animal Production**

(a) Development of the FAO/IAEA 'self-coating' RIA kit for progesterone in milk

As reported in the previous edition of the Newsletter, the development of a more self-sustaining technology for measuring progesterone by RIA was considered necessary. Thus, a monoclonal antibody-based assay was developed in the laboratory and we will initiate further field testing of this as well as training of counterparts in the early part of 1994.

(b) Effect of collection, treatment and storage on the stability of nutritional metabolites in blood

Studies on the above have been completed and a comprehensive report is in preparation. This will be included in the next shipment of FAO/IAEA metabolite kits to end-users. As indicated in the July Newsletter, the five metabolites studied (total protein, albumin, urea, hydroxybutyrate and phosphorus) are very stable in serum when deep frozen. However, hydroxy butyrate levels in plasma seem to increase with time, especially after three months of storage (see Table 1).

(c) Quality Assurance

QA support continues to be provided to the FAO/IAEA progesterone kit. Judging by the responses we receive, we are confident that 90% of the recipients of our progesterone kits submit analytical data which conform to statistical limits. The remaining 10% (3-7 labs normally) tend to have problems with pipetting accuracy, gamma counters with low counting efficiencies, or simple mathematical/statistical procedures. The emphasis in 1994 will be on encouraging more counterparts to

Table 1: Effect of cold storage (-20°C) on the concentration of nutritional metabolites in serum and plasma

	Duration of Storage (days)							
	0		45		98		180	
Metabolite	S	P	S	P	S	P	S	P
Total Protein (g/L)	75.8	84.6	76.8	79.0	75.5	80.5	76.6	81.5
Albumin (g/L)	44.7	38.7	41.5	40.2	42.8	43.1	44.9	43.3
β-hydroxybutyrate (mmol/L)	0.61	0.69	0.57	0.67	-	0.75	0.59	0.89*
Phosphorus (mmol/L)	1.39	1.67	1.57	1.77	1.52	1.45	1.45	1.77

S = serum; P = plasma
*indicates statistical ($p<.0.5$) difference between this value and 0 day storage

initiate internal quality control activities; appropriate advice will be provided from the laboratory.

The first panel of QA samples in support of the FAO/IAEA metabolite kits was sent out in September. Of the 16 recipients, only 7 responded within the allotted time. Since the purpose of the QA service is to help counterparts to develop confidence in the use of these technologies, we would be grateful if they would all respond within the generous time limit allowed. Otherwise, it leads to a great deal of frustration at this end and ties up scarce staff resources for much longer than anticipated.

(d) R&D

The three remaining FAA/IAEA metabolite kits for magnesium, copper and iron have now been validated in the laboratory and bench protocols have been written. Whereas programme funds do not permit the wholesale distribution of these kits to counterparts, individual requests for the supply of one (or more) of them might be considered if a deficiency is suspected. Please contact your Project/Technical Officer if you are interested.

(3) Fellowship Training

Six Fellows have been accepted for three month Group Training in animal disease diagnosis starting in April, 1994. In addition, one or two Fellows will be accepted for 1 year of training, after which it is expected that they will be able to act as technical experts who will be able to backstop and trouble shoot our projects.

(F) PUBLICATIONS

The results presented at the Final Research Coordination Meeeting of the FAO/IAEA Coordinated Research Programmes on the Use of Immunoassay Methods in Animal Reproduction and in Disease Diagnosis (Bangkok, February 1993) have now been edited and will be published under the IAEA's TECDOC Series in March 1994. The publication entitled "Strengthening Research on Animal Reproduction and Disease Diagnosis in Asia through the Application of Immunoassay Techniques" will be available free-of-charge by writing to the IAEA's Division of Publications.

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(G) FORTHCOMING EVENTS

(1) First FAO/IAEA Research Coordination Meeting on "Use of Immunoassay Methods for Improved Diagnosis of Trypanosomiasis and Monitoring Tsetse and Trypanosomiasis Control Programmes", ILRAD, Nairobi, Kenya, 7-11 February 1994

(2) FAO/IAEA Workshop on "Immunoassay and Related Techniques in Livestock Nutrition and Reproduction Research in Latin America", Valdivia, Chile, 7-11 March 1994

The Workshop will provide training in nuclear and related techniques in animal nutrition and reproduction. This will include experimental design, data handling and interpretation of participants' experimental data, and laboratory work on measurement of selected metabolites by biochemical methods and determination of progesterone by the radioimmunoassay technique. An adequate understanding of the theory of ruminant nutrition and reproduction will be assumed and the emphasis throughout will be on practical and applied research.

The event is being organized under the ARCAL III programme. Therefore, it is open for the participation of up to 15 scientists from the Latin American region. Nevertheless, Research Contract holders of the CRP on "Development of Supplementation Strategies for Milk-Producing Animals in Tropical and Subtropical Environments" will have priority in attending the Workshop. A few general lectures will guide the non-CRP participants on the usefulness of metabolic profiles but most effort will be given to analysing and interpreting the data of Research Contract holders.

(3) Final FAO/IAEA/SIDA Research Coordination Meeting on "Immunoassay Methods for the Diagnosis and Epidemiology of Animal Diseases in Latin America", Guadeloupe, 13-17 June 1994

This meeting will be held at CIRAD-EMVT. The emphasis will be on the preparation of manuscripts for publication as an IAEA-TECDOC. Participants will be informed in due course about the arrangements for the meeting.

(4) FAO/IAEA Inter-regional Training Course on the Use of Immunoassay and Molecular Methods for Animal Disease Diagnosis and Control, Seibersdorf, Austria, 24 October - 25 November 1994

PROSPECTUS

Place: FAO/IAEA Central Laboratory for ELISA and Molecular Techniques for Animal Disease Diagnosis, Agriculture Laboratory, Agency's Laboratory, Seibersdorf, Austria.

Deadline for Nominations: 1 July 1994

Organizers: International Atomic Energy Agency and the Food and Agricultural Organization of the United Nations.

Language: English

Participation: The training course is open to 20 participants from developing Member States of FAO/IAEA.

Background to the course: In developing countries, diseases affecting livestock continue to be a major constraint to establishing and improving sustainable animal production. Over the past 8 years, the major thrust of the Joint FAO/IAEA Programme in animal health has been the development and technology transfer of internationally standardized and validated enzyme immunoassay (ELISA) techniques for the diagnosis of major epizootic diseases to national laboratories. Many of these laboratories are now in a position to apply these assays to control, eradication and surveillance programmes and to act as national reference centres for this technique in their own countries. While serological techniques such as the enzyme immunoassay are the mainstay of infectious disease diagnosis, new molecular-based techniques (e.g. nucleic acid probes and polymerase chain reactions) are being developed which will augment serological diagnosis. In the future, these techniques will reach a stage of development where they will be more widely used than at present. They will then become an integral component the Joint FAO/IAEA Programme in animal health.

Purpose of the course: To provide an in-depth understanding of the immunological basis of infectious disease diagnosis with special emphasis on enzyme immunoassay development, standardization, quality control and trouble shooting. To provide an in-depth understanding of seroepidemiological principles with special emphasis on the application of enzyme immunoassay techniques in disease control, eradication and surveillance programmes. To introduce other molecular-based techniques for the detection and identification of infectious agents and to explain the role of these techniques in diagnostic programmes.

Participants' qualifications: Applicants must be experienced in laboratory techniques and have a working knowledge of

enzyme immunoassay and be either research scientists, veterinarians or senior laboratory technologists. The course will stress both immunological and epidemiological aspects of disease diagnosis and is aimed at those who will be responsible for application of enzyme immunoassay in control, eradication and surveillance programmes; it is not aimed at administration level managers or those with no proven experience in ELISA methods.

Nature of the course:

The course will be a combination of lectures and practicals. Lectures will include the immunological and seroepidemiological basis of disease diagnosis and control. Major viral, bacterial and haemoparasitic diseases will be used as examples. The practicals will be designed to demonstrate the immunological principles of indirect, competitive and antigen capture enzyme immunoassays and the variables which may affect their diagnostic performance. Participants will be given a data set which they will use to create a computerized database and analyse seroepidemiolocal parameters such as diagnostic specificity and sensitivity and predictive value.

The principles of other molecular-based techniques will be introduced and these techniques will be demonstrated in the laboratory.

Application procedure:

Nominations should be submitted in duplicate on the standard application forms for training courses. Completed forms should be endorsed by and returned through the official, established channels (e.g. 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, Wagramerstrasse 5, P.O. Box 100, A-1400 Vienna, Austria, **by 1 July 1994**. Nominations received after this date or applications sent directly by individuals or private institutions cannot be considered. Completed and endorsed application forms may be submitted by facsimile.

It is suggested that advance information of the nominations be submitted by telex/facsimile with the following information: name, age, academic background, present position and full working address (incl. telex, telephone and facsimile numbers), to enable the IAEA to make a preliminary evaluation of candidates.

Language certificate: In the case of countries in which English is not an official or working 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, cultural institution or an embassy of a country in which English is spoken.

Administrative and financial arrangements: Nominating Governments will be informed in due course of the names of selected candidates and at that time, full details will be given of procedures to be followed with regard to administrative and financial arrangements. The IAEA will pay the full cost of the participants' air travel from their home countries to Vienna and return. 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 organizers of the course do not accept liability for the payment of any costs or compensation that may arise from damage to or lose of personal property, or from illness, injury, disability or death of a participant while he/she is traveling 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.

(H) ESNA MEETING REPORT 1993

The report below of the Animal Sciences Working Group was prepared by Prof. B. Todorov (Bulgaria) following the 23rd Meeting of the Society for New Techniques in Agriculture (ESNA) which was held at Halle, Germany, from 5-9 September 1993.

The Working Group 2 met in 3 sessions during which 12 papers were presented, covering experimental animal physiology, metabolism, endocrinology, reproduction and virology.

A contribution to liver analysis by sort neutron activation (Selenium-77) was the subject of the paper presented by Binnerts (Holland). The method is available for large-scale analysis of freeze-dried powdered biological samples with at least 100 samples.

Kalaidjieva (Bulgaria) discussed the concept that prostaglandin inhibition did not disturb erythropoietin production and erythroid regeneration under conditions of hypoxia.

The paper presented by Pöschl (Czech Republic) was about determination of the transfer and distribution of caesium from contaminated feed in broiler chickens. He discussed the possible use of feed additives for reducing intestinal absorption of ^{137}Cs and preventing its transfer in the human feed chain and also for accelerating the elimination of radiocaesium for the body. Pöschl also reported data on milk progesterone levels in relation to the superovulatory response in an embryo transfer programme in cows. Milk progesterone levels provided good information on the character of the cycle and particularly on the activity of the corpus luteum.

Martino (Italy) reported his preliminary investigations on Coenzyme Q10 content in meat and its correlation with qualitative parameters. Bobek (Poland) presented very interesting results suggesting that in neonatal lambs both the sympatho-adrenal and pituitary-adrenal cortex axes were sensitive to stress. Isolation of lambs from their mothers was characterized by an emotional stress which was even more evident than during immobilisation. In a further paper, Bobec suggested that endogenous rT3 might participate in modifying oxygen consumption in birds.

A report was presented by Sechman (Poland) about the stimulatory effect of 3,5 3'-Triiodothyronine (T3) on 1,25-dihydroxyvitamin D3 induced chick Calbindin - D28k gene expression in chick intestine and kidney. Calbindin - D28k is a vitamin D dependent calcium binding protein expressed in the intestine, shell, gland, kidney and cerebellum. The results indicated that thyroid hormones might play a significant role in both the intestine and kidney as indirect regulators of calcium translocation involving Calbindin - D28k gene expression.

Skartynski (Poland) presented evidence suggesting that noradrenaline (NA) stimulated luteal oxytocin and progesterone secretion through β-adrenergic receptors. The secretion of prostaglandin (PGF2) was not involved in the mechanism of this

NA action. The blood pressure changed without influence of luteal β-receptors upon the function of corpus luteum.

Jaroszewski (Poland) reported that NA reduced the total amount of oxytocin in the bovine corpus luteum, but did not completely deplete it of this peptide, and decreased oxytocin content of the corpus luteum did not affect the length of the oestrous cycle in cattle.

Carnevali (Italy) reported that endouterine insemination of appenninic ewes during anoestrous using frozen semen has good possibility of success.

Todorov (Bulgaria) presented data about the sensitivity of RIA, ELISA and the microvirus neutralisation test (MVNT) for the detection of infectious bovine rhinotracheitis. The sensitivity of RIA was about 13% higher than that of ELISA and MVNT. This is very important for the early detection of seropositive animals for this disease.

During the sessions we discussed possibilities for:

- presenting papers on the new techniques of animal molecular biology (DNA, RNA analysis, polymerase chain reaction, etc) at the next meeting;

- promoting exchange of information in the field of veterinary physiology, virology and endocrinology.

Each session provided much useful practical and scientific information and opportunities for lively and critical discussions.

We noted with pleasure that 75% of the participants in the working group were young scientists.

On behalf of the participants in Working Group 2, I would like to thank the local secretary, Mrs. Grahn, for providing everything needed for the conduct of the meeting.