



Animal Production and Health Newsletter

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

Issue No. 11
January 1990

ISSN 1011-2529

CONTENTS

TO THE READER	2
A. PAST EVENTS	4
Regional Seminar for Africa in Animal Production and Health	4
Research Coordination Meeting on Indigenous Livestock Production in Africa	5
Research Coordination Meeting on Diagnosis of Trypanosomiasis	6
B. STATUS OF EXISTING COORDINATED RESEARCH PROGRAMMES	7
C. NEW COORDINATED RESEARCH PROGRAMME ON CAMELIDS	11
D. DEVELOPMENTS AT THE SECTION'S LABORATORY UNIT, SEIBERSDORF	14
E. PUBLICATIONS	17
F. COMPUTERISED JOURNAL ON LIVESTOCK PRODUCTION FOR RURAL DEVELOPMENT	21
G. FORTHCOMING EVENTS	29
H. FAO's PROGRAMME ON TRYPANOSOMIASIS	34

32 / 10

Dear Colleague,

This edition of the Newsletter is somewhat longer than normal because unlike previous editions where we carried information only on activities directly related to the Animal Production and Health Section of the Joint FAO/IAEA Division, this time we have included inputs provided from two other sources. In the first place, we have advertised the establishment of a new computerised journal called Livestock Production for Rural Development, and secondly we have provided information about one of the major activities being conducted by our sister Division in FAO, Rome - namely its programme on trypanosomiasis in Africa. Although these activities are not specifically Joint Division programmes as such, we are to some extent involved in both and they are certainly of such general interest and importance that we felt it was worthwhile to bring them to your attention.

As far as our own programmes are concerned, it may seem from a casual reading of the contents page that, with only 3 meetings being held during the last 6 months, we've been somewhat less busy than normal. However, this is far from the case! Certainly the organisation of these meetings, and particularly the Regional Seminar in Africa, which was attended by over 100 scientists from some 27 countries, was a major activity but there were many other things which occupied our minds and time. For example, the "bread-and-butter" Coordinated Research Programmes of the Section have been particularly time-consuming. In the first place, 4 of these programmes terminated during the past 6-9 months, and in the normal course of events we should in theory have had around 75 fewer Research Contracts and Agreements to look after. However, as you can see from the Newsletter, we are still running 8 Coordinated Research Programmes in support of research being conducted by approximately 120 veterinary and animal production institutes world-wide, and several of these programmes were initiated only during the last 6 months. We are also about to establish a further programme on camelids, and hopefully this will help to encourage research on these important animals. The point is, therefore, that there has been a substantial turnover in the institutes and people involved in our programmes in the recent past, and moreover as can be observed from the titles of the new projects being supported, the emphasis of our activities is slowly but surely moving away from pure disciplinary research and into on-farm multi-disciplinary studies. In other words, we are moving quickly to implement the recommendations made by the outside consultants we invited last year to examine our programmes.

Apart from this, it should be remembered that once a particular CRP has been concluded, the job of editing the final results and getting them published has still to be done. Therefore, a great deal of effort has been put into this task by the Section in recent months, and already the results of two programmes have been published by the IAEA. Three further publications (on buffalo, sheep and goats, and large ruminant production) are on the way to press and should hopefully appear over the next few months. Therefore, by the end of the year, the results of all completed CRP's in animal production and health should be published.

On the funding front, there is no definite news at present. Recently, our programmes in Africa and on disease diagnosis in general were evaluated by the principal funding organisations concerned. These evaluations were extremely positive, although as expected they contained a number of critical but constructive comments. In any case, we are quietly confident that all the programmes presently being supported by the Dutch Government and SIDA will continue for the next 3-5 years, but confirmation of this must await the next edition of the Newsletter.

The staffing of the Section has also changed substantially over the past 6 months due to a variety of reasons. In September, two of our technical staff at Seibersdorf, Doris Rothauer and Robert Hamilton, left us to take up respectively a post in medical research in Austria and to study for a PhD degree in UK. At around the same time, Noble Jayasuriya, our nutritionist, and Emyr Owen, who was with us for 1 year on sabbatical leave from Reading University in the UK also left - Noble to take up a position with FAO in Malawi, and Emyr to return home. Then, in October we heard that Wyn Richards had been appointed to the position of Head of the FAO/IAEA Agricultural Laboratory at Seibersdorf (responsible for the supervision of all agricultural activities), and finally (we hope!) Hermann Unger left us in November to work for GTZ and other organisations. The departure of so many key people from the Section over such a short period has naturally had a negative impact both on our laboratory support and headquarters programmes. Noble was with us for 6 years, Wyn for 4 years and Doris, Robert and Hermann for between 2 and 5 years each, and all contributed enormously to what we were trying to do. Emyr too provided many valuable inputs to the programme in the relatively short time he was here. However, much as we regret their loss to the Section, we understand their various reasons for leaving and can only thank them all for their tremendous dedication and hard work over the past years and wish them every success for the future.

As far as the future staffing of the Section is concerned, the only definite appointment which has been made so far is that of Mr. Lal Peiris from Sri Lanka to the Seibersdorf Unit as replacement of Robert Hamilton, and Mr. Giovanni Re from Italy who replaces Hermann as an Associate Professional Officer. However, offers of appointment have gone out to two further people - firstly to replace Noble and secondly, for the position of Head of our Laboratory Unit at Seibersdorf, and we have in addition recommended a replacement for Wyn Richards. Furthermore, we are about to be joined by Mr. Eugene van Rooij and Mr. Roland Geiger from the Netherlands and FRG respectively as Associate Professional Officers. Mr. Re's job is essentially to collaborate with Dr. Richard Jacobson of Cornell University on the development of an IBR diagnostic test, while Mr. van Rooij will work together with Camille Ooijen and Martyn Jeggo in support of our programmes in Africa involving rinderpest and trypanosomiasis. Mr. Geiger, who is an epidemiologist, will assist in the development of computer programmes for linking the results of immunoassay tests to other epidemiological information.

In summary, therefore, 6 of our staff have left the Section over the past 6 months, and 6 new people have either already joined us or will be joining us during the next few months. While such a sharp turnaround brings problems, it also brings with it new challenges, new ideas, and certainly new personalities. Those of us who have been associated with the Section's work for a number of years will do our best to ensure that the boat is kept on a steady course while the replacement crew joins us and gets to know the ropes. We are confident that the injection of new blood will be for the benefit of the programmes we are operating at present and which will emerge in the future.

With best wishes for 1990,

James Dargie, Francesco Castrignano, Mark Eisler, Roland Geiger,
Martyn Jeggo, Camille Ooijen, Oswin Perera, Kees Plaizier,
Giovanni Re, Eugene van Rooij, Dan Sharp

(A) PAST EVENTS

(i) FAO/IAEA Regional Seminar for Africa on "Improving Health and Reproductive Efficiency of Livestock through Radioimmunoassay and Related Techniques", Harare, Zimbabwe, 4-8 September 1989

Background information relating to this Seminar, which was held in conjunction with the 2nd RCM's of the Government of the Netherlands funded Regional African Coordinated Research Programmes on animal reproduction and diagnosis of vector-borne diseases, was given in the January 1989 Newsletter. In brief, the seminar aimed to provide scientists from various disciplines an opportunity to review and report on ways by which nuclear and related techniques can be used to assess parameters such as the nutritional value of feeds and the reproductive and disease status of livestock.

Over 100 scientists and numerous other interested parties applied to attend the Seminar. Unfortunately, due to limited space, participation was restricted. Sixty-one official participants from 27 countries (of which 21 were developing countries in Africa) attended. In addition to the FAO/IAEA Division five other international organizations were represented: FAO, IDESSA (Institut d'Elevage et de Médecine Vétérinaire des Pays Tropicaux), ILRAD (International Laboratory for Research in Animal Disease), ITC (International Trypanotolerant Centre (and WHO)). At the official opening of the Seminar, Prof. F.W.G. Hill, Dean of the Faculty of Veterinary Science, Mr.C.R.MacCullech, FAO Resident Representative in Zimbabwe and Prof. P. Makhurane, Pro-Vice Chancellor of the University of Zimbabwe welcomed the participants. The Honourable Comrade K.M. Kangai, Minister of Energy, Water Resources and Development officially opened the Seminar.

The programme consisted of joint sessions of general interest to all participants and separate sessions during which disease diagnosis or interaction between nutrition and reproduction were discussed.

The titles of the Seminar sessions were:

Disease: Reproduction Interactions - 4 presentations.

FAO Trypanotolerant Network - 6 presentations.

Major diseases of livestock in Africa - 2 presentations.

Nutrition: Reproduction Interactions - 4 presentations.

Diagnosis of trypanosomiasis - 15 presentations.

Reproduction in trypanotolerant cattle in West Africa - 7 presentations.

Cattle Reproduction - 8 presentations.

Sheep and Goat Reproduction - 5 presentations.

Buffalo Reproduction - 1 presentation.

Immunoassay Techniques - 2 presentations.

Open discussion on the appropriateness of research support provided to African scientists in animal production and health by international organization.

Presentation of work plans by FAO/IAEA Dutch Government funded Research Contractors.

In addition to the formal sessions, the participants undertook a field trip mid-week to see the livestock enterprises at the University of Harare

Research Farms and a field project at a communal settlement on the outskirts of Harare.

During the discussion on the appropriateness of research support from international organizations there was a frank and open debate on a number of issues. A number of participants emphasized the critical importance of the provision of appropriate training and the supply of diagnostic kits in their ability to conduct research successfully. Regarding the pursual of 'on-farm' research the majority of participants agreed that the initiative of the FAO/IAEA Division in this field was excellent. However, a number of those scientists actively involved in conducting on-farm research commented on the difficulties they sometimes encounter. It was generally agreed that the basic pre-requisites to ensure success in this approach were: (i) identification of 'better' small farmers willing to collaborate over a 3-5 year period; (ii) availability of transport; (iii) access to drugs or other 'services' to ensure the continued collaboration of project farmers; (iv) regular supply of diagnostic kits. Recipients of both Research Contract and Technical Cooperation projects from FAO/IAEA expressed the view that they appreciated the flexibility this dual support provided them in pursuing on-farm work.

As a result of a discussion by a select committee of senior scientists attending the seminar, it was decided that the publication of the proceedings of the Seminar as an IAEA Technical Document was not justified. This decision was based on the fact that the majority of the paper presentations were in the form of 'provisional findings' and hence a 'Tech-Doc' would be premature. However, it was agreed that photocopies of individual papers should be provided to interested parties on request. Consequently, those readers of this Newsletter interested in any of the papers identified in the Seminar programme as found in the January 1989 Newsletter should write to the Section.

Finally, the Animal Production and Health Section wishes to express its gratitude to the authorities of the University of Zimbabwe for agreeing to host the Seminar, the local Seminar committee (comprising of Messrs F.W.G. Hill, J.S.Ogaa, L.R. Ndlovu, D.B. Vickers, I.Dow, M.Sadza, and J. Hoffman) for their friendly organizational skills and to the Ministry of Energy, Water Resources and Development for assisting in the processing of visas, transportation etc. Most importantly however, the Section wishes to thank the participants for making the Seminar such a successful and happy occasion.

(ii) FAO/IAEA Second Research Coordination Meeting on "Improving the Productivity of Indigenous African Livestock Using Radioimmunoassay and Related Techniques"

The second meeting of the programme was held at the Faculty of Veterinary Science, University of Zimbabwe, in Harare from 4 - 8 September 1989 in conjunction with the Second Research Coordination Meeting on "Improving the Diagnosis and Control of Trypanosomiasis and other Vector-borne Diseases of African Livestock using Immunoassay Methods", and the a Regional Seminar described above on animal production and health. Fifteen of the 16 research contract holders attended the meeting, along with the 2 Research Agreement holders and participants of an FAO/Government of Italy Project on "Improvement, multiplication and conservation of trypanotolerant livestock in West Africa".

During the first and part of the second days of the meeting contract and agreement holders gave presentations on the work that had been conducted so far following which small workshop groups were established to produce detailed work plans for the forthcoming 18 months; these work plans were also

presented at the meeting. The following main general conclusions and recommendations were made:

- RIA laboratories are now operational in the vast majority of the institutes involved in the programme and the FAO/IAEA RIA kit for progesterone is performing very well in these laboratories.

- in many of the projects baseline data on productivity, reproductive performance, management and health are still being collected. Some of the projects however have already been able to identify constraints responsible for low livestock productivity and have embarked on studies in which low cost practical management changes are being introduced on farms in order to improve livestock productivity.

- to improve livestock productivity integrated studies on farming systems will have to be conducted. In these studies progesterone measurements can be used as a tool to monitor ovarian function. However, these measurements cannot be used in isolation but have to be analyzed in combination with animal records, rectal palpation findings, heat observation etc.

(iii) FAO/IAEA Second Research Coordination Meeting on "Improving the Diagnosis and Control of Trypanosomiasis and Other Vector-borne Diseases of African Livestock Using Immunassay Methods", Harare, Zimbabwe 4 - 9 September 1989

The second Research Coordination Meeting of this Netherlands Government funded programme was held at the Faculty of Veterinary Science of the University of Zimbabwe. The meeting was held in conjunction with an FAO/IAEA Regional Seminar for Africa on "Improving Health and Reproductive Efficiency of Livestock through Radio Immunoassay and Related Techniques" and the second Research Coordination Meeting of the Netherlands Government funded programme on "Improving the Productivity of Indigenous African Livestock Using Radioimmunoassay and Related Techniques". The meeting was attended by 11 Research Contract holders and 2 Research Agreement holders, from The Gambia, Ghana, Kenya (2), Mali, Morocco, Senegal, Somalia, Tanzania, Uganda, U.K., Zambia, Zimbabwe and a Steering Committee member of the programme, Prof. D. Zwart from The Netherlands.

Over the first and part of the second day of the meeting, all participants attended the Regional Seminar during which scientific papers on animal diseases and (re)production were presented by invited speakers. From the second day onwards the programme participants met separately from the other meeting participants and presentations were given by the research contract holders on their project situation and progress achieved so far during the project period 1988/89. Papers were also presented by the 2 Research Agreement holders. Following these presentations, a workshop was organised during which the 1990 workplans were discussed with the individual participants. These workplans were later presented during a meeting.

The following general conclusions and recommendations were formulated (summarized):

- the meeting provided a useful forum for the exchange of scientific and other project related information between the programme participants and the Agency.
- the meeting facilitated the identification and in depth discussion of the priorities for application of the test in the national control programmes of most of the participating countries.

- the transfer of ELISA technology has been achieved in most of the participating institutes. The assay has been established in 8 of the 10 institutes.
- field experience with the assay has led to essential ELISA kit modifications.
- assays should now be considered to be employed in epidemiological studies as a adjunct of national control and breeding programmes and in national tsetse and trypanosomiasis control programmes to assess the efficacy and strategic use of chemotherapy and chemoprophylaxis and the effectiveness of national tsetse control programmes in regard of tsetse clearance and re-invasion.
- the submission of quarterly progress reports by the research contract holders to the research agreement holders and the Agency was recommended.

This would allow the early detection of project constraints. Also, to standardise analysis of results and reporting, guidelines will be prepared by the agreement holders and the Agency.

(B) STATUS OF EXISTING COORDINATED RESEARCH PROGRAMMES

(i) Regional Network for Latin America on the Use of Immunoassay and Labelled DNA Probe Methods for the Diagnosis of Livestock Diseases

This SIDA-funded programme currently has 12 Research Contract and 3 Research Agreement holders and we are not seeking further participants. We intend to hold the final RCM under the programme in Costa Rica from 22 October - 2 November 1990 in association with a workshop on animal diseases being held under the auspices of the International Foundation for Science (IFS).

(ii) Improving the Productivity of Indigenous African Livestock using Radioimmunoassay and Related Techniques

This programme is funded by the Ministry of Foreign Affairs of the Government of the Netherlands. The programme has 16 Research Contracts and 2 Research Agreements. No further participants can be accepted. The third RCM of the programme will be held during the first few months of 1991.

(iii) Improving the Diagnosis and Control of Trypanosomiasis and other Vector-borne Diseases of African Livestock using Immunoassay Methods

This programme, also funded by the Government of the Netherlands, has 12 Research Contract and 2 Research Agreement holders; we are not seeking further proposals. The third RCM of the programme will be held in 1991.

(iv) Strengthening Animal Reproduction Research in Asia through the Application of Immunoassay Techniques

This programme now has a full complement of 10 contracts and 3 agreements. The list of participants was included in the Newsletter of January 1989. The second RCM will be held in 1991.

(v) Strengthening Animal Disease Diagnosis in Asia through the Application of Immunoassay Techniques

This programme has 9 contracts and 2 agreements and we are not seeking any further proposals. The second RCM will be held in 1991.

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

This programme has 14 Research Contracts and 5 Research Agreements and no further awards can be considered. The 2nd RCM of the programme will take place towards the end of 1990, and we are presently making plans to hold it in Asia.

(vii) Regional Network for Sero-surveillance of Rinderpest in Africa

This programme has 21 contract holders and three agreement holders and no further awards can be considered. The final RCM under this programme is being planned for Côte d'Ivoire, 19 - 23 November 1990.

The Rinderpest sero-monitoring network concerned with the serological monitoring of the Pan African Rinderpest Campaign (PARC) has now been established for over three years. The majority of the 21 contract holders in this programme are now routinely running the rinderpest ELISA with little difficulty. The programme has now moved into a phase of epidemiological study and the problems now being encountered are concerned with sample collection procedures and interpretation of results.

To assist in this, we are supplying contract holders in the programme with personal computers for data handling. We have developed two specific computer software programmes, EDI and SID. EDI (ELISA Data Information) is designed to link the ELISA reader to the computer to allow a customized approach to the testing and the easy transfer of results to SID. SID (Serum Information Data) is designed to store all the information collected with a serum sample, receive information from EDI, analyze the results and provide printed copies of the results for distribution to Rinderpest National Co-ordinators and the PARC team in Nairobi. At the present stage both EDI and SID have been sent to Mali, Nigeria, Ethiopia and Uganda for field evaluation and will be distributed to the remaining laboratories in the network with computers in the following two months.

At a recent meeting of the OIE in Paris, provisional guidelines were drawn up of requirements needed for countries to declare themselves free of rinderpest - an essential step towards global eradication of this disease. Central to this process is continued sero-monitoring of the national herd using ELISA, linked to cessation of vaccination and a disease surveillance programme. This is a major step towards what we hope will be the adoption of the FAO/IAEA rinderpest ELISA as the world-wide standard system for rinderpest sero-monitoring.

Rinderpest vaccination campaigns in the Middle-East (WAREC) and the Far-East (SAREC) are now underway with programmes of training for all aspects of the campaign being developed. For both SAREC and WAREC we have been approached to assist in sero-monitoring and expect a similar involvement to that in Africa.

(viii) Development of Field Supplementation Strategies for Improving Ruminant Productivity on Smallholder Farms in Latin America through the Use of Radioimmunoassay Techniques"

This programme has now been initiated with the award of 14 Research Contracts and 2 Agreements. The 1st RCM under the programme is now being arranged for Santiago, Chile, from 14-18 May 1990 and the following scientists and institutes are expected to be represented:

Contract Holder

Title of Research Project

1. Dr. E. Alvarado
Universidad Nacional Agraria
La Molina
Faculty of Animal Science
(Zootecnia)
Apartado 456
Lima,
PERU
 2. Dr. Mario Garcia
Veterinary Institute for Tropical
and High Altitude Research
(IVITA)
Facultad de Ciencias Veterinarias
Universidad Mayor de San Marcos
Apartado 4270
Lima,
PERU
 3. Dr. Nelson D. Martinez
Universidad Central de Venezuela
Facultad de Agronomia
Instituto de Produccion Animal
Apartado Postal 4579
Maracay, Estado Aragua,
VENEZUELA
 4. Dr. C. Ferreira Meirelles
Centro de Energia Nuclear na
Agricultura
Animal Science Section
Cx. Postal 96
13400 Piracicaba
Sao Paulo,
BRAZIL
 5. Dr. O.L. Melendez Calderon
Centro de Desarrollo Ganadero
Canton El Matasano
Laboratorio Central de Referencia
Nacional en Patologia Animal
Apartado Postal 554, Soyapango
San Salvador,
EL SALVADOR, C.A.
 6. Dr. Maria E. Mongiardino
Centro de Invest. en Cienc. Vet.
INTA - Inst. de Patobiologia
1708 Moron - C.C. 77
Buenos Aires,
ARGENTINA
 7. Dr. Rodolfo Pedroso Sosa
Centro de Investigaciones Para
El Mejoramiento Animal (CIMA)
La Habana,
REPUBLICA DE CUBA
- Optimization of Criollo cattle re-productive performance in the high-lands of Peru.
- The effect of feed supplementation on post-partum reproductive performance and milk yield in Holstein x Nellore cattle.
- Effect of strategic feed supplementation on productive and reproductive responses in dual purpose cattle.
- Feed supplementation strategies for improving cattle productivity in Sao Paulo State using radio-immunoassay technique.
- Effect of mineral supplementation on the reproductive efficiency of dairy cattle.
- Nutritional factors related with reproduction in grazing dairy herds.
- Reproductive behaviour and metabolic profiles of cattle fed sugar cane by-products.

8. Dr. Martha Olivera Angel
Universidad Nacional de Colombia
Facultad de Medicina Veterinaria
y de Zootecnia
Bogota,
COLOMBIA
- Productive and reproductive efficiency of dairy livestock supplemented with carnation flowers.
9. Dr. Ruy Orcasberro
Centro de Invest. Veterinarias
"M. Rubino"
Departamento de Bioquimica
Montevideo,
URUGUAY
- Mineral nutrition and reproductive performance of beef cattle in Uruguay.
10. Dr. Jorge I. Restrepo
CIPAV, Edificio Cámara de Comercio
Calle 8a, No. 3-14 Piso 9
Apartado Aéreo 7482
Cali,
COLOMBIA
- Intensive sheep production on sugar cane tops supplemented with multi-nutritional blocks and tree foliages.
11. Dr. William Vale
Universidade Federal do Para
Centro de Ciencias Biologicas
Campus Universitario do Guama
66.050 Belem - Para,
BRASIL
- Comparative study on the puberty and post-partum ovarian activity in water buffalo and Zebu females in the humid tropical Amazon.
12. Dr. Patricio Villalba
Comision Ecuatoriana de Energia
Atomica
Div. de Ciencias Animales
San Javier 295 y Avda. Orellana
Casilla 2517
Quito,
ECUADOR
- Identification of nutritional problems on typical livestock farms in the Cyambe valley of Ecuador and their relation to reproduction.
13. Dr. Luis Zarco
Universidad Nacional Autonoma
de Mexico
Facultad de Medicina Veterinaria
y Zootecnia
Ciudad Universitaria
Mexico D.F. 04510,
MEXICO
- Use of inexpensive supplementation and hormonal induction of ovarian activity to improve reproductive efficiency of Pelibuey sheep in the Mexican tropic.
14. Dr. Jorge Correa
Animal Reproduction Institute
Universidad Austral de Chile
Casilla 567
Valdivia,
CHILE
- Reproductive performance of dairy cattle belonging to small farm holders in the South of Chile: Effect of P4 and E2 treatment for anoestrus in relation to nutritional status.

prerequisite to improving camelid production must be the initiation of simple integrated studies on the nutritional requirements and reproductive efficiency of these animals, and the relationship between these two in the different camelid genotypes kept in their natural environments.

This programme, the scientific scope and goals of which are described below will be of an inter-regional nature, involving institutes principally in the Andean countries (Peru, Ecuador, Colombia, Chile and Bolivia) and around North and East Africa (Morocco, Algeria, Tunisia, Sudan, Kenya and Somalia), but subject to receipt of appropriate proposals may also include India, China, Pakistan and other Asian countries.

(iii) Scientific Scope and Goals

The overall aim of this project is to promote study of factors affecting the reproductive efficiency of camelids in different parts of the world, and thereby to increase knowledge, information exchange, and contact between scientists and institutions on a regional and inter-regional basis.

Animal productivity is largely dependent upon reproduction, and among the factors that determine lifetime production in females are: the time to reach puberty, the post-partum anoestrous period and calving interval, and calf mortality. In the male, the ability to produce viable sperm all the year round or during the breeding season of the female is the major factor governing reproductive success. In spite of the widespread recognition that camelids are an extremely important part of farming systems in many regions of the world, little research has been undertaken to define reproductive parameters under current systems of management and hence to obtain the necessary information for selection and genetic improvement. Related to this, there is extremely limited information on the endocrinological control of reproduction in these animals and of the role of environmental factors (e.g. nutrition and climate) in influencing various reproductive processes. For example, unlike other major meat and milk-producing livestock which show spontaneous ovulation, camelids are induced ovulators, i.e. follicular rupture is stimulated by copulation, and ovulation does not take place until about 1 day after coitus. The mechanism(s) responsible for egg shedding remain controversial and are in clear need of detailed study in order to identify and hence make use of artificial methods of ovulation induction for breeding programmes involving artificial insemination and/or embryo transfer.

Under this programme, radioimmunoassay (RIA) and related techniques for measuring the hormones which control reproductive processes (e.g. progesterone and luteinising hormone), will be used in conjunction with conventional clinical and production parameters to monitor the reproductive efficiency of different types of camelids and the role of nutrition as a constraint on such efficiency. These measurements would be used to:-

- determine the age of onset of sexual maturity of the male and the female, and examine the factors affecting this.
- study and compare the oestrous cycles of old and new world camelids, including length of cycle, oestrous period and ovulation. Efforts will also be made to develop correlations between hormonal levels and morphological changes as ascertained by laparoscopy and palpation.
- study post-partum ovarian activity and the influence of nutrition, calf-suckling regime and other factors on such activity.

- diagnose pregnancy and examine the endocrinology of pregnancy.
- study the interaction between nutritional and environmental factors (e.g. day light, temperature and season) on ovarian and testicular function.
- study experimental methods for the induction of ovulation.

Specifically, studies will be encouraged on the alpaca, llama, vicuña and guanaco. At the same time, studies will be granted on the dromedary camels in Africa and on the bactrian camels in Asia. In all cases, the emphasis will be on animals kept under normal grazing conditions and husbandry methods; studies involving animals maintained at research institutes will be restricted to those concerned with defining basic parameters of reproductive physiology and possible methods of ovulation induction.

The investigations described above will be conducted in a planned and coordinated fashion by all participating institutes, so that not only will basic bench-mark data be obtained on the reproductive physiology and efficiency of different types of camelids per se, but it will then be possible from the data generated to compare the performance of different genotypes kept under similar and different environmental conditions.

To support this effort standard RIA kits would be provided to all institutes and to monitor the reliability of the assays a hormone quality control service would be operated from the IAEA Laboratory at Seibersdorf, Austria.

(iv) Programme Management

On the basis of technically-sound proposals collaborating national institute will be awarded a Research Contract for an initial period of 1 year. This Contract will be renewable for a total period of 5 years subject to satisfactory progress being made during each contract period. Research Contracts provide modest financial support (up to US\$ 5,000/year) 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. In addition to Research Contracts (which are only awarded to developing country institutes), Research Agreements will be awarded to research institutes with special expertise in nutrition/reproduction relationships and the employment of RIA assays for reproductive hormones. Research Agreements do not provide financial support but holders participate in exchange of information and will be invited to attend Research Coordination Meetings to assist Contract holders in preparing work plans, solving methodological problems, analysing data, etc.

This Project will provide about 10 institutes with Research Contracts and 4 institutes with Research Agreements. The selection of all participants will be made by staff of the Joint FAO/IAEA Division's Animal Production and Health Section upon receipt of completed Contract and Agreement proposal forms.

Research Coordination Meetings will be held at the beginning of the programme and thereafter at intervals of approximately 15-18 months. Such meetings have the effect of encouraging close contact and information exchange between the scientists and institutes involved, as well as a uniform approach both to the practical utilisation of RIA techniques for the measurement of reproductive hormones.

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

(i) Nutrition

The nutrition laboratory continued with its feed evaluation and formulation testing programmes using the Rumen Simulation Techniques. Over the past three years the nutrition unit has characterised fibrous agricultural residues from many developing member states. Data covering over 25 residues have now been compiled and statistically analysed. This information will be available as a TECDOC publication in the near future.

A major problem in running Tilley and Terry in vitro techniques in many developing countries is the large variation which occurs in the quality of the diet fed to fistulated animals used to supply rumen liquor. This often leads to poor repeatability of digestibility determinations. One of our major activities during the past year therefore has been to evaluate the Rusitec as a source of rumen liquor for Tilley and Terry digestion studies. We now have the evidence to show that the effluent from Rusitec, collected over a 24 h period into a flask maintained at 39°C, can be used directly (without adding McDougall's buffer) to inoculated feed samples. Statistical analysis showed that DM and OM digestibilities of forage and fibrous feeds, determined using Rusitec effluent were highly correlated ($r=0.98$) with determinations made using fresh cow liquor.

During the past six months we have also carried out a number of laboratory experiments to ascertain the usefulness of the Tilley and Terry technique for assessing the rate of degradation of forage samples. The results are encouraging. This suggests that laboratories carrying out routine in vitro digestibility determinations could use the facility to estimate DM disappearance rates without have to use nylon bags in fistulated animals. Results from both these studies are now being prepared for publication and the experimental protocols will be available in the near future.

We have also developed two 'friendly' computer programmes, one for calculating in-vitro digestibility (DMD, OMD and D value) by the Tilley and Terry technique and the other for calculating Forage Fibre Analysis by the Van Soest method. These programmes, which can be used in all IBM compatible systems, are available free of charge. In addition, some useful analytical techniques for feed characterization are being compiled in the form of a laboratory manual and this too is now available.

(ii) Reproduction

Counterpart laboratories in developing countries have continued to be supplied with standardized radioimmunoassay (RIA) kits for the quantification of the reproductive hormone, progesterone (P4), in skim milk and blood plasma, thus enabling them to monitor reproductive status in agriculturally important species such as cattle, sheep, goats, buffalo, camelids and yaks. The standard kit consists of 100 P4 antibody-coated tubes, 100ml of buffered ^{125}I progesterone, and P4 standards in freeze-dried plasma and/or sodium azide-preserved skim milk. During the course of the year, a total of ca 2000 FAO/IAEA RIA P4 kits, in six bimonthly shipments, were sent to approximately 70 laboratories in approximately 50 countries.

The effective use of the FAO/IAEA RIA kits was monitored by counterpart laboratories through an "external quality control" (EQC) service. EQC standards were provided to counterpart labs twice during the year for analysis and submission of results to our laboratory. The EQC programme demonstrated that, on average, 88% of the responding counterpart labs were

within two standard deviations of the overall mean response. This impressive accuracy illustrates the success and reliability of the RIA kit supply service, and provides assurance of consistency in the results obtained by counterparts.

Technologies are being developed for monitoring thyroid function (total T3 and T4) as well as oestrus and placental well-being during pregnancy (total oestrogen). Progress has already been made in validation of commercially available T3 and T4 kits for use in agriculturally important animals, and antibodies for use in monitoring total oestrogens are being prepared.

In the tissue culture laboratory, hybridoma lines producing monoclonal antibodies against progesterone have been cultured and ascitic tumours induced in mice. The ascitic fluids obtained have a high concentration of antibodies, and these have been used to develop new "self-coating" RIA kits for P4. Although the results of the self-coating system with monoclonal antibodies are encouraging, attempts are in progress to improve assay characteristics (i.e., increase sensitivity and reduce variability). Rabbits have also been immunized against progesterone conjugates (11-alpha hydroxy-hemisuccinate-BSA, and 3-(carboxymethyl-BSA) to produce polyclonal antibodies for the development of self-coating assay systems.

Field validation of an enzyme-immunoassay (EIA) kit for P4 in skim milk was completed in September. This validation involved collaboration with 11 laboratories from developed and developing countries. Results of the validation showed that the EIA kit did not perform satisfactorily under developing country conditions, and more developmental work is under way to reduce intraassay variation. Validation of the plasma EIA kit for progesterone at the Unit's laboratory has been completed and field validation will be conducted shortly.

(iii) Disease Diagnosis

In general, work has continued with ELISA kit development and distribution, consolidating the position at the laboratory with the bulk purchase of kit reagents and plates, filing of kit information on a computer data-base, the development of a quality control system for one of our kits (rinderpest) and the further development of computer software for processing samples and handling the data generated. With particular kits the following developments have taken place:

The composition of the FAO/IAEA rinderpest kit has now remained the same for well over a year and we have now introduced a quality control service. The aim is to compare the reproducibility and sensitivity of the rinderpest ELISA between laboratories and as a means of quality control for the FAO/IAEA/SIDA rinderpest sero-monitoring network. The system of quality control is conducted with reagents already supplied with the kit and a group of known negative animals - those used to establish the local negative cut-off value. Two exercises need to be completed. One consists of titration of the kit control positive and negative sera. This will provide information on the performance of the test itself and the efficiency of the operator. The second procedure involving testing a negative population will provide a direct comparison of the positive/negative cut-off points between laboratories, a comparison of binding ratios and a comparison of the negative populations from different geographical areas. We hope to have all the results in by mid-year and anticipate visiting any laboratories encountering difficulties; this exercise will be repeated on an annual basis.

The FAO/IAEA brucellosis kit was altered last year and we are now confident that we have a reliable and fully validated assay. The kit was recently evaluated in eight European laboratories. A high degree of correlation between laboratories and in comparison with other tests was achieved and it is now being used in four countries as part of their national Brucellosis control programmes. We ourselves have established a bank of sera from different regions of the world from animals with a known history of brucellosis. This has not only helped in the kit development but will assist us in providing in the future, a quality control service for the kit. We are extremely grateful for the great deal of technical advice and for the reagents provided by Dr. Peter Wright (ADRI, Canada) and Dr. Alistair Macmillan (CVL, Weybridge).

In close collaboration with Dr. James Meegan (WHO) and Dr. Tom Ksiazek (US Army, Fort Detrick) we have developed an ELISA kit for detecting antibodies to Rift Valley Fever virus in ruminants. This kit will be used primarily in West Africa to determine the distribution of the virus in this region and perhaps identify more clearly the zoonotic risk. At present the kit is being used at the Central Veterinary laboratories in Mali but in the near future it will be provided to other veterinary laboratories in the region.

The ELISA kit for babesiosis based on antigens provided by Dr. Ian Wright's research group at CSIRO, Indooroopilly, Australia, has undergone several modifications since its introduction two years ago, the most recent being to utilize a red blood cell lysate from negative animals to decrease background levels. We are still awaiting results from several laboratories to make a proper evaluation of this approach. However, it is likely that during 1990, use will be made of recombinant antigens in the assay system. This should greatly improve the sensitivity of the test because prior adsorption of sera with red cells will no longer be required. We are greatly indebted to Dr. Wright as well as to Dr. David Waltisbuhl of CSIRO for all the support they have given during the development of this test and we look forward to a continuing collaboration in the field of babesiosis.

For some time now we have had problems with the supply of antigen for the FAO/IAEA infectious bovine rhinotracheitis kit. Following discussions with Dr. Richard Jacobson (Cornell University, USA) we are now in the process of developing a new assay. Based on Jacobson's KELA (Kinetic ELISA) system, but utilizing a single OD reading time, we are very confident that this new kit will be more sensitive and robust than the previous one. It is hoped that the kit will be ready for distribution by mid-year for validation in the field.

The FAO/IAEA antibovine kit is now available with ABTS as well as OPD.

(iv) Training

-Training of scientists from developing countries in immunoassay techniques related to livestock reproduction and disease diagnosis continued to play a major role in the Unit's activities in 1989. During the year 12 scientists from 10 countries were trained in RIA, EIA, ELISA, in vitro digestibility techniques, experimental design and in sample collection, storage and treatment.

-The staff of the Unit were also involved in a national training course on "ELISA for serodiagnosis of animal disease" held at BALTIVET, Bogor, Indonesia, 6-25 February 1989.

(v) Future Activities

No major changes are foreseen in the general support services provided by this Unit. Thus back-stopping will continue to be provided to regional programmes involved in the improvement of ruminant livestock production systems in tropical and sub-tropical countries. However, more laboratory support for scientists involved in 'on-farm' research (involving the interaction between nutrition, reproduction and disease) will be required. Consequently the present feed analytical services (Rusitec) will cease and a new thrust will focus more on the response of animals to various feeding strategies. This will require the development and validation of RIA's for measuring metabolic hormones eg. T3/T4 as well as other reproductive hormones eg. total oestrogens and correlating the levels of these with growth rate, milk production, wool growth etc. It will also involve the development and validation of test kits to monitor circulating metabolites (eg. β -hydroxybutyrate, albumin, blood urea nitrogen, minerals and trace elements), standard methods for routine haematology and for measuring internal/external parasite loads in order to help determine the major constraints to livestock productivity.

With the greatly increased interest shown by Member States in the diagnosis and control of animal diseases more effort will be made to standardise disease diagnostic methods in the Asian and Latin American regions in view of the success of this approach in Africa with rinderpest. In this regard, further disease diagnostic kits will be validated eg. Foot and Mouth disease to complement those presently supplied. An EQCS will be introduced for all disease diagnostic tests. Finally, attempts will be made to introduce monoclonal antibodies and labelled DNA probes into some countries and some diagnostic tests to improve their specificity and sensitivity.

(E) PUBLICATIONS

(i) Feeding Strategies for Improving Productivity of Ruminant Livestock in Developing Countries

This book has now been published by the IAEA and is essentially the proceedings of an FAO/IAEA Advisory Group Meeting held in Vienna from 13-17 March 1989. The publication is available from the Division of Publications, IAEA, price Austrian shillings: 600,-- or equivalent paid in convertible currency or UNESCO coupons. In addition to recommendations for future research, the book contains the following articles:

<u>Title of Paper</u>	<u>CONTENT</u>	<u>Authors</u>
Ruminant production systems in developing countries: Resource utilization.		C. Devendra (Singapore)
Ruminant feeding systems in Southeast Asia.		S. Jalaludin (Malaysia)
Constraints to improving reproductive efficiency of ruminant livestock in developing countries.		V. Buvanendran (Zimbabwe)
Comparative aspects of ruminants and camels grazing on a thornbush savannah pasture.		W. v. Engelhardt, T. Rutagwenda, M. Lechner-doll, M. Kaske, W. Schultka (Federal Republic of Germany)

<u>Title of Paper</u>	<u>Authors</u>
Hormones in growth and milk production: Future prospects in developing countries.	P.J. Buttery (United Kingdom)
Prospects of beta agonists for increasing protein deposition in ruminants in developing countries.	F. Berschauer (Federal Republic of Germany)
Food and animal characteristics relevant to the prediction of forage consumption and nutrient use in productive ruminants.	J.D. Oldham, H. Eayres, G.C. Emmans, X.Z. Hou, A.W. Illius, N.S. Jessop, R.W. Matthewman (United Kingdom)
Evaluation of feed resources for ruminants and ruminants for feed resources.	E.R. Orskov (United Kingdom)
Dietary manipulations for improving productivity in ruminant livestock.	D.E. Beever (United Kingdom)
Manipulation of the rumen to improve ruminant production.	J.V. Nolan, R.A. Leng (Australia)
Strategies for supplying micro-nutrients and feed additives to grazing ruminants.	J.B. Rowe, S.W. Godfrey (Australia)
Comparative responses of intake and rumen function in sheep and goats to supple- mentation of barley straw forages with urea and sulphur.	C.M. Tan, D.P. Poppi, A.R. Sykes (New Zealand)
Biodegradation of lignocellulosic materials: Present status and future prospects.	I.M. Morrison, R.E. Brice, Sandra A. Mousdale (United Kingdom)
Recent advances in chemical treatment of roughages and their relevance to animal production in developing countries.	E. Owen (United Kingdom) M.C.N. Jayasuriya (FAO/IAEA)

(ii) Livestock Reproduction in Latin America

This book contains the results of a 5-year CRP entitled "Regional Network for Improving the Reproductive Management of Meat- and Milk-producing Livestock in Latin America with the Aid of Radioimmunoassay" funded by FAO/IAEA between 1983-1988 as well as general conclusions and recommendations for future studies. It will be available for purchase by March 1990, and contains the following articles:

CONTENT

<u>Title of paper</u>	<u>Authors</u>
Reproductive performance of dairy cattle in Latin America.	R.T. Taylor, R. Barnabe, J.E. Correa, J. Jarrin, M-E. Mongiardino, J. Morales

<u>Title of Paper</u>	<u>Authors</u>
Milk progesterone in the evaluation of the reproductive performance of dairy cattle in Costa Rica.	R.T. Taylor, O. Robert, C. Madriz, R. Alfaro, V. Gonzalez, F. Hueckmann, A. Colmenares, S. Solano, R. de Armas
Effects of a subtropical climate on the fertility of dairy cattle in Cuba.	J.R. Morales, R. Pedroso, R. Solano, R. de Armas
Estudio de la actividad ovarica postparto en ganado lechero de dos areas geograficas en Ecuador donde se usan diferentes sistemas de alimentaci3n.	J. Jarrin, P. Villalba, E. Guerr3n, E. Zurita
A comparative study of oestrous cycle and ovulation characteristics of cattle kept at different altitudes in Peru.	H. Cardenas, W. Vivanco, E. Alvarado, A. Padilla, A. Flores
Reproductive performance and nutritional status of Holstein cows in Brazil.	C.F. Meirelles, D.M.S.S. Vitti, A.L. Abdalla
Determination of the reproductive performance of Holstein cows in Uruguay.	D. Cavestany, W. Miranda, R. Tagle, S. Gama, S. Lanzzeri
Progesterone profiles and post-partum fertility in dairy cattle in S. Chile.	J.E. Correa, R. Gatica, Paulina Tapia
Applied biotechnology for improving the fertility of herds in Argentina.	M-E. Mongiardino, A.R. Dick, R. Murray, M. Maciel, G. Ramos, G. Balbani
Effect of intravenous infusion of a soybean oil emulsion on plasma concentration of 15-keto-13, 14-dihydro-prostaglandin F ₂ α and ovarian function in cycling Holstein heifers.	M.C. Lucy, T.S. Gross, W.W. Thatcher
Evaluation of reproductive performance using the milk progesterone assay.	T.J. Reimers, R.D. Smith, S.K. Newman
Statistical analysis of repeated measurements in physiology experiments.	C.J. Wilcox, W.W. Thatcher, F.G. Martin
Actividad ovarica durante el periodo postparto en vacas adultas y primerizas de doble prop3sito en Guatemala.	H. Ordoñez-Chocano, A. Gatica, J. Miranda, R. Matamoros
Estudio sobre la eficiencia reproductiva en ganado doble prop3sito en Panamá, mediante el uso de tecnicas de radio-inmunoensayo.	O. Oneida, Calderon M.
Post-partum reproductive efficiency of pure and crossbred Zebu cattle under different management and nutritional conditions in the Amazon basin of Peru.	M. Garcia, Luisa Echevarria, W. Huanca

<u>Title of Paper</u>	<u>Authors</u>
The water buffalo in Latin America.	W.G. Vale
Studies on the reproduction of water buffalo in the Amazon valley.	W.G. Vale, O.M. Ohashi, J.S. Sousay, H.F.L. Ribeiro
Reproductive performance of Zebu cattle in Mexico.	C.S. Galina, C. Murcia, A. Beatty, R. Navarro-Fierro, A. Porras
Evaluation of an implant to synchronize oestrus and/or to resolve suckling anoestrous in Brahman cows.	M. Olivera, G. Martinez
Observations on oestrus synchronization in Zebu cattle.	C.S. Galina, A. Porras, R. Navarro-Fierro, C. Wild, A. Orihuela, C. Hernandez
Pilot study of the reproductive performance of Brazilian Nelore, Gir and Caracu cows.	C.F. Meirelles, R.C. Barnabe, A.L. Abdalla, V.H. Barnabe, E.H. Madureira, D.M.S.S. Vitti, S.M. Gennari, P.A. Pinto, E.O. Martins Sobrinho
Studies on postpartum reproductive performance of Hereford beef cows in Uruguay with the aid of progesterone assay.	D. Cavestany, J. Vizcarra, W. Cardozo, F. Perdigon, R. Tagle, S. Gama, S. Lanzzari
The potential for castration of domestic animals by active immunization against GnRH.	A. Gonzalez, S. Goubau, A.F. Allen, R.J. Mapletoft, R. Cohen, B.D. Murphy
Bibliometric studies related to the reproductive performance of cattle in the tropics.	J.M. Russell, C.S. Galina, E. Anta, A. Porras, L.A. Zarco
Hair sheep in Mexico and Venezuela: reproduction in Pelibuey and West African sheep.	J. Valencia, A. Gonzalez-Reyna, S. Lopez-Barbella
Breeding season of criollo and Granadina goats under constant nutritional levels in the Mexican highlands.	J. Valencia, L. Zarco, A. Ducoing, C. Murcia, H. Navarro
Factors determining the reproductive potential of Pelibuey sheep: effects of season and parturition on reproductive performance.	A. Gonzalez-Reyna, B.D. Murphy, E. Ortega-Rivas
Effect of restricted suckling upon postpartum reproductive activity in sheep.	S.F. Lopez-Barbella, N.D. Martinez-Guillen, Josefina B. de Combellas
Estudio del ciclo sexual, estacionalidad reproductiva y control del estro en cabras criollas en Chile.	A. Santa-Maria, J. Cox, E. Muñoz, R. Rodriguez, L. Caldera
An introduction to South American Camelids.	Bessie Urquieta, J.R. Rojas
Studies on the reproductive physiology of the vicuña (<u>Vicugna vicugna</u>).	Bessie Urquieta, J.R. Rojas

(iii) Helping Small Farmers to Improve their Livestock

This article was written for the 1989 Yearbook of the IAEA by J. Dargie. It explains some of the philosophy behind the FAO/IAEA Animal Production and Health programme and provides examples of the kind of work it is supporting in developing countries. A complimentary copy will be sent to all recipients of this Newsletter in February or March 1990.

(iv) Use of Crop Residues as Animal Feeds in Developing Countries

This paper written by E.Owen and M.C.N. Jayasuriya was published in Research and Development in Agriculture 6 (1989) 129-138.

(F) LIVESTOCK RESEARCH FOR RURAL DEVELOPMENT

In line with our policy of trying to help scientists in developing countries to keep abreast with the literature and to get the results of their own research published within as short a time as possible, the Animal Production and Health Section of the Joint FAO/IAEA Division, the International Foundation of Science (IFS), and the Department of Plant Sciences at Oxford University (UK) decided to support the efforts of CIPAV in Colombia to establish and run a computerised journal entitled "Livestock Research for Rural Development". We did this basically because we believe in the philosophy behind the journal (which is explained below) and because computers are being increasingly provided through FAO/IAEA Technical Cooperation and Research Contract programmes in developing countries to assist in data analyses, preparation of reports, papers, etc. We believe also that the availability of computers in developing countries will increase substantially over the next 10 years and that this will help to improve the quality of results, and their preparation and final presentation. If, at the same time, they offer encouragement to publish these results then all the better!

In addition to the literature retrieval service offered to counterparts of FAO/IAEA programmes in animal production and health, we can now provide free of charge a diskette containing each volume of Livestock Research for Rural Development to those FAO/IAEA counterparts who request it. We have also undertaken to edit any manuscripts sent by FAO/IAEA-TC counterparts and Research Contract holders who feel that their work could be published in this journal (the titles of papers which appeared in the first issue are given below). Any institute holding an FAO/IAEA TC project or research contract is able to apply for this service by completing the form at the end of the Newsletter and returning it to the Section in Vienna. Upon receipt of the form, the relevant diskettes will be sent.

CONTENT (Volume 1 Number 1, October 1989)

Preston, T.R. and Speedy A.W.: Livestock Research for Rural Development

Figuerola V: Experiencias cubanas en el uso de las mieles de caña para la alimentación porcina

Preston, T.R. and Leng, R.A.: The greenhouse effect and its implications for world agriculture

Bien-aime, A. and Denaud, L.: Feuilles de velvet bean et jus de canne-a-sucre pour la complementation du lapin en haiti

- Galindo, W., Rosales, M., Murgueitio, E. and Larrahondo, J.: Sustancias antinutricionales en las hojas de árboles forrajeros
- Machado, P.F. et al: Efeito do tratamento a pressao de vapor no bagaco de cana sobre a sua degradacao e digestibilidade
- Larrahondo, J. and Preston, T.R.: Control químico de la inversión de jugos de caña para la alimentación animal
- Solarte, A.: Development of feeding systems for rabbits and guinea pigs based on sugar cane juice and tree foliage
- Pedraza, G. X.: Cultivo de Spirulina máxima para suplementación proteica
- Rosales, M. et al: Uso de los árboles forrajeros para el control de protozoarios ruminales

LIVESTOCK RESEARCH FOR RURAL DEVELOPMENT

Thomas R Preston* and Andrew W Speedy**

*CIPAV, AA7482, Cali, Colombia

**Department Plant Science, University of Oxford,
Parks Road, Oxford OX1 3PF, UK

A computerised research journal to promote communication
among scientists and decision makers concerned
with the role of livestock technologies in
rural development in the Third World

BACKGROUND

Communication among scientists working in developing countries has always been difficult. There are many reasons for this. International scientific journals are without exception published in the industrialised countries. Their editorial policies reflect the interests of these countries; not those of developing countries. Many of them levy page charges (in hard currency!!). They are also highly expensive and beyond the reach of most individual scientists. In libraries and other educational and research institutions in the developing world, budgets are invariably restricted thus it is difficult to subscribe to all, or even a reasonable proportion of, the current journals and research periodicals.

Scientists from developing countries find it difficult to have their papers published internationally, due often to the impossibility of paying the page charges; or satisfying the editorial requirements.

The information published in the scientific journals of developed countries increasingly becomes less relevant to readers in developing countries. This is due to the current agricultural situation in industrial countries where surpluses of agricultural products and concern for human health jointly have had the effect

of discouraging applied agricultural research and promoting work on human nutrition.

Finally, there is the delay between finishing a piece of research and having the paper available in print. At least a year on average, and often more, is the lag time. Much of this delay is incurred by time spent in editing and reviewing but in the developing countries, this is compounded by the unreliable postal services.

Fortunately, developments in information technology are rapidly revolutionising the way written material is processed and transmitted. Not only in developed, but also in developing countries, micro-computers and their accessories are becoming commonplace.

OBJECTIVES

The long term aims of the journal are:

- * To promote the development of livestock production and associated technologies which are appropriate and sustainable, and contribute to self-reliant ecologically balanced rural development.
- * To take advantage of developments in computer technology in order to promote faster, easier and less costly communication among scientists active in rural development.

The specific aims are:

- * To establish an international forum for reporting the results of livestock research as this relates to rural development, the medium for which will be the magnetic disk that can be written and read by a micro-computer.
- * To promote the rapid exchange of research and development-orientated data at minimum cost to scientists and institutions in the developing countries.
- * To maintain an editorial policy of promoting those technologies which are likely to lead to increased self-reliance and ecologically balanced rural development.

LIVESTOCK RESEARCH FOR RURAL DEVELOPMENT achieves these objectives because:

- * it operates and can be read on the most basic IBM compatible microcomputers and printers.
- * it does not require any specialised software or word processing packages.
- * it will publish papers as fast as possible, with the minimum of centralised editorial input.
- * it will be distributed throughout the world, through a network of interested and sympathetic colleagues.

The Policy

The title of the journal is LIVESTOCK RESEARCH FOR RURAL DEVELOPMENT. The principal language will be English but papers will be accepted and published also in French, Spanish and Portuguese. Each paper will have a summary and key words in English and in the language in which the paper is written. One volume will be published each year, consisting of four or more numbers, each number consisting, on average, of 10 papers together with lists of contents and indices. The maximum length will normally be 16 pages (800 lines). Short notes are encouraged provided they are relevant to the aims of the journal.

The Necessary Equipment

LIVESTOCK RESEARCH FOR RURAL DEVELOPMENT can be read on any IBM compatible microcomputer with a minimum memory size of 256 Kbytes and one floppy disk drive, either 5/ or 3/ inch size. It will operate under MS-DOS 2.1 or more. It requires no modification to the CONFIG or AUTOEXEC files, no drivers to be installed and no specialised computer training. It can be viewed on monochrome, non-graphics screens and can be printed out on any printer that can reproduce the standard (USA) ASCII character set. The basic machine is available for as little as \$500, before local taxes and duties. The same equipment will run a word processor and spreadsheet/database which are the essential tools of the research worker.

The Software and Text Files

The journal consists of the articles, written in ASCII format (they can be TYPed or PRINTed from MS-DOS), and a simple software package that allows the user to view the articles and print them out on any printer. The program JOURNAL.COM was written in TURBO PASCAL and compiled for efficient operation. It is controlled by the cursor keys, the return key and 3 function keys, with no need for typed commands, except for the initial 'JOURNAL'. A small text file stores the volume details and contents.

Articles can be written using most popular wordprocessors. CIPAV specialises in WORDPERFECT 5 and this can convert files from WORDSTAR, WP4.2, DISPLAY WRITE and PROFESSIONAL WRITE. The only limitations are to avoid tabulations and indents, which must be replaced with spaces, and font changes and other specialist commands which are not possible to reproduce in ASCII.

Data are presented in tabular form at present, because of the limitations of some computers, printers and VDUs in handling graphics.

Administration and Editing:

The journal will be administered through a coordinating editorial centre (CIPAV, Colombia), in collaboration with the Department of Plant Sciences, Oxford University, UK, the Animal Production and Health Section of the Joint FAO/IAEA Division of the IAEA, Vienna, the International Foundation for Science, and sub-editorial groups representing each of the four languages and the major continental groupings.

Submission of papers

Papers must be submitted on disk (either 3.5 or 5.25inch), to the regional language sub-editor. Authors are required to have their papers refereed, before submission, by at least two scientists who have both post graduate qualifications and proven experience. A signed statement by the referees should accompany the submission. When authors have difficulty in locating appropriate referees, they should contact the nearest sub-editor who will provide names of suitable candidates.

The papers can be written with the aid of any of the major word processing programmes (eg: Word Perfect, Word Star, Word, Display Write, Professional Write). If other word processing packages are used (eg: FRAMEWORK) the paper should be saved in ASCII. The paper can be in any of the official languages: Spanish, Portuguese, French and English, but the preferred format should be followed (see notes for contributors).

For example, a paper originating from an African researcher and written in French should be submitted to the nearest sub-editor (French), in this case Dr C Kayouli, of the Institut National Agronomique, Tunis, Tunisia. The sub-editor will have the final responsibility for acceptance (or otherwise) of the paper and will then send the disk direct to the coordinating centre in Colombia. Similar procedures will be followed by researchers working in other languages and geographical regions.

In order to ensure that the journal can be printed with the minimum of hardware and software, data presentation will be restricted initially to tables. These should be written bearing in mind that the final paper will be prepared in ASCII format, thus the text should be written for standard size paper (65 characters x 54 lines, allowing for margins) and tables should not exceed 23 lines in length, so they can be accommodated on a standard monitor and printer. Graphs and similar illustrations will not be accepted in view of the special requirements these impose on printers.

To save time and money, papers (disks) will not normally be returned to authors (unless they so wish and are prepared to pay the costs). Papers that are accepted will be published as received with only minor editing.

The disks containing the edited papers will be received by the coordinating unit in Colombia. Editing will be minimal, mainly to ensure uniformity in style of presentation. As soon as 10 papers are available the particular number of the journal will be closed and the table of contents and indices prepared. The journal will be copied on both 3.5 and 5.25 inch disks and sent to sub-editors and to institutions and individuals who will copy and distribute the disks for individual subscribers.

For the final number of each year a volume index will be prepared of subjects and authors.

Subscribers to the journal:

Subscriptions to the journal will be paid for in the form of one floppy disk (or equivalent) for each number. To receive the journal the potential subscriber simply sends TWO blank disks

(3.5 or 5.25 inch) with a return stamped and addressed envelope, to the nearest collaborator. The journal will be copied onto one of the disks which will be returned to the subscriber. The second disk will be retained as payment.

Further Possibilities

LIVESTOCK PRODUCTION FOR RURAL DEVELOPMENT is not only a cheap medium for publication; it affords new potential for the transmission of scientific data.

Despite the simple form of the original disks, the journal may be printed on high quality laser printers for retention on bookshelves and in libraries.

Tabulated data in ASCII format can be further processed by the reader by statistical analysis or graphic presentation. The limitations of machine compatibility prevent the inclusion of graphs and diagrams in the journal but the subscriber is recommended to obtain a suitable graphics package such as LOTUS 1-2-3 or HARVARD GRAPHICS, to import the data, and to produce his or her own graphical material from the original data.

Future developments in technology, such as compact discs and other new storage media, will permit further development of the concept and increased capacity for publication.

COORDINATING EDITORIAL CENTRE

CIPAV

Edificio Cámara de Comercio,
Apartado Aéreo 7482,
Cali, Colombia.

Fax: (923)824627; Telex: 055724; Tel: (923)823271

Thomas R Preston (Editor)
Héctor Osorio de la Cruz (Technical Editor)
Mauricio Rosales (Technical Editor)
Enrique Murgueitio (Technical editor)

Central Editorial Board

José A Aguilar	Jaqueline Ashby
Raúl Botero	Julián Buitrago
Jaime Forero	Humberto Rojas

Sub-editors and collaborators

The following have agreed to act as sub-editors and/or to receive, copy and forward the disks.

SUB-EDITORIAL GROUP (SPANISH):

Europe: Professor Juan F Gálvez,
Universidad Politécnica, Escuela Técnica Superior de Ingenieros
Agronomos, Madrid 28040, España
Tel: 2444807

South America: Instituto de Producción Animal, Facultad de
Agronomía, Universidad Central de Venezuela, Maracay
Fax: (5843) 25204

Central America: Dr Raúl Godoy, Facultad de Medicina Veterinaria and Zootecnia, Universidad de Yucatan, Merida Apartado 116D, Yucatan, Mexico

Caribbean: Instituto de Ciencia Animal e Instituto de Investigaciones Porcinas, Gaveta Postal #1, Punta Brava, La Habana, Cuba (Tel: 299112; Telex: 51-1269 CIMEX CU)

SUB-EDITORIAL GROUP (ENGLISH)

Europe:

Dr. Andrew Speedy, Plant Sciences Department, University of Oxford, Parks Road, Oxford OX1 3PF, United Kingdom.
(Tel: 0865-270872/80; Telex: 83147 VIA OR G; Fax: 0865-270708)

Dr. E.R. Orskov, Rowett Research Institute, Bucksburn, Aberdeen, UK
(Tel: 0224 712751; Telex: 739988 ROWETT G)

South-East Asia and Pacific: Dr. R.A. Leng, Universidad de New England, Armidale NSW 2351, Australia (Tel: 067-732707; Telex: AA166050; Fax: 067-733122).

Caribbean: Dr. Thomas R. Preston, CIPAV, Apartado Aéreo 7482, Cali, COLOMBIA (Tel: 923-823271; Telex: 055724; FAX: 923-824627)

North-America: Dr. Peter Cheeke, Department Animal Science, Oregon State University, Corvallis, Oregon 97331-6702, USA (Tel: 503-7543431; Telex: 5105960682 OSU COVS)

SUB-EDITORIAL GROUP (FRENCH):

Africa: Dr. C. Kayouli, Institut National Agronomique de Tunisie, 43 Avenue Charles Nicole, 1002 Tunis-Belvedere, Republique de Tunisie (Tel: 280 950)

Europe: Dr. Jacques Hardouin, Departement de Production et Santé Animales, Institut de Médecine Tropicale Prince Leopold, 155, Nationalestraat, B-2000 Antwerp, Belgium
Tel: 03-238.58.80 Telex: 31648 TROPIC Fax: 32.3.216.44.97

SUB-EDITORIAL GROUP (PORTUGUESE):

Brasil: Dr. Pablo Machado, Dept of Zoology, Fundacao de Estudos Agrarios "Luiz de Queros", Ave Padua Dias II, 13400 Piracicaba, Brazil (Tel: 330011)

INTERNATIONAL INSTITUTIONS AND INDIVIDUALS THAT WILL RECEIVE, COPY AND FORWARD JOURNAL DISKS

INTERNATIONAL INSTITUTIONS

International Foundation for Science (Dr. Christina Arosenius)
Grev Turegatan 19, S-114 38, Stockholm, Suecia
Tel: 46-8-791-2900; Telex: 13722 IFS S; Fax: 4686602618

FAO/IAEA (Animal Production and Health Section) (Dr. James Dargie),
Wagramerstrasse 5, P.O Box 100, A-1400 Vienna, Austria;
Tel.: (222)2360-0; Telex: 1-12645; Fax: 234564

INDIVIDUAL COLLABORATORS (By country)

Australia

Prof. R.A. Leng,
Department Biochemistry, Microbiology and Nutrition, University
New England, Armidale NSW2351, Australia
Tel: (067)732707 Of; Telex: AA166050; Fax: 067.733122

Barbados

Mr. Keith Laurie,
Sugarland Farms, Salters, St George, Barbados

Belgium

Dr. Jacques Hardouin,
Department de Production et Sante Animales, Institut de Medicine
Tropicale. 155, Nationalestraat, B-2000 Antwerp, Belgium.
Tel: 03-238.58.80; Telex: 31648 TROPIC B; Fax: 32.3.216.44.97

Belize

Mr. René Montero, Department of Agriculture, Central Farm, Cayo
District, Belize CA; Tel: 0922131 or 0922129

Brazil

Dr Paulo F. Machado, Dept of Zoology, Fundacao de Estudios
Agrarios "Luiz de Queros", Ave Padua Dias II, 13400 Piracicaba,
Brazil. Tel:330011

Cuba

Instituto de Ciencia Animal, Tulipán, No 1011 2/47 and Loma,
Nuevo Vedado 6, La Habana, and Instituto de Investigaciones
Porcinas, Gaveta Postal #1, Punta Brava, La Habana, Cuba; Tel:
299112 ; Telex: c/o 51-1269 CIMEX CU

Denmark

Dr. Frands Dolberg,
17 Novembervej, 8210 Aarhus V, Dinamarca; Tel: 06-152704; Telex:
c/o DANIDA 31292 JK D

Ecuador

Eduardo Crespo, Casilla 6747, Guayaquil, Ecuador; Tel: 307253
302352; FAX: 327 373

Haiti

Alfredo Mena, IICA, Boite Postale 2020, Port-au-Prince, Haiti
Tel: 5-3634;

Honduras

Randolfo Cruz, Escuela Agricola Panamericana, Tegicalupa,
Honduras. Telex: 1567 EAPZAM H ; Fax: (504) 328543

Trinidad

Floyd Neckles, Sugarcane Feeds Centre, Pokhor Road, Longdenville,
Trinidad WI; Tel: 665-9967; Telex: 24520 UWI

Tunisia

Dr. C. Kayouli, Institut National Agronomique de Tunisie, 43 Avenue Charles Nicole, 1002 Tunis-Belvedere, Republique de Tunisie
Tel: 280 950

United Kingdom

Dr. Andrew Speedy, Plant Sciences Department, University of Oxford, Parks Road, Oxford OX1 3PF, United Kingdom; Tel: (0865)270872/80; Telex: 83147 VIA OR G; Fax: (0865)270708

United States

Dr. Joe Conrad, Animal Science Department, University of Florida, Gainesville, Florida 32611, USA; Tel: (904)392.2180; Telex: 568757;

Dr. Peter Cheeke, Department Animal Science, Oregon State University, Corvallis, Oregon 97331-6702, USA; Tel: (503)754-3431
Telex: 5105960682 OSU COVS ;

Venezuela

Instituto de Produccion Animal, Facultad de Agronomia UCV, Maracay, Venezuela. Fax: (5843) 25204

Vietnam

Professor Luu Trong Hieu; University of Agriculture and Forestry, Thu Duc, HochiMinh City, Vietnam 7

(G) FORTHCOMING EVENTS

- (i) First FAO/IAEA Research Coordination Meeting on "Development of Feed Supplementation Strategies for Improving Ruminant Productivity on Small-holder Farms in Latin America through the Use of Radioimmunoassay Techniques", Santiago, Chile, 14-18 May 1990.
- (ii) Second FAO/IAEA Research Coordination Meeting on "Development of Feeding Strategies for Improving Ruminant Productivity in Areas of Fluctuating Nutrient Supply through the Use of Nuclear and Related Techniques", Khon Kaen, Thailand, September 1990.
- (iii) Final FAO/IAEA Research Coordination Meeting on "Regional Network for Latin America on Animal Disease Diagnosis using Immunoassay and Labelled DNA Probe Techniques", in conjunction with IFS/FAO/IAEA Workshop, Costa Rica, 22 October - 2 November 1990.
- (iv) Final FAO/IAEA Research Coordination Meeting on "Sero-surveillance of Rinderpest and other Diseases in Africa using Immunoassay Techniques", Bingerville, Côte d'Ivoire, 19 - 23 November 1990.
- (v) FAO/IAEA Regional Training Course on "Application of Immunoassay and Related Techniques in Studies on Animal Production and Disease Control in Asia", Jakarta, Indonesia, 24 September - 19 October 1990.

P R O S P E C T U S

- Place: Centre for Application of Isotopes and Radiation, National Atomic Energy Agency (CAIR-BATAN), Jakarta, Indonesia.
- Deadline for nominations: 31 May 1990
- Organisers: International Atomic Energy Agency in co-operation with the Food and Agriculture Organisation and the Government of Indonesia, through the National Atomic Energy Agency (BATAN) and the Directorate General of Livestock Services (DGLS).
- Language: English
- Participation: The course is open for 20 participants from the Asia and Pacific region, engaged in research on animal production and health.
- Background of the course: Improvement of animal productivity in developing countries requires knowledge of the specific constraints operating under different environments and management systems. New techniques for measuring reproductive hormones (solid-phase RIA) and for diagnosing important livestock diseases (ELISA) are simpler, cheaper and more accurate than those currently being used. Introduction of these into national research, teaching and extension systems will strengthen the capability of countries in this region to overcome the problems of low fertility and disease which limit productivity of livestock.
- Purpose of the course: To train scientists in the region in the use of (a) the radioimmunoassay (RIA) technique for measurement of reproductive hormones and related methods for studies on animal reproduction, and (b) the enzyme linked immunosorbent assay (ELISA) technique for diagnosis of diseases and related methods for sero-epidemiological studies. (Note - the course will have two parallel streams of training, one dealing with reproduction and the other with disease diagnosis.)
- Participants' Qualifications: (a) For the course on reproduction: Candidates must have a degree in animal science, veterinary science or equivalent and be actively involved in research on livestock production or reproduction in their country.
- (b) For the course on diseases: Candidates must have a degree in veterinary science or equivalent, and be actively involved in diagnosis or control of livestock diseases in their country. For both components, young scientists with recent post-graduate qualifications will be given priority.
- Nature of the course: The course will be conducted in two parallel streams:
- (a) Reproduction/production - participants will be provided practical training in collection and processing

of blood and milk samples, RIA techniques, their validation and quality control, recording of related clinical/physiological data (e.g. rectal palpation, live weight, condition score) and their interpretation.

(b) Disease diagnosis/epidemiology - participants will be given practical training in ELISA techniques, with emphasis on the serological diagnosis of brucellosis and trypanosomiasis, and in related procedures such as blood sampling, haematology, recording of clinical data and epidemiological studies.

Both groups will also be given lectures on experimental design, statistical analysis and writing/presenting technical reports.

Application procedure:

Nominations should be submitted in duplicate on the standard IAEA nomination forms for training courses. Completed forms should be endorsed by, and returned through, the official channels established (the National Atomic Energy Authority, the Ministry of Foreign Affairs, 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 31 May 1990. Nominations received after that date or applications sent directly by individuals or by private institutions cannot be considered.

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

Language Certificate:

The course will be conducted in English. 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, 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 candidates selected and at that time will be given full details of the procedures to be followed with regard to administrative and financial arrangements.

The IAEA will pay the full cost of the participants' round trip air travel at the economy class rate from their home countries to Indonesia and back.

During their attendance at the training course participants will be provided by the IAEA with 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 loss of personal property, or from illness, injury, disability or death of a participant while he/she is travelling to and from or attending the training course and it is clearly understood that each Government, in nominating participants, undertakes responsibility for such coverage. Governments would be well advised to take out insurance against these risks.

- (vi) FAO/IAFA Regional Training Course on "The Use of Immunoassay Techniques in the Diagnosis and Control of Animal Diseases in Africa, Bingerville, Côte d'Ivoire, 29 October to 23 November 1990"

P R O S P E C T U S

Place: Laboratoire de Pathologie Animale and the Centre des Metiers de l'Electricité, Bingerville, Côte d'Ivoire.

Deadline for Nominations: 30 June 1990

Organizers: International Atomic Energy Agency in co-operation with the Food and Agricultural Organisation and the Government of Côte d'Ivoire.

Language: French

Participation: The course is open for 20 participants from franco-phone Africa engaged in animal disease diagnosis and control and working in Veterinary Laboratories, Animal Research Institutes or Universities.

Background of the Course: Many presently used diagnostic techniques have significant disadvantages to the animal disease diagnostician working in the developing country situation. Recently developed immunoassays (ELISA) are now available (often in a kit form) and can provide the opportunity to test many samples simply and quickly, and against a number of the major epizootics affecting livestock in the Region.

Purpose of the Course: To train scientists in the Region in the use of the Enzyme Linked Immunosorbent Assay (ELISA) techniques for the diagnosis and control of animal diseases.

Participants' Qualifications: Candidates should possess a veterinary or equivalent animal science degree and should be actively involved in the diagnosis and control of the major epizootics affecting livestock in Africa. They will need to have spent some time working in laboratories and possess knowledge of basic laboratory procedures and techniques.

Nature of the Course: The course is aimed to provide practical training in the use of the ELISA. This will cover most aspects of conducting an ELISA but will concentrate of the use of these techniques for the serological diagnosis of

brucellosis, babesiosis, contagious bovine pleuropneumonia and rinderpest. Lectures will be given on the theory of ELISA, the use of ELISA in animal disease diagnosis, the use of FAO/IAEA ELISA kits and the use of ELISA in sero-surveillance. Aspects of epizootiology relevant to animal disease diagnosis and control will be covered.

Application procedure:

Nominations should be submitted in duplicate on the standard IAEA nomination forms for training courses. Completed forms should be endorsed by, and returned through, the official channels established (the National Atomic Energy Authority, the Ministry of Foreign Affairs, 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 30 June 1990. Nominations received after that date or applications sent directly by individuals or by private institutions cannot be considered.

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

Language Certificate:

The course will be conducted in French. In the case of countries in which French is not an official or customary language, nominations must be accompanied by a separate certificate of the candidate's proficiency in French. This certificate must be issued by a language school, 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 candidates selected and at that time will be given full details of the procedures to be followed with regard to administrative and financial arrangements.

The IAEA will pay the full cost of the participants' round trip air travel at the economy class rate from their home countries to Côte d'Ivoire and back.

During their attendance at the training course participants will be provided by the IAEA with 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 loss of personal property, or from illness, injury, disability or death of a participant while he/she is travelling to and from or attending the training course and it is clearly understood that each Government, in nominating participants, undertakes responsibility for such coverage. Governments would be well advised to take out insurance against these risks.

(H) FAO'S PROGRAMME FOR THE CONTROL OF AFRICAN ANIMAL TRYPANOSOMIASIS AND RELATED DEVELOPMENTS

Introduction

Although animal trypanosomiasis occurs in most tropical countries, by far the most important constraint to animal production is caused by trypanosomes 1/ transmitted by tsetse flies and which are found only in Sub-saharan Africa.

Tsetse borne trypanosomiasis is a disease of both man (where it is known as sleeping sickness 2/) and his domestic animals except poultry. It has profoundly influenced the settlement and economic development of a major part of the African continent. It remains a major constraint to livestock production and rural development over some 700 million ha outside the tropical rainforest zone, much of which has considerable potential for food production. Control of African animal trypanosomiasis (AAT) could help increase farmland productivity for Africa's expanding population.

1/ Trypanosoma brucei brucei, T. congolense, T. vivax, T. simiae, T. uniforme and T. suis. T. vivax can be transmitted by biting flies other than tsetse flies and this trypanosome occurs in Latin America, in spite of the absence of these flies. Other non tsetse-borne trypanosomes are T. brucei evansi, the agent of Surra and T. equiperdum, which is transmitted by the coit and causes Dourine in equines.

2/ Caused by T. brucei gambiense and T.b. rhodesiense.

Background

In view of the urgent need to develop food production in Africa and the progress made in the control of AAT, the World Food Conference, in 1974, requested FAO to implement a long-term programme for the development of the areas affected by tsetse-borne trypanosomiasis.

Launched in 1975, the Programme for the Control of African Animal Trypanosomiasis and Related Developments first evaluated control methodologies and their impact on the environment, developed training activities, applied research and pilot field trials and undertook studies on rural development in relation to tsetse and trypanosomiasis control activities.

In 1979, FAO established a Commission on African Animal Trypanosomiasis and two Expert Panels to assist implementation of the Programme and advise on its technical environment and rural development aspects. An Inter-Departmental Working Group has been set up with FAO to coordinate activities with particular emphasis on land use and environmental aspects in relation to tsetse and trypanosomiasis control.

Simultaneously with the FAO Programme, WHO initiated a Special Programme for Research and Training on Tropical Diseases which includes sleeping sickness, and international research institutes (ILRAD, ILCA, ICIPE, ITC and CRTA) developed their programmes on trypanosomiasis and tsetse fly.

These initiatives have encouraged several bilateral and international assistance agencies to implement large-scale projects for research and training on animal trypanosomiasis and integrated control and rural development programmes.

Major Achievements of the Programme (1975-1987)

Since the inception of the FAO Programme, 34 of the 36 countries affected by AAT have been more or less actively involved in the Programme. Training of personnel, extension and dissemination of information are major activities of the Programme and some 600 senior level or middle level personnel have received training in the various disciplines involved in the Programme. In addition, short-term training courses or workshops have been implemented in 10 countries.

Four Manuals on tsetse and trypanosomiasis control, 11 technical publications, including rural development aspects and trypanotolerant livestock, 14 reports of technical meetings and 8 articles for the World Animal Review have been produced in English and French. Technical information is disseminated permanently through the Tsetse and Trypanosomiasis Information Quarterly, which is produced in cooperation with WHO, OAU, ODNRT and IEMVT.

FAO grants contracts to support applied research and pilot trials to improve control methods. Up to 1987, 33 contracts on various aspects of tsetse and trypanosomiasis have been granted to research institutions and government services, totalling US\$ 365,000. In addition, the Joint FAO/IAEA Division has undertaken research programmes on the use of the Sterile Insect Technique (SIT) for tsetse control, ELISA for diagnosis of animal trypanosomiasis, and metabolism of trypanocidal drugs.

Thirty-one countries have benefitted from technical missions to assist in project formulation or implementation, and the economic impact of trypanosomiasis on rural development has been studied in six countries. In addition, 12 multi-disciplinary missions have been mounted to assist countries or subregional organizations in the design of control and rural development programmes.

By the end of 1987, 42 field projects on tsetse/trypanosomiasis control and related development, including the rearing of trypanotolerant livestock, have been launched with the support of UNDP and other UN institutions, Trust Funds, mainly with the Government of Italy, and the FAO/TCP for a total of approx. US\$ 25 million. Eight projects amounting to some US\$ 9 million had a regional coverage. This did not include projects operated by the Joint FAO/IAEA Division, mainly the tsetse control project with the Sterile Insect Technique in Nigeria.

Strategy of the Programme

Initially the scope of the Programme was Pan-African and aimed at involving all countries affected by AAT. In spite of the achievements and considering the changes in the international economic situation and the progress in control techniques, it became obvious in 1984 that the strategy of the Programme should be adapted. It was therefore decided that the Programme should:

Focus on priority areas with good prospects for integrated control and development programmes, selected according to human population pressure and competition for land, need to increase food production, technical and economic feasibility of controlling animal trypanosomiasis, government priority for development and prospects for funding.

Give particular attention to the orderly development of the area rendered free of trypanosimiasis and protection of the environment.

Feasibility of the isolation of tsetse-cleared areas should be taken into consideration when defining control areas.

Promote the use of simple, low-cost and non-pollutant control techniques such as trypanosomiasis control by the strategic use of drugs, rearing of trypanotolerant livestock and mainly integrated tsetse control with the use of newly developed techniques such as visual and olfactory attractive devices or animals treated with slow-release insecticides. When the final objective is eradication of tsetse and trypanosomiasis, consideration should be given to the use of the Sterile Insect Technique.

Develop training and extension in these techniques and support applied research aiming at their improvement.

Develop close technical cooperation with all countries and institutions concerned with the programme, in particular through the FAO Commission and Panels of Experts on Trypanosomiasis.

This strategy has been fully supported by the External Evaluation commissioned by the Director-General to assess the Programme 12 years after it commenced operations, and was endorsed by the Twenty-fourth Session of the FAO Conference (Rome, November 1987), which recommended that the Programme be further developed.

Programme Activities for 1988-1989

1. Training and Information

Training of personnel, extension and dissemination of information continue to receive the highest priority in the Programme.

The Seventh FAO/OAU/WHO Seminar on Trypanosomiasis was held in Mombasa, Kenya, from 3 to 14 April 1989, in conjunction with the XX Session of the ISCTRC.

A Postgraduate Training Course on Trypanosomiasis for English-speaking personnel was organised in 1988, in cooperation with ODA/UK. A similar course for French-speaking personnel is planned for the end of 1989.

The Joint FAO/IAEA Division organised a Training Course on the use of the Sterile Insect Technique for tsetse control in June 1988, in Nigeria.

A 8-month course for English-speaking personnel is held every year in Lusaka, Zambia.

Efforts have been pursued for the rehabilitation of the Regional training centre for French-speaking personnel (Ecole de lutte anti-tsétsé) in Bobo-Dioulasso, Burkina Faso, and it is expected that the activities of this Centre will be pursued under a new EEC-supported programme.

Assistance has been provided for short-term national training courses in Ghana, Côte d'Ivoire, Ethiopia and Liberia.

The publication of the Tsetse and Trypanosomiasis Information Quarterly continued in cooperation with WHO, OAU, ODNRI and IEMVT.

A Training Manual on the Utilization of Trypanotolerant Livestock for Rural Development of Tsetse Infested Areas will be published by the end of

1989 and three technical publications on trypanotolerant livestock have been prepared. A film on the use of trypanotolerant livestock for rural development of tsetse infested areas was also produced in cooperation with CTA and ILCA.

2. Applied Research

FAO continues to promote applied research on improved control techniques through research contracts granted to national institutions and government services. They concern mainly the practical use of new or improved tsetse/trypanosomiasis control techniques according to local conditions. Priority is given to tsetse control by attractive devices and animals treated with slow release insecticides. The Joint FAO/IAEA Division continues its research programme on the Sterile Insect Technique, the use of ELISA for trypanosomiasis diagnosis and the metabolism of trypanocidal drugs in cattle.

This Division has convened Research Coordination Meetings on the use of the Sterile Insect Technique for tsetse control in Nigeria, in June 1988 and on trypanosomiasis diagnosis in Nairobi, in July 1988 and in Harare in September 1989.

3. Field Programme

Field activities concern either priority areas, suitable for large-scale integrated control and development programmes or projects aiming at the promotion of simple control techniques, suitable for general use, including trypanotolerant livestock.

3.1. Priority areas for integrated control and development programmes

3.1.1. The Onchocerciasis Control Programme area in West Africa has been selected as a priority area, considering the obvious need to control the two diseases, as a prerequisite to sound rural development. The area is covered by the Italy-supported Regional project for livestock, development in tsetse affected areas of West Africa which now concerns the 14 tsetse infested West African countries.

National tsetse control projects are being implemented in Côte d'Ivoire and Nigeria. A regional project for trypanosomiasis control in the Niger River Basin (Benin, Burkina Faso and Niger) has been approved in principle by UNDP. A national project has been formulated for trypanosomiasis/tsetse control and related rural development in Ghana. Research contracts on the new tsetse control technique have been granted to Mali, Burkina Faso, Côte d'Ivoire, Ghana, Togo, Benin and Niger, and particular efforts have been made to develop training activities in the sub-region. Under a TCP project a study of transhumances has been carried out in cooperation with CEBV.

3.1.2 The Kagera River Basin covers part of Burundi, Rwanda, Tanzania and Uganda where there is a considerable demographic pressure and need for new land, particularly in the two former countries.

Two TCP projects aiming at the establishment of Trypanosomiasis Control Units have been implemented in Rwanda and Burundi, and a research contract on tsetse control has been granted to Rwanda.

A Regional project for trypanosomiasis control in the Kagera Basin has been undertaken under UNDP preparatory assistance, in cooperation with ECA and ICIPE.

3.1.3. The common fly belt between Malawi, Mozambique, Zambia and Zimbabwe is covered by a large-scale control project funded by EEC. FAO is in particular responsible for training activities on tsetse/trypanosomiasis control and related development in the region.

TCP projects in Zambia, Zimbabwe and Malawi aim at strengthening veterinary services for the control of trypanosomiasis. Research contracts have been granted to Zambia and Zimbabwe.

Projects in Zimbabwe are concerned with the development of tsetse cleared areas and wildlife management.

3.1.4. Tsetse-infested areas in Ethiopia and Somalia, where settlement programmes are underway, form the fourth priority area. In Ethiopia a tsetse control project has been undertaken with TCP assistance in the Upper Didessa Valley with the objective of developing improved tsetse control techniques with insecticide impregnated screens. Activities are pursued through a UNDP project. A large-scale project has been formulated for submission to the FAO/Government Cooperative Programme.

In Somalia, a UNDP project aimed at supporting rural development in tsetse cleared areas and an integrated control and development programme is being formulated in cooperation with the African Development Bank.

3.2. Promotion of simple control techniques

3.2.1 Tsetse Control

In Ethiopia TCP and UNDP-supported projects aimed at promoting the use of attractive devices for tsetse control in the Upper Didessa Valley. In Zanzibar tsetse/trypanosomiasis integrated control and eradication have been undertaken with TCP and UNDP assistance using animals treated with slow release insecticides. Eradication will be achieved by the use of SIT. In Tanzania mainland a UNDP project aims at tsetse control with attractive devices in the Mbeya area with a view to facilitating settlement of migratory pastoralists. A similar TCP project has been implemented in Côte d'Ivoire.

3.2.2 Trypanotolerant livestock

The promotion of the utilisation of trypanotolerant livestock (cattle and small ruminants) for the development of tsetse infested areas is a major activity of the Programme. This is the responsibility of projects supported by UNDP and the Government of Italy which are based in ITC, Banjul, the Gambia.

A UNDP project for selection and multiplication of the Ndama breed is being carried out in Guinea. Activities are being pursued with the assistance of Italy. Other similar projects have been formulated for the Mano River Union (Liberia, Sierra Leone and Guinea), Côte d'Ivoire, Ghana and in Gabon of UDEAC.

Projects for the development of small ruminants trypanotolerant breeds have been carried out in The Gambia, Côte d'Ivoire, Togo and Congo. A project for the strengthening of veterinary services with particular reference to the N'dama breeds, is being undertaken in Guinea Bissau.

A meeting on the Role of Trypanotolerant Livestock for Rural Development of Tsetse Infested Areas is being held in Banjul (The Gambia) from 25 to 28 September 1989, in cooperation with ITC.

A film and three publications on various aspects of trypanotolerance have been produced in cooperation with several technical assistance agencies.

4. Coordination of the Programme

The overall coordination of the Programme is ensured by the Commission on African Animal Trypanosomiasis, which meets every two years. The Fifth Session of the Commission was held in Accra, Ghana, on 10 and 11 November 1988. It was preceded by a Joint Session of the Panels of Experts on Technical/Ecological and Development Aspects of the Programme for the Control of African Animal Trypanosomiasis and Related Development, which met from 7 to 9 November 1988 to discuss progress on "Integrated tsetse control and rural development".

The annual Meeting of the Liaison Officers for West Africa has been organised in Banjul, The Gambia, from 26 to 28 April 1989, by project RAF/88/100.

Conclusion - Future of the Programme

The Twenty-fourth Session of the FAO Conference (November 1987) has endorsed the conclusions of the Evaluation of the Programme for the Control of African Animal Trypanosomiasis and Related Development, and recommended that high priority be given to the development of this Programme in the FAO plans of action. During the biennium 1988-89, the full implementation of the Conference recommendation has been hampered by budgetary restrictions and the resulting shortage of staff both at FAO Headquarters and the Regional Office for Africa.

However, the budgetary provisions for the biennium 1990-91 are encouraging. Moreover, the field programme largely expanded with the approval of five large-scale regional or national projects and good prospects for the approval of several others, allowing to foresee a large expansion of the trypanosomiasis programme in the next few years.

Abbreviations

CEBV	Communauté économique du bétail et de la viande, Ouagadougou
CRITA	Centre de recherche sur la trypanosomiase animale, Bobo-Dioulasso
CTA	Technical Centre for Agricultural and Rural Cooperation, Wageningen, The Netherlands
ECA	Economic Commission for Africa, Addis Ababa
IAEA	International Atomic Energy Agency, Vienna
ICIPE	International Centre for Insect Physiology and Ecology, Nairobi
IEMVT	Institut d'élevage et de Médecine vétérinaire des Pays tropicaux, France
ILCA	International Livestock Centre for Africa, Addis Ababa
ILRAD	International Laboratory for Research on Animal Diseases, Nairobi
ITC	International Trypanotolerance Centre, Banjul
ODNRI	Overseas Development Natural Resource Institute, UK

OAU Organization of African Unity

TCP Technical Cooperation Programme, FAO

UDEAC Union douanière et économique d'Afrique Centrale, Bangui

For further information: Contact Dr. V. Kouba, Chief of the Animal Health
Service, FAO, Rome

APPLICATION TO RECEIVE LIVESTOCK RESEARCH FOR RURAL DEVELOPMENT

Name of FAO/IAEA Contract Holder/TC Counterpart:

Name and address of Institute:

Type of Computer:

Do you have MS DOS operating system?

Specify 3.5" and/or 5.25" disk drive availability:

Which Word Processor software do you use?

Type of printer available:

Please return to: Animal Production and Health Section
Joint FAO/IAEA Division
P.O. Box 100
A-1400 Vienna (AUSTRIA)

Animal Production and Health Newsletter
Joint FAO/IAEA Division of Nuclear Techniques
in Food and Agriculture
International Atomic Energy Agency
P.O. Box 100, A-1400 Vienna, Austria

Printed by the IAEA in Austria
February 1990

90-00416