Equator : informatieblad over veterinaire aspecten van ontwikkelingssamenwerking

EQUATOR

NEWSLETTER ON SCIENTIFIC CO-OPERATION IN TROPICAL ANIMAL HEALTH

ISSN 0923-3334

EQUATOR is a periodical of the Office for International Cooperation of the Faculty of Veterinary Medicine of Utrecht University

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March 2000

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VOLUME 12,2000

FROM THE EDITOR

Those of you who have a sharp eye for details, and veterinarians are known for that, will have noticed some changes on the cover page of EQUATOR. The main change is in the subtitle; from a 'Newsletter on veterinary aspects of international development cooperation' EQUATOR has become a **'Newsletter on scientific cooperation in tropical animal health'**.

For a number of reasons the editorial board decided to make this change in the name of the Newsletter at the start of the new millennium. In fact the change is a result of an on-going phenomenon and not of a sudden event. The words 'development cooperation' mean cooperation aiming at development. This implicitly means, development of and assistance to 'the South'. However, as 'the South' stands for countries in the (sub) tropical region, we can no longer speak of a whole region that requires assistance for its development. Some countries have made significant economic, cultural and scientific progress over the last decade, while others have not yet gone that far. Even when comparing veterinary institutions worldwide there is no longer a clear division North-South, but rather a range of institutions, each with its strengths and weaknesses.
EQUATOR would like to bring to the attention of its readers the strong points of veterinary education and science, in relation to tropical animal health, as these emerge from collaboration between veterinary institutions worldwide.

The second change is a more practical one. EQUATOR is a bimonthly publication, but due to time constraints it was not easy to produce 6 issues each year. The last 2 years only 5 issues were published. Moreover, the costs for printing and mailing have substantially increased. For these reasons we have decided to publish EQUATOR from 2000 onward as a quarterly, with issues coming out in March, June, September and December. As this has consequences for the columns 'Calendar' and 'Vacancies', we will make regular up-dates available on the internet (www.vet.uu.nl, search for: Equator).

'MEMORANDUM OF UNDERSTANDING' SIGNED BETWEEN THE VETERINARY FACULTIES OF THE UNVERSITY OF PRETORIA AND UTRECHT UNIVERSITY

After a period of about 2 years of informal contacts, the veterinary faculties of the universities of Pretoria and Utrecht have formalised their collaboration and laid down the objectives and the specific areas of their collaboration for the next 5 years in a 'Memorandum of Understanding'. The Memorandum was signed by the Deans of the faculties, Prof. Dr. N. Kriek and Prof. Dr. A.W.C.A. Cornelissen during a ceremony in Pretoria on 14 January, 2000. The emphasis of the collaboration will be on scientific co-operation and co-operation in education.

Scientific co-operation

The scientific collaboration will involve: Exchange of scientists; Exchange of staff and postgraduate students for research training; Exchange of postgraduate students for research towards MSc and PhD degrees; Joint supervision of postgraduate students (MSc and PhD); Joint research projects, preferably involving other partner institutes in the European Union (EU) and the Southern African Development Community (SADC); Organisation of and participation in scientific conferences, symposia, seminars and courses (e.g. for continuing education and MSc); Exchange of research findings and materials; Joint applications for fellowships and funding for research; Development of comparable research policies in relevant scientific fields.

Co-operation in education

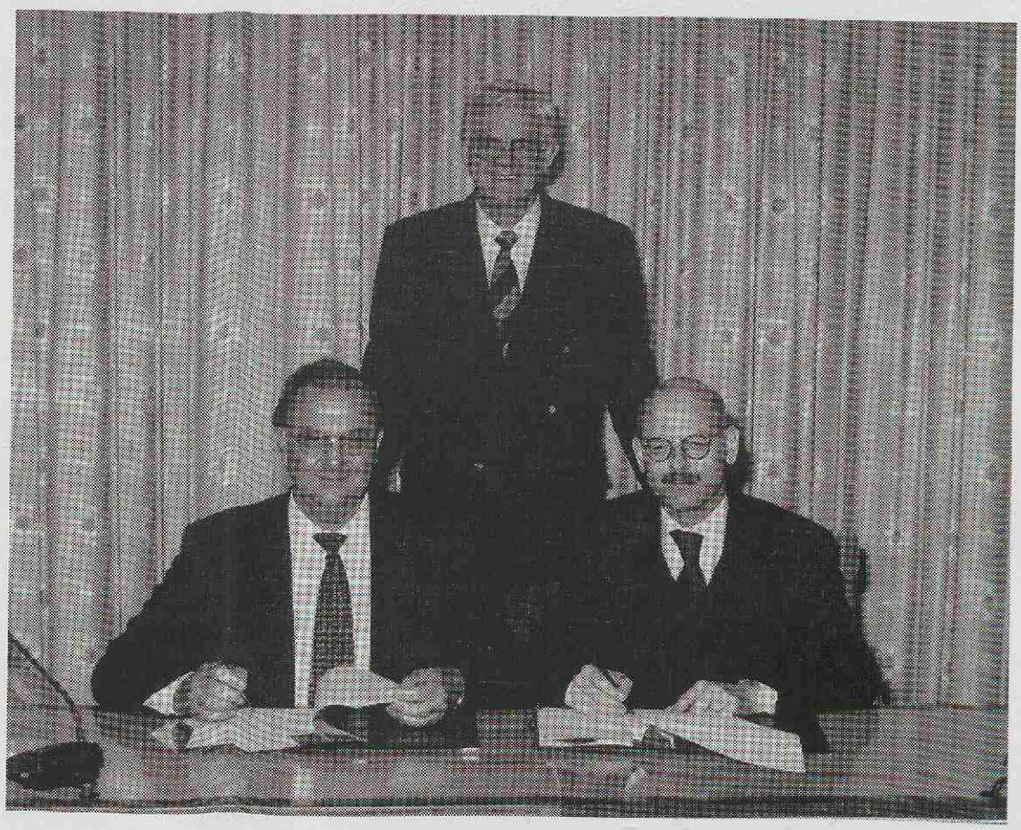
Co-operation in education and training will be developed through: Consultations on the veterinary curriculum and teaching methodologies; Exchange of teaching materials; Exchange of lecturers; Exchange of undergraduate students and residents with recognition of the study programme.

Press release in South Africa

The Faculty of Veterinary Science of the University of Pretoria presented, on the occasion of the signing, the following press release to inform the South African society about the event.

"The recent signing of a Memorandum of Understanding with the Faculty of Veterinary Medicine of Utrecht University in the Netherlands considerably strengthened the importance of the Faculty of Veterinary Science's position as a strategic force in the agricultural economy of South Africa as well as the sub region. The Utrecht Faculty has over many years developed close links with the veterinary faculties of Harare and Maputo. The Veterinary Faculty at Onderstepoort has historic links with the Faculty in Maputo having played a leading role at the time of its inception and has also more recently established firm ties with Harare. Thus apart from the mutual benefits the signing of the memorandum holds; the partnership agreement will have important regional implications as well.

In terms of the memorandum of understanding the scientific collaboration between these two strong institutions will be broadened through the exchange of scientists, technical personnel and students at both the postgraduate as well as the undergraduate level. Joint research projects involving partnerships with other institutions in the European Union and Southern African Development Community



Prof. Dr. N. Kriek and Prof. Dr. A.W.C.A. Cornelissen signed the MOU. Standing behind: Prof. Dr. T. Erasmus, Vice-Principal of the University of Pretoria (photo: University of Pretoria)

(SADC) that will evolve from this agreement will play a significant role in the bolstering of the scientific capacity of the sub region. The proposed partnership will lead to more cost-effective use of the available resources at both institutions as well as in the sub region. The synergistic utilization of the talent and expertise that exists in both institutions will make a considerable impact on the veterinary skills and services available to developing communities. This will assist the UP Faculty to fulfil its mission in this regard with greater urgency.

Co-operation in education forms a part of the agreement. A mutual exchange on veterinary curricula development will ensure that the Onderstepoort Faculty's educational programme meets international requirements while at the same time also addresses the needs of the community at large.

Both the Faculties of Veterinary Science of the University Pretoria and Veterinary Medicine of Utrecht University are recognized as leaders in veterinary education and research in their respective regions. As a result of the leadership role which the Onderstepoort Faculty is being called upon to play in the SADC region, the mutual benefit derived from the agreement between two strong institutions will play back positively into the sub region. Regional partnerships, which are currently being developed between the Veterinary Faculty at Onderstepoort and the other SADC Veterinary Faculties, will benefit greatly by the proposed North-South collaboration between Utrecht and Pretoria ensuring the creation of sustainability in veterinary expertise in the sub region. Such sustainability in the strategic area of veterinary science will be pivotal in the broader scheme of an African renaissance envisaged by our State President".

Links between Utrecht and southern Africa strengthened

In line with the policy of Utrecht University, the Faculty of Veterinary Medicine has, from 1985 onwards, developed collaborative programmes in education and research with the veterinary faculties of Zimbabwe and Mozambique. The collaboration with the Faculty of Veterinary Science in Harare is a joint project with the Royal Veterinary and Agricultural University (KVL) of Copenhagen (Denmark).

The establishment of a formal programme of collaboration with the Faculty of Veterinary Science in Onderstepoort in South Africa provides an excellent opportunity for Utrecht to expand the collaboration in the southern African region. By uniting the existing bilateral contacts between the 5 institutions a strong and effective consortium can be formed to maintain and strengthen veterinary education and improve the animal health situation in the SADC region.

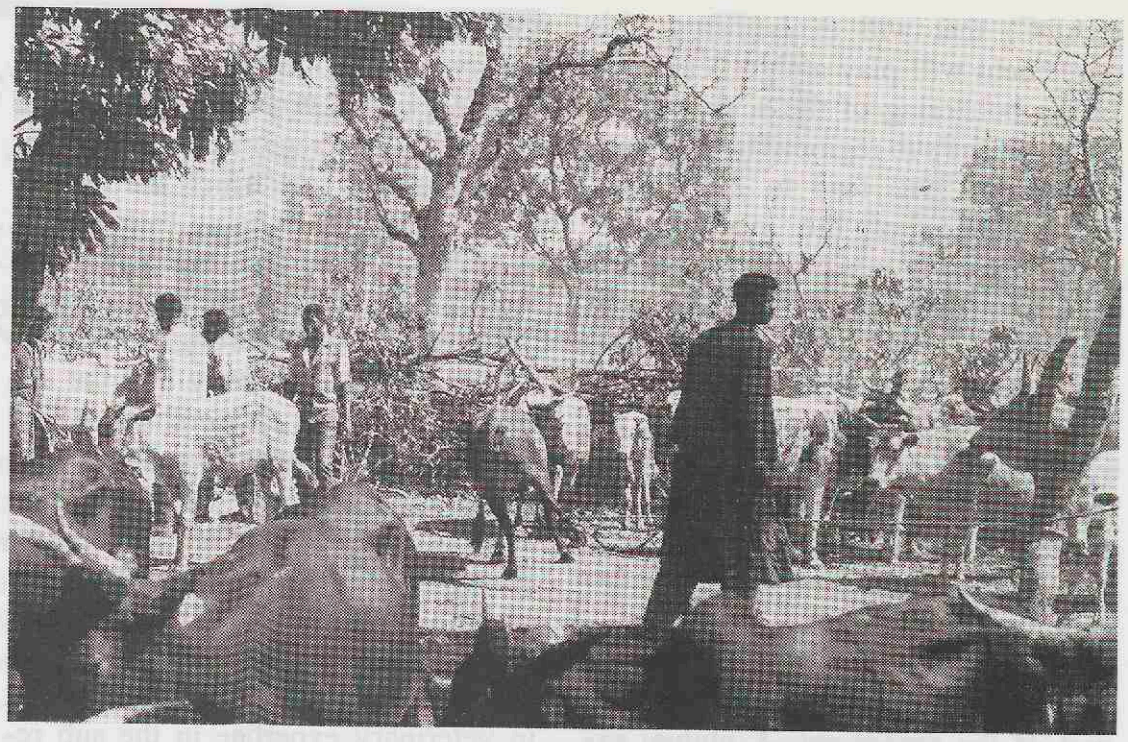
Robert Paling

LIVESTOCK AND ENVIROMENT

One of today's dilemma's is how to find a balance between a fast growing global demand for food and the need to sustain the natural resource base of land, water, air and biological diversity. Therefore the Commission of the European Union, the governments of Denmark, France, Germany, The Netherlands, United Kingdom, and the United States of America sponsored a study to identify ways to help the livestock sector to satisfy future demands while at the same time preserving the natural resource base. The Food and Agriculture Organisation of the United Nations, the US Agency for International Development and the Worldbank co-ordinated this study. The editorial board of EQUATOR considers this study of importance to its readers, as the topics addressed will play an important role in the future debate on livestock policies. For instance, the next AITVM conference (see "News from the AITVM" in this issue) will among others focus on livestock-environment interactions in relation to animal and human health. What follows is the text of Chapter 4, **Looking ahead: Elements of future strategies**, of the report **Livestock-Environment interactions, issues and options**, written by Henning Steinfeld (FAO), Cees de Haan (Worldbank) and Harvey Blackburn (USDA-AR).

LOOKING AHEAD: ELEMENTS OF FUTURE STRATEGIES

The challenge for policy makers and environmental and livestock specialists is to fully capture the contribution of livestock in development that will satisfy current and future human needs while maintaining the natural resource base. There is no resource-compromising aspect of animal protein production that cannot be resolved. The technologies exist but their successful adoption is often constrained by the difficulty in creating the right political and economic conditions in which environmentally friendly livestock production can take place. These difficulties stem from different interest spheres and complex links between livestock, the economy and society. Decision-makers in national governments, NGOs, at farming and community levels and in international and donor organisations, are the actors who must put the policy and technology elements to work within the context of consistent strategies. With government support and willingness to act, there are sufficient mechanisms to keep adverse effects of livestock production within tolerable limits and to enhance the net contribution to human welfare.



Production systems and ecosystems need to be documented; the Sahel is one of the current environmental 'hot spots' (photo: Paling)

The need for informed decision-making

There is ample evidence that current decision-making regarding the role of livestock in sustainable agriculture is hampered by a lack of information and awareness of the type, extent and causes of livestock's current negative and positive impacts on the environment and of what may be expected of any change of policy or action. The complexity of livestock's interaction with other sectors imposes a formidable task at any level of decision-making. Better information on which to base decision-making is therefore urgently required. Production systems and ecosystems need to be documented, with emphasis on current hot spots, future environmental hazards, and potential positive contributions. For that, there is a need to:

- take stock of resource endowments ("intrinsic scarcities of production factors"), technologies and policies; monitor resource use, through geo-referencing and assess environmental impact of technologies and policy changes;
- increase awareness among decision-makers, producers and consumers of the environmental effects of different modes of production; educate consumers about the health risks associated with excessive consumption of animal products, particularly in the rich countries;
- increase analytical skills at farming level, schools and universities, government and non-governmental institutions for environmental impact assessment and related policy analyses; further develop economic evaluation techniques for environmental goods at farming, project and national levels.

The need for consistent policies

Any sustainable livestock development strategy has to fully recognise the set of objectives, which govern behaviour. For many farmers, the first priority is household food security and family welfare. Less tangible future sustainability of resource use is often traded off against immediate food needs. At a policy level, social and economic objectives may be in conflict with environmental objectives or have different time scales. With multiple objectives in play a balance must be found between different production systems in different agro-ecological zones or regions, and technological options that govern resource use. The environment warrants government attention as a public good in addition to others, such as public health, equality and economic growth. Policy choices must be consistent with each other and be brought into the wider context of sustainable development. For example, subsidies on feed grains may help to supply inexpensive livestock products to urban centres and develop a "modern" livestock industry but, as has been seen, they often misdirect technology and resource use. It is therefore important to screen all relevant policies against internal consistency and their contribution to overall policy objectives. Once the objectives have been set, it is necessary to assess how current policies and operational measures support or act against these objectives. In the above analysis we have identified policies that make neither economic nor environmental sense (what may be called a lose-lose situation). These are poorly informed, formulated or simply misguided policies, or the result of the domination of certain interest groups. With growing trade liberalisation and reduced public expenditure these are being corrected in many cases. Examples are land titling through ranching in South America or the beef and milk tariff policies of the Common Agricultural Policy in the EU after the initial post-war justification become irrelevant. Here, political will must exist to accept possible negative public reaction from the beneficiaries of those policies. This political will is particularly important in countries with strong livestock interest groups. Other policies make economic sense mainly in the short term, but have negative environmental effects (what may be called a win-lose scenario) in the long term. An example is road construction in tropical forest areas where land requirements

and development needs may be in direct conflict with conservation objectives. Here, it is necessary to formulate local and specific complementary measures (Inc. protected areas, institutional development) to minimise the trade-off. As has been shown, the majority of negative livestock impacts on the environment fall into this category. A third set of policies are those that make both economic and environmental sense, but often do not pay off in the short term. These win-win situations are, for example, the reduction of methane emissions through increased animal productivity, livestock-wildlife integration and the use of slaughter waste for alternative feed or energy sources. However, problems occur because benefits that accrue to the global common goods are only slightly or not tangible for the originator of these benefits. A completely new set of mechanisms with novel financing approaches needs to be designed for the protection of these global commons.

In summary, there is a need to:

- set realistic objectives - environmental, economic, social - and decide on the balance between these objectives where trade-offs exist; identify critical conflict areas between broad social or economic objectives and environmental goals; identify policies that bear the potential for trade conflicts and try to negotiate bilateral arrangements;
- develop the analytical skills to screen and monitor policies for their desired and undesired effects;
- correct policies which are misguiding resource use or which have perverse effects; target policies carefully and as directly as possible avoiding sweeping arrangements for cost-effectiveness and;
- develop support schemes to finance accelerated adoption of win-win solutions such as benefit sharing through national and international arrangements, such as GEF.

The need for institutional development

With the livestock sector under pressure from surging demand and competition for resources, there is an increasing need for a legal basis with well-defined and enforceable rules and institutions for resource utilisation. In fact, a major underlying cause for important externalities is the insufficiently defined access to resources, like open access grazing land for pastoral systems or the use of surface water for the uncontrolled discharge of waste of industrial production systems or processing units. To a certain extent this restricts private behaviour, sometimes resulting in pressure against which the political will has to resist. Institutional development requires:

Preparation of a regulatory framework:

- to establish clear access rights to land. Clear rights of access to land is a necessary although rarely sufficient condition to provide the economic and social incentives to motivate people to protect and improve resources, particularly where traditional regimes of resource management come under pressure such as in pastoral systems and tropical rainforests;
- for land use and regional planning, to establish protected areas for fragile Eco-systems, with due attention to local capacity to enforce the protection, and to establish zoning for industrial production systems, to bring the animal densities in line with the absorptive capacity of land and water through quota systems;
- to prescribe regulations for waste control, use of noxious substances, management practices and labelling.

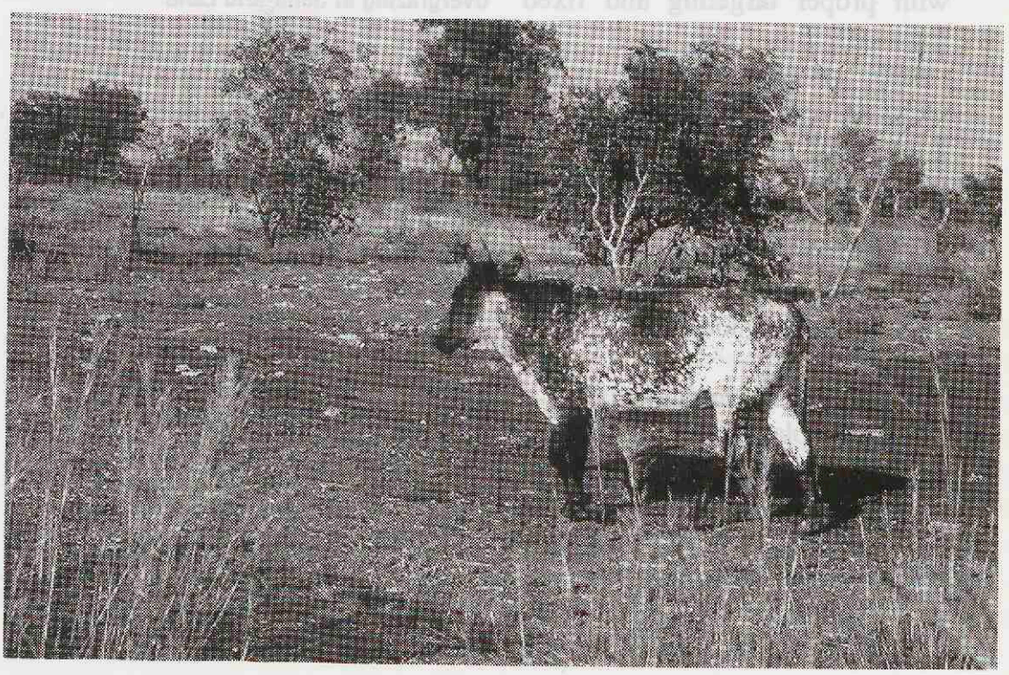
Empowerment of formal and informal institutions where the regulatory framework is available but insufficiently respected or enforced, by providing mandates and support. For pastoral systems in particular, the principle of subsidiarity needs to be applied by transferring responsibility for resource management to the lowest possible level, local groups.

Establishment of a legal authority for the implementation of environmental policies, preferably including an independent non-line agency with a mandate to monitor the use and protection of resources;

Use of participatory approaches in strategy formulation, planning and programme implementation.

The need to get prices right

Ideally, commodity prices should include all direct and indirect envi-



A major underlying cause for externalities is the insufficiently defined access to resources, like open access grazing land for pastoral systems (photo: Paling

ronmental costs in order to give market signals that embody the proper valuation of environmental goods. Prices should encourage efficient resource use and guide technologies to anticipated future scarcities. They should promote waste recycling and resource enhancing technologies. Astute pricing is a powerful tool and the instrument of choice where institutions are weak and where the financial or social costs of control become unreasonable. There may need to be differential prices between agricultural or livestock sectors and the rest of the economy. As a general rule a "level playing field" should be provided. Prices of different environmental and agricultural goods should be corrected for market failures where environmental costs and benefits are not adequately internalised. For example:

- eliminate subsidies for inputs such as water, concentrate feed, fossil fuel, fertiliser and reduce or abolish price support for livestock products and directly support farmers' incomes if that is socially or economically desirable;
- introduce cost recovery for communal water and grazing, and public services such as artificial insemination or clinical treatments provided to the producers;
- introduce levies or taxes for waste disposal;
- create price incentives for methane use and alleviate investment costs (preferred credit) for waste control and conversion facilities with proper targeting and fixed time scale;
- remove tax advantages for different sizes and types of enterprises where this is not warranted by public food or environmental concerns; and
- introduce equitable benefit sharing mechanisms for social and environmental goods.

The need for technological change

Levelling the playing field, and appropriate price signals may induce a different set of technologies. This new set will respond, to a higher degree, to true scarcities as they incorporate the value of environmental goods. This process needs to be facilitated and accelerated.

Firstly, there is the need to facilitate technology adoption, essentially by training, education and extension and by incorporating environmental aspects into extension messages and curricula; by providing credit where high investment costs constitute an impediment, for example, methane digesters or waste treatment facilities; correcting policies which are misguiding resource use or which have perverse effects; and financially supporting accelerated adoption of win-win solutions such as benefit sharing arrangements.

Secondly, there is a continued need to generate technologies if the adapted technological solution for more sustainable livestock production is not available. It is important to design technologies that anticipate future resource constraints based on current intrinsic scarcities. To achieve this there is a need to invest in basic and adaptive research and to create and sustain the institutional capacity to undertake the work.

Technological change is the key to solving the problems of sustainable agriculture as technology determines resource use. This study demonstrates that currently available technologies can already significantly increase efficiencies, enhance resources in use and recycle waste at various stages of the production process. The study also demonstrates that knowledge needs to progressively substitute for physical inputs, and that the scope for increasing knowledge about livestock production while simultaneously reducing the use of natural resources per unit of product is enormous.

The need to selectively develop infrastructure

This study has shown the importance of infrastructure, in particular to establish a better balance between livestock and land resources. Infrastructure development is often a prerequisite for technology uptake and resource access. Infrastructure development is a two edged sword in that it not only alleviates pressure on natural resources but also makes them accessible to sometimes uncontrolled exploitation as, for example, in the case of the tropical rainforests. It is therefore necessary to:

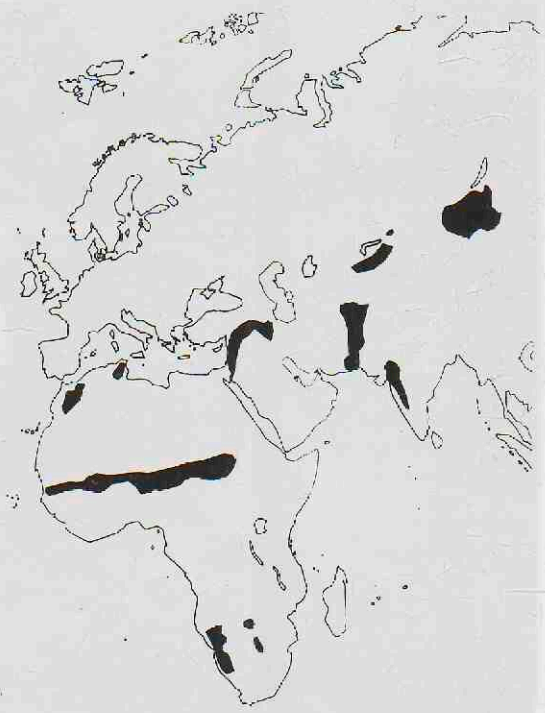
- construct, or facilitate the construction of slaughterhouses and dairies, and cold chain facilities in the vicinity of producing areas to avoid waste accumulation in sensitive and urban areas; The better the infrastructure the better the opportunities for geographic spread for intensive systems and for flexibility of adjustment to variable biomass growth in extensive pastoral systems;
- facilitate the establishment of markets, transport and communication while taking account of the trade-offs between increased road and transport infrastructure and biodiversity conservation.

The need to change perspective

All of the above changes will be brought about only if industry, policy makers and environmental groups:

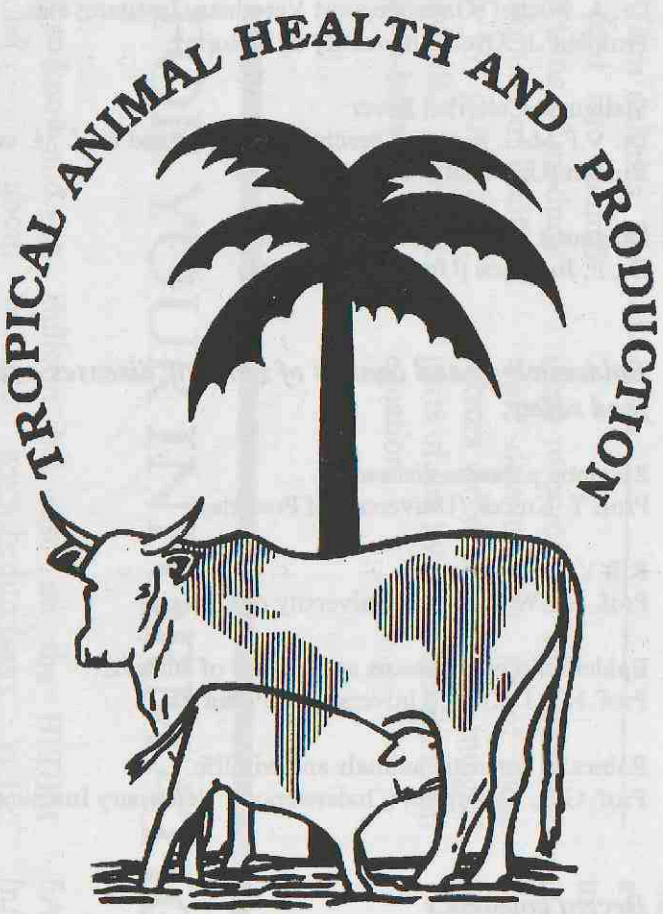
- remove the emotional conjecture, lack of objectivity and oversimplification from the debate on livestock- environment relationships;
- acknowledge the need to correct unsustainable livestock production systems and act accordingly. In the developing world, where

Environmental "Hot Spots":
Overgrazing in Semi-arid Land



1 SEPTEMBER, 2000

11th SYMPOSIUM ON



Diagnosis and control of transboundary infectious diseases in southern Africa

Time: 09.00 - 17.00 hours
Location: Faculty of Veterinary Medicine
Yalelaan 1, De Uithof, Utrecht
The Netherlands

Faculteit der Diergeneeskunde

Tropical animal health and production and the Faculty of Veterinary Medicine in Utrecht

Utrecht University, one of the 14 universities in the Netherlands, includes 14 faculties. Its Faculty of Veterinary Medicine is the only veterinary faculty in the Netherlands and, as a result of its scientific and educational standards, it has been accredited by the American and Canadian Veterinary Medical Associations since 1973. Within the Faculty there are 9 departments. Research on tropical animal health is mainly conducted in collaborative research projects in the tropics. In 1987 the Faculty's Office for International Cooperation (BIC) started with the coordination and extension of the international activities. In 1989 the Committee for the Advancement of Tropical veterinary Science (CATS) was established at the Faculty. The main objective of CATS is the perpetuation and promotion of research and education relevant to the tropics. The organization of the Symposia on Tropical Animal Health and Production is an activity of BIC and CATS. This years' Symposium is jointly organised with the Faculty of Veterinary Science of the University of Pretoria (South Africa) and the Onderstepoort Veterinary Institute, Onderstepoort (South Africa)

From 1990 a yearly symposium has been organised.

The themes were:

1990 Contributions and perspectives from the Faculty of Veterinary Medicine, Utrecht University
1991 Research for development: policies, priorities and options
1992 Bovine theileriosis
1993 Recent developments in veterinary epidemiology
1994 Application of biotechnology
1995 Helminth diseases of ruminants: diagnosis, epidemiology, and control
1996 Urbanisation: veterinary public health consequences
1997 Aquaculture and disease control
1998 Ruminant nutrition in disease resistance and reproduction
1999 Outcome and perspectives of collaborative research

Information:

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11th International Symposium

TROPICAL ANIMAL HEALTH AND PRODUCTION

DIAGNOSIS AND CONTROL OF TRANSBOUNDARY INFECTIOUS DISEASES IN SOUTHERN AFRICA

In 2000 Utrecht University's Faculty of Veterinary Medicine organises the 11th international symposium on Tropical Animal Health and Production. This year the Symposium is organised in collaboration with the Faculty of Veterinary Science of the University of Pretoria (South Africa) and the Onderstepoort Veterinary Institute, Onderstepoort (South Africa). The veterinary infrastructure in South Africa, including veterinary education and research, field and diagnostic services, and vaccine production, is very well developed and in a position to support the regional transboundary disease control of a number of important animal and zoonotic diseases. During the Symposium recent research on and field data of the major livestock diseases will be presented. The organizers are convinced that knowledge on diseases which are now occurring in Africa is indispensable for veterinary scientists in Europe in order to be prepared for exotic disease outbreaks in the future.
Of specific interest to veterinary training institutions are the various audio-visual materials (video's, CD-roms, and posters) on the infectious animal diseases of southern Africa, which will be demonstrated and sold during the symposium.

Symposium Organizing Committee

Prof. Dr. J.A.W. Coetzer
Dr. H. Egberink
J.H.A. de Gooijer (treasurer)
Prof. Dr. Dr. h.c.m. M.C. Horzinek (chairman)
Dr. R.W. Paling (secretary)
Dr. V.P.M.G. Rutten

PROGRAMME 1 SEPTEMBER, 2000

08.30 – 09.00 h. Registration

Opening and introduction of the programme

Prof. Dr. M.C. Horzinek (Utrecht University)

Diagnosis, epidemiology and control of diseases of domestic and wild ruminants

Foot and Mouth Disease: role of wildlife.
Prof. G.R. Thompson (Onderstepoort Veterinary Institute)

Epidemiology, diagnosis and control of tuberculosis in wildlife.
Dr. A. Michel (Onderstepoort Veterinary Institute) and Prof. N.P.J. Krick (University of Pretoria)

Malignant Catarrhal Fever
Dr. V.P.M.G. Rutten (Utrecht University) and Prof. M. van Vuuren (University of Pretoria)

Diagnosis and control of heartwater.
Dr. F. Jongejan (Utrecht University)

Epidemiology and control of zoonotic diseases and food safety

Zoonotic parasitic diseases.
Prof. T. Krecek (University of Pretoria)

Rift Valley Fever.
Prof. J.A.W. Coetzer (University of Pretoria)

Epidemiology, diagnosis and control of anthrax.
Prof. N.P.J. Krick (University of Pretoria)

Rabies in domestic animals and wildlife.
Prof. G.R. Thompson (Onderstepoort Veterinary Institute)

Recent epizootics

African Swine Fever: recent outbreaks.
Dr. M-L Penrith (University of Pretoria)

African Horse Sickness.
Prof. J.A.W. Coetzer (University of Pretoria)

Diagnosis and Control of Contagious Bovine Pleuropneumonia.
Dr. J. Picard (Onderstepoort Veterinary Institute)

Epilogue and closing

Reception

REGISTRATION FORM

I wish to attend the 11th Symposium "Tropical Animal Health and Production. Diagnosis and control of transboundary infectious diseases in southern Africa" on 1 September, 2000 at the Faculty of Veterinary Medicine, Utrecht, The Netherlands.

Registration fee: EURO 75 (NLG 165)

Staff members and students of Utrecht University, Wageningen University and Research Centre and University of Pretoria are exempted from registration fees.

After receipt of your registration you will receive instructions for payment

Please check box for lunch reservation.

☐ I wish to reserve lunch (NLG. 15,- to be paid at the registration desk)

☐ I do not wish to reserve

Name: .....

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Address: .....

Postal code: ..... City: .....

Country: .....

Tel.: ..... Telefax: .....

E-mail: .....

Date: .....

Signature: .....

Please forward before 1 August, 2000 to:

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Faculty of Veterinary Medicine
P.O. Box 80.163
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The Netherlands
Telefax: +31.30.2531815, E-mail: bic@vet.uu.nl

environmental pressure will grow most strongly over the next decades, policy makers must heed the strong warning signs and learn from the errors of the industrialised world;

- accept the ample evidence that the contribution of livestock to sustainable development can be greatly enhanced, provided the appropriate enabling environment is created, and act accordingly;
- take full account in future policy and planning of the dramatic changes transforming the global livestock sector. The shift towards grain crops for feed use may turn animal production into the single most important agricultural activity on the planet. Selecting the right land and water resources, efficient generation of feed, transporting feed to farm animals, the conversion of feed into animal protein, the marketing of products as well as the adoption of healthy consumer habits by, particularly, wealthier individuals, plus the potential synergism between efficient resource use and economy-wide development: all of these factors need to become integral parts of the livestock-environment equation.

Environmental "Hot Spots": Livestock and Deforestation

Conclusions

Improved management of the world's natural resources is essential if they are to continue to provide the basis for life support and human well being. Only with improved management can the dual objectives of sustainable agricultural production be fulfilled - to feed the world's growing population while sustaining its natural resource base. Livestock production is the largest land user and is about to turn into the most important agricultural activity in terms of economic output. Left to uncontrolled growth, not only will the environment suffer but human welfare is also likely to be compromised. However, this is unlikely to happen. The opportunities not only to mitigate environmental damage but to tap the immense development potential that livestock offer are large: awareness, political will and readiness to act are growing among all those involved and ensure that the problems are no longer denied but effectively tackled.

FOR YOUR INFORMATION 1

Everything you want to know and you never dared to ask ... about Minilivestock is now available not only in the BEDIM (Bureau for Exchange and Distribution of Information on Minilivestock) Bulletin but also on the BEDIM Website: www.bedim.fsagx. ac.be. BEDIM Bulletin and Website represent a joint activity between the Faculté des Sciences Agronomiques de Gembloux (Belgium) and FAO/AGAP.
Information: FAO, René Branckaert, Animal Production Officer (Tel.: +39.6.57054105, Telefax: +39.6.5705 5749, e-mail: rene.branckaert@fao. org).

FOR YOUR INFORMATION 2

INTERNATIONAL FOUNDATION FOR SCIENCE (IFS)

The International Foundation for Science (IFS) - Call for research grant applications from developing country scientists

The International Foundation for Science (IFS) provides support to young scientists of merit in developing countries by awarding research grants and providing grantees with additional services such as travel grants and purchasing assistance.

Research grants are awarded up to a maximum value of USD 12,000 for a period of one to three years and may be renewed twice. They are intended for the purchase of equipment, expendable supplies, and literature. Applicants must be citizens of, and carry out the research in, a developing country. They should also work at a university or national research institution in a developing country (countries in Europe, including Turkey and Cyprus, or the former

Soviet Union do not qualify for support). As well as being under the age of 40 (under 30 for applicants from China) and at the start of their research career, candidates must possess a higher academic degree, which should be at least an MSc or equivalent.

The IFS supports projects dealing with the management, use, and conservation of biological resources. The Foundation organizes its activities into six Research Areas, viz Animal Production, Aquatic Resources, Crop Science, Food Science, Forestry/ Agroforestry, and Natural Products.

For further information and application forms in English and French write to: IFS, Grev Turegatan 19, S-114 38 Stockholm, Sweden (Telefax: +46.8.54581801, E-mail: info@ifs.se; www.ifs.se).

NEWS FROM THE AITVM

Many readers of EQUATOR will have attended or read about the **9th International Conference of the Association of Institutions for Tropical Veterinary Medicine** (AITVM) which was held in September, 1998 in Harare, Zimbabwe. In EQUATOR 5/6 (Volume 10,1998) we presented a report and the highlights of the conference. The abstract of the recommendations of the Conference was published in EQUATOR 3 (Volume 11,1999). Participants of the conference have recently received the Proceedings of the 1998 AITVM Conference. These proceedings, published by the Faculty of Veterinary Science of the University of Zimbabwe, comprise 2 volumes with a total of 669 pages. They provide a huge amount of information and valuable recommendations for all those who are involved in the development of the livestock sector under tropical conditions.

Ordering of the Proceedings

A limited number of copies of the Proceedings of the 9th AITVM Conference (Harare, September 1998) (2 volumes) are still available at a price of US$ 60 (including postage). Orders can be placed by forwarding a check or money order of US$ 60, payable to "9th International Conference AITVM" to Prof. M.J. Obwolo, Faculty of Veterinary Science of the University of Zimbabwe, P.O. Box MP 167, Mount Pleasant, Harare, Zimbabwe,

AITVM Standing Committee

The AITVM Standing Committee, composed of representatives of the 12 founding member institutions, met in Copenhagen on 31 January, 2000. Important items on the agenda of the Standing Committee were: (1) the formulation of the AITVM statutes and the registration of the Association in the Netherlands (more news on this item and the membership of AITVM will be announced in the next issue of EQUATOR); (2) the development of the AITVM website (ready by April at www.aitvm.org); and (3) the selection of dates and topics for the 10th AITVM Conference (2001).

AITVM

10th AITVM Conference (Copenhagen, 20 - 24 August, 2001)

During the 9th Conference it was announced that the 10th Conference would be held in Denmark in 2001. We can now inform you about the dates and the location. The dates for the 10th AITVM Conference are 20-24 August, 2001 and the location is the Royal Veterinary and Agricultural University (KVL) in Copenhagen (Denmark). The Local conference Organizing Committee is composed of a number of experienced staff members from KVL, enforced with representatives from DANIDA (Denmark) and the veterinary faculties of Norway and Sweden. Prof. Dr. Torben Greve (Pro-vice-chancellor for Research of KVL) chairs the Committee. Dr. Niels Chr. Kyvsgaard of the Danish Center for Experimental Parasitology, who is also the representative of KVL in the Standing Committee, is the co-chairman of the organizing committee and the contact person at KVL (e-mail: nck@kvl.dk).

Programme of the 10th AITVM Conference

Following extensive consultations and discussions the Standing Committee and the Local Organizing Committee have selected as theme of the 10th Conference: **'Livestock, Community and Environment'.** Within this general theme the following subjects have been selected for the workshops. Invited speakers will address these subjects in plenary sessions or as keynotes at the workshops. Participants can present papers as oral presentation in one of the workshops or as a poster presentation.

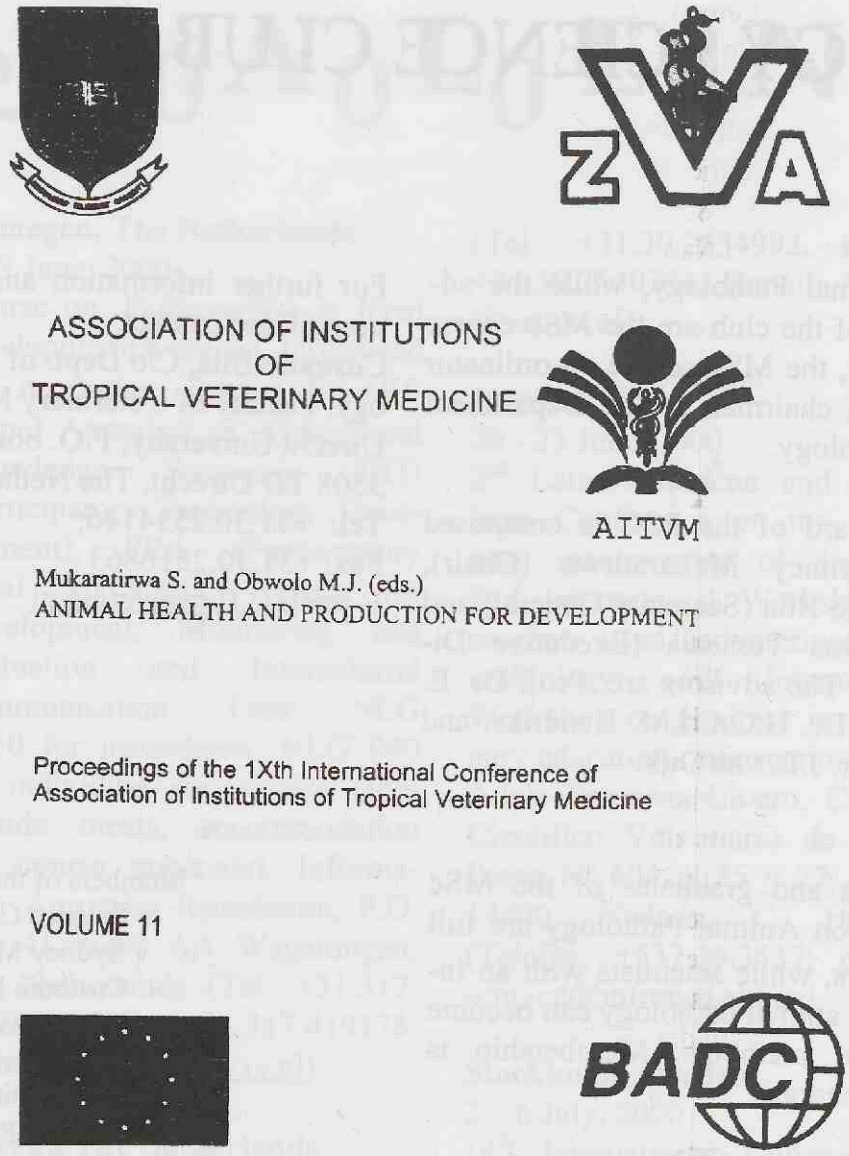
The subjects of the workshops are:

1) Livestock environment interactions and the impact on human and animal health

2) Appraisal of recent changes in delivery of livestock services

3) New approaches to veterinary training

4) Regional control of transboundary



epizootic diseases
5) Poultry production and health under smallholder conditions
6) Periurban animal production systems - opportunities and environmental constraints
7) Veterinary public health: aspects of zoonoses and food quality

Further details for submission of abstracts and registration will be presented in a flyer 'First Announcement of the 10th AITVM Conference', in EQUATOR and on the AITVM website.

Dr. R.W. Paling
General Secretary AITVM

VACANCIES
INTERNATIONAL COOPERATION

In order to save space in the EQUATOR for articles relevant to most readers the section 'Vacancies International Cooperation' will, from this issue of EQUATOR onwards, no longer contain the full text of the vacancies. For relevant vacancies we will only state: position title and number, name of the organization or employer, location and closing date. The full text of these and other advertisements can be consulted on the web site: http://www.vet.uu.nl (search for Equator). Here you will also find a list of Internet sites where vacancies in tropical animal health and production may be found.

Current vacancies

1. ANIMAL PRODUCTION OFFICER (No. 333-AGA), FAO, Rome (Italy), Closing date: 8 May, 2000

2. UNIT HEAD (No. 99/086), Animal Production Unit of IAEA, Seibersdorf, Vienna (Austria), Closing date: 9 March, 2000

PATHOLOGY SCIENCE CLUB

In December 1999 the students of the Master of Science Course on Animal Pathology of the Faculty of Veterinary Medicine, Utrecht University established a scientific group named Pathology Science Club (PSC). EQUATOR will provide space for publications by the PSC under the responsibility of the editorial board.

The major objectives are:

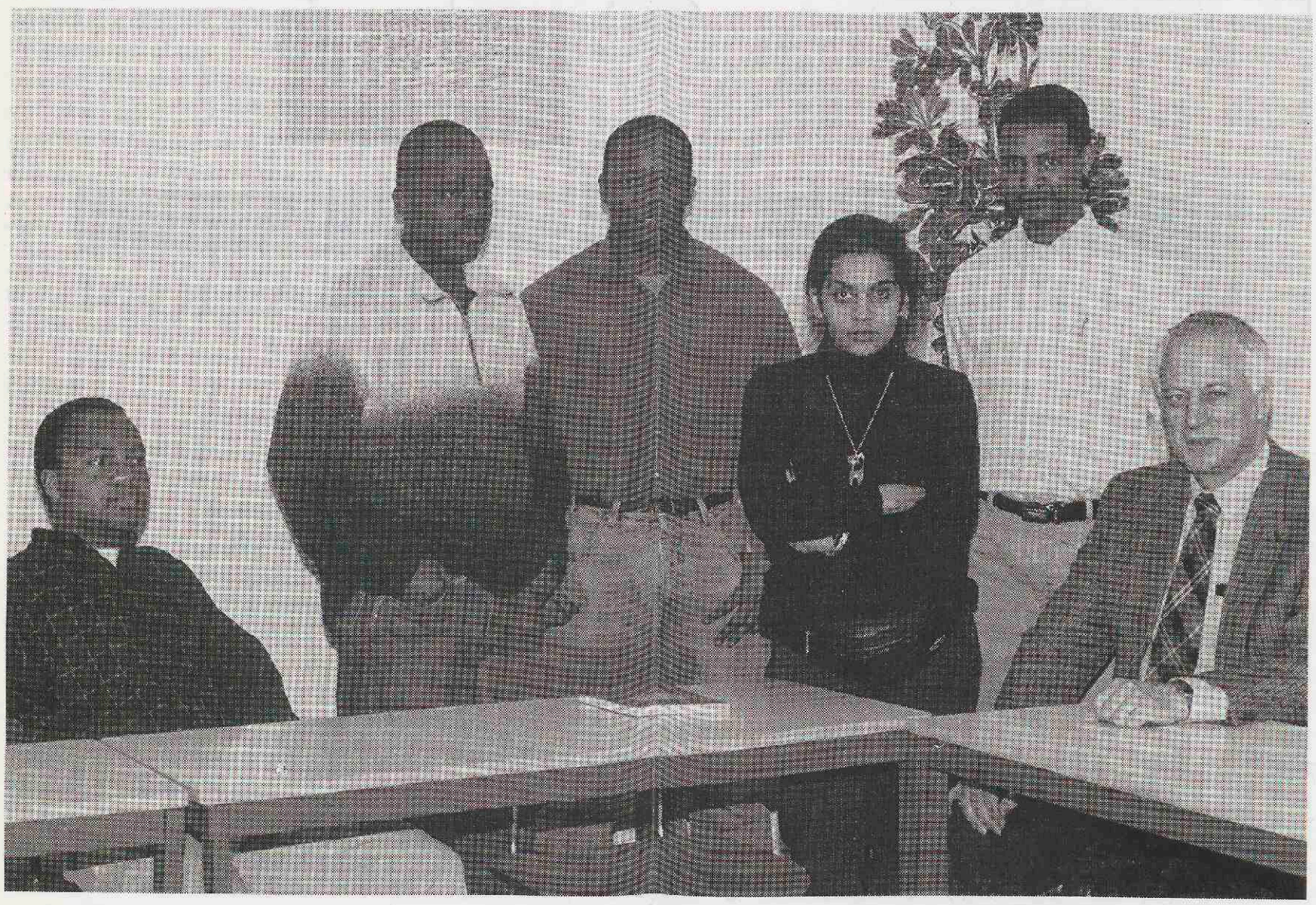
- Sharing scientific knowledge in Pathology,
- Promoting exchange of knowledge between members,
- Presentation and discussion of research results and,
- Publication of club activities.

The board of directors consists of the first year students of the MSc Course on Animal Pathology, while the advisers of the club are the MSc course director, the MSc course co-ordinator and the chairman of the Department of Pathology.

The board of the PSC is composed of:: Sydney Mukaratirwa (Chair), Custodio Bila (Secretary General) and Mathewos Tessema (Executive Director). The advisors are: Prof. Dr. E. Gruys, Dr. H.G.C.J.M. Hendriks, and Prof. Dr. J.E. van Dijk.

Students and graduates of the MSc Course on Animal Pathology are full members, while scientists with an interest in animal pathology can become affiliated members. Membership is free of charge.

For further information and registration, please contact:
Custodio Bila, C/o Dept. of Pathology, Faculty of Veterinary Medicine, Utrecht University, P.O. box 80.158, 3508 TD Utrecht, The Netherlands.
Tel: +31.30.2534146;
Fax: +31.30.2516863
E-mail: C.Bila@vet.uu.nl



Members of the Pathology Science Club (f.l.t.r.): Sydney Mukaratirwa, Custodio Bila, Joshua Malago, Asli Mete and Mathewos Tessema and the MSc Course Director, Prof. Dr. E. Gruys (Photo: Otter)

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Nijmegen, The Netherlands
5 - 9 June, 2000
Course on: Participation in local development(A-week). Organised by: Agromisa. Topics: RAAKS (Rapid Appraisal of Agricultural Knowledge Systems), PTD (Participatory Technology Development), PRA (Participatory Rural Appraisal), Theatre for Development, Monitoring and Evaluation and Intercultural Communication. Fees: NLG 2,950 for institutions; NLG 940 for individual participants (fees include meals, accommodation and course materials). Information: Agromisa Foundation, P.O. Box 41, 6700 AA Wageningen, The Netherlands (Tel. +31.317. 412217, telefax: +31.317.419178, E-mail: agromisa@wxs.nl)

Utrecht, The Netherlands
June 19 - 30, 2000
Workshop Molecular Biology and Recombinant-DNA Technology. Topics: Isolation of plasmid and chromosomal DNA; PCR; restriction enzyme digestion; gel electrophoresis; Southern and Western blotting; cloning in plasmids; transformation of bacteria; radioactive and non-radioactive labelling of DNA and oligonucleotides; hybridization; selection of recombinant-DNA clones with DNA probes and with monoclonal antibodies; bacterial expression; sequencing; computer analysis of DNA sequences; RNA isolation and amplification of cDNA; demonstration of DNA microarrays. Organised by: Institute of Infectious Diseases and Immunology, Faculty of Veterinary Medicine, Utrecht University. Deadline for application: 15 March 2000. Fee, excluding evening meals and accommodation: NLG 3,500. Information: Dr. J.A. Lenstra, P.O. Box 80.165, 3508, TD Utrecht, The Netherlands (Tel.: +31.30.2534992, telefax: +31.30.2540784, E-mail: Lenstra @vet.uu.nl).

Havana, Cuba
20 - 23 June, 2000
2nd Latin American and Caribbean Conference on the veterinary management of disasters; 2nd International Workshop on reagents used in veterinary microbiology; 3rd International Workshop on progress in veterinary education. Information: Dra. Adela Encinosa Li□ero, Consejo Científico Veterinario de Cuba, Paseo Nº 604 e/ 25 y 27, Apdo. 14400, Vedado, C. Habana. (Telefax: +537.30.3537; e-mail: scmvcd@infomed.sld.cu).

Stockholm, Sweden
2 – 6 July, 2000
14th International Congress on Animal Reproduction. Information: Dr Hans Gustafsson, Swedish University of Agricultural Sciences, P.O. Box 7039, S-750 07 Uppsala (Telefax: +46.18. 673545, e-mail: hans.gustafsson @og.slu.se).

Fontainebleau, France
21 - 24 August, 2000
10th International Conference on Trichinellosis Information: Docteurs Soulé et Booireau, Unité de parasitologie Laboratoire central de recherches vétérinaires, CNEVA Alfort, P.O. Box 67, 94703 Maison-Alfort cedex (Telefax: +33.1.43689762, e-mail: vaal11@calvacom.fr).

Barneveld, The Netherlands
21 August, 2000 - 23 February, 2001
30th International course on poultry husbandry and 30th International course on pig husbandry. Organised by: IPC Livestock International, Barneveld College. These courses will run at the same time. Following these courses participation is possible in the 23rd International animal feed training programme (AFTP), which runs from 26 February to 25 May, 2001. Direct entry in this last course is also possible. Fees including board and lodging: Poultry course: NLG 25,500; Pig course: NLG 25,500, Feed course; NLG 13,000 or 15,500 (direct entry). Closing date: 1 May, 2000. Information: IPC Livestock Barneveld College, Dep. of International Studies and Co-operation Programmes, P.O. Box 64, 3770 AB Barneveld (Telefax: +31.342.492813,e-mail: io@ipcdier.hacom.nl).

Utrecht, The Netherlands
1 September, 2000
11th International symposium: Tropical Animal Health and Production. Theme: Diagnosis and control of transboundary infectious diseases in southern Africa. Organised by: Faculty of Veterinary Medicine of Utrecht University, Faculty of Veterinary Science of the University of Pretoria and Onderstepoort Veterinary Institute. Registration fee: EURO 75. Registration before 1 August, 2000 to: Office for International Co-operation, Faculty of Veterinary Medicine, NL 3508 TD Utrecht (Telefax: +31.30.253-1815, e-mail: bic@vet.uu.nl (See announcement and registration form elsewhere in this issue of EQUATOR).

Utrecht, The Netherlands
1 September, 2000 - 31 August, 2002
International MSc programme of the Graduate School of Animal Health, Faculty of Veterinary Medicine, Utrecht University and the Institute for Animal Science and Health (ID-Lelystad). Programme: (1) MSc Course

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'Animal Pathology', duration 2 years (fee: NGL 35,000); (2) MSc course 'Veterinary Epidemiology', duration 18 months (fee: NLG 25,000); (3) MSc course 'Veterinary Anaesthesiology', duration 18 months (fee: NGL 35,000). Registration before 1 July, 2000. Information: Office for International Co-operation, Faculty of Veterinary Medicine. P.O. Box 80.163, 3508 TD Utrecht (Fax: +31.30.2531815, e-mail: bic@vet.uu.nl).

Panama City, Panama
11 - 15 September, 2000
17th Pan-American Congress of Veterinary Sciences. Information: Asociación Panameña de Médicos Veterinarios, Apartado Postal 6-2198, El Dorado, Panama (Telefax: +507.223.9689, e-mail: apmv98@cwp.net.pa).

Ocean Grove, Australia
17 - 21 September, 2000
International Pig Veterinary Society Congress (IPVS 2000). Information: IPVS 2000 Conference Secretariat, 140 The Parade, Ocean Grove, Victoria 3226 (Telefax: +61.3.52 555613, e-mail: rosscutler@pegasus.com.au; http://www.ava.com.au).

Durban, South Africa
20 - 22 September, 2000
South African Veterinary Association Congress. Information: Izani Event Specialists (Telefax: +27.31.563 3348; e-mail: izani@iafrica.com).

Punta del Este, Uruguay
4 – 8 December, 2000
XXI World Buiatrics Conference. Information: Gabriela Rohr, Cerrito 307, Montevideo 11.000 (Telefax: +598.29160220, e-mail: grohr@rohrsa.com).

Sydney, Australia
2 – 6 July, 2001
Veterinary Conservation Biology: Wildlife health and Management in Australasia. Jointly organised by: AAVCB, WAWW, WSNZVA and WDA. Information: L. Vogelnest, Taronga Zoo, P.O. Box 20, Mosman NSW 2088, Australia (Telefax: +61.2.99784516, e-mail: lvogelnest@zoo.nsw.gov.au

South Africa
22-27 July, 2001
6th Biennial meeting of the Society for Tropical Veterinary Medicine (STVM). Theme: Wildlife and livestock disease and sustainability. Information: Wendy C. Brown, Department of Veterinary Microbiology, Washington State University, Pullman, WA 99164 (E-mail: wbrown@vetmed.wsu.edu).

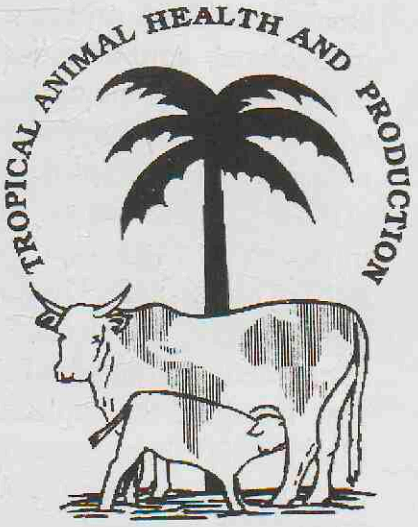
Copenhagen (Denmark)
20-24 August, 2001
10th International Conference of the Association of Institutions for Tropical Veterinary Medicine (AITVM). Theme: 'Livestock, Community and Environment'. Location: Royal Veterinary and Agricultural University (KVL). Information: Dr. Niels Chr. Kyvsgaard, KVL, Danish Center for Experimental Parasitology, 13 Bülowsvej, DK-1870 Frederiksberg C., Copenhagen (Telefax: + 45.35. 282774, e-mail: nck@kvl.dk). (For further information see elsewhere in this EQUATOR).

REGISTER NOW!

1 SEPTEMBER, 2000

Time: 09.00 - 17.00 hours
Location: Faculty of Veterinary Medicine
Yalelaan 1, De Uithof, Utrecht
The Netherlands

11th SYMPOSIUM ON



Diagnosis and control of transboundary infectious diseases in southern Africa

EQUATOR

NEWSLETTER ON SCIENTIFIC CO-OPERATION IN TROPICAL ANIMAL HEALTH

ISSN 0923-3334

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October 2000

2/3

VOLUME 12, 2000

FROM THE EDITOR

The Editorial Board has some explaining to do. We received some letters from readers of EQUATOR, asking whether we had forgotten to send them the June issue. No, you were not forgotten, we simply did not produce the second issue of EQUATOR in June as was announced in the editorial of the first issue of this year. Various reasons played a role, like difficulties with our regular printer, as well as a very heavy workload and personal circumstances.

But we are going to make up for it in this double issue (2/3) of EQUATOR Volume 12.

Did you already have a look at the **web pages** of the Office for International Cooperation (BIC) at www.vet.uu.nl/english/faculty/bureau/bic/? Here you can find **EQUATOR** and other interesting information. The columns: 'Vacancies International Cooperation' and the 'Calendar' are regularly updated, also in-between successive issues. You can also find here the main articles of the current years' issues of EQUATOR. These articles may occasionally provide you with useful teaching material. Articles can be downloaded and may be reproduced on the condition that the source and author(s) are clearly indicated.

The Editorial Board likes to call your special attention to the developments, which have taken place in respect of the status of the ***Association of Institutions for Tropical Veterinary Medicine*** (AITVM). AITVM exists already since 1973, when a group of scientists interested in tropical animal health, formed the first Standing Committee in Edinburgh under the chairmanship of Sir Alexander Robertson. Although the AITVM has been an active organisation ever since, it was not an officially registered body. This has changed now. Statutes were composed and on 7 September, 2000, the Foundation AITVM was registered in the commercial register of the Chamber of Commerce Utrecht.

We call upon the readers of EQUATOR, who are working at a university, faculty or institute, which is active in the field of tropical animal health and/or production, to seriously consider applying for AITVM membership now. Details are given in the article **'News from the AITVM'** and on the AITVM web pages (www.aitvm.org).

DIAGNOSIS AND CONTROL OF TRANSBOUNDARY INFECTIOUS DISEASES IN SOUTH AFRICA

11th Symposium on Tropical Animal Health and Production highlights research in southern Africa

On 1 September, 2000 the 11th Symposium on Tropical Animal Health and Production entitled 'Diagnosis and control of transboundary infectious diseases in southern Africa', was organised in Utrecht. In line with the recently signed agreement of cooperation, this years' symposium was a joint effort of the veterinary faculties of the universities of Utrecht and Pretoria, in collaboration with the ARC - Onderstepoort Veterinary Institute of South Africa.

Prof. M.C. Horzinek, Director of the Utrecht Graduate School of Animal Health and chairman of the Symposium Organizing Committee introduced the symposium in his word of welcome as follows. 'The topics to be discussed should appeal not only to the tropical diseases specialist but also to the general microbiologist with an epidemiological inclination. Emerging infections are enigmatic by definition, but also the notoriously re-emerging infectious diseases discussed during this symposium beg enough questions to put them on the agenda. The role of wildlife as reservoirs of the various agents will be discussed and their spread to the domestic fauna; veterinary diagnostic and control measures will portray our profession's role in dealing with epizootics and zoonoses. After all, wildlife does not respect political boundaries, and its peripatetic behaviour makes disease control in the tropics a continuous challenge. This challenge can be met only when specialists from different disciplines and origins join forces; our symposium makes this point'.

Indeed a mixed audience of about 100 participants from various disciplines and from a number of countries in Europe and Africa attended the Symposium and discussed the risks of and control methods for these emerging diseases for Africa as well as for Europe. This article presents some highlights of the Symposium. Extended abstracts are presented in the 'Programme and abstracts' book[1]. Moreover, the scientists of the Department of Veterinary Tropical Diseases of the Onderstepoort veterinary faculty presented a series of videos and posters and a set of CD-roms, which provide excellent reference material for education and research.

The role of wildlife

During the first session attention was given to the **epidemiology, diagnosis, and control of diseases of domestic ruminants and wildlife**: foot and mouth disease (FMD), tuberculosis caused by *Mycobacterium bovis* and malignant catarrhal fever.

Dr. W. Vosloo of the ARC - Onderstepoort Veterinary Institute, described the role of the African Buffalo in the epidemiology of **foot and mouth disease** in southern Africa. African buffalo maintain the FMD virus (SAT types) and on rare occasions transmit FMD to cattle. Unlike the situation in most regions of the world, FMD is therefore not eradicable from many part of sub-Saharan Africa. Conflicting situations are created by the need to fence wildlife conservation areas to separate cattle and buffalo, the need to vaccinate cattle in the surrounding areas and the requirement of meat importing countries that bovine products should derive from non-vaccinated herds. Dr. Voslo concluded her presentation by stating: 'It is essential that the impacts that FMD control programmes have on the environment, sustainable utilization of animal resources and opportunities for commercialisation of livestock through international trade, be minimized but that FMD control remains effective. To achieve this will require careful re-consideration of present control policies in southern Africa'.

11th SYMPOSIUM ON TROPICAL ANIMAL HEALTH AND PRODUCTION

Bovine tuberculosis

An overview of tuberculosis caused by *Mycobacterium bovis* in domestic and wild animals in South Africa was jointly presented by Prof. N.P.J. Kriek of the Faculty of Veterinary Science (Onderstepoort) and Dr. A. Michel of the Tuberculosis Laboratory of the ARC - Onderstepoort Veterinary Institute. Tuberculosis caused by *Mycobacterium bovis* is thought to have been introduced into southern Africa by infected cattle from Europe in the mid 1800s. Presently in South Africa the disease is under control in cattle, but infection in wildlife is a major issue. To date the infection is rife in the Kruger National Park (KNP) and in the Hluhluwe-Umfolozi Park in KwaZulu-Natal. In these parks buf-

[1] Programme and Abstracts. 11th Symposium on Tropical Animal Health And Production 'Diagnosis and control of transboundary infectious diseases in southern Africa', 1 September, 2000, Eds. J.A.W. Coetzer and J.H.A. de Gooijer. Utrecht University, Utrecht. ISBN 90-6159-032-9, pp. 1-68. Copies available from the Editorial Office.

Dr. Vosloo described the role of the African buffalo in the epidemiology of FMD (Photo: De Gooijer)

falo have been shown to be maintenance hosts. Spillover has been detected in species such as greater kudu, lion, leopard, cheetah, baboon and spotted hyena.

The control of tuberculosis in wildlife is mostly done on an *ad hoc* basis, as a well-defined policy for the management of the disease in the various species of wildlife has not been formulated. Currently, no transportation of buffaloes is allowed unless they have tested negative for tuberculosis. Control of the infection in wildlife is not possible at this stage as no validated test exists for many of the species and the epidemiology of the disease is not fully understood.

Studies to elucidate the molecular epidemiology, using the standardized genetic fingerprinting method of restriction fragment length polymorphism (RFLP), were carried out on *M. bovis* isolates from wildlife in the Greater Kruger National Park (KNP). The preliminary results indicate the existence of one principal or even a unique source of *M. bovis* infection to the KNP and the adjacent reserves. By means of RFLP this source was identified as a cattle herd on a farm bordering the KNP in the south.

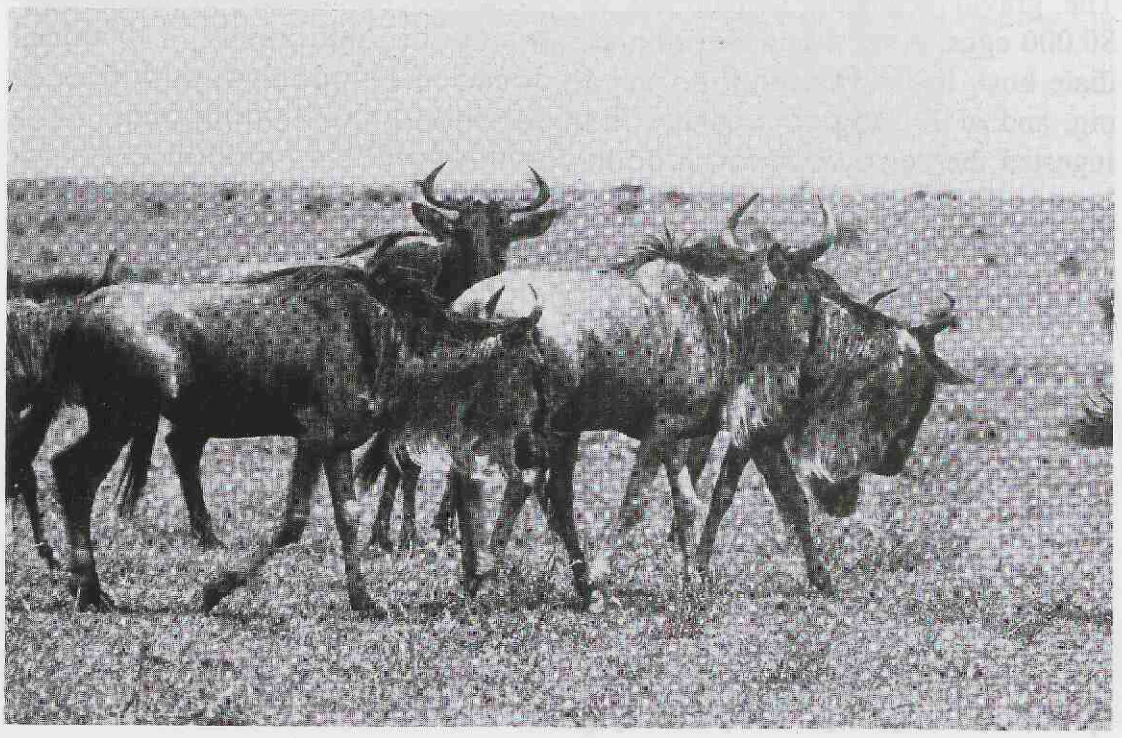
Malignant catarrhal fever

Prof. M. van Vuuren of the Faculty of Veterinary Science (Onderstepoort) presented an overview of the epidemiology of malignant catarrhal fever (MCF) in southern Africa. MCF occurs through infection with either the gamma herpes virus of wildebeest (alcelaphine herpesvirus-1; AHV-1) or of domestic sheep (ovine herpesvirus-2; OHV-2). In their natural hosts, these viruses do not produce clinical disease. In Africa, MCF is predominantly found in cattle, where cattle are in close contact with the blue wildebeest and rarely the black wildebeest. Transmission of AHV-1 is very efficient among wildebeest. All calves become infected in the first few months of life and all adult wildebeest have neutralizing antibodies. Reports consistently indicate that spread in cattle does not occur from animals with clinical MCF. The usual source of AHV-1 is wildebeest calves. The actual mode of spread has not been established.

There is no vaccine against MCF. The only reliable preventive measure is to keep cattle separated from wildebeest. Separation of wildebeest and cattle by several hundred metres is regarded as necessary to prevent infection in cattle.

South Africa is the only country in Africa that instituted formal control measures in an effort to control MCF in cattle. Legislation was enacted in 1984. Methods to control the disease included the movement of wildebeest only on the strength of veterinary permits, and the removal of wildebeest from unregistered properties. Under pressure of game ranchers and groups involved in ecotourism, the control measures were lifted in 1993. The lifting of control measures heralded a period of unrestricted movement of wildebeest with a concomitant increase in cases of MCF in cattle. The increase in the incidence of MCF justifies the perception that wildebeest-associated MCF is an emerging disease in South Africa.

Collaborative research projects on MCF are envisaged for the coming years between research institutes in South Africa, Zimbabwe, Kenya, UK, and the Netherlands.



In Africa, wildebeest are the usual source of MCF virus (Photo: Paling)

Epidemics of RVF tend to occur in Africa in association with high rainfall (Photo: Paling)

Diagnosis and control of heartwater

Prof. Dr. F. Jongejan of the Faculty of Veterinary Medicine (Utrecht) presented progress that has been made over recent years in the improvement of the diagnosis and the development of potential vaccines for the control of *Cowdria ruminantium* infection in ruminants.

C. ruminantium is a tick-borne rickettsial agent that causes cowdriosis (or heartwater), an economically important disease affecting domestic ruminants in sub-Saharan Africa and certain Caribbean Islands. The disease is transmitted by at least 10 species of *Amblyomma* ticks.

None of the clinical signs are pathognomonic for the disease. Definite diagnosis is made after death by demonstrating *Cowdria* colonies within endothelial cell of capillaries of stained brain squash smears. For an accurate assessment of the distribution of the disease, a diagnostic method is needed. Using an immunogenic region of the Major Antigenic Protein (MAP1) (MAP1-B fragment) as antigen, an ELISA has been developed, which in now used as a test kit at 20 institutes in Africa, Guadeloupe and USA. A PCR assay based on MAP1 can be used to detect *Cowdria* in vertebrate hosts and ticks. However, there is no reliable method yet for the molecular typing of different *Cowdria* stocks. *In vitro* culture of *Cowdria* has led to the development of attenuated and inactivated vaccines to ultimately replace current infection and treatment methods.

Research on tick borne-diseases, specifically on heartwater, is an excellent example whereby international cooperation between research institutes, national and international organisations and private enterprise can result in significant progress in a relatively short period of time.

Zoonoses and food safety

The second session of the Symposium was devoted to **Epidemiology and control of zoonotic diseases and food safety**. Special attention was given to zoonotic parasites, and the viral diseases, Rift Valley fever, rabies and African swine fever.

In her presentation on '**Zoonotic parasitic diseases**: A southern and eastern African perspective', Prof. T. Krecek of the Faculty of Veterinary Science (Onderstepoort) reviewed the diseases caused by *Taenia solium* and *Taenia saginata,* with emphasis on the current situation in eastern and southern Africa.

The adult tapeworms of both *T. solium* and *T. saginata* occur throughout Africa, and cause human taeniosis. Humans become infected with either of these *Taenia* species when they consume meat containing viable cysticerci, which develop into tapeworms in the intestinal lumen. The gravid terminal segments of the adult tapeworms are passed out in the faeces. The gravid segments contain up to 80,000 eggs. After a suitable intermediate host, in the case of *T. solium* a pig, and of *T. saginata* a bovine, has ingested the eggs, larvae hatch in the lumen of the gut. These then invade the submucosa of the small intestine and are carried in the lymph and blood streams to the tissues and organs of the host where, at their predilection sites, i.e. striated muscle, they develop into infective cysticerci. If humans ingest the eggs of *T. solium* because of environmental contamination from tapeworm carriers (e.g. food handlers), cysticerci may develop in their tissues and organs, like the brain. The method for the control of both species is five-pronged: improved pig and/or cattle management including better husbandry practices, whereby these animal species are prevented from coming into contact with human faeces; proper meat inspection; improved personal and environmental hygiene; treatment of infected humans; and expansion of relevant health education for handlers, stockmen and farmers.

Prof. Krecek concluded that: 'Recent research work, particularly that in Mozambique, Tanzania, Zambia, Zimbabwe and South Africa, has revealed some startling findings, particularly the high prevalences of cysticercosis and taeniosis in these countries. These helminths, and the diseases that they cause pose a significant threat to food safety and security in the region concerned. There is a need for socio-economic studies and to assess the impact of these tapeworms on both human and animal health, and productivity as well as on agriculture. Now is the time for a multidisciplinary and multinational effort to address these diseases in spite of resource constraints'.

Rift Valley fever

Prof. J.A.W. Coetzer of the Faculty of Veterinary Science (Onderstepoort) presented an epidemiological perspective of Rift Valley fever (RVF), a truly emerging disease with outbreaks in the late 1950s and 1970s in South Africa, in the 1970s along the Nile in Egypt and in the 1980s in western and eastern Africa, and most recently (2000) in the Arabian sub-continent.

Rift Valley fever is an acute hepatic and sometimes haemorrhagic disease of domestic ruminants and humans (until recently only) in Africa, caused by a mosquito-borne virus. The haemostatic derangement, which manifests as a viral haemorrhagic fever with bleeding tendency, is most severe in the fatal hepatic syndrome in animals and humans.

Epidemics tend to occur in eastern, central and southern African countries usually at irregular intervals of five to 15 years or longer associated with above average rainfall. The recent outbreaks of RVF in countries in North and West Africa occurred independently of rainfall in dry countries, apparently in association with vectors which breed in large rivers and dams.

Although a wide variety of domestic and wild ruminants are susceptible to RVF, the disease is mainly of economic importance in sheep, goats and cattle with newborn animals being most susceptible. Humans become infected mainly from contact with animal tissues. Human infection presumably results from the contact of virus with abraded skin, wounds or mucous membranes but aerosol infections are possible. The majority of RVF infections in humans are unapparent or are associated with moderate to severe, non-fatal, and influenza-like illness. A minority of patients develop ocular lesions, encephalitis or severe hepatic disease.

Prof. Coetzer had a predicting vision as he concluded: 'The recent epidemics in Egypt, Senegal, Mauritania, Kenya, Tanzania and Somalia were characterized by unusually high morbidity rates in both domestic ruminants and humans and serve as a warning that RVF can not only extend beyond its usual distribution range but also has the potential to occur outside Africa'.

Antrax is well controlled in cattle

Prof. Kriek presented an overview of the epidemiology, diagnosis and control of anthrax in southern Africa. Anthrax is a septicaemic disease caused by the bacterium *Bacillus anthracis*. It is highly contagious and rapidly fatal, affects domesticated and a very wide range of free-ranging wild animals, and humans, and varies in manifestation from per-acute or acute to chronic. Anthrax is one of the true endemic diseases of Africa and its presence there dates back to biblical times. The disease in Africa is primarily one of wildlife although outbreaks in animals and man do occur sporadically. The pattern of the disease is closely associated with the presence of the infection in wildlife conservation areas in which anthrax occurs endemically. Extensive epidemics occur sporadically at intervals of 10 - 20 years.

There is a marked difference in the susceptibility to the disease in different animal species, both domestic and wild herbivores are most susceptible whereas carnivores and omnivores are less susceptible.

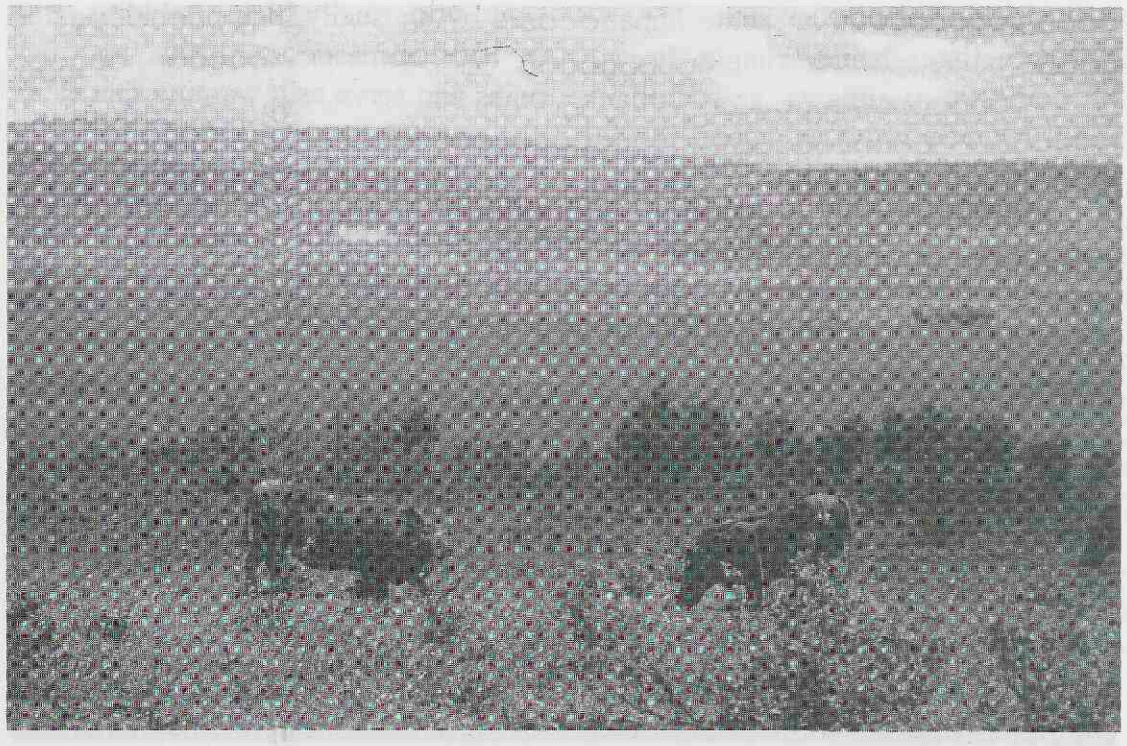
Confirmation of the diagnosis is dependent on the detection of typical bacteria in smears of blood or tissue fluids from animals that have died of the disease. The measures applied to control anthrax are those that would break the cycle of infection and include surveillance, prophylactic procedures such as vaccination and disinfection, quarantine, immunization, treatment, and disposal of carcasses. Because of compulsory vaccination, the prevalence of the disease in South Africa has declined markedly from that recorded for a period in the 1920s during which losses of 50-60,000 head of cattle annually were encountered, to where less than 3 outbreaks of the disease on average occurred per year during the last 25 years.

Rabies is still spreading

Due to unexpected circumstances in South Africa, the unexpected speaker for the next subject was Prof. R. Swanepoel, world expert in the field of rabies. He described the situation of endemic rabies in South Africa. During the 1940s rabies in dogs appeared in northern Namibia and northern Botswana, a cycle that appeared to have originated in Angola. That was the start of a pandemic that continues to the present. By 1950 it had reached western Botswana and that year also spread into Zimbabwe and northern South Africa. In succeeding years it spread into southern Mozambique and then into the KwaZulu-Natal Province of Souh Africa. This epidemic in dogs continues to move down South Africa's East Coast. Following the establishment of dog rabies in southern Africa the disease appeared in other canid species, including jackal and in bat-eared fox, which maintain the 'canid' biotype. Recently it has become apparent that rabies is a significant threat to the endangered African wild dog. The 'viverrid' biotype is maintained by Herpestid species like the mongoose.

Control of dog rabies in southern Africa has concentrated mainly on mass vaccination. Dog population control has also been practiced but has lately lost popularity. On the whole the vaccination methods have only achieved vaccination coverage of 10 to 40 per cent. Political instability and insuffi-

Prof. Swanepoel presented an overview of rabies in southern Africa (Photo: De Gooijer)



The cycle of ASF virus can involve warthogs and soft ticks (Photo: Paling)

cient financial resources have taken their toll on the regularity and efficacy of dog rabies campaigns. Oral vaccination for rabies has shown promise for the immunisation of jackals. In studies carried out in Zimbabwe modified live rabies vaccines were shown to be effective for immunizing jackals.

Recent epizootics

A number of animal diseases has manifested its self as an epidemic in recent years. Three of these were presented in the last session of the Symposium on: recent epizootics.

Dr. M-L Penrith of the ARC - Onderstepoort Veterinary Institute, presented a paper entitled: **African swine fever**: A re-emerging disease? African swine fever (ASF) is a highly lethal viral disease of domestic pigs that manifests as a haemorrhagic fever. The high mortality rate of close to 100%, and the fact that to date no vaccine exists, so that control depends on the slaughter and destruction of all infected and in-contact pigs, ensure that ASF has devastating effects on pig production in countries where it occurs. The existence of an ancient sylvatic cycle that involves wild African suids, in particular warthogs, and soft-shelled argasid ticks of the *Ornithodoros moubata* complex, is well-known. In many countries in central and West Africa, a cycle occurs in domestic pigs, which may or may not involve *Ornithodoros,* but is characterized by a higher than expected survival rate. The domestic cycle requires further study.

The recent emergence of the disease in especially West Africa (1982-1996), Kenya and Uganda (1994-1996) and Madagascar (1998) has highlighted the problem of applying conventional control measures under African conditions and the need for alternative control measures; such as farmer-based strategies for safe pig farming. These strategies offer the only real hope of sustainable control. To establish these, massive information campaigns and training are required, together with commitment from governments to provide the necessary resources.

African horse sickness

Prof. A.J. Guthrie, director of the Equine Research Centre (Onderstepoort) presented a paper on: Recent epidemics of African horse sickness. African horsesickness (AHS) is an infectious, non-contagious disease of equids (horses, donkeys, mules and zebra) caused by an orbivirus, which is transmitted by biting midges (*Culicoides* spp). It is endemic in parts of tropical Africa. The first recorded outbreak of AHS in South Africa occurred in 1719, approximately 66 years after the introduction of horses from Java. Since then, regular epidemics of AHS have occurred every 20 to 30 years. The worst of these epidemics occurred in 1854/55 and resulted in the death of approximately 40% of the population of 170,000 horses. Currently, cases of AHS occur annually in the northeastern parts of the country.

The disease is also reported from time to time in countries in North Africa from where it has occasionally extended into countries of the Middle East (1930, 1944, 1959/1961) and Spain and Portugal (1966, 1987/1990).

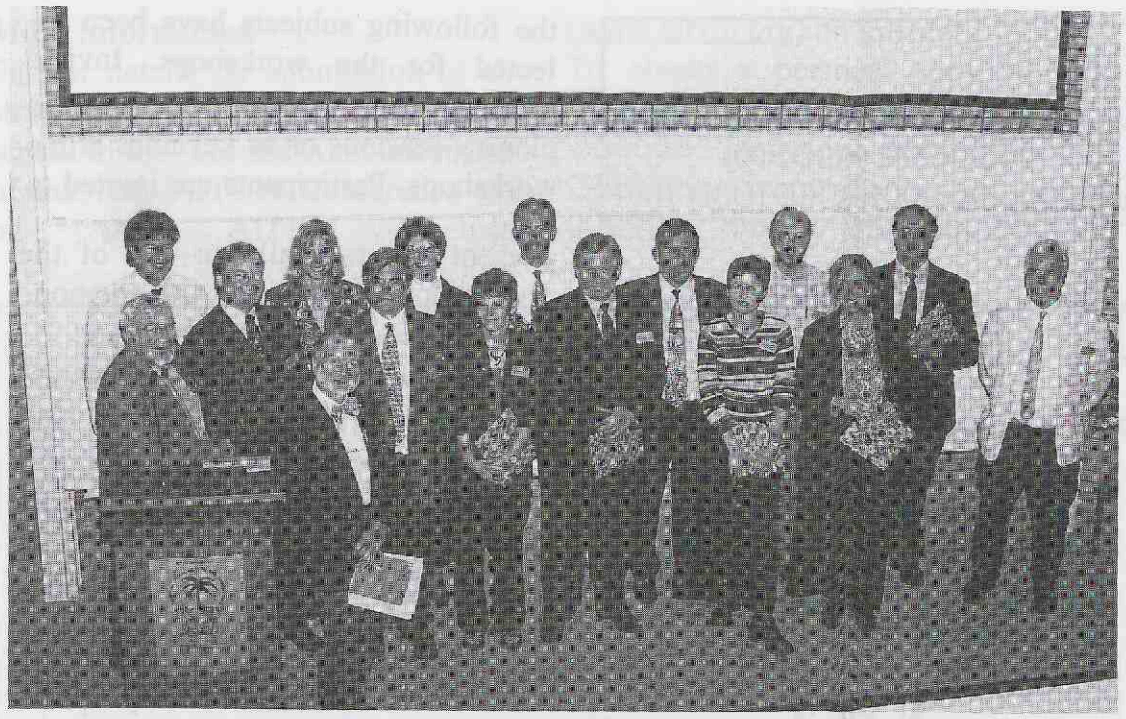
The recent outbreak in Spain (1987) was a result of the importation of infected zebra from Namibia. As a result of an extensive and expensive vaccination compains (US $ 30 million) in Morocco, Portugal and southern Spain, AHS was controlled after 3 years.

Recently (1999) an outbreak was reported from the Western Cape Province, Stellenbosch district, of South Africa, after an illegal transport from the northeastern region. The rapidity with which the diagnosis of AHS was made and by which quarantine and control measures like intensive vaccination were instituted, is believed to have played a major role in the restriction of the epidemic to a small area. Only 31 horses died in an area of 15 km around the first outbreak.

As AHS is an exotic disease in most countries outside of Africa, the state veterinary authorities must be immediately informed of any suspect case. Rapid diagnostic tests, including the antigen capture ELISA, are available at reference laboratories and appropriate specimens from any suspect cases should be submitted to such laboratories.

Contagious bovine pleuropneumonia

The last paper of the Symposium was presented by Dr. J. Picard of the Faculty of Veterinary Science (Onderstepoort) and was entitled: Contagious bovine pleuropneumonia: A worldwide perspective with emphasis on the epidemiology, diagnosis and control. Contagious bovine pleuropneumonia (CBPP) is a disease of cattle and occasionally Asian buffalo caused by *Mycoplasma mycoides* subspecies *mycoides.* A serofibrinous pleuro-



Speakers and organizers of the 11th Symposium TAHP (Photo: Van Oers)

pneumonia and pulmonary sequestra characterize the disease that may result in a chronic, sub-clinical carrier state in many recovered animals. As CBPP can easily go undetected for long periods of time and cause severe cattle losses, it is considered to be one of the most important diseases in the African context.

During the early part of the 20th century, CBPP was eradicated from much of Europe. However, certain southern European countries continue to experience periodic outbreaks. The disease occurs in parts of Asia and in certain countries in North, West and East Africa. In Africa, socio-economic practices can be responsible for the spread of CBPP into non-endemic areas or countries.

A presumptive diagnosis is based on clinical signs and necropsy. It is essential that laboratory tests be done to confirm the disease. As one test cannot detect all cases, especially if they are chronic, a panel of tests for antigen and antibody detection is required. Repeated vaccination with the live attenuated vaccine is recommended for use in Africa.

In southern Africa, CBPP occurs in Angola and the Ovambo and Kavango districts of northern Namibia. Vaccination and the slaughter of sick cattle was the method of choice in the control of CBPP in these areas. Recently (1995), Botswana experienced an extensive outbreak of CBPP. It has subsequently been successfully eradicated from this country using a, for African conditions, unique regime of slaughter of all infected and in-contact cattle. The OIE prepared a code with recommendations for countries importing cattle.

Conclusion

The symposium was a unique opportunity for scientists of different disciplines and from different countries to discuss the significant progress that has been made over the recent years in the diagnosis (specially by molecular techniques), understanding of the epidemiology, and in the approaches to control of diseases in Africa. As was demonstrated, that in many cases the control requires a multi-disciplinary, socio-economically based approach, to be of long lasting effect. Last but not least, awareness was created among the European participants of the risks of emerging diseases, which may have been eradicated long time ago, but for which continuous alertness is required.

Dr. Robert Paling

AITVM REGISTERED AS FOUNDATION

Mandate of the Foundation AITVM

The AITVM aims to improve human health and quality of life by means of increased and safe food production in tropical regions through enhancement of research, training and education in veterinary medicine and livestock production within the framework of sustainable development.

Foundation

The *Association of Institutions for Tropical Veterinary Medicine* (AITVM) was 'officially' founded as a non-profit foundation on 21 August, 2000, when the General Secretary signed the 'Founding Statute' on behalf of the members of the Standing Committee in Utrecht (the Netherlands).

The AITVM exists since 1973, when a group of scientists interested in tropical animal health, formed the first Standing Committee in Edinburgh under the chairmanship of Sir Alexander Robertson. Although the AITVM has been an active organisation ever since, it was not an officially registered body. This has changed now. Statutes, in accordance with the Netherlands' law written in Dutch, were composed by combining the Statutes as agreed by the Standing Committee Meeting on 31 January, 2000, with a number of articles required to give the Foundation its legal base in the Netherlands.

On 7 September, 2000, the Foundation AITVM was registered as a 'legal person' in the commercial register of the Chamber of Commerce Utrecht.

Registration fees
Early registration (before 15 April, 2001) for
participants from AITVM member institutions: DKK 2,100 (USD 250)
Other participants: DKK 2,500 (USD 300)
Late registration (after 15 April 2001): Additional charge DKK 800 (USD 100)

FROM THE AITVM

Call for new member institutes. You are welcome!
Are you working in a public institution, like a university, faculty or institute, which is active in the field of tropical animal health and/or production, and are you interested to apply for membership? Then you should look at the AITVM homepage (www.aitvm.org) under /Organisation / Information for new members/.
The Dean or Director of your institute should fill the 'AITVM Membership Application Form' which can be downloaded and printed from the website. The form should be forwarded to the AITVM Secretariat. Any questions? Send your e-mail to aitvm@vet.uu.nl

10th AITVM CONFERENCE Copenhagen, 20-24 August, 2001

Main international event on tropical animal health and production
The 3-yearly AITVM International Conference is a main international event on tropical animal health and production for veterinary and animal production scientists and animal science specialists from all over the world.
The 10th AITVM Conference will be held in Denmark from 20 - 24 August, 2001. The location is the Royal Veterinary and Agricultural University (KVL) in Copenhagen (Denmark). The Local Organizing Committee is composed of a number of experienced staff members from KVL, enforced with representatives from DANIDA (Denmark) and the veterinary faculties of Norway and Sweden. Prof. Dr. Torben Greve (Pro-vice-chancellor for Research of KVL) chairs the Committee. Dr. Niels Kyvsgaard is the co-chairman and the contact person at KVL (e-mail: nck@kvl.dk).

Important dates to remember

Deadline for submission of Abstract:	15 February, 2001
Deadline for early registration:	15 April, 2001
Deadline for submission of full text:	20 August, 2001
Conference Days:	20 - 24 August, 2001

Programme of the 10th AITVM Conference
The theme of the 10th Conference reflects the main issues in tropical animal production at this moment: **'Livestock, Community and Environment'**. Within this general theme the following subjects have been selected for the workshops. Invited speakers will address these subjects in plenary sessions or as keynotes at the workshops. Participants are invited to present papers orally in one of the workshops or as a poster presentation. The subjects of the workshops are:

- Livestock-environment interactions and the impact on human health and animal health and reproduction.
- Appraisal of recent changes in delivery of livestock services.
- New approaches to veterinary education.
- Control of transboundary epizootic diseases.
- Poultry production and health under smallholder conditions.
- Peri-urban animal production systems - opportunities and environmental constraints.
- Veterinary public health: aspects of zoonoses and food quality

Scholarships
The Organising Committee will approach relevant national and international organisations and agencies in an effort to secure attendance of participants from developing countries.

Members of the AITVM Standing Committee in Copenhagen (January, 2000) (Photo: collection KVL)

More information
Further details for submission of abstracts and registration will be presented in the 'Second Announcement' of the 10th AITVM Conference and on the AITVM website (www.aitvm.org) on internet.
To obtain a personal copy of the 'Second Announcement' please forward the 'Notice of interest' to the Conference Secretariat by fax , mail, e-mail, or directly from the AITVM internet pages.

Dr. Robert W. Paling,
General Secretary AITVM

Notice of interest

I am interested to attend the 10th International Conference of the Association of Institutions for Tropical Veterinary Medicine (AITVM) in Copenhagen, **20 - 24 August 2001**.
Please send me further information about the Conference.

Title (Prof/Dr/Ms/Mr): .....

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Mail or fax this information to:

AITVM Conference Secretariat
The Danish Centre for Experimental Parasitology
Royal Veterinary and Agricultural University
Ridebanevej 3
DK-1870 Frederiksberg C
Denmark

Fax: +45.35.282774

PATHOLOGY OF SCHISTOSOMIASIS IN CATTLE, A REVIEW[1]

Introduction

Schistosomiasis is a chronic parasitic disease caused by a trematode blood fluke of the family of *Schistosomatidae* and genus *Schistosoma*. It is a common disease in Africa and Asia and most infections in endemic areas occur at a subclinical level. It has been established that the highs rates of subclinical infections cause significant losses in animal growth and productivity and induce increased susceptibility to other parasitic or bacterial diseases.

At least 30% of the cattle population living in areas that are endemic for bovine schistosomiasis, is infected with schistosomes. This represents about 165 million cattle in Africa and Asia. It is also a very important zoonosis. At least 200 million individuals are infected with the trematode worm, *Schistosoma*, while 600 million people are exposed to infection and are potential victims of this parasite.

[1] The references used for this article can be obtained from the editorial office or from the EQUATOR web pages at www.vet.uu.nl/english/faculty/bureau/bic/equator

Schistosome species and geographical distribution

A total of 19 different species are described world-wide. The distribution of the intermediate host snail in the environment determines the distribution of *Schistosoma* species around the world. Five species are human parasites, namely *S. haematobium*, *S. mansoni*, *S. japonicum*, *S. intercalatum*, and *S. mecongi*. As many as ten different species of schistosomes have been reported to naturally infect cattle: *S. mattheei, S. bovis* and *S. curassoni* in Africa and the Mediterranean region, *S. spindale, S. nasale* and *S. japonicum in* Asia. The other three species are primarily parasites of antelopes (S. *margrebowiei* and S. l*eiperi* in Africa) and pigs (*S. incognitum* in Asia), which occasionally infect cattle.

Schistosoma japonicum is an important zoonosis. *Schistosoma mattheei* may occasionally infect man as a result of cross breeding between male *S. haematobium* and female *S. mattheei*.

Pathology and pathogenesis

The pathology of schistosomiasis in cattle is described for *S. mattheei*, *S. bovis, S. spindale* and *S. nasale* infections. All schistosoma species affect the liver, intestine and lungs with exception of *S. nasale,* which is found in the nasal mucosa. *S. mattheei* may be found in the bladder and uterus. *S. spindale* is also found in the bladder. *S. bovis* may also cause damage in the pancreas, forestomachs and abomasum, particularly in heavily infected cattle.

The lesions caused by ovideposition in schistosomiasis infections may be more important than those provoked by the parasites themselves. This could be due to large amounts of eggs produced. It is estimated that each female *Schistosoma* produces 20-3.500 eggs per day depending on the species involved. This fact reflects the morbidity and prognosis of each infection.

Schistosomiasis is one of the most prevalent chronic inflammatory diseases among infections characterized by granulomatous inflammation. These inflammatory processes consist of polymorphonuclear cells, lymphocytes, macrophages, plasma cells and fibroblasts (Figure 1). The 'Splendore-Hoeppli' phenomenon is also a common finding. Radiating eosinophilic clubs deposited around the agent characterise this process (Figure 1) similar to what is known in actinomycosis.

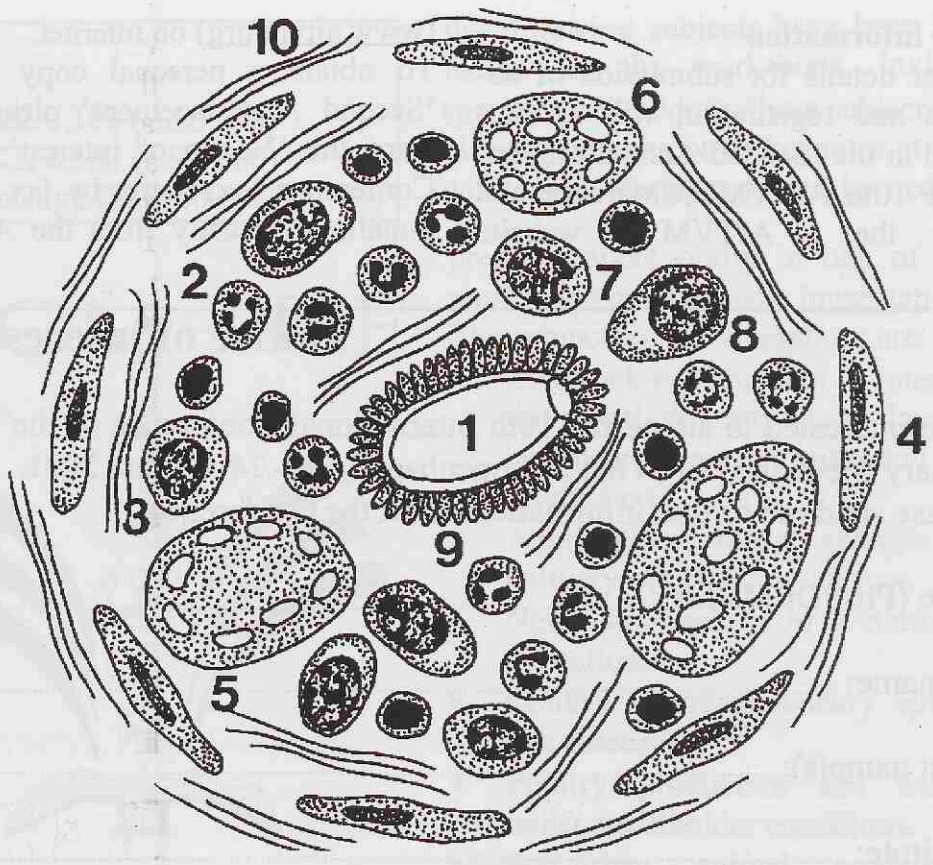


Figure 1: Granulomatous inflammation in *Schistosoma* infection.
1. Egg of *Schistosoma;* 2. Polymorphonuclear granulocytes; 3. Macrophages; 4. Fibroblasts; 5. Langhans' type giant cell; 6. Foreign-body giant cell; 7. Lymphocytes; 8. Plasma cells; 9. 'Splendore-Hoeppl' phenomenon.

The inflammatory process starts with soluble egg antigens released from the miracidium, which are captured and processed by local antigen-presenting cells (APCs) leading to stimulation of CD4+ T-cells. The APCs are mainly granuloma macrophage cells, and dendritic cells.

The intercellular adhesion molecule-1 (ICAM-1) plays a crucial role by promoting cell-to-cell adhesion in schistosomiasis. The cytokines interleukin-1 (IL-1), tumor necrosis factor-α (TNF-α) or interferon-γ (IF-γ) induce the ICAM-1 expression. Moreover, this molecule is involved in production of interleukin-2 (IL-2) and Interleukin-4 (IL-4), and thus in lymphocyte proliferation and antibody production.

Following sensitisation, further antigenic secretions stimulate memory T-cells to secrete IL-2, IL-4 and interleukin-5 (IL-5), which promote infiltration and activation of lymphocytes, recruitment of eosinophils and macrophages to the site of the developing granuloma.

Scar formation characterizes the last phase of *Schistosoma* granulomatous inflammation. The lymphocytes, fibroblasts, macrophages and, in the liver, moreover, hepatocytes and Ito cells in response to egg components produce fibrogenic factors, which are mitogenic for fibroblasts. Cytokines such as IL-1, IL-4, TNF-α, and fibroblast stimulating factor-I (FsF-I) stimulate fibroblast attraction. These cytokines increase their peptide synthesis and favour turnover of collagen.

Conclusion

Schistosomiasis is a very important disease in Africa and Asia. Although it occurs at a subclinical level, significant losses in bovine production have been reported in those continents.

From literature, the role of domestic animals and wild ruminants in human schistosomiasis seems to be underes-

timated in Africa. Further studies of the epidemiology of the disease and the possible pathogenicity of *Schistosoma mattheei* and others species for human beings should be carried out.

Granulomatous inflammation and presence of 'Splendore-Hoeppli' phenomenon generally characterize the pathological picture of *Schistosoma* infection. The granulomatous lesions seem to be due to egg deposition rather than by the parasites themselves.

The available knowledge concerning the mechanism of the disease in domestic animals is scarce and is mainly extrapolated from experimentally infected bovines and mice, and spontaneously infected human beings. The roles of acute phase proteins, specific immunity, the mechanisms, nature and functional importance of the fibrosis process are to be outlined. In general, a pathological comparative approach with other chronic inflammatory diseases like tuberculosis, actinomycosis and actinobacillosis, should be considered in bovines and others ruminants. The nature and formation of 'Hoeppli-Splendore' phenomenon are open to speculation and require further studies.

Custodio G. Bila

(Faculty of Veterinary Science, Eduardo Mondlane University, Maputo, Mozambique)

VETERINARY TRAINEESHIPS IN THE TROPICS

A practical period in Zimbabwe

During the last part of their education at the Faculty of Veterinary Medicine of Utrecht University, the Netherlands, veterinary students with an interest in the tropics can choose to do a student traineeship as part of their veterinary education in a tropical country. After finishing their veterinary education, the special course on tropical animal health and husbandry and the practical training in a tropical country, these young veterinarians are well prepared to start a professional career in the livestock sector in any part of the world. Christa de Ruijter and Maaike Keijser completed their traineeship at the Faculty of Veterinary Science in Harare (Zimbabwe) where they looked at the role of Veterinary Livestock Technicians.

Introduction

It was already a long time ago that we decided to apply for a research traineeship in Africa. But, when we finally did we were lucky, because through the Office for International Co-operation of Utrecht University's Faculty of Veterinary Medicine we got the opportunity to participate in the PhD research project of Dr. P.S.A.Woods at the University of Zimbabwe (UZ).

The first weeks

After a long flight, we finally arrived in Harare. We were collected by a friendly driver of UZ, who brought us to the Peterborough lodge. This would be our home for the next three months. In the first week we had time to adjust to our new environment, which did not take much effort, because living in Harare is like living in a western European city. What we did not expect was the weather; it was colder in Zimbabwe than in the Netherlands that time of year.

Our arrival in Zimbabwe turned out to be perfectly timed, because during our second week, there was a veterinary congress at Kariba, which we attended. It was a good opportunity for us to talk with veterinarians from Zimbabwe and South Africa. One of the most interesting lectures, in our opinion, was on tuberculosis (TB) in lions in the Kruger National Park in South Africa. It appeared that lions get TB from buffalo. TB has only mild effects in these animals, but for lions it is a deadly disease.

A VLT in Nyakudya

Dr. Woods' PhD project is executed in the communal areas around Harare. Regions are being compared, one attended by a Veterinary Livestock Technician (VLT) and a veterinarian, and the other area by a VLT only. During a veterinary training of about eighteen months a VLT acquires basic knowledge on diseases, management, etcetera.

After we returned from Kariba we travelled by commuter busses to Nyakudya, a small village north of Harare to learn about life in the rural areas, the way the subsistence farmers work and live, and about the work of a

Estimating the age by looking at the teeth (Photo: Keijzer)

VLT.
Every time we thought the bus was full, the Zimbabweans thought differently. There always fit more people in a bus than you think! This journey was a great experience. In Nyakudya we spent some days with Norah, a veterinary livestock technician. We stayed at the Animal Health Centre, which is the VLT's office. It was a big change from the luxury of Kariba to the rather primitive circumstances in this place. There was no running water or electricity and we had to make a fire to cook on.
We learned a lot of interesting and inventive things. For example: we never thought of using soap as lubricant. And when a mombi (shona for cow, it was the first word in shona we learned) is in labour and the calf would not come out, just pull until it comes out. That is because a VLT does not have the possibility to do a caesarean. In a particular case we ended up pulling with six people! But the calf came out, and both mother and child were fine.

During the week we spent in the village, the VLT also taught farmers about diseases, drugs and management. They (and we too) learned very interesting techniques that week, like deworming cattle using a Coca-Cola bottle, dehorning and castrations. The castrations and dehorning were done without any sedation or anaesthetics. Therefore it was not surprising that sometimes the cattle were difficult to handle!
At the end of our stay in Nyakudya we had got an impression of the work of a VLT and the importance of that work, especially in the areas, where there are no veterinarians.
During our last evening, a farmer, who was so rich he could afford two wives, invited us. During dinner, where we were the guests of honour, they played really loud pop-music, probably to make us feel at home!

Research is hard work
When we returned to Harare, we could start our research. Our task in the project was the practical part: We were supposed to do a general physical examination of the farmers' animals, to score body condition, to take faecal samples and to estimated the animals' age by looking at the teeth pattern. Dr. Woods and her assistants did questionnaires
We made a protocol, and we started training the men, who would be the animal handlers and interviewers during the project. The training was great fun, because catching a cow might seem a simple and easy job, but sometimes it involved a lot of running and some cows are cleverer than you think.

After the training we finally started to work on the project. Every week we went to another communal area around Harare and did our examinations on farms at different distances from the Animal Health Centre.
Every day we had to get up as early as 4.30 h. a.m. to go to the farms. We had to go that early because the mombis are in the kraal (fenced area) dur-

We always had a big audience (Photo: Keijzer)

When we return after a day of hard work, a traditional Zimbabwean meal was waiting for us. (Photo: Keijzer)

ing night-time only. During the day they are grazing on the communal land.

When we returned to the AHC after a day of hard work, a traditional Zimbabwean meal was waiting for us; sadza with muriwo (relish). At first we ate the sadza with a spoon, but in the end we ate it like real Zimbabweans: with our hands.

And because we had to wake up early, we also went to bed early, right after dinner, at 7.00 h. p.m.!

Every week we went to another communal area. The examinations went great, but some mombis were very wild and hard to handle. Sometimes our men were pulled through the whole kraal! And then there were the very big, nasty looking horns. And, normally the safest place is behind a cow, because a cow kicks sideways, but we found out there are exceptions to that rule!

Every day, after finishing our work in the communal land, we went back to the AHC. There we injected formaline in the plastic bags with faeces to conserve them. A lot of locals that were passing by, especially children were really interested in what we were doing, so we always had a big audience. Also, while we were at the AHC or during our work, the farmers consulted us on veterinary problems, so we almost felt like real veterinarians.

Veterinary problems

Before we started our research, we expected that the body condition of the cows would be bad, but to our surprise the majority turned out to have a good body condition, despite the dry season. One of the biggest problems was that almost all cows were infested with ticks, due to the fact that in most areas there is shortage of acaricides and water, and the distance to the diptank is often long. Other disorders we found were eye problems, and wounds from hitting (with sticks) and from barbed wire. Animals in poor condition were often suffering from helminth infections.

But there was more ...

In the weekends we returned to Harare from where we took the opportunity to make trips with friends we had met in the lodge, for example to the Victoria Falls and the Eastern Highlands. So besides doing research we also had a chance to see more of this beautiful country.

We had a great time in Zimbabwe. We learned a lot, saw a lot and enjoyed everything. We would like to thank everyone who made our stay such a wonderful experience.

Christa de Ruijter
Maaike Keijser

The majority cattle had a good body condition, despite the dry season (Photo: Keijzer)

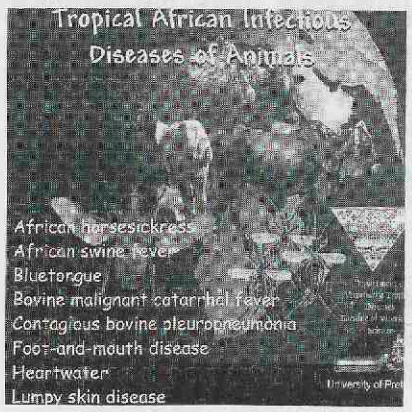
EDUCATIONAL CD'S ON ANIMAL INFECTIOUS DISEASES IN AFRICA

NOW FOR SALE!

The department of Veterinary Tropical Diseases produced 2 unique CD's, that provide you with high quality pictures and a short description of the following important animal diseases which occur in southern Africa.

Tropical African Infectious Diseases of Animals

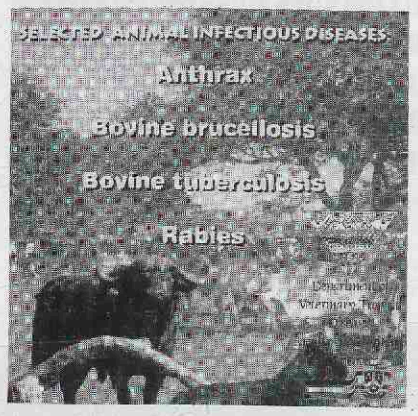
This CD provides information on the aetiology, epidemiology (including distribution, transmission, and host/reservoirs), socio-economic impact, clinical signs, pathology, diagnosis and control/eradication of each disease. The section on contagious bovine pleuropneumonia also includes video material and sound.



- African horsesickness
- African swine fever
- Bluetongue
- Bovine malignant catarrhal fever
- Contagious bovine pleuropneumonia
- Foot-and-mouth disease
- Heartwater
- Lumpy skin disease

This CD provides information on the aetiology, epidemiology (including distribution, transmission, and host/reservoirs), socio-economic impact, clinical signs, pathology, diagnosis and control/eradication of each disease. The section on contagious bovine pleuropneumonia also includes video material and sound.

Selected Infectious Diseases



- Anthrax
- Bovine brucelosis
- Bovine tuberculosis
- Rabies

This CD provides information and pictures on the aetiology, epidemiology, pathogenesis, clinical signs, pathology, differential diagnosis and control/eradication of some infectious diseases that potentially threaten the livestock industry of southern Africa, as well as a consideration of the impact of them on wildlife populations and the relative risks of each disease to livestock.

The CD's can be ordered for US$ 20 each. Please send your order by mail to Rina Serfontein, Department of Veterinary Tropical Diseases, Faculty of Veterinary Science, Private Bag X04, Onderstepoort 0110, South Africa, or by email to rserfont@op.up.ac.za.

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INTRODUCING WENDELA WAPENAAR

Last month the Editorial Board of EQUATOR asked me to join the team. I accepted and from now on I will contribute with hopefully interesting articles from a student's point of view.

In 1992, I started my veterinary education in Gent (Belgium). After that year I could continue at Utrecht University's Faculty of Veterinary Medicine. Now I am in my final year. My main interest is in large animal practice because of its relationship with and importance for human health and welfare. Beside several traineeships at practices in the Netherlands, I visited - and worked in- countries like Mozambique, Sweden, Israel, and China.

During my study I was active in committees concerning the student participation in the quality of education. Since 1995 I am a board member of the Foundation DIO, *Diergeneeskunde In Ontwikkelingssamenwerking* (Veterinary Medicine in Development Co-operation). DIO is an NGO and is located at the veterinary faculty. Its volunteers answer questions on veterinary subjects from people in developing countries and execute small projects. Besides that DIO organises symposia and information evenings for people who are interested in the veterinary aspects of working in developing countries.

From the above you will understand my enthusiasm for EQUATOR and the Office for International Co-operation of my faculty. I hope you will enjoy my contributions!

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Dead Sea, Israel
1 - 5 November, 2000
3rd International Conference on Emerging Zoonoses. Conference Secretariat: Emerging Zoonoses 2000, Target Tours Ltd., P.O. Box 29041, Tel Aviv 61920 (Tel.: +972.3.517 5150, fax: +972.3.5175155, e-mail: zoo2000@targetconf.com

Wageningen, the Nether- lands
26 November - 9 December, 2000
International course on 'Livestock – environment interactions'. Course programme: Introduction; Main issues in livestock-environment interactions; Policy framework and policy principles for addressing livestock-environment interactions; Policy development for balancing livestock-environment interactions. Course fee: NLG 5,500. Information and registration: International Agricultural Centre (IAC), P.O. Box 88, 6700 AB Wageningen (Tel.: +31.317.490111, fax: +31.317.418552, e-mail: a.j.nell@iac.agro.nl, www.iac.agro.nl).

Punta del Este, Uruguay
4 – 8 December, 2000
XXI World Buiatrics Conference. Information: Gabriela Rohr, Cerrito 307, Montevideo 11.000 (Fax: +598.29160220, e-mail: grohr@rohrsa.com).

Stellenbosch, South Africa
21 - 25 January
5th International Sheep Veterinary Congress. Organised by: Prof. Gareth Bath (Fax: +27.11.7927522, e-mail: reshot@yebo.co.za. Reservations: P.O. Box 782902, Sandton, 2146, South Africa or AACV, Anne Cover (Tel.: +61.7.33787944; fax: +61.7. 38783559, e-mail: aacv@ava.com.au; www.up.ac.za/academic/lhpg)

Melbbourne, Australia
5 March – 15 December, 2001
Degree of Master of Veterinary Studies (MVS) in Avian Health. Organized by: Faculty of Veterinary Science, Univ. of Melbourne. Areas of study: Poultry pathology; Infectious diseases causes and serology; Disease, diagnosis, prevention and control; Poultry production systems and procedures; Product-related kno-

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wledge, meat processing and egg packaging plants. Tuition fee: $A 27,000. Closing date for applications: 30 November, 2000. Information: Dr. Trevor Bagust, Course Co-ordinator, Faculty of Veterinary Science, Univ. of Melbourne, Parkville, Victoria 3052 (Tel.: +61.3.93449676, fax: +61.3.93449675, email: t.bagust@vet.unimelb. edu.au).

Barneveld, The Netherlands
26 March - 25 May, 2001
23rd International animal feed training programme (AFTP). Organized by: IPC Livestock International, Barneveld College. Fees including board and lodging: NGL 15,500. Information: IPC Livestock Barneveld College, Dep. of International Studies and Co-operation Programmes, P.O. Box 64, 3770 AB Barneveld (Tel.: +31.342.414881, fax: +31. 342.492813, e-mail: io@ipcdier.hacom.nl).

Sydney, Australia
2 – 6 July, 2001
Veterinary Conservation Biology: Wildlife health and Management in Australasia. Jointly organised by: AAVCB, WAWW, WSNZVA and WDA. Programme: Conservation biology in Australasia; Wildlife utilisation; Marine wildlife and birds; Wildlife recovery and reintroduction programmes and vertebrate pests; Wildlife health in Australasia. Information: L. Vogelnest, Taronga Zoo and Quarantine Centre, P.O. Box 20, Mosman NSW 2088, Australia (Fax: +61.2. 99784516, e-mail: lvgel nest@zoo.nsw.gov.au

South Africa
22-27 July, 2001
6th Biennial meeting of the Society for Tropical Veterinary Medicine (STVM). Theme: Wildlife and livestock disease and sustainability. Information: Wendy C. Brown, Department of Veterinary Microbiology, Washington State University, Pullman, WA 99164 (E-mail: wbrown@vetmed.wsu. edu).

Copenhagen (Denmark)
20-24 August, 2001
10th International Conference of the Association of Institutions for Tropical Veterinary Medicine (AITVM). Theme: 'Livestock, Community and Environment'. Location: Royal Veterinary and Agricultural University (KVL). Information: Dr. Niels Chr. Kyvsgaard, KVL, Danish Center for Experimental Parasitology, 13 Bülowsvej, DK-1870 Frederiksberg C., Copenhagen (Fax: + 45.35.282774, e-mail: nck@kvl.dk, www.aitvm.org).

Barneveld, The Netherlands
24 August, 2001 – 1 March, 2002
International course on poultry husbandry and International course on pig husbandry. Organized by: IPC Livestock International, Barneveld College. These courses will run at the same time. Following these courses participation is possible in the International animal feed training programme (AFTP), which runs from 4 March to 31 May, 2002. Direct entry in this last course is also possible. Fees including board and lodging: Poultry course: NLG 25,500; Pig course: NLG 25,500, Feed course; NLG 13,000 or 15,500 (direct entry). Closing date: 1 May, 2001. Information: IPC Livestock Barneveld College, Dep. of International Studies and Co-operation Programmes, P.O. Box 64, 3770 AB Barneveld (Tel.: +31.342.414881, fax: +31. 342.492813, e-mail: io@ipcdier.hacom.nl).

Stresa, Italy
26-30 August, 2001
18th International Conference of the World Association for the Advancement of Veterinary Parasitology (WAAVP). Information: New Team, Via C. Ghiretti, 2, I-43100 Parma (Tel.: +39.521. 293913, fax: +39.521.294036, e-mail: new team.parma@iol.it).

Utrecht, The Netherlands
1 September, 2001 - 31 August, 2003
International MSc programme of the Graduate School of Animal Health, Faculty of Veterinary Medicine Utrecht University and ID-DLO Institute for Animal Science and Health, Lelystad. Programme: MSc Course 'Animal Pathology' duration 2 years (fee: NLG 35,000); MSc course 'Veterinary Anaesthesiology', duration 18 months (fee: NLG 35,000). Registration before 1 August, 2001. Information: Office for International Co-operation, Faculty of Veterinary Medicine. P.O. Box 80.163, 3508 TD Utrecht (Fax: +31.30.2531815, e-mail: bic@vet.uu.nl, www.vet.uu.nl).

EQUATOR

NEWSLETTER ON SCIENTIFIC CO-OPERATION IN TROPICAL ANIMAL HEALTH

ISSN 0923-3334

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December 2000

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VOLUME 12, 2000

FROM THE EDITOR

As a spin-off from the yearly Symposium on Tropical Animal Health and Production the editorial board usually publishes some of the symposium papers in EQUATOR. As you might remember from Robert Paling's report in EQUATOR 2/3, the year 2000 topic was "Diagnosis and control of transboundary diseases in southern Africa". Because of a recent outbreak of Rift Valley Fever in Yemen and Saudi Arabia, and the permanent threat of foot-and-mouth disease outbreaks in southern Africa we decided to publish the contributions on these topics in this last issue of 2000.
Furthermore you can update your knowledge on trypanosomosis, dairy cattle health problems in China and on Khon Kaen, the center for horse racing in Thailand.

To conclude this last year of the old millennium the editorial board wishes you a very merry Christmas and a happy NEW YEAR!

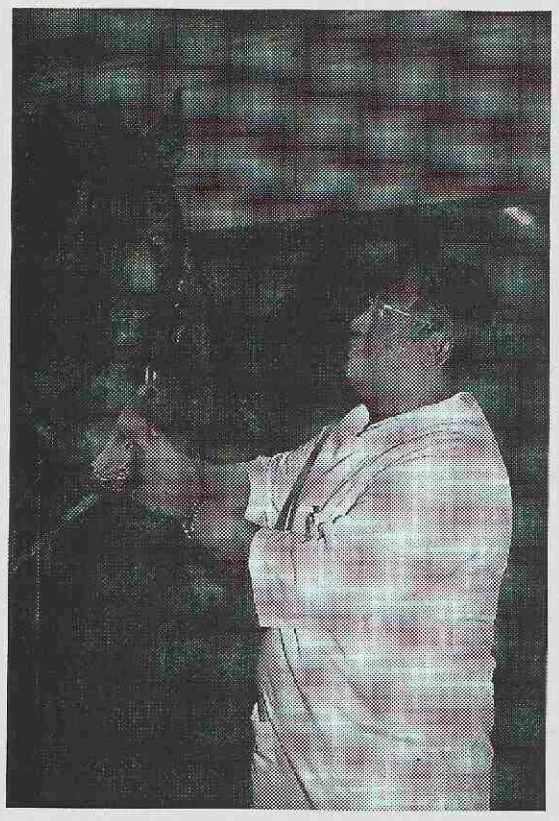
A THAI VETERINARIAN IN UTRECHT

"I would like to create a beautiful Equine Centre at Khon Kaen"

Dr. Suchat Wattanachai is one of the young Thai veterinarians who follow a clinical training programme at Utrecht University's Faculty of Veterinary Medicine. These trainings are part of the Memorandum of Understanding that has been signed by the Thai Ministry of University Affairs and the Faculty of Veterinary Medicine of Utrecht University. For 3 months Dr. Suchat was a guest of the Utrecht Department of Equine Sciences. One of EQUATOR's reporters asked this ever-smiling Thai clinician about his experiences.

Dr. Suchat, could you tell something about the situation at your Faculty?

"I am a lecturer in large animal surgery, equine anaesthesiology and equine radiology at Khon Kaen University. Khon Kaen is situated in the north-eastern part of the country which is the centre for horse racing. We are with four staff members at the department. Apart from myself the staff consists of Dr. Pavin, who is in charge of the Ambulatory Clinic, Dr. Mongkol who is in charge of equine reproduction, and Dr. Prawit who is currently in Michigan, USA to per-



form a PhD study on equine exercise physiology."

What kind of horses are you dealing with mostly, are they similar to the horses you see here?

"No, the type of horses is different. Here you have mainly warmbloods that are being used for dressage and jumping. In Thailand horse racing is the most important branch of the equestrian sports. While the most important race tracks are in Bangkok, the area around Khon Kaen has a large number of racing stables.

How many veterinary students do you have at Khon Kaen?

At Khon Kaen each year 80 students enter our course. We teach, like in Utrecht, a 6 year course of which the last two years are devoted to clinical training. However, unfortunately we have much less patients than you have in Utrecht. By the way, I noticed that in general your students are as eager to learn something as ours. Only, your students have much better opportunities.

Are there other differences when you compare the Dutch situation with the situation in Khon Kaen?

Oh yes, there are many. It starts with the owners. In Thailand many owners will first try to treat their animals

Dr. Suchat with a Frisian horse (Photo: Gootjes)

themselves. Then, if all local remedies have failed and the animal is getting worse and worse, they will call a veterinarian. Of course, those are not the best cases to treat. Your owners here are much better educated. Here in Utrecht I am seeing horses that are presented because of a lameness and it is hard for even the most experienced veterinary surgeon to tell which limb is the lame one. In many cases you really need to trot the horse on a hard surface in a circle to correctly assess the lameness. In Thailand you won't need that. If they call you for a lame horse, everybody who is not blind will be able to tell which is the affected limb.

Another important difference is in the facilities. You are very well equipped here. It is not only that you can dispose of sophisticated and expensive equipment of good quality, there is obviously also a lot of experience and expertise on how to arrange things in the most efficient and effective way. Here it is very easy to cast a horse for surgery or to take X-rays of even the head or neck.

The fact that you have a high caseload and also many indoor patients makes it easy to teach your students and your young staff-members. In Khon Kaen we have no facilities for indoor large animal patients and our caseload is low.

That means that there is still a lot of work to do in Thailand?

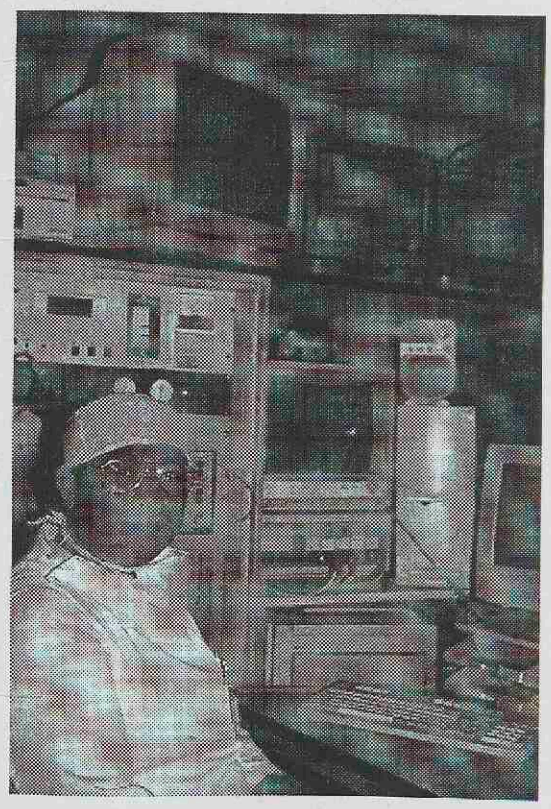
Oh, certainly, but the situation is improving gradually. There is now, in all Thai faculties, a slowly increasing number of staff-members with experience abroad. People like me who have stayed for a relatively short period in another country, but also people who have, for instance, done a PhD study in places like Hannover, or Michigan State University or Utrecht. An example of the last category is Dr. Pisit Suwannachot who is currently finishing his PhD thesis at Utrecht's Department of Physiology. While improving equine health care, clients will become better educated also, because they will see the good results when they present patients early to the clinic. So, there is hope!

Was this period in Utrecht useful for you?

Without any doubt. It is really different to read about things in a book than to see yourself how things can and should be done. I have seen many aspects of equine medicine. Mostly orthopaedics, but now I have also a very good idea about colic surgery. Furthermore, I stayed for two weeks at the department of Diagnostic Imaging and have been at Internal Medicine. I really enjoyed the trips to the field with that friendly doctor of yours who runs the Equine Ambulatory Clinic. What is his name again? Yes, Peter Stolk! I have seen a lot of very practical things that I can use when I am back home, with or without little adaptations,.

Did you have time to see something of the Netherlands?

A bit. I have been to Lelystad, to Belgium, and of course to Amsterdam. Next Sunday I'll visit the race track Duindigt in The Hague,.



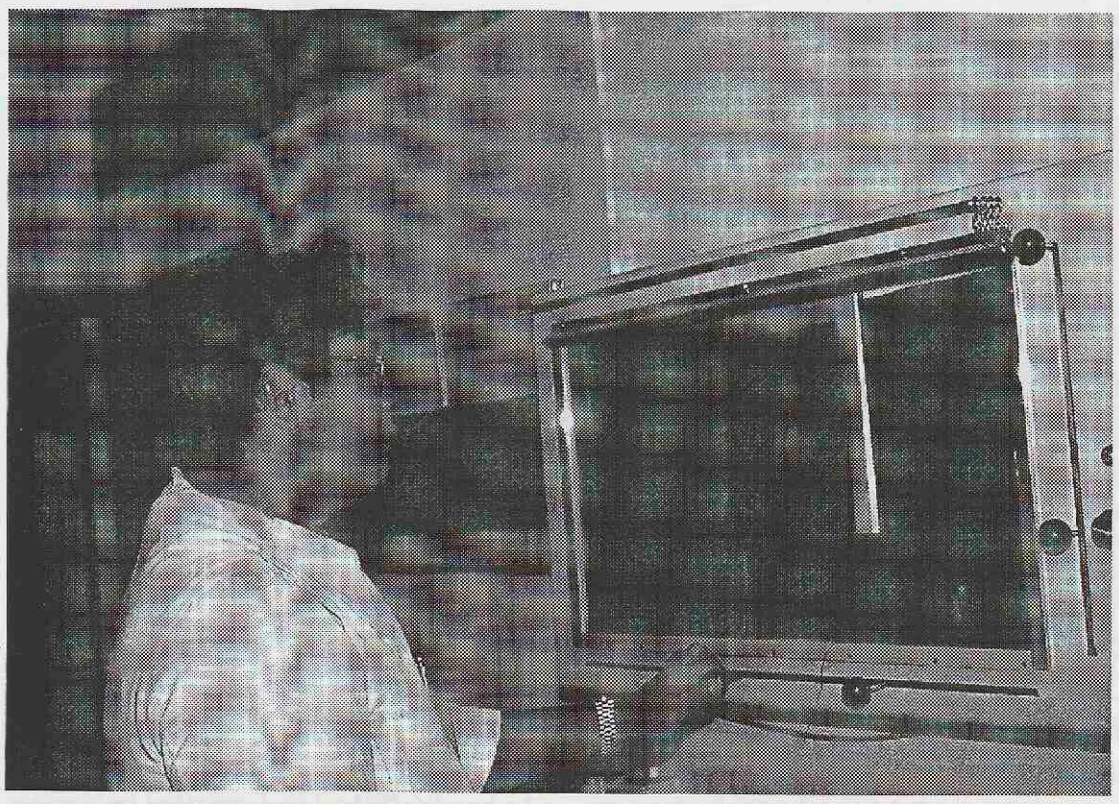
In the surgery room with the anaesthetic monitoring equipment in the background. (Photo: Gootjes)

Interpreting a radiograph at the Radiology Department. (Photo: Gootjes)

The last question, what is your greatest ambition?

I want to make a nice equine clinic at Khon Kaen University that can serve as a centre of excellence for the whole region. That will be great for the students too, as it will attract many cases!

René van Weeren



FOOT AND MOUTH DISEASE IN SOUTHERN AFRICA: RE-EVALUTION OF THE APPROACH TO CONTROL

Introduction

Eradication of foot and mouth disease (FMD) from significant portions of the world is one of the success stories of veterinary science in the last ten years. In that time the disease was finally eradicated from countries comprising the European Union as well as much of South America. The disease was historically a serious limiting factor for trade in animals and animal products in these regions. In south East Asia concerted efforts towards controlling FMD are being implemented although recent events in Taiwan, Korea and Japan are disquieting especially because the sources of these epidemics are not entirely clear; nor are the species affinities of these outbreak viruses always consistent with past experience.

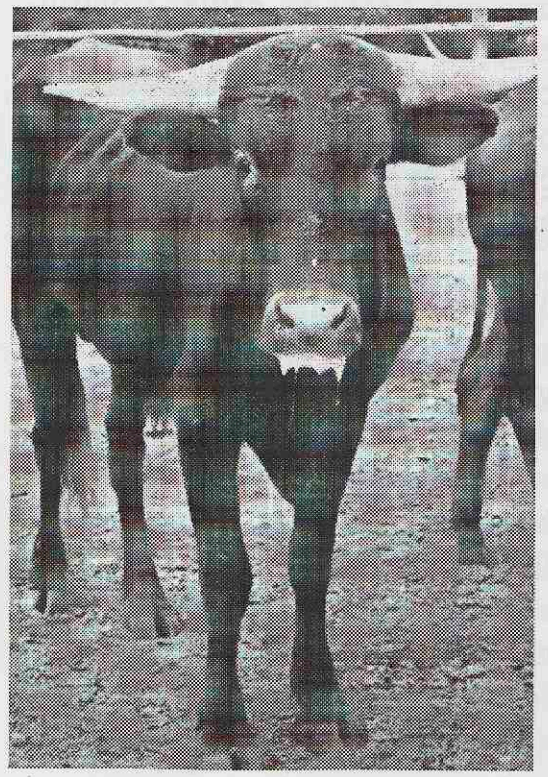
In Africa, by contrast, little has changed over the last ten years: FMD is widespread throughout the continent, except for southern Africa, and is often ignored because it is not usually a fatal disease. Furthermore, international, especially intercontinental, trade in livestock and their products on which Foot and mouth disease has its greatest effect, is limited. Foot and mouth disease is therefore usually considered to be of lesser significance than diseases such as rinderpest, contagious bovine pleuropneumonia and East Coast fever that have high mortality rates and the potential for causing devastating direct losses to livestock owners. On the other hand, commercialization and exploitation of the livestock potential of the arid regions of sub-Saharan Africa through trade will be constrained by FMD for the foreseeable future unless ways of rendering exports of livestock products safe with respect to FMD can be found.

Unlike the situation in most other regions of the world, FMD is not eradicable from many parts of sub-Saharan Africa because it is maintained there by large populations of African buffalo. Buffalo not only maintain some types of FMD viruses but, on rare occasions, transmit FMD to cattle. Controlling the transmission of FMD to cattle is therefore presently the only option for effective FMD control in areas where both buffalo and domestic livestock occur.

This discussion will focus on southern Africa because that region is the most agriculturally developed in sub-Saharan Africa with established export industries based on livestock, necessitating the maintenance of effective FMD control. This is based on two fundamental strategies: (i) vaccination of livestock, primarily cattle, against FMD and (ii) separation of

wildlife populations, particularly African buffalo that maintain the SAT types of FMD virus, from livestock. Fencing, as a means of effecting separation between wildlife and livestock, and so controlling FMD, is widely used in southern Africa. Vaccination and movement control have recently been supplemented by international agreement that countries in which FMD occurs endemically or epidemically may be divided into FMD-infected and FMD-free zones (International Animal Health Code of the *Office International des Epizooties* - OIE). Thus in several southern African countries areas where African buffalo occur there are designated "infected" zones while the rest of the country is accepted as a FMD-free zone from which countries free of FMD may safely import livestock products.

This apparently satisfactory situation is being challenged by two developments. Firstly, fencing used to control animal movement, particularly that of wildlife, is held to have serious adverse environmental impacts in ecologically fragile areas. Thus it is suggested by ecologists that some fences should be decommissioned because they are damaging to the environment. Secondly, there is growing evidence that routine vaccination programmes conducted in southern Africa are not inducing effective levels of herd immunity. This leads to the possibility that the apparent success of vaccination programmes may be largely due to the vaccinated cattle not being challenged in the field. To complicate the issue, the policy of separation between buffalo and livestock advocated by most animal health authorities in southern Africa is also being constrained by the need for integration of land-use that renders wide separation between buffalo and cattle increasingly difficult.



FMD is widespread throughout Africa (Photo: Collection Faculty of Veterinary Science, Onderstepoort)

For these reasons the traditional approach to FMD control in southern Africa needs to be re-evaluated and future policies based on scientifically defensible and cost-effective policies. This can only be achieved if the ways in which FMD viruses are maintained and transmitted are accurately understood.

Foot and mouth disease viruses in southern Africa and distribution of topotypes

South African Territories (SAT) types 1, 2 and 3 viruses are endemic to southern Africa and cause the vast majority of disease outbreaks; the other three types that occur in Africa (A, O and C) tend to be prevalent in specific localities in northern parts of the region.

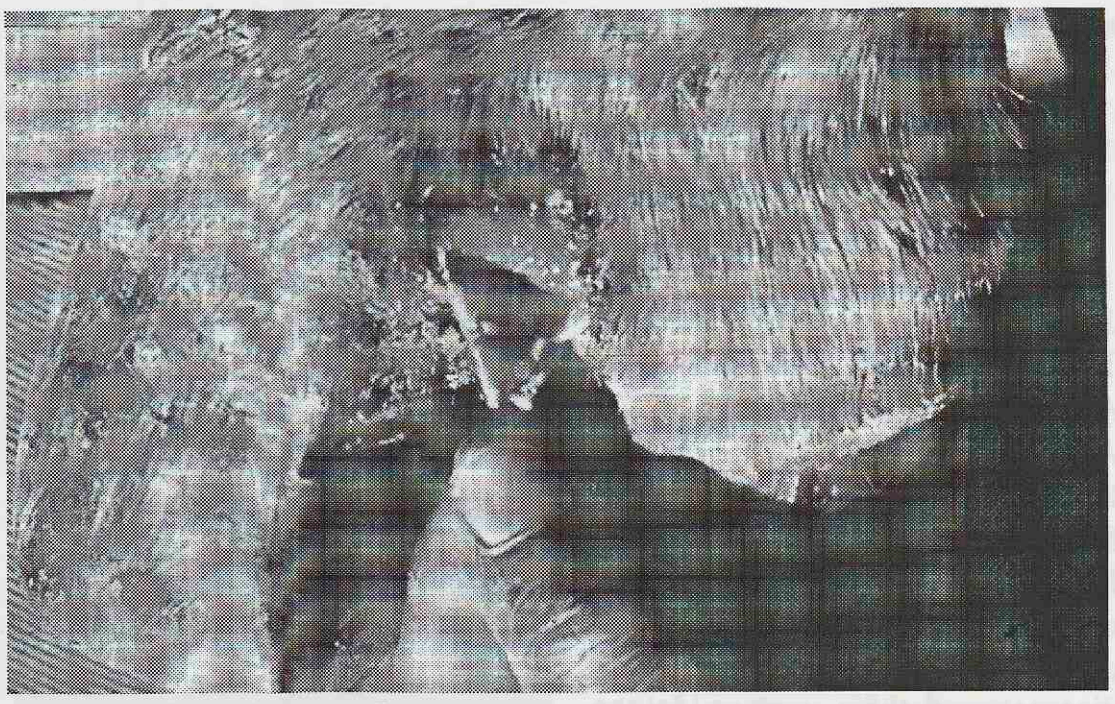
The SAT types have high levels of intratypic variation reflected in the genome sequences so far analysed. Furthermore, variants tend to be geographically dispersed resulting in so-called "topotypes" being located in distinct areas that have little if any correlation with country boundaries. Genome sequencing has enabled the relationships between viruses to be measured accurately and thereby the origin of outbreaks can often now be determined in considerable detail. This has resulted in unequivocal demonstration that buffalo sometimes serve as the source of infection for cattle. However, antigenic variation between viruses of the same type also means that vaccine that may be effective in one locality may be less so in another. For that reason it is important for countries purchasing vaccine to ensure that the virus strains contained in the vaccine are not only of the appropriate type(s) but will also be effective against the particular variants (sometimes referred to as subtypes) likely to challenge the vaccinated animals in the field.

Species of animals important in maintaining and spreading FMD

The only species that have been proven to be capable of maintaining SAT-type FMD viruses indefinitely are cattle and African buffalo. Other cloven-hoofed species such as sheep and goats and various species of antelope may be involved in outbreaks caused by these viruses and even transmit them to cohorts as well as other species but long-term maintenance has not so far been demonstrated. In the Kruger National Park in South Africa approximately biannual outbreaks of FMD have been diagnosed in impala over the last 20 years. It has been clearly shown that these outbreaks are derived from buffalo herds in the vicinity of the outbreak focus.

Vaccination as a method of controlling FMD in Southern Africa

Vaccination against FMD has long



FMD: Typical foot lesion (Photo: Collection Faculty of Veterinary Science, Onderstepoort)

been recognized as difficult for a number of reasons:

- it protects against development of disease but not necessarily infection
- the problem of antigenic variation mentioned above
- even the best FMD vaccines stimulate ephemeral immune responses and therefore vaccine has to be administered repeatedly at short intervals (every four to six months) where field challenge is frequent
- FMD vaccines, being inactivated and having to be produced in biologically secure facilities, are expensive (approximately $1 per dose).

Despite these problems, and as is the case elsewhere, there is circumstantial evidence in southern Africa for the historical efficacy of vaccination programmes in the control of FMD. However, serological assessment of the proportion of animals that have protective antibody levels against FMD in cattle routinely vaccinated is lower than expected, i.e. levels of herd immunity based on such surveys are below the 70 per cent level that are generally required to control highly contagious infections.

Fencing: arguments for and against

The ecological objections to fences have been mentioned but it needs to be pointed out that their usefulness in controlling FMD in several countries including Botswana, Zimbabwe and South Africa has been demonstrated by long experience. This may appear surprising in the light of European experience where airborne transmission has been important in transmitting the virus over distances measuring numbers of kilometres. However, in southern Africa air-borne transmission has never been recorded. The reasons for this are thought to be the absence of pigs in endemic areas and the very low stocking rates that obtain in these predominantly arid areas. On the other hand, it has also been shown that on occasion antelope such as impala sometimes transmit FMD across fences to cattle. It appears the impala become infected by contact with buffalo and then, during the incubation period, jump over buffalo-proof fences and infect cattle on the other side.

Strategies for FMD control in Southern Africa: should there be a change?

There is therefore a conundrum confronting FMD control in southern Africa: control programmes based on vaccination have, by and large, a record of success while objective measures of herd immunity induced by these programmes appear to indicate that they are inadequate. This complicates the response to requests for changes to FMD control policies proposed by the environmental lobby, *viz.* greater reliance on vaccination and decommissioning of fences. That would create another problem in that meat and other products derived from vaccinated livestock are frequently prohibited from being imported into FMD-free countries.

We have been and are still in the process of investigating this issue in a general sense and also in relation to specific environmental developments. Examples include management of areas surrounding the Kruger National Park in South Africa, wildlife conservancies in South east Zimbabwe, in the Okavango Delta area (Ngamiland) of Botswana and the initiative to establish the Gaza Transfrontier Conservation Area involving consolidation of wildlife reserves in South Africa, Mozambique and Zimbabwe.

It is essential that the impacts that FMD control programmes have on the environment, sustainable utilization of animal resources and opportunities for commercialization of livestock through international trade, be minimized but that FMD control remains effective. To achieve this will require careful reconsideration of present control policies in southern Africa.

G.R. Thomson, W. Vosloo and A.D.S. Bastos

ARC - Onderstepoort Veterinary Institute, Private Bag X5, Onderstepoort 0110, South Africa

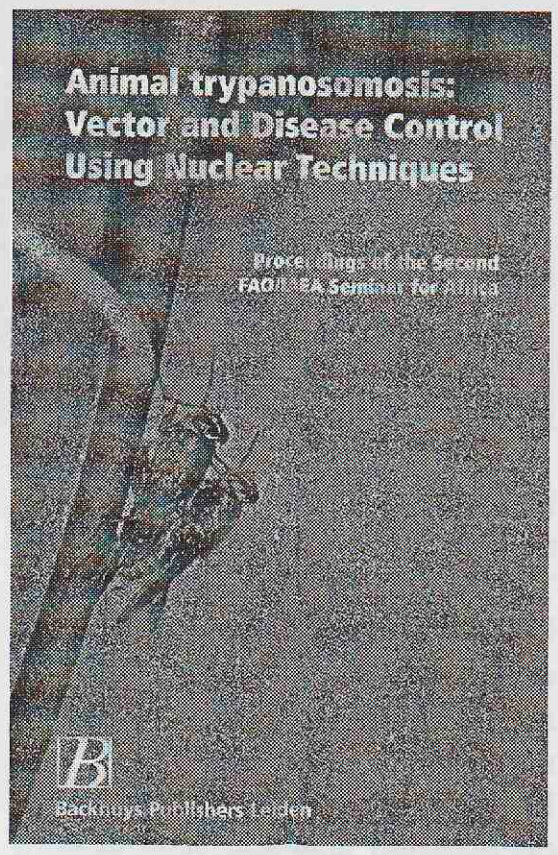
IAEA PUBLISHES TWO BOOKS ON TRYPANOSOMOSIS

Joint FAO/IAEA Division

The International Atomic Energy Agency (IAEA) and the Food and Agriculture Organisation (FAO), through their Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, have as one of their tasks the promotion of nuclear techniques in the control of diseases and their vectors. In the area of the control of animal trypanosomosis the Joint FAO/IAEA division has been active for two decades and has supported and actively participated in two major programmes. One programme is directed at advancing the Sterile Insect Technique (SIT) for the control of the tsetse fly as the main vector of animal and human trypanosomosis in Africa. The other programme is concerned with the introduction of new and improved diagnostic techniques for the detection of trypanosomal antigen and antibody detection. Recently the scientific results of both programmes were published.

Tsetse eradication on Unguja Island (Zanzibar)

The book *'Animal trypanosomosis: Vector and disease control using nuclear techniques'*[1], contains the proceedings of the Second FAO/IAEA seminar for Africa held from 27 November – 1 December 1995 at Zanzibar (Tanzania). The seminar, attended by 71 participants from 24 countries, was held at the time when tsetse eradication operations were in full



swing on Unguja Island (Zanzibar, Tanzania). Mass releases of sterile male tsetse were conducted at that time. The seminar in 1995 focused on tsetse SIT as part of an integrated area-wide approach, as well as aspects of tsetse biology relevant to SIT and mass rearing.

The seminar was divided in a number of sessions and the proceedings follow this division. For each session the full text of the presentations is included as well as a concluding report and a summary of the discussion. The sessions were dealing with the following subjects: tsetse attractants, country reports, including a report from Botswana, Kenya, Ethiopia, South Africa, Tanzania and Zimbabwe, tsetse biology, genetics and biochemistry and of course the prospects of tsetse SIT and the activities, plans and expectations of the IAEA supported tsetse eradication programme on Unguja Island.

The book contains a wealth of information about the status of and ideas on tsetse control and eradication in the mid nineteen nineties. However, it is unfortunate that it has taken 4 years to publish the proceeding of the seminar, as more recent information is already available. For example one can read about the outcome of the SIT operation on Unguja Island in the second book, recently published by IAEA, on diagnosis of trypanosomosis. In one of the papers the eradication of tsetse from Unjuga Island was confirmed by reports on the monitoring of livestock by haematological and parasitological tests.

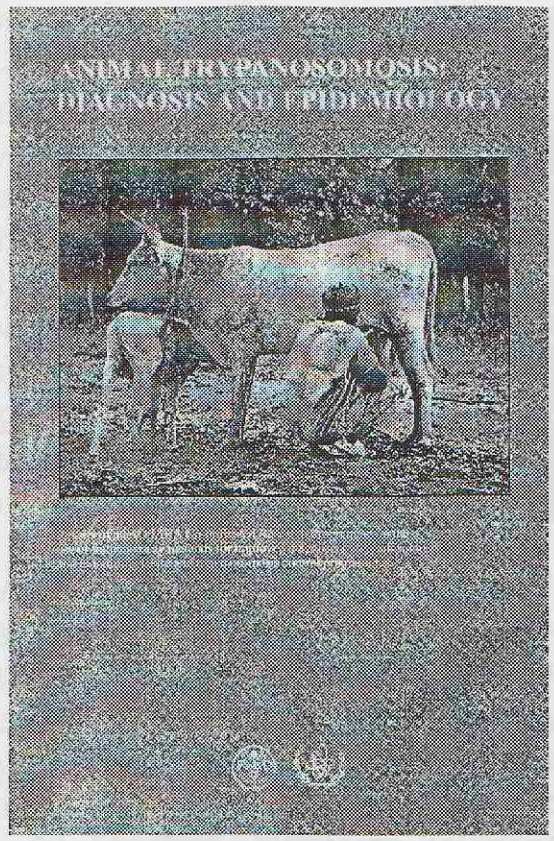
Trypanosome antibody ELISA successfully implemented

The book *'Animal trypanosomosis: Diagnosis and epidemiology'*[2] contains the results of a five year (1995-2000) FAO/IAEA Co-ordinated Research Programme on the use of immunoassay methods for improved diagnosis of trypanosomosis and monitoring tsetse and trypanosomosis control programmes. In 1987 a 5-year programme was started to validate an ELISA to detect trypanosomal antigens. The test was validated in 10 laboratories in Africa. The results indicated a reasonable but sometimes-variable sensitivity and specificity. The results of this programme and the follow-up 2-year project were published in IAEA-TECDOC-707 and 925.

The government of the Netherlands supported the next 5-year project. Twenty research institutes were involved, of which 15 were located in Africa. IAEA supported projects in Africa with US $ 5-10,000 per year to perform the antibody detecting ELISA for try-

[1] International Atomic Energy Agency, Vienna (1999). Animal trypanosomosis: Vector and disease control using nuclear techniques. ISBN 90-5782-048-X, Backhuys Publishers, Leiden, the Netherlands, pp. 311.

[2] International Atomic Energy Agency, Vienna (2000). Animal trypanosomosis: Diagnosis and epidemiology. ISBN 90-5782-065-X, Backhuys Publishers, Leiden, the Netherlands, pp. 251.



panosomes using a completely prepared and standardised test kit from the IAEA laboratories in Seibersdorf. Staff of the AIEA regularly visited the 15 projects and results were presented to expert advisors during meetings, which were held every 18 months. The general conclusion of the project was that ELISA plates pre-coated with denatured antigen of *Trypanosoma congolense* and *T. vivax* were reproducible and reliable. The recently published book[2], compiled under the responsibility of Dr. R.H. Dwinger, contains the articles with the results of the 15 projects as well as some review articles on diagnostic and epidemiological aspects of the disease in African livestock.

Future activities

It is expected that in the future the production and distribution of the ELISA kits will be on a commercial basis by KETRI in Kenya. A next 5-year phase (2000-2005) of the trypanosomosis control programme has already been initiated and project sites and contract holders have been selected in Africa, Asia and South America and include also diagnostic centres for human sleeping sickness. The emphasis of this Co-ordinated Research Programme will be on the introduction of PCR technology and the comparison with the established ELISA technology.

Conclusion

The commitment of the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture to applied research for control of trypanosomosis is commendable and has over the years produced various successes of which the livestock sector in Africa has benefited. The publication of the results in books rather then in TECDOCs greatly enhances the accessibility and wider distribution of the results. This is also stimulated because the two books *'Animal trypanosomosis: Vector and disease control using nuclear techniques'* and *'Animal trypanosomosis: Diagnosis and epidemiology'* are available free of charge upon written request by interested institutes, organisations, universities, colleges, libraries, projects etc. from the IAEA[3].

Dr. R.W.Paling

[3]Animal Production and Health Section, Joint FAO/IAEA Division in Food and Agriculture, International Atomic Energy Agency, P.O. Box 100, A-1400 Vienna, Austria

RIFT VALLEY FEVER: AN EPIDEMIOLOGICAL PERSPECTIVE

Introduction

Rift Valley fever is an acute hepatic and sometimes haemorrhagic disease of domestic ruminants and humans in Africa, caused by a mosquito-borne virus. The haemostatic derangement which manifests as a viral haemorrhagic fever with bleeding tendency and evidence of disseminated intravascular coagulopathy is most severe in the fatal hepatic syndrome in animals and humans. Hepatic disease which are essentially similar in all susceptible domestic animals and humans is most severe in extremely susceptible hosts, such as new-born lambs and kids.

Epidemics occur when particularly heavy rains favour the breeding of mosquito vectors. The disease was first recognized in the Rift Valley in Kenya at the turn of the century and was recorded in southern Africa late in 1950 when an estimated 100 000 sheep died and 500 000 ewes aborted in South Africa alone. A second severe epidemic occurred in southern Africa in 1974 and 1975 during which more severe losses were reported than the 1950 epidemic.

In 1977 and 1978, a major epidemic occurred in the Nile delta and along the Nile in Egypt, causing an unprecedented number of human infections and deaths, as well as numerous deaths and abortions in sheep and cattle and some losses in

goats, water buffaloes and camels. Severe outbreaks affecting both livestock and humans occurred in Senegal and Mauritania in 1987 and in several countries (Kenya, Tanzania, Ethiopia and Somalia) in eastern Africa in 1997/98.

Epidemiology

Rift Valley fever is caused by a *Phlebovirus* of the family Bunyaviridae. No significant antigenic differences have been detected between Rift Valley fever isolates and laboratory passaged strains from many countries, but differences in pathogenicity have been demonstrated.

Outbreaks or serological evidence of RVF have been limited to the African continent and Madagascar. Apart from the more recent outbreaks in Sudan, Egypt, Senegal and Mauritania, epidemics have tended to occur in eastern, central and southern African countries usually at irregular intervals of five to 15 years or longer associated with above average rainfall. The recent outbreaks of RVF in countries in North and West Africa occurred independently of rainfall in dry countries, apparently in association with vectors which breed in large rivers and dams.

The Rift Valley (Photo: Collection Faculty of Veterinary Science, Onderstepoort)

The central enigma in the epidemiology of RVF has always concerned the fate of the virus during the inter-epidemic periods. For decades it was widely accepted that the virus is endemic in indigenous forests, where it circulated in mosquitoes and unknown vertebrates, and that it spread to livestock-rearing areas when heavy rains favoured the breeding of epidemic mosquito vectors. However there is no proof that the virus is maintained in transmission cycles in birds, monkeys, baboons or other wild vertebrates.

Although the possibility of endemicity in forests cannot be dismissed entirely, it is currently postulated that RVF virus in sub-Saharan Africa is maintained in inter-epidemic periods principally by transovarial transmission in aedine mosquitoes particularly in areas where there are dambos or broad vleis, with a low level of transmission to livestock. It is thought that epidemics are precipitated by abnormally heavy rains which lead to an explosive increase in vector populations and spread of the disease from these endemic foci.

Serological surveys in cattle and wildlife indicate that varying amounts of virus activity occur each year in certain areas in eastern and southern Africa without epidemics occurring. In southern Africa the onset of epidemics tends to be recognized late in summer following an initial increase in vector populations.

Pans, dambos and vleis retain water for months or even years, and constitute an ideal environment for the breeding of mosquitoes, particularly floodwater-breeding aedines of the subgenera *Aedimorphus* and *Neomelaniconion*, which attach their eggs to vegetation such as grasses, sedges and rushes at the water's edge. In contrast to culicine mosquitoes, the eggs of aedines have to be subjected to a period of drying as the water recedes in order to hatch on being wetted again when next the pan, dambo or vlei floods. Thus, aedine mosquitoes overwinter as eggs. The eggs can survive for long periods in dried mud possibly for several seasons if pans, dambos or vleis remain dry.

The flooding of dambos or vleis and the humid weather conditions prevailing in epidemics favour the breeding not only of the aedine maintenance vectors such as *Aedes*

The recent outbreaks of RVF in Africa occurred independently of rainfall in dry countries (Photo: Collection Faculty of Veterinary Science, Onderstepoort)

mcintoshi, Aedes unidentatus and *Aedes juppi* and the non-aedine mosquitoes such as *Culex* and *Anopheles* species which serve as epidemic vectors, but also of other biting insects such as midges, phlebotomids, stomoxids and simulids which are all potential mechanical transmitters of RVF virus. Contagion is not considered to be important in livestock, as opposed to the case in humans.

Although a wide variety of domestic and wild ruminants are susceptible to RVF, the disease is mainly of economic importance in sheep, goats and cattle with new-born animals being most susceptible.

The course of the disease is usually peracute and lambs rarely survive more than 24-36 hours after the onset of the first signs of illness; many are simply found dead. In animals less than a week old mortality is 90 per cent or more. Lambs and kids older than two weeks and mature sheep and goats are significantly less susceptible than are new-borns. Pregnant sheep and goats may abort at any stage of gestation as a result of the febrile reaction and/or infection of the foetus. In adult sheep mortality rates varying from five to 30 per cent and abortion rates of 40 to 100 per cent have been reported in outbreaks. Goats are said to be more resistant to the disease than sheep, but in some outbreaks similar mortality and abortion rates to those in sheep have been reported.

The disease in calves resembles that in lambs and sheep. The estimated mortality rate for calves during epidemics is about 10 to 20 per cent. Infection is frequently inapparent in adult cattle. The death rate in adult cattle does not generally appear to exceed 10 per cent. Frequently, abortion is the only manifestation of the disease in a herd. Average abortion rates of 15 to 40 per cent have been reported during epidemics. As in sheep and goats, cows may abort at any stage of gestation, the aborted foetus usually being moderately autolysed.

No pathogenicity tests have been conducted on camels, but antibody has been detected in camels where abortions occurred during RVF epidemics. In Eqypt high prevalences of RVF antibody were found in domesticated water buffaloes, and abortion and low death rates have been associated with the disease. Low prevalences of antibody to RVF virus but no evidence of disease have been detected in African buffaloes (*Cyncerus caffer*) and a few species of antelopes.

In contrast to the main vector, *Culex pipiens*, in the Egyptian epidemic of 1977-78, the principal mosquito vectors of RVF in southern Africa tend to be zoophilic and sylvatic and are therefore not inclined to feed on humans. Humans become infected mainly from contact with animal tissues. Generally, persons at risk are involved in the livestock industry, such as farmers, farm labourers who salvage carcasses for human consumption, veterinarians and their assistants, and abattoir workers. Human infection presumably results from the contact of virus with abraded skin, wounds or mucous membranes but aerosol infections is possible. The majority of RVF infections in humans are inapparent or are associated with moderate to severe, non-fatal, influenza-like illness, but a minority, probably less than one per cent, of patients develop ocular lesions, encephalitis or severe hepatic disease with haemorrhagic manifestations.

After an incubation period of two to six days, the onset of the benign illness in humans is usually very sudden. The disease is characterized by rigor, fever that persists for several days and is often biphasic, headache with retro-orbital pain and photophobia, weakness, and muscle and joint pains. Sometimes there is nausea and vomiting, abdominal pain, vertigo, epistaxis and a petechial rash. In a minority of patients the disease is complicated by the development of ocular lesions at the time of the initial illness or up to four weeks later. The ocular disease usually presents as a loss of acuity of central vision, sometimes with development of scotomas as a result of ischaemic lesions in the macular and paramacular areas of the retina. The loss of visual acuity generally resolves over a period of months with variable residual scarring of the retina, but in instances of severe haemorrhage and detachment of the retina there may be permanent uni- or bilateral blindness.

Diagnosis and control

One should suspect RVF when heavy rains are followed by the occurrence of abortions in sheep, goats and cattle together with fatal disease, particularly in young animals, which is marked by necrotic hepatitis and haemorrhage in the abomasum and serosal surfaces. Frequently there is also influenza-like illness in farm workers. Specimens should be submitted for laboratory confirmation of the diagnosis.

A major factor contributing to the abatement of epidemics is the onset of cold weather, which suppresses vector activity. In southern Africa outbreaks tend to terminate abruptly soon after the first frosts of winter. In contrast, virus activity may persist in parts of Africa, which experience warmer winters. Vector control is of limited or no use in the control of RVF and immunization remains the only effective way to protect livestock. Although the use

of vaccine is beneficial in reducing losses, it is generally applied too late to avert epidemics or to prevent considerable losses from occurring.

Epidemics of RVF tend to occur at irregular intervals of many years and it is usually difficult to persuade farmers to vaccinate livestock during long inter-epidemic periods. The occurrence of epidemics is difficult to predict and they usually have a very sudden onset. An attempt has been made to utilize satellite imaging for the prediction of RVF outbreaks through the development of a green vegetation index as a marker of dambo or pan flooding but it remains to be determined whether this technique finds application. Hence it is advisable in African countries with large sheep and goat populations to immunize the offspring of vaccinated ewes and nannies on a regular basis at six months of age, when colostral immunity has waned, with a single dose of the modified live Smithburn vaccine. This should afford life-long protection. Lambs and kids of susceptible dams can be immunized at any age.

Veterinarians and others engaged in the livestock industry should be made aware of the potential dangers of exposure to zoonotic agents in handling tissues of diseased animals, and precautions should be increased during RVF epidemics.

The recent epidemics in Egypt, Senegal, Mauritania, Kenya, Tanzania and Somalia were characterized by unusually high morbidity rates in both domestic ruminants and humans and serve as a warning that RVF can not only extend beyond its usual distribution range but also has the potential to occur outside Africa.

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DAIRY FARMING IN CHINA

Most veterinary students stay in Utrecht during their six years of study. However, some students go abroad to study for a while at one of the partner institutions of Utrecht University's Faculty of Veterinary Medicine. Others travel around the globe in their spare time or decide to gain clinical experience under "exotic" circumstances. One of those active students is Richard Olde Riekerink, board member of the Foundation DIO. What follows is what he calls his "personal experience" at the Canton American Flower Lounge Livestock Co., Ltd, a dairy farm near Guangzou,China.

Introduction

When you think of animal husbandry in China, you probably think of small swine herds, poultry and maybe of some fish, but surely not of dairy cattle. Although this is not so well known, the dairy industry is a fast growing branch of agricultural business. Especially in the big cities, the demand for fresh milk is growing. But in Asia one would expect that the consumption of milk will never become very popular because lactase deficiency is common in the Asian population. The question whether this lactase deficiency is genetic, is disputed. Fact is that milk consumption in China is increasing, because of the growing awareness of healthy nutrition. To partly satisfy the increasing demand a large amount of powdered milk is imported. On the shelves of the larger supermarkets you have an enormous choice in powdered milk or UHT milk, but also the share of fresh milk is increasing.

A dairy farm near Guangzou

In the southeast of China, near Guangzhou (formerly Canton), an American businessman established a large dairy farm in the early eighties. His intention was to provide fresh high quality milk for the cities Guangzhou and Hong Kong. Because the knowledge of modern dairy farming was and still is scarce in China, he needed advice from western experts. Therefore the American dairy specialist, Prof. D. V. Armstrong, was contacted because of his knowledge of heat stress in dairy cattle. He advised on the design of barns and the milking parlor. Because the climate in Guangzhou is subtropical to tropical, the less well-adapted Holstein-Friesian cows have to be cooled to achieve high production. At this moment, there are about 1.200 cows in freestall barns and about 1000 head of youngstock. The average production level is approximately 6000 kg per cow. Milk fat and protein are not measured because the milk is sold for fluid consumption after processing. The milk is cooled to 4°C by a turbo-cooler before it is put into the bulk tank. From this tank, it is transported almost daily to their own local milk processing plant in Guangzhou or Hong Kong.

The veterinary problems on a dairy farm under these conditions are not much different from those on most dairy farms, except that they are more severe and frequent.

Heat stress

The most important problem is heat stress. Problems arising from heat stress include nutrition (the cows eat less), the estrous cycle elongates, cows show fewer signs of heat, and the immune system is suppressed, thus other diseases have more chances.

You can handle heat stress quite well under these circumstances, by locating barns on hilltops, aligning them with the prevailing wind, designing barns with reflecting raised roofs with a shallow angle, installation of ventilation equipment, and sprinklers that can cool cows.

Mastitis

Mastitis is the second major problem. Environmental bacteria and other pathogens can survive very well under these warm and humid conditions and *probably* cause a lot of mastitis cases. I say *probably*, because I have tried to identify the pathogen. The equipment on the farm was not suited to identify pathogens, therefore I sent samples to a government laboratory. This government laboratory gave the results after 3 weeks(!): all samples were negative, without explanation. I did not send other samples to this laboratory. Because of the course of clinical cases, I suspected most of the cases were environmental clinical mastitis due to acute, watery yellowish milk with clots and fibrine in it, sometimes with blood. In spite of the fact that no pathogens could be identified, a fitting treatment had to be found. There was a belief that resistance to intramammary antibiotics was developing and therefore, an antibiogram would be very useful. With the available laboratory equipment I tried to culture pathogens out of clinical quarter samples on a standard agar plate (a blood agar would have been better). By putting a little droplet of antibiotic on the plate after striking the plate, a day later you have an impression of which antibiotic is the best choice. It is probably not very accurate, but it gives you an idea under the given circumstances.

Probably, the free stalls caused most

The average production level is approximately 6000 kg per cow (Photo: Olde Riekerink)

of the mastitis problems. These stalls were built 16 years ago and were never really maintained, because everybody waited for the construction of a new, larger farm.

As a result, most free stall separators were worn out or broken, in a lot of stalls the mattresses were gone, and no bedding material was used. The free stalls were too small for the cows. In short, they were not comfortable or clean and many cows were lying in the alleyways where it was even dirtier. Fortunately, at this moment the freestall separators are being repaired and the management is trying out sand bedding in the freestalls. The cows seem to appreciate that.

Commercial Development work

It is an enormous challenge to manage a dairy farm of this size well in a country like China. The warm climate provides its own challenges and makes fighting the "normal" dairy farm problems more difficult. The motivation and willingness to work of the staff and the high milk price in relation to the labor costs make dairying favorable. Regarding this, it could be argued that development projects should have a more commercial character. Sustainability –as long as there is a market for the milk- is guaranteed. In this case, it leads to the expansion of the farm. It generates labour, not only to the people working on the farm and in the processing plant, but also to the connected Chinese businesses. There is transfer of knowledge. Without this, it is hard or even impossible to manage a farm of this size with mainly Chinese staff. This knowledge has given some of the workers the inspiration to start a dairy farm themselves, and not without success! And last but not least: the aspect of food-security. The product of this dairy farm is an excellent, safe, protein rich, and healthy supplement in the diet of many Chinese.

R.G.M. Olde Riekerink
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Stellenbosch, South Africa
21 - 25 January, 2001
5th International Sheep Veterinary Congress. Organised by: Prof. Gareth Bath (Fax: +27.11.7927522, e-mail: reshot@yebo.co.za). Reservations: P.O. Box 782902, Sandton, 2146, South Africa or AACV, Anne Cover (Tel.: +61.7.33787944; fax: +61.7. 38783559,e-mail: aacv@ava.com.au; www.up.ac.za/academic/lhpg)

Palmerston North, New Zealand
19 –23 February, 2001
International Conference - Animal Health Economics. Location: Massey University. Contact: D. McCrae, Massey University EpiCentre, (Tel.: +64.6.3505270, fax +64.6.3505716, e-mail : epicentre@massey.ac.nz, http://epicentre.massey.ac.nz).

Berlin, Germany
5 March – 25 May, 2001
Short term training in Veterinary Epidemiology. Three modules of 4 weeks each, which can also be elected separately. Three consecutive intensive workshops (3 days each) are organised from 28 May to 8 June, 2001). Module 1: Introduction to computer use and orientation to statistics; Module 2: Epidemiology I and Statistics I; Module 3: Epidemiology II and Statistics II. Organised by: Postgraduate Studies in International Animal Health, Free University Berlin. Course fee: DM 3,150 per module of 4 weeks and DM 800 per workshop of 3 days. Fee for full programme: DM 10,000. Closing date: 15 January, 2001. Application:

Coordinator Postgraduate studies, Free University, Luisenstrasse 56, 10117 Berlin (Tel.: +49.30.20936063, fax: +49.30.20936349, e-mail: tropvet@city.vetmed.fu-berlin.de).

Melbbourne, Australia
5 March – 15 December, 2001
Degree of Master of Veterinary Studies (MVS) in Avian Health. Organized by: Faculty of Veterinary Science, Univ. of Melbourne. Areas of study: Poultry pathology; Infectious diseases causes and serology; Disease, diagnosis, prevention and control; Poultry production systems and procedures; Product-related knowledge, meat processing and egg packaging plants. Tuition fee: $A 27,000. Closing date for applications: 30 November, 2000. Information: Dr. Trevor Bagust, Course Co-ordinator, Faculty of Veterinary Science, Univ. of Melbourne, Parkville, Victoria 3052 (Tel.: +61.3.93449676, fax: +61.3.93449675, email: t.bagust@vet.unimelb. edu.au).

Barneveld, The Netherlands
26 March - 25 May, 2001
23rd International animal feed training programme (AFTP). Organized by: IPC Livestock International, Barneveld College. Fees including board and lodging: NGL 15,500. Information: IPC Livestock Barneveld College, Dep. of International Studies and Co-operation Programmes, P.O. Box 64, 3770 AB Barneveld (Tel.: +31.342.414881, fax: +31. 342.492813, e-mail: io@ipcdier.hacom.nl).

Melbourne, Australia
13 –18 May, 2001
3rd Pan Pacific Veterinary Conference. Location: Melbourne Convention Centre. Contact: D. Culliver, AVA Conference Organising Service (address: P.O. Box 4257, Kingston ACT 2604, tel. +61.2. 62738855, fax +61.2.62738899, e-mail: avacos@ava.com.au, www.ava.com.au).

Sydney, Australia
2 – 6 July, 2001
Veterinary Conservation Biology: Wildlife health and Management in Australasia. Jointly organised by: AAVCB, WAWW, WSNZVA and WDA. Programme: Conservation biology in Australasia; Wildlife utilisation; Marine wildlife and birds; Wildlife recovery and reintroduction programmes and vertebrate pests; Wildlife health in Australasia. Information: L. Vogelnest, Taronga Zoo and Quarantine Centre, P.O. Box 20, Mosman NSW 2088, Australia (Fax: +61.2. 99784516, e-mail: lvgel nest@zoo.nsw.gov.au)

San Francisco, USA
12 – 14 July, 2001
Conference higher education and research for agriculture and food systems in the 21st century. Organized by the Global Consortium of Higher Education and Research for Agriculture (GCHERA). Information: GCHERA Secretariat (e-mail: gchera@iastate.edu, http:/www.gchera.iasate.edu/).

South Africa
22-27 July, 2001
6th Biennial meeting of the Society for Tropical Veterinary Medicine (STVM). Theme: Wildlife and livestock disease and sustainability. Information: Wendy C. Brown, Department of Veterinary Microbiology, Washington State University, Pullman, WA 99164 (E-mail: wbrown@vetmed.wsu. edu).

Copenhagen (Denmark)
20-24 August, 2001
10th International Conference of the Association of Institutions for Tropical Veterinary Medicine (AITVM). Theme: 'Livestock, Community and Environment'. Subjects: (1) Livestock-environment interactions and the impact on human health and animal health and reproduction; (2) Appraisal of recent changes in delivery of livestock services; (3) New approaches to veterinary education; (4) Control of transboundary epizootic diseases; (5) Poultry production and health under smallholder conditions; (6) peri-urban animal production systems - opportunities and environmental constraints; (7) Veterinary public health: aspects of zoonoses and food quality. Scholarships: The Organising Committee will approach relevant national and international organisations and agencies in an effort to secure attendance of participants from developing countries. Location: Royal Veterinary and Agricultural University (KVL). Information: Dr. Niels Chr. Kyvsgaard, KVL, Danish Center for Experimental Parasitology, 13 Bülowsvej, DK-1870 Frederiksberg C., Copenhagen (Fax: + 45.35. 282774, e-mail: nck@kvl.dk, www.aitvm.org).

Barneveld, The Netherlands
24 August, 2001 – 1 March, 2002
International course on poultry husbandry and International course on pig husbandry. Organized by: IPC Livestock International, Barneveld College. These courses will run at the same time. Following these courses participation is possible in the International animal feed training programme (AFTP), which runs from 4 March to 31 May, 2002. Direct entry in this last course is also possible. Fees including board and lodging: Poultry course: NLG 25,500; Pig course: NLG 25,500, Feed course; NLG 13,000 or 15,500 (direct entry). Closing date: 1 May, 2001. Information: IPC Livestock Barneveld College, Dep. of International Studies and Co-operation Programmes, P.O. Box 64, 3770 AB Barneveld (Tel.: +31.342.414881, fax: +31. 342.4-92813, e-mail: io@ipcdier.hacom.nl).

Stresa, Italy
26-30 August, 2001
18th International Conference of the World Association for the Advancement of Veterinary Parasitology (WAAVP). Information: New Team, Via C. Ghiretti, 2, I-43100 Parma (Tel.: +39.521. 293913, fax: +39.521.294036, e-mail: newteam.parma@iol.it).

Utrecht, The Netherlands
1 September, 2001 - 31 August, 2003
International MSc programme of the Graduate School of Animal Health, Faculty of Veterinary Medicine Utrecht University and ID-DLO Institute for Animal Science and Health, Lelystad. Programme: MSc Course 'Animal Pathology', duration 2 years (fee: NLG 35,000); MSc course 'Veterinary Anaesthesiology', duration 18 months (fee: NLG 35,000). Registration before 1 August, 2001. Information: Office for International Co-operation, Faculty of Veterinary Medicine. P.O. Box 80.163, 3508 TD Utrecht (Fax: +31.30.2531815, e-mail: bic@vet.uu.nl, www.vet.uu.nl).