Equator : informatieblad over veterinaire aspecten van ontwikkelingssamenwerking

EQUATOR

NEWSLETTER ON VETERINARY ASPECTS OF INTERNATIONAL DEVELOPMENT COOPERATION

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LETS WORK BETTER TOGHETER

Interview with Dr. Hank Fitzhugh, Director General of the International Livestock Research Insitute (ILRI)

Dr. Hank Fitzhugh, Director General of the International Livestock Research Institute (ILRI), visited The Netherlands during a few days in January, 1999. For this occasion 2 workshops were organized at the Wageningen University and Research Center and at the ID/DLO Institute in Lelystad. During these workshops, meetings of working groups and informal talks, Dr. Fitzhugh was given the opportunity to present ILRI's programme and to discuss with Dutch scientists from Wageningen, Lelystad and Utrecht, the areas for future collaboration. The editor of EQUATOR took this opportunity to ask Dr. Fitzhugh a number of questions specifically related to animal health and post graduate training. To give a more balanced impression of what ILRI stands for we have added an excerpt of the ILRI web site (http://www.cgiar.org/ilri/).

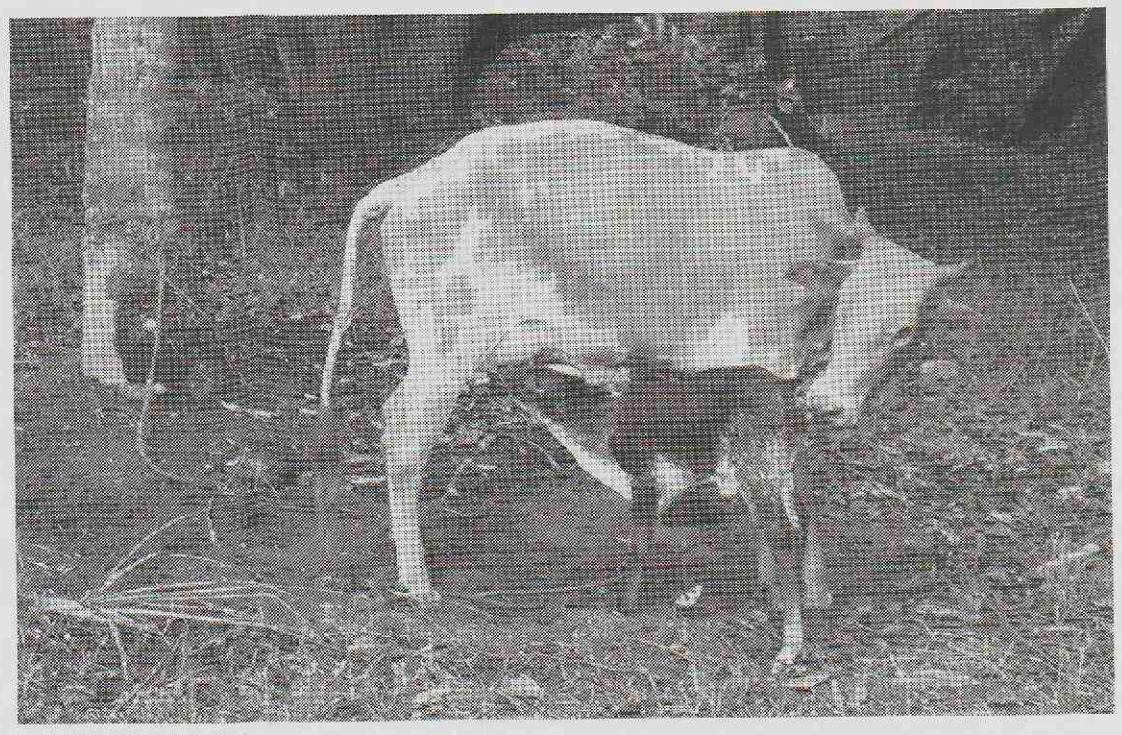
What is the purpose of your visit to The Netherlands?

'The principle purpose for me is to become better acquainted with Dutch scientists in both animal production and animal health. I have not been in The Netherlands for a number of years, so I did not have an opportunity to meet the scientists and the directors of the institutes. As ILRI looks to the future, we think that we can do more by strengthening our working relationships with Dutch scientists.'

What do you see as the greatest threats to animal health in the tropics, apart from inadequate nutrition?

'.....The last part of that question sort of surprised me. Indeed it is difficult for animals to stay healthy if they are not adequately fed. The problems of animal health are many. Epidemic diseases, such as rinderpest, and the devastating effect that they have, is well known. But realistically it is the diseases caused by parasites, including internal parasites, blood sucking parasites, and bacterial and viral diseases that they carry, that, even though they may not kill the animal, are most important. It is the loss of productivity that we see as really being the greatest problem in the tropics.

Other aspects that we are giving much more emphasis in our research in epidemiology are the diseases of trade and diseases of production. We see livestock as a principle means by which small holder producers and national governments, will be able to generate income. But if their trade is limited because of disease quarantine barriers then this really restricts the income that could result from it. An example is what has happened in East Africa last year with the problem of Rift Valley Fever. The export of livestock from East Africa into Saudi



ILRI's beneficiaries are the livestock owners in developing countries who are attempting to rise from a subsistence existence to enter the market economy (Photo: Paling)

Arabia and other areas, which had been a tremendous profit generating opportunity for livestock producers, was effectively stopped.
For ILRI we do not see that we will get into biological research of these diseases, but there is need to get into the epidemiological research and to help others identify where they can intervene with biological or other types of technical or technological research on these diseases of trade and production.'

Do you see examples of these diseases in Asia as well?

'Well very much so. In fact our group working in epidemiology, which is lead by Brian Perry, has been asked to work in the Southeast Asian area, specifically Thailand, but also in other countries in Indochina, on foot-and-mouth disease. The movement of livestock in that area is very substantial. It is difficult to control it at the borders and the control of foot-and-mouth disease has become a very serious problem. It is a regional problem, not just a national problem. So Brian and his colleagues, working with Thai scientists and veterinarians and also with FAO veterinarians, are doing an epidemiological study of foot-and-mouth disease in that region.'

Could this work also include swine fever in south-east Asia or not yet?

'Well, a good question. But we are not yet working on swine fever.'

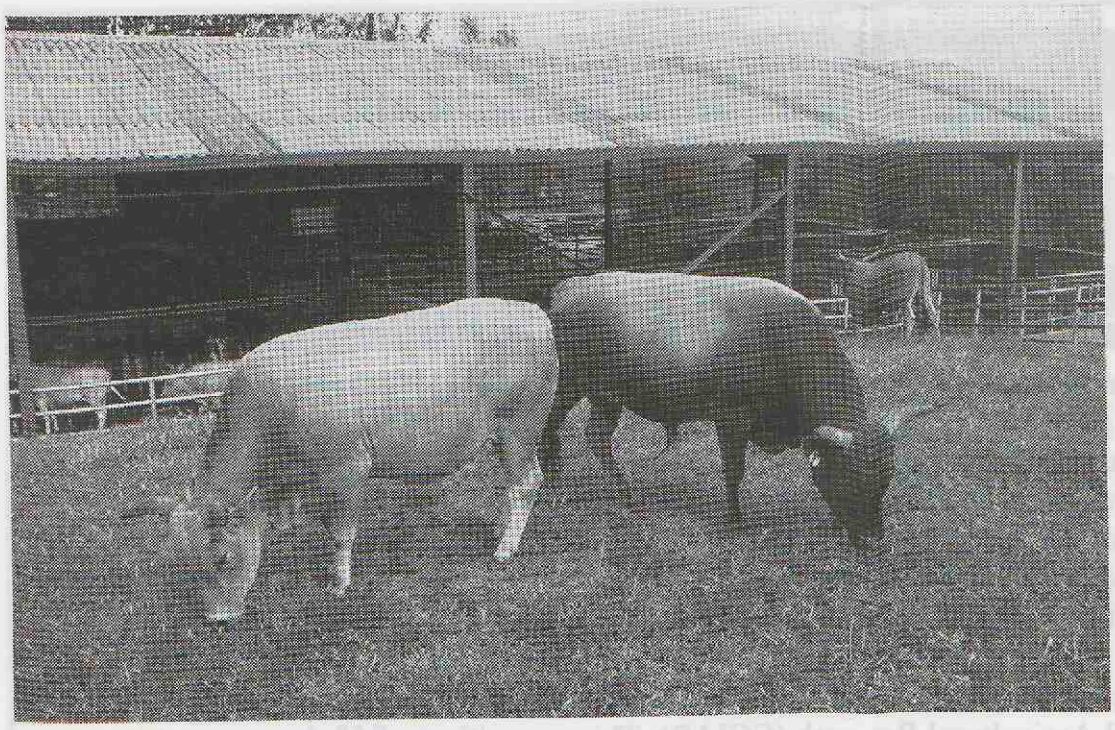
From the diseases you mentioned so far, biological research at ILRI is restricted to some of the parasitic diseases. In the past ILRAD had an emphasis on theileriosis and trypanosomosis, with a substantial group of researchers. Now, under the present ILRI, this has been scaled down. Do you still reckon that ILRI has a role to play in basic research on these diseases at the moment?

'Yes, I do agree. I am talking about your statement that we scaled down these research areas. What we have been faced with is that the new institute has a global mandate, outside sub-Saharan Africa. So, what we had to do was to shift resources from animal health to address problems in Asia and Latin America, as well as in Africa. Necessarily that meant that slightly less emphasis is going into biological research, such as vaccine development and diagnostics for trypanosomosis and theileriosis. We continue to see that we have a comparative advantage for this research because we got more than 20 years of institutional experience. Particularly as we move this research to the molecular biology of both the parasite and the host and the interaction between these heamoprotozoan parasites and the ruminant host. We need to maintain that capacity and we are. In fact we are actually expanding some areas of this work. For example on *Theileria parva* we have research aimed at mapping the genome of *T. parva*. The concept being that when we know the genome of this parasite, we will be better placed to do research aimed at either vaccines or other control measures.
On the trypanosomosis side the emphasis is very much on identifying the basis for the genetics of trypanotolerance. We have collaboration with Dutch scientists such as Johan van Arendonk, identifying the genetic basis for trypanotolerance.

Let me summarise. We continue to have a primary emphasis on *Theileria parva* and the various trypanosomes. We broaden this work in epidemiology to other diseases as well but without getting into the biological research. One other area that did come in from ILCA is the genetic research on resistance to internal parasites. So we do have a major research programme, primarily with small ruminants, on resistance to internal parasites.'

Concerning the contacts between ILRI and universities, especially in the area of postgraduate training programmes: How do you see the development of contacts between ILRI and universities in Africa, Asia and Latin America? Is there also a role for the universities in Europe?

'Well, very much so. The opportunities for increasing livestock production are greatest in developing countries. People like you and me, that are from developed countries, recognise that there is really not much enthusiasm about increasing livestock production and productivity in our countries. We are people who are eating more than what the doctor says that we should be eating. But the demand for livestock products in developing countries is likely to more then double over the next 20 years. There are tremendous opportunities, but these op-



N'Dama bulls at ILRI: 'On the trypanosomosis side emphasis is on identifying the basis for the genetics of trypanotolerance' (Photo: ILRAD)

portunities can only be met if we can eliminate the losses due to disease, parasites and other wastages, as well as improve nutrition, genetics and so on.

In order to do that with the limited resources available, it is important that we work better together. We can mobilise all of the resources in the universities and the research institutes around the world and then still we would probably not have enough means to do what is needed. ILRI is quite directly involved in mobilising these resources, bringing the capacity of both individual scientists as well as the institutes in developed countries to bear on problems of livestock in developing countries. There are a number of ways that this can be done. One is bringing the scientific capacities directly through by involving the scientists of institutes in for example The Netherlands. Another way is to involve your students in research; sometimes this may involve research in our laboratories in Kenya or Ethiopia. These students may be from developing countries or from developed countries. These are ways that we see for working together.

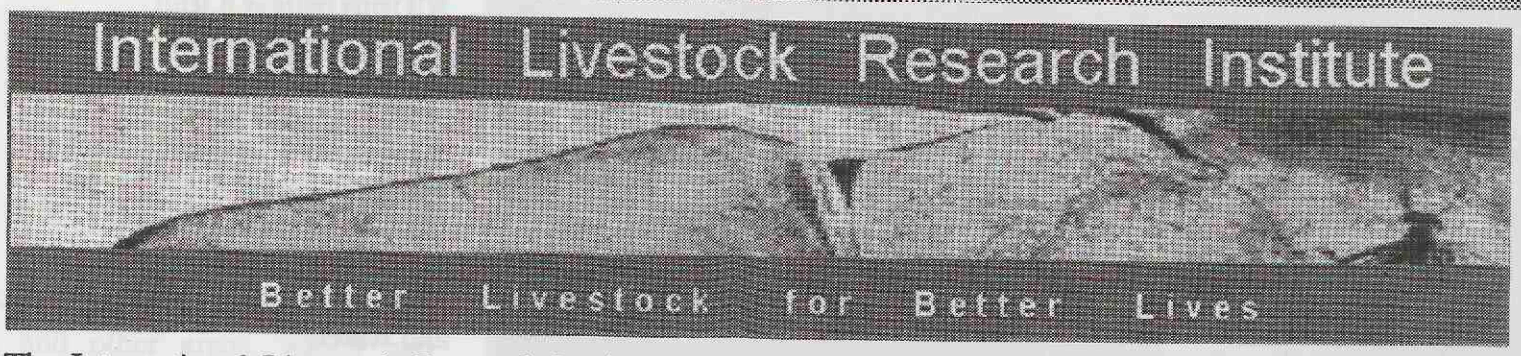
In fact the principle reason why I am here, is to identify opportunities to work with scientists and actually to bring the students to work with our scientists on joint research activities.'

Considering the contacts between ILRI and the universities in Africa and Asia; is there a specific programme, a way that scientists in these universities can make contact with ILRI? I ask this, because when I bring up ILRI during my visits to these institutes, the reaction is: 'ILRI is an institute in Nairobi or Addis and is not for us.' Is there a system whereby people can be introduced to the activities of ILRI and collaborate with ILRI?

'Increasingly the research that ILRI scientists are involved in is done through consortia. These consortia include scientists out of the national institutes. These national institutes include both universities as well as the research institutes. Most countries also have a national agricultural research institute. The opportunity to work through these consortia depends on which country they are in, because we are not working in every country of course. We also have opportunities for scientists to come and work in our laboratories for a period of time and we do have scientific exchanges. There are these possibilities, but I can tell you that the need and the demand for it exceed our capacity to serve it, because we have our own limitations. At this particular moment we have scientists spending 3 months to a year with us from Korea, China and Brazil. Last year we had scientists from Thailand and a number of African countries. It is a good opportunity but it is one that just cannot serve the entire demand. This has been noted, not only for livestock, but also for the other areas that the centres of the Consultative Group on International Agricultural Research (CGIAR) are working in, such as crops, trees soil and water.

Recently there was a review of the entire CG system, referred to as the 'system review' and a strong recommendation, particular focused on Africa, was the need for the CGIAR to lay more emphasis on capacity building. It was recognised that the capacities in Africa, that had been built up with support from a number of countries, including the Netherlands, had actually deteriorated over the passed decade. There was a real concern that universities, as well as the national research institutes, no longer had the capacity to serve the needs of the African countries. There was also recognition that the additional official development systems, that supported this capacity building in the 1980-ies, was less available now. Therefore the problems are there, the need is there, but the capability is not as good as is was even 10 years ago.'

'So the recommendation was made to establish an 'African capacity building initiative'. This will be done, but it is also recognised that these CGIAR centres themselves do not have the comparative advantage to do a lot of the training because they are research institutes. The thrust of the African capacity building initiative is actually to provide a means by which the scientists out of the universities and institutes in Africa can identify the short and long-term training needs and can actually commission them to meet demands of the society. But is our intend to then call upon the training to come out of for example European universities. There are initiatives, such as NATURA, which have been developed in Europe. Quite a few universities in Europe, North America and other countries have actually set up sandwich courses and other means by which they can assist on capacity building. During 1999 this initiative will be established, supported and move ahead. We would expect by the



The International Livestock Research Institute works to improve the well-being of people in developing countries by enhancing the diverse and essential contributions livestock make to smallholder farming. Two-thirds of the world's domestic animals are kept in developing countries, where over 90% are owned by rural smallholders. Ruminant animals provide poor farmers with the resources they need most: high-quality food, animal traction and transport, manure to fertilise croplands, a daily income through dairying, and insurance against disaster. **ILRI** research products are helping to solve the severe problems that hold back animal agriculture, sustainable food production and economic development in the tropics.

ILRI is a non-profit institution governed by an international Board of Trustees. The institute belongs to the Consultative Group on International Agricultural Research (CGIAR). This consortium of 58 donor countries, foundations and organisations funds the work of **ILRI** and 15 other international agricultural research centres. Most of these Centres are located in developing countries; all are working to help smallholder farmers in those countries intensify and sustain their food production. **ILRI** began operations in 1995 with consolidation of staff and facilities of two former CGIAR livestock centres: the International Laboratory for Research on Animal Diseases (ILRAD), based in Nairobi, Kenya, and the International Livestock Centre for Africa (ILCA), based in Addis Ababa, Ethiopia.

Feeding an extra 90 million people a year, most of them in developing countries, while preserving the earth's land, water and biodiversity will challenge the world well into the next century. To help meet that challenge, **ILRI** supports Future Harvest, a CGIAR public awareness campaign that builds understanding of the critical role international agricultural research plays in forestalling a food and environmental crisis of the twenty-first century.

ILRI has a global mandate to enhance the well-being of present and future generations in developing countries through research that improves sustainable livestock production. **ILRI**'s mission is to improve the productivity of smallholder livestock and mixed crop-and-livestock systems while protecting the natural resources that support these systems. **ILRI** is the first institute to take on the full complex of inter-related researchable problems in smallholder animal-based agriculture throughout the developing world.
ILRI's key stakeholders are its investors, the 37 donor agencies funding the research, its partners, the 200-plus institutions collaborating with **ILRI** in research in animal agriculture, its clients, which are the **ILRI** partners that employ the products of this collaborative research, and its beneficiaries, the hundreds of millions of livestock owners in developing countries who are attempting to rise from a subsistence existence to enter the market economy.

As the lead centre within the CGIAR for global livestock research, **ILRI** does not attempt to do everything itself, but rather acts as a convener and strong supporter of livestock research partnerships, networks and consortia worldwide. This collaborative institutional approach was commended in 1997, when the CGIAR Chairman's Science Award for Outstanding Partnerships was bestowed on a smallholder dairy research project conducted jointly by **ILRI** and the Kenya Agricultural Research Institute.

ILRI's partners include advanced research institutions of industrialised countries, national agricultural research systems of developing countries, international agricultural research centres, international and regional research and development organisations, private sector companies and non-governmental organisations.

ILRI's headquarters are in Nairobi, Kenya; another substantial campus is located in Addis Ababa, Ethiopia. **ILRI** also has scientific teams working in Burkina Faso, Colombia, India, Peru, the Philippines, Niger and Nigeria. **ILRI** employs 111 internationally recruited scientific and administrative staff and 18 short-term visiting scientists and consultants. The disciplines, expertise, nationalities and backgrounds of **ILRI**'s international staff are highly diverse.

For more information: http://www.cgiar.org/ILRI

end of the year, if not earlier, to see a new means by which the abilities, skills and capacities out of universities, such as Utrecht, could be brought to bear on the needs of African universities.'

My final question concerns the fellowship programme through WOTRO (Netherlands Foundation for the Advancement of Tropical Research). *How is ILRI going to implement the fellowships that are being made available through WOTRO for postgraduate training?*

'It is actually a key part of our strategy. It is a directed strategy to try to bring in the skills, experiences and scientific expertise of scientists in developed countries and focus them on the problems of livestock in developing countries. One of the ways to do this is to bring students out of the universities, that is those in the Netherlands, bring them into Africa and Asia and focus the graduate research of those students on the important problems of livestock in developing countries. Not only do you get the benefits of the scientists early in their career when they are highly motivated, work hard and get things done; but you can also bring in the skills and experience of the major professors from universities. We see that the need for livestock production is so great and the health problems are so big, that the only way that we can address them is by mobilising all the resources, wherever we can, around the world. Coming back specifically to the support from WOTRO, one of the ways to do it is to bring both early career and the more established scientists to bear on these problems. We are very pleased to have this support from WOTRO.'

Dr. R.W. Paling
(26 January, 1999)

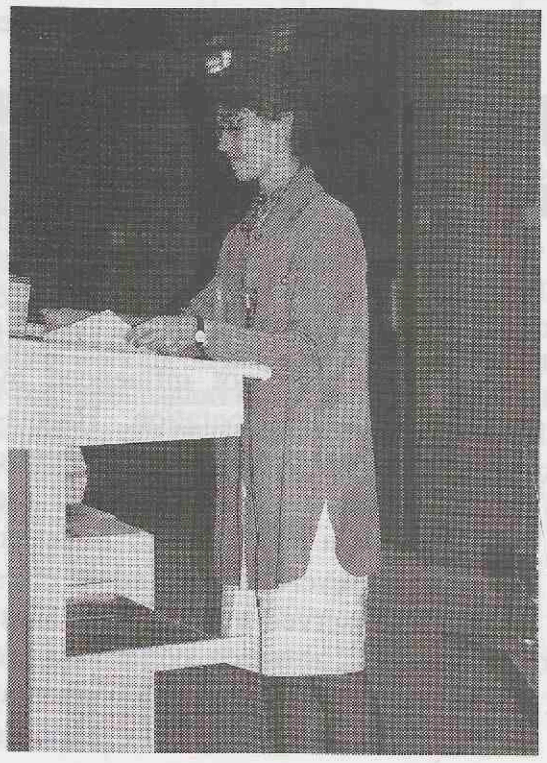
Effects of diet and trypanosomosis in Djallonké ewes in the Gambia

Introduction

Djallonké sheep are the main breed in the Gambia and are considered as trypanotolerant. Adequate reproductive performance is an essential component in efficient animal production. Trypanotolerance in sheep and goats has been described as an ability to maintain production under infection. In trypanotolerant breeds, physiological factors such as pregnancy and lactation and malnutrition may interact with resistance to the effects of trypanosome infection. Two experiments were conducted on-station at the coastal site of the International Trypanotolerance Centre (ITC), The Gambia, West Africa. The site is considered to be at no risk of tsetse challenge. Studies in Djallonké sheep demonstrated the effects of the nutritional status on their resilience to the effects of infection under natural trypanosome challenge and under experimental infection.

Ewe lamb experiment

In the first experiment, twenty-four Djallonké ewe lambs, at a respective weaning age of 4 months were used in a randomised complete block design (blocks based on date of birth). Within blocks, lambs were randomly assigned to one of four treatment combinations: infected high dietary level (HI), control high dietary level (HC), infected low dietary level (LI) and control low dietary level (LC). Feed was offered in a manner that allowed for individually daily feed intake measurements. Animals on the low dietary level were offered a restricted ration, whereas the high diet groups were offered an unrestricted amount. On attainment of six months of age, animals allocated to the infection groups were inoculated with 1 x 104 bloodstream forms of Trypanosoma congolense. A ram, fitted with a colour marking harness was kept with the lambs at all times to help confirm mating times.

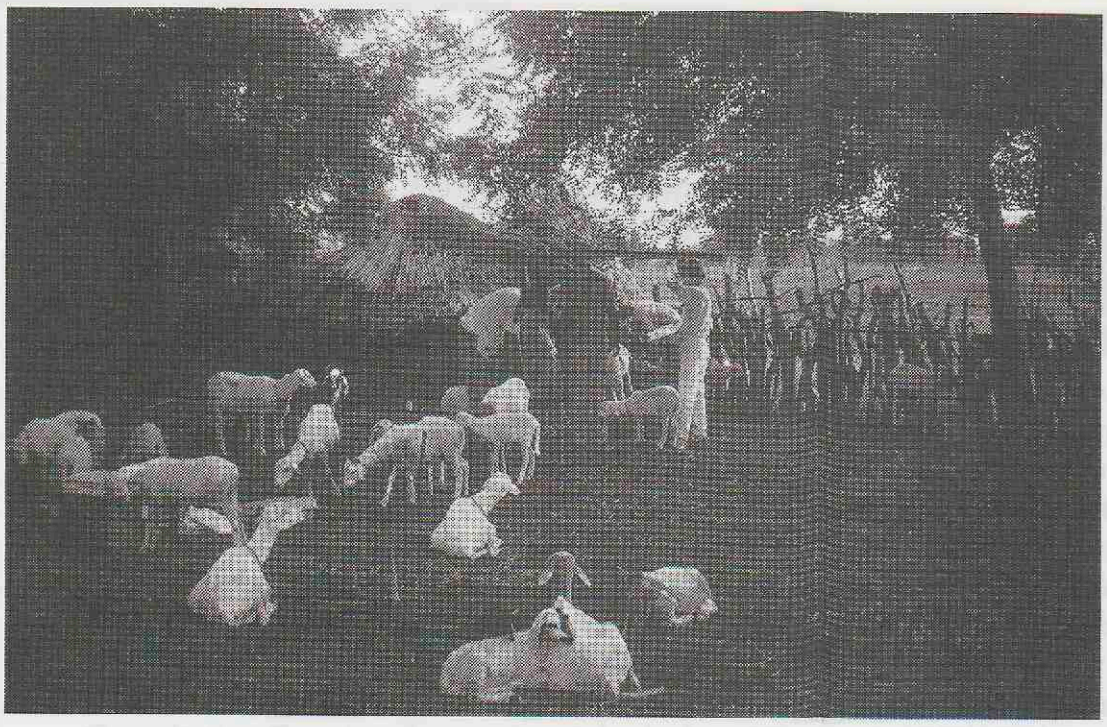


Dr. Sabine Osaer at the 9th Symposium on 'Tropical Animal and Production' in Utrecht November, 1998 (Photo: De Gooijer)

Adult ewe experiment

In experiment 2, forty-two adult ewes were similarly allocated in a randomised block design to one of four treatment combinations as in Experiment 1 (HI, HC, LI, LC). Following parturition's, rations were adapted for lactation. Daily rations were fed per group. In order to synchronise time of breeding with the peak parasitaemia, all ewes were oestrus synchronised. LI and HI ewes were inoculated in a similar way as in Experiment 1, and timed in a way that the peak of parasitaemia would coincide with oestrus. Rams were introduced to the experimental groups at the expected time of oestrus. Considering the design of both experiments, interactions between the effects of trypanosome infection and nutrition were of high interest and were included in the analytical model.

Relations between diet, *T. congolense* infection and weight gain in ewe lambs



Djallonké sheep are the main sheep breed in the Gambia (Photo: Osaer)

In the first experiment, mortality due to trypanosome infection was zero and clinical symptoms were not obvious in the ewe lambs. Despite the initial higher parasitaemia score in group HI, intensity of parasitaemia in the infected ewe lambs was not influenced by the level of diet. The degree of anaemia caused by trypanosome infection was similar in groups LI and HI. The dietary condition did not influence the haematocrit levels. However, high dietary supplementation resulted temporarily in a better haematopoietic response following trypanosome infection, measured as a macrocytic anaemia. Trypanosome infection had a negative effect on live weight gain during the chronic phase, with the difference being more obvious in the HI group. Although the dry matter intake was significantly depressed due to infection and most noticeably in the HI, the depression in weight gain in the former group could not be entirely explained by the drop in feed intake. The latter results gave evidence of increased maintenance requirements due to infection, which led to a decreased nitrogen and energy retention and therefore reduction of the weight gain.

Effects of diet and trypanosome infection on onset and out come of the first reproductive cycle in ewe lambs

The age when the first peak in plasma progesterone concentration occurred varied considerably in the ewe lambs and was not influenced by trypanosome infection. However, high supplementary feeding significantly reduced the age at first cycling (254.8 ± 33.4 days vs. 348.3 ± 33.4 days respectively for high and low diet groups; P 0.05). Age at first lambing was similarly reduced by the diet (564.7± 15.5 days vs. 616.3 ± 15.5 for H and L groups respectively; P< 0.05). Trypanosome infection tended (P 0.09) to delay age at first lambing with a mean difference of 31.5 ± 22.4 days between infected and controls. Interactions between diet and infection for age at first cycling / lambing were not significant; indicating these effects were just additive. Neither birth weights nor growth rates of offspring born to the experimental animals were significantly affected by previous trypanosome infection, nor by the diet of the dam. In contrast, lamb mortality up to 3 months of age was significantly increased by infection of the dam and most losses arose in the infected group on the low diet.

Relations between diet and parasitaemia in ewes

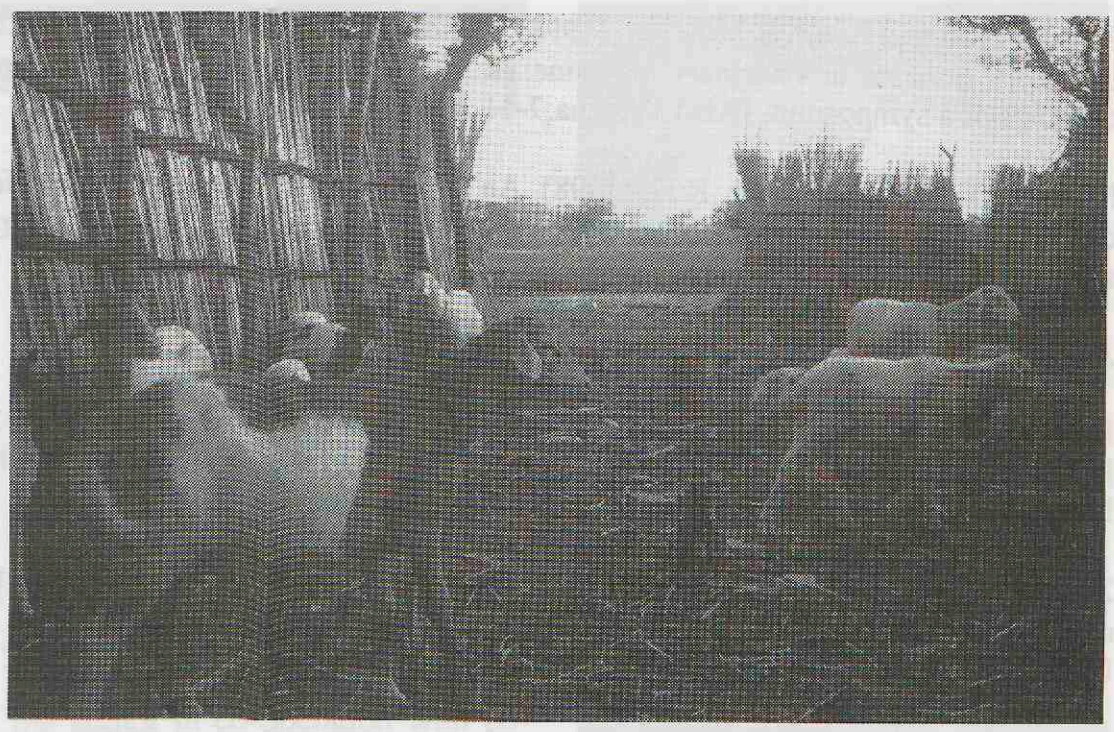
In experiment 2, two ewes from group HI and one from group LI died as a result of trypanosomosis during the acute phase of infection. Severity of parasitaemia was not influenced by nutritional supplementation. Haematology responses were similar to those in the young ewes, except that the initial drop in PCV due to infection was more severe in the adult ewes than that observed in the young ones, the anaemia, however, could also not be encountered by high supplementation. A better haematopoietic response was observed in the high supplemented group, similar to what was observed in experiment one.

Effects of diet and *T. congolense* infection on reproductive performance in ewes

Progesterone levels during the synchronised cycle were significantly depressed due to infection. Diet nor the interaction diet*infection had a significant influence on luteal progesterone production during the first cycle. Levels of pregnant specific protein B (PSPB), which is a protein deriving from the foetus, in pregnant sheep at day 21 and 26 were not significantly affected by nutrition or infection, despite the tendency of a decrease in infected groups. *T. congolense* clearly affected establishment of pregnancy, as shown by lower rates of conception and extended intervals between breeding and confirmation of pregnancy (15.2 ± 10.0 and 78.4 ± 25.0 days, respectively for control and infected groups), nor was there any benefit of nutritional supplementation. The mean time needed to conceive was also reflecting the presence of repeat breeders, occurring most frequent in the infected groups, with mean intervals for respectively LC, LI, HC and HI groups of 29.8 ± 17.2 days, 58.2 ± 19.1 days, 0.6 ± 11.5 days and 98.6 ± 48.9 days. Mean progesterone concentration during pregnancy, in those ewes which lambed, was not significantly influenced by diet or infection. However, the effect of both the *T. congolense* infection and nutritional supplementation on the maintenance and outcome of pregnancy was not clear with the LI and HC performing well and poor pregnancy outcomes in groups HI and LC, although differences in litter size might explain these anomalies.

Relations between diet, *T. congolense* infection and weight gain in ewes and their offspring

Live weight gains during pregnancy due to higher supplements were significantly depressed by infection, with a difference of 1.1 kg ± 0.4 between the control and infected diet groups



Sampling of Djallonké sheep in villages in the Gambia (Photo: B. Goossens

(interaction diet*infection; $P<0.01$). Whilst an overall diet effect remained, post partum weights were even lower in the LI group as compared to the low control. In contrast to experiment one, high supplementary feeding of the ewes resulted in faster daily gains of their lambs. In addition, trypanosome infection interacted significantly ($P< 0.01$) with the diet effect and resulted in the poorest lamb growth rates in those deriving from the LI group. Unlike in experiment one, infection of the dam did not affect lamb survival rates. These inconsistent findings on lamb performance may be partly explained by the differences in interval between trypanosome infection in the dam and parturition in the two experiments.

Conclusions

In the young ewes, the effects of trypanosome infection on attainment of puberty and consequently age at first lambing were indirectly mediated through depression of their growth rates.

In the adult breeding ewes, the most pronounced effect of *T. congolense* was a negative influence on establishment of pregnancy, with nutritional supplementation unable to overcome this effect but having a beneficial influence on maintenance and successful outcome of pregnancy. However, individual exceptions indicated that some ewes cope better with the negative effects of infection and poor nutrition. Nutritional supplementation enabled a better erythropoietic response to *T. congolense* infection in both young and adult ewes. High supplementation of infected dams resulted either in better offspring survival rates or improved lamb growth rates as compared to the low supplemented ones.

The benefits of supplementary feeding of growing sheep infected with trypanosomes was not clear since large part of the extra feed was used to compensate for infection. Further research should explore this. However, the results undoubtedly indicated the delaying effect of insufficient feeding on onset of puberty and reproductive performance in young Djallonké sheep. Dietary supplementation of trypanosome-infected Djallonké ewes during pregnancy and lactation improves productivity in terms of ewe live weight and improved lamb growth rates to weaning.

S. Osaer[1], B. Goossens[1] and I. Jeffcoate[2]

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(This paper was presented at the 9th Symposium on 'Tropical Animal and Production. Ruminant nutrition in disease resistance and reproduction', 27 November, 1998, Utrecht, The Netherlands. The full text is published in the 'Programme and abstracts', pp 31-34).

RECENT PUBLICATIONS 26

The section RECENT PUBLICATIONS is included in the English issues of EQUATOR. Scientific publications of the Faculty of Veterinary Medicine and other research institutes in The Netherlands, relevant to livestock production and health in the tropics as well as titles of papers by Dutch veterinary scientists working on animal health and production topics in relation to developing countries, will be included. Please inform the editor of your publications so we can bring them to the attention of the readers of EQUATOR. For reprints contact the authors directly, their addresses can be obtained from the editorial office. Copies of the abstract book of the 9th Symposium Tropical Animal Health and Production. Ruminant nutrition in disease resistance and reproduction. Utrecht, 27 November, 1998 are available from the editors office.

ANIMAL HEALTH

Eerden, B.J.M. van der (1998). The FAO/IAEA external quality assurance programme for disease diagnosis. In: Towards livestock disease diagnosis and control in the 21st century. Proceedings of a symposium, IAEA, Vienna,, 7-11 April, 1997, pp. 319-338.

Kramps, J.A. and Rooij, E.M.A. van (1998). Validation, standardisation and control of ELISA techniques for diagnosis of infectious diseases in veterinary medicine. In: Towards livestock disease diagnosis and control in the 21st century. Proceedings of a symposium, IAEA, Vienna,7-11 April, 1997, pp: 293-303.

Ndegwa, T.K. and Dwinger, R.H. (1998). An introduction to the geographic information system and its use in livestock disease control programmes. In: Towards livestock disease diagnosis and control in the 21st century. Proceedings of a symposium, IAEA, Vienna, 7-11 April, 1997, pp: 383-396.

ANIMAL NUTRITION

Beynen, A.C. and Rutten, V.P.M.G. (1998). Nutrition and disease resistance. In: Tropical Animal Health and Production. Ruminant nutrition in disease resistance and reproduction. Utrecht, 27 November, 1998. Eds. J.H.A. de Gooijer and R.W. Paling. pp. 7-9.

Zwart, D., Schrama, J.W. and Dam, J.T.P van (1998). Roughage feeding and trypanosome infections in West African dwarf goats. In: Tropical Animal Health and Production. Ruminant nutrition in disease resistance and reproduction. Utrecht, 27 November, 1998. Eds. J.H.A. de Gooijer and R.W. Paling. pp. 25-30.

ANIMAL PRODUCTION

Udo, H. and Cornelissen, T. (1998). Livestock in resource-poor farming systems. Outlook on Agriculture 27: 237-242.

Zwart, D., Keulen, H. van and Noordhuizen, J.P.T.M. (1998). Veterinary science in the context of sustainable livestock production. In: Towards livestock disease diagnosis and control in the 21st century. Proceedings of a symposium, IAEA, Vienna, 7-11 April, 1997, pp: 475-489.

TICK-BORNE DISEASES, THEIR AGENTS AND VECTORS

Boultier, N.R., Brown, C.G.D., Kirvar, E., Glass, E. Campbell, J., Morzaria, S., Nene, V., Musoke, A., Oliveira, C. d', Gubbels, M.J., Jongejan, F. and Hall, F.R. (1998). Different vaccine strategies used to protect against *Theileria annulata*. Annals of the New York Academy of Sciences 849: 234-246.

Brown, C.G.D., Ilhan, T., Kirvar, E., Thomas, M., Wilkie, G., Leemans, I. and Hooshmand-Rad, P. (1998). *Theileria lestoquardi* and *T. annulata* in cattle, sheep and goats. *In vitro* and *in vivo* studies. Annals of the New York Academy of Sciences 849: 44-51.

Katzer, F., McKellar, S., Ben Miled, L., Oliveira C. d' and Shiels, B. (1998). Selection for antigenic diversity of Tams1, the major merozoite antigen of *Theileria annulata*. Annals of the New York Academy of Sciences 849: 96-108.

Kock, N.D., Moore, P.F., Jongejan, F., Houghton, J., Hubert, J. and Coffman, R.L. (1998). Suppression of interleukin-5 prevents mortality in Balb/C mice infected with Cowdria ruminantium. Annals of the New York Academy of Sciences 849: 378-380.

Leemans, I., Hooshmand-Rad, P., Brown, C.G.D., Kirvar, E., Wilkie, G. and Uggla, A. (1998). *In vitro* infectivity and *in vivo* cross-protectivity of *Theileria lestoquardi* and *T. annulata* in sheep and cattle. Annals of the New York Academy of Sciences 849: 408-411.

Mahan, S.M., Semu, S.M., Peter, T.F. and Jongejan, F. (1998). Evaluation of the MAP-1B ELISA for cowdriosis with field sera from livestock in Zimbabwe. Annals of the New York Academy of Sciences 849: 259-261.

Mondry, R., Martinez, D., Camus, E., Licbisch, A., Katz, J.B., Dewald, R., Vliet, A.H.M. van and Jongejan, F. (1998). Validation and comparison of three enzyme-linked immunosorbent assays for the detection of antibodies to *Cowdria ruminantium* infection. Annals of the New York Academy of Sciences 849: 262-272.

Totté, P., McKeever, D., Jongejan, F., Barbet, A., Mahan, S.M., Mwangi, D. and Bensaid, A. (1998). Analysis of cellular responses to native and recombinant proteins of *Cowdria ruminantium*. Annals of the New York Academy of Sciences 849: 155-160.

Uilenberg, G. (1998). Tickborne diseases control. In: Towards livestock disease diagnosis and control in the 21st century. Proceedings of a symposium, IAEA, Vienna, 7-11 April, 1997, pp: 219-230.

FOR YOUR INFORMATION 1

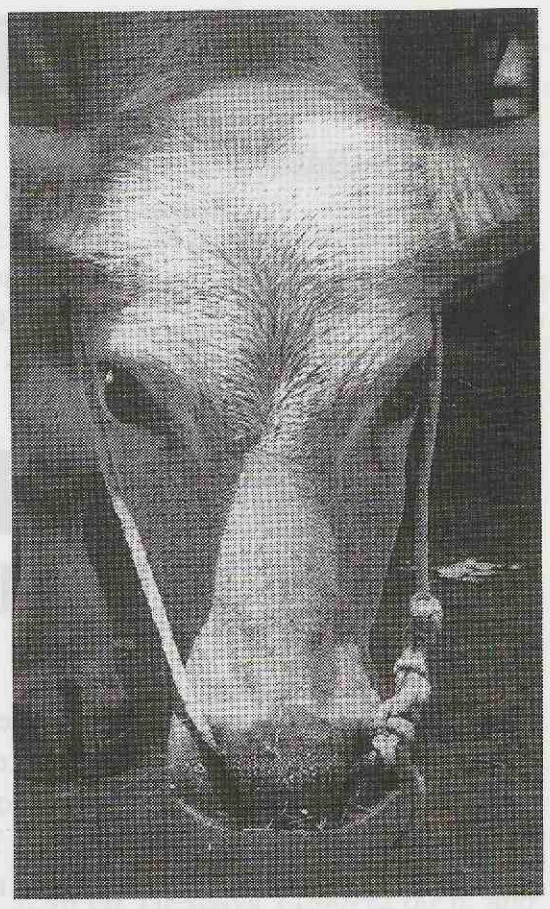
HAEMORRHAGIC SEPTICAEMIA IN DAIRY BUFFALOES IN PAKISTAN. Pathogenesis and prevention of the disease

Najmul Hasnain Shah

Dissertation for the doctors (PhD) degree at the Vrije Universiteit, Amsterdam (The Netherlands) on 21 December, 1998 (100 pages).

This dissertation describes the work of the author in co-operation with co-workers and colleagues. It is partly a compilation of studies published earlier in scientific journals.
Haemorrhagic septicaemia in buffaloes is caused by *Pasteurella multocida* of different identified serotypes i.e. A,B,D,E and F. The regular outbreaks are of high economic significance. The different serotypes and strains have been studied with respect to their expression of iron-regulated membrane proteins and their immunogenicity of polysaccharide antigens. Interesting is the finding that the impairment of the innate immunity is most likely due to the macrophage vacuolating cytotoxic activity of the bacteria causing macrophage cell death.
The development of an improved oil adjuvant vaccine is described. Its safety, the immune response and the protection have been experimentally checked. The vaccine induced a high IgG antibody titre and proved in cross challenges to be significantly more protective than the local vaccines.
This typical veterinary work fitted in a programme under the supervision of his promotor Prof. Dr F.K. de Graaf of the Faculty of Biology of the Vrije Universiteit, Amsterdam, This programme aims at the application of different biotechnical techniques in tropical countries.
Dr. S. Nasir Hussain Shah, who is the director of the Centre of Animal Biotechnology, Veterinary Research Institute, Peshawar, Pakisrtan, was the co-promotor of Najmul Hasnain Shah. Some years ago, in 1990, Dr. Nasir Shah received his PhD degree at the Utrecht University based on his research on: 'Prolonged calving intervals in the Nili Ravi buffaloes'.
The study of Dr. Najmul Hasnain Shah was financially support by The Netherlands Foundation for the Advancement of Tropical Research (WOTRO-NWO) and the Ministry of Foreign Affairs.

References:
Shah, N.H., Biewenga, J. Shah. N.H. and Graaf, F.K. de (1996). Vacuolating cytotoxic activity of *Pasteurella multocida* causing haemorrhagic septicaemia in buffalo and cattle. FEMS Microbiol. Lett. 143: 97-101
Shah, N.H., Shah, N.H. and Graaf, F.K. de (1997). Protection to haemorrhagic septicaemia induced by vaccination of buffalo calves with an improved oil adjuvant vaccine. FEMS Microbiol. Lett. 155: 203-278.
Veken, J.W., Shah, N.H., Klaasen, P. Oudega, B. and Graaf, K.F. de (1996). Binding of host-binding proteins and expression of iron-regulated membrane proteins by different serotypes of *Pasteurella multocida* causing haemorrhagic septicaemia. Microbial Pathogenesis. 21: 59-64.



Improved vaccine protects water buffaloes against haemorrhagic septicaemia (Photo: Paling)

FOR YOUR INFORMATION 2

Announcement of DIO symposium

Every year the DIO Foundation (Foundation for Veterinary Medicine in Development Co-operation) organises a symposium for its members, supporters and others who are interested. The tittle of this year's symposium is: **'DIO goes Africa'**. Speakers are invited to throw their light on the role of veterinary aid in developing countries in Africa. In Africa development co-operation is an important step on the way to improved food supply and public health. The symposium takes place on **15 April, 1999** in the Androclus building of the Faculty of Veterinary Medicine (Yalelaan 1, De Uithof, Utrecht) and starts at 19.30 h. Everybody is warmly invited.

Information: DIO tel.: 030.2532032

TRYPANOSOMOSIS

Rebeski, D.E., Winger, E.M., Rooij, E.M.A. van, Schöchl, R., Schuller, W. and Dwinger, R.H. (1998). Pitfalls in the application of antigen immunoassays: monitoring of *Trypanosoma vivax* infection in two goats using direct and indirect diagnostic techniques. In: Towards livestock disease diagnosis and control in the 21st century. Proceedings of a symposium, IAEA, Vienna, 7-11 April, 1997, pp: 577-579.

VACANCIES

INTERNATIONAL COOPERATION

This section contains vacancy announcements which the editorial board considers to be of possible interest to Dutch veterinarians. Besides vacancies that will be taken from Vacatureblad Internationale Samenwerking, Tijdschrift voor Diergeneeskunde, Veterinary Record, Intro vacatures (RPDAdvies/Ministry of Internal Affairs) etc., there will be room for personnel advertisements. For further information about the vacancies please contact the institution or company directly.

International Livestock Research Institute (ILRI)

ILRI has a position for a:

LIVESTOCK GENETICIST— Project Co-ordinator, Development of Disease Resistant Livestock (Nairobi)

Vac. nr.: PCDL/01/99

Location: ILRI-Nairobi, Kenya

General Information

International Livestock Research Institute (ILRI) is a non-profit international research organisation, serving a global mandate to improve productivity of small-holder livestock systems and to protect the natural resources that support these systems. ILRI has staff and activities in Latin America, Asia and Africa and headquarters in Nairobi and principal facilities in Kenya and Ethiopia. ILRI is one of the 16 research centres supported by the Consultative Group on International Agricultural Research (CGIAR), which comprises over 55 member countries, international organisations and foundations. The co-sponsors for the CGIAR are the World Bank, the Food and Agriculture Organization (FAO), the United Nations Development Programme (UNDP) and United Nations Environment Programme (UNEP).

The position

ILRI has a position for a Project Co-ordinator in Development of Disease Resistant Livestock. This is a senior position in the Institute. The successful candidate will join a multi-disciplinary team in the Biosciences Programme, reporting to the Programme Director. The incumbent is responsible for co-ordination of the whole project area which currently includes operational projects, based in Africa and Asia conducting research on the genetics of resistance to trypanosomosis in cattle and laboratory animals, and the genetics of resistance to helminths in small ruminants and laboratory animals. The Co-ordinator is directly responsible for scientific leadership and all management aspects of the Project. He/she is required to manage project funds and to play a major role in identifying and obtaining new sources of funding. Development and co-ordination of collaborative projects with other laboratories is an important component of the work.

Qualifications and experience

- A PhD degree or equivalent, with appropriate specialisation in animal molecular and/or quantitative genetics
- Ten or more years relevant research and management experience, and an extensive publication record are required.
- The successful candidate will also have experience in QTL technology and its application in breeding programmes and a good understanding of the patterns of genetics of disease resistance, preferably with appropriate developing country experience. In addition.
- Good communication and interpersonal skills
- Ability to perform in a multi-disciplinary and multi-cultural research environment
- Fluency in spoken and written English are essential.

Conditions

The initial contact for this position is for a three-year term with the possibility of extension.

ILRI provides excellent benefits including employer-paid medical, life and disability insurance and retirement benefits. The salary, dependent on experience, is paid in US dollars. Relocation, housing, annual leave travel and education allowances are also provided. On-site accommodation in fully furnished houses is provided subject to availability.

Application

Applicants should send a cover letter, resume and the names and addresses (including telephone, fax and e-mail)

of three referees who are knowledgeable about the candidate's professional qualifications to the Human Resources Manager, ILRI, P.O. Box 30709, Nairobi, Kenya; Telephone: 254 2 630743; fax: 254 2 631499; e-mail: m.morehouse@cgnet.com. Applications should include current telephone number, mailing address and e-mail address or fax number (if available). The name and reference number of the position for which the application is made should be clearly marked on the envelopes of mailed, or on the faxed or e-mail applications. Screening of applications will begin **on 22 March 1999** and will continue until the post is filled.
ILRI is an equal opportunity employer. Qualified women and citizens of developing countries are particularly encouraged to apply.

Ministry of Foreign Affairs
Netherlands Development Assistance (NEDA-HPI)

The Netherlands Development Assistance has a vacancy in the operational expert programme for a:

LECTURER IN LARGE ANIMAL SURGERY (Zimbabwe)

Location
University of Zimbabwe, Faculty of Veterinary Sciences, Department of Clinical Veterinary Studies, Harare, Zimbabwe

Vac. nr.: 99/ZIM/008/S

Duration: three years

General information
The Faculty of Veterinary Science requires an experienced large animal surgeon, preferably conversant with both horses and cattle, and with a bias toward bovine surgery.
The need for this specific expertise is enormous in Zimbabwe, mostly because of the importance of cattle for the economy of the country.

There are three Departments in the Faculty of Veterinary Science with one Professor. The Dean is Head of the Faculty and is answerable to the Vice-Chancellor of the University. The operational expert would be answerable to the Head of Department.

Duties/Job description
- To establish a large animal surgery unit and to be the de facto Head during the time of employment.
- To be responsible for handling all primary and referred large animal surgery cases.
- To attend to all field cases which cannot be transported to the University Hospital.
- To participate, along with large animal medicine clinicians, in rounds.
- To teach and train students.
- Involvement in research is a University policy.
- Appointed member of the Hospital Management Board

Qualifications and experience
- A relevant post graduate qualification or a minimum of five years post qualification involvement in surgery.
- Evidence of publications is a prerequisite

Language: English

Information
Mrs. A. Pfaff (tel: +31.30.70.348 5296 on Tuesdays 11.00-12.00 h. and on Thursdays 16.00-17.00 h.)

Application:
You are requested to send your application quoting the relevant vacancy number to: Hoofdafdeling Personele Zaken Internationale Samenwerking, Bureau Uitzendingen (HPI/UZ), Postbus 20061, NL-2500 EB Den Haag (Teleax: +31.30.70.348 6702).

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London, UK
20 - 23 March, 1999
Short course on Repeated Measures Analysis. Programme: Computer based practical training; small group size; models for repeated continuous, discrete and conditional longitudinal data. Course leaders: Prof. Yrjo Grohn (Cornell University) and Dr. Ynte Schukken (Utrecht University). Organised by: Royal Veterinary College, Hawkshead Campus, Potters bar, Hertfordshire. Fee: UK pounds 290 + VAT. Registration: Maggie McEvoy, UVCE, The Royal Veterinary College, Royal College Street, London NW1 0TU (Tel.: + 171.4685170; telefax: + 171. 3830615; e-mail: mmcevoy@rvc. ac.uk).

Wageningen, The Netherlands
11 - 25 April, 1999
2nd International Course on Livestock and Environment Interactions. Organised by: International Agricultural Centre and Wageningen Agricultural University. Information: Director of the IAC, P.O. Box 88, NL 6700 AB Wageningen (Tel.: +31.317. 490111, telefax: +31. 317418552, e-mail: iac@iac.agro.nl).

Nairobi, Kenya
19 - 23 April, 1999
Conference of the Commonwealth Veterinary Association. Information: CVA/KVA Committee (Telefax: +254.2.631325; e-mail: biosystems@ iconnect. co.ke).

College Station, Texas, USA
2 - 5 June, 1999
9th International Symposium of the World Association of Veterinary Laboratory Diagnosticians(WAVLD) Information: Dr. Konrad Eugster (Telefax: +1.409. 8451794; http:// www.tvmdl.tamu. edu).

Key West, Florida, USA

12 - 16 June, 1999
5th Biennial Conference of the Society for Tropical Veterinary Medicine (STVM). Tropical Diseases: Control and prevention in the context of the new world order. Organised by: University of Florida. Programme: (1) Epidemiology of emerging diseases: Microbiology and Parasitology; (2) World trade and disease control: Dynamics of food production and populations; (3) Bioterrorsm and its prevention; (4) The tools of control and prevention: I. Diagnostic technology; (5) II. Vaccines and pharmaceuticals and (6) III. Quarantine , regulatory control and communication. Information: Beth Miller-Tipton, Office of Conferences and Institutes (OCI), University of Florida, P.O. Box 110750, Gainsville, Fl 32611, USA (Tel.: +1.352. 3925930, telefax: +1.352. 3929734, e-mail: bamt@gnv.ifas.ufl.edu; http:/www.ifas.ufl.edu/ ~conferweb/stvm.htm).

Marseille, France
13 - 16 June, 1999
International Conference on Rickettsia and Rickettsial Diseases. Information: M. Philippe Brouqui, Unité des rickettsies (Telefax: +33.4.91830390; e-mail: philippe.brouqui@medecine.univ-mrs.fr).

Manila, Philippines
29 June - 2 July, 1999
2nd International Animal Feeds and Veterinary Drugs Congress. Information: Secretariat (Fax: +63.2.9247954; e-mail: aezville@cheerful.com)

Wageningen, The Netherlands
15 August - 19 November, 1999
27th International course on dairy farming in rural development. Course programme: Introduction; Dairy development; Farming systems; Statistics; Economics and agricultural credit; Breeding; Pasture production; Nutrition and feeding: Animal health; Reproduction and AI, Extension and case studies. Course fee: Dfl. 6,000. Closing date: 1 May, 1999. Information and registration: International Agricultural Centre (IAC), P.O. Box 88, 6700 AB Wageningen (Tel.: +31.317.490111, telefax: +31.317 418552, e-mail: iac@iac.agro.nl).

Barneveld, The Netherlands
23 August, 1999 - 24 February, 2000
29th International course on poultry husbandry and 29th 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 22nd International animal feed training programme (AFTP), which runs from 1 March to 27 May, 2000. Direct entry in this last course is also possible. Fees including board and lodging: Poultry course: Dfl. 24,500; Pig course: Dfl. 24,500, Feed course; Dfl. 12,000 or 14,500 (direct entry). Closing date: 1 May, 1999. Information: IPC Livestock Barneveld College, Dep. of International Studies and Cooperation Programmes, P.O. Box 64, 3770 AB Barneveld (Tel.: +31.342.414881, telefax: +31.342.4-92813, e-mail: io@ipcdier.hacom.nl).

The High Tatras, Slovakia
30 August – 2 September, 1999
3rd International Conference on Ticks and Tick-borne Pathogens (TTP 1999). Programme: Tick-borne pathogens (arboviruses; other pathogens); tick-host interphase; tick control; geographic distribution and GIS; tick biology; tick ecology; tick morphology, taxonomy and sysetematics. Organised by: Institute of Zoology, Slovak Academy of Sciences and NERC Inst. Virology and Environmental Microbiology, Oxford, UK. Information: Dr. Milan Labuda, Director, Institute of Zoology, Slovak Academy of Sciences, Dubravska cesta 9, 842 06 Bratislava, Slovakia (Tel.: +42.17. 3783248; telefax: + 42.17.37897 57, e-mail: uzaelabu@savba.sk).

Utrecht, The Netherlands
1 September, 1999 - 31 August, 2001
International MSc program- me 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: Dfl. 35,000); MSc Course 'Modern Approaches in Veterinary Microbiology and Immunology' duration 18 months (fee: Dfl. 68,500); MSc course 'Veterinary Anaesthesiology' duration 18 months (fee: Dfl. 35,000). Registration before 1 August, 1999. 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).

Lyon, France
23 - 26 September, 1999
Joint meeting of the World Association of Wildlife Veterinarians (WAWV), the European Section of the Wildlife Disease Association (EWDA) and the European Association Zoo and Wildlife Veterinarians (EAZWV) at the World Veterinary Congress in Lyon. Information: Dr. Marc Artois, CNEVA Nancy, Domaine de Pixerecourt, BP 9, 54220 Malzeville,(http://www.uniud.it/DSPA/wildvet/wawv/wawv.htm).

Lyon, France
23 - 29 September, 1999
1999 World Vet Congress. Organised by: the World Veterinary Association (WVA) and the World Small Animal Veterinary Association (WSAVA). Information: MONDIAL VET 1999, CNVSPA, 40 rue de Berri, F75008 Paris (Tel.: +33.1. 538 39160, telefax: +33.1.53839 169, E-mail: mondialvet@aol.com; http:/www.mondialvet99.org).

Edinburgh, Scotland, UK
October, 1999 - September, 2000
Four MSc courses on: 'Tropical animal production and health', 'Sustainable rural development in the tropics', 'Tropical veterinary medicine' and 'International animal health' are organised by the Centre for Tropical Veterinary Medicine of the Royal (Dick) School of Veterinary Studies of the Edinburgh University. The course programme has a modular format including: 6 months taught courses and a 6 months dissertation project. For the MPhil degree an additional research project is carries out during 18 months. Information: The Director, the Centre for Tropical Veterinary Medicine, Easter Bush, Roslin, Midlothian EH25 9RG, Scotland (Tel.: +44.131.6506289; fax: +44.131.4455099, e-mail: david.w.tayler@ed.ac.uk; http://www.vet.ed.ac.uk/ctvm).

EQUATOR

NEWSLETTER ON VETERINARY ASPECTS OF INTERNATIONAL DEVELOPMENT COOPERATION

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March - April, 1999

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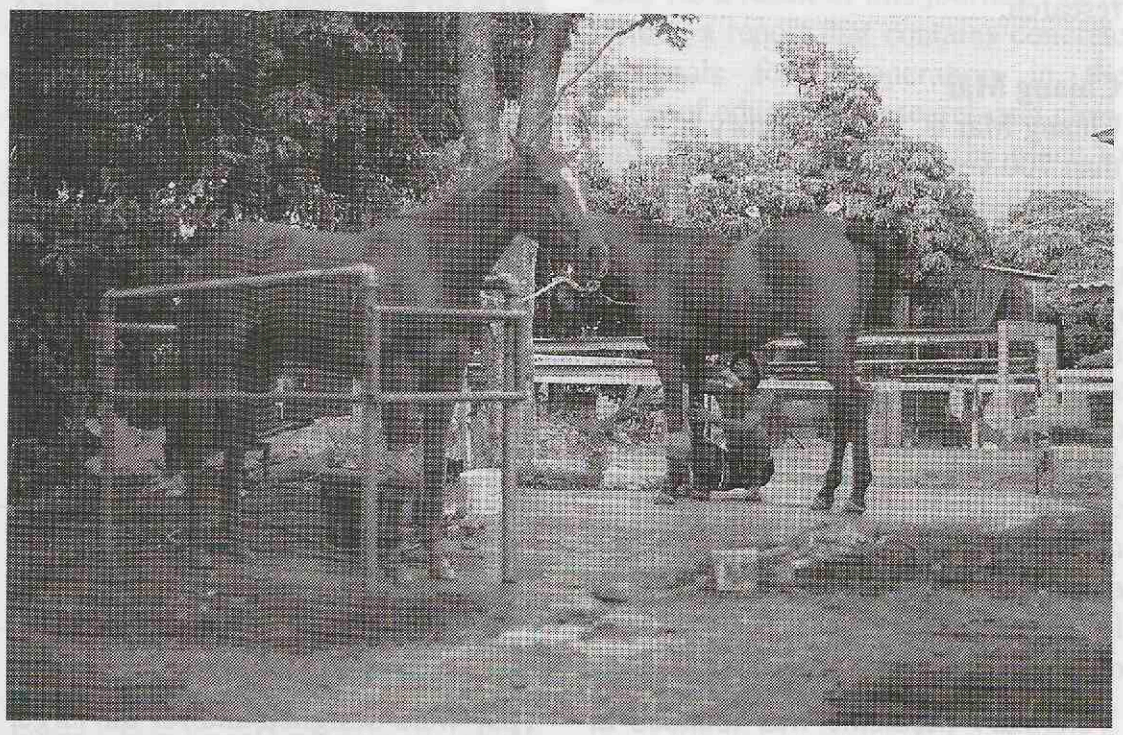
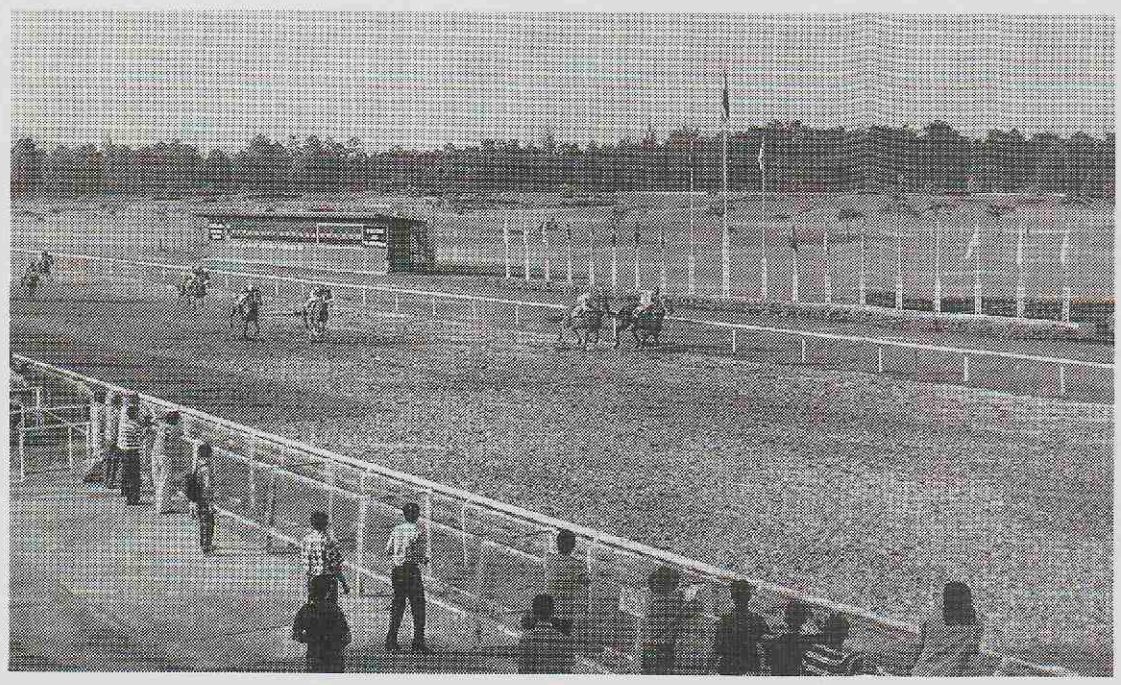
VOLUME 11, 1999

EQUINE PRACTICE IN THAILAND

"Flight TG 779 to Bangkok? I'm afraid that one is delayed, sir. The plane did not arrive." The man behind the desk at Copenhagen International Airport looked imperturbable. I was on my first stop of a journey that would lead me from Amsterdam via Copenhagen and Bangkok to Chiang Mai, Thailand's second city in the Northern part of the country and home to the Chiang Mai Veterinary Faculty. While I was starting to digest the information and began thinking about spending the night at the airport and trying to get into contact with my Thai counterparts to tell them I would be a bit late, the man behind the desk dialled a number and began a long conversation in Danish. When he finally put down the receiver, he said: "No problem, sir, we'll send you with SAS to Beijing, China, and then with Air China to Bangkok. We'll re-book your internal flight to Chiang Mai." And that was what happened. I arrived only six hours later than planned in Chiang Mai, but not after having had the unforgettable experience at Beijing Airport to see the struggle between the ground stewards who wanted to get these unplanned transit passengers (in total a group of about 30 persons had been rerouted) as soon as possible to the plane that was waiting and at the other side the bureaucratic officials of the Chinese Immigration who wanted that all bureaucratic procedures should be followed correctly. Both parties grew more nervous with time passing and it all ended up with a random distribution of boarding passes (I myself had one with the name of a certain Mr. Back) and our group passing through the diplomatic corridor, but the plane left with a delay of only three quarters of an hour. It was a memorable start of a memorable journey.



Two horses with problems of the carpus and fetlock joint respectively (Photo: Van Weeren)



The Chiang Mai racetrack (Photo: Van Weeren)

The purpose of my visit

My visit to Chiang Mai (and later to Khon Kaen) was meant to explore the possibilities for cooperation in the field of equine sciences. Under the memorandum of understanding that has been signed by both the Thai Ministry for University Affairs and Utrecht University, several PhD students came to Utrecht University's Faculty of Veterinary Medicine for periods of 4-5 years. The first one, Dr. Theera Rukkwamsuk, (see this issue of EQUATOR) has just recently defended his thesis successfully. As a representative of the newly formed Utrecht Department of Equine Sciences my interest was to see if there were possibilities in any of the fields a veterinary faculty traditionally is involved in: teaching, patient care and research.

Chiang Mai

Chiang Mai is, with a history of more than 700 years, one of the oldest cities of Thailand. Some parts of the old brick walls that once surrounded the entire city have remained and the canal at the outer side of the ancient wall has been reconstructed. Chiang Mai is one of the most touristic parts of Thailand because of the natural scenery and its rich culture. It was the first city outside Bangkok where a university was founded in 1964. Chiang Mai university grew rapidly from a handful of faculties in 1964 to 17 faculties at present. The Faculty of Veterinary Medicine was founded in 1994, which means that the Faculty is still, both in a technical and organisational sense, under construction.

The Veterinary Faculty

At present, the preclinical programme comprises three years of students. The fourth year will start in June 1999. As in the Netherlands, the curriculum will be 6 years. It is interesting to note that the Chiang Mai course, not unlike the new Dutch curriculum, is characterized by a problem-solving approach. Also, in the final year there are both compulsory and elective "clerkships", so students have to choose and to specialize in a certain field.

Dr. Ted Tesaprateep is dean of the Chiang Mai Faculty of Veterinary Medicine. He originates from the oldest Thai Veterinary Faculty of Chulalongkorn University, Bangkok, and now has taken up the tremendous task of building a complete new faculty. He can talk with great enthusiasm about his job, though he himself admits that it is not an easy one. He showed me various albums with photographs in which the still short history of the faculty was covered. Only 5 years ago, what are now the Faculty premises was still barren land. Now, most of the buildings are there and I must admit the Thai architects and constructors did a great job. The Faculty is nicely situated a few miles outside the city of Chiang Mai. The buildings have plenty of space and look beautiful. Where do we find that in present-day Western constructions? They were designed and for the larger part constructed before the onset of the economic crisis, or "before the bubble burst", as they use to say in Thailand. After the crisis resources dropped considerably and giant budgetary cuts were made, but there is still money to finish the buildings. At the time of my visit most buildings had been erected, some were still under construction. Another thing is the building of a solid team of staff members. At present, the faculty has 20 scientific faculty staff members. Most of them are young and enthusiastic, but also relatively inexperienced. This, Dr. Ted admits, is another challenge which is hard to take in the present time of economic recession.

The equine section

The person in charge of the construction of the equine section, Lt. Col. Chumnan Trinarong, is an exception to the rule. Not that he is not enthusiastic. In fact, he is very much so, but he has a 20-year long experience as a veterinarian serving in the Thai army. He took me to a lot of stables and other places where horses are kept. Horse keeping in Thailand is still in its infancy. There is nothing like an equine tradition as in Europe or the United States. This means that relatively few people have experience with horses and many basic things have to be taught. One of the things Dr. Chumnan is already doing with the preclinical students, is giving them classes in the grooming and handling of horses. This is a very good idea and more than necessary in a country where few students are exposed to horses before starting their veterinary career. He has also made good contacts with many horse owners and trainers in the surroundings of Chiang Mai, thus preparing for an adequate Equine Ambulatory Clinic that will be established once the clinical phase of the curriculum has started. In the Thai "horse industry" the army is an important factor, much more so than in the Netherlands. It is for instance the army that owns and exploits the Chiang Mai racetrack. They also own quite a lot of horses and mules for ceremonial duties and for transport in mountainous areas. However, do not think about the Thai army as a grim

Dr. Siraya positioning a horse on the operation table in the 'Horsepital' (Photo: Van Weeren)

institution with heavily armed guards who point their AK-47 at you on every corner. When I visited the Chiang Mai racetrack together with Dr. Ted and Dr. Chumnan's girl-friend Bong, who is a great horse-lover herself, I was invited into the office of the management. The colonel who was in charge welcomed me in his shirt's sleeves with a good glass of beer and I must say it was nice to stay there. Because in earlier times I very regularly went to the Dutch racetrack at Duindigt, I could well compare the atmosphere, and there appeared to be hardly any difference. I really felt at home at once. From a professional viewpoint there was a difference, however, as it became evident that a considerable number of horses that were racing suffered from some kind of lameness. In fact, lameness is the major problem in Thai equine veterinary medicine. This is not unlike the Dutch situation, but the types of lameness are different. Whereas in Holland we see an increasing amount of very subtle lamenesses that sometimes are very hard to trace down, in Thailand there was a real abundance of classical causes of lameness such as bowed tendons, osteoarthritis of the carpal and fetlock joints, desmitis of the suspensory ligament, etc. Later, in Khon Kaen I came across a surprisingly high number of cases of ataxia. This all indicates that equine veterinary medicine is in its infancy too in Thailand and that much can be done...

Thai people are very friendly. I was extremely well received by my Thai counterparts, which made me enjoy my stay tremendously. I already mentioned Dr. Ted Tesaprateep, the dean at Chiang Mai who even took me to a place for typical Thai massage (which is a relaxing experience!), and Dr. Chumnan with his girl-friend. Many more people received me well in Chiang Mai, too many to mention.

Via Bangkok to Khon Kaen

In Khon Kaen also I was received in a very friendly atmosphere by, among others, the dean Dr. Prachak Puapermpoonsiri and the assistant dean for foreign affairs, Dr. Suneerat Aiumlamai. The veterinary faculty in Khon Kaen was founded in 1986. Though situated in the North-eastern part of Thailand, which is the centre of thoroughbred breeding, there is no real emphasis on the equine species. This is in part due to the fact that the faculty is relatively understaffed as the enrolment of first-year students was recently increased from 60 to 80 per year, without any concomitant increase in numbers of staff. Nevertheless, could this problem be overcome, there would be good possibilities for the establishment of a flourishing equine practice, as horses are relatively abundant in the area. Also, one of the staff members, Dr. Pawin, has good contacts with a large number of equine stud farms and training stations in the region.

A private horse clinic

From Khon Kaen I made a trip to the only private equine practice in the region, the so-called "Horsepital" which is managed by Dr. Siraya Chunekamrai and co-workers. I happened to have heard from Dr. Siraya by means of her publications on articular cartilage, which was her PhD subject at Cornell University. Now she has established the only private equine clinic in the whole of Thailand. I must say I was impressed. She owns a very neat, well-organized clinic in which the work is performed according to internationally acknowledged standards. When talking to her, it became clear that she has to fight to get people used to these high standards (and to get them pay for it!), but she shows the way that should be followed. With increasing interest in the equestrian sports (and a gradually improving economy after the great collapse), standards in equine care and medicine will be raised. A first example is that the World Equestrian Organisation (*FEI/Fédération Equestre International*) has given Thailand an international status which means that the country meets the requirements for the organisation of international events.

Conclusion

In conclusion it can be stated that there are many possibilities for cooperation in the field of equine medicine. As a result of this journey I have written a report that contains concrete proposals for co-operation in the fields of education, research and clinical practice. This is not the place to give full details. However, we shall try to keep the readers of EQUATOR informed on the subject, once action is being undertaken. There is much demand for expertise in the field of equine care and medicine. Perhaps more important, there is also an enormous willingness to improve standards. It is the commitment of the Thai people which makes cooperation so promising. Last but not least, it is a wonderful country with wonderful people and who would not like to collaborate on that basis?

René van Weeren

FIRST THAI VETERINARIAN DEFENDS HIS PHD THESIS IN UTRECHT

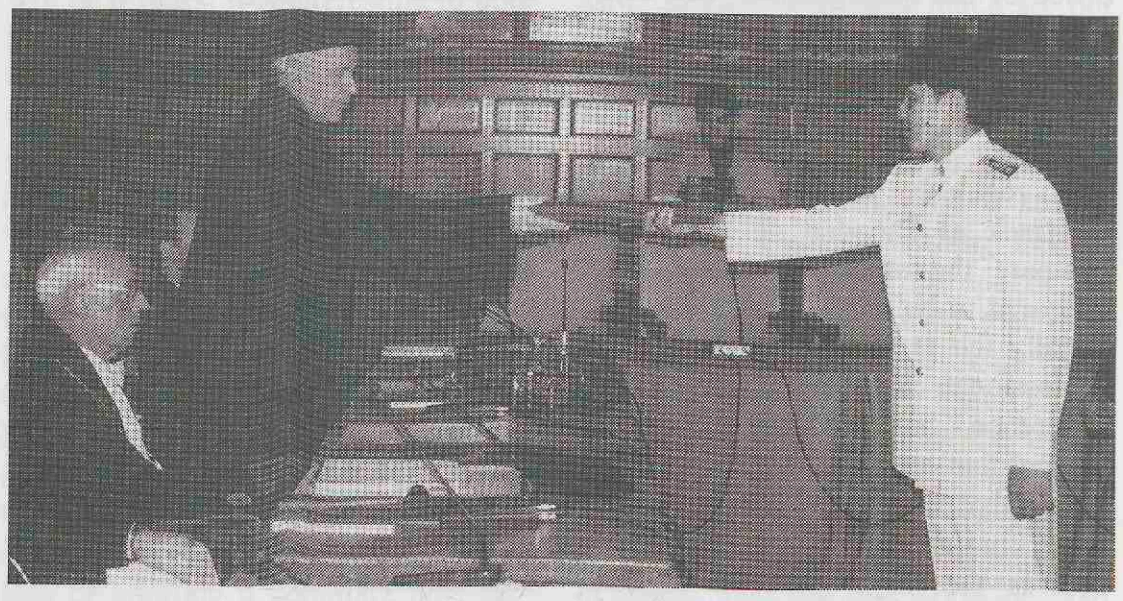
On 27 July, 1993 the first Memorandum of Understanding between the Ministry of University Affairs of Thailand and the Faculty of Veterinary Medicine of Utrecht University, the Netherlands was signed. This Memorandum aimed at strenghtening the scientific co-operation between the Faculties of Veterinary Medicine at Kasetsart University, Chulalongkorn University and Khon Kaen University of Thailand and the Utrecht Faculty. Also exchange of faculty members would be encouraged for teaching, research training, post graduate and post doctoral studies. The Memorandum was renewed and extended on 10 June, 1998. New partners were Chiang Mai University and Mahidol University.

On 14 March, 1995 Theera Rukkwamsuk, staff member at Kasetsart University arrived at Schiphol Airport to do a PhD study in Utrecht on fatty liver syndrom in dairy cattle. Theera received a scholarship from the Anandamahidol Foundation "under the Royal Patronage of His Majesty the King of Thailand" for a period of 4 years. This foundation provides scholarships to young Thai graduates to continue their postgraduate studies abroad, in order to build up a group of scholars in various fields of specialization to provide academic leadership in Thailand.

After a hesitant start – Theera's first supervisor left the department – Theera Rukkwamsuk proved to be a talented PhD student. Under the joint supervision of Dr. Theo Wensing and Dr. Math Geelen of the Utrecht Faculty of Veterinary Medicine and Dr. Theo Kruip of the Institute for Animal Science and Health at Lelystad, he wrote 8 scientific articles for publication in the Journal of Dairy Science, the Veterinary Quarterly and Theriogenology. His scientific output resulted in the thesis "Negative energy balance in postparturient dairy cows: consequences and adaptations. With particular reference to lipid metabolism in adipose tissue and liver", which Theera Rukkwamsuk successfully defended on 8 April, 1999. The editors of EQUATOR congratulate Dr. Theera Rukkwamsuk PhD with this important milestone, both in his career and in the co-operation between Thailand and The Netherlands.

Jean de Gooijer

Waiting for the decision of the 'promotion committee' (Photo: De Gooijer)



Dr. Theera Rukkwamsuk receives his PhD degree certificate from his promotor, Prof. Dr H.J. Breukink (Photo: De Gooijer)

Dr Theo Wensing compliments his former student during the *laudatio* (Photo: De Gooijer)

KVL STUDENTS ENCOUNTER 'REAL' AFRICA

A student exchange programme is part of the link service contract between the Faculty of Veterinary Science of the University of Zimbabwe and the Royal Veterinary and Agricultural University (KVL) in Copenhagen, Denmark and Utrecht University's Faculty of Veterinary Medicine. Thomas Gadegard Koch and Linda Hjorth, 2 veterinary students at KVL, went to Zimbabwe for 3 months in the period 28 August - 5 December 1998. Linda Hjorth wrote a report on their first encounter with 'real' Africa.

Arrival

I will always remember the view from the plane, when I first saw the real Africa. It was noon, the sun shone in a clear blue sky and lit up the rusty coloured earth. Odd clusters of Acasia trees could be seen scattered over the vast landscape. The view was as beautiful as I had expected it to be.

On Friday, August 28th 1998, after a long flight we finally landed at Harare International Airport, the sheer size of which reminded us more of an airfield! However, the pilot landed the comparatively huge jumbo safely. With anticipation and subsequent butterflies we wondered what would be ahead of us. We had many unanswered questions like: *Was coming to Zimbabwe really the right thing to do?, Where will we stay?, Would the university live up to our expectations?, Would we make friends?, How would the local people react to us?, How different were our lifestyles?, Did we have enough money?*, And so on.

We were to be met by some staff members from the University of Zimbabwe! We had sent an e-mail to the University with our arrival times, and therefore expected to see a sign with our names on it as we walked into the arrival hall. We stood there, waiting for 2 hours, becoming gradually more anxious, very much like 2 European students not having a clue about the new world they had just stepped into. We decided to write a sign with our names on it, in the hope that we might be singled out. One hour later I reconsidered the effectiveness of this great idea, because we were still standing there. It was approaching 4 p.m., when we decided to venture out into this unknown world to find our own way. We took a taxi to the university, where we luckily bumped into Fortune and Brighton, two friendly residents who were on their way home. They took the time to direct us to Prof. Obwolo – one of the names of our contacts at the university. Prof. Obwolo was rather surprised when the two of us suddenly stood there before him. He explained that he was aware that 2 students were coming over from Denmark, but because the telephones at the University were down, he had not received our e-mail with the arrival times.

Encounter with the dean

We soon discovered how kind Prof. Obwolo was. He apologised for the inconveniences suffered at the airport and drove us to hotel Bronte, where we spent our first night in Zimbabwe. Next morning we were picked up by Prof. Obwolo, who drove us to the neighbourhood where he had found a self-contained cottage. This cottage was part of a large house, where a family of five plus a maid lived. Once we had dropped off our baggage, Prof. Obwolo took us to the local shopping centre (West-gate), where he sat down, made himself comfortable, picked up a newspaper and then invited us to 'take our time'. We found the situation rather amusing – the dean of the veterinary faculty driving us around in his own car during his free weekend. A situation that one would never experience in Denmark. The mother of the family, Mrs. Dhlembeu, was actually Prof. Obwolo's secretary. The university was relatively far away from the house, so every day Mrs. Dhlembeu gave us a lift.

Ambulatory service

On our first day at school we went to meet the head of the clinical department. We entered his office and sat in two very soft chairs. Dr Busayi is a big man, but he looked even bigger in his white suit and dotted tie behind a huge desk. Dr Busayi asked us: 'What would you like to do?'. So we explained what veterinary aspects we would like to cover during our time in Zimbabwe. He instantly proved to be

When you drive to the rural areas you see the 'real' Africa (Photo: Paling)

a man of his words and made calls to various people to help fulfil our expectations. Dr Busayi would be on ambulatory in the rural areas surrounding Harare the next day and he implied that we could join him. 'I'll pick you up at 6.30 a.m.', he said. This was rather early! I wondered if he would go on ambulatory in his white suit and dotted tie. But, the next morning it turned out that Dr Busayi wore a coverall. Again it was the professor, who picked up all of the 10 students that were going on ambulatory. We all sat in the back of a Landrover and with a lot of equipment it was an extremely tight fit. Not only physically, but also mentally it was a tough day. We were asked a lot of questions concerning different species, housing and drugs. In between Dr Busayi gave a short lecture on subjects he thought we needed to improve our knowledge on. All in all we had a very exciting day in the field and we were tired when we returned to our house again at 8.15 p.m.

The following three months included a range of adventures and impressions. Among many different exciting experiences, we recall the following as the most memorable.

Small animal surgery

I went to Avondale and Thomas went to Harare Central. This was more or less like a small animal practice in Denmark, with vaccinations, fleas and diarrhoea. Among the more exotic cases was a lot of dogs that had been intoxicated, litters of pups with parvo, and babesiosis. Thomas had the honour of operating a hen with bumblefoot!

Horse surgery

We both went to Borrowdale. This was a very interesting two weeks. This horse practice employs 4 vets who only deal with horses. In Zimbabwe there are a lot of stud farms where thoroughbred are bred which are used to race. During these weeks we went to a lot of stud farms, because it was the breeding season. And we also went to the racetrack to prepare the horses for the coming race. Horse racing is an expensive sport. Thomas is a horse expert so this period was particularly interesting for him. But it was I who won a lot of money at the racetrack. Beginners luck!, Thomas said....

Conference

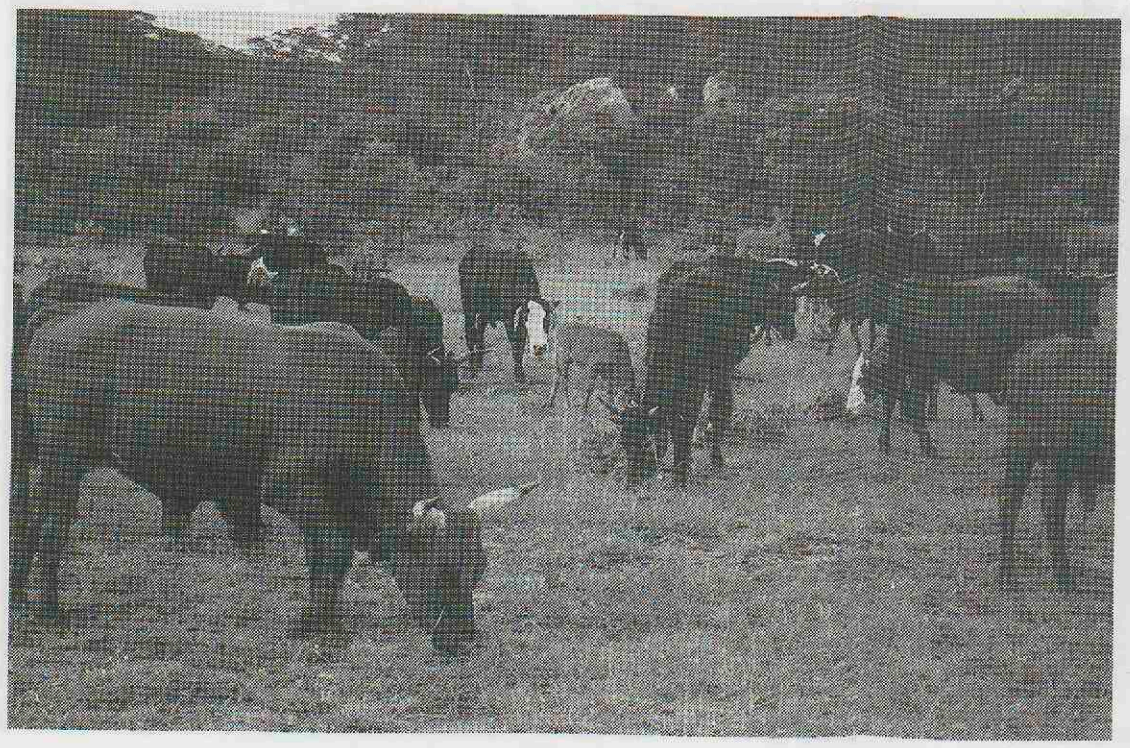
We went to the 9th AITVM Conference on 'Tropical Veterinary Medicine'. It was one of the larger international conferences that we attended, with a lot of interesting speakers from all over the world. But I must admit that the most interesting feature of the day was the luxurious lunch served at the Sheraton hotel in Harare. During the week there were arrangements to go see different things around Harare. We went to an ostrich abattoir. I noticed how clean it was and the high standard of the abattoir. We also went to an ostrich farm. It was a very good tour on which we saw how to breed ostriches under the African sun!

Other activities

Between these arranged events we participated in activities at the university. Among other things we went to Friday lectures, where the students presented their own cases. Sometimes professors from other countries presented results of their studies. For example, Prof. Skadhauge from Den mark presented a case concerning ostrich bladders!

Thomas came in contact with a group who worked on rumen flukes, its biotopes and hosts. During a delicious dinner in Mozambique, Thomas lectured on snails that housed the fluke. I must mention that we had seafood. I think he got inspired from all the shells on our plate!

I enjoyed very much to go on ambulatory, large animal practice in the rural areas. But it is very different from as we know it in Denmark. You drive to the rural areas and see the 'real' Africa, where people live in huts with only one room, where it is 5 kilometres to the nearest water pump and where people live from the vegetables they can grow in the heat. To own a cow in these areas is more valuable than one may think. A cow provides draught power, and is used to plough with. A cow may give a little milk which is fed to the children, but this is secondary and not the main purpose. Of course we visited also large farms, with cows, pigs or chicken. On ambulatory, you had cases that would easily be solved in Denmark. In Africa it is more difficult because of lack of drugs or equipment. Major problems in these areas are to convince the owner of the necessity to water the animals and provide them with shade. It is very frustrating to explain this again and again! But in spite of this, I found what I had come for to Africa: people, animals, nature. To see how the landscape changed its character, colour and expression every time we came back, it was fantastic! I could go on and tell



To own a cow in the rural areas is more valuable than one may think (Photo: Paling)

many stories from ambulatory but its not the point here.

Beside the veterinary 'events' we, of course, also travelled a lot, both in Zimbabwe, and the surrounding countries in southern Africa. We recall lovely trips to Mana Pools, Victoria Falls, Domboshawa and Eastern Highlands and tours in Mozambique, Namibia, Botswana and Zambia.
We have met many kind and nice people. People at the University, veterinarians and students, people we have lived with, bus drivers, the girl at the supermarket, the man on the road from whom we bought our giraffes ... they all were so open and accepted us with a big smile. The warmth and friendliness one meets everywhere is fantastic. There are so many people we would like to meet again or stay in touch with, but with the awareness that if we are to meet again, one day we have to go to Zimbabwe again, because unfortunately most of them cannot afford to visit Denmark.

This stay in Zimbabwe fulfilled all our expectations. All the questions at the beginning were for nothing, but could be one of the reasons why a trip like this turns out to be a success – you ought to be a little nervous, when you are travelling half way around the earth.

Saturday, December 5th at 4.20 p.m., we took off from Harare International Airport. It was a sad moment. Many new friends were at the airport waving goodbye or may be – I'll be seeing you! At least, I hope so.

On behalf of both of us,

Linda Hjorth

TOWARDS LIVESTOCK DISEASE DIAGNOSIS AND CONTROL IN THE 21st CENTURY

Proceedings of an international symposium on the diagnosis and control of livestock diseases using nuclear and related techniques jointly organised by the International Atomic Energy Agency and the Food and Agriculture Organisation of the United Nations and held in Vienna, 7-11 April 1997. 600 pages, ISBN: 0074-1884.

Editor: International Atomic Energy Agency, Wagramerstrasse 5, P.O. Box 100, A-1400 Vienna, Austria.

It is perhaps good to memorise that the International Atomic Energy Agency (IAEA) does not only control nuclear plants and the proliferation of nuclear weapons, but also plays an active role in the use of "Atoms for Peace". It has for this purpose, jointly with the Food and Agriculture Organisation (FAO), a sub-programme in animal production with a mandate "to improve livestock production in developing countries through the support of problem oriented research that identifies the constraints on production and develops cost effective and sustainable solutions using nuclear based technologies". In practice the term "nuclear technology" is interpreted broadly and also includes e.g. the Enzyme Linked Immunosorbent Assay (ELISA).

The aim of the symposium was to review the existing and emerging techniques used in disease diagnosis and control and to put them in the context for use in developing countries in the 21st century.
A rather ambitious task, because it should at least indicate the global problems in livestock development for the next century and how advances may be harnessed to solve these problems. The programme of the symposium did indeed cover many aspects related to disease control in the areas of epidemiology, serology, molecular biology and its applications in vaccine production and diagnosis, geographic information systems, as well as socio-economics.
Although the scientific level of the presentations in general was high, they differed greatly in their prospective for developing countries.

A group of presentations dealt with the use of the ELISA and molecular techniques (polymerase chain reaction, genetic relationships between causative viruses, etc.) in the control and diagnosis of infectious diseases in the developing countries like rinderpest, foot-and-mouth disease, trypanosomosis, contagious bovine pleuropneumonia, etc. Examples were given of their applications in developing countries and some success stories were presented, e.g. for rinderpest.

Presentations were given with rather futuristic aspects, e.g. the opportunities and new developments in the field of biosensors and pen-side testing. Thought provoking was the concept of using blood-sucking insects as vaccine delivery mechanisms. The technique of DNA mediated vaccines was described as a future way for immunisation. Surprisingly, however, very little was said about the use of marker and recombinant vaccines for tropical diseases.

Some presentations gave the present concepts and state of the science of e.g. epidemiology. During the 1970s, however, the limitations of data gath-

ering were recognised, and Rapid Rural Appraisal emerged. This approach focuses on qualitative rather then hard data and farmers' perception of major problems.

A good overview was given of the general principles of the cost-benefit analyses in animal disease control, but no examples were given for situations in developing countries.

Information technology, modelling and the use of geographic information systems will become more and more important in the future and practical applications were mentioned in the field of trypanosomosis, rinderpest and African horse sickness, but also their use as a decision support system, involving different disciplines, for livestock production in the tropics.

Quite a lot of these technical innovations have been developed either by international agencies or in the developed countries. Transfer of this knowledge to developing countries, in combination with training, thereby maintaining a good quality of the products is of great importance. Papers in this respect were on e.g. the FAO/IAEA external quality assurance programmes for disease control and validation, standardisation and control of ELISA techniques. The training aspects were further worked out in a paper on the need for appropriate post-graduate training (with the emphasis on appropriate) to support surveillance and control of animal diseases in southern Africa.

In a presentation on tickborne disease control, the lessons of the past and the prospects for the future were placed in perspective. Control has often relied to a considerable extent on the use of chemical acaricides and curative drugs. The accent has recently shifted to a flexible approach, integrating various control measures. Reasons for this are acaricide resistance, economic factors and public health concern.

A paper on the role of veterinary science in the context of sustainable livestock production stressed that important tools are available to the veterinarian, like epidemiology, diagnostic tests and vaccines. They will only lead, however, to sustainable livestock production when they are placed in the right socio-economic context.

At the end the symposium was summarised in a thought provoking paper, whereby the application of all these emerging technologies on disease diagnosis and control was assessed for its use in developing countries. It noticed a deficiency in the symposium, i.e. the lack of a discussion of the veterinary infrastructure required to apply practically the valuable information gained from these new technologies. It posed the rhetoric question: "Who will undertake the control of the major epidemic diseases in developing countries - molecular biologists?" It strongly argued in this respect in favour of good clinical observations and due emphasis on the "old fashioned" qualitative epidemiology. It noticed an increasing use of test kits, but with it the danger of establishing a kit user mentality with built-in dependency on (international) donor agencies and a lack of ability to appreciate the advantages and limitations of these kits. The ultimate aim should be that the countries concerned have sustainable diagnostic expertise and services of their own and can address emerging diseases with their own resources. The relative small market in developing countries for diagnostic tests and vaccines may at the end be the greatest stumbling block for all these new applications!

In conclusion it can be said that the symposium offered a wealth of information and the proceedings can be recommended to anybody who is connected with animal production and health in developing countries. The more disciplinary oriented worker certainly has better scientific resources available, but after reading these proceedings he/she will be aware that a good technology for developed countries, is not automatically a success in developing countries.

Prof. Dr. D. Zwart

VACANCIES

INTERNATIONAL COOPERATION

This section contains vacancy announcements which the editorial board considers to be of possible interest to Dutch veterinarians. Besides vacancies that will be taken from Vacatureblad Internationale Samenwerking, Tijdschrift voor Diergeneeskunde, Veterinary Record, Intro vacatures (RPDAdvies/Ministry of Internal Affairs) etc., there will be room for personnel advertisements. For further information about the vacancies please contact the institution or company directly.

FOOD AND AGRICULTURE ORGANISATION (FAO) OF THE UNITED NATIONS

FAO has a position for an:

ANIMAL HEALTH OFFICER (F/M) Virology

Vacancy No.: 207-AGA

Duties

Under the general supervision of the Chief, Animal Health Service and within the Infectious Diseases-EMPRES Group, the incumbent will be responsible for the development, scheduling and implementation of policies and programmes in the field of viral animal diseases in the context of the animal diseases component of FAO's priority programme: "Emergency Prevention System (EMPRES) for Transboundary Animal and Plant Pests and Diseases" and will assume responsibility for the Secretariat of the Global Rinderpest Eradication Programme. More specifically:

supervise the development and implementation of an adequate information system for the monitoring of the global status of rinderpest and the effectiveness of national and international programmes for rinderpest control; provide strategic orientation, develop methodologies and issue guidelines for technical strategies for the progressive control of rinderpest leading to internationally verifiable global eradication; ensure the conduct of, and lead studies and reviews, on technical, policy and programme issues for the progressive control of rinderpest and related animal viral diseases, particularly those of strategic significance to EMPRES, such as foot-and-mouth disease; supervise and co-ordinate exchange of information on rinderpest and related diseases to ensure widest contacts within and outside the Organisation; assist FAO members and international organisations with reviews and provision of policy and technical advice for the progressive control of rinderpest and related diseases and international verification of disease-free status; represent FAO in co-ordinating international responses to rinderpest emergencies, lead or participate in missions, task forces and review teams; when required, provide technical support to other aspects of the EMPRES programme, especially the early warning and early reaction to transboundary animal viral diseases; plan, organise and lead technical meetings, expert consultations and workshops; prepare and edit major technical papers on rinderpest and related viral diseases for discussion and publication; design and implement programmes and projects; as required participate in appraisal of field projects; and provide supervision and technical backstopping; develop and ensure delivery of training programmes; perform other related duties as required.

Qualifications
University degree in Veterinary Science/Medicine and a Ph.D. or equivalent qualification in either Epidemiology or Applied Animal Virology.
Ten years of progressively responsible experience in the diagnosis, epidemiology and/or control of epidemic diseases of livestock with five years at international level including work in developing countries. Experience in planning and supervising programme activities.

Initiative, high sense of responsibility and ability to plan and organise work clearly and concisely. Analytical leadership, co-ordination managerial, negotiating and advisory skills; maturity, initiative, diplomacy, tact, and a high sense of responsibility. Ability to organise and conduct technical meetings and develop and implement programmes and studies. Ability to make effective oral presentations; write clear and concise reports; knowledge of FAO activities, structures and procedures. Computer literacy and ability to use computers and word processing equipment. Ability to maintain good working relationships with people of different national and cultural backgrounds
Working knowledge (level C) of English, French or Spanish and limited knowledge (level B) of one of the other two languages.

Desirable
Specific experience with the organisation of national and regional control or eradication of a disease of strategic relevance tot the EMPRES programme, especially either rinderpest or foot-and-mouth disease. Limited knowledge (level B) of a third or more languages of the organisation (i.e. English, French, Spanish, Arabic, Chinese).

Division Animal Health Service, Animal Production and Health Division, Agriculture Department.

Remuneration
Net salary per year (inclusive of a variable element for post adjustment).
With dependents from US$ 78,981 to US$ 93,983.
Without dependents from US$ 73,341 to US$ 86,456.

Additional information
Applications from qualified women candidates are encouraged.

Location
Rome

Type of Appointment
Fixed-term, three years.

Grade
P5

Closing date
10 May 1999.

THE VETERINARY FACULTY OF THE FREE UNIVERSITY BERLIN in collaboration with the **INTERNATIONAL TRYPANOTOLERANCE CENTRE (ITC),** The Gambia
is looking for a :

VETERINARY SCIENTIST.

Tasks
The co-ordination and implementation of research projects in the field of *disease complexes in peri-urban livestock systems* with emphasis on the small-scale dairy industry. Animal production, reproduction, zoonoses and vector-borne diseases in the peri-urban system are also of importance.

Qualifications
The scientist should hold a postgraduate degree, have substantial laboratory and field experience in microbiology, parasitology and epidemiology. The incumbent should be able to guide and supervise students in their MSc/PhD research. He/she should be a good co-ordinator, team worker and be able to work efficiently within the local administration. He/she should have proficiency in English and French.

Location
The incumbent shall work for the Collaborative Research Unit of the Veterinary Faculty, FU Berlin, though the contract will be signed with the ITC. Location of this post is Banjul, The Gambia.

Remuneration
Salary is equivalent to the German BAT IIa.

Type of Appointment
The post is to be filled by 1.7.99 for one year with an option to extend on a yearly basis for a maximum period of 5 years.

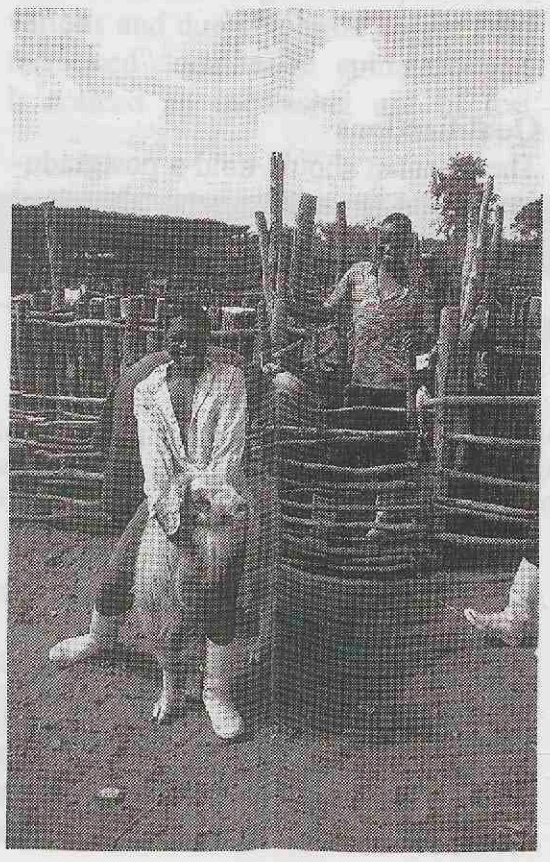
Applications
Please send complete applications to: FU Berlin, Postgraduate Studies in Tropical Veterinary Medicine, attention Dr Münstermann, Luisenstr. 56, D 10117 Berlin.

TRAINEESHIPS IN THE TROPICS

heartwater research on goats in Mozambique

Like many other Dutch veterinary students I wanted to study some time in a foreign country after the exam at the end of the 4th year. It would be even better if I could use this time to participate in a research project and use the results to write my end-of-study thesis. Because Utrecht University's Faculty of Veterinary Medicine has no direct possibilities for people like me, you just spread your ideas about what you would like to do and where you would like to go. This could work well in case someone is looking for some help, then he knows where to find you. An other student, Daan Vink, had prepared a new research project, as a follow up of research he had done in the north of Mozambique in 1997 (see EQUATOR No. 5, December 1997). As his time was limited, since he had to finish his study in The Netherlands, he was looking for someone else to complete the research.
In January 1998 I left for Mozambique ....

Heartwater in Mozambique
As unknown as heartwater is in The Netherlands, so well known is the disease in Africa. It stands high on the list of deathly diseases in livestock. Because of all the re-stocking projects initiated in Mozambique, this country is a perfect example to show how a disease like heartwater spreads. The civil war, which ended 7 years ago, decimated the livestock, exacerbated by droughts and floods in the last 20 years. Several development organisations offered the possibility to buy livestock and used it in their restocking projects. The distributed livestock came from surrounding countries and provinces and a lot of these animals were not adapted to the different geo-climatic conditions and tick species common in the south of Mozambique. *Amblyomma hebreum* is the vector for the transmission of *Cowdria ruminantium* (the agent that causes heartwater) and it has a specific distribution pattern.
Many owners who just got their new livestock were disappointed because lots of animals died of heartwater after the re-location, as they came out of a heartwater free area. It is possible to cure these animals with antibiotics, like tetracycline. Therefore heartwater should be diagnosed in a very early stage and the infected animal should be treated with these antibiotics in short time. The infrastructure and financial status of Mozambique are big limitations to the control of heartwater. Many development programmes that were concerned with the re-stocking of livestock, turned out to be less successful than expected. Because it is not in their favour to make such failures public, the same problems keep appearing in new projects.



Newly introduced goats are highly susceptible to infection with cowdriosis (Photo: collection Wapenaar)

A solution could be a good, user friendly vaccine to vaccinate all imported animals, before setting them out in the fields. Several universities are doing research on this subject, so is the Faculty of Veterinary Medicine in Utrecht.

The research project
The research consisted of two subjects: (1) to conduct a field sero survey to assess the seroprevalence of heartwater (*Cowdria ruminantium*) among flocks of indigenous goats of smallholders in the south of Mozambique, by sampling and analysing 326 goat-serum samples and (2) to isolate, cryopreserve and type field stocks of *Cowdria ruminantium*, by collecting infective blood samples from goats suffering from heartwater.
For this purpose 15 sentinel goats were bought in the north of Mozambique (Marara) and were transported to the south of Mozambique. Because these sentinel goats came from a heartwater free area and had not build up any immunity, they had to be susceptible to the disease. In fact they were all tested sero-negative by the Cowdria MAP 1-b ELISA.
Three groups of 5 goats were made, two groups were exposed to a natural field infection. One group was kept at the Veterinary Faculty of the Eduardo Mondlane University in Maputo and were used for intravenous inoculation with cryopreserved suspected infective blood samples, that were collected in the field during serosurvey sampling activities. By watching the clinical development of the disease intensively (rise of body temperature etc.), we were able to collect blood in heparin tubes after the onset of a persistent fever. The samples were taken to the laboratory as soon as possible and were there cryoprotected with DMSO and stored at -80°C in liquid nitrogen. The diagnosis of heartwater was confirmed whenever possible by a post mortem examination (lung oedema, hydrothorax, hydropericardium, mucosal ptechiae, perirenal oedema, renal ptechiae, lymph node oedema and ptechiae, brain oedema and ptechiae) and the examination of brain crush smears.

Serological survey
Before I left for Mozambique, people

We collected samples from many places in the southern provinces of Mozambique (Photo: collection Wapenaar)

already told me not to expect the Dutch efficiency I was used to. In the first weeks in Mozambique this became very clear; I was expecting the 15 sentinel goats to arrive within a limited period. This period became 2 months in stead of the 2 weeks I expected. During this time Daan Vink and I worked on collecting the serum samples from goats of the small holder sector. We tried to get samples from as many different places as possible (within the three southern provinces of Mozambique), to give a good representation of the endemic stability. The result of the serosurvey was a seroprevalence of 66%, which compared to the seroprevalence of 8% in the northern province (Tete), confirms the theory on endemic stability.

Field isolates

Within two weeks after the first group went into the field, the first sentinel goat was brought back to the Veterinary Faculty in Maputo with obvious heartwater symptoms (fever, anorexia, nervous symptoms as pedalling, nystagmus, saliving). This animal became, among others, a successful donor of heartwater infected blood samples. Because they show very clear symptoms these animals are very successful donors of infectious blood samples. Thirteen suspected infective blood samples were collected in this way and presently they are being cultured and analysed at the Department of Parasitology and Tropical Veterinary Medicine in Utrecht. The purpose is to determine the different strains that are collected. In the long term these strains may be used to make a successful and user-friendly vaccine against heartwater.

Wendela Wapenaar

(More detailed results can be found in the end-of-study thesis "Heartwater in goats in Mozambique" by W.D. Vink and W. Wapenaar which is available at the library of the Faculty of Veterinary Medicine, P.O. Box 80.159, NL 3508 TD Utrecht, and from undersigned through EQUATOR's editorial office).

AGENDA

College Station, Texas, USA
2 - 5 June, 1999
9th International Symposium of the World Association of Veterinary Laboratory Diagnosticians Information: Dr. Konrad Eugster (Fax: +1.409.8451794; http://www.tvmdl.tamu.edu).

Key West, Florida, USA
12 - 16 June, 1999
5th Biennial Conference of the Society for Tropical Veterinary Medicine (STVM). Tropical Diseases: Control and prevention in the context of the new world order. Organised by: University of Florida. Programme: (1) Epidemiology of emerging diseases: Microbiology and Parasitology; (2) World trade and disease control: Dynamics of food production and populations; (3) Bioterrorism and its prevention; (4) The tools of control and prevention: I. Diagnostic technology; (5) II. Vaccines and pharmaceuticals and (6) III. Quarantine, regulatory control and communication. Information: Beth Miller-Tipton, Office of Conferences and Institutes (OCI), University of Florida, P.O. Box 110750, Gainsville, Fl 32611 (Tel.: +1.352. 3925930, telefax: +1.352. 3929734, e-mail: bamt@gnv.ifas. ufl.edu; http://www.ifas.ufl.edu/~conferweb/stvm.htm).

Marseille, France
13 - 16 June, 1999
International Conference on Rickettsia and Rickettsial Diseases. Information: M. Philippe Brouqui, Unité des rickettsies (Fax: +33.4.91830390; e-mail: philippe.brouqui@medecine.univ-mrs.fr).

Manila, Philippines
29 June - 2 July, 1999
2nd International Animal Feeds and Veterinary Drugs Congress. Information: Secretariat (Fax: +63.2. 9247954; e-mail: aezville@cheerful.com).

CALENDAR 2000

The High Tatras, Slovakia
30 August – 2 September, 1999
3rd International Conference on Ticks and Tick-borne Pathogens (TTP 1999). Programme: Tick-borne pathogens; tick-host interphase; tick control; geographic distribution and GIS; tick biology; tick ecology; tick morphology, taxonomy and sysetematics. Organised by: Institute of Zoology, Slovak Academy of Sciences and NERC Inst. Virology and Environmental Microbiology, Oxford, UK. Information: Dr. Milan Labuda, Director, Institute of Zoology, Slovak Academy of Sciences, Dubravska cesta 9, 842 06 Bratislava, Slovakia (Tel.: +42.17. 3783248; fax: +42.17. 3789757, e-mail: uzaelabu@savba.sk).

Utrecht, The Netherlands
1 September, 1999 - 31 August, 2001
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: NGL 35,000); MSc Course 'Modern Approaches in Veterinary Microbiology and Immunology' duration 18 months (fee: NGL 68,500); MSc course 'Veterinary Anaesthesiology' duration 18 months (fee: NGL 35,000). Registration before 1 August, 1999. 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).

Lyon, France
23 - 26 September, 1999
Joint meeting of the World Association of Wildlife Veterinarians (WAWV), the European Section of the Wildlife Disease Association (EWDA) and the European Association Zoo and Wildlife Veterinarians (EAZWV) at the World Veterinary Congress in Lyon. Information: Dr. Marc Artois, CNEVA Nancy, Domaine de Pixerecourt, BP 9, 54220 Mazeville(http://www.uniud.it/DSPA/wildvet/wawv/wawv.htm).

Lyon, France
23 - 29 September, 1999
1999 World Vet Congress. Organised by: the World Veterinary Association (WVA) and the World Small Animal Veterinary Association (WSAVA). Information: MONDIAL VET 1999, CNVSPA, 40 rue de Berri, F75008 Paris (Tel.: +33.1. 538 39160, telefax: +33.1.53839 169, E-mail: mondialvet@aol.com; http://www.Mondialvet99.org).

Edinburgh, Scotland, UK
October, 1999 - September, 2000
Four MSc courses on: 'Tropical animal production and health', 'Sustainable rural development in the tropics', 'Tropical veterinary medicine' and 'International animal health' are organised by the Centre for Tropical Veterinary Medicine of the Royal (Dick) School of Veterinary Studies of the Edinburgh University. The course programme has a modular format including: 6 months taught courses and a 6 months dissertation project. For the MPhil degree an additional research project is carried out during 18 months. Information: The Director, the Centre for Tropical Veterinary Medicine, Easter Bush, Roslin, Midlothian EH25 9RG, Scotland (Tel.: +44.131.6506289; fax: +44.131.4455099, e-mail: david.w.taylor@ed.ac.uk; http://www.vet.ed.ac.uk/ctvm).

Irbid, Jordan
23 - 24 October, 1999
1st International Conference on Sheep and Goat Diseases and Productivity. Programme: Medicine and surgery; Pathology; Microbiology; Reproduction; Nutrition; Epidemiology; breeding and management; Meat and dairy products and hygiene; Hair and wool. Registration: Dr Shawkat Lafi, Conference Secretary, Jordan University of Science and Technology, Faculty of Veterinary Medicine, P.O. Box 3030, Irbid 22110 (Fax: +962.2.295123, e-mail: shoatcon@just.edu.jo, http://www.just.edu.jo/sheep&goatconf/).

Berlin, Germany
January, 2000 - December, 2001
Master of Science Degree in Tropical Veterinary Epidemiology (MSc TVE). The study programme is offered with 3 study options: Option 1. Freie Universität Berlin-Addis Ababa University Joint Postgraduate Programme; Option 2. Berlin-Germany Programme; Option 3. Berlin-Home Country Programme. The course programme has a modular format with course work part A, with basic and applied lectures and demonstrations, and by practical exercises carried out in Berlin (first year). Under option 1 Part B with individual research work for the MSc thesis in Ethiopia, allowing also for research in the East African region under special arrangements (first and second year); under option 2, part B lasts for 7 months in Berlin; and under option 3 individual research work is undertaken in the home country of the participant. Information: The Co-ordinator, Postgraduate Studies in Tropical Veterinary Medicine, Freie Universität Berlin, Luisenstrasse 56, 10117 Berlin (Tel.: +49.30.20936063; fax: +49.30. 20936349; e-mail: TropVet@city.vetmed.fu-berlin.de; http://www.vetmed.fu-berlin.de).

Barneveld, The Netherlands
1 March - 27 May, 2000
22nd International animal feed training programme (AFTP). Organized by: IPC Livestock International, Barneveld College. Fees including board and lodging: NGL 14,500. Information: IPC Livestock Barneveld College, Dep. of International Studies and Cooperation Programmes, P.O. Box 64, 3770 AB Barneveld (Tel.: +31.342.414881, fax: +31. 342.492813, e-mail: io@ipcdier.hacom.nl).

EQUATOR

NEWSLETTER ON VETERINARY ASPECTS OF INTERNATIONAL DEVELOPMENT COOPERATION

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REGIONAL CO-OPERATION: CORNERSTONE FOR VETERINARY EDUCATION AND RESEARCH AT ONDERSTEPOORT

For many years international contacts with South Africa have not been feasible and this concerned also the exchanges in the field of veterinary medicine. However, ever since the transition to a democratically elected government and the abolishment of apartheid, South Africa has been aiming at developing normal contacts with its neighbours as member of SADC (Southern African Development Community). The admission of South Africa as a member of the Lomé Convention opened the way to extend the contacts with the countries of the European Union. Stimulated by this policy of building international links, which is also strongly present at the Faculty of Veterinary Science of the University of Pretoria, the deputy dean and the head of the Office for International Co-operation of the Faculty of Veterinary Medicine of Utrecht University paid a visit to the Faculty of Veterinary Science at Onderstepoort in January, 1999. As these first contacts were very positive from both sides, a follow-up visit by a senior staff member of Onderstepoort to Utrecht was a logical follow-up. Recently, Prof. J.A.W. Coetzer, head of the Department of Tropical Veterinary Diseases, paid a visit to Utrecht to identify possible areas of co-operation. EQUATOR interviewed Prof. Coetzer just before he took off for his next destination.

Can you introduce us to your faculty?

"I am from the Faculty of Veterinary Science which has got a long history of involvement in training. In fact we are about 80 years old. We have a sister faculty at Medunsa, she has been going for about 15 years. We are in the process of amalgamation. We have made good progress and in the last month or two the new dean and deputy dean, the director of the hospital and also the new heads of department have been appointed. Within the next two months there will be placement of staff. The amalgamation process will be completed by 2003 but up to then we will be running 3 curricula: there will be the old Medunsa curriculum, the old Onderstepoort curriculum and the new curriculum, which was implemented last year. This new curriculum consists basically of a more disciplinary approach in the first year or two followed by a species approach -as you do it in Utrecht- for the later years, for example bovine health and production, equine health and production and small animal clinical studies."

Your new curriculum, will it be in English?

"Yes, everything now is in English. It is the policy of the faculty that all lectures will be given in English. There is still a debate on how the exams will be done. Currently the "old" exam papers are done in English while students can still answer in "Afrikaans", or one of the other main local languages. Eventually all lectures and exam papers should be in English. The language question is a sensitive issue. I would guess about 30% of the students are "Afrikaans" speaking at the campus and 60-70% are mother tongue English."

What is the size of the faculty after the amalgamation of the staff?

"Scientific staff will be, following amalgamation, about 120, but this is another aspect which will be determined in the next two months, based on the strategic plans. Total staff will be about 250. At the University of Pretoria there has been already a significant cut in support staff, by contracting services out rather than employing people permanently. Similarly, the same process for academic staff will follow, but for the time being, while we are amalgamating, they have exempted us from this rationalisation. But it is an on-going process. A new initiative at the University of Pretoria is to say that faculties should collaborate closer and form rather schools than faculties. Further linking of disciplins in this rationalisation process can be between medicine and veterinary medicine or veterinary medicine and agriculture. That can be a reality in the next couple of months."

Will the number for the intake of students be added up for Medunsa and Onderstepoort?

"An investigation report on behalf of the ANC government indicated that about 100 students in the amalgamated faculty would be sufficient to serve the country."

As a veterinary faculty you have attained high standards, also in the veterinary service and control of infectious diseases. Please, highlight some of the important diseases you are dealing with at the moment.

Prof. Coetzer in Utrecht
(Photo: De Gooijer)

"I think we have a proud record in terms of quality training for that reason. Perhaps as an introduction, we have got reciprocity with the Royal Veterinary College (London, UK) and also with Massey University (New Zealand). We also investigate reciprocity with Australia and other parts of the world. So, we have always been known for our quality training.

We have got a broad based curriculum and serve the community at the broadest level. For that reason we try to train generalists. There is little specialisation at the undergraduate level. That is more at the postgraduate level where people would like to go deeper into equine practice or companion animals. Our veterinary profession is a little bit different from other African countries, because we have got a strong private practice component. Obviously we must cater for that. Livestock is very important in terms of production and other benefits derived from livestock to the broader communities of southern Africa. So, there is a strong emphasis on infectious parasitic diseases of our region, of which there are many. Many are well controlled but we still need to be able to diagnose and thoroughly understand the epidemiology.
So, in the curriculum there is a strong emphasis on the infectious parasitic diseases. Among the important infectious ones is still foot-and-mouth, although we have not got outbreaks. But buffaloes are still carriers of the virus and there are strict control measures in our country. African Swine fever is a reality. We have got it in our country, not in domestic pigs but the wild pigs, the warthogs are carriers.
Other important diseases, like Contagious Bovine Pleuropneumonia (CBPP) -although we haven't got it in our country- are reported in our neighbouring countries. In Botswana they did a good job in eradicating the disease, but it is still a main threat. Trypanosomosis is a disease of the region, still in our country very limited. We need to address that. And then, obviously, there are the ticks and tick borne diseases.
We got a very strong equine industry in the country and African Horse Sickness is still a threat, it occurs during good rainy seasons. In our department we got a very strong emphasis on equines, all funded by the industry.
Then we have got vector borne diseases, like Rift Valley Fever, Lumpy Skin Disease, Blue Tongue, and Bovine Ephemeral Fever. In brief: we must live with these diseases, we cannot eradicate them like Europe has done with many of these diseases through proper control measures. Fortunately, for many of these vector borne diseases there are good vaccines. We need to know how to live with, control or eradicate these to reduce losses.
And then the companion animal component. As I have explained we got many private practitioners, 1,200 of the 2,400 veterinarians in the country. A big component of the recent graduates will go into companion animal medicine clinics and equines, there is a strong emphasis on that. So in South

Africa we need a balance between companion animals, which includes cats, dogs and horses, and the production animals, livestock species."

Your experience with education for these infectious diseases, also at post-graduate level, is quite important for the region. Could you tell us something about the courses you have developed and which are taught for regional purposes as well?

"Our Department of Veterinary Tropical Diseases serves all disciplins of infectious diseases. Viral diseases, bacterial diseases, protozoal diseases and all the disciplins of parasitology, helminthology, ectoparasitology are in my department. Before the new government we could not associate freely, so we could not fully utilise our resources and knowledge base to the benefit of the region. So many of these tropical disease courses were, or are still given in Edinburgh and other places in the world. Since we could associate freely our department put a strong emphasis on skills orientated modular short courses which may vary from 1-5 week courses. We have designed modules to deal with the important issues of the region of which the epidemic diseases as I have explained are still occurring. So we have a week long course on African epizootic diseases because it is important to create awareness about foot-and-mouth, African Swine Fever and rinderpest. Field veterinarians might not have seen these cases, therefore, in this course, we reproduce cases of these particular diseases, so that they can see them and know which specimen and control measures should be taken. Similarly for laboratory diagnostics, we got our series of modules dealing with all the disciplins of infectious diseases and parasitology and also outside my department modules of pathology and toxicology are being taught. All the disciplins which are necessary in a regional or central veterinary diagnostic lab to support diagnosis, are taught through skills or technically orientated courses.

These modules are very popular. We receive many candidates from Africa and even outside the continent to participate in our short courses. It is a major activity and we run from 7 to 10 modules a year, just in my department, which gives us the opportunity to link with the region. These courses are all certificated and are all credited so that they can use it towards further postgraduate qualification, in most cases for Master of Science (MSc)."

How do you get your courses credited and financed?

Wildlife is a major resource of the region (Photo: Collection University of Pretoria)

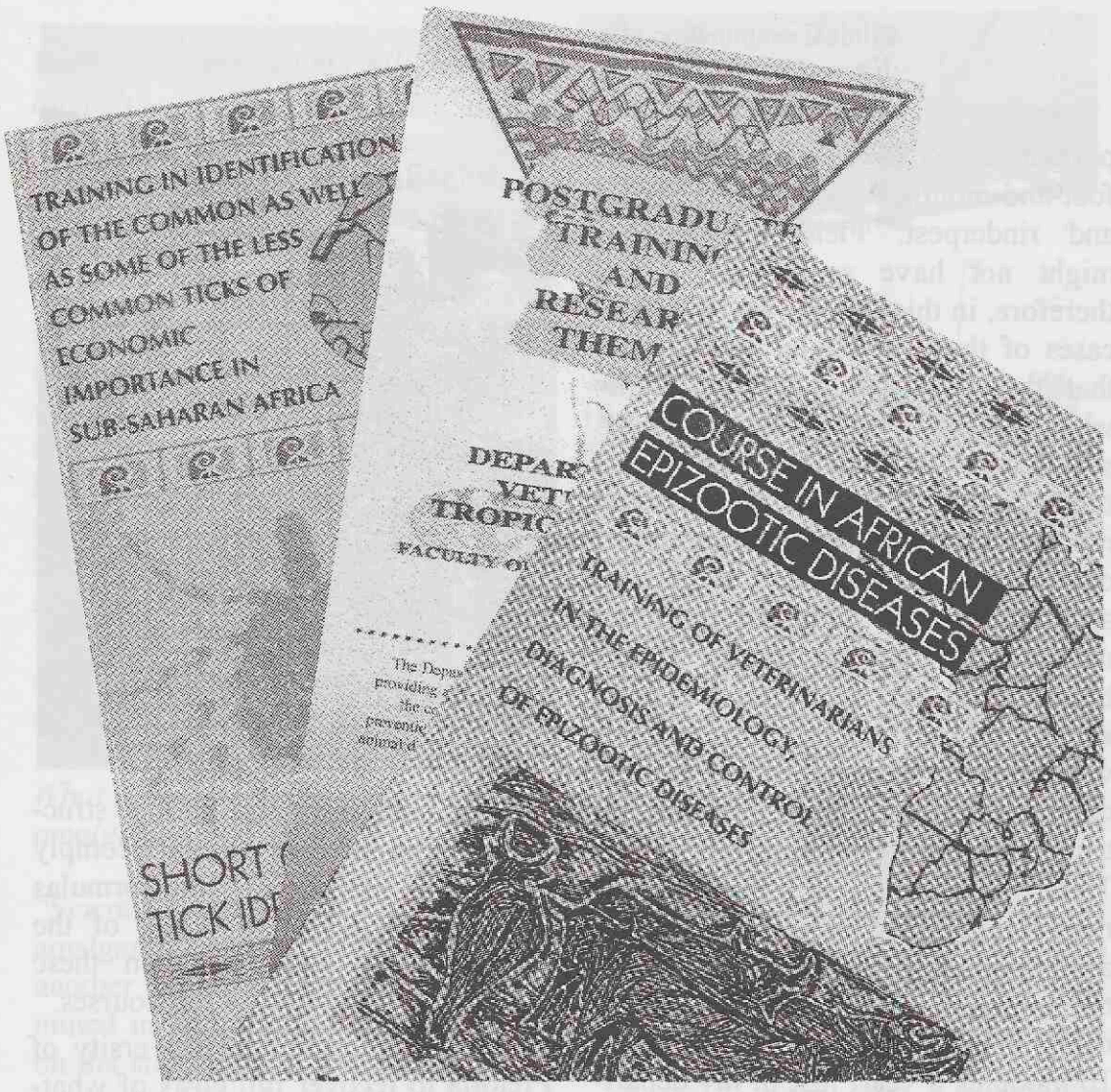
Clinical examination of a horse (Photo: Collection University of Pretoria)

"We do it through the normal structures in the faculty, we must comply to certain regulations and formulas and then through the senate of the University of Pretoria. Then these courses are registered as full courses.

It is also policy at the University of Pretoria to recover full costs of whatever you do. So we charge a course fee which will include all the materials. For example in the laboratory diagnostics series they do hands on. We have got good facilities where people can isolate viruses, prepare media, prepare cell cultures. You use a lot of consumables and animals for teaching, that puts the price somewhat up. And obviously accommodation and air fares, it is a long way to southern Africa.... But notwithstanding, our prices are very competitive with other international courses.

However, this is new and brings in another burden on our department, particularly administratively. For that reason I have appointed a full time course convenor to administer these courses."

Could you present to us the Master of Science degree course in tropical animal health and food safety? This initiative is received very well in the region and is a major activity of yourself and your institute.



"I am very optimistic about this regional MSc and we made tremendous progress in the last two years that we have been involved. It involves the Sokoine University in Tanzania, and the Faculties of Veterinary Science in Zimbabwe, Zambia, South Africa and Mozambique. So, they have all been involved and there is a steering committee where one representative of each faculty serves on. What we have done is to look at the priorities of the region as outlined by different workshops in the region and also by the steering committee of veterinary services. In this committee are all the directors of the region. They have outlined certain priorities in terms of animal health and production. Tsetse and trypanosomosis is one, ticks and tick borne diseases is another one, and furthermore epizootic diseases, which include foot-and-mouth and African swine fever, CBPP, and Newcastle disease. Similarly laboratory diagnostics have been highlighted as a very important aspect to train people to go back to their diagnostic labs. Some of these labs have been depleted of man power and do not function optimally. Then there is also an initiative to train people in veterinary public health and food safety. The last area of priority is wildlife, which is a major resource of the region. And linking with that environmental management. So we have gone a long way to come to the model.

We develop the curriculum through workshops in the region, where everybody in a particular area, for example in tsetse and tryps, is brought together. That topic is debated, the curriculum designed and put into a modular structure. So it is a modular regional MSc on part time basis (see figure 1). These modules vary from 4 to sometimes 6 weeks in duration. Students will come there, go back to their country, apply, get some assignments and come back. The first year of the model consists of core modules, including introductory epidemiology, scientific writing and research methodology, followed later on in the year by applied epidemiology and then ultimately by a module on communication and extension, so that people can convey the message and communicate efficiently in the region. Then they can choose between all those specialization units. Who is interested in ticks and tick borne diseases takes that subject, etcetera. In the third year time will be allocated for research. The planning of that project will really start in the second year. It will be an in-country research project based on the area of specialisation that they have selected.

The modules, apart from veterinary public health and food safety, wildlife and environmental management, all have been designed and completed and during the last part of this year we will do the rest. Then everything is in place.

There has been a significant interest from inside and outside the region in this regional masters. Countries from Europe, like the Nordic countries, also have expressed their interest in these modules. I foresee that in time they will play a significant role in the presentation of the particular stream by acting as tutors or promotors or other ways to support it.

There will also be a feasibility study later this year, when a team consisting of the deans of all the faculties and external people will go to all participating faculties to evaluate in terms of: Can they really do what they have said?, Have they got the required laboratories, equipment, accommodation, and stability in the university? All that will be assessed before we kick off, hopefully in the year 2000. I am very keen, and similarly are all the other faculties in the region very enthusiastic about this regional MSc in the field of tropical animal health and food safety."

Who co-ordinates all these activities?

"At this time we have got the steering committee, with a representative of each faculty, and I am the co-ordinator of this programme currently, but we have decided that, if money is available, we will appoint a co-ordinator. The post will be at a veterinary level and the central secretariat will be at Onderstepoort. That is what the steering committee decided. Once we got the money for this particular post, it will be advertised in the region and then my responsibility will be taken over by this person who will administer, market and do other aspects related to the regional MSc."

How does the programme fit in the

policy on education of the SADC organisation?

"It fits in very well. There was an initiative by the SADC interregional skills development programme to appoint an Irish consultancy to look at the 14 countries within the SADC region in terms of the strength of each country. So, national consultants for each country were appointed to look at what are these strengths in terms of medicine, agriculture, engineering, veterinary medicine, the broad spectrum. Rather than to duplicate what is already done in other countries it is better to create centres of excellence. Then to get movement of students and tutors within the region and get cross border accreditation of courses and modules. We have presented this regional MSc to the national consultants in South Africa and Zimbabwe. And they dropped it in the SADC regional final report, and in that final report we were identified as one of the 10 priority projects in the region. So it has been prioritised within SADC and I can also say that in the last two months I had discussions with SACCAR (Southern African Centre for Co-operation in Agriculture and Natural Resources Research and Training) and SADC. Now it has been approved politically for the region as an important programme."

You have been here for a couple of days now at Utrecht's Faculty of Veterinary Medicine. Do you see possibilities for collaboration between Utrecht and Onderstepoort and maybe linking these possibilities with our other partners in the region, Zimbabwe and Mozambique?

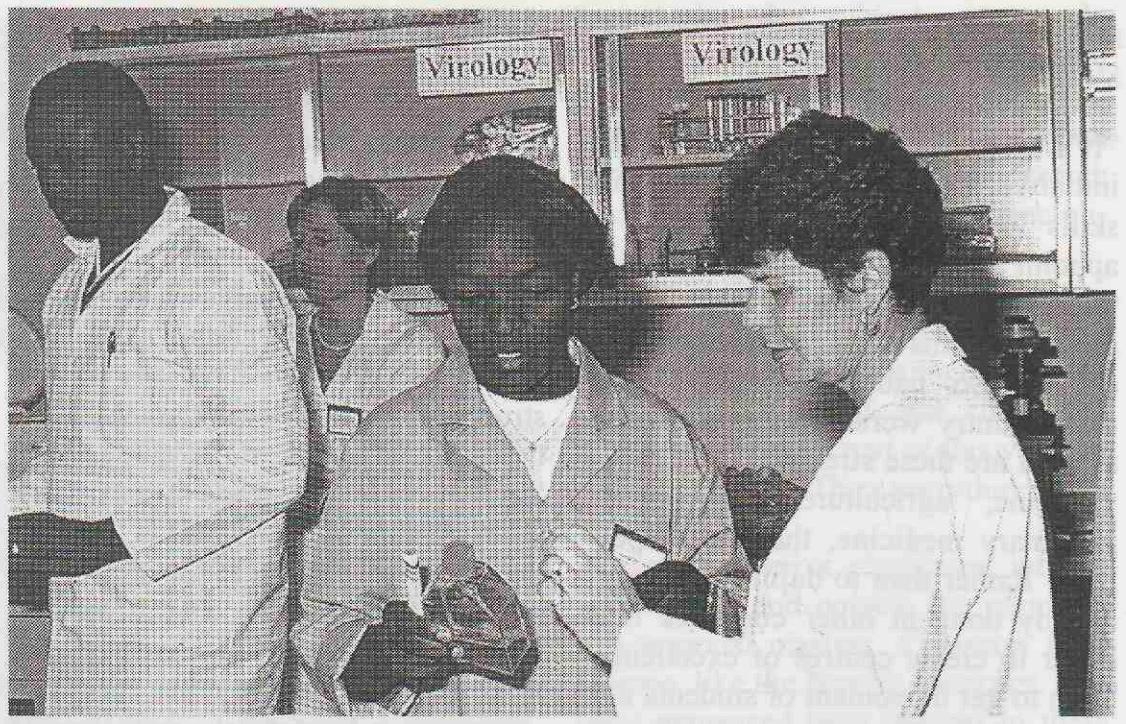
"I was very much impressed by what I have learned the last couple of days. It is obvious that you have got a very strong faculty with very good facilities and a good staff component. Similarly a long history in veterinary training, almost 180 years I believe. In South Africa we have got almost 80 years of involvement. The advantage is that in the region we have got all these tropical diseases that are still occurring under natural conditions. If we can link the technology, which is very sound in your faculty, to the environment where all these diseases occur, this can be very useful in studying these diseases more in-depth. Another big advantage is that at Onderstepoort in the broadest context we are from the Faculty of Veterinary Science, but across the road is the Onderstepoort Veterinary Institute, which is a research institute. Part of that is a high security facility where diseases like foot-and-mouth and African swine fever can be studied. I think by utilising these facilities optimally research projects can then be executed at a lower cost in our environment. So there is ample opportunity to link the two faculties; it will be beneficial for both. You have got a very strong immunology component, particularly in the Department of Infectious Diseases and Immunology to study disease processes and mechanisms. That will even underpin vaccine production which can be very useful in many of the studies that we do in southern Africa.
Obviously, Utrecht has been involved in the region very intensively, in Zimbabwe but also in Mozambique. Similarly we have had a lot of influence and contacts in the region. By linking the two strong partners, your aims in the region and our aims in the region can be strengthened, focussing on research and training, particularly postgraduate training. So I am optimistic that an agreement will ensure long term sustainability of on-going research, postgraduate training in themes as ticks and tick borne diseases or epidemic diseases, and running courses together. We have got similar aims for our country and the region. I foresee that Utrecht also can play a meaningful role within the regional MSc in presenting or joining and linking with some of these specializations as epidemiology or the core modules ticks and tick borne diseases or veterinary public health."

Do you see a possibility for undergraduate collaboration, like exchange of students?

"Yes, no doubt! It will be relatively easy to my opinion to set up this kind of exchange programmes. We have got this kind of programmes with Madison Wisconsin, UCDavis and to a lesser extent with Fort Collins in the United States. We have got a very good veterinary faculty, I can say that in all modesty, from the clinical side a very good hospital, an extensive hospital from intensive care to whatever can be done there. It is particularly strong in companion animals and equine clinical services. We get many requests internationally from faculties for students to take part in the clinics here. We allow them to come and it is a refreshing experience. Utrecht can take part in that. Also, if a student from Utrecht has a particular interest in veterinary tropical diseases he can get a broad exposure for a period of time, rotating through the different disciplins in my department. Toxicol-

POSTGRADUATE MODEL

Year 1	**Core Modules**	University of Zambia
Year 2	**Tsetse & Tryps Control**	University of Zimbabwe
	Ticks and Tick-borne Diseases	Sokoine, Tanzania
	Epizootic Diseases	Onderstepoort, South Africa
	Laboratory Diagnostics	Onderstepoort, South Africa
	Vet Public Helath and Food Safety	Must still be decided
	Wildlife and Environmental Management	Must still be decided
Year 3	**Research project**	Must still be decided



Discussing cell culture at the virology laboratory (Photo: Collection University of Pretoria)

ogy, pathology, whatsoever, can be added to the programme. I foresee that that will be relatively easy. You have got a very good veterinary hospital, which can service our students very well. I believe that you also got an international course on veterinary public health. It might be useful to exploit that further, students from our side can participate in that course."

Anything else that you would like to add?

"I am very optimistic that when we sit down and look at the ingredients of the memorandum of understanding between the University of Pretoria and Utrecht University, we veterinarians can add substantial matters to this agreement.
We should have a long term vision when drafting a memorandum of understanding. Perhaps one day -this is an idea which I have entertained for quite a period of time- a school of tropical animal health and production for the southern African region will be established, wherein everybody, all the faculties who will benefit, take part. My opinion is that Utrecht can be a very strong partner in establishing such a school, linking a consortium of faculties together and addressing postgraduate training on a regional basis. The regional MSc can be a component, but many other aspects can be added to serve the region and also your interest."

Jean de Gooijer and Robert Paling

FACULTY OF VETERINARY SCIENCE OF THE UNIVERSITY OF PRETORIA

The Faculty of Veterinary Science is one of the 11 faculties of the University of Pretoria and is based at Onderstepoort at 25 km from Pretoria. Other faculties are concerned with e.g. biology, agriculture, medicine and dentistry. The Faculty of Veterinary Science was founded in 1920. Besides undergraduate courses for the BVSc degree, it offers a variety of postgraduate training opportunities for veterinary practitioners, clinical specialists, diagnosticians and research scientists.

The mission of the Faculty of Veterinary Science is to provide effective veterinary and paraveterinary manpower and expertise in order to promote the welfare of the total socio-economic spectrum of communities in South Africa and other countries in Sub-Saharan Africa by improving and maintaining animal health, welfare, production and performance, veterinary public health and the conservation of natural resources.

The faculty has 11 departments of which the Department of Veterinary Tropical Diseases is one of the largest. It was created on 1 March 1993 by amalgamating the Departments of Infectious Diseases and Parasitology. This created ideal circumstances to house various related disciplines under one roof and to

follow a multidisciplinary and integrated, problem-solving approach, particular pertaining to teaching and research.

The Department of Veterinary Tropical Diseases contributes to the Faculty's mission by providing veterinary manpower and the community with relevant knowledge on the prevention and control of infectious and parasitic animal diseases to improve sustainable socio-economic development in south Africa and elsewhere.

The Department of Veterinary Tropical Diseases offers undergraduate courses for veterinary students in the 3rd to 6th year of the veterinary curriculum and diploma courses for veterinary nurses. The subjects include: bacterial, protozoal and viral diseases and ecto-parasitology, helminthology, immunology and microbiology. These courses aim to enable graduates and diplomates to diagnose infectious and parasitic diseases of animals and implement cost-effective measures, appropriate to diverse systems of management and socio-economic conditions.

Postgraduate study programmes includes studies for various degrees such as the BVSc (hons), PhD, MSc and DVSc. The BVSc (hons) follows a modular approach to accommodate the needs and interest of the student. The DVSc degree is awarded on post-doctoral publications of the candidate. The MSc and PhD degrees require that a research project is successfully completed and in addition an examination may be required. Postgraduate training is closely linked to research. Research is focused on defining disease problems and devising, developing and applying innovative and appropriate methods to prevent and control diseases. Field work is an important and integral component of most research projects. Research is conducted on five themes: (1) Equine diseases, (2) Ruminant diseases, (3) Vector-borne diseases, (4) Wildlife research theme and (5) Socio-economic aspects.

The Department offers a range of diagnostic services and as well as advisory and consultancy services. Short postgraduate continuing education courses on a variety of topics receive special emphasis and are given annually to meet the changing needs of the veterinary profession and the community. Priority is given to students from South Africa and other African countries. These postgraduate continuing education courses include a series of modules of 2-4 weeks in veterinary diagnostics: 'Bacteriology and mycology', 'Applied veterinary ecto-parasitology and protozoology', 'Virology (Part I: host systems)', 'Applied veterinary helminthology' etc..

Short courses of 1 week are also developed in specific topics such as: 'Tick identification' and 'African epizootic diseases'. This last course has also raised interest in other parts of the world and staff from Onderstepoort will present the course in the United States (1999) and Europe (2000). Much attention is paid by the Department to the development of teaching materials such as videos, posters and CD-ROMs.

Major changes and developments have taking place in recent years and are still taking place at Faculty of Veterinary Science of the University of Pretoria. The most important ones are the amalgamation of the veterinary faculties of Onderstepoort and Medunsa at the location of Onderstepoort and the development and introduction in 1998 of a new veterinary curriculum, taught in English.

The development of the 'Regional MSc in Tropical Animal Health and Food Safety', a joint effort of 5 veterinary faculties in the SADC region, which is co-ordinated by the Department of Veterinary Tropical Diseases at Onderstepoort, provides the faculty at Onderstepoort with a unique challenge to take a central position in the development of an adequate, sustainable, regional veterinary infrastructure to serve the southern African livestock sector.

(For information: Head of Department, Department of Veterinary Tropical Diseases, Faculty of Veterinary Science, University of Pretoria, Private Bag X04, Onderstepoort, 0110, South Africa (tel. +27.12.5298269, telefax: +27.12.5298312, e-mail: infek5@op1.up.ac.za).

ABSTRACT OF THE RECOMMENDATIONS ON ANIMAL HEALTH AND LIVESTOCK DEVELOPMENT POLICIES FORMULATED BY THE 9th INTERNATIONAL CONFERENCE OF THE ASSOCIATION OF INSTITUTIONS FOR TROPICAL VETERINARY MEDICINE (AITVM)

HARARE, ZIMBABWE, 14-18 SEPTEMBER 1998

Objective of this document

This document states the mission and activities of the Association of Institutions for Tropical Veterinary Medicine (AITVM) and highlights the main recommendations on livestock development policies, jointly formulated by 225 specialists in tropical animal health and livestock production, which are of relevance to Ministries of Agriculture, Education, Health and National Parks and Tourism, regional and international organisations and donor agencies. The AITVM will distribute these recommendations widely and support their implementation.

AITVM's mission

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

Activities of AITVM

- to facilitate and stimulate international collaboration
- to promote and co-ordinate research and training in animal health and production in the tropics
- to inform policy makers of current and future strategies in animal health and production research for sustainable rural development
- to organise international conferences at regular intervals on themes concerning livestock in the tropics.

Introduction of the AITVM Conference

The AITVM organises every 3 year an international conference for experts in tropical animal health and livestock production. New developments in education, research and extension are presented and discussed. Recommendations for livestock development policies are formulated. The 9th Conference, which had as theme 'Animal Health and Production for Development', was held in Harare (Zimbabwe) from 14-18 September, 1998. The Conference was attended by a total 225 representatives from governments and private organisations and projects in the SADC countries, international organisations and institutions for higher education and research in Africa, Europe, Asia, America and Australia. Some 50 papers were presented, including keynote addresses, research communications and posters. Presentations and workshops covered 5 themes for which policy recommendations were formulated. Abstracts of the presentations, summaries of the discussions and the full text of the recommendations, are published in the proceedings of the Conference.

FROM THE AITVM

RECOMMENDATIONS

Needs and possibilities for regional integrated animal disease control

When disease problems pose a recognised, significant constraint to livestock production for farmers and nations, regional co-operation should be initiated. Regional approaches can only co-ordinate national strategies, but can not implement the control measures, which is a national responsibility. The aim and nature of regional integrated animal disease control will vary from region to region and priorities will shift over time.

A number of principles should be taken into account when regional disease control programmes are formulated:

- A holistic and multidisciplinary approaches should be adopted.
- Problem analyses and needs assessments should be conducted before planning starts.
- Cost recovery should be introduced without jeopardising public interest.
- Factors which may affect sustainability should be identified.
- Long term programmes should incorporate shorter term projects.
- Appropriate monitoring and evaluation systems should be established to provide feedback during the running of the project at the levels of policy, strategy, planning and implementation.

Increasing efficiency of the public and private health delivery systems

Efficient animal health delivery services can be characterised as: cost-effective, convenient, accessible to the beneficiaries, appropriate, timely and client-oriented. The design of policy and legislative frameworks should be based on relevant research, efficient information systems and on the demonstration of the economic importance of livestock with respect to the national gross domestic product.

The following initiatives should be undertaken:

- Policy legislation must be put in place, as macro-economic and livestock sector policies are the determinants of successful development and sustainability of the livestock industry.
- Standardised training and extension services must be developed in order to improve the performance of the public and private sectors.
- The role of the public and private sectors in the health delivery systems must be defined. National and international disease surveillance networks are the priority of the public sector. The private sector should continue to develop and adequate credit systems should be set up. Unfair competition from public services, projects or other agencies and NGOs should cease.
- Privatised community-based animal health delivery services should be developed, particularly, but not exclusively, in pastoralist areas. Legislation of the organisational structure and monitoring by government veterinary services should be put in place.
- Research activities should focus on the impact of macro-economic policies on livestock service delivery systems and cost/benefit analysis of animal health control programmes.

Re-orientation of the veterinary curriculum

Numerous developments determine that institutions for veterinary education need to re-orientate and review their curricula continuously. These developments include: economic developments and changes in land use and production systems; changes in disease patterns and new emerging diseases; privatisation of veterinary services and liberalisation of trade. There is a necessity to improve the clinical skills and skills for surveillance, diagnosis and control of economically important animal diseases. Veterinary curricula need to be harmonise to make degrees internationally recognisable. The standards of veterinary education need to be internationally determined, quality of education assessed and institutions and courses accredited. AITVM could play a role in these matters.

Actions to be undertaken to improve the undergraduate veterinary education:

- The curriculum should be reviewed periodically, flexible and demand-driven.
- The curriculum should be harmonised on a regional basis.
- The financial base for veterinary training should be broaden.
- A regional accreditation system should be established.
- Elective courses should be included in the veterinary curriculum.
- The number of students admitted to the veterinary education should match the jobs available.

Actions to be undertaken to develop and improve postgraduate education:

- International and regional postgraduate programmes should be promoted.
- Postgraduate courses should address the broad needs of the veterinary profession.
- The regional research agenda should be defined and prioritised through dialogue between governments and universities.
- The information exchange and collaboration between universities should improve and resources shared where possible.
- Funds allocated to postgraduate training should increase.
- Postgraduate programmes should have an international accreditation system.

Domestic animal and wildlife resource management

In the livestock sector there is a recognition of the contribution of 'indigenous' ruminants and poultry in low-input systems to the well-being of the small holder by virtue of their tolerance of the tropical environment, parasites and diseases.

Specific measures recommended to improve the productivity:

- Development of appropriate feeding and management systems (e.g. strategic and tactical supplementation) to improve health and reduce neonatal mortality.
- Promote selection of disease resistant breeds.
- Wildlife management needs a more favourable legislative and economic environment, which equates with that in livestock production, so that the profession can help wildlife reach its economic potential.

Actions to be undertaken to develop and improve the wildlife sector:

- Transfer the right to use wildlife to the local community and create a legal framework.
- Create an appropriate economic environment to develop the wildlife industry.
- Form wildlife user associations with a political voice.
- Extend the concept of livestock biodiversity to include wild animals.
- Introduce education at all levels and encourage educative tourism.
- Train veterinarians in systems analysis, ecology and economics.
- Develop novel methods in: diagnosis and control and management of diseases.
- Reduce the risk of disease transmission from wildlife to livestock and visa versa.
- Undertake applied research into cost-effective techniques for harvesting, processing and marketing of wildlife products.

Veterinary public health and food safety

Surveillance of many zoonotic diseases is inadequate in many countries. There are problems in the control of zoonotic diseases in general, but given that some countries are more successful than others, it appears that these problems are not necessarily insurmountable. The delivery of veterinary public health (VPH) services is often problematic which concerns all levels. HIV/AIDS has major effects on farm economies, food production and also impacts livestock production efficiency in the rural sector. There is a lack of information on specific zoonotic diseases affecting HIV-infected individuals in developing countries.

Actions to be undertaken to improve the of veterinary public health situation:

- Development of improved diagnostic tests for zoonotic diseases in both humans and animals.
- Development of active surveillance systems based on population-based sampling and rapid dissemination of information.
- To ensure governmental support, carry out local studies on knowledge, attitudes and practices, prior to instituting control programmes.
- More emphasis should be placed on 'community ownership' of control programmes.
- Delivery of health information at the local level should make use of innovative communication technology.
- Awareness is needed for improved hygiene, including slaughter and processing of animal products.
- Animal health legislation should be science-based, user-friendly and enforceable by law.
- There should be one department (or ministry) of public health within a country.
- There should be better collaboration between physicians and veterinarians in the investigation of zoonotic disease outbreaks and control, especially at the local level.
- Appropriate educational materials should be developed based on simple problem-based cases and should be supported by visual exercises by extension staff..
- Veterinary schools should provide a strong component of public health and epidemiology in their curriculum.
- Research is urgently needed into the specific zoonotic diseases affecting HIV-infected individuals.
- Practical preventive measures are needed related to food and water hygiene and animal contact to reduce the risk of zoonotic infections in these high-risk individuals.

Information
AITVM Secretariate, Dr. R.W. Paling, Utrecht University, Faculty of Veterinary Medicine, Office for International Co-operation, P.O. Box 80.163, NL 3508 TD Utrecht, The Netherlands (fax: +31.30.2531815, e-mail: bic@vet.uu.nl)

ANNOUNCEMENT

10th International Conference of the Association of Institutions for Tropical Veterinary Medicine (AITVM)

Location:
Royal Veterinary and Agricultural University (KVL), Copenhagen, Denmark

Dates: 22-26 August, 2001

VACANCIES

INTERNATIONAL COOPERATION

This section contains vacancy announcements which the editorial board considers to be of possible interest to Dutch veterinarians. Besides vacancies that will be taken from Vacatureblad Internationale Samenwerking, Tijdschrift voor Diergeneeskunde, Veterinary Record, Intro vacatures (RPDAdvies/Ministry of Internal Affairs) etc., there will be room for personnel advertisements. For further information about the vacancies please contact the institution or company directly.

MINISTERIE VAN BUITENLANDSE ZAKEN

Within the framework of the Netherlands Development Cooperation the International Cooperation Personnel Branch (HPI) is responsible for recruting personnel for temporary assignments relating to development programmes and projects.

ZIMBABWE

The University of Zimbabwe in Harare is looking for the following operational expert:

LECTURER IN LARGE ANIMAL SURGERY

General information
The Faculty of Veterinary Science of the University of Zimbabwe has three Departments. The Dean is the head of the Faculty and is answerable to the Vice-Chancellor of the University of Zimbabwe. The Faculty is staffed with approximately 45 academic staff members and has an annual intake of 30 students in a 5-year veterinary curriculum. The Faculty of Veterinary Science has a long-term university linkage programme with the Faculty of Veterinary Medicine of Utrecht University (the Netherlands).
The Faculty of Veterinary Science requires a competent and experienced large animal surgeon, preferably conversant with both horses and cattle, with a bias toward bovine surgery. The duties of the operational expert will therefore be to teach, conduct research, and carry out clinical service in the field of Large Animal Surgery. The operational expert will be answerable to the Head of Department of Clinical Veterinary Studies.
The need for this specific expertise is enormous in Zimbabwe, because of the

importance of cattle for the subsistence sector as well as for the commercial beef and milk production sectors, which reflexes directly on the economy of the country.

Duties/Job description
To establish a large animal surgery unit at the University Hospital and to be the de facto head ;
To assume leadership in this discipline
To be responsible for handling all primary and referred large animal surgery cases;
To interact with clients and private practitioners;
To attend to field cases which cannot be transported to the University Hospital;
To participate, along with the large animal medicine clinicians, in clinical rounds;
To teach and train students;
Involvement in research is a University policy;
Appointed member of the Hospital Management Board.

Qualifications and experience:
A veterinary degree and a relevant post graduate qualification or a minimum of five years postqualification involvement in surgery. Evidence of publications is a prerequisite. Excellent command of the English language

Duration: 3 years

Information:
Mr. G. Luyendijk (tel: +31.70.348. 6741) or Mrs. A. Pfaff (tel: +31. 70. 3485296) between 16.00 and 17.00 hours.
You are requested to send your application including the names and adresses of 4 referees before 22 July, 1999, quoting vacancy number 99/ZIM/008/S to: Hoofdafdeling Personele Zaken Internationale Samenwerking, Bureau Uitzendingen (HPI/-UZ), Postbus 20061, NL-2500 EB Den Haag (Telefax: +31.30.70.348 6702).

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The High Tatras, Slovakia
30 August – 2 September, 1999
3rd International Conference on Ticks and Tick-borne Pathogens (TTP 1999). Programme: Tick-borne pathogens; tick-host interphase; tick control; geographic distribution and GIS; tick biology; tick ecology; tick morphology, taxonomy and sysetematics. Organised by: Institute of Zoology, Slovak Academy of Sciences and NERC Inst. Virology and Environmental Microbiology, Oxford, UK. Information: Dr. Milan Labuda, Director, Institute of Zoology, Slovak Academy of Sciences, Dubravska cesta 9, 842 06 Bratislava, Slovakia (Tel.: +42.17.3783248; fax: +42.17. 3789757, e-mail: uzaelabu@ savba.sk).

Utrecht, The Netherlands
1 September, 1999 - 31 August, 2001
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: NGL 35,000); MSc Course 'Modern Approaches in Veterinary Microbiology and Immunology' duration 18 months (fee: NGL 68,500); MSc course 'Veterinary Anaesthesiology' duration 18 months (fee: NGL 35,000). Registration before 1 August, 1999. 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).

Entebbe, Uganda
6 – 10 September, 1999
Veterinary Pathology Symposium: Theme - Wildlife diseases and epizootic diseases of livestock in Africa. Organised by: Southern and Eastern Africa Division of the C.L. Davis DVM Foundation. Information: Prof. Ojok Lonzy, Faculty of Veterinary Medicine, Makerere University, P.O. 7062, Kampala, Uganda (Tel.: +256.1.530483, fax: +256.1.554685, e-mail: vetpath@infocom.co.ug)

Harare, Zimbabwe
15 – 17 September, 1999
Annual Congress of the Zimbabwe Veterinary Association. Location: Kariba. Information: ZVA, P.O. Box CY 168, Causeway, Harare. (E-mail: georgie@ loffras.icon.co.zw).

London, UK
September, 1999 - September, 2000
MSc Veterinary Epidemiology. Organised by: London School of Hygiene and Tropical Medicine and The Royal Veterinary College. Starting date: late September. Duration: 1 year. Information: The Registry, London School of Hygiene, 50 Bedford Square, London , WC1B 3DP (Tel.: +44.171.9272239, fax: +44.171.3230638, e-mail: registry @1shtm.ac.uk,http://www.1shtm ac. uk).

CALENDAR

Lyon, France
23 - 26 September, 1999
Joint meeting of the World Association of Wildlife Veterinarians (WAWV), the European Section of the Wildlife Disease Association (EWDA) and the European Association Zoo and Wildlife Veterinarians (EAZWV) at the World Veterinary Congress in Lyon. Information: Dr. Marc Artois, CNEVA Nancy, Domaine de Pixerecourt, BP 9, 54220 Malzeville(http://www.uniud.it/DSPA/wildvet/wawv/wawv.htm).

Lyon, France
23 - 29 September, 1999
1999 World Vet Congress. Organised by : the World Veterinary Association (WVA) and the World Small Animal Veterinary Association (WSAVA). Information: MONDIAL VET 1999, CNVSPA, 40 rue de Berri, F75008 Paris (Tel.: +33.1. 538 39160, telefax: +33.1.53839 169, E-mail: mondialvet@aol.com; http://www.mondialvet99.org).

Edinburgh, Scotland, UK
October, 1999 - September, 2000
Four MSc courses on: 'Tropical animal production and health', 'Sustainable rural development in the tropics', 'Tropical veterinary medicine' and 'International animal health' are organised by the Centre for Tropical Veterinary Medicine of the Royal (Dick) School of Veterinary Studies of the Edinburgh University. The course programme has a modular format including: 6 months taught courses and a 6 months dissertation project. For the MPhil degree an additional research project is carried out during 18 months. Information: The Director, the Centre for Tropical Veterinary Medicine, Easter Bush, Roslin, Midlothian EH25 9RG, Scotland (Tel.: +44.131.6506289; fax: +44. 131.4455099, e-mail: david.w. taylor@ed.ac.uk; http:// www.vet.ed.ac.uk/ctvm).

Irbid, Jordan
23 - 24 October, 1999
1st International Conference on Sheep and Goat Diseases and Productivity. Programme: Medicine and surgery; Pathology; Microbiology; Reproduction; Nutrition; Epidemiology; breeding and management; Meat and dairy products and hygiene; Hair and wool. Registration: Dr Shawkat Lafi, Conference Secretary, Jordan University of Science and Technology, Faculty of Veterinary Medicine, P.O. Box 3030, Irbid 22110 (Fax: +962.2.295 123; email shoatcon@just.edu.jo; http://www.just.edu.jo/sheepandgoatconf/).

Utrecht, The Netherlands
5 November, 1999
10th International symposium: Tropical Animal Health and Production. Theme: 'Outcome of and perspectives for collaborative reseach'. Organized by the Committee for the Advancement of Tropical veterinary Science (CATS) and the Office for International Co-operation of the Faculty of Veterinary Medicine of Utrecht University. Registration before 25 October, 1999 to Office for International Co-operation, Faculty of Veterinary Medicine (Telefax: +31.30.2531815, e-mail: bic@vet.uu.nl See announcement and registration form in the next issue of EQUATOR).

Berlin, Germany
January, 2000 - December, 2001
Master of Science Degree in Tropical Veterinary Epidemiology (MSc TVE). The study programme is offered with 3 study options: Option 1. Freie Universität Berlin-Addis Ababa University Joint Postgraduate Programme; Option 2. Berlin-Germany Programme; Option 3. Berlin-Home Country Programme. The course programme has a modular format with course work part A, with basic and applied lectures and demonstrations, and by practical exercises carried out in Berlin (first year). Under option 1 Part B with individual research work for the MSc thesis in Ethiopia, allowing also for research in the East African region under special arrangements (first and second year); under option 2, part B lasts for 7 months in Berlin; and under option 3 individual research work is undertaken in the home country of the participant. Information: The Co-ordinator, Postgraduate Studies in Tropical Veterinary Medicine, Freie Universität Berlin, Luisenstrasse 56, 10117 Berlin (Tel.: +49.30.20936063; fax: +49. 30.20936349; e-mail: TropVet@city.vetmed.fu-berlin.de; http:// www.vetmed.fu-berlin.de).

Barneveld, The Netherlands
1 March - 27 May, 2000
22nd International animal feed training programme (AFTP). Organized by: IPC Livestock International, Barneveld College. Fees including board and lodging: NGL 14,500. 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).

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 (Fax: +46.18.673545, e-mail: hans.gustafsson@og. slu.se).

EQUATOR

NEWSLETTER ON VETERINARY ASPECTS OF INTERNATIONAL DEVELOPMENT COOPERATION

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VOLUME 11, 1999

REPETITIVE DNA ELEMENTS AS GENETIC AND PHYLOGENETIC MARKERS IN THE GENOMES OF CATTLE AND OTHER RUMINANTS

I.J. Nijman, PhD thesis, Utrecht University

On 2 September, 1999 Ies Nijman, researcher at the section of Bacteriology of the Department of Infectious Diseases and Immunology of the Faculty of Veterinary Medicine of Utrecht University, the Netherlands, defended his PhD thesis on "Repetitive DNA elements as genetic and phylogenetic markers in the genomes of cattle and other ruminants". The editorial board considered parts of this thesis of relevance and interest to the readers of EQUATOR.

Introduction

Wild populations always adapt to the environment, while men constantly tries to improve his domesticated flocks in order to increase their production, to control diseases or to conserve biodiversity. Cattle and cattle-like species are the world's most important livestock. Nowadays, molecular tools are used to optimise breeding, investigate genetic diseases and elucidate cattle species phylogeny. DNA markers identify diversity at the molecular level and allow the inference of genetic and phylogenetic relationships. In his thesis Dr. Nijman describes the use of different types of DNA markers to unravel the genetic diversity and molecular history of cattle and related species, and demonstrates the value of repetitive DNA elements as markers for the genetics and speciation of cattle.

Ruminant species

Since the neolithic period cattle have had a huge impact on the cultural development of mankind. Before domestication, wild cattle already inspired the artists of cave paintings. Since 10,000 BC, domesticated cattle have been a source of milk, meat, hides and draught power.

Cattle belong to the ruminant underorder, which comprises the families *Bovidae* (hollow horned), *Cervidae* (deer), *Antilocapridae* (pronghorns), *Giraffidae* (giraffes and okapis) and the *Tragulidae* (chevrotains).

The *Bovidae* contain more than 100 different species, which include the world's most important domesticated species, like cattle, goats and sheep.

Wild and domesticated cattle form, together with the buffalo species, the *Bovini* tribe. While all the species of the *Bovidae* and *Bovini* are taxonomically well defined, again the phylogenetic relationships have not been unambiguously resolved by either morphological studies or molecular studies.

Within the *Bovini*, a separate group comprises the buffaloes, which consists of the African or Cape buffalo (*Syncerus caffer*) from the African savannas,

the Indonesian anoa (*Anoa depressicornis*, mountain or lowland) and the Asiatic water-buffalo (*Bubalus bubalis*, swamp or river type). This group, except for the dangerous African buffalo, is domesticated and used as draught (swamp buffalo) or dairy and beef animals (river buffalo). The banteng (*Bos javanicus* or *Bos banteng*), which also lives in South-East Asia and Indonesia, has been domesticated as Bali cattle and is mainly used for labor and meat production. In India and surrounding areas, the remaining thousands of the wild gaur or Indian bison (*Bos gaurus*) can be found, but its domesticated relative, the gayal (*Bos frontalis*) is more abundant. These large, but friendly animals mainly serve as status symbols, but are used as beef animals as well. Both the American bison (*Bison bison*, in the USA and Canada, confusingly also called buffalo) as well as the European bison (wisent, *Bison bonasus*) experienced a severe population bottleneck. Conservation efforts have restored the number of bisons (from 800 in 1984 to approximately 25,000) and wisents (from 23 breeding pairs to approximately 3,000 animals in zoos and parks). The only cattle species able to live at high altitudes on the mountains of China (Tibet) and Siberia are the long-haired yaks (*Bos grunniens*) and these animals have been domesticated as carry, draught and dairy animals. The most common species of cattle is *Bos taurus* and in tropical regions the zebu (*Bos Indicus*, humped cattle). These species are very closely related but have been independently domesticated around 7,000 BC. Since then, a great variety of different breeds have emerged. Nowadays, large numbers of cattle are kept all over the world in various agricultural production systems.

Introgression and hybridization

The relatively short divergence time between *Bos taurus* and *Bos indicus*, of only 100,000 to 200,000 years explains the viability of hybrid offspring. Also, hybridization between other cattle-like species is not uncommon. Although complete viability is limited to taurindicine hybrids only, other hybridizations usually yield fertile cows and sterile bulls. Crossing of these hybrid cows with bulls from one of the parent species may restore the fertility of the bulls of later generations. In this way, hybrid populations or even breeds can be maintained.

In Africa, introgression of Indian zebu bulls in taurine herds since 700 AD improved the tolerance of the cattle to hot and dry conditions. On the other hand, zebu introgression in certain N'Dama populations in West Africa diminishes tolerance to *Trypanosoma* spp. causing trypanosomosis, and is therefore unfavorable. More recent taurindicine breeds are bred in the United States, New Zealand and Australia and are also exported to several other countries.

Hybridization of banteng and zebu is supposed to occur frequently and may have led to the Madura breed. Yak-taurine hybrid animals, named yakows in Tibet, Siberia, China and Mongolia yield favorable heterosis effects and are better adapted to medium high regions (1,500-2,000 m), grow larger and produce more milk then the yaks. In the USA bison-taurine hybridizations have created the Beefalo breed with its reputed low fat, low calorie meat quality. Finally, the gayal-zebu crosses or selembu are better adapted to the hot and dry climate of Burma and India and the females are valued for their milk yield. However, written records of the species composition of these breeds are in most cases not available, while they often are economically important and have high traditional value.

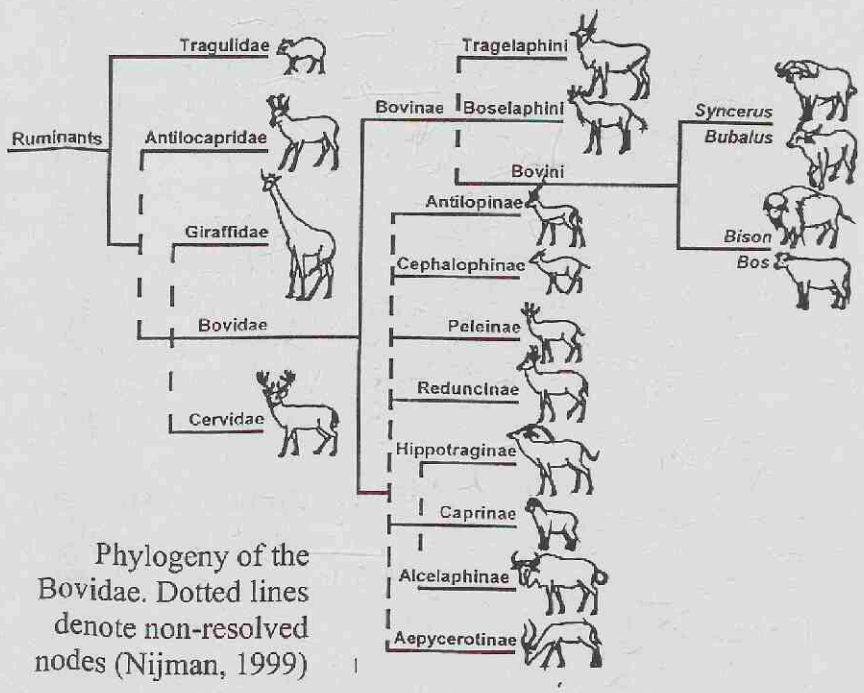
Genetic and phylogenetic markers

Any well defined phenotypic or molecular difference between individuals or species can be considered as a marker of variation: morphological, physiological, pathogenic traits or diversity at the molecular level. Genetic markers can be used to investigate inherited differences between individuals within a family or breed structure, while phylogenetic markers are informative for evolutionary relationships between species.

Molecular markers are generally superior to morphological markers for the following reasons:

1. The detection of their state, usually by PCR, is unambiguous and straightforward.
2. The variation at the molecular level is such that several markers can be found in any region of the genome.
3. Data sets of equivalent markers can be generated and analyzed by quantitative methods. In contrast, it is usually difficult to weigh the various morphological traits.
4. Markers may either represent single loci in the genome or represent several loci simultaneously, like the presence of a DNA repeat or a DNA fingerprinting pattern.

Often, the molecular variation that underlies a phenotype has been identi-



Phylogeny of the Bovidae. Dotted lines denote non-resolved nodes (Nijman, 1999)

fied, providing a direct link between phenotypic and molecular markers. Most markers, however, are in the non-coding 'junk' DNA and any associated change in the phenotype is unlikely.

Genetic markers

Genetic markers exploit variation within the species. Marker variants (alleles) are inherited in a Mendelian way and may elucidate the genetics of a certain trait. If the inheritance of a phenotype correlates with the inheritance of a marker, for instance in pedigrees (co-segregation), that marker is genetically linked to the gene underlying that phenotype. This indicates that the marker and the gene are proximate on the same chromosome. The most well known molecular genetic markers are the fast evolving, multi-allelic microsatellites (see figure). Other examples are restriction fragment length polymorphisms (RFLP), based on point mutations in restriction sites, random amplified polymorphic DNA (RAPD) and amplified fragment length polymorphisms (AFLP). A promise for the future is the efficient detection of point mutations using DNA chip hybridization.

Phylogenetic markers

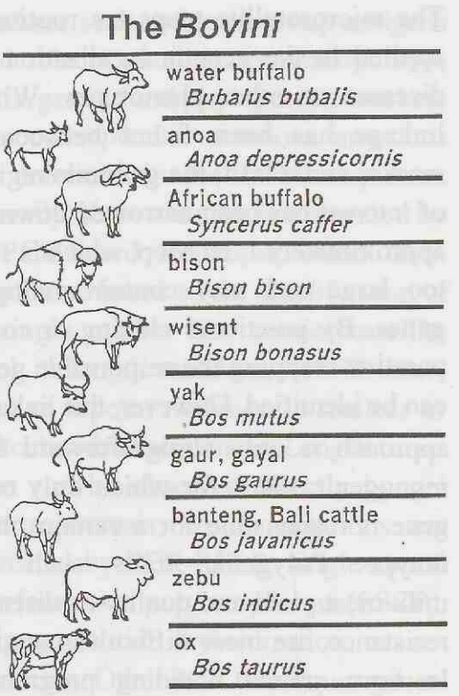
The evolution of species spans a much larger time period than the few generations covered in genetics. Traditionally, morphology has been a powerful phylogenetic marker, but most progress in phylogenetic reconstruction is now based on DNA markers. So far most phylogenetic DNA markers are sequence changes in various kinds of loci like nuclear genes, mitochondrial t-RNA or rRNA genes or the mitochondrial displacement loop (D-loop). Other DNA-based markers can be DNA arrangements or the amplification of repeat families. Variation in the mitochondrial genome is informative for the female lineage, while the Y-chromosome is paternally transmitted. This is especially relevant for herd animals like cattle since introgression usually takes place through the paternal line. So mitochondrial DNA provides informative markers for the origin of the herd, while the Y-chromosome may reveal genetic admixtures of other breeds or species.

Basically, phylogenetic reconstruction assumes that if a marker has the same state in a group of species, these species are clustered and the species with a different marker state are excluded. In a dataset, several markers are considered and various algorithms are available to reconstruct the phylogeny of the species investigated.

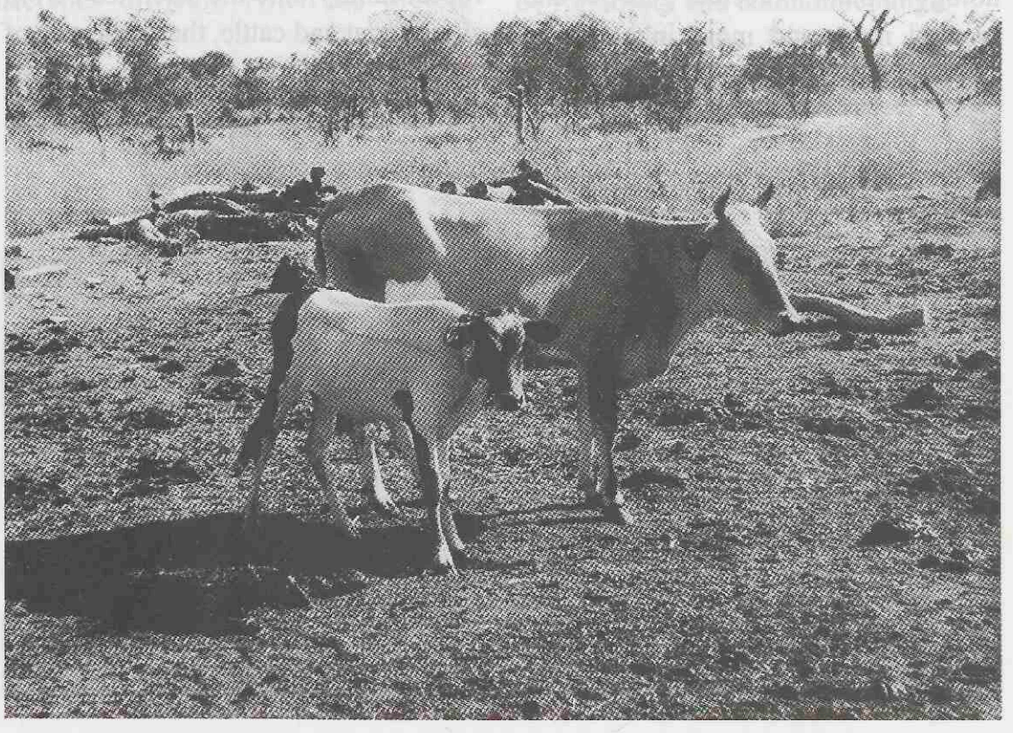
In the thesis novel types of phylogenetic markers are described: satellite DNA polymorphisms that represent several centromeric loci and appears to be informative for species hybridization and phylogeny. AFLP, originally a genetic technique, which yields several bi-allelic markers in a single experiment, might also reveal introgression. Individual SINE retrotranspositions that are evolutionary unique events and may be suitable to compare phylogenies of different parts of the genome where species are grouped if they share a common SINE (Short Interspersed Nuclear Elements) insertion.

Microsatellite genetic markers

Nowadays, the most well-known genetic markers for mammalian species are the microsatellites. In up to 200.000 positions in the genome, di,- tri- or tetranucleotide repeats are present. Slippage of the DNA polymerase I during replication of these repeats creates allelic length variants. The detection of these alleles is straightforward: PCR primers located in the unique regions flanking the repeat, amplify a DNA fragment containing the microsatellite and length variants can be determined on polyacrylamide gels.



Species of the *Bovini* (Nijman, 1999)



N'dama cow with crossbred calf. Zebu introgression in N'Dama populations in West Africa diminishes tolerance to *Trypanosoma* spp. (Photo: Paling)

The microsatellite maps are routinely applied in the genetic localization of diseases or other phenotypes. When linkage has been found between a marker and a trait, the genomic region of interest has been narrowed down to approximately 1-10 Mbp, which is still too large and may contain multiple genes. By positional cloning or comparative mapping the responsible gene can be identified. However, this linkage approach is only straightforward for monogenic traits, for which only one gene is responsible for a certain phenotype. Polygenic traits such as milk/meat yield and quality or disease resistance, are more difficult to study. In farm animal breeding programs, marker assistant selection (MAS) is envisaged to positively or negatively select animals with marker alleles linked to these quantitative traits in order to improve the offspring. So far, this has not been realized yet for farm animals. A more promising scenario may be the selection of candidate genes by comparative mapping. After identifying a region of interest, the involvement of this gene can be verified by association studies in which a population-wide analysis may prove a correlation to be true or false.

Amplified fragment length polymorphisms (AFLP)

AFLP is now a standard marker technology in plant molecular genetics and is used more and more in bacterial, parasitic and animal genomic research. This technique is based on selective amplification of restriction fragments. AFLP is used to estimate the genetic diversity within a species and genomic divergence of related species. The fingerprints are converted to similarity matrices and the species genomic distances are visualized in a principal coordinate plot. This thesis demonstrates that AFLP is also suitable to detect the hybrid origin of African cattle breeds and the Indonesian Madura and Bali cattle.

Repetitive DNA

Centromeric tandem repeats or satellite DNA is the most abundant component of the eukaryotic genome. It consists of almost identical DNA sequences linked in head-to-tail formation and is usually organized in higher order structures. Satellites are mainly located in the centromeres and may account for up to 20% of the total genome.

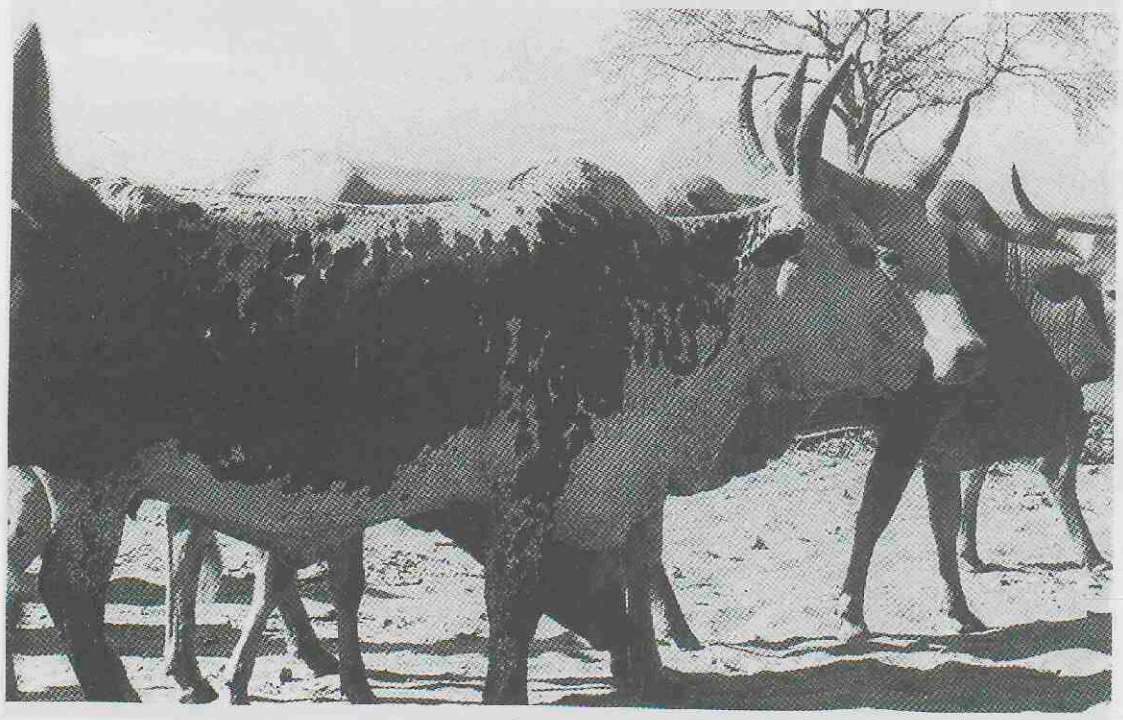
Surprisingly, satellite DNA is not only the most abundant, but also the most variable component of the eukaryotic genome. Satellites can be specific for a subfamily, a tribe or even a species. For instance, the bovine satellite III accounts for 4% of the total genome of cattle, but is virtually absent in water buffalo and only partially present in African buffalo.

If related species share a homologous repeat family, like the satellites I from sheep, goat and cattle, the sequences of the repeat units are more similar within the species than between the species. This phenomena is called concerted evolution. Several mechanisms leading to a concerted evolution have been proposed: unequal crossing-over or slipped-strand mispairing, gene conversion and saltatory replication. When these species specific mutations are present in homologous satellites of interbreeding species, hybrid offspring of two different species have a mixture of satellite variants. This can be detected by Southern blotting or PCR-RFLP. So variation in satellite DNA is an informative marker for species introgression.

***Bos indicus-taurus* hybridization**

There are two sister taxa of domestic cattle, humpless *Bos taurus* and humped *Bos indicus*, or zebu. Both species are represented in Africa. For example, N'Dama and other *Bos taurus* breeds are found in western Africa and animals of *Bos indicus* morphology predominate in eastern Africa. The taxa are closely related and hybridisation between *Bos taurus* and *Bos indicus* results in fertile "taurindicus" breeds. Remarkably, all African breeds harbour taurine type mtDNA, but zebu Y chromosomal and autosomal marker alleles are often found. It was suggested that the numerous sanga breeds (cattle with intermediate hump morphology) in southern Africa are a result of hybridisations between African *Bos taurus* and humped *Bos indicus*.

Taurine and indicine cattle have different adaptations to African local conditions. In western Africa, which is one of the regions where tsetse-borne trypanosomosis is prevalent, the taurine N'Dama breed has developed a natural resistance against this disease. This unique property makes the *Bos taurus*



Nguni cattle. Sanga breeds (cattle with intermediate hump morphology) in southern Africa are a result of hybridisations between African *Bos taurus* and humped *Bos indicus* (Photo: Paling)

animals of this region valuable for export to other regions. However, hybridisation with encroaching zebu breeds, which are better adapted to dry and hot climates, is frequent and is known to dilute the trypanotolerance trait.

Several types of genetic markers have been described to distinguish zebu and taurine cattle. Presently, microsatellite markers are considered to be the most informative, but determining allele frequencies requires screening of many individual animals.

The thesis describes satellite DNA variation that detects hybridisation of *Bos indicus* and *Bos taurus* in African cattle populations. On Southern blots hybridised to a satellite III probe, relative intensities of *Hinf* I fragments correlated with the taurine-zebu composition in hybrid animals as deduced from AFLP genotyping of the same animals and previous data on microsatellite allele frequencies. Similar results were obtained by PCR-RFLP analysis of a zebu specific mutation in the repeat unit of satellite 1.711b. Analysis of individuals from 20 African cattle breeds indicate that the centromeric satellites of the sanga breeds are of the taurine type and that several East African zebu breeds are hybrids between taurine and zebu. These satellite RFLP, or SFLP, markers provide a fast method to screen the genetic make-up of African cattle.

Hybrid origin of Madura and Bali cattle

Interspecies hybridization of *Bovini* species has in several cases led to the formation of hybrid animals, populations or breeds, but this is not always documented. Because of economical, traditional, historical and veterinary considerations, knowledge about the genetic composition of a hybrid breed is relevant. We have used mitochondrial D-loop sequences, amplified fragment length polymorphisms (AFLP) and species specific mutations in centromeric satellite DNA to detect if and to what extent species introgression has occurred in the Indonesian Madura and Bali breeds. Satellite units are more homologous in a species than between species because of their concerted evolution, and therefore mutation can be species specific. By a PCR-RFLP (or SFLP, satellite fragment length polymorphism) these mutations can be detected in hybrid offspring and reveals the parental satellite variants. Madura cattle has a mitochondrial D-loop similar to the Banteng (*Bos banteng*), while we detected a zebu variant in one Bali individual. Both SFLP and AFLP indicate that the nuclear genome of the Madura breed is mainly from the zebu, but has a clear banteng component. Bali cattle is considered as a domesticated form of the banteng, but we found indications of zebu introgression in at least three individual animals.

Molecular markers in genetics and evolutionary biology

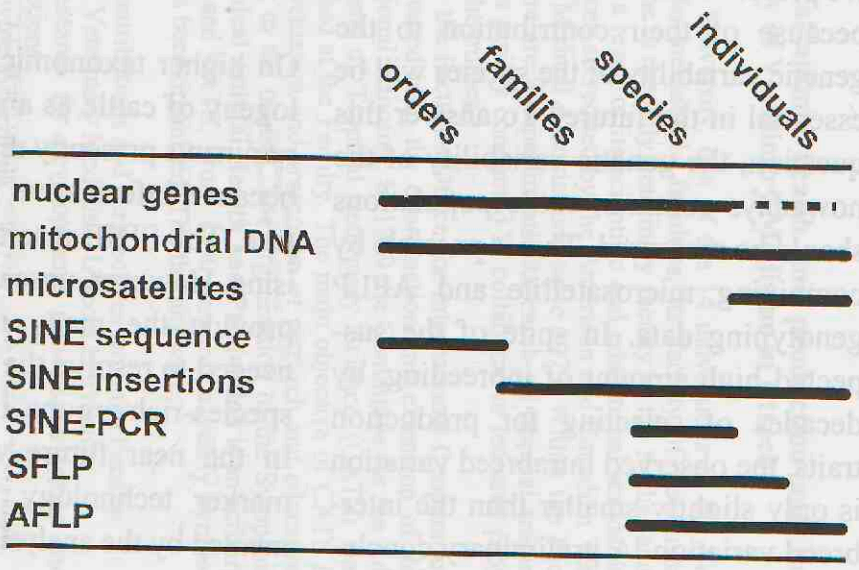
General discussion and conclusion

Within the vast complexity of the mammalian genome, changes in the DNA sequence mark its history and evolution. Extracting this information becomes more and more feasible with the coming of new techniques and automation and when available, this information spreads the world quickly.

But with the methodological repertoire of the molecular geneticist still expanding, the choice of the most appropriate tool becomes difficult. After the protein markers such as blood group antigens and electrophoretic polymorphisms, most genetic and phylogenetic markers now correspond to mutations, insertions or deletions in the DNA sequence. Usually, these changes are revealed by a PCR-based technique. Most techniques are based on the amplification of a single marker like a microsatellite with its length variation, a SINE insertion or a point mutation in nuclear or mitochondrial sequences. Length variation can be observed directly by gel electrophoresis, while mutations are detected by PCR-RFLP, single-strand conformation polymorphisms (SSCP), oligonucleotide hybridization or sequencing. Other PCR techniques generate a multi-marker pattern revealing several mutations distributed over the whole genome, like random amplified polymorphic DNA (RAPD), amplified fragment length polymorphisms (AFLP), direct amplified length polymorphisms (DALPs), SINE-PCR or satellite fragment length polymorphisms (SFLP). In addition, the sequence of the locus may provide more detailed information were every change is a separate marker, for instance the single nucleotide polymorphisms (snp's).

Each marker category has its own specific range of application. The major considerations in the choice of genetic or phylogenetic markers are their level of variability and taxonomic range.

Level of informativeness of the different types of DNA markers (Nijman, 1999)



Future prospects of cattle genetics and phylogenetics

The cattle genetic map becomes more and more saturated with microsatellite markers, increasing the chances of localizing monogenetic disorders and these chances are even boosted by the upcoming comparative mapping information. The limiting factor is the identification of monogenetic phenotypes and the collection of samples for linkage analysis.

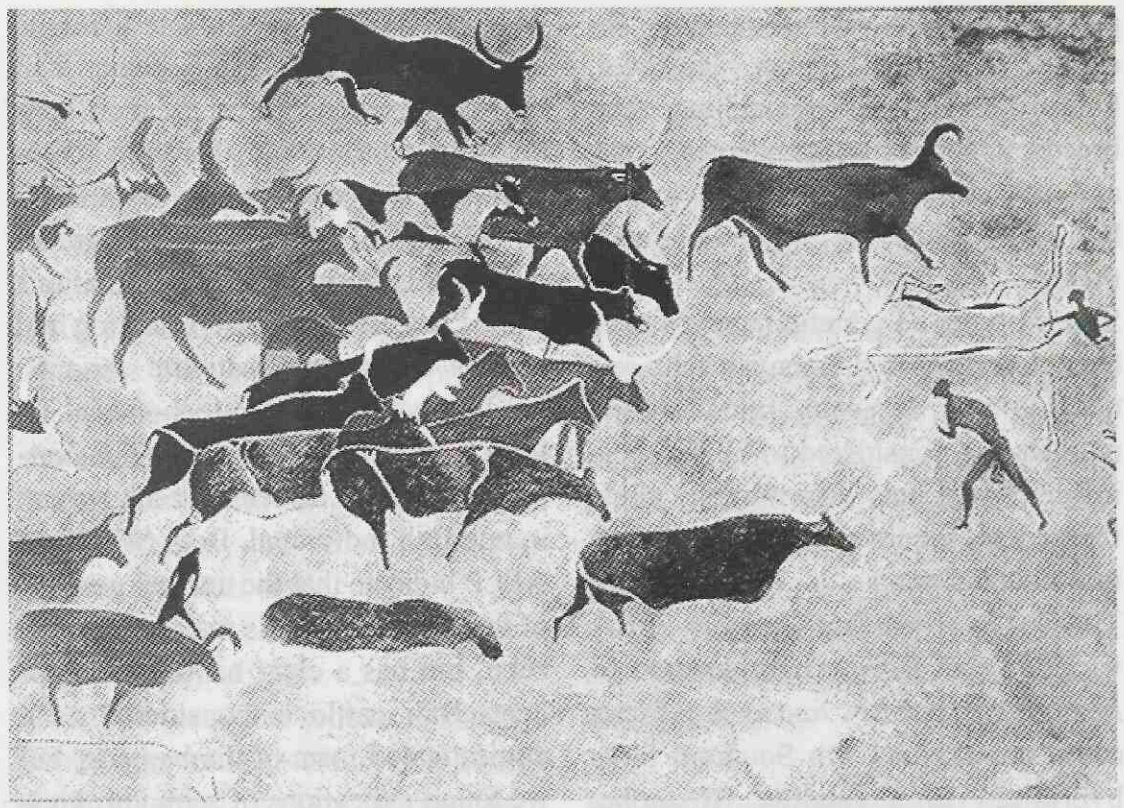
More demanding but certainly not less interesting will be the uncovering of genes of the quantative trait loci (QTLs). These traits like milk or meat yield and quality or disease resistance are economically important but genetically complex. Several genes may contribute (not necessarily equally or fully additive) to these phenotypes that are not always strictly definable. Traditional linkage analysis often yields not more than approximate localizations of the QTL's, and these regions are not necessarily the same in different families. Further progress may depend on the rise of high throughput genotyping methods like the DNA-chip technology and in-depth functional and comparative genomic studies of the human and mouse genomes.

Next to the ongoing gene hunt, studying cattle genetic diversity becomes increasingly important. In many of the 750 traditional cattle breeds, the number of animals is diminishing since most farmers concentrate on efficient production breeds, like for milk production the Holstein Friesian. Should we preserve the less productive breeds because of their contribution to the genetic variability of the species will be essential in the future? To answer this question, the genetic variability of the nowadays common cattle populations should be measured. This is possible by combining microsatellite and AFLP genotyping data. In spite of the suspected high amount of inbreeding, by decades of selecting for production traits, the observed intrabreed variation is only slightly smaller than the interbreed variation. A preliminary conclusion is that only a small part of the cattle genome is involved in selection and that the diversity of the rest of the genome has more or less been retained. So conservation of breeds may not be relevant for the total diversity of the species, but rather for the conservation of the breed-specific phenotypes that are valuable for agricultural, social, traditional or historical reasons.

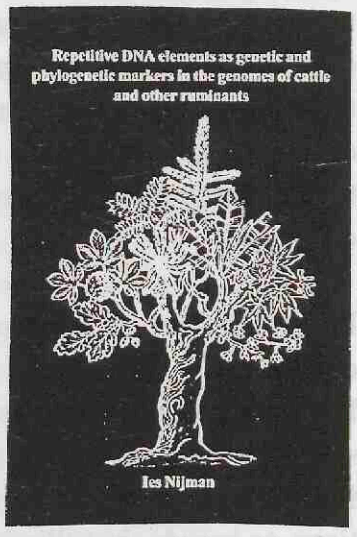
A consequence of the surprisingly high intrabreed variation (or low interbreed variation) is the lack of breed specific markers. One approach to be able to distinguish breed at the genetic level may be the isolation of Y chromosomal markers. Alternatively, breed-specific fixation of AFLP markers may be identified by the analysis of samples pooled per breed. Such markers may be used to elucidate the phylogeny of cattle breeds and to verify the origin of beef samples and other cattle products.

On higher taxonomic levels, the phylogeny of cattle as a species and other ruminants presently remains unresolved because informative markers are still rare. The SINE insertions seem promising. However, upscaling is required to provide the many markers that are needed to resolve the phylogeny of the species-rich groups, like the Bovidae.

In the near future we envisage that marker technology will be complemented by the analysis of differences of expression patterns of individual animals, breeds or cattle species by DNA microarrays or by again other methodological breakthroughs.



Cattle from the 'Bovidian' period. Fresco from the Tassili n'Ajjer in the Sahara (Source: 'A natural history of domestucated mammals' by J.Clutton-Brock, 1987).



Reference: I.J. Nijman (1999) PhD thesis, Utrecht University, IBSN: 90-393-2151-5, pp. 144. Parts of thesis adapted for EQUATOR by Jean de Gooijer. For further **information** please contact Dr. I.J. Nijman, Faculty of Veterinary Medicine, Dept. of Infectious Diseases and Immunology, P.O. Box 80.165, NL 3508 TD Utrecht (Fax: +31.30. 2540784, e-mail: i.nijman@vet.uu.nl).

REGISTRATION FORM

I wish to attend the 10th Symposium "Tropical Animal Health and Production. **Outcome and perspectives of collaborative research**" on 5 November, 1999 at the Faculty of Veterinary Medicine, De Uithof, Utrecht.

Registration is free, but please check box for lunch reservation.

- ❑ I wish to reserve lunch (Dfl. 15,- to be paid at the registration desk)
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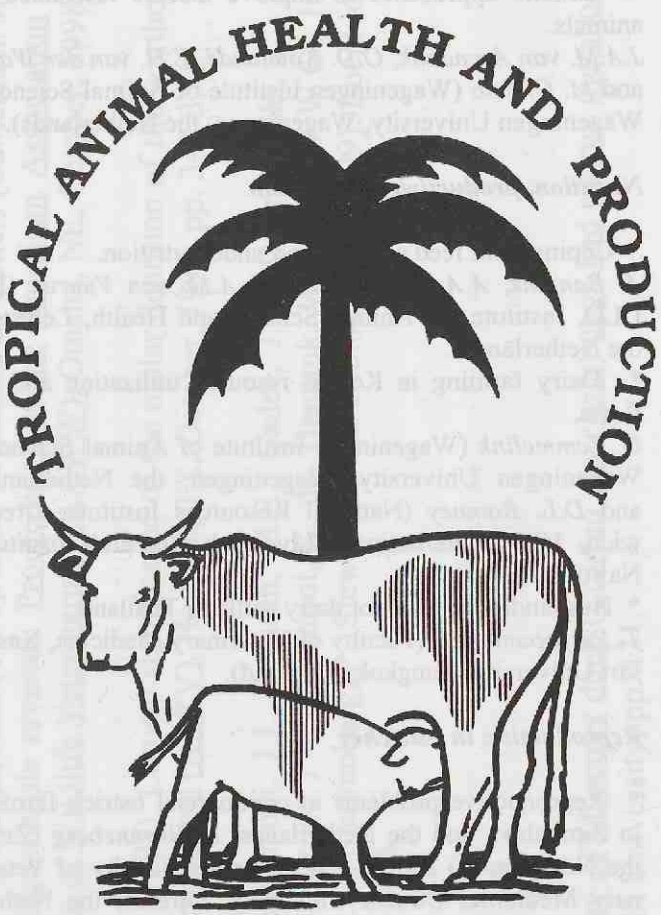
5 NOVEMBER, 1999

10th SYMPOSIUM ON



Outcome and perspectives of collaborative research

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

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. From 1990 onwards a yearly symposium has been organized. 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

Information:
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Faculty of Veterinary Medicine
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Tel.: +31.30.2532116, Telefax: +31.30.2531815
E-mail: bic@vet.uu.nl
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10th International Symposium

TROPICAL ANIMAL HEALTH AND PRODUCTION

OUTCOME AND PERSPECTIVES OF COLLABORATIVE RESEARCH

In 1999 Utrecht University's Faculty of Veterinary Medicine organises the 10th international symposium on **Tropical Animal Health and Production.** This 10th Symposium highlights the commitment of the research institutes in the Netherlands towards livestock health and production in the tropics. Therefore the organising committee selected as theme for this jubilee symposium: **Outcome and perspectives of collaborative research.** The programme of the symposium presents recent results of collaborative research of institutes in the Netherlands and the tropics. Promising ongoing and planned research activities will be presented by scientists from the various institutes as well.

Symposium Organizing Committee
Dr. K.K.I.M. de Balogh
J.H.A. de Gooijer (treasurer)
Dr. R.W. Paling (secretary)
Dr. V.P.M.G. Rutten
Prof. Dr M.A.M. Taverne (chairman)
Dr Ir. H.M.J. Udo

PROGRAMME 5 NOVEMBER, 1999

08.30 – 09.00 h. Registration

Introductory presentations

* Priorities for north-south collaboration.
J.A.W. Coetzer (Faculty of Veterinary Science, University of Pretoria, Onderstepoort, South Africa).
* Research on tropical animal health and production in the Netherlands: an overview.
R.W. Paling (Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands) and *H.M.J. Udo* (Wageningen University and Research Centre, Wageningen, the Netherlands).
International funding policies and possibilities for livestock research
Speaker to be identified (the Netherlands)

Diagnosis and control of infectious diseases

* Recent developments in the diagnosis of Malignant Catarrhal Fever (MCF).
D. Mukwedeya (Faculty of Veterinary Science, University of Zimbabwe, Harare, Zimbabwe), *V.P.M.G. Rutten* (Faculty of Veterinary Medicine, Utrecht University, Utrecht , the Netherlands) and *H.W. Reid* (Moredun Research Institute, Edinburgh, UK).
* Integrated control of ticks and tick-borne diseases of ruminants in the tropics.
F. Jongejan (Faculty of Veterinary Medicine, Utrecht University, Utrecht , the Netherlands) *et al.*
* Genetic approaches to improve disease resistance of animals.
J.A.M. van Arendonk, O.D. Koudandé, E.H. van der Waaij and *M. Okomo* (Wageningen Institute of Animal Sciences, Wageningen University, Wageningen, the Netherlands).

Nutrition, productivity and health

* Coping with feed scarcity and undernutrition.
A. Bannink, A.A. Ayantunde and *A.M. van Vuuren* (ID-DLO, Institute for Animal Science and Health, Lelystad, the Netherlands).
* Dairy farming in Kenya: resource utilization and N-flows.
G. Zemmelink (Wageningen Institute of Animal Sciences, Wageningen University, Wageningen, the Netherlands) and *D.L. Romney* (National Resources Institute, Greenwich, UK / International Livestock Research Institute, Nairobi, Kenya)
* Husbandry systems for dairy cattle in Thailand.
T. Pinyopummintr (Faculty of Veterinary Medicine, Kasetsart University, Bangkok, Thailand).

Reproduction in ostriches

* Reproductive problems in commercial ostrich farming in Zimbabwe and the Netherlands. *R. Bronneberg* (Zeist, the Netherlands) and *M.A.M. Taverne* (Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands)
* Testical structure and the process of spermatogenesis in the ostrich.
J. Soley and *H.B. Groenewald* (Faculty of Veterinary Science, University of Pretoria, Onderstepoort, South Africa).
* Seasonal morphological changes and the immunolocalization of the LH receptor in the gonads of juvenile ostriches (*Struthio camelus*).
M.C. Madekurozwa (Faculty of Veterinary Science, University of Zimbabwe, Harare, Zimbabwe) and *K.J. Teerds* (Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands).

Epilogue and closing
Reception

Faculteit der Diergeneeskunde

The section RECENT PUBLICATIONS of EQUATOR contains the references of scientific publications of the Faculty of Veterinary Medicine and other research institutes in The Netherlands, relevant to livestock production and health in the tropics. Titles of publications by veterinary scientists from the Netherlands, working on animal health and production in relation to developing countries, are also included. Please inform the editor of your publications so we can bring them to the attention of the readers of EQUATOR. For reprints contact the authors directly, their addresses can be obtained from the editorial office.

ANIMAL HEALTH

Balogh, K.K.I.M. de, Dimande, A.P., Lught, J.J. van de, Molyneux, R.J., Naudé, T.W. and Welman, W.G. (1999). A lysosomal storage disease induces by *Ipomoea carnea* in goats in Mozambique. Journal of Veterinary Diagnostic Investigations 11: 266-273.

DeMaar, T.W.L., Bolhuis, H. van and Mugo, M.J. (1998). Field anesthesia of camels (*Camelus dromedarius*) and the use of medetomidine/ketamine with atipamezole reversal. Proceedings of the American Association of Zoo Veterinarians (AAZV) and American Association of Wildlife Veterinarians (AAWW), Omaha, NE, October, 1998, pp. 54-57.

DeMaar, T.W.L. and Kuiper, Y.J. (1997). Clinical significance of the molar dentition of the warthog. Proceedings of the American Association of Zoo Veterinarians (AAZV), Houston, TX, October, 1997, pp. 348-350.

Otter, W. den, Balemans, L., Battermann, J.J., Bernsen, M.R., Cadee, J.A., Dobrowolski, Z., Everse, L.A., Fiszer-Maliszewska, L., Gavhumende, R., Groot, J.W. de, Groot, K. de, Hennink, W.E., Hill, F.W.G., Jurgenliemp-Schulz, I, Klein, W.R., Koten, J-W, Maas, R.A., Steerenberg, P., Stewart, R. and Zembala, M. (1999). Local low-dose IL-2 therapy. Hepato-Gastoenterology 46: 1280-1286.

ANIMAL PRODUCTION

Harun, M.A.S. (1998). Hatchability of Muscovy duck (*Cairina moschata*) eggs and energy metabolism of ducklings in a tropical climate. PhD thesis Utrecht University, pp. 131.

TICK-BORNE DISEASES, THEIR AGENTS AND VECTORS

Dwinger, R.H. (1999). Ticks and tick-borne diseases of equids. In: Equine Infectious Diseases VIII, Eds. U. Wernery, J. F. Wade, J. A. Mumford and O.R. Kaaden, R & W Publications (Newmarket) Ltd., UK, pp. 306-310.

Jongejan, F. (1998). Integrated control of ticks and tick-borne diseases (ICTTD). Parasitology Today 14: 173-174.

Leemans, I., Brown, D., Fossum, C., Hooshmand-Rad, P., Kirvar, E., Wilkie, G. and Uggla, A. (1999). Infectivity and cross-immunity studies of *Theileria lestoquardi* and *Theileria. annulata* in sheep and cattle: II. *In vitro* studies. Veterinary Parasitology 82: 193-204.

Leemans, I., Brown, D., Hooshmand-Rad, P., Kirvar, E. and Uggla, A. (1999). Infectivity and cross-immunity studies of *Theileria lestoquardi* and *Theileria. annulata* in sheep and cattle: I. *In vivo* responses. Veterinary Parasitology 82: 179-192.

Mahan, S.M., Allsopp, B., Kocan, K.M., Palmer, G.H. and Jongejan, F. (1999). Vaccine strategies for *Cowdria ruminantium* infections and their application to other Erlichial infections. Parasitology Today 15: 290-284.

CALENDAR 2000

Wageningen, the Netherlands
28 November-11 December, 1999
International course on 'Livestock and 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: Dfl. 5,500. Information and registration: International Agricultural Centre (IAC), P.O. Box 88, 6700 AB Wageningen (Tel.: +31.317.490111, telefax: +31.317 418552, e-mail: iac@iac.agro.nl, http://www.iac-agro.nl).

Berlin, Germany
January, 2000 - December, 2001
Master of Science Degree in Tropical Veterinary Epidemiology (MSc TVE). The study programme is offered with 3 study options: Option 1. Freie Universität Berlin-Addis Ababa University Joint Postgraduate Programme; Option 2. Berlin-Germany Programme; Option 3. Berlin-Home Country Programme. The course programme has a modular format with course work part A, with basic and applied lectures and demonstrations, and by practical exercises carried out in Berlin (first year).
Under option 1 Part B with individual research work for the MSc thesis in Ethiopia, allowing also for research in the East African region under special arrangements (first and second year); under option 2, part B lasts for 7 months in Berlin; and under option 3 individual research work is undertaken in the home country of the participant. Information: The Co-ordinator, Postgraduate Studies in Tropical Veterinary Medicine, Freie Universität Berlin, Luisenstrasse 56, 10117 Berlin (Tel.: +49.30.20 936063; fax: +49.30.20936349; e-mail: tropVet @city.vetmed.fu-berlin.de; http://www.vetmed. fu-berlin.de).

Maastricht, the Netherlands
9 – 11 January, 2000
26th Annual Conference of the International Embryo Transfer Society. Information: IETS. (e-mail: icts@assochq.org; http:// www.iets.uiuc.edu).

Melbourne, Australia
28 February – 20 December, 2000
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, 1999. Information: Dr. Trevor Bagust, Course Co-ordinator, Faculty of Veterinary Science, Univ. of Melbourne, Parkville, Victoria 3052 (Tel.: +61.3.93449676, telefax: +61.3.93449675, e-mail: t.bagust@vet.unimelb.edu.au).

Barneveld, The Netherlands
1 March - 27 May, 2000
22nd International animal feed training programme (AFTP). Organised by: IPC Livestock International, Barneveld College. Fees including board and lodging: NGL 14,500. 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).

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 (Fax: +46.18.673545, e-mail: hans.gustafsson@og. slu.se).

Barneveld, The Netherlands
21 August, 2000 - 23 February, 2001
30th International course on poultry husbandry and 30th 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 23nd 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: Dfl. 25,500; Pig course: Dfl. 25,500, Feed course; Dfl. 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 (Tel.: +31.342.4-14881, telefax: +31.342.492813, e-mail: io@ipcdier.hacom.nl).

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).

EQUATOR

NEWSLETTER ON VETERINARY ASPECTS OF INTERNATIONAL DEVELOPMENT COOPERATION

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

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October – December 1999

5/6

VOLUME 11, 1999

OUTCOME AND PERSPECTIVES OF COLLABORATIVE RESEARCH

Utrecht Symposium: Institutional linkages and research networks form the basis for North-South collaboration in the next decade

Dr. Robert W. Paling

On 5 November, 1999, the Faculty of Veterinary Medicine of Utrecht University organised for the 10th time the international Symposium on 'Tropical Animal Health and Production'. This year's symposium was entitled: 'Outcome and perspectives of collaborative research'

Because of the jubilee occasion, the organising committee, chaired by Prof. Dr. M.A.M. Taverne, made a general programme that reviewed the organisational structure of the North-South research collaboration in the field of animal health and production. The impending change of the millennium was also a good moment to reflect upon the future relationships between research institutes in the tropics and in The Netherlands, taking into account the strategies which countries in the tropics have developed. Therefore the programme gave the opportunity to present ideas for a format that would make the North-South collaboration viable in the next decade.

Following the official opening of the Symposium by Prof. Dr. A.W.C.A. Cornelissen, Dean of the Utrecht Faculty of Veterinary Medicine, a keynote address entitled: 'North - South collaboration: A challenge for the new millennium', was presented by Prof. Dr. J.A.W. Coetzer of the Faculty of Veterinary Science of Onderstepoort (University of Pretoria, South Africa). In subsequent presentations the activities of Utrecht's Faculty of Veterinary Medicine and the Wageningen University and Research Centre were reviewed. As limited funds are the bottleneck for many of the envisaged activities, the contribution by Dr. B. Mons of the Netherlands Organisation for Scientific Research (NWO) shone a light on international funding policies and possibilities for identifying funding for livestock research.
Thereafter nine speakers, from the Netherlands, Zimbabwe and Thailand, presented their papers on collaborative research in the field of animal health and production. These presentations were grouped in three sessions: (1) Diagnosis and control of infectious diseases; (2) Nutrition, productivity and health; and (3) Reproduction in ostriches.

With over 100 participants coming from 11 African, 11 Asian, 2 Latin American and 2 European countries the organisers can look back with satisfaction to a well attended and interesting symposium.

North - South collaboration

Prof. Coetzer of the Faculty of Veterinary Science (Onderstepoort, South Africa) opened the Symposium by asking: "Are there any benefits in strengthening or establishing collaboration between partners in the South with those in the North? The connectedness of the world today makes it relatively easy to set up partnerships, alliances or consortia to create centres of excellence or specialisation in order to establish competitive advantages. The key objectives of veterinary faculties/ institutions in the South and North should be to create world-class partnerships". Prof. Coetzer discussed the political background and international trends that impact on the modern workplace. He also highlighted recent changes in the veterinary milieu in the Southern African Development Community (SADC) region that offer new challenges and opportunities in terms of South-South and South-North collaboration.

Prof. Coetzer put the ambitions even higher by stressing that: "The time is very opportune to explore the interest and feasibility of establishing a vibrant, thriving and globally competitive virtual school or centre of excellence in Tropical Animal Health and Food Safety between South and North partners. As a first step partners should identify potential areas or themes of convergence and focus on basic and applied research and postgraduate training".

Research on tropical animal health and production in the Netherlands

Representatives of Utrecht (Dr. R.W. Paling) and Wageningen (Dr. Ir. H.M.J. Udo) presented the research activities of the institutes in the Netherlands.

In Utrecht research relevant to the tropics has mainly two components. Firstly, research in collaboration with institutes in a limited number of regions in the tropics, like southern Africa and Southeast Asia. This research covers studies on the development of diagnostics, therapeutics and vaccines for tick borne diseases but also for (viral) diseases, which have a wider distribution then the tropics. Furthermore there is collaborative research conducted on a herd-level, looking at herd health management, reproduction, nutrition and epidemiology.

The second component of collaboration is the participation of young researchers in postgraduate training programmes (MSc and PhD) in Utrecht.

In Wageningen in the past, livestock development projects were strongly technology driven, and research was poorly integrated in development efforts. Therefore, in the eighties the emphasis in development projects gradually shifted from solely looking at livestock to an integrated approach to rural development. In this period, Wageningen Agricultural University became involved in the execution of many large-scale development projects in the field of animal production.

Dr. Madekurozwa receives an attention from the chairman, Prof. Taverne.
(Photo: Collection BIC)

Nowadays, emphasis has shifted to research programmes and projects that concentrate on PhD sandwich projects. In his presentation Dr. Udo highlighted some of the important conclusions of these studies.

Funding

Unfortunately, funding for the support of international postgraduate students as well as for collaborative research between scientists in the South and the North remains very scarce, although excellent candidates for postgraduate studies are numerous and the potential of international research collaboration to contribute to development is very promising. Dr. B. Mons of the Netherlands Organisation for Scientific Research (NWO) presented some international funding policies and possibilities for identifying funding for livestock research. He presented 'SHARED' (Scientists for Health And REsearch for Development project, an EU/INCO Consorted action) as useful tool for establishing databases on research topics and researchers, partner search for contacts between researchers in the North and the South and for identification of relevant funding agencies. 'SHARED' (http://www.shared.de) is also available for the livestock sector.

Diagnosis and control of infectious diseases

Research on the improvement of the diagnosis and control of infectious diseases remains the main target of the collaborative research of Utrecht and its partners.

Dr. D.T. Mukwedeya of the Faculty of Veterinary Science of the University of Zimbabwe amplified the progress made in the studies on the diagnosis of Malignant Catarrhal Fever (MCF). Wildlife conservation and commercial game ranching in Zimbabwe, South Africa and Kenya is the cause of increasing losses in cattle due to MCF. A research project was initiated involving research institutes in Harare, Utrecht and Edinburgh (Moredun Research Institute). Dr.

Dr. Tanu Pinyopummintr presented an overview of the Thai dairy sector. (Photo: Collection BIC)

Mukwedeya presented the outcome of serological tests (IFAT and PCR) using cattle and wildebeest sera. An important observation was that a substantial number of cattle recovered from clinical MCF, a very unusual finding in MCF. He concluded that the pathogenesis of AHV-1 and the immune responses by susceptible cattle are more complex than previously thought. Thus, a cautious approach to the diagnosis of MCF is required.

Ticks and tick-borne diseases

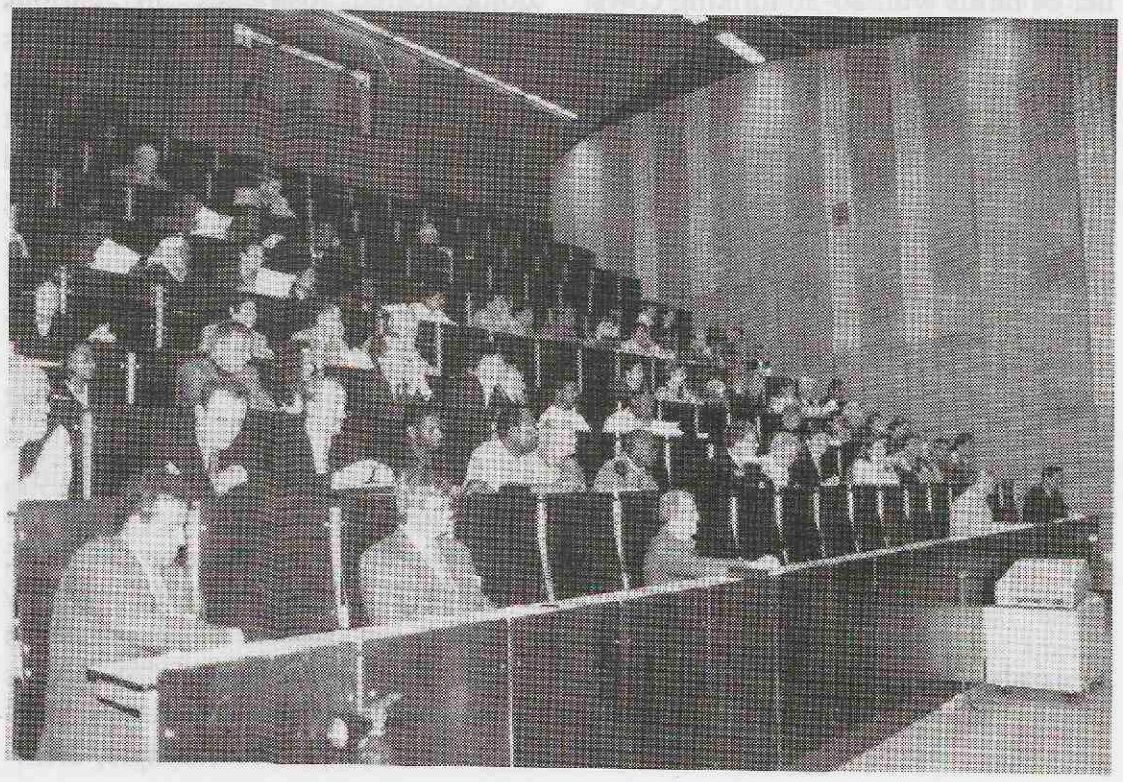
In 1996 a EU/INCO Concerted Action Project, co-ordinated by Dr. F. Jongejan of the Utrecht Faculty of Veterinary Medicine entitled: 'Integrated Control of Ticks and Tick-borne Diseases' (ICTTD), started with 40 participants from 24 laboratories in 8 European and 9 African and Caribbean countries (http://www.uu.nl/tropical.ticks). During the Symposium Dr. Jongejan presented a selection of recent research findings on molecular diagnostics and vaccines developed against ticks and tick-borne pathogens.

Genetic resistance

The International Livestock Research Institute (ILRI), together with its collaborators, has a successful record of research on the genetics of disease resistance and has carried out long-term quantitative and molecular genetic studies on trypanotolerance in cattle and on resistance to gastrointestinal helminth parasites in sheep. In 1996 ILRI and the Wageningen Institute of Animal Sciences (WIAS) started collaborative research to investigate possibilities to design schemes to genetically improve disease resistance in cattle and sheep. Prof. Van Arendonk of WIAS presented some results of the research that was concentrated on the design of breeding schemes to improve disease resistance and to evaluate the benefit of using information from molecular genetic research. This includes studies on: marker assisted introgression in cattle and mice and marker assisted breeding in cattle in relation to trypanotolerance. The aim of the research on resistance to parasitic worms in sheep is to identify molecular genetic markers linked to specific regions of the ovine genome that are responsible for resistance to gastro-intestinal nematode parasites in East African Red Maasai sheep.

Nutrition, productivity and health

The afternoon programme on 'Nutrition, productivity and health' started with 2 presentations by animal scientists from ID-Lelystad (Drs. A. Bannink) and Wageningen (Dr. Ir. G. Zemmelink). The North-South programme of the Netherlands' Agricultural Research Department (DLO) includes a nutrient monitoring programme to visualise the sustainability of farming systems. The Research Institute for Agrobiology and Soil Fertility (AB) and the Institute for Animal Science and Health (ID) work together with partners in Africa in this programme. In his presentation Drs. Bannink discussed the impact of feed scarcity on nutrient management and livestock production in sub-Saharan Africa, and the useful role that modelling can play in quantifying this impact. He gave some examples that made clear that the goal of the modelling effort gives a limit to as how far



With more than 100 participants the symposium was well attended (Photo: Collection BIC)

During a coffee break Prof. Van Arendonk (left) and Prof. Coetzer (right) found time for a discussion. (Photo: Collection BIC)

existing variation may be simplified in a model. The goal of the model determines what level of detail is needed. In the North-South programme a tool has been developed to monitor nutrient cycling in tropical farming systems.
Dr. Zemmelink presented data on a study conducted in collaboration with ILRI on dairy farming in Kenya looking at available resources and nitrogen flows. The study was conducted to examine the balance of feed supply and animal production in Kiambu district, one of the main milk supplying areas for Nairobi city. Also the effect of manure on the estimated profitability of the system and the effect of livestock on N flows was examined.

Dairy farming in Thailand

Dr. Tanu Pinyopummintr of the Kasetsart University presented a comprehensive overview of the Thai dairy sector. Traditionally milk and dairy products are not part of the daily diet in Thailand. Only in the sixties was commercial dairy farming introduced. Management structures and services that were developed and which supports a dairy industry that comprises mostly small farm holders with 5-10 milking cows. There is a small number of farms with 20-50 milking cows. The national dairy herd counts approximately 300,000 head of cattle, with an average production of 11 kg/cow/day. Resulting in a production which covers about 75% of the national demand for milk. Dr. Tanu concluded: "Fierce competition from other dairy producing countries is always a threat to the unstable local industry. Therefore, a new set of traits is required of dairy farmers, i.e., more educated, free market oriented, ready to adopt new knowledge and technology, etc. Then, the industry promises a bright future".

Reproduction in ostriches

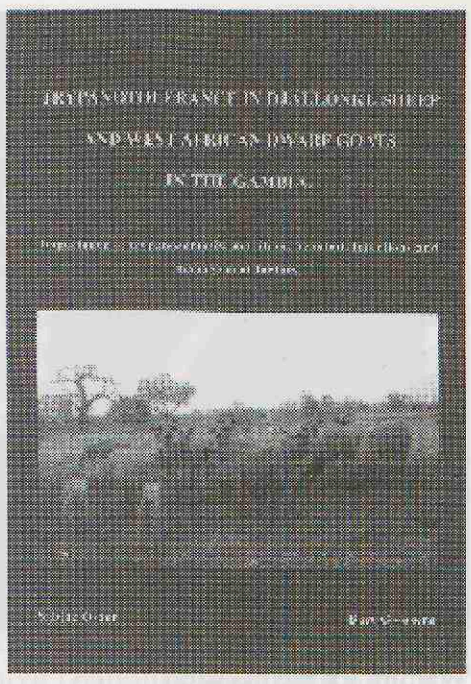
During the preparation of the programme of the Symposium it became clear that research on reproduction in ostriches is on-going in Utrecht, Onderstepoort and Harare, covering different aspects of the same problem: poor reproductive performance. Both wild and farmed (semi-)domesticated ostriches are indeterminate breeders as they can lay eggs all year round. However, ostriches can still be considered to be seasonal breeders as in both wild and farmed populations a marked seasonality in reproductive activity and egg laying exists. Ostriches are photoperiod dependent. Fertility and rate of egg production rapidly increases in the spring, when day length increases. Drs. Bronneberg summarised aspects of the reproductive biology of the ostrich e.g. physiology and endocrinology and presented figures on egg production of domesticated ostriches in various parts of the world. A project was started in The Netherlands that aims to find out whether the measurement of plasma hormone levels in the blood and transcutaneous ultrasonic imaging of the ovaries can reveal clinical relevant information with a diagnostic and predictive value towards egg production in farmed breeding ostriches.
Prof. J.T. Soley of Onderstepoort (South Africa) noted that: "In contrast to the situation in domestic poultry, where in-depth studies have been carried out on the reproductive system, very little information is currently available on aspects of reproduction in ostriches. Many basic questions remain unanswered and certain avenues of research (for example, artificial insemination) are hampered by a lack of elementary data". In his presentation he reviewed, by presenting an extraordinary series of lightmicroscopic and electronmicroscopic pictures, the basic architecture of the testis with emphasis on the morphological features characterising the process of spermatogenesis.
Dr. M-C. Madekurozwa of Harare (Zimbabwe) presented results of the collaborative research conducted with Utrecht on the seasonal changes in the immunolocalization of the LH receptor in the gonads of the juvenile ostrich. Special attention was given to the morphological changes in the ovary and testis in relation to the day length using immuno-histochemical techniques. She concluded: "That there is stimulation of the hypothalamic-pituitary axis even during periods of short day lengths and that in the ovary, immunoreactivity was limited to cells in the large developing follicles; indicating that steroidogenesis is restricted to these follicles".
Information gained in this study could be used as a basis for the use of exogenous hormones for inducing earlier sexual maturation.

Conclusion

Prof. Taverne concluded, from the still numerous attendance of the Symposium at the moment of his closing words that people had enjoyed the Symposium. Moreover, he was sure that the Symposium had provided new ideas and possibilities for contacts for collaboration in the future.

TRYPANOTOLERANCE IN DJALLONKE SHEEP AND WEST AFRICAN DWARF GOATS IN THE GAMBIA

Importance of trypanosomosis, nutrition, helminth infections and management factors



On 4 November, 1999 a rather unique event took place in Utrecht University's Academy building. At 13.30 hours the Belgian veterinary spouses Sabine Osaer and Bart Goossens defended their joint PhD thesis on trypanotolerance in Djallonke sheep and West African Dwarf goats in The Gambia. Their promotores were Prof. Stanny Geerts from the Department of Animal Health of the Prince Leopold Institute of Tropical Medicine in Antwerp, Belgium, and Prof. Albert Cornelissen from the Department of Parasitology and Tropical Veterinary Medicine of the Faculty of Veterinary Medicine, Utrecht University, the Netherlands. Co-promotor was Dr. Maarten Eysker. This thesis reflects the research they performed during the past years at the International Trypanotolerance Centre (ITC) in The Gambia. As this thesis might be of interest to the readers of EQUATOR the editorial board decided to publish the summary of this thesis. More information on this research or copies of the thesis can be obtained by sending a request to the authors, c/o ITC, PMB 14, Banjul, The Gambia. E-mail: bart.sabine@commit.gm.

Introduction

Over the last decade increasing efforts were put into investigating the possible role of breeds of livestock with a natural resistance against trypanosomosis. These breeds, most of them indigenous to West and Central Africa, are called trypanotolerant because they survive and remain productive in tsetse infested areas where other breeds do not survive without treatment. Trypanotolerant small ruminants mainly include Djallonke sheep and West African Dwarf (WAD) goats. The animals of these breeds are of a relatively small size, but have proven to be productive under difficult conditions. This indicates their potential role for a more sustainable solution to the growing demand for animal protein in much of tsetse infested Africa.

The role of trypanotolerant small ruminants

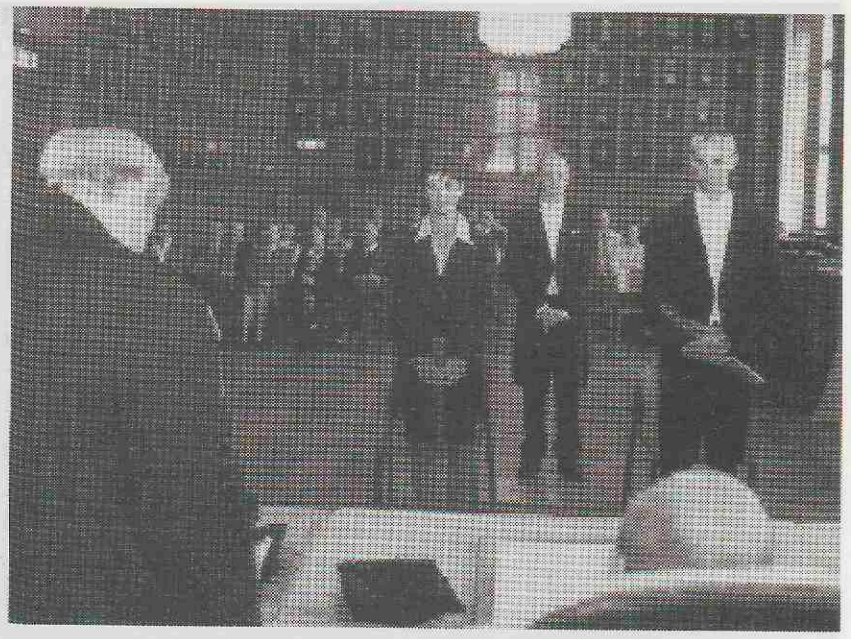
In chapter one some general information is given about the role of trypanotolerant small ruminants within the mixed farming systems of The Gambia. The overall productivity of livestock in The Gambia is far below its potential. The increase in livestock numbers has not followed the rapid trend of the human population. In the prospect of increasing overall productivity of the livestock sector, small ruminants are well positioned. Besides this approach, there is need to intensify individual animal productivity by limiting the influencing factors. There is a potential high benefit from sheep and goats in both the traditional farming systems and in more intensified production systems. Both systems, however, have their constraints. These include bio-technical factors such as disease pressure, reproductive wastage, nutrition and management beside socio-economic, traditional and institutional factors. Increased animal production will concurrently need some intensification of fodder production and novel conservation methods to limit further environmental pressure. Understanding all influencing factors and their possible interactions would lead to appropriate intervention measures with farmer community participation. This will in turn assure sustainability. Impact of the interventions and evaluation of their cost/benefits for the target population is subject of continuous socio-economic follow-up.

This explains the need for a multifactorial approach to study influencing factors on potential improvement of small ruminant productivity for the benefit of the human population. The work reported in this thesis examines the level of trypanotolerance in the Djallonke sheep and the West African Dwarf goats as well as the influence of different stress factors on their trypanotolerant quality and on the productivity in these breeds. Experimental and on-farm studies were carried out concurrently.

'Resilience' rather than 'resistance'

In chapter two the phenomenon of trypanotolerance in Djallonke sheep and WAD goats has been examined. The series of studies, using either a single artificial *Trypanosoma congolense* inoculation or natural infection with trypanosomes demonstrated a certain degree of trypanotolerance in the indigenous West African dwarf breeds of sheep and goats. The general course of trypanosomosis was evaluated including clinical parameters, haematological changes, immune response and body weight changes both under artificial and natural infection. Very low mortality rates together with the ability to maintain positive weight gain following infection were considered as the main features of trypanotolerance in small ruminants. However, in these breeds the control of parasitaemia and anaemia following trypanosome infection was less prominent than in trypa-

Waiting for the decision of the PhD committee can take time … (Photo: AV Department)



Prof. Geerts addresses the new doctors during his *laudatio* (Photo: AV Department)

notolerant cattle. Based on our observations, it seems more appropriate to define trypanotolerance in small ruminants as a 'resilience' to infection rather than 'resistance'. Djallonke sheep appeared to express a higher degree of trypanotolerance than the WAD goats following artificial infection with *T. congolense*. In addition, the quick haematological changes and antibody responses following artificial trypanosome infection in our study further confirmed the innate resistance in Djallonke sheep and to a lesser extent in WAD goats. The epidemiology of natural trypanosome infections in sheep and goats in two areas of high and moderate tsetse challenge respectively, revealed that goats have lower infection rates than sheep. Overall, both species seem to be less infected than cattle based in the same area. Lower feeding success of tsetse flies and different host-vector interaction in small ruminants than in cattle are presumably contributing factors. In spite of their trypanotolerance, trypanosomosis remained an important constraint to health and productivity of sheep and goats, but other factors such as helminth infections, seasonal nutritional constraints, and management were found of equal importance and interfered at certain times with their resilience to trypanosomosis.

Reproductive performance

The effects of trypanosomosis on the reproductive performance of male and female trypanotolerant small ruminants are described in chapter three. It was demonstrated that a single experimental *T. congolense* infection affected the reproductive performance of does more severely than that of ewes. Prevalence of abortions and stillbirths was higher and intervals to first kidding longer, resulting in fewer kids born alive. On the other hand, kids from infected does appeared to have an equal probability of survival and similar performance as those from controls. The infected sheep had lambing rates and intervals to first lambing comparable with those of the controls. In contrast, lamb performance was significantly affected by infection of the dam, due to increased lamb mortality together with reduced growth rates. Infected goats did not attain full recovery in the second year post infection. In contrast, infected ewes reached normal productivity indices in the second year, in spite of a chronic parasitaemia in both species. In sheep as well as in goats under natural trypanosomosis risk, parturition intervals increased significantly following infection. Trypanosome infection of the dam increased mortality in the lambs and not in the kids which was in agreement with the results following single infection, but in contrast, neither birth weight nor growth rates of lambs were affected.

The study of the semen characteristics of Djallonke rams following *T. congolense* infection revealed some transient changes in sperm quality and not in quantity. The semen quality parameters which were temporarily affected by trypanosome infection included mass motility, percentage live sperm cells and minor sperm cell abnormalities. The nature of these indicated a mild testicular degeneration, hence, reproductive performance was not irreversibly affected. The impact of the *T. congolense* infection on the Djallonke rams was also evident in negative weight changes and a higher rate of mounting refusals. Large individual differences in reproductive response to infection were found amongst Djallonke rams and could be important in ranking for trypanotolerance.

The influence of nutrition

The importance of nutrition on the resistance to the effects of trypanosomosis in Djallonke ewes was studied in chapter four, with particular reference to their reproductive performance. It was found that *T. congolense* infection in its acute phase impaired the establishment of pregnancy. This could not be countered by dietary supplements. The luteal progesterone level was clearly depressed by infection and not by dietary level. The key role of luteal progesterone in successful conception was hereby confirmed. Maintenance of pregnancy was influenced by nutrition, which mainly was shown by the comparison of dietary control groups, but also by trypanosome infection, although its effects had become more chronic. Similar to what was found in the rams, individual variation indicated that some ewes did cope better with the combined effects of trypanosome infection and low nutrition on their reproduction performance. Adequate nutrition interacted positively with the course of infection in Djallonke ewes during

pregnancy and lactation as indicated by improved haematopoiesis and better productivity in terms of ewe's live weight and improved lamb growth rates to weaning. The results in the young ewe lambs indicated no direct effects of *T. congolense* infection on attainment of puberty but age at first lambing tended to be delayed. Nevertheless, the negative correlation between weight and age at puberty confirmed that the onset of puberty was indirectly delayed through infection-induced depression of growth. In contrast, supplementary feeding reduced the onset of reproductive function independently. Similar to the adult ewes, diet interacted positively with the effects of trypanosome infection resulting in a better haematopoietic response and better survival rate of their lambs, although this was at the cost of their own weight gain. The results undoubtedly showed a delaying, independent effect of low dietary level and trypanosome infection, although the latter acted indirectly, on onset of reproductive activity in young Djallonke sheep.

The changes in biochemical parameters as observed in infected young and adult ewes supported the results on live weight patterns and haematological changes and provided some useful indications of their nitrogen and energy metabolism. Interactive effects between trypanosome infection and diet were mostly absent, indicating their independence but also their additive action. Trypanosome-induced reductions in total protein and albumin in the serum were not countered by dietary supplements. Trypanosome infection tended to increase plasma urea levels, indicating, together with the declined total protein and albumin, a disorder in the nitrogen metabolism pattern. The lowest glucose levels found in the infected young ewes on low diet level as well as the transient peak values of plasma NEFA and BHBA levels in the adult ewes, which were indicating temporary ketogenesis, reflected the trypanosome-induced anorexia during the acute phase of infection. A trypanosome-induced alteration of the nutrient metabolism was present in both young and adult Djallonke ewes irrespective of the dietary status. However, since the effect of nutrition was mostly independent, it conferred added benefits against the debilitating effects of trypanosomosis under the conditions of this study.

Helminths and trypanosome infection

In chapter five the interaction of helminths and trypanosome infection was studied under controlled and on-farm experiments. The interaction between a controlled *T. congolense* and *Haemonchus contortus* infection was studied in young female Djallonke sheep. Analyses of the clinical, haematological and production parameters clearly indicated the pathogenicity of the infections and the severity of mixed infections compared with single infections. The immunosuppressive effect of trypanosome infection was clearly reflected in the course of the *Haemonchus* infection. This study showed that trypanotolerance is not absolute and that a concurrent *H. contortus* infection may result in a reduced resilience. Since under field conditions mixed infections occur very frequently, reducing the impact of helminth infections in trypanosome infected small ruminants will benefit the expression of their trypanotolerance.

The results of the on-farm intervention trial demonstrated the beneficial effects of prophylactic anthelmintic treatment on weight gain, reproduction and health parameters in both sheep and goats, despite the constant risk of trypanosome and helminth infection. Although there was no interaction between the two pathogens, the trypanosome infection diminished the positive effects of anthelmintic treatment on their productivity and health parameters. Nonetheless, the productivity indices were considerably increased in both treated sheep and goats. Cost-benefit analyses would need to confirm whether such intervention is recommendable at rural level but it is certainly optimising the trypanotolerance in these breeds.

Trypanotolerance is genetically linked

In chapter six, the disease resistance in naive Djallonke sheep and their F1 - Sahelian x Djallonke crosses was compared in a multifactorial study including *T. congolense,* natural helminth infection and different levels of nutrition. The difference in parasitaemia control and immune response following a single *T. congolense* infection proved that the trypanotolerant trait in Djallonke sheep was genetically linked. In addition, previous suggestions on the existence of innate resistance to helminths were again confirmed in the Djallonke breed.

Although their crosses with the trypanosusceptible Sahelian breed expressed a reduced trypanotolerance and lower resistance to helminth infection, the impact of both pathogens on PCV and body weight was similar. The effects of low dietary allowances, helminths and *T. congolense* infection were independent but additive on the parameters PCV and live weight.

However, some interaction between

Prof. Cornelissen congratulates Dr. Goossens during the reception after the PhD ceremony (Photo: AV Department)

trypanosome infection and helminth infection was seen as a higher nematode egg excretion in the trypanosome infected animals explained by the immuno depressive effect of the latter, which confirms previous findings, as described in chapter 5. It is expected that the larger size and better growth rates of crossbreeds are promising for intensification of meat production. However, appropriate sanitary measures should be taken to optimise the production environment.

Management

The impact of nutritional management and husbandry on health and production in indigenous small ruminants at farm level is highlighted in chapter seven. The implantation of vintage based and community managed Intensive Feeding Gardens (IFG) containing forage legumes (mainly *Leucaena* spp.) is described. This intervention is aiming at improving the nutritional status of village based animals, specially targeting at the special needs of animals around pregnancy and lactation, with a minimum of cost and labour involved but a maximum of benefits, the latter to make it adaptable and acceptable to the rural farmer. The results indicated that the concept of IFG installation at village level was accepted by the farmers in the study area. Since these IFG may be combined with vegetable planting in the dry season and food crop planting in the rainy season, it avoids conflicts between farmers and livestock owners. Nutritional supplementation during late pregnancy and/or early lactation combined with a change in nutritional management clearly demonstrated positive effects on offspring survival and growth rates in both sheep and goats. High quality fodder supply from forage legume trees as grown in IFG has a possible benefit for rural based sheep and goat production. Fodder produced in these IFG can be used either directly or conserved to supplement when needed. Furthermore, it can be mixed with other components to manufacture High Quality Supplement Blocs. These are easy to manufacture and can be stored. All these interventions will be subject to further on-farm evaluation and will be tested equally in more intensified peri-urban production sites.

Sabine Osaer and Bart Goossens

VACANCIES

INTERNATIONAL COOPERATION

This section contains vacancy announcements which the editorial board considers to be of possible interest to Dutch veterinarians. Besides vacancies that will be taken from Vacatureblad Internationale Samenwerking, Tijdschrift voor Diergeneeskunde, Veterinary Record, Intro vacatures (RPDAdvies/Ministry of Internal Affairs) etc., there will be room for personnel advertisements. For further information about the vacancies please contact the institution or company directly.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO)

The Animal Production Service, Animal Production and Health Division, Agriculture Department of FAO has a position for an

ANIMAL PRODUCTION OFFICER
(Small Animals)

Vacancy number: 288-AGA

Duties

Under the general supervision of the Chief, Animal Production Service, and the immediate supervision of the Senior Officer (Livestock Production Systems) will assist in the analysis, development and implementation of the Division's activity in the field of poultry and other small (ruminant and monogastric) animals, emphasis is to be put on the deployment of the genetic potential of these animals under the target production conditions. More specifically:

- collect, analyze, update and disseminate scientific and technical information and maintain data bases and information systems on small animal production and improvement;
- participate in the design of options for the genetic improvement of small animal species populations in priority production systems;
- develop and maintain contacts with relevant research and development institutions and networks in order to evaluate scientific and technical progress in the field of the small animal industry;
- assist in developing policy, technical requirements, methods and guidelines in small animal production and improvement;
- develop and facilitate the transfer of appropriate technology to developing countries;
- analyze development programmes for small animals and in particular for poultry production, and provide technical guidance to animal production training institutions;
- ensure the provision of decision support on the use and upgrading of small animal production particularly in highly populated areas;
- participate in the design and implementation of projects including joint activities and task forces and, as requested, provide technical backstopping to field projects;
- develop training material and participate in the conduct of training courses;
- prepare and participate in technical meetings;
- prepare background information and draft technical papers for discussion and/or publication;
- perform other related duties as required.

Qualifications

University degree in animal science
Five years of progressively responsible professional experience in animal production, minimum three years of experience at international level.
Working knowledge (level C) of English, French or Spanish and limited knowledge (level B) of one of the other two.
Ability to analyze technical issues, to write clear and concise reports and make effective oral presentations;
Maturity, initiative, tact and a high sense of responsibility; Computer literacy and ability to use word processing, database and other standard software; Ability to work harmoniously with people of different national and cultural backgrounds.

Desirable

Animal breeding experience. Working experience in developing countries. Limited knowledge (level B) of the other language mentioned above.

Remuneration
A net salary per year (inclusive of a variable element for post adjustment) from US$ 46646 to US$ 60023 (without dependents) and from US$ 49985 to US$ 64552 (with dependents).

Location
Rome

Type of appointment
Fixed Term: Three years

Deadline for application
27 December 1999.

The Animal Health Service, Animal Production and Health Division, Agriculture Department of FAO has a position for an:

ANIMAL HEALTH OFFICER
(Integrated Health Management)

Vacancy number: 303-AGA

Duties
Under general supervision of the Service Chief, Animal Health Service, and the immediate supervision of the
Senior Officer (Insect Pest Management), and within the Parasitic Diseases Group, the incumbent will provide technical support for the identification and development of an integrated approach to animal health management, placing emphasis on Insect Borne Diseases, in particular trypanosomosis, and will participate in the programming and policy activities. More specifically :
- analyse and disseminate epidemiological information and data, develop and maintain information systems and databases: on agricultural (farming systems, livestock densities and distribution) and environmental disease determinants (droughts, floods, climate change, abundance of insect vectors) and advise FAO Members and relevant institutions on related policies and principles;
- propose criteria for Integrated Management of Insect Borne Diseases and trypanosomosis in particular, which are in accordance to internationally accepted agro-ecological, socioeconomic and technical pest management principles;
-design and conduct analytical studies of technical policy and programme issues (i.e standards to assess the impact of Insect Borne Diseases and the control thereof, on natural resource utilization and animal agriculture);
-manage the co-ordination and exchange of information within and outside the organization; consolidate and further develop a georeferenced livestock information system, with a disease risk mapping facility, adequate
to the spatial analysis of diseases and relevant livestock production aspects using trypanosomosis as a model;
-develop and advise on strategies, policies, technical requirements, methods and guidelines and, in particular, on community based disease management for the control of Insect Borne Diseases; design and implement programmes and projects; co-ordinate joint activities and participate in task forces; as required, participate in the formulation and appraisal of field projects, the recruitment and technical supervision of field staff and provide technical backstopping; develop training material, organize and conduct training courses; prepare technical documentation and papers for discussion and/or publication; assist FAO Members in their programmes through reviews and the provision of policy and technical advice;
-perform other related duties as required.

Qualifications
Advanced university degree in veterinary science, including epidemiology, preferably with a specialisation in insect borne diseases. Seven years of progressively responsible and professional experience in integrated Insect Borne Diseases management. Practical involvement in field based control operations. Working knowledge (level C) of English, French or Spanish and limited knowledge (level B) of one of the other two.
Ability to analyze technical and scientific information; to organize and coordinate meetings and training activities; ability to write clearly and concisely, edit reports and make effective oral presentations. Maturity, initiative, tact and high sense of responsibility; computer literacy and ability to use word processing and other standard software; ability to work harmoniously with people of different national and cultural backgrounds.

Desirable
Working experience in developing countries. Limited nowledge (Level B) of the other language mentioned above. Knowledge of FAO activities, structure and procedures.

Remuneration
A net salary per year (inclusive of a variable element for post adjustment) from US$ 56011 to US$ 70301 (without dependents) and from US$ 60165 to US$ 75839 (with dependents).

Location
Rome

Type of appointment
Fixed Term: Three years

Deadline for application
26 January 2000

Additional information for both vacancies
These vacancies are open to male and female candidates. Application from qualified women candidates are encouraged Please note that FAO staff members are international civil servants subject to the authority of the
Director-General and may be assigned to any activities, offices or duty stations of the Organization.

Applications for vacancies
Management Support Unit, Agriculture Department, FAO, Viale delle Terme di Caracalla, 00100 - Rome, Italy. Fax: +39 06 5705 5022

Applicants will be contacted only if they are short-listed. In this connection please note that the selection process may take up to six months for completion.
Note: FAO is a non-smoking environment.

INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE (ILRI)

ILRI has a position for a

PROJECT COORDINATOR
(Integrated Control of Livestock Diseases)

Vacancy number: PCICLD/09/99

General information
The International Livestock Research Institute (ILRI) is a non-profit international research organisation serving a global mandate to improve productivity of smallholder livestock systems and to protect the natural resources that support these systems. ILRI has staff and activities in Latin America, Asia and Africa, headquarters in Nairobi and principal facilities in Kenya and Ethiopia. ILRI is one of the 16 research centres supported by the Consultative Group on International Agricultural Research (CGIAR), which comprises over 55 member countries, international organisations and foundations. The co-sponsors for the CGIAR are the World Bank, the Food and Agriculture Organization (FAO), the United Nations Development Programme (UNDP) and United Nations Environment Programme (UNEP).

The position
ILRI is recruiting a livestock scientist to lead its research in animal health and livestock disease control. This is a senior position in the Institute reporting to the Deputy Director General (Programmes). The successful candidate will lead multidisciplinary research in vaccines and diagnostics for improved control of diseases of livestock in the tropics (with current emphasis on haemo-parasitic diseases) and develop improved strategies for disease control through quantitative epidemiology and economic impact assessment.

The Project Coordinator will be responsible for providing intellectual leadership, and planning, coordinating and managing the research from product development to delivery. This will include: prioritising research; developing project plans and budgets; obtaining external funds; developing linkages with external research groups to establish critical research capacity and with the private sector for product development and marketing; and developing appropriate linkages with national programmes to identify research priorities and ensure effective delivery of products and technologies. In order to develop an integrated programme, close collaboration will be required with other research groups in ILRI including those involved with: genetics and feeds research, systems analysis and impact assessment, socio-economic policy and production systems.

Current research capacities that the Project Coordinator will oversee include molecular biology, immunology, antigen identification and delivery, genomics, epidemiology, decision support systems, and vaccine/-diagnostics delivery. Resources include advanced research laboratories, electron microscopy, biometrics, small and farm animal facilities, and tsetse and tick rearing facilities.

Qualifications
A PhD or equivalent with sound knowledge of tropical animal health, and appropriate specialisation in veterinary immunology, parasitology, epidemiology, and/or vaccine production are required. Successful experience in funding proposal development, research management and team building and significant publication record are essential. Good communication and interpersonal skills, an ability to work in a multi-disciplinary and multi-cultural society and fluency in spoken and written English are also essential.
The successful candidate should have fieldwork experience in applying approaches described above; survey design, implementation, and some management/supervisory experience. Previous experience working in Africa would be desirable.

Location
Nairobi, Kenya

Conditions
The initial contract for this position will be for a three-year term with the possibility of extension. ILRI offers a competitive compensation package, dependant on experience that is paid in US dollars.

Applications
Applicants should send a cover letter, curriculum vitae and the names and addresses (including telephone, fax and e-mail) of three referees who are knowledgeable about the candidate's professional qualifications and work experience to the Human Resources Manager, ILRI, P.O. Box 30709, Nairobi, Kenya.
Telephone: 254-2-630743; Fax: 254-2-631499; email: ILRI-KENYA@cgiar. org
The name and reference number of the position for which the application is made should be clearly marked on the envelopes of mailed, or on the fax or e-mail applications. Screening of applications will begin on 1 December 1999 and will continue until the post is filled.

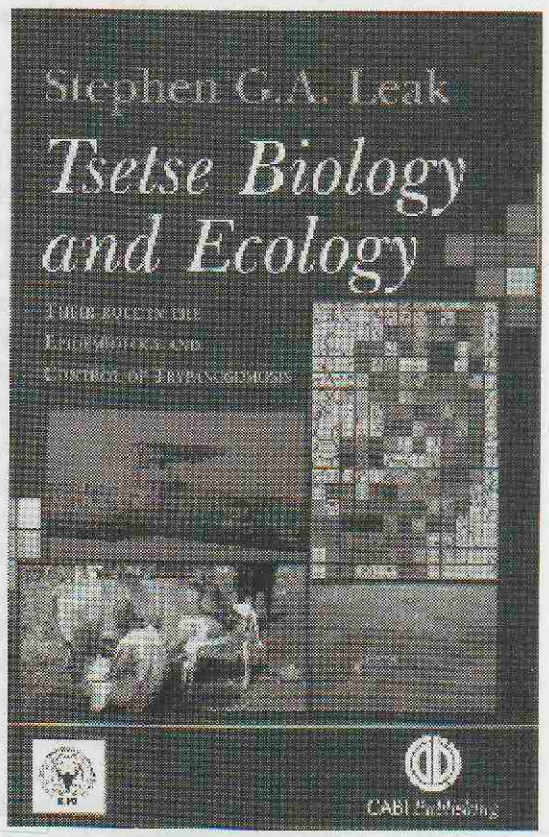
Additional information
ILRI is an equal opportunity employer. Qualified women and professionals from developing countries are particularly encouraged to apply.

FOR YOUR INFORMATION 1

TSETSE BIOLOGY AND ECOLOGY: THEIR ROLE IN THE EPIDEMIOLOGY AND CONTROL OF TRYPANOSOMOSIS

By: S.G.A. Leak, *International Livestock research Institute, Nairobi, Kenya*

Published December, 1998, CABI Publishing (E-mail: orders@cabi.org), ISBN 0-85199-300-1, 592 pp.
(Hardbound price: USD120 / GBP65)



Domestic livestock in Africa are of importance not only as a source of milk and meat but also as a source of animal traction enabling farmers to cultivate larger areas with crops providing the staple foods. Trypanosomosis, a parasitic disease transmitted cyclically by the tsetse fly (*Glossina* spp.), is arguably still the main constraint to livestock production on the African continent, preventing full use of the land to feed the rapidly increasing human population. Sleeping sickness, the disease caused in humans by species of *Trypanosoma*, is an important neglected disease posing a threat to millions of people in tsetse-infested areas. Often wrongly thought of as a disease of the past, the prevalence of human sleeping sickness is increasing in many areas.
Although alternative methods to control the disease are being investigated, such as immunological approaches, use of chemotherapy or exploitation

of the trypanotolerance trait, it is only control or eradication of the tsetse fly vector which will remove the treat of the disease rather than providing a better means of 'living' with it. As a result of the economic impact of tsetse-transmitted trypanosomosis, a large amount of research literature has been produced. This book provides a comprehensive review of this literature. The text ids divided into four parts: tsetse biology and ecology, epidemiology, vector control and disease control.

Readership: The book is invaluable for medical and veterinary entomologist, parasitologists and epidemiologists.

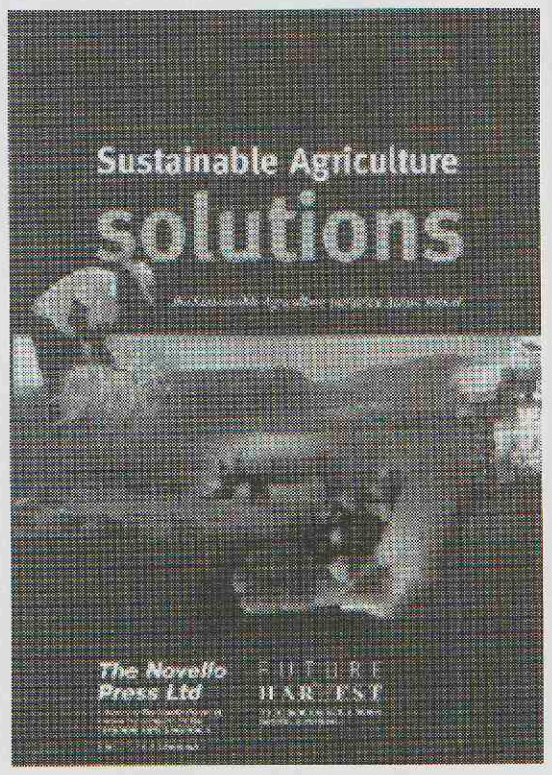
Content: Part 1: *Tsetse biology and ecology*. Introduction; Classification and anatomy; Biology; Physiology; Genetics; Sampling tsetse populations; Ecology – distribution and habits; Behavioural ecology; Population dynamics; Odour attractants. Part 2: *Epidemiology*. Host-parasite interactions; Epidemiology of human sleeping sickness; Epidemiology of trypanosomosis of domestic livestock; Estimation of disease risk – Models of disease transmission. Part 3: *Vector control*. Insecticidal spraying; Traps and targets; Application of insecticides to livestock; Non-insecticidal methods of tsetse control; general issues relating to the successful use of tsetse control techniques. Part 4: *Control of trypanosomosis*. Control of trypanosomosis in domestic livestock.

FOR YOUR INFORMATION 2

SUSTAINABLE AGRICULTURE SOLUTIONS: THE SUSTAINABLE AGRICULTURAL INITIATIVE ACTION REPORT

Edited by: A.J. Fairclough, *Sustainable Agricultural Initiative, London, UK.*

Published July, 1999, The Novello Press Ltd (E-mail: novellopress@msn.com), 317 pp.



The Sustainable Agriculture Initiative aims to guide agriculture towards an integrated sustainable framework, where the combination of agricultural practice with an increased understanding of the beneficial use of modern appropriate technology can lead to greater yields now and for the next millennium. The purpose of the Sustainable Agriculture Initiative (SAI) Action Report is to have widespread influence on the adoption of agricultural practices and the use of modern appropriate technologies throughout developing countries. It is distributed free of charge because this is the only way to ensure that it reaches its designated audience. The distribution of 14,000 copies is funded privately and institutionally.

The papers contained within the Action Report are therefore a series of practical recommendations in all areas that contribute to present and future agriculture, and highlight the importance of maintaining environmental frameworks for this; reforestation, ground water management and desertification, for example, and their impact upon the sustainability of agriculture are dealt with in great depth. The specific solutions recommended refer to the most beneficial uses and applications of appropriate technologies as having an integral role in the future of agriculture in developing countries.

Readership: Agriculture departments of donor aid agencies and development banks; Agriculture ministries; Fisheries forestry and rural development ministries; Central and sectoral agriculture agencies; Agriculture co-operatives; Major agricultural privateers; Agricultural programme administrators and NGOs; Agricultural research institutes.

Content: The Action Report contains nine chapters of which Chapter 5 deals with **livestock**, covering the following subjects: 1. Animal feeds (P. Osuji, International Livestock Research Institute); 2. Animal diseases (D. Preslar, Animal Health, Emerging Animal Diseases Project); 3. Breeding (K. Oldenbroek, Breeding and Genetics, ID-DLO, the Netherlands); 4.Sustainable rural livestock management (T. Ogborn, Heifer Project International); 5.Ruminants and bio-regional food self reliancy (A. Fredeen, Nova Scotia Agricultural College, Canada) and 6. Sustainable ruminant production systems (B. Mullen, University of Queensland, Australia).

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Maastricht, The Netherlands
9 – 11 January, 2000
26th Annual Conference of the International Embryo Transfer Society. Information: IETS. (E-mail: iets@assochq.org; http://www.iets.uiuc.edu).

Barneveld, The Netherlands
1 March - 27 May, 2000
22nd International animal feed training programme (AFTP). Organised by: IPC Livestock International, Barneveld College. Fees including board and lodging: NLG 14,500. 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).

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 Liñero, 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, PO Box 67, 94703 Maison-Alfort cedex (Telefax: +33.1.43 68 97 62, 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 - 31 August, 2002
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: (1) MSc Course 'Animal Pathology', duration 2 years (fee: NGL 35,000); (2) MSc Course 'Modern Approaches in Veterinary Microbiology and Immunology', duration 18 months (fee: NGL 68,500); (3) MSc course 'Veterinary Epidemiology', duration 18 months (fee: NLG 25,000); (4) 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.ausvac.com.au/ipvs 2000 and 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).