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Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture and FAO/IAEA Agriculture and Biotechnology Laboratory, Seibersdorf

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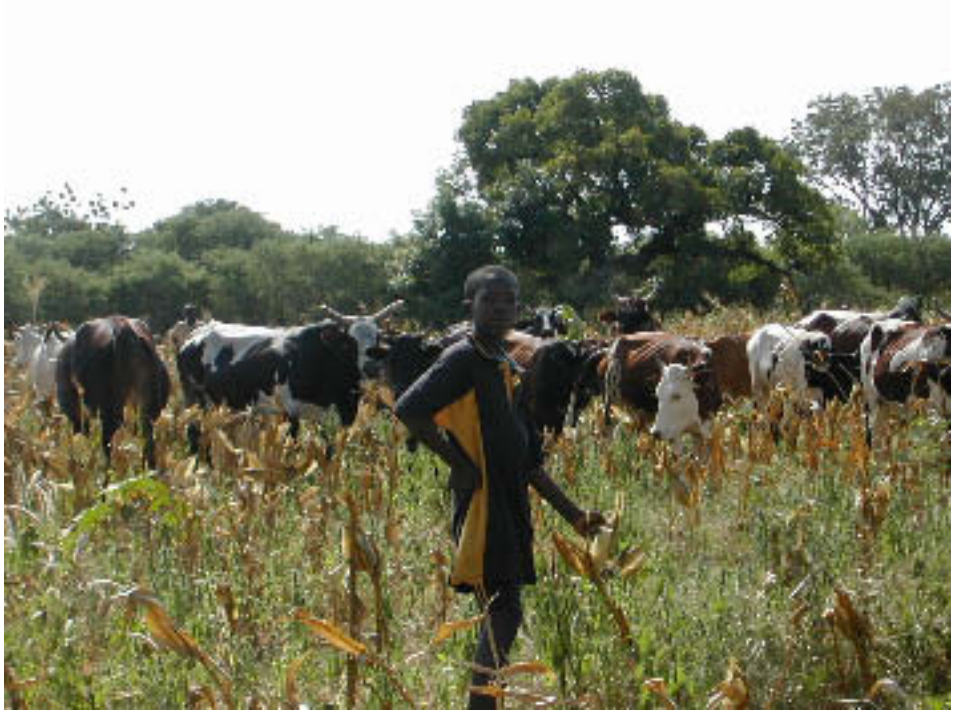

Small-holder dairy farmer in the North-West of Cameroon

TO OUR READERS

Dear Colleagues,

Once again the year is coming to an end and 2005 is looming ahead. I wish to thank you all for your support throughout this year and hope that our interactions will grow with each Newsletter. I want to also express my appreciation to all who have given us their feedback on the status of our Coordinated Research Projects (CRP), Technical Cooperation Projects (TCP) and other activities that have been included in our Newsletters. We hope that this will continue. At the same-time, I also want to encourage you all to send us your comments, suggestions or ideas about the Newsletter. Thanks to all that have done so in the past.

IAEA
International Atomic Energy Agency

In the June 2004 Newsletter, we focused on the topic of molecular diagnostic technologies and the way forward. It is clear from the feedback, that there is a strong desire for having reliable, definitive, sensitive, specific, cost effective and "on-site" diagnostic tests, in parallel with so-called herd or population surveillance tests. This will allow for the implementation of more effective disease control strategies. It is indeed exciting to consider the current technological explosion and its consequences and what potential advantages might be in store for many of our Member States. This will also help to ensure that we keep abreast of new developments and employ the most appropriate tools.

Many of you highlighted the need for research-oriented training, better control of transboundary animal diseases and the tools needed, inter-laboratory standardization of tests and procedures and availability of lyophilized standards to assist in this process. To address some of these issues, we have initiated two consultancy meetings to try and prioritize issues of importance and to respond to the requests by Member States; The first will be a meeting on education to improve the quality of research in developing countries and the second, a meeting on early warning devices and tools for the timely and rapid detection of animal diseases. The conclusions and recommendations will be placed on the web as soon as they are available and published in the next Newsletter. The Animal Production and Health Sub-programme will continue to move progressively forward and in pace with developments within the livestock field so as to optimally serve our Member States. Project teams will still be encouraged to keep abreast of current technological developments and to promote their implementation where feasible, allowing a better positioning of our Member States with respect to international trade and other livestock-related issues. This will in turn promote improved quality assured measurements in animal husbandry and health practices, and also lead to a greater autonomy for Member States. The next topic under discussion in our Newsletter will focus on the management of animal genetic resources.

Concerning news related to our staff; in November, we said farewell to Oswin Perera on the completion of his second 7 year term with the IAEA. He and Tamalee returned to Sri-Lanka where a new and promising future awaits them. Oswin was a great asset to the Sub-programme, responsible for technology transfer to Member States related to animal reproduction. His dedication and hard work is much appreciated and he will be greatly missed as a friend and colleague. We hope, however, that we will be able to continue using his expertise for the benefit of our Member States. Oswin can be reached by email at oswinperera@yahoo.co.uk. We want to also congratulate Andrew Cannavan as new head of the Agrochemicals Unit at Seibersdorf and wish him well with his new position. He is, however, not completely lost to the Sub-programme as we still plan to make use of his veterinary pharmacological expertise. Following the departure of Oswin and Andrew from the Sub-programme, we have advertised two vacancies and hope to appoint suitable incumbents soon. Finally, Mr. Gustavo Avelar, who served as a cost-free intern since June 2004 working on a microsatellite mapping project for sheep helminth resistance in collaboration with ILRI, Nairobi, Kenya, returned to Brazil to complete his PhD. We want to thank him for his dedication and hard work

Both past and future activities are described in further detail on our website and I therefore strongly encourage you all to visit it and let us know of your ideas, comments, concerns or questions. We thank all those who have responded to our request to update the details of their contact and mailing addresses, and urge others to please do so by replying to R.Schellander@iaea.org.

Finally, I want to wish you and your families all the best in the year ahead.

Gerrit Viljoen,
Head, Animal Production and Health Section

STAFF

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The Animal Production Unit, Seibersdorf, is a collaborating Center for ELISA and molecular technologies in animal disease diagnosis for the OIE.

FORTHCOMING EVENTS

Third RCM to Develop Methodologies for Demonstrating Increases in the Productivity of Peri-urban Dairy Cattle Using an Integrated Approach to Nutrition, Reproductive Management and Disease Control (D3.10.23)

Technical Officer: Harinder Makkar

This RCM will be held in Pretoria, South Africa, from 14 to 18 March 2005. The objective of the meeting is to present and discuss results of completed field surveys, laboratory investigations and partial budget analyses; to review on-going interventions; to assess the applicability of the Livestock Information Management Application (LIMA) and make recommendations for any changes necessary; and to finalize an integrated strategy for implementation during the final phase of the project. The local organizer is Dr. Leon Prozesky, Section of Pathology, Department of Paraveterinary Sciences, Faculty of Veterinary Science, University of Pretoria.

Third RCM to Develop Strategies for the Effective Monitoring of Veterinary Drug Residues in Livestock and Livestock Products in Developing Countries (D3.20.22)

Technical Officer: Andrew Cannavan

This RCM will be held in Natal, Brazil, from 11 to 15 April 2005. The progress of the research and development carried out over the first 3 years of the project will be reviewed and the work plans finalized for the final phase, which will include validation of methods, technology transfer and finalization of assay protocols.

Third RCM to Develop, Validate and Standardize Methodologies for the Use of PCR and PCR-ELISA in the Diagnosis and Monitoring of Control and Eradication Programmes for Trypanosomosis (D3.20.21)

Technical Officer: John Crowther

The final RCM is scheduled to be held in Hanoi, from 20 to 24 June 2005. It is hoped that dates can be arranged so that participants may stay in Hanoi to attend the meeting of the Society for Tropical Veterinary Medicine (STVM).

Project Coordination Meeting for the RCA Project: Integrated Approach for Improving Livestock Production Utilizing Indigenous Resources and Conserving the Environment (RAS/5/044)

Technical Officer: Harinder Makkar

The meeting will be held in March/April 2005 to plan activities of this new project. The venue for the meeting has not yet been finalized. The objectives of this project are to improve animal productivity and decrease emission of greenhouse gases, (methane and carbon dioxide) and discharge of nutrients (nitrogen and phosphorus) into the environment; and to identify and adopt better breeding strategies that will improve animal productivity through the use of better selection criteria for offspring from cross-breeding programmes, optimum utilization of appropriate indigenous cows, and improving procedures for management, nutrition and healthcare programmes in dairy farms. Representatives from 12 to 14 RCA Member States are likely to participate in this meeting.

Molecular diagnostic PCR Fellowship Training Course

Technical Officer: Gerrit Viljoen

The fourth FAO/IAEA PCR and Molecular Diagnostic Training Course will be held in cooperation with PCRbiotech, Microbiology Department, University of Pretoria, South Africa from 16 May to 15 June 2005.

The course is designed to establish basic understanding of fundamental molecular biological principles and biotechnological application. In addition this course will give concrete guidelines and hands-on training on practical aspects of PCR. These aspects include good laboratory practice and requirements for setting-up PCR laboratories, standardization of PCR protocols, the implementation of PCR diagnostic tests and good service delivery, awareness of difficulties as well as advantages of the assay, current advances in the PCR procedures and the placement of PCR in relation to other tests.

The course coordinator is Prof Louis Nel. The course presenters will be Prof Louis Nel (louis.nel@up.ac.za) and Prof Gerrit Viljoen (G.J.Viljoen@iaea.org).

PAST EVENTS

FAO/IAEA Inter-regional Training Course on Molecular Methods in Animal Genetics and Breeding

Technical Officers: Oswin Perera and Fernando Garcia

This training course was held from 14 to 25 June 2004 at the FAO/IAEA Agriculture and Biotechnology Laboratory in Seibersdorf, Austria. Sixteen participants from Member States of FAO and IAEA and attended. The objective of the course was to enhance knowledge and practical training on current molecular marker techniques and experimental design in livestock genetic resources characterization in order to obtain information that can be used to develop breeding strategies aimed at maximizing the utilization of indigenous breeds in developing countries. The course included lectures, practical exercises and discussions on the following topics: molecular biology theory, sampling procedures, DNA extraction and purification, polymerase chain reaction (PCR), DNA microsatellite analysis using different electrophoresis systems, DNA sequencing and applications of DNA markers (marker-assisted selection – MAS, marker assisted conservation – MAC, functional genomics, parentage testing, linkage analysis, genetic mapping principles and related computer software utilization) to improve the use of these techniques in developing countries.

The course was considered extremely successful according to the analysis of the trainees evaluation. The highly motivated atmosphere of the training course lead to strong interaction between the lecturers and trainees which will be continued in various projects, especially, in the Coordinated Research Project (CRP) on Gene Based Technologies in Livestock Breeding: Characterization of Small Ruminant Genetic Resources in Asia, which started this year.

Final RCM on Use of Nuclear Techniques to Develop Simple Tannin Assays for Predicting and Improving the Safety and Efficiency of Tanniniferous Forage (D3.10.22)

Technical Officer: Harinder Makkar

This meeting was held from 7 to 11 June 2004 in Kars, Turkey. Eleven Research Contract, Agreement and Technical Contract holders participated. The objective of the meeting was to evaluate the work conducted in the second phase of the project in which the main aim was to develop strategies for detanninification of tree and shrub leaves and to use the promising ones to enhance the nutrient availability from these feed resources. The results from this programme will be published in a special issue of the Animal Feed Science and Technology journal, which is likely to be published in early 2005. Main achievements are available at the AP&H Section website.

Third RCM on the Use of Non-structural Protein of Foot-and-Mouth Disease Virus (FMDV) to Differentiate between Vaccinated and Infected Animals (D3 20.20)

Technical Officer: John Crowther

The Third Research Coordination Meeting of the FAO/IAEA Coordinated Research Project D3.20.20 on "The use of non-structural protein of foot-and-mouth disease virus (FMDV) to differentiate between vaccinated and infected animals" was held in Cebu, Philippines from 5 to 9 July 2004.

The meeting discussed the results obtained from different systems to assess antibodies against FMD in vaccinated and infected livestock and planned strategies

based on the data for the monitoring of FMD and identification of virus disease in the face of vaccination. The Research Contract holders delivered country reports and the Agreement holders presented information on a competitive NSP assay from Geelong and Vienna Veterinary University; as well as a new platform for a test system for diagnosis; experimental results on carrier studies at the World Reference Laboratory, Pirbright; and epidemiological uses of NSP tests. Representatives of commercial companies involved in kit supply attended and gave papers. Experts delivered papers on aspects of NSP testing and wider issues of assay validation; laboratory accreditation and comparative testing of kits from an EU perspective and in a major EU study.

The meeting concluded that there was enough data to recommend assays as being 'fit for purpose' for many of the epidemiological needs for FMD testing for antibodies. Two major developments will be covered to the end of the CRP in 2004. (1) The identification, collection, initial characterization and delivery of large volumes (approximately a minimum of 500mL) of antisera (various species) needed for world standards for FMD NSP testing (to be sent to Geelong and Seibersdorf laboratories for irradiation, characterization and storage). The company Svanova agreed also to take any irradiated sera and lyophilize this free of charge in readiness for inclusion in any standards exercise in future without cost. The TO identified a source of sera produced against tissue culture derived NSP in cattle used to test 'poor' vaccines and the counterpart responsible agreed to collect such sera in future. (2) The comparative assessment and validation of the Competition-ELISA developed in the first technical contract with Geelong, Australia with other commercially available kits, the second contract with Geelong will be used to send kits and examine data. Those attending are shown below.

Research Contract holders
A. Braga (Brazil), K. Dyrting, (Honk Kong, China), W. Linchongsubongkoch (Thailand), C. Sanchez (Colombia), A. M. Espinoza (Peru), E. Maradei (Argentina), M.M. Kyin (Myanmar), B.C. Verin (Philippines-local organizer)
Agreement holders
H. Unger (Austria), C. Morrissy (Australia), L.S. Christensen (Denmark), S. Parida (UK),
Companies
C. Egli (Bommeli Diagnostic, Intervet), M. Merza (Svanova, Sweden), C.E. Jacobs (CEDI Diagnostics, Netherlands), A.M. Walfield (United Biomedical Incorporated, UBI-USA).
Experts
A. Dekker, A. Colling (CSIRO, Geelong, Australia
Observers
J. Lubroth (FAO, Rome, Italy), K. Sliter (USA mission, Vienna, Austria), R. Sodnomdarjaa (Mongolia), W.D. Santos, E.F. Jones, D. Ounpomma (Thailand).

Training course on Use of Immunoenzymatic and Molecular Techniques for Diagnosing Brucellosis in Cattle, Sheep and Goats (RER/5/012)

Technical Officer: John Crowther

The training course was held at Faculty of Veterinary Medicine, Skopje, Macedonia, from 27 September to 2 October 2004

The programme involved practical sessions for screening sera and milk samples for antibodies against brucella using an Indirect ELISA (iELISA) commercial kits that have been validated in the Macedonian laboratory, as well as by a competitive ELISA (C-ELISA). Sera and milk samples from the Macedonian bank, as well as those brought from various member states, were examined. The PCR to detect the brucella genome was demonstrated by the invited expert. The TO gave lectures on routine serological methods and quality control and discussed TC activities emphasizing the possibilities for national projects and training on molecular methods. Validation data for the tests was given in lectures as well as supplied on a CD Rom. The necessity and needs for accreditation of laboratories was discussed

Visits to three farms were made to examine the different qualities of sheep and goat production systems in Macedonia, these reflected those in the region as a whole. A visit was arranged to the Ministry of Agriculture, Forestry and Water Economy where developments of a national informative system for control of brucellosis and other livestock diseases, were demonstrated. A lecture was given on designing electronic reporting systems for use in control programmes.

It was agreed that the course was too short to allow a greater depth of understanding of serological and molecular techniques to be made. It was agreed that the system using commercial kits for detecting antibodies against *brucella abortus* in cattle was validated sufficiently for use in sheep and goats and was a great adjunct to routine screening of samples as well as in testing bulk milk samples. It was concluded that the validation data should be submitted to the OIE on their new template-driven format developed to evaluate system in terms of fitness for purpose. It was proposed that another training course should be arranged in future, for two weeks. The provision of kits under the regional project was also recommended. The TO agreed to send details of internal quality control charting methods for indirect and competitive ELISA; accreditation principles and background papers by CD Rom.

Trainers
Dr. J. Bosnakovski, Professor of Faculty of Veterinary Medicine at the University St. Ciril and Metodij, Skopje (Course Director)
Dr. D. Mitrov, Assistant Professor of Faculty of Veterinary Medicine at the University St. Ciril and Metodij
Dr. I. Naletoski, Assistant Professor of Faculty of Veterinary Medicine at the University St. Ciril and Metodij, Skopje
Dr. S. Chokrevski, Director of Veterinary Service, Ministry of Agriculture, Forestry and Water Economy, Skopje R. Macedonia.

Experts
Prof. L. Nel, Dept of Microbiology, Faculty of Natural and Agricultural Science, University of Pretoria
J. R. Crowther, Technical Officer Joint FAO/IAEA Division, Vienna.

Participants
D. Laci and A. Terkuci; Albania
S. Abdullayeva and T. Bashirova; Azerbaijan
L. Arapovic and D. Camo; Bosnia and Herzegovina
D. Ivanov and P. Sabev; Bulgaria
E. Tsintidou; Cyprus
D. Djokic and D. Lausevic; Serbia and Montenegro
G. Altay; Turkey

Final Project Review Meeting of the AFRA Project: Improving and Increasing Milk and Meat Production (RAF/5/046)

Technical Officer: Oswin Perera

The meeting was held in Ougadougou, Burkina Faso, from 4 to 8 October 2004.

The objectives of the meeting were to review results obtained during the full period of the project, including field and laboratory work, cost-benefit analyses and in-country training and education activities; assess outputs and outcomes, and make recommendations on follow-up activities that should be addressed through national resources and a new TC project that has been approved (Footnote A status); and assist with the editing of scientific papers of Project Counterparts (PCs) for publication in an Agency TECDOC.

Of the twelve AFRA Member States (MSs) continuing to participate in the project, PCs from 10 countries (Burkina Faso, Ethiopia, Kenya, Senegal, South Africa, Sudan, Tanzania, Tunisia, Uganda and Zambia) submitted final reports and all, except the PC from Senegal (who was taken ill shortly before commencing travel), attended the meeting. It was supported by an IAEA expert (Dr. M. Garcia, Peru) and the Technical Officer.

The meeting was hosted by the Ministry of Animal Resources in Burkina Faso and was held at the Hotel Nazemse, Ouagadougou, where all participants were also accommodated. The opening was addressed by the Minister of Animal Resources (Chief Guest), Director General of Veterinary Services and the Technical Officer.

The full meeting report is available on the AP&H Section's website. Electronic versions of the report, the scientific papers of PCs, PowerPoint presentations and related documents were placed on a CD-ROM and distributed to all national PCs of AFRA Member States participating in the project.

Training Course on FDM Serology (RAS/5/041)

Technical Officer: John Crowther

A two-week training course on the serological and molecular diagnosis of FMD was held in Pakchong, Thailand, from 11 to 22 October 2004 under the regional project RAS/5/041.

The two week course covered the theoretical and practical aspects of Enzyme Linked Immunosorbent Assays (ELISA) for the identification and typing of FMD viruses; the measurement of overall antibodies against FMD using the liquid phase blocking ELISA (LPBE); assessment of antibodies against the non structural proteins (NSP) of FMD to differentiate infected and vaccinated livestock as well as quality control aspects of each of the assays. The meeting also coincided with the opening ceremony for the new high security laboratory and then a lecture was given on FMD in South East Asia by the new regional coordinator of the South West Asian FMD campaign. In the first week of training the capture ELISA for typing was run by the participants. This is an important assay and essential to allow accurate diagnosis and rapid typing of FMD. The participants are now confident they can reproduce the test in their laboratories. A competitive ELISA was demonstrated to allow the different protocol to be studied. The LPBE was run successfully. Lectures on FMD structure and function, epidemiology, assay formats, quality control and assurance were given. The second week involved training using the commercial kits and the IAEA developed kit for detecting antibodies against the NSP of FMD, all of which was successful.

During the time, extensive discussions were made with the staff at Pakchong concerning future activities under

the TC regional project including the production of rabbit, guinea pig and chicken sera locally; the development of an indirect ELISA for antibody screening; the collection of large volumes of reference sera for standards to be sent to the Agency laboratory at Seibersdorf; the further validation and distribution of the of the NSP ELISA developed under the CRP D3. 20 20; fellowship training with respect to kit development and laboratory management of the high security facility. Lectures were delivered by Dr. Gleeson on FMD testing, epidemiology of FMD in S. E. Asia, strategies for sample collection and testing. Impending projects were discussed involving the AAHL, Geelong laboratory in helping Pakchong develop their high security facility, the development of an Indirect ELISA for antibody assessment; the use of formalin stabilized inactivated purified FMD virus as reagents and standards in tests and the future activities under the TC regional project.

Overall, there was a difference in the capabilities of the trainees as well as their experience in the use of ELISA. The training course helped greatly in giving confidence to laboratory workers and therefore improve diagnostic capabilities nationally. In some cases ELISA kits were unavailable nationally and the mini kits to be given at the end of the course will allow diagnosis to be made. Basic knowledge is still needed by most in interpreting data and implementing internal quality control procedures. There is also a need to provide information as to the use of the NSP kits. It is recommended that more training is given on these areas. It is also recommended that the kit for NSP antibody detection developed through the CRP D3. 20. 20., is made available to S.E. Asia laboratories and that this is distributed from Pakchong. Generally the local organization and readiness through the Pakchong laboratory was excellent and all the staff involved proved extremely competent. The experts were also excellent and particular thanks should be made to the expert C. Morrissy who ran the course at the practical level for two weeks and the staff at Pakchong.

Workshop on Food Safety Requirements for the International Market: Strategies for Residues Programmes

Technical Officer: Andrew Cannavan

This workshop, which was conducted in Spanish, was held in Chile, from 18 to 22 October 2004. The aim was to build awareness of the major elements involved in the implementation of residues control programmes. The workshop was attended by 51 delegates drawn from academia, residue control laboratories, regulators and administrators (25 direct participants representing 15 Latin American countries; 19 observers; 3 special attendees, and 4 foreign experts). A series of presentations were given by invited speakers from the Latin American region, the EU and USA. Topics included the design of residue control programmes, strategies for the prevention and control of veterinary drug residues in food, licensing of veterinary medicines, pharmacokinetic models for the assessment of withdrawal periods, the role of reference laboratories in the EU, validation of analytical methods, quality control in analytical laboratories, the production and use of reference materials, proficiency testing protocols, interpretation of relevant legislation, EU requirements for third countries and the role of the EU Food and Veterinary Office in evaluating residue control systems. The participants actively participated through questions and contributions during plenary and in discussion sessions. Clearly, there is currently a wide spectrum of competence in the areas of residue control and veterinary medicine regulatory systems in South and Central America and it was concluded that this workshop will help address this issue.

Thanks are due to the Chilean Government for hosting this event and to the team of local and international organizers and presenters for their hard work in making the workshop successful.

Final Project Review Meeting for the RCA Project: Improving Animal productivity and Reproductive Efficiency (RAS/5/035)

Technical Officer: Harinder Makkar

The meeting was hosted jointly by the Office of Atoms for Peace (OAP) and Dairy Promotion Organisation (DPO), Bangkok, Thailand from 11 to 15 October 2004. It was attended by all 25 nominated PCs from 12 RCA MSs (Bangladesh, P.R. China, India, Indonesia, Malaysia, Mongolia, Myanmar, Pakistan, Philippines, Sri Lanka, Thailand and Vietnam) and was supported by three IAEA experts (Dr. Malcolm Knox of Australia for nutrition and Dr. Peter Ball of the United Kingdom and Dr. A.S. Nanda from India for reproduction) and the writer as Technical Officers (TO). Mr. Prinath Dias, RCA Coordinator, IAEA also participated in the meeting. The work done including the training activities conducted, and their impact at the level of end users was evaluated. The results will be collated for publication as an Agency TECDOC. All the objectives of the project have been achieved. Detailed report is available at our website.

Consultants Meeting on Education to Improve the Quality of Research from Developing Countries

Technical Officer: John Crowther

The meeting was held in Vienna, Austria, from 22 to 26 November 2004.

Although most countries have some access to training components, these can be patchy and of uncertain quality. University systems often fail at the postgraduate level. Research training is often a problem in developed countries, and even more in developing countries. The definition of what makes a researcher and how he/she gets to be one of quality is not easy. However, it is apparent that this area is very weak in most developing countries in the research field it is often difficult to receive the supervision and level of research necessary. The quality and experience is manifest where contact is made with scientists by TOs in CRP and TC programmes. There is limited access to published literature, so that often scientists are many years behind current developments and have difficulties assessing the feasibility and usefulness of new science. There is little confidence in stating ideas based on knowledge and there is generally a very low standard of personnel to promulgate effective research. Technology transfer attempts to provide the appropriate tools to solve problems in developing countries however, it must be recognized that the raw material for problem solving is the individual. The skills, education, awareness and confidence of such individuals are vital to allow use of technologies in relevant areas. Project implementation in TC as well as coordinated research programmes, rely on national scientists' abilities. The extension of technology into real impact is in the hands of individuals and collections of individuals who should be able to identify, plan and implement work to a common end for national and regional interests.

The research mind is best set to allow more general understanding of all problems. A complete training in this area would greatly facilitate all aspects of science.

A full meeting report will be provided in the next issue.

Consultants Meeting Early Warning Devices and Tools for the Early and Rapid Detection of Animal Diseases

Technical Officer: Gerrit Viljoen

The meeting was held at the Vienna International Center, Vienna, Austria from 29 November to 3 December 2004.

This consultancy is to evaluate the tools, the technology and the type of data needed in support of early warning systems. The topics under discussion will include amplification and non-amplification systems, biosensors, nanotechnology devices and equipment, communication technologies, administrative and logistical set-ups, networks and partnerships.

The detection and characterization of specific nucleic acids and proteins of medico- veterinary pathogens have proven invaluable for diagnostic purposes. Apart from hybridization and sequencing techniques, ELISA and PCR and numerous other methods have contributed significantly to this process. The integration of amplification and signal detection systems including on-line real-time devices, have increased speed and sensitivity and greatly facilitated the quantification of target proteins and nucleic acids. Rugged portable real-time instruments for field use and robotic devices for processing samples are already available commercially.

Nucleic acid based-technologies are making considerable contributions to the field of diagnostics. PCR-based assays are already being utilized routinely by many laboratories and on-going developments are refining as well as expanding their capabilities. The use of real-time PCR and automated sample processing devices have already made significant contributions in reducing contamination whilst improving test consistency, rapidity, sensitivity and throughput. Improving the sensitivity of detection would also obviate the need to perform amplification reactions and its requirement to have suitable primers to amplify the target sequence. Several alternative target, probe and signal amplification systems have been described (LCR, SDA, RCA, bDNA, invasive cleavase). In addition, technologies to enhance separation and detection of nucleic acids have been developed (capillary electrophoresis, mass spectrometry). Labelling and detection methods other than radioactivity are also making important contributions (enzymatic, fluorescence, chemiluminescence, and nanoparticle labelling). Nevertheless, conventional microbiological assays should be maintained to validate and guide further developments with the newer diagnostic approaches. Commercial kits for the molecular detection of the most important pathogens are increasingly becoming available. There is also a need to standardize nucleic acid assays through ring tests and the establishment of suitable guidelines and quality control programmes. The availability of lyophilized standards will assist in this process. The need for suitably trained staff to perform and evaluate nucleic acid- and protein-based assays, as well as the costs associated with many associated technological platforms is also an important requirement and in some cases an obstacle for their wider application. There is a need for centralized facilities to perform such tests but developments in integrated systems are likely to allow for future point-of-care testing. Rapid developments in biosensors are producing more effective biological recognition molecules as well as transducers. Many of these have the potential of generating signals following the detection of single molecules. Microarray technologies have the potential of parallel testing large numbers of pathogens simultaneously, and this can have significant contributions to the diagnostic capabilities of many laboratories. Developments on the integration of sample processing, amplification and analysis and the eventual production of effective commercial testing devices would herald an

important achievement in allowing for point-of-care testing. Advances in nanotechnology have potentially important contributions to make in this process, with the likelihood that test results could be obtained within minutes. Suitable wireless communication systems with centralized data banks as well as access to decision making tools will allow for speedy therapeutic and prophylactic decision making, a desirable achievement in any effective diagnostics programme.

The FAO/IAEA Joint Division, in collaboration with the FAO, OIE and WHO are aware of the dynamic changes in technologies and equipment and therefore organized this technical consultant's meeting regarding "early warning devices and tools". The topics included: early warning devices and systems - the technology; amplification systems ("back-pack" lightcycler, self sustainable devices, on-line real-time PCR devices, hand held devises, "lab on a chip"); on-site types (dip-sticks, non amplification systems); biosensors as one category with all the various system sub-categories (other sensors also); nano-equipment; communications technologies (GPRS/mobile phone-IR-laptop-satellite-information centre etc, bioinformatics, electronics etc), administrative, logistical set-ups, networks, partnerships etc) and other items. The big issue of discussion was where is the technology going and how can we maximize its use.

A full meeting report will be provided in the next issue.

STATUS OF COORDINATED RESEARCH PROJECTS

Use of Nuclear and Related Techniques to Develop Simple Tannin Assays for Predicting and Improving the Safety and Efficiency of Feeding Ruminants on Tanniniferous Tree Foliage (D3.10.22)

Technical Officer: Harinder Makkar

This CRP has concluded with the final RCM held in Kars, Turkey in June 2004. For additional information, refer to the previous section.

Integrated Approach for Improving Small-scale Market Oriented Dairy Systems (D3.10.23)

Technical Officer: Oswin Perera

This CRP is now in its third year and has a full complement of participants, comprising ten Research Contracts, one Technical Contract and four Research Agreements. The second RCM was held from 21 to 25 July 2003 in Asunción, Paraguay. The third RCM is scheduled from 14 to 18 March 2005 in South Africa and the final RCM will be held towards the end of 2006 in Asia.

Development and Use of Rumen Molecular Techniques for Predicting and Enhancing Productivity (D3.10.24)

Technical Officer: Harinder Makkar

There are currently eight Research Contract holders and five Agreement holders. The next RCM and a training workshop on methodologies for measuring methane from ruminants will be held in September 2005 at the Institute of Animal Sciences / Animal Nutrition ETH Zurich, Switzerland.

Gene-based Technologies in Livestock Breeding: Phase 1 Characterization of Small Ruminant Genetic Resources in Asia (D3.10.25)

Technical Officers: Oswin Perera and Fernando Garcia

This CRP was initiated in November 2004 with the award of eight Research Contracts and one Technical Contract. Three Research Agreements are expected to be awarded in early 2005.

A planning meeting and training workshop will be held from 13 to 23 December 2004 at the International Livestock Research Institute (ILRI) in Nairobi, Kenya, for the Chief Scientific Investigators who have been awarded Research Contracts. It will be conducted by staff at ILRI who are be collaborating in the CRP, in close consultation with staff from NAFA, NAAL and FAO. The training course will cover essential aspects of theory and practical work for field and laboratory procedures, as well as the standardization of methods and reagents. The planning meeting will review and formulate the individual work plans of participants for the first year and make recommendations on the technical and implementation aspects of the CRP. The first RCM will be held in late 2005, to review the first year's work and develop work plans for the second year.

Standardized Methods for Using Polymerase Chain Reaction (PCR) and Related Molecular Technologies for Rapid and Improved Animal Disease Diagnosis (D3.20.17)

Technical Officer: John Crowther

This CRP has concluded. It is planned to hold a consultants meeting to review the data and prepare a manuscript reviewing all experiences in transferring the technology of PCR to developing countries in association with a PCR manual written to aid developing country scientists implement the technique, by the end of 2005.

The Use of Non-structural Protein of Foot-and-Mouth Disease Virus (FMDV) to Differentiate Between Vaccinated and Infected Animals (D3.20.20)

Technical Officer: John Crowther

The final RCM was held in Cebu, Philippines and a detailed report is contained in Past Events Section of this Newsletter.

Developing, Validating and Standardizing Methodologies for the Use of PCR and PCR-ELISA in the Diagnosis and Monitoring of Control and Eradication Programmes for Trypanosomosis (D3.20.21)

Technical Officer: John Crowther

The final RCM will be held in Hanoi in 2005.

The Development of Strategies for the Effective Monitoring of Veterinary Drug Residues in Livestock and Livestock Products in Developing Countries (D3.20.22)

Technical Officer: Andrew Cannavan

The second RCM for this project was held in Pretoria South Africa, from 3 to 7 November 2003. The CRP involves a full complement of 12 Research Contract holders, three Research Agreement holders and two Technical Contract holders.

African Swine Fever Technical Contract 11294 (D3.00.00)

Technical Officer: John Crowther

Indirect ELISA kits are still available from the Institut Sénégalais de Recherches Agricoles ISRA, Laboratoire National de l'Elevage et de Recherches Vétérinaires (LNERV), for the detection of antibodies against ASF. Each kit includes plates, tips and reagents for testing 2800 samples and costs US$ 2000. Applications for kits should be made to the Senegal laboratory directly (Dr. Joseph Sarr; Josarr@refer.sn).

NEW COORDINATED RESEARCH PROJECTS

General information applicable to all Coordinated Research Projects

Submission of Proposals

Research Contract proposal forms can be obtained from IAEA, National Atomic Energy Commissions, UNDP offices or by contacting the Technical Officer. The form can also be downloaded from the URL http://www.iaea.org/programmes/ri/uc.html

Such proposals need to be countersigned by the Head of the Institutions and sent directly to the IAEA. They do not need to be routed through other official channels unless local regulations require otherwise.

Complementary FAO/IAEA Support

IAEA has a programme of support through national Technical Cooperation (TC) Projects. Such support is available to IAEA Member States and can include additional support such as equipment, specialized training through IAEA training fellowships and the provision of technical assistance through visits by IAEA experts for periods of up to one month. Full details of the TC Programme and information on how to prepare a project proposal are available at the URL http://www-tc.iaea.org/tcweb/default.as

For further information contact Roswitha Schellander (r.schellaner@iaea.org)

The Control of Contagious Bovine Pleuro Pneumonia in Sub-Saharan Africa

Technical Officer: John Crowther

Rationale and background:

Contagious bovine pleuro pneumonia (CBPP) is a highly infectious cattle disease endemic in many African countries. The Office International des Epizooties (OIE) lists CBPP in the disease category A (high socio-economic impact) and FAO regards it as one of the transboundary animal diseases (TAD) being the most serious constraints to the development of the livestock sector in sub-Saharan Africa. Control programs using mass vaccination in the 1980's reduced the prevalence enormously but in the past few years the disease has spread. The hardest hit countries are from the Southern African Development Community (SADC). Namibia and Botswana are the only countries in Africa with an active livestock trade to the EU, being free of foot and mouth disease (FMD) and CBPP. CBPP outbreaks in Angola and Northern Namibia now threatened this situation.

CBPP control and eradication depend on proper diagnosis, surveillance of cattle in diseased areas and intervention by vaccination and movement restrictions and in the worst-case scenario, culling.

Disease confirmation currently relies on time consuming bacterial culture methods. Problems with sample transport and contamination make identification cumbersome. The Polymerase Chain Reaction (PCR) is a quick and reliable alternative molecular tool providing high sensitivity but is not yet a frequently used method in most African laboratories. CBPP epidemiology is based on serology where the prescribed complement fixation test (CFT) has a limited sensitivity and a competitive enzyme linked immunosorbent assay (C-ELISA) is not yet fully validated reducing its diagnostic value. None of the tests can differentiate vaccinated from infected animals.

Addressing these issues will as well support the efforts of the Pan African Programme for the Control of Epizootics (PACE) in curbing CBPP.

Overall objectives

The target of this CRP is to support SADC countries to: gain the capacity for quick and reliable CBPP diagnosis by improving and validating diagnostic tools; perform applied research on new molecular methods in diagnosis and epidemiology; and support the installation of a disease monitoring system to better identify and control CBPP and ultimately demonstrate freedom of disease according to the OIE pathway.

Specific research objectives

- Monitoring CBPP infection by use of PCR and agglutination technique
- Validation of competition and indirect tests (C-ELISA and I-ELISA) for disease diagnosis
- Determination of CBPP isolates applying PCR sequencing
- Evaluation of the immune response to LppQ in infected and carrier animals (skin test)
- Standard Operation Procedures (SOPs) produced for sample collection and quality assurance (QA)

Expected Research Outputs

- Diagnostic and operational capability is established in the cooperating laboratories to perform CBPP surveillance and early disease diagnosis
- SOPs and quality assurance for CBPP diagnosis
- Sequence data from CBPP field isolates
- A skin test to detect latent carriers

Proposals

The closing date for submission of proposals is 21 January 2005. Selection of proposals for award of contracts is expected to be by 1 May 2005.

Implementation procedure

Proposals selected for award of Research Contracts will be provided with funds, on a cost-sharing basis, to cover part of the local costs during the first year of the project. Subsequently, annual renewals will be available, based on satisfactory progress, up to a total of five years. The maximum award available under a Research Contract is US$ 11 000 for the first year and US$ 6000 for the subsequent years. It is mandatory that Contract holders have support from their institutes for part of the local costs of the project. In addition to the award of Research Contracts, scientists with international expertise in the fields covered by this project will be considered for award of Research Agreements, which do not carry cash awards. They will function as resource persons in this project to provide assistance to Contract holders.

The CRP will be implemented in collaboration with OAU-IBAR and in consultation with the Research Agreement holders.

A Research Coordination Meeting (RCM) will be held at the commencement of the project, to which all Contract and Agreement holders will be invited. This meeting will discuss the proposed work plans of each research team and elaborate a unified and coordinated approach to the studies that will be undertaken during the first two years. At the same time a training course in PCR technology will be given. A second RCM will be

held after 18–24 months to present results from each research team, review progress and define further work plans for the remainder of the project period. A final RCM will be held at the conclusion of the project to present the final results and to prepare the papers presented by participants for publication by FAO/IAEA.

Veterinary Surveillance of Rift Valley Fever

Technical Officer: Gerrit Viljoen

Rationale and background

Rift Valley Fever (RVF) is a zoonosis caused by a bunya virus inflicting great economic losses from reduced productivity, abortions in pregnant animals and high mortality in animals and humans. RVF is defined as one of the hemorrhagic fever viruses in the emerging diseases group. It was first isolated in 1930 in the Rift Valley of Kenya from sheep and is endemic in sub Saharan Africa. Periodic disease has been recorded in animals and humans with major outbreaks in Egypt, South Mauritania, Madagascar, Northern Kenya and Somalia. In September 2000, RVF was reported outside of the African Continent for the first time in Saudi Arabia and Yemen. These outbreaks lead to more than 2000 human cases killing nearly 300 people and 20 000 abortions in livestock in Yemen. This expansion in epidemic area to the Arabian Peninsula raises the possibility of threat of RVF to other parts of Asia and Europe.

Transmission of RVF is by mosquitoes or by contact. Many different species of mosquitoes are known to be vectors. There is, therefore, the potential for epizootics and associated human epidemics following the introduction of the virus into new.

RVF-vaccines for veterinary use are available, but live-attenuated vaccines have been shown to produce birth defects and abortions, while inactivated vaccines induce only short lived and incomplete protection. A live-attenuated vaccine for humans is under development and not yet commercially available. The diagnosis of RVF depends nowadays on serology. The existing enzyme linked immuno sorbent assay (ELISA) is widely in use but lacks specificity and is produced from virus culture, potentially transporting the germ. Direct virus diagnosis demands high security labs not available in most countries.

The Polymerase Chain Reaction (PCR) is a quick, reliable and safe alternative molecular tool providing high sensitivity but is not yet a frequently used method in most laboratories. A competitive ELISA for RVF would have the additional advantage of being species un-specific and supporting research in the potential hosts of this disease.

Overall objectives

The target of this CRP is to support countries in risk of major RVF outbreaks to gain the capacity for a quick and reliable diagnosis of this disease and by the evaluation of epidemiological patterns allow an early warning.

Specific research objectives

- Evaluation of RT-PCR and PCR sequencing for early detection of virus and its use in molecular epidemiology
- Evaluation, validation and use of the existing and new ELISAs in serological surveys
- Evaluation of recombinant antigens for use in indirect and competition ELISAs (rC-ELISA)
- Harmonization of SOP's and introduction of quality assurance procedures for RVF-ELISA and RT-PCR
- Set up of an epidemiological database supporting risk assessment for RVF outbreaks

Expected research outputs

- Validated diagnostic tools and descriptions of RVF tests based on fitness for purpose
- Standard diagnostic procedures for surveillance and early diagnosis using PCR and ELISA, defined reference material available
- An rC-ELISA developed to measure antibodies against RVF from all species (including non-ruminant species)
- An epidemiological databank established

Proposals

The closing date for submission of proposals is 21 January 2005. Selection of proposals for award of contracts is expected by 1 May 2005.

Implementation procedure

Proposals selected for award of Research Contracts will be provided with funds, on a cost-sharing basis, to cover part of the local costs during the first year of the project. Subsequently, annual renewals will be available, based on satisfactory progress, up to a total of five years. The maximum award available under a Research Contract is $12 000 for the first year and $9000 for the subsequent years. It is mandatory that Contract holders have support from their institutes for part of the local costs of the project. In addition to the award of Research Contracts, scientists with international expertise in the fields covered by this project will be considered for award of Research Agreements, which do not carry cash awards. They will function as resource persons in this project to provide assistance to Contract holders.

The CRP will be implemented in collaboration with OAU-IBAR and in consultation with the Research Agreement holders.

A Research Coordination Meeting (RCM) will be held at the commencement of the project, to which all Contract and Agreement holders will be invited. This meeting will discuss the proposed work plans of each research team and elaborate a unified and coordinated approach to the studies that will be undertaken during the first two years. At the same time a training course in PCR technology will be given. A second RCM will be held after 18-24 months to present results from each research team, review progress and define further work plans for the remainder of the project period. A final RCM will be held at the conclusion of the project to present the final results and to prepare the papers presented by participants for publication by FAO/IAEA.

TECHNICAL COOPERATION PROJECTS

Operational Projects in 2003/2004 and Technical Officers responsible for implementation

ANG5002, Upgrading Laboratory Services for Diagnosis of Animal Diseases, John Crowther and Gerrit Viljoen

BEN5002, Diagnosis and Control of Animal Diseases, John Crowther

BGD5023, Development of Agroforestry-Based Livestock Production Systems, Harinder Makkar

BKF5002, Development of a Veterinary Medicine to Combat the Fowl Pox Virus, Gerrit Viljoen

BOL5014, Differential Diagnosis of Foot and Mouth Disease, John Crowther

CMR5011, Nuclear Techniques for Improving Local Ruminant Productivity, Harinder Makkar and Oswin Perera

CMR5012, Diagnosis and Surveillance of Major Animal Diseases Using Molecular Biology Techniques, John Crowther and Gerrit Viljoen

COL5020, Use of Protein Banks for Improving Pork Production, Harinder Makkar

CPR5014, Increasing the Productivity of Crop/Livestock Production System, Harinder Makkar

CYP5019, Accreditation of Laboratory for Control of Foods of Animal Origin, Andrew Cannavan

ELS5009, Improving Cattle Production and QC for Monitoring of Animal Diseases, Oswin Perera

ETH5012, Integrating Sterile Insect Technique for Tsetse Eradication, Gerrit Viljoen and Udo Feldmann

INS5029, Supplementary Feeding and Reproduction Management of Cattle, Oswin Perera and Harinder Makkar

INS5032, Improving Beef and Dairy Cattle Production in Yogyakarta, Oswin Perera and Harinder Makkar

INT5148, Establishing Quality Systems in Veterinary Testing Laboratories, John Crowther

IRA/5/012 Preparation of ELISA Kits for Diagnosis of Foot and Mouth Disease, John Crowther

MAG5012, Increasing Self-sufficiency in Domestic Meat and Milk Production, Harinder Makkar

MAL5025, Food Safety Monitoring Programme for Livestock Products, Andrew Cannavan

MAT5003, Surveillance Programmes for Contaminants in Foods of Animal Origin, Andrew Cannavan

MEX5026, Improving the Reproductive Performance of Pelibuey Sheep in Tropical Mexico Using Local Feed Resources, Harinder Makkar

MON5012, Monitoring of Residues in Livestock Products and Surveillance of Animal Diseases, Andrew Cannavan

MYA5011, Development of Supplementary Feeding Strategies Based on Local Feed Sources, Harinder Makkar

MYA5012, Diagnosis and Control of Swine Vesicular Disease and Swine Brucellosis, John Crowther

NAM5007, Control of Animal Diseases in Northern Namibia, Gerrit Viljoen

NIR5032, Control and Eradication of African Swine Fever, John Crowther

PAK0007, Human Resource Development and Nuclear Technology Support, Oswin Perera

PAK5041, Setting Up Immunoassay and Molecular-Based Methods to Monitor and Survey Rinderpest Disease, John Crowther

POL5010, Increasing Pig Productivity Through Radioimmunoassay to Determine Methods for Advancing Puberty in Gilts, Oswin Perera

RAF0013, ICT-Based Training to Strengthen LDC Capacity, John Crowther and Oswin Perera

RAF5046, Increasing and Improving Milk and Meat Production (AFRA III-2), Oswin Perera

RAF5053, Assistance to OAU/IBAR PACE Programme for the Control and Eradication of Major Dis-

eases Affecting Livestock, Gerrit Viljoen, Mamadou Lelenta

RAS5035, Improving Animal Productivity and Reproductive Efficiency (RCA), Oswin Perera and Harinder Makkar

RAS5041, Production of Foot and Mouth Disease Antigen and Antibody ELISA Reagent Kit (RCA), John Crowther

RER5012, Regional Control of Brucellosis in Sheep and Goats, John Crowther

SAF7002, Development of Veterinary Vaccines and Strengthening Drug Residue Laboratory Capabilities, John Crowther

SIL5006, Improving the Productivity of N'dama Cattle, Oswin Perera and Harinder Makkar

SRL5035, Monitoring and Control of Residues in Livestock Products, Andrew Cannavan

SUD5027, Control of Ticks and Tick-Borne Diseases Using ELISA, Gerrit Viljoen

TUN5021, Fodder Shrubs as Feed Resources to Improve Livestock Productivity, Harinder Makkar

URT5021, Livestock Development in Zanzibar After Tsetse Eradication, Oswin Perera, Harinder Makkar and Gerrit Viljoen

YEM5004, Improving the Diagnosis of Animal Diseases, John Crowther

YEM5005, Monitoring of Veterinary Drug Residues, Andrew Cannavan

ZAI5013, Improving Animal Disease Diagnosis, Gerrit Viljoen

ZAI5014, Upgrading Laboratory Services for Diagnosis of Animal Diseases, John Crowther

Operational Projects in 2005/2006 and Technical Officers responsible for implementation

ANG/5/004, Monitoring and Control of Transboundary Animal Diseases, John Crowther

BEN/5/002, Diagnosis and Control of Animal Diseases, John Crowther

BKF/5/002, Development of a Veterinary Medicine to Combat the Fowl Pox Virus, Gerrit Viljoen

BOL/5/016, Diagnosis and Molecular Characterization of the Foot-and-Mouth Disease Virus, John Crowther

CMR/5/011, Nuclear Techniques for Improving Local Ruminant Productivity, new TO

ELS/5010, Improving Nutrition Practices and Reproductive Efficiency in Cattle, Harinder Makkar

ERI/5/003, Monitoring and Control of Transboundary Animal Diseases, Gerrit Viljoen

HON/5/002, Improvement in the Nutritional and Sanitary Conditions of Cattle to Enhance their Productivity through Nuclear Methods, Harinder Makkar

IVC/5/028, Surveillance and control of African Swine Fever, Adama Diallo

KEN/5/025, Development of Diagnostic Tests and Vaccines for Livestock Diseases, Gerrit Viljoen

MAG/05/12, Increasing Self-sufficiency in Domestic Meat and Milk Production, Harinder Makkar

MLI/5/019, Improving Pneumopathies Diagnosis in Ruminants Using PCR, Gerrit Viljoen

MON/5/013, Diagnosis and Surveillance of Transboundary Animal Diseases and Production of Diagnostic Reagents, John Crowther

MYA/5/013, Integrated Approach for Enhancing Cattle Productivity, Harinder Makkar

NER/5/011, Upgrading Laboratory Services for Diagnosis of Animal Diseases, Adama Diallo

PAN/5/014, Improving Cattle Production and Quality Control for Monitoring of Animal Diseases, John Crowther

PER/5/027, Use of Nuclear Techniques to Improve Alpacas Productive and Reproductive Methods, new TO

RAF/5/054, Improvement of Livestock Productivity through an Integrated Application of Technologies (AFRA III-4), Oswin Perera

RAF/5/055, Support to African Union's Regional Programmes for Control and Eradication of Major Epizootics, Gerrit Viljoen

RAF/5/055, Support to African Union's Regional Programmes for Control and Eradication of Major Epizootics, Gerrit Viljoen

RAS/5/044, Integrated Approach for Improving Livestock Production Utilizing Indigenous Resources and Conserving the Environment (RCA), new TO

RER/5/012, Regional Control of Brucellosis in Sheep and Goats, John Crowther

SIL/5/006, Improving the Productivity of N'dama Cattle, Oswin Perera

SUD/5/028, Epidemiology and Control of Snail-borne Diseases in Irrigated Areas, John Crowther

SUD/5/029, The Characterization and Quality Assured Production of an Attenuated Theileria Annulata vaccine, John Crowther

TUN/5/021, Fodder Shrubs as Feed Resources to Improve Livestock Productivity, Harinder Makkar

UGA/5/026, Monitoring and Control of Foot and Mouth Disease, John Crowther

YEM/5/006, Quality Management for Upgrading Animal Disease Control, John Crowther

ZAI/5/014, Upgrading Laboratory Services for Diagnosis of Animal Diseases, John Crowther

ZIM/5/010, Improvement of Veterinary Diagnostic Laboratory Services, John Crowther

ACTIVITIES OF THE ANIMAL PRODUCTION UNIT (APU) AT THE FAO/IAEA AGRICULTURE AND BIOTECHNOLOGY LABORATORY

Development of NSP-based ELISA test for FMD Diagnosis

In support of the CRP on "The Use of Non-structural Protein of Foot-and-Mouth Disease Virus (FMDV) to Differentiate between Vaccinated and Infected Animals" (D3.20.20), the APU has been working on the development of an ELISA based on the use of a recombinant FMDV non-structural 3ABC protein. First results of an indirect ELISA format are promising and kits will be sent soon to the FMD World Reference Laboratory at Pirbright, the United Kingdom, for evaluation.

Activities of the Animal Production Unit (APU) at the FAO/IAEA Agriculture and Biotechnology Laboratory

Since July 2004 the Animal Production Unit is involved in the international Consortium composed by the International Livestock Research Institute - ILRI - Nairobi – Kenya and the United States Department of Agriculture – USA, which aim to identify and characterize quantitative trait loci (QTL) and its derived genetic markers, for helminth genetic resistance in sheep.

The IAEA task comprehends the mapping of four from 26 + XY chromosomes of sheep. The mapping strategy involves a backcross population of Red Masaai (helminth resistant) and Dorper (helminth susceptible) composed by 400 animals.

DNA samples were provided by ILRI to the consortium members and DNA microsatellite analysis was performed by each group independently. APU was able to finalize the analysis of 26 markers up to now and the data will be presented in Nairobi – Kenya in December.

Consultant in APU

Dr Charles Bodjo, virologist at the Laboratoire de Pathologie Animale de Bingerville, Côte d'Ivoire, has spent three months in APU to work on the development of a PPR specific ELISA test, a project supported by the European Union through the African Union (AU/IBAR) PACE programme.

Training of fellows in APU

Mr. Gustavo Avelar is a DVM from Sao Paulo State University (UNESP) Brazil, and is currently performing his PhD in the same university in the field of molecular genetics, searching for genetic markers related to productivity (early puberty, weight gain, carcass quality, among others) in zebu cattle (Nelore breed) in Brazil using the ultimate QTL mapping technologies. He came to Vienna sponsored by the IAEA for the 1st FAO/IAEA Interregional Training Course on Molecular Methods in Livestock Genetics and Breeding, and after the course he was enrolled as cost-free expert (internship) from 5 July to 15 November. He was engaged in the microsatellite mapping project for sheep helminth resistance in a collaborative consortium with ILRI - Nairobi – Kenya and USDA - USA. His hard and precise work has allowed us to conduct an important part of our task by helping to introduce in APU the high throughput routine analysis of DNA samples for gene mapping purposes.

PUBLICATIONS

Recent Publications:

Estimation of microbial protein supply in ruminants using urinary purine derivatives

This publication presents various models, describing the quantitative excretion of purine derivatives in urine, developed for various breeds of cattle and for sheep, goat, camel and buffalo and their use for estimation of microbial protein supply in ruminant livestock. It also describes progress made over the last decade in analytical methods for determining purine derivatives, and a unique approach for estimating microbial protein supply using spot urine samples developed under the FAO/IAEA CRP. This approach of using spot urine samples dispenses with quantitative recovery of urine, enabling its use by field and extension workers for evaluation of the nutritional status of farm animals. Future areas of research are also highlighted in the book. This book is a good source of reference for research workers, students and extension workers alike. It will help promote the efficient use of conventional and unconventional feed resources for meeting the huge demand for feed being imposed by the '*Livestock Revolution*' taking place in developing countries.

For more information contact Harinder Makkar.

In Press:

Proceedings of the FAO/IAEA International Symposium on Applications of gene-based technologies for improving animal production and health in developing countries. These will be available in early 2005.

A guidebook dealing with practical aspects of PCR technologies as applied in the veterinary sphere, is being prepared by the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture. The manuscript is now being edited and should be available as a publication early in 2005.

Urea-Molasses Multinutrient Blocks – Simple and effective feed supplement technology for ruminant agriculture. This publication provides a comprehensive overview of the practical aspects of development and use of urea-molasses multinutrient blocks in different parts of the world. Experiences are also presented from some countries on the production of blocks with local alternative materials, and with therapeutic additives. The impact of using these blocks by farmers in terms of enhanced income and improved cost-benefit ratio are discussed. The book also considers future research and development areas. It is hoped that this publication will be of great practical value to extension workers, students and researchers, and to those thinking of using such feed supplementation technology or of starting commercial production. This book as an FAO Animal Production And Health Paper will be available in early 2005.

The Establishment of Quality Systems in Agriculture Laboratories in Developing Countries, IAEA Centered Issue for the Journal 'Accreditation and Quality Assurance - ACQUAL'

In Preparation:

Manual on screening and confirmatory methodologies for veterinary drug residues.

Handbook on regulatory aspects of veterinary drugs and residue control.

Laboratory Manual on methods in gut microbial ecology for ruminants

Publications in Scientific Journals and Conference Proceedings

A list of Articles from APHS and APU staff published in Scientific Journals and Conference Proceedings is available on our AP&H Section website at the URL http://www.iaea.org/programmes/nafa/d3/public/d3_pbl_6.html

CD-ROMs

A CD-ROM is available dealing with training material for the diagnosis of rinderpest and for the preparation for the OIE pathway. It was produced under an IAEA Technical Cooperation project RAF/0/013 'ICT based training to strengthen LDC capacity'. Contact J. Crowther for further information.

A CD-ROM containing a training package on estimation of microbial protein supply in ruminants from the determination of urinary purine derivatives. Contact Harinder Makkar (h.makkar@iaea.org)

A new batch of CDs with a training package to help artificial insemination (AI) technicians to improve the performance of AI and field services provided to farmers was produced for users with a slow Internet connection and is now available through the APHS. It is also acces-

sible from the AP&H Section website: http://www.iaea.org/programmes/nafa/d3/index.html

Information on New FAO titles:

To be regularly informed on FAO new titles, subscribe to FAO-Bookinfo, the free electronic newsletter from the FAO Sales and Marketing Group. All you have to do is to send an E-mail to mailserv@mailserv.fao.org, leave the subject blank and then put in the first line of the message the following: Subscribe FAO-Bookinfo-L.

Websites

- The AP&H Section website is being updated on a regular basis. Please feel free to look at it and make comments. http://www.iaea.org/programmes/nafa/d3/index.html

- International Symposium on Application of Gene-Based Technologies for Improving Animal Production and Health in Developing Countries, 6–10 October 2003,Vienna, Austria http://www.iaea.org/programmes/nafa/d3/index-symp2003.html

- A training package to help artificial insemination (AI) technicians to improve the performance of AI and field services provided to farmers is now accessible from the AP&H Section website (http://www.iaea.org/programmes/nafa/d3/index.html). It was produced under an IAEA Technical Cooperation Project – RAF/0/013 – 'ICT-BASED TRAINING TO STRENGHTEN LDC CAPACITY' with the collaboration of the Animal Production & Health Section of the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture. This package is also available as a CD ROM from the for users who have no access to internet connection.

- FAO/IAEA Guidelines for Establishing Quality Systems in Veterinary Diagnostic Testing Laboratories http://www.iaea.org/programmes/nafa/d3/public/guidelines.pdf

- Web-based interactive programme about ISO/IEC 17025 http://www.aplactraining.asn.au.

- Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture website: http://www.iaea.org/programmes/nafa/

- FAO website: http://www.fao.org/

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