In this issue

Abstracts & Resolutions
of the
Pan Commonwealth Veterinary Conference
Harare, Zimbabwe
COMMONWEALTH VETERINARY ASSOCIATION

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ALSO

Abstracts and Resolutions
of Pan Commonwealth Veterinary Conference
Harare, 10th - 14th September 1990
After the euphoria of hosting the First Pan Commonwealth Veterinary Conference at Harare, has subsided the Commonwealth Veterinary Association has started in earnest its forward planning. The Executive Committee which met in London in April 91 has chalked out a plan of action for the successful implementation of the resolutions and various agencies and individuals have been assigned this job. Readers have also been invited to suggest ways and means of achieving the objectives of the resolutions. The veterinary profession will look forward to the successful achievements of the goal of the Conference i.e. Animal Health and Production in the year 2001.

The resignation of Jim on health grounds has been a severe jolt and one cannot envisage the CVA without Jim. However, Jim’s health is of more importance and all of us wish him good health and speedy recovery.

The CVA has at the same time been rejuvenated with the induction of two new regional representatives Labohang and Syed. With Bakary & Bert taking over as President and Vice President respectively and Trevor continuing in the CVA as Programme Director, the affairs of the CVA from 1992 will continue to be in capable and experienced hands.

The January 1991 issue of the CVA News was again received with appreciation especially the cover in colour. The prompt and early receipt of the news (which was sent by AirMail) has been lauded by many readers. I thank the readers for their encouragement and the executive of the CVA for the independence they have given me to edit and publish the news.

Response to my request for information on the exact time taken for the receipt of the news has been overwhelming. However much to my disappointment news from the regions is very meagre or none. I once again request you to send news items of interest for Publication.

S. Abdul Rahman
Editor
Members would have noted from the inside back cover of the January 1991 edition of the News that it was reported with regret that Dr. J. Archibald, Secretary/Treasurer of the Commonwealth Veterinary Association has retired from his post on health grounds. This is indeed a sad blow to this Association because as all of you know Jim has been an indefatigable worker on behalf of this Association over many many years. We are all sorry that his health prevented him from attending the Harare Conference to see the successful result of all the hard work which he put into the preparation of the Conference. We shall miss Jim's wise counselling and steady hand at the tiller of our financial affairs. I know that you all wish him well and I am sure that he will be happy to hear from any of you who wish to write to him.

We were also able to visit Commonwealth Institute and learned something of the work done by that organisation. The President of the British Veterinary Association entertained the Executive to dinner at the BVA where we were able to discuss many matters on an informal basis.

Following the retirement of Professor Jim Archibald, it was necessary to elect a new Secretary/Treasurer and Dr Bill Fryor, Australia was elected with immediate effect. Elections for President, Vice President were also held as this was the last Executive meeting before these posts fall vacant at the end of this year. I am pleased to be able to inform you that with effect from 1 January 1992 the President will be Dr Bakary Touray, The Gambia and the Vice President will be Dr Bert Stevenson, Canada.

The minutes of the Executive Meeting are being circulated to Council Members giving full details of that meeting, to enable Council Members to keep their respective National Association informed of events.

My term of office as President expires at the end of this year, consequently this will be the last time which I shall write the President's Column and I would like to take this opportunity of thanking you all for your support and good wishes during my term of office. With the full co-operation of the Executive, it has been possible not only to hold a Pan Commonwealth Conference for the first time but also to spread the work of the Association to various countries of the Commonwealth. I shall still be active in the affairs of the Association as the Executive insisted that I remain a member of the Committee for the time being with the specific task of maintaining the close contact which we have established with the Commonwealth Foundation, Commonwealth Secretariat and various other bodies.

I know that you will all continue to give the same support to the newly elected Officers which you have always given to me.

J.T. Blackburn
President - CVA

July 1991
WHAT THEY SAY...  
Pan Commonwealth Veterinary Conference:  
A Great Success

This first Pan Commonwealth Veterinary Conference held in Harare, Zimbabwe, provided an excellent opportunity to discuss technical, political and educational aspects of the veterinary profession with colleagues from around the Commonwealth. It was not a conference where I gained knowledge of direct use to me in practice, but the learning was very valuable nonetheless.

It was interesting to ponder the conflict between the aspirations of politicians who see village farmers as the mainstay of animal production, and the village farmers themselves who have aims rooted in tradition. The African village farmer gains more status from cattle than from cash. The Papua New Guinea village farmer gains his prestige by providing a large fat pig for the feast, not by selling it when it is prime.

As veterinarians we have to ask ourselves if helping productivity at village level is in fact contributing to more environmental degradation through overgrazing.

Veterinary education was a major theme of the Conference, and while it was interesting to discuss with western university academics the move to more electives, free time and role acting in their courses, it was also enlightening to hear how universities in developing countries were incorporating understanding of culture within the course. Without understanding the culture, we cannot understand the client, and without this understanding help is ineffective.

Another interesting subject was the economic challenge to further development of the wild areas of Africa. A paper outlined the earning power in overseas funds of undeveloped gamerich areas as compared to developed land running cattle and other stock. Tourists go to Africa to see wildlife and scenery, not cattle. The undeveloped lands were shown in this paper to have earning power ten times greater than developed farmed country. The tsetse fly may in fact be Africa's saviour, its control a disaster.

The combination of stimulating papers, discussions with colleagues from so many countries and the visitation by two Heads of State, President Mugabe of Zimbabwe and Sir Dawda Jawara, President of The Gambia made this a most memorable occasion. It was an excellent example of the opportunities offered through the Association for international veterinary contact.

Bob Duckworth.  
President  
New Zealand Veterinary Association

Executive Committee Meeting of CVA

The EC Meeting of CVA was held from 29th April to 30th May 1991 at London. It was attended by Dr. J.T. Blackburn, Dr. B.N. Touray, Dr. D.D. Wanasinghe, Dr. L. Khomari, Dr. A. Mews and the new regional representative from Australasia Dr. Jalaluddin. Among the invitees to the meeting were Dr. Bert Stevenson, Council Member, Canada, Dr. W.J. Pryor former R.R. Australasia and Dr. S. Abdul Rahman Editor CVA News. The highlights of the heavy agenda were the implementation of the Pan Commonwealth Conference Resolutions & Forward planning. The executive also elected new officebearers for the next term commencing on 1.1.92. Dr. B.N. Touray and Dr. Bert Stevenson were elected as President and Vice President respectively and the executive appointment of Dr. W.J. Pryor as Secretary/Treasurer was ratified by the executive.

A new executive position of Programme Director was created and Dr. J.T. Blackburn was elected as the first Programme Director (wef 1.1.92). The Editor CVA News was also made a member of the Executive Committee.

Executive Committee Members of CVA with guests at Commonwealth House
Dr. Pryor elected as Secretary/Treasurer of CVA

Dr. W.J. Pryor who has been Council Member of Australia for 8 years and Regional Representative of Australasia for 6 years has been elected as the Secretary Treasurer of CVA. Dr. Pryor takes charge on the resignation of Dr. Archibald.

Dr. Pryor who hails from Scotalburn, Victoria is the former Professor and Dean of the Veterinary School University of Massey, New Zealand and former Dean of the Veterinary School University of Queensland. He is currently an international veterinary consultant and is the Chairman of the Australasian Veterinary Schools Accreditation Committee.

Dr. Pryor has held many important posts during the past. He has been president of the Australian Veterinary Association, President of The Australian College of Veterinary Scientists and President of the Australian Society of Animal Production.

Dr. Pryor has travelled extensively in South East Asia and the Pacific region where he has worked for many years to assist veterinary services and education. For this he has been awarded a D.Sc (h.c.) from Massey Uni. in 1988.

He is married and his wife Ann also assists CVA programmes. He has five sons one of whom is also a Veterinary graduate.

News Book/Journal Project Co-ordinator

Dr. Wayne Lees, is the new Project Co-ordinator for the Journal/Book/Audiovisual Programme of the CVA.

Dr. Lees address is:
P.O. Box 640
Lethbridge, Alberta
T1J 3Z4
Canada

Dr. Jim Archibald Made Honorary Life Member of CVA

The Executive Committee of CVA which met in London on April 29th 1991 unanimously elected Dr. Archibald as a Honorary Life Member of the CVA for his services to the Association. This is the first time that someone has been personally elected to Life Membership of the Association.

New Regional Representative of Australasia

Dr. Syed Jalaluddin Deputy Vice Chancellor of Univ. Perak who Malaysia has been elected as the Regional Representative of the Australasian Region. He succeeds Dr. W.J. Pryor, Council Member of Australia who is now the Secretary/Treasurer of CVA.

Dr. Blackburn elected as Chairman of OCA

Dr. J.T. Blackburn President of CVA has been elected as Chairman of the Organisation of Commonwealth Associations (OCA) which is made up of representatives of all the Commonwealth Professional Associations.

Profiles of the newly elected office bearers who take charge from 1.1.1992 will be published in our January 1992 issue of the CVA News.
37 Elephants die in India's Mysore forests
Besides poaching, infectious disease suspected

As many as 37 wild elephants have reportedly died in the Mysore Forest Circle, falling within the proposed Project Elephant area, during the last 14 months.

While 14 elephant deaths, 7 each have been recorded in the Mysore and Chamrajnagar divisions, a reason for worry for the forest officials here has been the death of 23 elephants in the Kollegal division alone, with 8 deaths reported during the last two months.

Elephant deaths during the previous years have been attributed to the dread poacher and sandalwood smuggler Veerappan, who is still eluding both the Tamil Nadu and Karnataka police, sheltered in the forests of Male Mahadeshwara Hills and the adjoining forest areas.

But of the 15 elephants which died in Kollegal, the area where Veerappan is taking shelter, during the last year, only three died due to poaching, And Forest Departments records show that while six female elephants died natural deaths, the cause of death of one tusker and five other female elephants remain unknown.

Similarly, during the first two months of the current year, eight elephants have died in Kollegal division. Though records show that seven of them died natural deaths, and the reason for the death of the other not known, it is clear that the seven elephants including the six which died "natural" deaths last year have all not died of natural death.

The forest officials here suspected an epidemic as being the cause of elephant deaths in Kollegal division and requested a team of experts from the Institute of Animal Health and Veterinary Biologicals, Bangalore to investigate into the death of elephants in the division. But, the report of the investigation team led by the Director and Disease Investigation Officer of the Institute and comprising veterinarian in-charge of forest elephants, Mysore division, Dr. Nanjappa, and Assistant Conservator of Forest, Hanur, Mr. Vijay Jogi, has not pinpointed the exact cause of death.

News from Pakistan
Training Course on Teddy Goat Production

Okara: A two weeks training course on "Teddy Goat Production at Village Level" had been organized for nineteen teachers of APWA Adult Education Centre from 5th to 16th August, 1990 at Livestock Production Research Institute, Bahadurnagar to acquaint them with basic knowledge of breeding, feeding, management and health care of mini goats. The teddy goat production programme in APWA is a part of Women Integrated Development Activities Programme introduced with the cooperation of UNICEF. Under this programme, teddy goats are distributed amongst the poor rural women in 25 projected villages to increase the income of their families. The participants of course are supposed to guide and assist the lady farmers in propagation of teddy goats after getting training from the Institute.

Concentrate feeding and lameness in dairy cattle

Concentrate feeding has been implicated as a cause of lameness in dairy cattle, but the identification of the individual nutrients which may be responsible is less clear. In this experiment two groups of 24 cows were fed diets which were the same in terms of the concentrate: forage ratio, and the daily intakes of metabolizable energy and crude protein, but one group received a starchy source of energy (barley) and the other a fibrous source of energy (sugarbeet pulp). Both groups were offered the diets in a 60:40 concentrate: dry matter grass silage dry matter ratio during weeks 3 to 25 of lactation. There were significantly more clinical cases of lameness, which lasted significantly longer, among the cows fed the barley based diet, although there were no significant differences between the groups in terms of milk production or liveweight gain.

Voluntary Vets for Servet

The concept of Servet (Service by Vets) was presented at the Commonwealth Veterinary Association regional meeting in the Solomon Islands. Servet is an international veterinary arrangement for vets in the commonwealth and beyond to help developing countries by giving voluntary veterinary services for any aspects of livestock (and other animals) development. The volunteer vet is expected not only to give his service free but also meet the cost of his own international travel to and from the developing country. In return, the recipient (developing country) is expected to contribute to the food and lodging of the visiting vet.

Since the launching of Servet, more than 160 vets from the US, Canada, the UK, Australia, Nigeria, New Zealand, India, and Korea have indicated their desire to help poor countries. They have registered with Servet. At the same time, Servet has received requests from organisations and institutes. The requests have come from the Philippines, Sri Lanka, Cook Islands, Fiji, India, Papua New Guinea, Mauritius, and Botswana. They have asked for vets to help in veterinary diagnostic laboratories, revise meat hygiene regulations, sterilise pets, start a small farm, conduct seminars and teach para-vets. The requesting organisations include the blind, veterinary colleges, the deaf, government institutes, and animal welfare. Servet has helped an animal sanctuary in India. It is finalising positions for field work in Papua New Guinea and a pet sterilization campaign in Mauritius.

Veterinarians and others with expertise in livestock production wishing to give their professional service are requested to write to Servet. You do not need to be a specialist; you can be a young graduate. You need to be prepared to give in the broadest sense of the word, and to do so under difficult working conditions. Please indicate the period of service for each assignment. This can range from 2 weeks to one year, and longer.

Servet fills a niche for veterinarians who wish to make their personal contribution to the international community in a satisfying and meaningful way. It can be done with minimal fuss.

C.H. Gimby, BVSc, MRCVS
Servet
402, Dunean Road
Singapore 1128
Republic of Singapore

BLOOD TRANSFUSION: A HISTORICAL REVIEW

The first blood transfusions were performed in the early 17th century and were from animals to people. Then, in 1885, Richard Lower successfully transfused blood from a carotid artery of one dog into a jugular vein of another through a silver tube. This success prompted him to transfuse the blood of a lamb into a melancholic insane man in an attempt to modify his 'unbalanced character'. The transfusion was successful but the man's character remained unchanged. Later attempts by Jean-Baptiste Denis to calm a maniac with transfusions of calf blood were less successful, the man died and Denis was accused of murder. Although he was later acquitted, further transfusions were prohibited by Parliament in Paris, and most of Europe, including the Royal Society in London, followed the French edict. As a result, no transfusions were reported for the next 150 years. The subsequent gradual acquisition of knowledge about blood, and the development of the techniques which have made blood transfusions in people and animals a matter of routine are described briefly and clearly.


The Artist Veterinarian

Dr. Ken I. Waterson, a practising veterinarian from Victoria, Australia, has devoted his artistic talents to the study of animals in art form.

In 1985 Dr. Waterson completed a year's internship in orthopaedic surgery at Massey University, completing a Diploma of Veterinary Clinical Studies (Orthopaedic Surgery). In 1986 he was successful in his Membership examination in Small Animal Surgery for the Australian College of Veterinary surgeons. During his internship at Massey, Dr. Waterson rekindled his interest in art by drawing all the diagrams for his thesis on total hip replacement in the dog. Since then, he has studied under some leading artists from the Victorian and Malvern Artists' Societies. Dr. Waterson has exhibited in the Camberwell, Waverley and Benalla Rotary Art Shows, and at the Malvern Artists' Society. He has been commissioned to paint from time to time.

Dr. Waterson's thorough grounding in the anatomy and physiology of animals and animal movement, coupled with a strong appreciation of all animals, has led to the variation and interest in animal studies which are painted in his exhibits. His paintings were exhibited at the recently concluded International conference on Veterinarians and Environment at Darling Harbour, Sydney.
News from Malaysia

The following are the office bearers of the Veterinary Association of Malaysia:

President: Prof. Dr. Syed Jalaludin Syed Salim
Deputy Vice Chancellor, Universiti Pertanian Malaysia, 43400 UPM Serdang, Selangor.

Vice President: Dato' Dr. Kardin Hj. Shukor

Past President: Dato' Prof. Dr. Ahmad Mustaffa Hj. Babjee

Secretary: Dr. Abdul Aziz Saharee

Assistant Secretary: Dr. Fatimah Iskandar

Treasurer: Dr. Sharifudin Abdul Wahab

Editor: Dr. Henry Too Hing Lee

Committee Members:
- Dr. Matto Abdul Rahman
- Dr. Maznah Ahmad
- Dr. S. Silavaganathan
- Dr. V. Ananthan

Correspondence: Hon Secretary Faculty of Veterinary Medicine & Animal Science, Universiti Pertanian Malaysia, 43400 Serdang, Selangor Ehsan, Malaysia.

CANADA CARIBBEAN

Letter from the Caribbean
Another Drug for the Treatment of Dermatophilosis

Since Dermatophilosis (Senkoba, Cutaneous Streptothrixiosis) is very widespread in Antigua, a variety of drugs are used, even by the farmers themselves for its treatment.

1. Oxytetracycline 1/m 20mg/kg bodyweight
2. Amoxicillin 1/m 15mg/kg bodyweight
3. Penicillin + Streptomycin 1/m 44mg + 44,000 u/kg
4. Topical application of either vaseline + Sulphur, or vaseline + Iodine

Due to the continuous use of the above parenteral medicines over many years, there is resistance to these drugs in some farms or in some areas.

This year about 18 cattle were treated for Dermatophilosis with Erythromycin Lactobionate 1/v at a dose of 2mg/1b body weight. All the animals responded to the treatment in 4-10 days though the disease recurred in some of them.

Since the route of administration of Erythromycin Lactobionate is intravenous most of the farmers will not try to use it themselves and so there is little chance of resistance to this drug.

Subcutaneous injection of Ivermectin was tried on Dermatophilosis affected animals without any effect.

13th December 1990
Jose Mathew, Veterinary Officer, Veterinary & Livestock Division, Antigua & Barbuda

Pan Pacific Veterinary Conference on Veterinarians and the Environment held at Darling Harbour, Sydney a great success

The scientific programme spread over 33 streams was a packed one. Most of the sessions were well attended. The organisers had left no stone unturned to make this conference a memorable one. Apart from the Australian and New Zealand veterinarians there were number of overseas delegates from Japan, China, Taiwan, the Philippines, Thailand, Malaysia, Indonesia, India, South Africa, the UK, the United States and Canada.

Platypus

The platypus can swim and dive,
With paddle tail for overdrive,
And roots in creeks or rivers.

On each hind leg he bears a spur,
And dresses in a soft thick fur,
Therefore be never stingers.

His lady platypussy mate,
From time to time will ovulate,
And store eggs in her tunnel.

Then when they hatch as smooth as silk,
She nurses them with mother's milk,
While resting in her tunnel.

He strikes a most beguiling pose,
A duck bill has been for a nose,
Oh how could one conceive it?

That such a quirky artist,
Could in this ordered world exist,
You surely won't believe it.

- Len Green,
13 Parsley Rd, Vaucluse, NSW 2030.
Gifts from Canada to the School of Veterinary Medicine, the U.W.I., through the Commonwealth Veterinary Association

The Commonwealth Veterinary Association (CVA) has, for several years, sought contributions of veterinary books, journals, and equipment for distribution to colleagues and organizations in less developed Commonwealth countries. This programme was run by Dr. Bert Stevenson, the CVA Council Member for Canada and now by Dr. Wayne Lees.

On May 30, 1990, two valuable gifts, one of 13 books from the series “The Veterinary Clinics of North America” and 215 macroscopic and microscopic pathological slides were formally handed over to the Director of the new School of Veterinary Medicine, Faculty of Medical Sciences, the University of the West Indies, in Trinidad. The former gift was donated by the Alberta Agriculture Library and the latter by Dr. A. Bundza, Animal Diseases Research Institute, Nepean, Ontario.

The gift of books was handed over by Prof. H.E. Williams, the CVA Council Member for Trinidad & Tobago, while the slides were handed over by Dr. B. Stemshorn, currently Coordinator, Caribbean Animal and Plant Health Information Network (Caraphin), Inter-American Institute for Cooperation on Agriculture, in Trinidad and Tobago. Prof. V. St. Omer, Director, School of Veterinary Medicine and Prof. K.A. Butler, Dean, Faculty of Medical Sciences, received the gifts.

L to R are Prof. A.K. Butler, Dean, Faculty of Medical Sciences, The University of West Indies (UWI), Trinidad, Dr. Vincent St. Omer, Director, School of Veterinary Medicine, Faculty of Medical Sciences, UWI, Trinidad, Dr. Barry Stemshorn, then Coordinator, Caribbean Animal and Plant Health Information Network, and Dr. Holman E. Williams, Council Member, Trinidad & Tobago.

Poultry Development in Africa

Poultry provide a readily available source of animal protein, in the form of meat and eggs, and yet the protein deficiency gap of Africa’s citizens is still widening. To provide a forum for discussing ways of improving poultry productivity, and thereby family nutrition, CTA organized an International Seminar in Thessaloniki, Greece, in October 1990. Fifty delegates representing 21 African countries (anglophone and francophone), European scientific research establishments, national administrations and international funding organizations, met to exchange practical experience and to formulate the best strategy for achieving Africa’s potential in this field.

Unconventional feedstuffs

The participants at the Seminar agreed that a collection and compilation of feedstuffs and an assessment of their nutritive value should be undertaken. Sources of unconventional feeds of no use in human nutrition yet ideal for poultry, were reported by many delegates. For instance, in Uganda, the freshwater lakes provide a source for fishmeal as do the waste products of the fish smokehouses of Cote d’Ivoire. Brewers’ grains, a by-product of the beer industry, are an excellent food source as is palm oil sludge. Cottonseed cake, provided it is fed in the correct proportion and at the right time, can also be used.

Ensuring that such information is widely available was seen as one of the major development tasks for the future. One of the problems identified at the Seminar was that African scientists found exchange of information with European countries easier than with their African neighbours. Yet, it is between countries that experience similar conditions, that dialogue is likely to prove most valuable.

Pig production costs halved

The use of locally-available raw materials has halved the cost of pig production in the Solomon Islands.

In trials funded by the Overseas Development Administration’s Geographical Division, local copra meal, cassava and fishmeal were fed to pigs instead of fresh coconut and cassava, although it is still necessary to import vitamins and minerals. Such has been the demand for the local feed that a feedmill at Mamara has been brought back into operation, and now produces 40-60 tonnes per month.

Natural Resources Institute UK
Tanzanian Veterinary Association's 9th Scientific Conference

The Tanzanian Veterinary Association is to hold its 9th Scientific Conference at Arusha International Conference Centre from 3rd to 5th December 1991.

The theme of the conference is “Veterinary Medicine in the 21st Century”. This theme has been chosen so as to discuss the challenges facing the profession, more so in the Third World Countries by the Year 2000 and beyond. Invitations have been extended to Sister Associations within and outside the SADCC countries as well as allied International Research Organisations and Pharmaceutical Companies. The conference shall also bring together Animal Scientists, Livestock Economists, Rural Sociologists, Extension and Research Workers in addition to Veterinarians.

Tanzanian Veterinary Association therefore invites you to participate at the forthcoming Scientific Conference. Those wishing to present papers or display products: abstracts or intentions to display products should be submitted to the Hon. Secretary not later than 30th September 1991.

The Kenya Veterinary Association Scientific Conference
April 26th - 28th 1991

The Kenya Veterinary Association had scheduled to hold its Scientific conference from 26th to 28th April 1991 at the Faculty of Veterinary Medicine, University of Nairobi at Kibete, Kenya.

The theme of the Conference was “Private Veterinary Practices”. Details of the conference are awaited.

News from Uganda

The Uganda Veterinary Association held a Scientific Conference from 4th to 5th April 1991 with the theme “Towards Improvement of Animal Health and Production through privatization”.

A number of papers were presented and discussed among which were:

- Private Veterinary Practice Management
- Economics of Livestock Farming
- Practicability of embryo transfer techniques in Uganda
- A comparative study of dried blood on filter and serum samples for serodiagnosis of Anaplasmosis
- The use of DNA probes in studies on the epidemiology of Trypanosomiasis in Uganda
- Rinderpest vaccination responses and its epidemiology among Ugandan cattle monitored by ELISA.

The Conference was followed by transaction of the business of the Association after which the following office bearers were elected for a two year term.

President: Dr. John Mukibi
Vice-President: Dr. T. Kiryapawo
Secretary: Dr. C. Kudamba
Assistant Secretary: Dr. (Miss) M. Makuru
Treasurer: Associate Prof. (Miss) T. Kibirige-Seburuya
Assistant Treasurer: Dr. S. Katumisi
Committee Members: Dr. B. Mwesigye, Dr. G. Mukibi

- Dr. John Mukibi
President, Uganda Veterinary Association,
P.O. Box 16540, Kampala, Uganda

News from Nigeria

Appointment as a Patron

Dr. J.T. Blackburn President, Commonwealth Veterinary Association has been appointed as one of the patrons of the African Veterinary Medical Student Association in view of his untiring efforts in the promotion of veterinary medicine in the continent.

Our hearty congratulations and felicitations.
UK MEDITERRANEAN

Veterinary Philately

Stamp collecting is a popular hobby worldwide. Many themes are depicted on stamps and particularly interesting to veterinary surgeons is thematic veterinary philately - collecting stamps and other postal items which feature veterinary surgeons; education; conferences; animal diseases; zoonoses (which would bring in scientists who are not veterinarians); import controls; export of animals and their products; animal welfare; etc. Inevitably there is overlapping of these areas of interest. In addition to stamps, there are postal history items, first day covers, commemorative covers, special cancellations and slogan postmarks.

The above areas of interest can be illustrated by reference to various stamps and postal items that have been issued by Commonwealth countries.

The only Commonwealth veterinarian to feature on stamps is someone who can claim to appear on many more stamps than anyone else - over 450 at the last count! He is a Glasgow graduate of 1953 - His Excellency Sir Dawda Kairaba Jawara, FRCVS, President of Gambia and Patron of the Commonwealth Veterinary Association.1

Veterinary education is illustrated by a stamp issued by Uganda in 1972, which commemorates the 50th Anniversary of Makerere University, Kampala, and by a Nigerian Stamps issued in 1973 on the occasion of the 25th anniversary of the University of Ibadan. In the United Kingdom the bicentenary of the Royal Veterinary College, London was commemorated represented by a pre-paid envelope issued in Australia in 1983 for the 22nd World Veterinary association Congress at Perth. The first Commonwealth Veterinary Conference in Zimbabwe in September 1990 was promoted by the use of special slogan postmarks.

The Joint Campaign Against Rinderpest, mounted by the Organisation of African Unity between 1962-1976, is an excellent example of stamps being used for educational purposes in disease control. At least ten countries issued stamps including Kenya, Tanzania and Uganda in 1971 and Nigeria in 1967. In 1971 Australia issued a stamp entitled "Animal Science" which shows a veterinary surgeon handling a lamb. The VIIIth International Congress of Protozoology was held in Nairobi in 1985 and Kenya issued a set of four stamps, two of which illustrate the life cycles of animal diseases - babesiosis in the dogs and trypanosomiasis in cattle.

The zoonoses are represented by two stamps issued by Malta in 1964 at the time of an FAO anti-brucellosis congress.

11
The importance of import controls is very well illustrated by a set of three stamps from the Cocos (Keeling) Islands which depict the opening of an animal quarantine station in 1981. In 1978 Uganda issued a stamp showing imported Hereford cattle being off-loaded from a plane.

New Zealand has issued a number of stamps related to the export of livestock products such as meat, butter and wool. Particularly interesting is a New Zealand stamp issued in 1982 to commemorate the centenary of the export of frozen meat - it shows the sailing ship "Dunedin" that carried the first consignment in 1882 as well as the type of boat in use one hundred years later. One of the stamps issued to celebrate Botswana's independence in 1966 shows Lobatsi Abattoir, which exports meat to many countries.

A set of four animal welfare stamps was issued by the United Kingdom to commemorate the 150th anniversary of the Royal Society for the Prevention of Cruelty to Animals in 1990, and the centenaries of corresponding societies in Australia (1971) and in New Zealand (1982) were commemorated by single stamps 15, 16.

This is just a brief introduction to veterinary philately, which is a very interesting hobby. Hopefully Commonwealth countries will continue to produce further suitable stamps and perhaps one day we may even get the portrait of another veterinarian on a postage stamp!

The author would be delighted to hear from any readers who share his interest in Veterinary philately.

David Locke
4, Rathmore Road, Cambridge.
CBI 4AD England

Editor's Note: Commemorative stamp has been issued on 22.5.84 by Sri Lanka in honour of Dr. W. Arthur de Silva, a Veterinarian of considerable repute.

Draft WSPA Policy statement on Fish farming
(Toralf B Metveit)

It is important to keep in mind that fish, like mammals, are capable of experiencing frustration and stress. They can also suffer and feel pain.

Hence the human responsibility, in a fish farming context, to provide for the welfare of the individual fish.

Dependent on the species, climatic conditions whether on-shore or off-shore farming, open or closed farming etc., certain factors should be taken into account.

1. The density of the fish in the ponds is essential. Many problems related to fish farming are connected with stress and the number of fish per unit of water.
2. The handling of the fish during production, transportation and slaughter should be carried out in a proper and careful way.
3. Location, direction of water flow and exchange of water, external and internal supply of pollution etc., play an important role.
4. Water quality, biological, microbiological and physiochemical, is fundamental with respect to the well being of the individual fish.

Bed or insufficient environmental conditions, may, as in animal farming in general, lead to stress and decreased immune response.

A combination of these factors could cause infections and other avoidable and unacceptable so-called "man made diseases".

Taking into account the above considerations, WSPA urges the fish farming industry to continuously improve the systems with regard to the welfare of the individual fish.

This implies a continual review of current practices and the setting of satisfactory welfare standards and environmental safeguards.
Dealing with Ruminant Helminthiasis under Third World Conditions of Husbandry.

ROBERT MARES,
Retired State Veterinarian, African Third World Veterinary Services.

1. Introduction
This paper is based on work prepared for the Pan Commonwealth Veterinary Conference in Harare, Zimbabwe and summarized in the abstract for the Conference proceedings (Mares 1990). The original has been revised to include discussion points from the other papers presented at the helminthiosis sessions.

2. Summary
It is commonly accepted in the profession that helminthological problems are responsible for high morbidity and mortality and hence for economic loss. These assumptions are thought to apply in the third world equally with the developed world. This is implied in the content of papers presented at the conference.

A review of past reports from the colonial era and other published material is presented to challenge the above view. It must be accepted that the methods of modern farming cannot be imposed quickly or easily on the third world. Clinical veterinary medicine alone is not enough to solve problems, nor is strict control of animal husbandry. But both may be employed as means to the end of better understanding.

3. Definitions
The following words will be used as convenient definitions and not in any derogatory sense.

Third world: Those areas of the world that may be considered undeveloped, under-developed or developing in a relative sense.

Natives: The people of a given area who have lived there traditionally for many generations.

Nomads: natives of a given area who have to move grazings seasonally in order to survive.

Peasants: natives whose agricultural practices are traditional rather than modern.

4. Distribution of Helminths
The ubiquity of helminth parasites is not in doubt. Two hundred years ago, when William Moorcroft studied at Lyons, one of Europe's first veterinary schools, helminths were already a subject on the curriculum. Later Moorcroft found tape worms in Tibet and gid in Waziristan in 1812 and 1824.

Local changes in distribution are related to climate and ecology, i.e., the agro-ecological environment. Horak (1981) has described the host and climatic distribution of helminth parasites in southern Africa. The type of husbandry also has an effect: in Mali distribution of fluke is subject to the different management practices of various ethnic groups.

Distribution and epidemiology of Fasciola has received much attention in Nyasaland/Malawi.

5. Significance of Helminths
Significance can be looked at from the point of view of the severity of the disease or of economic loss. The first might not necessarily lead on to the second.

I. Disease significance.
In spite of the wide distribution of helminths greater attention in the third world has always been given to the epizootic diseases: East Coast fever, foot and mouth disease, pleuro-pneumonia, rinderpest, etc. It is axiomatic to expect loss from such diseases. If veterinary services did not tackle them with vigour, livestock keeping would stop or be reduced to patently un-economic level. Attention is also given to diseases against which there is effective prophylaxis: anthrax, black quarter, botulism, etc. For example in Botswana in 1957 there were over a million anthrax vaccinations and only about four thousand treatments for worms.

Descriptions of severe helminthiasis in native animals are rare in past annual reports of ex-colonial countries and equally so in personal reminiscence. It would appear that under "natural" conditions stock have the ability to survive without veterinary intervention. Among feral sheep in the Orkneys for example 35% mortality is due to dental disease 35% to starvation and only 13% to parasitic gastro-enteritis.

With game animals, even when subjected to poor conditions, this applies also: on an over stocked small private reserve the highest burdens found were in a single aged hartebeest and a group of eight immature blesbok, nine animals out of thirty six examined. "The presence of parasites in most wild animals is a perfectly natural phenomenon, but their effect is minimal on a healthy beast. However any drop in the hosts' conditions can be fatal ... (or)... aggravated by artificial situations".

No brief is held for the accuracy or scientific standards of the annual reports of the colonial era: but at least they got written. For many years after his departure Cockedge (1924) was spoken of with respect in Somalland. This in spite of saying that trypanosomiasis was of no great significance in camels! But his opinion that sheep and goats are often worm free (1935) was confirmed twenty years later. Sheep guts, free from nodular worm, were popular with Arab exporters of sausage casings.

In similar country Nianja in 1980 found "No classical acute form of
parasitism": the "anaemic status" he observed from Feb to May, was perhaps only coincidental.

Beal by 1913 had "collected numerous parasites" including the ubiquitous Haemonchus. Clinical helminthiasis however was reported only on the two government farms then in existence Rinderpest and pleuro-pneumonia however always featured in his reports.

Steward (1930) followed Beal, and commented that it was hard to distinguish malnutritions from worm infestation.

Simpson (1949) reports only examining 20 sheep and 54 cattle samples. No word of helminthiasis appears in the reports 1953 to 1956. Fry (1958) recorded heavy burdens in sheep on the newly started university farm; but was wrong to assume from this any problem in native sheep. In Hutchinson's time (1955) the only clinical cases of helminthiasis were on Government farms. It appears that trouble is rare except when attempts are made to impose modern methods on peasant farmers. The contribution from Papua New Guinea illustrates this point.

Early Nyasaland reports make few comments on haemochoria. DeMeza (1938) gave the first host parasite check list. This was ever after repeated in annual reports with newly diagnosed parasites added. Wilson (1939) considered helminths secondary, arising from poor nutrition: Only Faulkner (1958) and Aspinall (1960) claimed that helminths were a "major source of loss", Yet in a certain year only 28 faeces samples from sheep and 11 from cattle were examined in the laboratory.

Liver fluke was seen as a problem causing condemnation of livers in the abattoir, not a disease in the field.

In Botswana from 1933 no mention of helminths is made in reports by Chase (1933), Hobday (1942), Hay (1943) and Rowe (1951). The provision of worm remedies to farmers is mentioned but these were European ranchers, not natives. Unsworth (1959) and Falconer (1961) quote figures of losses from "poverty" and contrast them with losses from helminthiasis: e.g. 535 deaths from worms in cattle contrast with 24618 deaths from poverty.

Carmichael (1972) in his "preliminary investigation" into the helminths of ruminants in Botswana thought that cattle did not appear to acquire helminths from game and associated "massive outbreaks" with over-grazing, concentration of cattle at bore holes, protein and phosphorus deficiencies to "poverty".

- Directors of Veterinary Services with many years experience are as likely to be correct that "poverty" is the true cause of loss, as are research officers usually present for but a single tour of duty like Carmichael Payne's report (1980), also prepared after a single tour, listed some score of sheep and cattle helminths and asserted their importance without adducing any evidence. In the twelve month period immediately after Payne left a mere 200 sheep faeces were sent to the laboratory which simply confirmed "... the known seasonality of helminthiasis and indicated that after dosing the egg count was lowered. (Mares 1981).

An attempt was made to judge the disease significance of helminths over a two year period in Transkei, (Mares et al. 1982, 1984). Samples were taken by field officers from all districts, all agro-ecological areas and at all seasons. Eighteen different parasites were identified in cattle and twenty in sheep. Worm egg counts indicated that the majority of village stock, while undoubtedly infected, did not carry burdens considered as pathogenic by Mares and Soulsby's criteria (loc. cit.). Only 5% of 1500 samples were above the critical level in sheep, and the same in cattle. Egg counts were checked against the subjective clinical opinion of the sender as to the condition of the animal. Staff considered that only 10% of that 5% of sheep whose faeces revealed over 2000 e.g.g were in poor conditions. In cattle the percentage was higher: 40% over the critical level of 600 e.g.g in poor condition. Of course, condition could be quite unrelated to the worm burden but it did appear as if helminths in Transkei were a significant cause of disease even in high rainfall areas. Cattle owned by the staff on a well run forestry plantation, had higher egg counts, but were also in better condition than their fellows in the villages. Attending to animal husbandry and nutrition is more important than dosing for parasites.

**ii. Economic significance**

It is difficult to estimate economic loss in peasant communities where domestic livestock are not kept for economic purposes. In 1955 in the Northern Territories of Gold Coast, maize was tied up with the roots of the crop, and the roots were turned away to a few inches in height as it got further away from the night krais of the stalk or moisture from the run off from the roots. Milk was unobtainable in villages teeming with cattle. Yet, near by in the quarantine station, imported cattle from the Sahel were trekked through daily to feed the coca farmers of Ashanti, the workers in the gold fields and the population of the coastal ports. Under such circumstances it was pointless to consider the economic significance of helminths in the local herds. (Mares, personal communication).

Is it possible to devise any method capable of estimating actual economic loss, if any, from parasites in native areas? Njanka (1990) is stating the obvious by saying that strategic parasite control will improve productivity. Profitability should be the operative word.

In a peasant community there is the "... very high cost and considerable difficulty of obtaining experimental animals." Obtaining an accurate concept of loss would require ... an elaborate set of observations... continued over a number of years" (Fitzsimmons 1971).

In his helminth survey of sheep in Lesotho, Fitzsimmons (loc. cit.) noted that the sheep population had decreased over the previous ten years. He blamed internal parasites, deterioration of pastures and droughts. In contrast figures for Transkei indicated an essentially static stock population over the forty years up to 1980 (Mares, 1984). This might be, not from multiplication of the native herd, but because it was very common for Transkeians to buy stock from South African farmers with farms near to the borders. Fitzsimmons calculated that worms cost Lesotho some two hundred
cooperatives. Treatment for worms by stomach tube in horses took up much time at the mobile clinics; farmers, impressed by the rapid action of the drug, gladly paid the small sum charged. Dosing of ruminants at the dip tanks was also done by field assistants or farmers without supervision.

Faecal worm egg counts confirmed the effectiveness of the treatments but no consideration was given to the fact that the stock went straight back on to uncontrolled communal grazing. The indications from annual reports were that 25% of sheep had anthelmintic dosing per annum and no more than 2% of cattle. No cost-benefit analysis would suggest that this was worth doing! (Mares, Loc. Cit.)

The only excuse for ad hoc dosing in the third world is that it pleases the farmer, puts him in touch with veterinary services and, hopefully, in the way of getting advice of a more valuable nature.

The conscientious clinician must carefully consider all relevant facts before dispensing his nostrums. Not least should he consider the risks of inducing drug resistance. This is very adequately recorded in the literature particularly with the benzimidazoles. (Coles, et al 1990)

The warning example from Fiji is included in the papers presented at Harare (Banks, 1990) Laboratory test for evaluation of anthelmintics, and assessment of drug resistance are available but time consuming. (Coles, 1990)

Recent work (Reinecke 1990) warns that the day is not far off when no drugs will be effective.

ii. Strategic dosing.

The concept of strategic dosing is well understood and it remains for the individual to assess the benefits in the context of his own area, or individual farm. If grazing is communal however it seems a waste of time and money to attempt it.

Reinecke (1960) described exhaustive field experiments in the NW Cape to work out strategies. He confirmed that the worm egg count often bore little relationship to worm burden or disease significance. He considered the survival of larvae in the dung pats, the action of dung beetles, the climatology etc etc and his sound proposals included the erection of concrete calf pens; impractical in the conditions of the average African village. This failure to consider the application of advice to native areas is sadly all too common.

Pullan and Sewell (1980) in Nigeria pointed out that many experiments in Africa were conducted on Government farms; so they conducted their experiments among chosen native stock at their own home grazing. Fortnightly dosing improved weight gains and reduced e.g., but not until later in the dry season. They concluded that during the rains native animals resist parasites if their level of nutrition is adequate. Ndumukong, Sewell, and Asansi, (1987) found that dosing with fenbendazole five times a year was as effective as doing it monthly. This shows the importance of considering your costs.

The commercial scheme suggested for Transkei (Mares, Loc. Cit.) involved all cattle and sheep in whole villages being "blanketed" with anthelmintic. It was rejected as it seemed probable that the only gainer would be the drug company. But in a country such as Malawi, where cattle are readily available at stated times for dipping or vaccinations etc, the idea might be worth considering. This is endorsed by the success claimed in Zimbabwe at the Conference in the abstracts by Duncan and Forbes, and Hoyer (1990). But neither paper produced enough statistical evidence, or gave sufficient details of the conditions and procedures; fencing, paddock rotation, rainfall, state of the grazing and so on.

iii. Development of Immunity

Cattle and sheep appear to develop an immunity to helminths as they grow older. This is less marked in sheep, and, in both species, may break down in old age or under environmental stress. There have recently been suggestions from the Glasgow Veterinary College that the Scottish Black Face and Masai
breeds may have a natural immunity. Banks (loc. cit.) proposes investigating this in Fiji goats. These ideas produced an enthusiastic reception during the Conference discussions. It was suggested in Malawi that the high incidence of hookworm in goats might give the native stock some resistance to other helminths. In Lesotho Fitzsimmons (loc. cit.) suggested that the dominant Haemonchus could stimulate antibody production against other nematodes.

Immunization against lung worm by the use of irradiated larvae is successful; but no method on the same principal has yet been devised for stomach worms.

With some diseases it has long been recognized that giving a curative drug at the time of, or soon after, infection helps to produce immunity. The principle has been used in immunization for CEF, heart water and so on.

In Transkei an attempt was made to immunize sheep on communal village grazing by repeated treatments with "Nivax" (levamisole plus enterotoxemia vaccine-Mares 1982). The results were inconclusive but faecal worm egg counts were lower for an indefinite period afterwards. Mitchell and Armour (1981) suggested that levamisole has immunomodulatory properties which may have contributed to producing this effect.

iv. Costs of anthelmintics

The cost per dose of any anthelmintic may be obtained from the list prices and the effectiveness from the product data sheets; and, in southern Africa, VanWyk’s tables (1978). From drugs available in Transkei in 1982 a cost effective index was calculated (Mares, loc. cit.), the smaller the index the more effective the drug. With ivermectin there is a bonus for activity against external parasites. Ignoring this, ivermectin’s index was high. Systamex (oxendazole) was the most cost effective in cattle and Bovizole (thiabendazole) least. It might cost seven times more to use this drug than Systamex!

In sheep Systamex was bettered by Panacur (fenbendazole). Boniam (cam bendazole) and Trimintic (diisophenol) were least cost effective. The latter has been withdrawn.

A survey of costs and drugs used in a white farming area in South Africa in 1989 (Louw, 1990) considered that the cost per head was a negligible cost production factor. The dosing intervals bore some relation to a pattern of strategic dosing and the frequency of dosing was too low to give any risk of drug resistance developing. This paper also confirmed the costliness of ivermectin. The complications involved in making any comparable study in a native area or drawing any worthwhile conclusions need no emphasis.

v. Control considerations

Control of helminthiasis is essentially a husbandry problem, which in the native context means an educational problem. Grazing control, breeding programmes, advice on dosing, immunization and cost must all be considered. Cognisance of the biology and life cycles of the parasites diagnosed will lead to attention to watering points, avoidance of marshy areas, cleaning of kraals etc. Some of these ideas may be preached successfully even in communal grazing areas where advice to improve nutrition is of little avail. All such points are very adequately covered by VanWyk (1990), but the complexities render their application to native areas impractical.

What the text books advise is well known: but the implementation of advice is not easy with any farming community in first world or third.

Beal in Gold Coast (loc. cit.) advised weekly dosing with copper sulphate and moving sheep to the hills during the rainy season. It should perhaps be noted that in northern Ghana there are not really many hills! We can but wonder at the impracticality of the proposals.

7. Discussion and Conclusions

Is helminthiasis in the third world a problem that needs attention? Does it have the disease and economic significance sometimes suggested? In the extreme conditions obtaining in many overgrazed areas the action of helminths on the stock population, by reducing it, might be to ultimate benefit. In Transkei, (Mares, loc. cit.) where conditions could hardly have been worse, whatever else the stock suffered from it was not helminthiasis. Was this because the mixed grazing meant that the horses ate the cattle parasites and so on? Perhaps the pastures were so denuded that even worm larvae could survive! But parasites were there. The laboratory technician’s flock included a fine Merino ram, it had a worm egg count of 10,000 e.p.g. 85% Haemonchus larvae were cultured from the faecal material and yet by looking at the animal, it was hard to see that there was anything wrong with it.

Any discussion on animal disease in Africa must lead to one on conservation. In Transkei, in 1941, a committee of investigation into overgrazing stated that “... the dead asset of cattle was depriving future generations, "but what could be done when "the voice of the native people was unanimous in its opposition to any stock limitation"? It was also said that dipping was contra-indicated because driving cattle to the tanks “materially assisted soil erosion” (Young, 1941).

Is the problem worst in southern Africa? Can we blame the “system” of migrant labour with earnings sent home to be spent on cattle? The problem exists wherever the first and the third world rub shoulders.

Dealing with helminthiasis in rural Africa is perhaps a microcosm of the third world’s other problems. But, in spite of the very great obstacles to be overcome in changing peasant methods and outlook, we must not stop employing the only means we have available: good medications coupled with sound advice. To give up would be a policy of despair. We may gain understanding by obliging the peasant when he seeks our help. We must continue to run our veterinary services but take always a critical and sceptical view of the benefits we hope to bestow.
Discarded battery kills 55 heifers

December proved to be particularly wet and windy with heavy rainfall and gales in the second half of the month, says the Veterinary Investigation Services' disease surveillance report for that month.

As far as cattle were concerned, the most dramatic event of the month was an outbreak of lead poisoning in a group of bulling dairy heifers. A discarded 24 volt lead battery, weighing approximately 25 kg, was inadvertently scooped up with straw being added to a complete diet in a feeder box. The disintegrated battery, mixed through the complete diet, was fed to the group of 80 bulling heifers and two bulls. After an initial period of inappetence the first animals died rapidly. Later cases displayed the more typical signs of ataxia, head pressing, teeth grinding and convulsions leading to death.

Post mortem examination of a heifer at the VI centre identified lead poisoning as the cause of death and subsequent searching revealed pieces of battery in the feed and in the forestomachs of fatalities.

Livestock movement restrictions were imposed by the divisional executive officer under the Food and Environment Protection Act. Subsequent blood testing confirmed that the contaminated feed had been fed only to the heifer group and restrictions were amended accordingly. In the end 55 heifers died or were destroyed on humane grounds.

The disposal of this number of carcasses in itself presented difficulties and the divisional veterinary officer and his staff in Taunton gave advice on on-farm burial.

Veterinary Record, February 16, 1991.

Fears of 'blue ear' disease

Ministry of Agriculture (UK) veterinary officers are investigating possible outbreaks of 'blue ear' disease in two pig herds in Humberside. Movement restrictions have been imposed on the two sites, which are 25 miles apart but owned by the same farmer. On the first, 23 of 207 sows had shown signs with three deaths and on the second there had been 14 suspected cases among the 200 sow herd. In both herds there had been an increased incidence of abortion and premature farrowings.

A MAFF spokesman gave details of the investigation on May 23. He said it would probably be another two weeks before all the possible differential diagnoses had been eliminated.

The disease was first reported in Germany earlier this year and further outbreaks have since been identified in the Netherlands, Belgium and Spain (VR. May 18, p483; May 25, p488). The causal agent has not yet been identified but the signs in adult pigs include pyrexia, anorexia and cyanosis of the extremities. It also causes reproductive problems, including premature farrowing, aboritions and stillbirths. The majority of piglets born alive to affected sows die within 48 hours or without scour.

In the Netherlands the disease is diagnosed if, after 14 days from the commencement of the condition in a herd, two of the following criteria apply: 8 percent abortions or premature births; 20 per cent stillbirths; 26 per cent neonatal losses.

Veterinary Record, February 16, 1991.

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IgA deficiency in German Shepherd dogs


Research in Veterinary Science 50.

Bacterial overgrowth in the proximal small intestine is an important cause of weight loss and diarrhoea in dogs, particularly German shepherd dogs, and the reasons for the failure of local protective mechanisms to prevent the resulting damage to the brush border are not clear. In an investigation of various breeds of dog it was found that the concentrations of IgA, but not IgM or IgG, was significantly lower in the serum of healthy German shepherd dogs than in other purebred or mixed breed dogs. However, the reduced serum concentration was not due to a relative deficiency of IgA-producing cells in the gut but, presumably, to a deficiency in the synthesis or secretion of IgA. This hypothesis was supported by the finding that even in German shepherd dogs with small intestinal bacterial overgrowth the serum concentration of IgA was low, suggesting that in this breed the development of local immunity might be defective.
Sudanese farmers take to Donkey Power

In Darfur Province, West Sudan, donkeys are gradually becoming the main draught animal. This has been made possible because a chisel plough, based on the ancient ard plough, has been developed especially for use with donkeys.

Although camels have been used as draught animals in the area, most of the cultivation work has been done by hand because although most families have donkeys, they have been used only as beasts of burden.

Three years ago the Intermediate Technology Development Group began the Kekakaba Smallholders Project to encourage the use of donkeys as draught animals. Various designs of plough were tried including a mouldboard plough. But with low rainfall and soils that are prone to capping, it was felt that a chisel plough would do a better job.

The chisel comprises a winged tine which can cultivate to a depth of about 150mm, which is enough for millet. Also, it opens up the soil for good water penetration.

A suitable harness for the donkey has also been developed. It is made of nylon webbing which is available in the area. Local blacksmiths are being encouraged to make the plough. Costs are being kept to a minimum, about 50% of the cost of a bag of millet.

ITDG, Myson House, Railway Terrace, Rugby CV21 3HT, UK

Nominations for President of WVA

Dr. J.T. Blackburn, President of the Commonwealth Veterinary Association, has been nominated for election as President of the World Veterinary Association. The election will take place at the WVA Congress in Rio de Janeiro in August.

His interest in international affairs is well known to the BVA, where he has been Chairman of the European Affairs Committee and the Overseas Committee. He was a founder member and president of the European Association of State Veterinary Officers, which he represented on the Federation of Veterinarians of the EC (FVE).

Dr Blackburn’s interest in developing countries, which began in his schooldays, led him to become a district veterinary officer in Tanganyika in 1959; appointments in Kenya and Ethiopia followed.

Dr Blackburn returned to England and joined the State Veterinary Service in 1968. He was appointed BVA representative on the Commonwealth Veterinary Association in 1980 and was elected President in 1988, having been largely responsible for initiating the successful Pan Commonwealth Veterinary Conference (the first of its kind) in Harare last September.

During his BVA presidency, Dr Blackburn led a successful campaign to take the BVA back into the World Veterinary Association. He was appointed UK representative on the WVA Permanent Committee (now the General Assembly) in 1985.

The other contender for the President’s post from the Commonwealth is Dr. John E. Mc Gowan, Senior Assistant Deputy Minister, Agriculture Canada. He is the first Veterinarian to hold such a high office in the public service of Canada. He is the Canadian representative to the World Veterinary Association and was instrumental in bringing the XXIII congress to Montreal in 1987.

Dr Mc Gowan has been active in the Office International des Epizooties (OIE) since 1976. He has also been involved in the development and construction of the Atlantic Veterinary College at the Univ. of Prince Edward Islands, and to the expansion and upgrading of facilities at both Ontario Veterinary College, Univ. of Guelph, and Western College of Veterinary Medicine Univ. of Saskatchewan.

Bio-Gas Technology in Tanzania

The Meshalu family live in Kimando, a small village about 15km from Arusha in northern Tanzania. They keep five head of upgraded cattle, and sell the milk in town. Mrs Meshalu participated in a seminar for smallholders which was conducted at the Livestock Training Institute in Tengeru. She was so impressed by the biogas plant she saw there that she persuaded her husband that they should install their own unit. They got in touch with the Biogas Extension Service (BES) of the Centre for Agricultural Mechanization and Rural Technologies (CAMARTEC). CAMARTEC has been promoting biogas technology since 1983, in collaboration with Gate/GTZ.

The Meshalas installed a standardized 16m3 fixed dome plant. The 4m3 of biogas per day provides enough fuel for cooking two meals for six people, preparing tea, coffee and heating water and also for lighting. So the family now enjoys easy, clean and smoke-free cooking. The newly- laid concrete floor of their cowshed allows easier filling of the biogas plant and improves hygiene.

The high population density of the region and the intensive agriculture results in high demand for domestic energy and fertilizer and the relative scarcity of fuelwood makes biogas technology particularly attractive. Purchase of feeding materials is often a major problem. However, the very high yields of fodder grass which result from the application of digested slurry is of great benefit. It can also replace costly mineral fertilizer.

BES is currently training engineers and craftsmen in the construction of biogas units in Arusha and Kilimanjaro Regions and supervises the first constructions carried out by the trainees. Many other families will benefit from the “cow to the cooker” technology.
COMMONWEALTH DAY MESSAGE
1991
FROM HER MAJESTY THE QUEEN HEAD
OF THE COMMONWEALTH

Each year, the Commonwealth Day celebrations draw attention to the multi-nation, multi-race and multi-faith nature of this unique organisation. But we should also be looking at ways to make practical use of these advantages. I therefore welcome the idea that this year the theme of the celebrations should be "Science in the Commonwealth".

The laws of nature, which have been uncovered by scientists of all nations, are valid everywhere on earth. They are not affected by political, religious or racial differences. Scientific discoveries affect all our lives and they already have an important influence on the natural world.

But with scientific progress, as we climb one hill another has a way of coming into view. For example, medical science has made it possible for more children to survive and for more adults to live healthier and longer lives. This is the positive achievement but it has also resulted in an alarming growth in the world's human population. Agricultural science has made it possible to produce more food, and industrial science has brought a higher standard of living to many people.

But the processes of agricultural and industrial production are using up more and more of the world's limited natural resources. We are now looking for ways of using science to protect our natural environment and not destroy it. If we succeed, we can be sure that there will be another hill to climb.

Science therefore poses a serious dilemma. In itself, it is neither good nor bad; the problems are only created by the way it is used. The challenge to scientists today is to bring benefits of science to the less prosperous communities whilst at the same time safeguarding the natural world. To do this successfully our scientists will need understanding and encouragement of the population as a whole.

The Commonwealth, with its many well tried channels of communication and consultation, is uniquely placed not only to enable member countries to keep abreast of scientific advances, but also to help them benefit from their practical application. I believe that the Commonwealth tradition of quiet co-operation and its advantage of common language can make a special contribution to the practical application of science wherever it is most needed for the sake of human welfare as well as for the long-term health of our planet.

ELIZABETH R.

Animal Welfare Extremes: Is This For Real?

Recently, the parents of a 6-year old child agreed to have her donate a kidney to a young chimpanzee who was suffering from simian nephritis. The father of the child visited the ailing primate in his cage at the Perkins Animal Clinic in Atlanta bearing a large bunch of bananas.

"As a family, we are 100 percent committed to animal welfare," said the father, a 40-year old health food store owner, "but sometimes it can be kind of frustrating. I heard about a laboratory rat out in California who needs a heart transplant. I'd really like to donate mine, but how will they fit it into that tiny little chest cavity?"

Vetscript April 1991

New Zealand free from Bovine Brucellosis

Dr John Hellstrom, MAF's Chief Veterinary Officer, announced to OIE on 10 December 1990 that the last two herds under quarantine because of a history of serological reactions in the complement fixation test for brucellosis were accredited free of the disease in December 1989. Since then no further cases of brucellosis have been detected.

All cattle herds containing breeding animals are under regular surveillance for brucellosis. It is intended to continue to screen the cattle population through regular surveillance tests for a period of five years after the destruction of the last animal considered serologically positive in the complement fixation test.

Bob Duckworth
New Executive Director for NZVA

Bob Duckworth qualified as a veterinarian in 1964 (Liverpool) and his practice-oriented career includes general practice and specialist poultry practice in the UK, government service in Jamaica and 20 years mixed practice in New Zealand. Bob has been a member of the Animal Remedies Board, Veterinary Services Council, the Rural Veterinary Development Committee, the Sheep and Beef Cattle Society executive, Club Practitioners Branch execu-
tive and NZVA Council. As you know, he has been president of NZVA for the past two years. In this new position, Bob will spend three working days a week wearing his NZVA hat and the remainder of his time will be devoted to managing his Wanganui practice.

* * *

NZVA JOINS UFAW

The New Zealand Veterinary Association recently became a member of UFAW, the Universities Federation for Animal Welfare.

UFAW is a charity concerned with improving the welfare of all animals. As a science-based animal welfare society, it accepts that animals are used for food, for experiments and for many other purposes; but does not accept that any animal should be treated inhumanely or abused.

It aims to improve the well-being of all animals, to reduce infliction of pain or distress, and to ensure they are killed humanely.

* * *

The Uganda Veterinary Association (UVA) held a Scientific Conference from 4th - 5th April 1991. At the end of the Conference, the UVA conducted its Association business during which a new Executive Committee was elected for a two year period.

The new office bearers of the Ugandan Veterinary Association are:

President : Dr. John Mukibi
Vice-President : Dr. T.S. Kiryapawo
Secretary : Dr. C.A.L. Kudamba
Assist. Secretary : Dr. (Miss) M. Makuru
Treasurer : Assoc. Prof. (Mrs.) T. Kiriririge-Sebunya
Assist. Treasurer : Dr. S.P. Kafumisi
Committee Members : Dr. B. Mwesigye
                  : Dr. Y. Sentongo
                  : Dr. G. Mukilibi-Muka

The main activity of the Association currently is to plan, direct and co-ordinate all activities regarding the privatization of Veterinary Services in Uganda. There are two projects, one E.E.C. funded and the other funded by The World Bank/IDA, both of which have components to assist Veterinarians to go into Private Practice.

Sd/-
Dr. John Mukibi
President
Uganda Veterinary Association

* * *

The Wild Life

By Laurie Harris in AG-Rapport March-April 1991

Dr. Eric Broughton, a special projects officer with Foods production and Inspection Branch's Animal Health Division, leads what can only be described as a wild life.

Dr. Broughton travels all over Canada making stops to see and test wild life ranging from elk to polar bears as part of his job at Agriculture Canada.

Along with his work on the diseased northern bison problem, he is also "loaned out" to help train park wardens to deal with bear problems in Canada's national parks. This contact has led to some hair-raising situations.

One such instance occurred at Cape Churchill when Dr. Broughton and four other scientists were studying a polar bear. Dr. Broughton injected the immobilized bear with a reversal agent - and that's when the FUN began! The agent worked too well and the bear awakened unexpectedly.

With the angry bear between them and the fenced-in camp, Dr. Broughton and one of the scientists just managed to escape the bear's wrath when it chased the three other scientists into the safety of the compound.

"That bear stayed around camp all day," recalls Dr. Broughton. "He was really mad."

While he admits there is an element of danger in working with bears, he emphasizes its necessity.

"Without this technique to immobilize bears and move them to remote areas, problem bears in our national parks would have to be shot. I see this as a conservation effort."

Although Dr. Broughton likes his work with the animals, he does find the intense travelling takes its toll.

"All the moving around from place to place can get on the long side," he explains. "However I've seen areas in this country that most people are unfamiliar with. Working in the north in Resolute and Melville Island with the Inuit is an incredible experience. I have great admiration for Canada's native people and their way of life."

In 1965, Dr. Broughton, a graduate of Ontario Veterinary College at Guelph University (class of '55) and a former professor at Iowa State University, joined Agriculture Canada and began working on the diseased bison problem.

Although Dr. Broughton does have an office in Ottawa much of his time is spent literally "in the field" testing bison and, he says, that suits him fine.

"I've always been involved and interested in the wildlife field," he says. "I enjoy being outside, close to nature."

"Besides, it sure beats being cooped up in an office everyday!"

* * *
Pan Commonwealth Veterinary Conference
Harare, Zimbabwe

10th – 14th September 1990

Abstracts
and
Resolutions
The Pan-Commonwealth Veterinary Conference
Scientific Programme

W J PRIOR, Chairman

The primary purpose of the Scientific Program is firstly to provide a range of leading world authorities to introduce in plenary sessions some issues judged of critical importance in considering means to improve the quality of life of small village livestock farmers. Secondly the Conference is to conduct workshops confronting questions on these issues which with particular emphasis on realistic assessments and, if possible, practical solutions.

Although the Conference is located in Africa, it is in fact globally oriented to the concerns of all countries of the Commonwealth. The Scientific Sessions Committee was conscious however that many visitors from other continents would have interest in some special features of animal health and production in the African environment. For this reason special sessions on veterinary topics and wildlife management relating to Africa have been incorporated.

The Committee was particularly appreciative of the large number of papers offered and greatly regrets that many papers of quality could not be fitted into the program.

My personal thanks are due to the other members of the Scientific Sessions Committee, Dr. Duncan Brown (CTVM, Edinburgh), Dr. Chris Foggin (Veterinary Research Laboratory, Harare), and the President and Honorary Secretary (ex-officio). Our thanks are due also to the invited speakers who accepted our invitation to speak at the plenary sessions or to lead workshops, to organisations who sponsored speakers and to all others who offered papers or program assistance.

The Committee was very aware of communication problems with speakers in so many different countries but believes that the tyranny of distance was overcome or blunted by the goodwill of those concerned and thanks them sincerely for this.
ANIMAL HEALTH - Day 1 Tuesday, 11th September, 1990

Session 1 Vector Borne Diseases
8.40-10.00 (Plenary)
8.40 The epidemiology and impact of tick and fly borne haemoparasitic diseases of ruminants.
9.00 Trypanotolerance - an environmentally sound and technically feasible option for combating trypanosomiasis in tropical Africa.
9.20 Frozen vaccines against bovine babesiosis and anaplasmosis-research and applications in Australia and Sri Lanka.
9.40 Progress towards the development of sub-unit vaccines against Theileria parva and other tick-borne disease.

10.00-10.30 MORNING TEA

Session 2 Helminthiasis of Ruminants
10.30-12.00 (Plenary)
10.30 An example of an integrated approach to parasite control in goats in Pacific Islands.
10.50 Th epidemiology and control of gastrointestinal nematodes in cattle in Zimbabwe
11.10 Attempts to reduce the impact of helminthiasis in small holder sheep production in Papua New Guinea

11.30-12.00 Keynote address-Sir Dawda Jawara - Patron, Commonwealth Veterinary Association

12.00 Gastrointestinal parasitism: evaluation and treatment strategies in small ruminants in a nomadic pastoral ecosystem.

12.30-1.30 LUNCH

Session 3 Workshop on Trypanosomiasis and Tick Fevers and their Control at the Village Level 1.30-3.30 Discussion leaders (10-15 minutes each)

3.30-4.00 AFTERNOON TEA

Session 4 Workshop on Nematode Control in Small Ruminants, Buffaloes and Cattle at Village Level 4.00-5.30 Discussion Leaders (10-15 minutes)

ANIMAL HEALTH - Day 2 Wednesday, 12th September, 1990

NO MORNING SESSIONS IN ANIMAL HEALTH

Session 1 New Perspectives on Veterinary Services
1.30-3.30
1.30 Veterinary services in Zimbabwe-past present and future.
1.55 The changing face of animal health companies and its consequences for the veterinary practitioner in Africa.
2.20 Open discussion-veterinary services for the village livestock farmer.

3.30-4.00 AFTERNOON TEA

Session 2 Zoonotics and Their Control
4.00-5.30
4.00 Village veterinary services improvement as adjunct to Rinderpest control.
4.20 Disease survey in communal lands in Zimbabwe.
4.40 The role of a reference laboratory for isolation and characterisation of Foot and Mouth disease virus in the Central and Southern African region.
5.00 Contagious bovine pleuropneumonia in Southern Africa and its effect on rural development.
NO MORNING SESSIONS IN ANIMAL HEALTH

Session 1 Veterinary Topics from Commonwealth Tropical Africa
1.30-3.30 (Short Presentations).
   Environment
1.30 Pursuing environmentally sound veterinary practices.
   Poultry
1.50 Subclinical Gumboro disease in broilers and its effects on the poultry industry.
2.10 Disease constraints of African poultry output hindering the transition from traditional to semi-intensive production.
   Cattle
2.30 Prevalence of Brucellosis in cattle from communal lands
   Sheep
2.50 Coccidia in sheep in Zimbabwe.
   Swine

3.30-4.00 AFTERNOON TEA

Session 2 Second Workshop on Vector Borne Disease Control
4.00-5.30

ANIMAL PRODUCTION - DAY 1 Wednesday, 12th September, 1990

Session 1 Improved Livestock Production in Village Farming Systems
8.30-10.00 (Plenary)
8.30 Maximising fertility of ruminants in village farming systems in the tropics.
9.00 Draught animal power in agricultural production systems: an appraisal towards the year 2000.
9.30 Improving ruminant livestock production in sedentary small holder farming system in Kenya.

10.00-10.30 MORNING TEA

Session 2 Village Potential of Aquaculture and Dairying
10.30-12.00
10.30 Water quality, parasitism and nutrition in tropical fresh water aquaculture.
11.20 Development of bovine somatotropin (sometribove) in Europe and North America and its application for milk production in Zimbabwe.
11.40 Effect of land tenure systems on peasant animal production.

12.00-1.30 LUNCH

Session 3 Workshop on Village Education for Livestock Production and Poor Ruminant Fertility
1.30-3.30
Discussion Leaders (15 minutes each)

3.30-4.00 AFTERNOON TEA

4.00-5.00
Discussion Leader (15 minutes)
Session 4b Workshop on Limitations/Responses to Introduction of Freshwater Aquaculture.
5.00-6.00
Discussion Leader (15 minutes)
ANIMAL PRODUCTION - Day 2  Thursday 13th September, 1990

NO MORNING SESSIONS IN ANIMAL PRODUCTION

Session 1  Wildlife Management
1.30-3.30
1.30  Novel concepts in Wildlife utilisation in Zimbabwe.
2.00  Saving the Black Rhino-veterinary problems associated with capture and translocation.
2.20  Foot & Mouth disease in wildlife
2.40  Game Culling for meat production in Zimbabwe.
3.00  Role of veterinarians in reducing the conflict between livestock development and wildlife conservation in developing countries.

3.30-4.00  AFTERNOON TEA

Session 2  Wildlife Management (continued)
4.00-5.30
4.00  New drugs for use in wildlife.
4.25  Physical and chemical capture of African wildlife.
4.50  Tick control on eland and buffalo using flumethrin 1% pour-on through the Duncan applicator.
5.10  Diseases of farmed Ostriches and Crocodiles.

VETERINARY EDUCATION  Tuesday 11th September, 1990

Session 3  Education Workshop
1.30-3.30  Exploration of mutual recognition of veterinary degrees throughout the Commonwealth

VETERINARY EDUCATION  Thursday 13th September, 1990

Session 1
8.30-10.00 (Plenary)
1.  The Undergraduate curriculum in veterinary education in developing countries.
2.  Graduate training in veterinary education within the Commonwealth - options and opportunities.

10.00-10.30  MORNING TEA

Session 2  Workshop 1
10.30-12.00
1.  Reciprocal Recognition of Degrees.
2.  Continuing Professional Development.
3.  Regional Post-graduate Training Courses.

12.00-1.30  LUNCH

Session 3  Workshop 2
1.30-3.30
1.  Veterinary Auxiliaries.
2.  The LVA Animal Health Assistant Report.
3.  The Training and Deployment of Veterinary Extension Assistants in Zimbabwe.
4.  Training and work of "Barefoot Vets".

3.30-4.00  AFTERNOON TEA

Session 4  Workshop 3
4.00-5.30
1.  Distance Learning.
2.  The undergraduate opinion.
3.  The Role of the Commonwealth Foundation and professional associations in training at village level
I Animal Health
Day 1 Tuesday 11th September 1990
Session I Vector Borne Diseases

The Epidemiology and Impact of Tick and Fly Borne Haemoparasitic Diseases of Ruminants
L.L. CALLOW, 2, Macquarie Crt, Mt Ommaney, Queensland 4174, Australia

If considered taxonomically, haemoparasites of ruminants fall into three main groups: the piroplasms represented by Babesia and Theileria; the trypanosomes by Trypanosoma; and the rickettsias by Anaplasma and Cowdria. If considered by vectors, there are six main groups: B. bovis, B. bigemina and A. marginale transmitted by Boophilus ticks; T. parva by Rhipicephalus appendiculatus; T. annulata by Hyalomma ticks; African trypanosomes by tsetse flies; T. evansi and T. vivax by tadarids; and C. ruminantium by Amblyomma ticks. There are other host-parasite-vector systems, but these are of minor economic importance compared with those just listed.

Different factors interact in the causation of overt haemoparasitic disease. The most basic is genetic resistance of hosts. Examples include: Babesia in which Bos indicus breeds are less affected than Bos taurus cattle by B. bovis; trypanosomiasis in which Nama cattle are trypanotolerant and heartwater (cowdriosis) in which indigenous African ruminants are less affected than livestock introduced from Europe.

Age is another factor: the increased resistance of calves to babesiosis and probably other infections is well known. Aged, debilitated or pregnant stock have reduced resistance.

The status of the infecting parasite is important. Strains within the groups may vary both in virulence and antigenicity. Virulence changes have been most dramatically shown for Babesia. Antigenic variation is well known as the main constraint to effective control of African trypanosomiasis. The size of the infecting dose determines the outcome in some diseases.

The prevalence of vectors which dictates the transmission rate, is important in epidemiology, although the disease pattern which occurs are sometimes puzzling. Large tsetse populations cause severe trypanosomiasis in local cattle. However, animals exposed continually to large numbers of ticks suffer minimally from tick borne disease. When few tsetse are present, trypanosomiasis is much less of a problem, but when tick populations are low, losses from tick borne disease, particularly babesiosis and anaplasmosis may arise. The explanation lies in the fact that a single infection with Babesia or A. marginale (and probably T. parva) early in life confers solid immunity whereas even multiple infections with African trypanosomes may not immunise effectively. When few ticks are present, the first infection with tick borne parasites may be delayed until the cattle have grown older and become more susceptible to disease.

The impact of the diseases varies according to the parasite, its location and the production system involved. For African trypanosomiasis, there are invariably costs which can be very high. For the other infections, the impact may range from negligible in indigenous cattle to devastating in susceptible Bos taurus cattle. The villagers in Africa may suffer because the presence of trypanosomiasis prevents them from owning cattle for production or ploughing. Tick borne diseases affect small farmers throughout the tropics and subtropics because the diseases are often lethal to exotic cattle introduced in livestock improvement programs.

Control of the different diseases may never be easy. In the future, current techniques for vaccinating against tick borne diseases will be further refined and applied more widely than at present. Greater use of trypanotolerant livestock currently is the best answer to African trypanosomiasis. Biomolecular engineering may provide some solutions to the problems eventually. The transfer of responsibility for tick control in certain countries from the government to the farmer will bring overall savings in the cost of tick and tick borne control and, eventually, improved productivity.

Trypanotolerance - An Environmental Sound and Technically Feasible Option for Combating Trypanosomiasis in Tropical Africa
BAKARY N. TOURAY, International Trypanotolerance Centre PMB 14, Banjul, The Gambia

Tsetse-borne trypanosomiasis is one of the most important limiting factors to livestock production in humid and sub-humid tropical Africa, affecting 38 countries on the continent and covering an area larger than the total land mass of the United States of America. The affected areas are those which would otherwise be most suited for livestock development in terms of feed resources and availability of water.

Despite substantial international and national efforts to control the vector and the disease only limited progress has been made. Control of the vector is difficult because the methods are either expensive or environmentally hazardous, while the drugs available for treating or preventing the diseases are few. A vaccine is still not available.

In Africa, certain breeds of domestic ruminants are able to live and produce in tsetse-infested areas - a phenomenon known as trypanotolerance. The use of such breeds to increase livestock production in the humid and sub-humid zones of sub-Saharan Africa is a viable option for combating trypanosomiasis. Furthermore, evidence is accumulating that these trypanotolerant breeds are also comparatively more resistant to several other disease constraints in the affected zones. This paper presents the work being carried out at the International Trypanotolerance Centre (ITC) aimed at the expansion of the germplasm of trypanotolerant livestock.
Frozen Vaccines Against Bovine Babesiosis and Anaplasmosis - Research and Application in Australia and Sri Lanka

R.J. Dalglish¹, D.J. Weilgama², W.K. Jorgensen¹, A.J. de Vos³, M. Navaratne², G. Perera² and C. Weerasinghe²

1. Queensland Department of Primary Industries, Animal Research Institute, Yeerongpilly, Australia
2. Department of Animal Production and Health, Veterinary Research Institute, Peradeniya, Sri Lanka

Frozen vaccines containing living Babesia bovis, Babesia bigemina and Anaplasma centrale are being evaluated in field trials in Australia and Sri Lanka. The vaccines were developed as part of a collaborative project between the Department of Animal Production and Health in Sri Lanka and the Queensland Department of Primary Industries in Australia, with financial support from the Australian Centre for International Agricultural Research.

The project's main objective was to develop a system for the production and distribution of reliable vaccines against bovine babesiosis and anaplasmosis in Sri Lanka. Although methods for producing living, chilled vaccines for the generally extensive cattle industries in northern Australia were well established to suit the relatively small and intermittent demand for vaccines in Sri Lanka, the outcome will benefit both countries. The frozen vaccines under evaluation meet Sri Lanka's needs and provide Australia with an alternative to conventional, chilled vaccines. The techniques developed will also be useful in other countries where the parasites are endemic.

The vaccines' essential component is parasitised blood from splenectomised calves infected with 'attenuated' strains of the respective parasites. Laboratory-based experiments were designed to maximise parasite survival after frozen storage, and to test techniques for dilution after thawing to provide larger volumes of usable vaccine. Methods for packaging and distribution were also developed. Collaborative research and technology transfer were facilitated by exchange visits by scientists between the Tick Fever Research Centre in Australia and the Veterinary Research Institute in Sri Lanka. Successful field trials have been performed in both countries.

Notable features of the vaccines include: (1) the technology required for production is uncomplicated; (2) production and supply can be regulated to suit either an intermittent or continuous demand; (3) batches of prepared vaccine can be tested for quality before release; (4) single dose containers for smallholder use as well as multidose containers for larger herds can be prepared; (5) provided that liquid nitrogen is available, the vaccines can be transported long distances (internationally) and stored for up to 5 years before use; (6) the use of glycerol as a cryoprotectant extends post-storage viability of the vaccine parasites even when exposed to high environmental temperatures; (7) the vaccines provide lifelong immunity in most cattle following a single, subcutaneous inoculation.

The future for living vaccines against babesiosis and anaplasmosis, whether chilled or frozen, depends on the outcome of current efforts in several countries to develop non-living alternatives. Recombinant antigens have not fulfilled early promise, and vaccines comprising a limited array of antigens are unlikely to be very protective. The next step may be vaccines based on living organisms, genetically modified to express only the desirable characteristics of low and stable virulence, high immunogenicity and absence of infectivity for the vector. If these eventuate, the cryopreservation techniques developed within this project will have application well into the 21st century.

Progress Towards the Development of Sub-unit Vaccines against Theileria parva and Other Tick-Borne Diseases

A.J. Museke and V. Nene, International Laboratory for Research on Animal Diseases, P.O. Box 30709, Nairobi, Kenya

Tick-borne parasites, as a group, cause some of the most economically important diseases of cattle. The major parasites belong to the four different genera, namely, Theileria, Babesia, Anaplasma and Cawdria and are transmitted by several species of ticks. The current methods of control involve treatment of infected cattle with acaricides, use of live vaccines and chemotherapy. The methods have several drawbacks which include generation of tick resistance to acaricides, development of carrier states and lack of protection between different strains of parasites. The latter is particularly important for Theileria parva.

For these reasons alternative methods of control are being sought. The search for improved methods of control has centered on the development of subunit vaccines and efforts are directed towards identifying antigens which induce either humoral or cell mediated responses against the various stages of the parasites in mammalian hosts. For antigens which induce humoral responses, a 67 kilodalton (kDa) polypeptide has been identified on the surface of Theileria parva sporozoites while an 84 kDa surface protein has been detected on the same stage in T. anulata. For Babesia bigemina and B. bovis merozoites, surface polypeptides of molecular masses 55 kDa and 42 kDa, respectively, have been identified while a 105 kDa molecule has been found on the surface of erythrocytic stages of Anaplasma marginale. All these antigens induce neutralising antibodies against the respective stages of the parasites in cattle and such animals exhibit some degree of immunity. Potentially protective antigens have not yet been identified in Cawdria organisms. The genes encoding the five identified polypeptides have been cloned, sequenced and the different recombinant antigens are presently being tested for their immunogenicity in cattle. The work on the identification of antigens which might be target molecules for cell mediated responses, particularly important in the case of Theileria and possibly for Cawdria, is still in its infancy.

A number of adjuvants are available for use in vaccine development, the most attractive of which is the immunostimulatory complex (ISCOMS). This adjuvant is reported to induce both humoral and cell mediated immune responses. An alternative method is to package the genes encoding protective antigens into a live vector, such as vaccinia or attenuated species of Salmonellae. These vectors are also reported to stimulate both arms of the immune response. Ultimately, the development of a composite vaccine against the major tick-borne disease would be desirable.
Session II Helminthiasis of Ruminants

An Example of an Integrated Approach to Parasite Control in Goats in the Pacific Islands

DAVID BANKS, C/o Department of Primary Industries and Energy, Canberra ACT, Australia

This paper gives an example of a Pacific Island country which has in the past relied totally on the use of anthelmintics to control internal parasites in goats, with undesirable consequences. A more integrated approach is advocated, and the paper gives a practical example applicable to small farmers.

Internal parasites are a major constraint on commercial goat farming in Fiji, and the intensity of infection is such that the recommended drenching interval has been every three weeks throughout the year. One of the consequences has been the development, confirmed by egg count reduction tests, of widespread anthelmintic resistance to levamisole, benzimidazoles and more recently, ivermectin. The parasite population on one farm is now resistant to all three of the commonly used broad spectrum anthelmintic groups. Research efforts are concentrated on defining the epidemiology of the parasites involved, with the aim of reducing the dependence on suppressive drenching as the sole method of control.

Trials have indicated that 

*Haemonchus contortus* and *Trichostrongylus colubriformis* are the two main pathogenic species with no major break in transmission at any time of the year.

Hatching of parasite eggs and development of larvae on pasture is extremely rapid, but the survival of infective larvae is very short compared to temperate climates (9-13 weeks). Control methods have attempted to exploit this short survival time, but all attempts to break the cycle of infection by strategically timed drenching have failed. A four day on four weeks off rapid pasture rotation system however has given encouraging results.

An extension program now being advocated for goat farmers is designed to reduce the speed of onset of anthelmintic resistance by recommending the use of higher dose rates than those for sheep, minimal drenching frequency, incomplete herd drenching in some cases and rotation of drugs. Confining goats to nightyards is discouraged and trial of the rapid pasture rotation system is suggested on farms with multiple drug resistance.

The heritability of host resistance in Fijian goats is under investigation and if sufficiently high, a breeding program to produce genetically resistant animals will be established.

The Epidemiology and Control of Gastrointestinal nematodes of cattle in Zimbabwe

IM DUNCAN 1 and AB FORBES 2, 1Agricultura Pte. Ltd, Harare Zimbabwe, 2. MSD AGVET, Hertfordshire, UK

**Introduction**

History has shown that the development of a productive agricultural industry is fundamental to the cultural and economic evolution of human societies. Not only does agriculture provide the rudiments for nutritional sufficiency for the indigenous population, but the surplus achieved by improved productivity allows for opportunities to trade, and frees people from the land to diversify into other worthwhile activities.

Much of the world's landmass is unsuitable for sustainable crop production but there remain large areas which can support herbivores including domestic ruminants. The factors which can affect the efficiency of livestock are genetics, husbandry, nutrition and disease. Whilst the epidemic diseases eg. rinderpest, must be controlled to avoid the risk of occasional catastrophes, it is the endemic diseases which exert the greater effects on productivity. Parasites are involved in many endemic diseases and their control can provide immediate benefits to livestock farmers at all levels.

**Epidemiology**

In locations with well-defined seasons, the occurrence of gastro-intestinal (GI) parasitism is normally related to the temperature and moisture conditions which favour larval survival and development on the pasture. In countries like Zimbabwe, which have a hot dry season and a rainy season, the pattern of larval distribution on the pasture is as follows. Relatively few of the free-living larvae of the important GI nematodes eg *Haemonchus* survive on pasture until the end of the dry season. The source of infection therefore at the start of the rains is:

1. Residual survival larvae on pasture
2. Larvae developing from eggs deposited by grazing stock. These eggs may come from adult female worms which remain from the previous rainy season or from females which have resumed development after surviving as inhibited larvae in the gut mucosa during the dry season.

Generally conditions during the rainy season are suitable for the development and survival of free-living larvae, eg optimal conditions for *Haemonchus* larvae are a mean monthly temperature of 15-37°C and a minimum of 50 mm rain per month. Thus there is a rapid build up of infective larvae after the start of the rains and this persists until the dry season when development is retarded and mortality of larvae increases.
Regional Parasite Control Programmes

The following control programmes have been adopted in Zimbabwe and other countries with similar climates. At the start of the dry season, all grazing stock is treated with an anthelmintic with proven activity against both adult and, particularly, larval (including inhibited larvae) GI nematodes. For first year calves, this normally coincides with weaning. This treatment is valuable for insuring that animals survive conditions of potentially poor nutrition without the added burden of parasites. Additionally there are epidemiological benefits to be gained from the removal of parasites which can act as a reservoir for the next rainy seasons. Further anthelmintic treatments are given 3 weeks after the start of the first effective rains and this may be repeated at intervals, depending on the anthelmintics used (persistent effects), the parasite challenge and the host susceptibility. A recent trial in Zimbabwe, utilising ivermectin, has confirmed the cost-effectiveness of strategic anthelmintic treatments and demonstrated that the initial costs can be more than offset by increased returns.

Conclusion

Whilst eradication of GI nematodes is not a realistic option, much of the damage done by parasites can be eliminated by reducing parasite populations below levels which cause harm. Control need not rest solely on the use of parasiticides; nevertheless the adoption of a simple parasite control programme using strategic anthelmintic treatments provides an easy, cost-effective means of improving health, productivity and ultimately profitability of cattle under a wide variety of climatic and management conditions.

Attempts to Reduce the Impact of Helminthiasis in Small Holder Sheep Production in Papua New Guinea

NINGIGA, A., NUNN, M.J., OWEN I.L. AND YUNAMU, Y.A., Department of Agriculture and Livestock, P.O. Box 2141, Boroko, Papua New Guinea

Pigs and poultry are the dominant livestock species in Papua New Guinea (PNG), where ruminants were first introduced only late last century. About 87% of people in PNG live in village communities and ruminants have significant potential for both subsistence and smallholder production.

Early attempts to establish sheep in the highlands of PNG failed, largely due to the effects of gastrointestinal parasites and liver fluke, combined with the poor reproductive performance of temperate sheep in the tropics. Beef cattle were successfully farmed on ranches and plantations, but smallholder production proved to be of limited success owing to sociological and financial reasons. Goat production was not encouraged for fear of milk being contaminated and spreading human diseases, and of the potential damage to gardens and slopes. These factors led to renewed interest in sheep, culminating in an aid-assisted project of importations commencing in 1975.

This paper describes the severe effect of internal parasites on intensively farmed sheep in the wet tropical highlands of PNG and the strategies adopted to control these parasites. Acute outbreaks of fascioliasis and haemonchiasis have caused high mortalities (of some 30% of adult ewes and 44% of lambs, respectively) in intensively farmed sheep and require skilled management and expensive chemotherapy for control.

The management skills and cost of anthelmintics required to control internal parasites in intensively farmed sheep in PNG are well beyond the resources of smallholder farmers, so a strategy was developed to ensure that sheep distributed are as free as possible of parasitic and other diseases. The paper outlines the pre-movement quarantine and treatments used to ensure distribution of problem-free sheep to smallholders and reviews available data on the success of this and other management strategies in minimising the impact of internal parasites.

Despite the proven potential for internal parasites to cause very severe losses in sheep in PNG, current indications are that the strategies adopted have led to the development of economically and sociologically viable smallholder sheep production free of significant losses from internal parasites.

Gastrointestinal Parasitism: Evaluation of Parasitism in Small Ruminants and Treatment Strategies for Control Programmes in a Nomadic Pastoral Ecosystem

J.C. NJANJA, Unesco (Tremu), P.O. Box 340, Lodwar, Kenya

Evaluation of gastrointestinal parasitism in sheep and goats was carried out on project flocks of indigenous small ruminants from August, 1986 to December, 1989 in Central Turkana district of Kenya. Faecal samples were collected from individual animals for faecal egg counts and faecal cultures. Packed cell volumes were determined and parasites collected at necropsy for identification.

The pattern of relative susceptibility was similar in both species. Peak egg counts were observed after the rains (April-June) and low counts during late dry season (December-April). Third stage larvae of Haemonchus contortus were dominant on faecal cultures; other larvae identified were of Trichostongylus spp. and Oesophagostomum spp. At necropsy high numbers of H. contortus were found in the abomasum; other worms found were O. columbianum and Moniezia expansa in both species and Stilesia hepatica in goats only.

No classical acute form of parasitism was observed, however death of ewes and does with chronic infections characterised by poor body condition and anaemia occurred at the end of dry season with the onset of long rains. The results of parasitological and post mortem examinations confirmed that parasitism is mainly linked to the high incidence of H. contortus. Anaemic status in the flocks was observed in both species in March, April and May and in goats in February.

To determine the effects of parasitism, the initial flock was separated into two flocks after one annual cycle and anthelmintic introduced to one of them. Productivity parameters (mortalities, growth items, weight gains, body condition and milk production) in treated groups were better than those in non-treated group. Reduction of egg counts in treated group indicated the efficacy of anthelmintics.

The findings are suggestive of strategic parasite control programmes to reduce the effects of haemonchosis during periods of nutritional stress (late dry season), minimise infection levels after onset of the long rains and improve productivity of small ruminants in arid ecosystems.
Pathology of Animal Trypanosomiasis
V.O. ANOSA, Department of Veterinary Pathology University of Ibadan, Ibadan, Nigeria

The major causes of animal trypanosomiasis are *Trypanosoma vivax* and *T. congolense*, which are essentially plasma parasites, and *T. brucei* and *T. evansi*, which are tissue-invading parasites. Following intradermal infection by tsetse flies or syringe passage, the host develops a swelling termed the chancre at the infection site composed of proliferating trypanosomes and mono-nuclear cell infiltration.

The gross pathological changes in trypanosomiasis, which include spleenomegaly, hepatomegaly, hyperplasia or hypoplasia of red bone marrow (RBM) and testicular atrophy, are not pathognomonic. Common pathological changes include anemia, leucopenia, thrombocytopenia, lymphoid hyperplasia or hypoplasia with immunodepression, and degeneration and atrophy of reproductive organs. The causation of the anaemia is multifactorial, and includes haemolysis, marrow dyserythropoiesis and haemodilution. While infections with *T. brucei* and *T. evansi* in rodents and cattle induce moderate reticuloocyte responses, *T. vivax* and *T. congolense* infections of ruminants show only a weak reticuloocyte response. Studies in *T. vivax* infection of cattle show that phagocytosis of normoblasts, reticuloocytes and mature erythrocytes in the RBM contribute to this non-responsiveness.

Leucopenia with lymphopenia, neutropenia, eosinopenia and monocytosis occur, associated with hypoplasia of myeloid elements in the RBM but with proliferation of monocytes and macrophages. Further, there is phagocytosis of neutrophils and eosinophils in the spleen and liver. Thrombocytopenia occurs due to platelet clumping and marked platelet phagocytosis in the spleen, liver and RBM, while the megakaryocyte mass increases slightly.

The spleen shows hyperplasia of macrophages and plasma cells, and is the graveyard of erythrocytes, granulocytes and platelets. The liver shows hyperplasia of Kupffer cells, and ranks next to the spleen in blood cell destruction.

Lymphoid tissue in spleen and lymph nodes initially becomes hyperplastic with considerable transformation of lymphocytes to plasma cells while hyperplasia generally ensues later in infection. These changes, coupled with production of large quantities of non-specific IgM as well as other aberrations of the immune system, precipitate immunodepression which often leads to secondary bacterial and other infections.

Testicular atrophy with hypospermia and sperm abnormalities such as bent tails, coiled tails and detached heads occur in infected animals. Testicular tubular epithelia are hyperplastic due to necrosis and destruction of tubular cells. Intertubular monocellular cell reaction occurs in *T. brucei* and *T. evansi* infections but not in *T. vivax* or *T. congolense* infections except around foci of calcification in *T. vivax*-infected ruminants. *T. brucei* and *T. evansi* additionally induce periorchitis and epididymitis.

Infected females develop ovarian hypoplasia with follicular atrophy and cystic degeneration; comitantly, aberrations such as low levels of progesterone, elongated oestrus cycles, silent heat, stillbirths and abortions occur.

Tissue-invading trypanosomes induce additional pathology associated with tissue invasiveness, including myocarditis, encephalomyelitis, glomerulonephritis, interstitial nephritis, dermatitis, as well as formation of granulomas in many other organs. These lesions are associated with tissue necrosis and infiltration by lymphocytes, plasma cells and macrophages.

The severity of these lesions is influenced by parasite and host factors. Particularly noteworthy are the trypanotolerant cattle breeds, the N'dama and Mутuru, which develop less severe pathology and could be exploited to improve protein supply in trypanosomiasis endemic areas. By the year 2001, the objective is for 70% of the animal trypanosomiasis immunogenicity. Consequently, the hope for the farmer, by the year 2001, is that while waiting for the vaccine, a planned multiplication of trypanotolerant cattle and their crosses with high yielding stock (since such crosses have exhibited tolerance close to that shown by the trypanotolerant stock) should be planned and executed to mature at that time. Comitantly, vigorous efforts should be made to develop new and cheap drugs and prophylaxis and treatment of clinical trypanosomiasis.

Immunization of Smallholder Dairy Cattle in Malawi against Tick-borne Diseases
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A programme to develop farming amongst smallholder farmers has been in operation in Malawi since 1971. Crossbred dairy heifers (Friesian/Holstein K Malawi Zebu) are sold to selected farmers in Malawi. Smallholder farmers are around the three major cities and a regular milk collection service is provided. An artificial insemination service and an extension service assists farmers to breed and rear crossbred heifers to augment their herds.

Tick-borne diseases have proved a major constraint to the programme, particularly in the Central and Northern Regions where East Coast fever is endemic and anaplasmosis, babesiosis and heartwater also occur. Surveys have revealed an annual mortality in crossbred dairy cattle of 12-26%; of these 50-90% are attributed to East Coast fever. Treatment with organophosphate acaricides at weekly intervals throughout the year and continuous housing and zero-grazing are recommended for the control of tick-borne diseases but are difficult to apply effectively in practice.

Immunization against tick-borne diseases has been introduced as an adjunct to tick control in the Central and Northern Regions. Crossbred dairy heifers reared on Government farms and destined for sale to smallholder farmers have, since 1986, been immunized against East Coast fever through inoculation of a combination of three *Theileria parva* paraxenic clones and simultaneous treatment with oxytetracycline. Supplementary immunization with *Anaplasma centrale* and attenuated *Babesia bigemina* and *Babesia bovis* stocks originating from Australia was initiated in 1988. Immunization against heartwater using the infection and treatment method with the Ball's strain was started on a trial basis in 1989. Immunization of previously non-immunized crossbred cattle already in the milkshed areas, for anaplasmosis, babesiosis and East Coast fever, began in 1989. Upto 31st March 1990 approximately 200 immunized crossbred dairy cattle have been released to smallholders and a total of 378 have been immunized within the milkshed areas. This number is expected to increase rapidly as most Government rearing farms are now practising regular immunization and the programme of immunisation within the milkshed areas is being expanded.

It is too early to assess the benefits of immunization in the field. Field trials with crossbred cattle exposed to heavy natural tick infestation have shown a marked reduction of mortality from all the diseases in immunized animals compared to controls. A survey of cows immunized against East Coast fever only and released into the Lilongwe milkshed area has revealed a reduction in overall annual mortality and a reduction in the proportion of deaths attributed to East Coast fever as compared to non-immunized controls but the data is not sufficiently precise to demonstrate a statistically significant difference.
Prospects for Tsetse Control in Zambia in the 2000's

H.G.B. Chizyuka and D.N. Lumumba Veterinary Research Laboratory, P.O. Box 8101 Causeway, Harare, Zimbabwe

Tsetse distribution in Zambia should be viewed from the fact that it assumed wide areas of distribution. About 33% of the land mass is tsetse infested. Past tsetse control operations took the form of the application of persistent chemicals into the environment and ecological manipulation through bush clearing and elimination of the fly's food source. Both methods cannot be used any longer due to environmental hazards caused and, for another reason, that their effectiveness in suppressing tsetse population is questionable. Alternative tsetse control tactics involve sequential aerosol application of chemicals. Unlike residual chemicals, non-persistent insecticides sequentially applied pose minimal dangers into the environment and can be used to cover wide areas within a short period of time. However, effective control (eradication) can only be realised when used on flat terrain and under suitable weather conditions.

The major set back with all tsetse control techniques is that re-invasion into the reclaimed areas sooner or later occurs unless the whole tsetse-infested area has been cleared. In view of this problem, a regional concept to tsetse control has been deemed necessary to secure long term solution. Secondly, the techniques of advancing targets in areas where the tsetse belt is restricted within national boundaries has been called for. Disease control has been recommended in areas where vector eradication is not feasible.

Prospects for Tick control in Zambia

R.G. Pigram & H.G.B. Chizyuka Veterinary Research Laboratory P.O.Box 8101 Causeway, Harare, Zimbabwe

A historical review of animal health and production in Africa indicates that the origin of tick control coincides with the introduction of exotic cattle by European settlers at the turn of the century. Thereafter, it was considered essential to dip indigenous cattle and, in many African countries there was legislation to enforce tick control.

The case of tick control was reviewed at a Commonwealth Agricultural meeting in Tanzania in 1984. It was noted that countries lacking intensive tick control facilities were keen to establish them whereas countries that had them were trying to find ways to rid themselves of the burden.

In 1988, it was estimated that intensive tick control for the Zambian National herd would cost some US $10 million for acaricides alone (= US $ 4.0/ha/year). This figure is 13 to 52 times more expensive, depending on the use of toxaphene or arsenic, than the cost in the early 1950's. Thus the past decade the escalating costs of control, particularly the foreign exchange component, led many countries including Zambia to review their tick control policy. As part of this process, studies on integrated tick and tickborne disease (TBD) control were carried out to assess the cost-benefits of various options.

On farm investigations in Zambia demonstrated that:
(i) the effects of tick control on herd productivity are complex,
(ii) intensive tick control per se in the multipurpose rural livestock system in unbalanced,
(iii) the maintenance of enzootic stability to TBD coupled with seasonal, strategic tick control is economically viable and more robust.

Analysis of interactions demonstrate that the direct effect of ticks on herd productivity is not related simply to tick numbers. Seasonal tick control may cause increased milk yields which then lead to faster calf growth, earlier weaning and shorter calving intervals. The consequences of these events is a change in calving period to the more favourable rainy season. Thus, in alternate parturitions occurring in seasons of better nutrition, lactation yields may be 30 to 40% greater than those occurring in dry seasons. In contrast and somewhat unexpectedly, however, the effects of tick feeding on liveweight gain seem to be reduced during the hot dry season. This is thought to be related to the level of metabolic activity which is lower in dry season periods when nutrition is poor. A further significant interaction is that between tick control, season, calf age and calf mortality. A greater proportion of deaths at less than 2 months of age occurred in tick-free calves (77%) than in tick-infested calves (38%). Moreover, in the rainy season the proportion of calf mortality was lower in the tick free herd (38%) than in the tick-infested herd (65%).

Although intensive tick control increases herd output by some 25%, the value of the additional products is only 60% of the control costs. In areas where malignant thilariosis is epizootic, and enzootic stability is unattainable, mortality can be minimised through immunization which is much cheaper and more efficient than intensive dipping.

It is concluded that in Zambia the prospects for the continuation of integrated tick and TBD disease are good.

The Application of Deltamethrin to cattle for tsetse control

A. Wilson, Veterinary Research Laboratory P.O.Box 8101 Causeway, Harare, Zimbabwe

The tsetse fly is a major constraint on livestock and crop production in Africa. It inhabits 10 million sq km in which area it transmits trypanosomiasis to animals and man. Techniques for control are costly and complicated. It is reasoned that tsetse flies attracted to cattle treated with a potent, non repellent residual insecticide, would alight, acquire a lethal amount and die.

Experiments

M.C. Thomson carried out a controlled experiment in which wild tsetse flies (G. morsitans and G. pallidipes) alighting on an ox sprayed with deltamethrin and on an untreated control ox were captured at regular intervals over a period of eight weeks. The mortality of tsetse alighting on the sprayed ox was 95% for 14 days and knockdown was 70% or more for eight weeks.

In a further controlled experiment Mitchell and Rees compared the effects of deltamethrin used as a spray wash and as a pour on. This essentially confirmed the earlier work and showed that the pour on was as effective as the spray but, at the dosage used, had a longer residual effect and 70 days after treatment knockdown was still 20%. These workers exposed knocked down tsetse flies in the natural habitat and found that over 90% were aborted within 5 hours, thus confirming similar observations made by Lavissiere in W. Africa and Thomson in Zimbabwe. Under field conditions knockdown may almost equate to kill.

Trials

In a large scale field trial in Zimbabwe, 20,000 cattle in an area of 2,000 sq km were dipped every 14 days in a
Dealing with Ruminant Helminthiasis in Rural Africa
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Introduction

Terms used in describing third world conditions are defined as follows:

Indigenous people - The people of a given area who have lived there traditionally for many generations.

Nomads - Stock owning peoples native to a given area who have to move forage seasonally in order to survive.

Peasant farmers - Indigenous people indulging in agricultural practices that are traditional rather than modern.

It is usually accepted in the third world that helminthological problems are:

1. Important as responsible for high morbidity and mortality
2. Automatically equated with economic loss
3. To be approached as clinical and management problems

Distribution of helminths

The ubiquity of helminth parasites is not in doubt. Monnig (1928, 1938), followed by Soulsby (1968) have accurately recorded the host and geographical distribution of the helminths of the world. Round's check list (1968) probably gave the last word on the matter for Africa.

Local changes in distribution in relation to climate and ecology are well known. They may be affected by the "... different management practices of various ethnic groups", both nomad and settled. Also the agroecological environment may have a profound effect.

Significance of helminths

Significance is examined first from the point of view of the actual severity of the disease caused and secondly of economic loss.

1. Disease significance. It is axiomatic to assume loss from diseases but very few instances of clinical helminthiasis in native owned animals under peasant farmer husbandry are recorded in the literature. It would appear that animals under 'natural' conditions have the ability to survive without active human intervention. Reports and the author's experience are cited to substantiate this opinion.

ii. Economic significance. It has proved difficult to estimate economic loss in peasant farmer communities where domestic livestock are not kept solely for economic purposes.

Treatment and Control

Treatment is examined under five headings:

i. Treatment as an ad hoc resort. The clinician has assumed and the peasant farmer has demanded, that a sick animal requires a curative drug.

ii. Strategic dosing

iii. Dosing in an attempt to produce immunity

iv. Vaccination

v. An estimation of cost effectiveness of anthelmintics.

Control is looked at as a husbandry problem, which in the context of indigenous people is essentially an educational problem.

Conclusion

Before embarking on extensive dosing or control methods in any area of indigenous people it is essential that a close study be made of all relevant facts. Too often loss and the need to take action is assumed by extrapolation from results seen when the natural environment is modified by expatriate settlers, or outside experts.

The value of gaining the confidence of the indigenous by the judicious use of veterinary drugs and know-how must not however be over looked.

References


I Animal Health

Day 2 Wednesday 12th September 1990

Session I New Perspectives on Veterinary Services

Veterinary Services in Zimbabwe: The past, the Present and the Future (1890-2001)
R. Busayi Sr, Vet Officer, Dept of Vet Services, P.O.Box Ry 41, Raytons, Bulawayo, Zimbabwe

Livestock farming, albeit primitive, was going on before the arrival of the settlers. The first Veterinary Surgeon was appointed in 1898, six years after the arrival of the Pioneer Column. Veterinary training in Europe worked in a new environment, with unfamiliar diseases and they suffered from relatively new diseases like malaria. The local people mistreated the settlers, so they were very uncooperative and prejudiced to start with.

Nevertheless the Veterinary Services of that time managed to eradicate rabies, contagious bovine pleuropneumonia, glanders, epizootic lymphangitis, East Coast Fever, African swine fever and contagious epipharyngitis. Although the veterinary infrastructure was skeletal and staffing was poor; dedication, motivation and hard work on the part of veterinary staff were keys to their resounding successes.

As time passed by the advisory and regulatory role of the Veterinary Services became apparent. Promulgated regulations which today are embodied in the Animal Health Act were (are) a useful tool. Cattle dipping, diseases reporting and vaccination of dogs against rabies for example were mandatory.

Livestock movements were monitored closely and infected properties quarantined. Slaughter policy did not feature much.

The 1980-1990 decade was approached on a note of optimism and enthusiasm to uphold the high standards of the past. Learn from past mistakes, shift emphasis from individual health care to herd health schemes and “take” veterinary services to the people. Post-independence staff recruitment is going on, decentralization to provinces and districts is encouraging, there have been tremendous in-roads into research and training, use of mass media has improved and the diagnosis and control of diseases has become swift, efficient and effective.

Community veterinary health service has been boosted by the construction of veterinary clinics nationwide. Not least on the programme is the construction, reconstruction, repair and maintenance of dip tanks destroyed during the war of liberation. The decade also saw the establishment of a veterinary faculty to train veterinarians.

Despite the problem of tickborne diseases and the socioeconomic effects of isolated incidents of FMD outbreaks the Veterinary activities have had a national impact. Animal health, production and productivity have been our major concern since independence while eradication of FMD is our future goal.

Successes of the Veterinary Services in the future (1991-2001) depend, to a large extent, on how we overcome constraints such as financial support, shortage of transport, staff problems, livestock diseases, overstocking and overgrazing and land degradation. These constraints are a real threat in view of the fact that our 1991-2001 logo could well be: “Veterinary Services for all livestock owners by year 2001”.

Meanwhile policy changes have to be reviewed to match the dynamism of the profession. There is need to:

(i) make greater in-roads into livestock research on diseases, production and husbandry;
(ii) analyse the national impact of livestock research programmes and the cost-effectiveness of prophylactic measures;
(iii) emphasize Community Veterinary Health Services;
(iv) be selective in adopting (if need be) privatization;
(v) adopt the computer for data processing to improve on our diseases reporting systems;
(vi) address ourselves, as a nation, to the frightening 3% p.a. population growth.

It is Zimbabwe’s intention to avert food crisis and achieve self-sustainability and self sufficiency in line with the spirit and substance of the 1984 Harare Declaration on the Food Crisis in Africa. To this end the Veterinary Services will contribute its inputs in no small measure.

The Changing Face of the Animal Health Companies and its consequences for the Veterinary Practitioner in Africa
P. Jeffries, Technical Services (Africa), RMB Animal Health, Lingenham UK

An assessment is made of the current commitment of the animal health industry to the African continent with consideration for the major changes in forms of take-overs, mergers and increased regulatory legislation which are effecting the industry. This theme is developed to assess the implications for further investment in products specific to the African market and considers the factors limiting such investment.

It is suggested that the current international economic climate, combined with the limited animal health product sales to Africa, preclude major new investment into products which would be of benefit to livestock productivity on the continent eg. trypanocides. It is argued that this situation is unlikely to change in the short to medium term.

Having identified the constraints, some methods for improving the situation are outlined from the varying perspectives of governments, donor agencies, veterinarians and the pharmaceutical companies themselves. Those suggest a move towards privatization of the veterinary sector as recommended by the World Bank and other bodies, a change in purchasing...
policies by the donor agencies and an increased commitment on the part of the remaining pharmaceutical companies by way of increased practical support for veterinary services.

In conclusion, a speculative assessment is made of the role of the animal health industry in Africa at the beginning of the next century and the implication this has for farmers, particularly in the traditional sector.

If present policy is pursued it is likely that there will be fewer of the major pharmaceutical companies operating directly into Africa and that there will be a move towards generic suppliers who will offer limited support to the sector and, potentially, poor quality products. There will be fewer products available and developments specific to Africa will be very limited.

Session II Panzootics and their control

PARC's Role in Improving Livestock Services
(S. THOMSON - Kenya)

The Pan African Rinderpest Campaign (PARC) has two main objectives which are:-
- eradication of Rinderpest from Africa
- revitalise the livestock services and improve the animal health care particularly in rural areas.

The problems vary greatly between countries and there is no solution which suits everyone. Projects are drawn up after dialogue with the participating country taking into account the situation and its needs.

The aim is to improve the livestock services by getting them on a more economic and sustainable footing. The users of the services should pay for the drugs and where practical for the service. The general principals to achieve this are:
- encourage the setting up of private veterinary practice, the training of veterinary assistants and auxiliaries to carry out simple veterinary procedures and services to be on a payment basis
- the better distribution of drugs by sale through private pharmacies or if by government then the money realised must go into a revolving fund
- taxes received on imports or exports of livestock sector.

The major constraint on goats is disease, with helminthiasis being an important cause of clinical and sub-clinical losses elsewhere in sub-Saharan Africa.

Flocks of goats in two CFAs were monitored over several years. Animals were weighed and body condition scored. Faecal samples were taken for helminth egg and coccidial oocyst counts. A mini-metabolite profile was performed using blood and serum.

Peak median helminth egg counts of 1200 eggs per gram (epg), 800epg and 800epg were recorded in Such CFAs in the periods 86/87, 87/88 and 88/89 respectively. In Chinyika CFA in 88/89, the peak median count was 4 000 epg. Peak median coccidial oocyst counts were in general below 10,000 oocysts per gram (opg) except for one flock where a peak of 108 2000opg was seen, probably related to a particular goat house.

From rainfall records, it is postulated that faecal worm egg counts are influenced by rainfall in the previous year and by management derived factors, in particular the high stocking densities caused by the low proportion of grazing land available during the growing (i.e. rainy) season in over populated CFAs. These results emphasise the variable and unpredictable degree of severity of helminthiasis in goats under this traditional management system. The need to assess the risk in each area is emphasised.

Faecal worm egg counts were higher in untreated adults than untreated non-adults, suggesting that there is no age-acquired immunity in the animals studied. The adults animals acted as reservoirs of infection for the non-adults in the wet season, carrying helminths, probably as inhibited larvae, over the dry season.

The currently recommended prophylactic anthelmintic program of dosing at the start of the rains was found to be ineffective in this study, but a single dose given at the start of the dry season seemed to have some carry over protective effect for the subsequent rainy season. A single dose given during the rains depressed faecal worm egg counts for 2 to 3 months.

"Intestinal Helminthiosis and Coccidiosis of Goats in Communal Farming Areas of Zimbabwe"

M.J. HOYER - Dept. of Clinical Studies, Univ. Zimbabwe, P.O.Box. 16 Mt. Pleasant Harare, Zimbabwe

Increasing land pressure in Zimbabwe is leading to increasing nutritional limitation on the productivity of communal farming area (CFA) livestock. Due to their feeding strategy, this is less likely to apply to goats than to other ruminant species.

The currently recommended prophylactic anthelmintic program of dosing at the start of the rainy season was found to be ineffective in this study, but a single dose given at the start of the dry season seemed to have some carry over protective effect for the subsequent rainy season. A single dose given during the rains depressed faecal worm egg counts for 2 to 3 months.
From weight, condition score and haemoglobin levels, it is suggested that even low levels of parasitism (peak median of <1000egg) leads to a lowering of weight gain in non-adults. Peak median counts of >1000egg lead to lowering of haemoglobins in adults and non-adults. However, a single dose of anthelmintic in the middle of the rains is insufficient to reverse this. Peak median counts of >1000egg lead to a rapid loss in condition score and haemoglobin levels and a single dose of anthelmintic does lead to at least partial reversal of these changes.

It is suggested that further work with larger numbers of animals should be carried out to confirm these findings. Further work is also required to clarify the importance of coccidiosis in goats in the CFAs of Zimbabwe.

The Role of a Reference Laboratory for Isolation/Characterisation of Foot and Mouth Disease in Southern Africa

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One of the characteristics of the foot and mouth disease virus is its antigenic and immunologic variability. Of the seven main antigen types known, SAT1, SAT2, and SAT3 are the most frequently encountered in Southern Africa. No cross protection between these types exists, and an animal recovering from infection with one type of virus remains vulnerable to infection from another type.

Within one individual type, minor immunological and antigenic differences can appear, which characterise sub-types. A sub-type difference can result in partial or total vaccination failure according to the closeness of relevant sub-types.

The study of types and sub-types constitutes therefore an essential step before initiating prevention based on vaccination, in order to select the correct antigen. Once selection is made, constant field monitoring of the various FMD virus strains is also necessary to provide the user with a vaccine containing antigens currently adapted to field conditions.

Since the setting up of vaccine production in 1979, the Botswana Vaccine Institute has undertaken the immunological study of strains originating in various countries of Southern and East Africa.

In 1985, BVT was appointed by the OIE as Regional Reference Laboratory for FMD. In this context one of its main responsibilities is to carry out field monitoring in the area.

This presentation refers to the strains studied since 1985, and methods used to characterise them immunologically and to measure the degree of protection conferred by the vaccine.

Contagious Bovine Pleuropneumonia - Its Effect on Rural Development in Namibia

HERBERT SCHNEIDER, Ministry of Agriculture, Department of Agriculture, Veterinary Services and Rural Development, WINDHOEK, Namibia

Contagious bovine pleuropneumonia (CBPP) presently occurs in the Southern Africa region in Angola and Namibia. In Namibia the disease is limited to the northern border districts Ovambo and Kavango, but the districts of Kaoko, Bushmanland and Caprivi are also subjected to CBPP control measures. The occurrence of CBPP in Southern Africa as a whole is briefly described and the severe socio-economic consequences this disease has for the sub-continent. Apart from being the cause of high mortalities, thereby impoverishing large parts of the population, CBPP severely retarded economic development, as trade was impaired due to a lack of transport oxen, which also caused mining companies to close down.

Present-day control measures for CBPP in Namibia include quarantine and movement controls, prophylactic vaccinations using a locally manufactured freeze-dried T1-strain vaccine and regular veterinary inspections of all cattle in the northern border districts. The disease and the control measures employed have a direct negative effect on the proper utilization of available agricultural land and hamper proper land-use planning. The free marketing of cattle and the development of commercial farming operations in the rural communal areas of Namibia is severely restricted, while constant veterinary disease surveillance and annual vaccinations place a high financial burden on the budget of the veterinary administration.

Possibilities to eradicate CBPP in Namibia within the current decade are described and the necessity for an inter-regional approach to achieve this aim is emphasized.
Pursuing Environmentally Sound Veterinary Practices: An exciting challenge for the 1990s and beyond

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Major global environmental problems, such as the greenhouse effect and the depletion of the ozone layer, are currently receiving widespread attention. However, there are other signs of environmental degradation which will also directly affect our roles as veterinarians: soil erosion, acidification and salinization, deforestation, desertification, increasing chemical residues, the contamination of water suppliers and the extinction of native flora and fauna. The veterinary profession can play a key role in the response of the agricultural and livestock industries to these problems. By the year 2000, animal health and production must incorporate practices which are not only economically efficient but also environmentally sustainable.

The pursuit of environmentally sound practices may be the most important challenge facing our profession in the 1990s. Preventive veterinary medicine, based on immunoprophylaxis and managerial practices, must come to the fore. The solutions, on the whole, will not be simple, nor will they be uniform across the globe. We will be forced to take stock of the environment in which we work, to study its soil composition, vegetation, rainfall patterns and, perhaps most importantly, the needs and resources of the people in that region.

Although there is much to be learnt, veterinarians the world over can begin to emphasize measures which are less deleterious to the ecosystem; for example, the development of herd health programmes which place greater emphasis on the selection of animals with resistance to disease (e.g., trypanotolerant livestock), paddock rotation (to decrease the use of insecticides and anthelmintics), the use of non-persistent chemicals (to decrease chemical residues in plants and animals), stocking density and grazing plans (to avoid overgrazing) and agroforestry (the use of trees to provide fodder, shelter, molluscicidal substances, improved soil fertility and decreased soil erosion).

It is in the Third World, where resources frequently are limiting, that research into energy-efficient, low-cost, sustainable agricultural practices receives most attention and some programmes are already meeting with success. Agroforestry systems, in particular, appear to be well-suited to the production of crops and livestock in a manner which can be sustained in the long term. In these systems, trees are grown in combination or in sequences with agricultural crops and/or animals on small holdings or large estates. In Sub-Saharan Africa, the Acacia albida tree, keeps its leaves in the dry season and serves as browse for livestock when little fodder is available. At the end of the dry season, the leanest time of the year, it drops protein-rich pods which can be used for fodder. When the rainy season arrives, the tree sheds its leaves and therefore does not compete with grass or crops for light. Soil around the trees is enriched by the tree’s nitrogen-fixing root nodules, by leaf fall any by the droppings of livestock that shelter from the hot sun.

I am confident that we have the ability to make our practices environmentally sound to ensure that they meet the needs of the present without compromising the ability of future generations to meet their own needs, for they have a right to a secure environment. The onus is on us to guarantee that right.

Very Virulent Gumboro Disease in Broilers and its effects on the poultry industry

JUTTA B.U. Tebe-Kelly

The incidence and diagnosis of Very Virulent Infectious Bursal Disease (VVIBD) in broilers in Zimbabwe and determination of suitable vaccines and vaccination programmes are discussed.

The importance of biosecurity, litter beetle control and disinfection of poultry houses is stressed, and the incidence of this disease in different types of housing is mentioned.

Comparisons between affected and unaffected flocks are drawn to show the economic impact made on broiler production by this disease.

Constraints on African poultry output hindering the transition from traditional to semi-intensive production

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Work in Malawi’s Shire Highlands in 1982-4 investigated disease constraints on poultry production in rural and semi-intensive sectors both present and subsequently expected; effects on progress are evaluated.

Village poultry production

Average family flocks had 10 fowls, producing 25 eggs each p.a., laid in 2 or 3 clutches. From these 250 eggs, low hatchability (70%), mortality to 6 weeks (70%), to point of lay (50%), left 28 replacements, and with half female the flock
barely replaced itself annually. If the family of 10 people ate one egg each per month (120/year), the flock didn’t replace itself. Necropsies on 33 submissions of village fowls, comprising 58 birds highlighted the importance of Newcastle disease as cause of death. The fact that essentially similar systems of village poultry keeping, using birds of similar performance have evolved worldwide, suggests the system is in equilibrium with village lifestyle - little output, but zero inputs. This equilibrium, plus the risk-averse nature of village society, suggests that changes in poultry husbandry practices by the year 2001 will be minimal.

Small scale commercial production

Because of the low contribution village poultry make to human nutrition, governments and development agencies have worked towards semi-intensive, commercial poultry production. In Malawi, this has been spearheaded by distribution of Black Australorp chickens through government sales points, birds having been reared at the breeder farm to 6 weeks. After sale, some free range, others are housed in a variety of enclosures from runs to cages.

Diagnoses on 385 such poultry showed the importance of control of coccidiosis and related conditions (ulcerative enteritis and intussusception) found to account for 40% of deaths. Failures of management (suffocation, starvation and gizzard impaction) were next in importance.

The concept of the 'Frontier of Intensification' (FOI)

In Africa, the largest consumers of poultry meat (other than white S Africans) are highly urbanised black S Africans, Egyptians and Algerians. This suggests that urbanisation and integration into a cash economy increases poultry production through increased demand. Improvements in output requires inputs. Inputs means cash, and once cash is involved, poultry keeping is moved from the majority subsistence sector to the minority commercial sector, concentrated around towns where people earn wages, This is the FOI where production gains will occur in the next decade. With the FOI establishing itself in small towns where there are some government wage earners and traders to provide cash to buy the produce, I would suggest seed money be placed with those who have shown skill in risk taking i.e. traders, helping them into poultry production.

The only government action needed is removal of impediments to success. This may require more political will than can sometimes be shown eg poor feed quality due to competition from humans is obviously a political problem as demonstrations outside feedmills during maize shortages attest. Theft is a problem in some localities. Around large third world cities, open-sided sheds are easy targets and theft may be a bigger problem than disease.

Overall, the necropsy results support the assertion that early stages of intensification of poultry production require attention to feed quality, control of parasitic disease, especially coccidiosis, and vaccination against Newcastle disease. The V4-strain ND vaccine trialled in SE Asia should be used in permanently public-funded vaccination of village fowl around centres of emerging semi-intensive production.

As nutritional and veterinary expertise, and products are readily available in the developed world, solutions involve government decisions to provide foreign exchange for their purchase.

Although coccidiosis for example, can be minimised by good hygiene, the unavailability of anticoccidials makes it not possible to equal production levels of the developed world.

Risks associated with the transition to semi-intensive poultry keeping can be further reduced by intelligent breed selection. As egg-laying strains should be suitable for farming in cages or on the floor in open-sided houses, a docile temperament is advisable. They should be colour-separable, permitting confidence in the sex being purchased. A large carcass at the end of lay helps to pay for purchase of the next flock - it also provides for reasonable growth of the off-side males as a cheap entry into chicken production. Hardiness and livability in both parent and commercial generation are more important in meat chickens than excellent feed conversion and conformation.

Prevalence of Brucellosis in cattle from communal lands in Zimbabwe

MOGENS MASSEW, Zimbabwe

The preliminary results of a National Bovine Brucellosis Survey in the communal areas of Zimbabwe are presented. The cattle production system in the communal areas is typically based on small, extensively managed herds. Vaccination against brucellosis is seldom practised, if at all. 30,052 blood samples from female cattle over 18 months of age obtained from 112 collection points, as well as 6,761 blood samples from animals stratified into ten different age and sex groups from 113 collection points throughout Zimbabwe during 1997-1999 were screened serologically for presence of antibodies to Brucella abortus with the Rose Bengal test. The mercaptoethanol serum agglutination test and the complement fixation test were used to confirm positive reactions.

An overall prevalence of 3.3% serologically positive animals was recorded in female cattle over 18 months, with a prevalence range of 0 to 7.6% in the eight provinces of Zimbabwe. Within collection points, a prevalence range of 0 to 16% serologically positive animals was recorded.
Abstracts

A highly significant prevalence increase with age was recorded, with a prevalence ranging from 0.22% in animals less than one year to 2.1% in animals over four years of age. The prevalence of serologically positive males (0.77%) was significantly lower than that of females (1.3%).

The possible consequences of the results of the survey for future brucellosis control strategies in the communal areas of Zimbabwe are discussed.

Coccidia in sheep in Zimbabwe
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Coccidia of sheep were studied in Zimbabwe for the first time. Faecal samples were collected from the animals per reumum every month from sheep farms around Harare. The oocysts per gram of faeces (OPG) was ascertained by McMaster technique and identification of the oocysts was mostly made on sporulation. Almost all the sheep revealed coccidian oocysts in faeces at one time or the other. On an average 83.3% of 497 sheep passed oocysts showing a positivity rate between 72.8% and 94.8% at these farms; the infection being present almost consistently throughout the year. Among the positives 71.0% revealed <1000 OPG, 22.0% showed 1000-5000 OPG, 3.6% from 5000-10,000 OPG, 2.6% from 104 - 5 x 104, 0.5% showed 106 and one animal had passed over 106 OPG. Animals showing high counts revealed gradual or sudden drop in faecal count indicative of immune response that was short lived.

Eleven species of coccidia were revealed from 122 animals. Eimeria ovina was the most prevalent species found invariably (100%) in all the animals, followed by E. parva (98.3%), E. ovina (95.0%), E. hahata (91.0%), E. crandallis (69.7%), E. faurei (61.4%), E. granulosa (63.2%), E. caprina (26.2%), E. pallida (24.6%), E. intricata (23.8%) and E. christensenii (12.3%). Among these 122 animals E. ovina was also the most predominant species showing highest count in 59 sheep (48.4%), followed in decreasing predominance by E. parva in 25 (20.5%), E. hahata in 15 (12.8%), E. ovina in 10 (8.2%), E. granulosa in six (4.9%), E. intricata in three sheep (2.5%), E. pallida in two (1.6%), E. faurei and E. caprina once each where other species encountered never showed predominance anytime.

The sheep usually harboured more than two species of coccidia; 27.8% of 122 sheep harboured six species, 9.0% nine species, 4.1% four species while 1.6% showed each three and ten species of coccidia.

The persistence of African Swine Fever in an enzootic region of Southern Africa - A Molecular Epidemiological Study
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African Swine fever (ASF) is an extremely serious problem to the village pig keepers of many African countries and is presently a growing problem in the Southern African region. In this region several very large zones exist where ASF is enzootic in village pigs, where it severely reduces the number of pigs available for consumption by regular outbreaks of disease with mortality rates between 85 and 100%; in these enzootic regions ASF is by far the largest constraint on pig productivity. The presence of large numbers of carrier pigs within these regions provides reservoirs from which the virus may be introduced into ASF free regions or countries. In addition, the virus is widespread within warthog - (tick) Ornithodoros moubata populations throughout Africa south of the Sudan.

Outbreaks of ASF in previously free areas are becoming increasingly common and evidence from DNA fingerprinting will be given to support the view that these are the result of virus introductions from areas where ASF is enzootic in village pigs, rather than wildlife sources.

The results of DNA fingerprinting of isolates from outbreaks of disease in village pigs from within an enzootic region will be given to support the view that most outbreaks originate from local carrier animals, and spread of disease is facilitated by the free range husbandry system practiced during the dry season. The role played by O. moubata ticks, where present, is also considered and the measures that could reduce the incidence of new disease outbreaks in villages are reviewed and discussed.

Stringent national and international precautionary measures must be maintained if ASF is not to spread further within Southern Africa, or enter the currently free areas of West Africa, or other continents. If such measures should fail devastating epizootics of ASF may occur and new enzootic regions may emerge from which ASF may prove impossible to eradicate.

The authors sincerely hope that with national and international vigilance, the spread of ASF may be halted - and that measures taken at the village level may successfully reduce the number of new outbreaks of ASF, and lead to widespread benefits in pig productivity and human nutrition in those areas.
II Animal Production
Day 1 Wednesday 12th September 1980

Session I Improved Livestock Production in Village Farming Systems

Maximising Fertility of Ruminants in Village Farming Systems in the tropics
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The world's population of ruminants is mostly located in the tropics and belongs to some of the poorest segments of rural society - the small and landless peasants who own over 90% of the ruminant resources throughout Asia and Africa. Poor productivity is a striking feature of ruminants reared under the traditional village systems. The major limitations to productivity in this system are low reproductive rates, inefficient utilization of the available feed resources, a harsh environment and high mortality rates.

Throughout Asia and Africa, developing countries have concentrated their efforts on controlling infectious and parasitic diseases in the hope that the natural increase in livestock numbers could supply the protein needs of the human population. Although successful sometimes, this strategy more often failed because efficient livestock production is, to a considerable extent, dependent upon maximizing reproductive performance. To overcome the poor productivity of livestock, some tropical countries have even imported the more productive but unadapted temperate stock into the harsh environment. These attempts, in most cases have failed due not only to the effects of climate but also to social and economic constraints.

Knowledge on the regulation of reproduction of ruminants in the tropics has rapidly expanded through the accumulation of benchmark information mostly through the application of sensitive radio-immuneassays to measure reproductive hormones. As a result, the role of non-infectious factors contributing to reproductive failure of ruminants at the smallholder level has been well-documented.

This paper reviews the unique features of ruminant reproduction in village farming systems in the tropics, then examines aspects of male and female fertility which are most vulnerable to thermal stress and inadequate nutrition, and finally presents reproductive management programmes that could maximise fertility of cattle, buffaloes, goat and sheep.

The effects of a tropical environment on reproduction are complex. Therefore, any programme to improve the reproductive efficiency of ruminants at the village level would require a multidisciplinary approach. Baseline data on fertility, mortality and growth rates of ruminants are urgently needed so as to determine the impact of nutrition and diseases on ruminants under the existing village farming systems. Management strategies must be explored wherever possible to improve reproductive efficiency of ruminants in village farming systems. Cost-effective technological packages to augment reproduction need to be developed and their suitability tested by 'on farm' trials before they are adopted in village farming systems.

By the Year 2001, milk and meat production at the village level would increase significantly as production will be optimized through maximization of the available feed resources, mainly agrobased by-products as well as improvements in fertility through the adoption of modern technological packages.

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Draught animal power (DAP) is used extensively throughout Asia and Africa, mainly for cropping activities and local transport, but its adoption in much of sub-Saharan Africa is relatively recent, dating from the expansion especially of cotton and groundnut production in the colonial era. This situation contrasts with that in Ethiopia and Asia, where DAP has been employed for centuries.

Until recent times DAP has received little research attention, emphasis having been placed on promoting mechanical traction which was perceived as being the best method of achieving acceptable progress in the agricultural systems of developing countries. However, the widespread failure of tractorization programmes, and the practical and economic inappropriativeness of such technologies for the myriad smallholdings (<5ha) which exist in these farming systems have been highlighted so frequently that the importance of maximizing the efficiency of DAP utilization in the context of the smallholder village farmer is beyond debate. Increased production of human food is a global imperative, and to achieve this, marked increases in the resources devoted to research on all aspects of DAP utilization are eminently well justified. Major benefits shown to accrue from the use of DAP
include labour saving and expansion of cropped areas, and improvements in timeliness of sowing, flexibility to sow different crops in the same season and crop yields.

The major emphasis of this review concerns aspects of particular relevance to the animals involved in these systems, with the aim of helping to focus the direction of research effort on those areas of particular priority in specific regions. A widely recognized major constraint to the effective use of DAP is nutrition, in both qualitative and quantitative terms. Forage resources available are limited usually to natural pastures and crop residues that are normally of poor quality, especially during dry seasons. Agro-industrial by-products can make valuable contributions to improving animal performance, and a priority research area involves the strategic use of locally available materials to maximize the efficiency of resource utilization in an environmentally sustainable manner.

Voluntary feed intake apparently is not increased by the imposition of work. Reports indicate a small extraprotein requirement, the major consideration being that for metabolizable energy. Methods to assess these requirements have been proposed, thus facilitating the design of appropriate regimes for use in the field experimentation necessary to establish practicable recommendations for specific agro-ecological systems.

Working animals frequently are required to plough only for 2-4 weeks each year. Despite their availability for local cartage duties at other times, such systems use resources inefficiently, where oxen nevertheless require full-time maintenance. In the African context the use of females for traction is limited, and considerable potential exists for them to replace oxen, thus effecting substantial economies of feed use, provided appropriate feeding and management systems can be devised to minimize deleterious effects of work on reproduction and lactation. This also is an area deserving of much further research than it currently receives.

Examination of the influence of body size on tractive effort has produced equivocal conclusions, probably related not only to differences in that required for varying soil types and agricultural practices, but also to confounding with variations in body condition which more accurately reflects differences in tissue energy reserves than does body weight per se. Increased research effort is required to further resolve these relationships.

The likely result will be improved DAP management by the village livestock farmer and ability to make judgements about the choice of bovidae or equidae for DAP.

Improving Ruminant Livestock Production in Sedentary Small Holder Farming Systems in Kenya

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Traditionally small holder cattle farmers have been described as subsistence producers, but post independent Kenya has seen a rising proportion of them moving into commercial dairy production. Currently close to eighty percent of the national milk production comes from the small holders; mainly from the medium to high altitude high rainfall areas and from the peri-urban agro-pastoral areas. Much of the beef and mutton consumed in the local markets also comes from the agro-pastoral small holders. There is also a growing consciousness that crop farming and raising livestock are complementary activities and any efforts to improve livestock productivity need not necessarily compete adversely for the scarce land resources available to the farmers.

The contribution of small ruminants to dairy production is not significant. This section of dairy production needs to be exploited further especially in view of the ever decreasing land holdings in high and medium potential areas. However before the dairy potential of milk goats can be realised, there will be a need to change the eating habits so that goat milk is accepted by the majority of the population more readily.

Constraints to increased livestock productivity in Kenya are quality and quantity of available feed and uncertain/inadequate producer incentives in that prices of livestock products are not competitive vis-a-vis food production and in many areas artificial insemination services for cattle are not effective due to a number of logistical problems. Available statistics indicate that apart from reproductive wastage, calf mortalities are high and many small holders are not effectively replacing their cows with improved calf crop. Tick borne diseases such as East Coast fever and anaplasmosis take a heavy toll of the cattle from the small holder farms. In Coast and Nyanza provinces trypanosomiasis is a limiting disease to cattle raising.

It is advocated that improved livestock productivity in small holders can be achieved by improving the level of nutrition through improved utilization of crop residues using either forage legumes or, where economical, by using concentrate supplements. Forage conservation needs to be extended and where appropriate other farm by-products such as poultry litter and leaf stripping can be important sources of supplementary feeding. There is a need to improve artificial insemination efficiency and perhaps to consider the use of bull camps where appropriate. The system of communal acaricide control needs to be studied and improved.
Session II  Village Potential of Aquaculture and Dairying

Water Quality, Parasitism and Nutrition in Tropical Freshwater Aquaculture
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Successful aquaculture operations require adequate water quality, nutrition and the control of parasites. Good water quality is paramount and is achieved by proper construction and management of ponds. Poor water quality depresses growth rates and resistance to disease and parasites. The most important water quality variables are temperature, dissolved oxygen, pH, alkalinity, hardness and ammonia and nitrite. Pollution of water is important since crayfish and fish are very susceptible to heavy metal and pesticide contamination. The parasites that can affect fish are briefly discussed. Because of the high stocking densities used in aquaculture, parasite numbers can increase rapidly, depressing growth and causing mass mortalities. Further, parasitism predisposes fish to disease by stressing stock and, in some cases, by causing mechanical damage. Good management will minimise the impact of parasites by using appropriate species and stocking densities, utilising weaknesses in parasite life cycles, ensuring the health of stock and using strategic therapy. Inadequate nutrition may severely limit growth and predispose to disease in fish and crustacea. The dietary component most important in limiting growth of herbivorous and detrivorous fish such as Tilapia spp. is protein. Protein is rarely a limiting factor in the growth of carnivores because their diet is of a high quality. Protein sources for herbivorous and detrivorous fish are much less expensive however. The maximisation of natural feed production and supplementary feeding are discussed. In line with agricultural industries, aquaculture is likely to become more intensive. This will require more refined pond management in order to maintain water quality. Parasitism will become more important and the use of supplementary feeds will increase as stocking densities outstrip the natural production of ponds.

Key results from these studies were that (1) small scale dairying is widespread in nearly all cattle herds (2) milk extracted for human use per cow/year is about 400 kg, (3) both producers and the general public in these villages use milk regularly in their diets (4) herdsmen/owners derive 50-75% of estimated livestock incomes from milk, (5) milk sales alone is nearly three times the government approved daily minimum wage to public servants.

Development of Bovine Somatotropin (Sometribove) in Europe and North America and its application for milk production in Zimbabwe
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The effect on milk production, health and reproduction of bovine somatotropin (BST) has been studied extensively in temperate climates with Bos taurus cattle. International conferences have also highlighted the potential of somatotropins in sheep, goats, pigs and fish.

In contrast only one short term trial has been recorded with...
indigenous livestock in a tropical climate, and that was in India with buffaloes whose milk yield was increased by 3 kg per day. To date no studies have been reported on the effect of BST on milk production of Bos indicus cows or dairy crossbreds. The present study was undertaken to determine the effect of BST on Bos taurus, Bos indicus and dairy crossbreds in Zimbabwe.

Twenty-four Bos indicus (Mashona/Nkonde and 36 dairy crossbreds at Henderson Research Station and 24 Jerseys (Farm A), 40 Friesians (Farm B) and 48 Holsteins (Farm C) received, at 14 day intervals, eight subcutaneous injections of 500 mg Sometride, Monsanto's prolonged release formulation of BST.

At treatment initiation cows on the commercial farms had completed 90-180 days of lactation. When averaged over the first five 2-week cycles BST significantly increased milk yield/cow by 2.9, 3.8 and 3.0 kg/day on Farms A, B and C respectively. Cows remained in good health.

Bos indicus cows were divided in two groups based on stage of lactation. Groups 1 and 2 contained cows 75-95 and 96-125 days in milk, respectively. During the first seven cycles control cows in Group 1 produced on average a milk yield of 0.5 kg/day compared with the significantly higher milk yield of 2.0 kg/day for the BST treated cows. In addition, lactation length of treated cows was extended by 5 weeks. The combined result was that the total milk produced by treated cows was 987 kg compared with 704 kg for the control cows. The body condition of treated cows was slightly lower (2.43) compared with controls (2.68). Milk composition was not affected. In Group 2 BST did not affect milk yield, milk composition or body condition.

The present work shows that Sometribove can influence milk production in both exotic and indigenous cows which are often used in smallholder dairy development schemes. The work at Henderson should be extended to investigate factors that might influence the response to BST in Bos indicus cows and to monitor carefully controlled studies in existing smallholder schemes.

This should determine if the results at Henderson can be repeated in the field. Increased production must clearly be matched by the provision of appropriate processing and manufacturing facilities. It may be desirable to provide smallholder dairy schemes with small scale processing plants, as every effort should be made to ensure that the increased production generated by such schemes is readily available and easily accessible to the local rural communities where they are based and where the demand and need for milk is high.

By the year 2001 we can expect further major developments arising from an improved understanding of the basic mechanisms involved in milk production.

Effect of land tenure systems on peasant animal production
P. Butler, Zimbabwe

The effect of land tenure systems on peasant animal production is discussed purely in the context of Zimbabwe. The history of land ownership in pre and post independent Zimbabwe is briefly reviewed. Differences in productivity between the three peasant land tenure systems are presented and possible reasons for these differences discussed. Finally changes in Zimbabwean land tenure systems to increase peasant animal productivity are postulated.

Session III Workshop on Village Education for Livestock Production and Poor Ruminant Fertility

Animal Production at the Village Level in Sri Lanka
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About 70% of the 17 million human population in Sri Lanka are rural dwellers. Sri Lanka has an agriculturally based economy. About 60% of all species of livestock are kept by small and marginal farmers and landless agricultural labourers.

The major species of livestock reared in Sri Lanka are cattle, buffaloes, goat, sheep, pigs and chicken in the following numbers: cattle 1.78 million, buffaloes 0.96m, goats 0.53m, sheep 66,000 and chicken 7.64m. According to the livestock production trends, the animal population increase by the year 2001 would be very marginal, except poultry. The majority of animal species are indigenous breeds or their crosses which are low producers but are hardy animals adapted to the rough environment and poor management levels.

The livestock enterprises of small and marginal farmers, all of which are at village level, are not self sustaining. These either augment their below subsistence level income or provide alternative sources of employment to some unemployed members of the family. Due to poor production the owners are not encouraged to adopt proper husbandry practices. The existence of such a vicious cycle and poor institutional support has resulted in the slow growth of the rural livestock sector. Livestock production enterprises of rural farmers are not specialized but are integrated crop/livestock production systems, where the animal component receives least attention and is never the major component.
Village Management of Small Ruminants in The Gambia
ELIZABETH MULLINEAUX AND ANNE C GREENWOOD
International Trypanotolerance Centre, PMB 14, Banjul, The Gambia

The small ruminants of The Gambia are most characteristically the Djallonke sheep and West African Dwarf goat breeds. These animals are well adapted to local conditions and are kept extensively throughout the country.

A study of the health and management of sheep and goats in ten rural villages in The Gambia found that 75% of family units (compounds) owned small ruminants, compared with 40% which owned cattle. Sheep were found to be the most widely kept small ruminant with an average of eight animals per compound compared with an average of six goats. The wider ownership and lower cash value of small ruminants compared with cattle makes them a useful store of wealth for sale at times of financial need, particularly in poorer compounds. Within the study villages 41% of goats and 31% of sheep were owned by women. These animals provide an important source of cash for family needs, often being sold to buy clothes or medicines or to pay for school fees.

Village animals are rarely slaughtered except at times of celebration such as weddings. Adult male animals are usually preferred for such events. The peak time of year for sale and slaughter of small ruminants is the Islamic festival of Toubasti. Demand for male sheep at this time of year is such as to have produced an opening for the commercial fattening of these animals.

Small ruminants have a prominent position in village compound life. Unlike cattle which are usually to be found in large groups on the periphery of the village, sheep and goats are usually housed or tethered overnight within the compound. The two small ruminant species are usually housed separately. The housing provided varies from a simple tethering area to a specially constructed building with a roof, woven wall and raised slatted floor. Usually new housing is built or old structures are repaired for the wet season (June-October). The use of housing may help prevent disease such as foot rot and helminthiasis in the wet season, but may predispose to problems such as respiratory disease in the dry season (November-May).

During the dry season, small ruminants are released from their compounds early in the morning and graze unsupervised throughout the day. At night they return to be given water and often supplementary feed, most commonly groundnut hay. During the wet season, animals may be kept in the compounds until midday and are restricted upon their release by tethering or herding. Although necessary to prevent crop damage, this practice restricts the utilization of good grazing at a time of year when the animals are often compromised by disease. Some villages employ a herdman for the wet season whilst in others the small ruminants are the responsibility of the compound children. In the late wet season sheeps and goats benefit from crop residues such as maize bran. More selective and controlled use of such supplementary feeding may help overcome problems of disease and high mortality rates in some village flocks.
Session IV-A Workshop on Animal Preference and Means of Training for Draught Animal Power

The Donkey - An Important Animal

W. MOGES MESKEL, The International Donkey Protection Trust, UK

Ethiopia possesses some four million donkeys (Janke H., 1983) which play a great role in the economy of the nation. However studies pertaining to the donkeys, including the disease, management and their economic significance are untouched.

For a period of two years, the management offered to the donkeys was observed, and questionnaires were made to the peasants in different areas in the country. Preliminary surveys on diseases of donkeys around Debre Zeit were made and the following general feature of the Ethiopian donkeys were noted.

Generally donkeys are at the hands of poor peasants, the latter comprising the majority of Ethiopian peasants. Observation made in Gondar Region (1987) showed that about 75% of the peasants own one or more donkeys.

At the hands of poor peasants, and with the mistaken view that these animals are hardy and tolerant to any ill treatment and disease, it has been noted that they are subjected to several diseases and are poorly managed.

Out of the donkeys attended to around Debre Zeit, and which were carrying grains to the market, about 1.76% were lame and out of the female donkeys 12.27% were apparently pregnant, revealing the mismanagement practised. About 11.47% of them were also suffering from back sore of different degrees. The approximate average longevity of Ethiopian donkeys is about 11 years. To this end poor management and diseases have contributed considerably.

Donkeys in many parts of the country are ready for the first loading at about 3 years of age, serving as a pack animal after 4 years of age. An average Ethiopian donkey may carry 80-100 kgs of load. However, under certain circumstances they are forced to carry up to 150 kg for certain distant. After service of long working years, if a donkey is no longer able to serve its owner, it will be thrown outside.


Occasionally outbreaks of anthrax are a challenge to the health of donkeys in many parts of the country. Others like respiratory problems, sarcoïd infection (2.8% positive around Debre Zeit) and wounds of traumatic origin besides some others are also recorded.

Other relevant information pertaining to the management, disease and economic significance of the donkeys is discussed. A thorough study on the role of Ethiopian donkeys in the national economy and survey on the health status of these animals is recommended.

Session IV-B Workshop on Limitations / Responses To Introduction of Freshwater Aquaculture

Aquaculture in Village Farming Systems in Africa

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World fishery resources peaked in the 1970s and fish can no longer be considered as universally abundant and inexpensive source of animal protein. In Africa alone, projections for the year 2001 are that annual demand for fish will exceed supply by two to four million tonnes. Alternative sources of animal protein production would therefore have to be found, and it is feasible that aquaculture could go some way toward meeting this demand.

Current village farming systems may not be able to produce sufficient for the projected needs without serious environmental consequences. Emphasis on increasing yields or land area may not be possible within the socio-economic framework of the farmer. Total integration within the agro-ecosystem may however provide an alternative, more efficient, use of available on-farm resources and by-product recycling. Where water is available integrated agriculture-aquaculture systems may become a viable enterprise.

The fish pond could become an additional farming subsystem. Fish convert crop residues (i.e. maize or rice bran), livestock manures (i.e poultry, pig or cattle) and farm wastes (i.e. grasses, weeds or rotten fruits) into high quality protein. The pond also contributes to bio-decomposition of agricultural and domestic wastes. The resultant enriched muds then find use as fertilizers for crops or vegetables. Pond water provides a source for domestic use, irrigation of vegetables, watering of livestock and for rearing ducks. Pond banks become a convenient zone for diversification in food production contributing to household food security. Domestic cooking fire ash would find use as a lime agent to balance high pH in organically enriched ponds. Harvesting of fish can be effected by such traditional methods as hook and line, plunge baskets, scoop nets or reed fences and farmers are therefore able to harvest fresh fish on demand or for sale.

Integration of aquaculture at village level may not only be restricted to ponds. Incorporation of fish into rice paddy systems as in SE Asia, and in desalination or flood irrigation as in the hovash of Egypt are very old traditions which could become more widespread. The Acadja or brushworks of West Africa could with integrated agroforestry increase fish yields of village water storage reservoirs, lakes or lagoons, and at the same time cater for fuel wood requirements to process fish catches.

There are few village fish farmers per se, most are farmers with fish ponds who in Africa have a long history of failures. Perhaps the main reason for this has been the lack of vision to promote aquaculture as a multi-disciplined and integrated component of the farming system.
II Animal Production

Day 2 Thursday 13th September 1990

Session I Wildlife Management

Novel Concepts in Wildlife Utilization in Zimbabwe

BRIAN A. CHILD, Game Ranching Unit Department of National Parks and Wildlife Management, Zimbabwe.

Wildlife utilization has become an important component of extensive agriculture in Zimbabwe and this importance is growing. The primary reason is the escalating world demand for tourist destinations associated with nature, and the rapidly rising price of outdoor recreation.

Wildlife enterprises having no big game (i.e., elephant, buffalo, lion, leopard) can be as or more profitable than livestock production, where big game is available, they are substantially more so.

In Zimbabwe, wildlife is raising economic returns from semi-arid rangelands, usually as a complement to cattle, but increasingly as a replacement once wildlife populations have built up. Many of Zimbabwe's cattle ranches raise their profits significantly by promoting wildlife populations and selling trophy animals. This entails few extra costs since wildlife populations can be improved and a complementary enterprise added by simply taking cognizance of wildlife by ensuring that water is readily available, poaching is controlled and the environment is healthy. Once ranchers become confident that they can market safari hunting, they will find it more profitable and therefore begin to reduce livestock populations to leave more resources available for wildlife, some replace cattle altogether. At present landholders depend largely on foreign trophy hunters for their income but a trend towards the addition of non-consumptive uses (e.g., tourist lodges) is emerging.

Having proven itself a profitable and competitive enterprise on large commercial ranches, wildlife utilization is being encouraged in communal areas where the wildlife resources are often superior and include big game. To do this major institutional developments are necessary: the crucial improvements are the privatization of benefits and control to individual communities, and developing the management capacity of these communities.

The benefits to these areas are much greater than those achieved in the commercial sector. In addition to raising income levels, Zimbabwe's wildlife programmes have catalysed the evolution of more efficient economic systems at the local level, with repercussion far beyond wildlife conservation.

The incentive to capture the large financial benefits associated with big game has encouraged communities to organize the large institutional changes necessary to capture and sustain these benefits. They have delineated their resources, set up management bodies, planned resource use according to scarcity, and are now also allocating these resources more efficiently. The income from wildlife has also given local communities economic power. This enables them to begin to manage their own affairs, to become efficient and independent, and ultimately to become efficient, self-dependent economic units.

In developing wildlife sectors the priority is to establish a market mechanism which reflects the true economic comparative advantage of wildlife. Once this is done the sector will look after itself. The first step - an absolute prerequisite - is to encourage 'ownership' so that landholders can utilize wildlife and are accountable for their management decisions. Having set up these foundations for using wildlife, markets can then be developed and improved. The markets for recreation (hunting and tourism) are expanding rapidly, but those for products are unnecessarily limited despite a high demand for meat in urban areas, game producers cannot find markets for animals they need to cull. This is where veterinarians can make the greatest contribution - by facilitating the marketing of wildlife products, especially meat, and by removing the suspicion of wildlife that is often borne of ignorance. Veterinarians can also make a great contribution in developing the technology of intensive production, as is happening with crocodiles and ostriches in Zimbabwe where the returns on research are very high. The scope for similar work in free-ranging situations is much less since veterinary problems are not yet limiting.

Saving the Black Rhinoceros (Diceros bicornis)-Veterinary problems associated with capture and translocation


Since 1966 over 300 black rhinoceroses have been captured and translocated from park- and reserve threatened areas in the Zambezi valley to Wildlife Estate land and private ranches. Poaching of this species continues across the entire northern border with Zambia and many areas previously untouched are now suffering incursions by poaching gangs.

A National Conservation Strategy for the Black Rhinoceros in Zimbabwe has been published this year and represents a major step forwards in ensuring the survival of this endangered species into the year 2000. The strategy has several components, with the main thrust being the designation of wildlife areas with more than 100 animals as priority reserve areas for conservation. Black rhinoceroses will be captured and translocated from non-designated areas. There is the potential for the capture and translocation of over 200 animals in 1990 and 1991.

The capture and translocation program has not been without problems and research carried out both in the Midlands and Zambezi Valley since 1988 has provided a wealth of information on the effects of intensive management of the black rhinoceros (Diceros bicornis), and has highlighted many problems related to capture and translocation, including high stress morbidity, a high mortality rate (13%), including horn loss, and subsequent mortality, susceptibility of rhinos to bacterial infections and the long-term effects of boma confinement. Self-inflicted trauma has been identified as a significant stressor to the rhinoceroses in captivity, with the loss of horns presenting major medical and management problems both in the boma and following release. Interspecies aggression following translocation has resulted in several mortalities.

Evaluation of the effects of transport (up to 200 km), extended immobilization times (up to 360 minutes) and boma confinement periods (1-80 days) on biological parameters indicate major changes in stress and health indices. Some of these indicate long-term tissue damage and compromise to an already chronically stressed animal and may have a significant bearing on mortalities. Nutritional stress is an important component to the overall effects of stress on rhinoceroses related to capture management. Data indicates that if boma management is good the animals return to a more stable (homeostatic) status (biological and medical).
Abstracts

Modifications in boma management and especially nutritional requirements are key areas to be examined and changes implemented. Long acting tranquillisers have shown considerable promise in the boma management of the black rhinoceros.

The Role of Wildlife in the Epidemiology of Foot and Mouth disease.

E.C. ANDERSON, Wildlife Disease Section, Veterinary Research Laboratory, P.O. Box 8101, Harare, Zimbabwe.

Foot and mouth disease is of primary economic importance because of its effect on the productivity of high producing domestic animals. As a consequence of this, a secondary significant economic effect is its influence on the international trade in livestock and livestock products. This loss is incurred by those countries in which the disease is endemic. While the disease is actively controlled in many of these countries by vaccination and zoon-sanitary measures to good effect, in some an additional problem is posed by the presence of populations of wild susceptible animals. It is therefore of great importance that the role of wild animals in the ecology of the disease is understood.

In this presentation species susceptibility, the pathogenesis and persistence of infection and the potential for transmission of infection are discussed. Transmission studies have hitherto had to be done under very artificial circumstances where carrier wild animals were placed in close contact with susceptible domestic animals. The use of molecular methods to study inter-species transmission now makes it possible to study free-living populations. Examples of their use are given. Results of recent work on the ecology of FMD in Zimbabwe are presented.

Game Culling for Meat Production in Zimbabwe

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Meat is a highly nutritious food, much of which, consumed by the human race today, originates from domestic animals that are raised specifically for slaughter and local consumption, or for export. In rural areas of Africa, however, domestic animals often have uses other than purely for slaughter. Meat may, therefore not be as readily available as in urban areas.

Large populations of wild antelope, particularly impala, could become an important supplementary meat source for rural folk. In Zimbabwe the impala population has been estimated to be in excess of 300,000, more than 60 per cent of which occurs in National Parks and Communal areas. Experience in this country has shown that slaughter of impala for meat production can be carried out successfully. During the last 10 years some 18,000 of these animals have been shot, dressed and inspected for human consumption. Two methods of culling have been used in:

a. night-time shooting using a high-powered rifle and spotlight. Carcases were blad and degutted on spot and then transported to a central abattoir for dressing, inspection and refrigeration;
b. groups of animals were herded into an enclosure or 'boma'. After being rested the animals were shot at close range, followed by immediate bleeding and degutting. The carcases were then moved to an adjacent 'butchery' for dressing and inspection and then held in a mobile refrigerator.

Because of the generally warm weather during most of the year operations have been carried out at night during the winter months, to take advantage of the lower ambient temperatures in order to reduce spoilage and improve shelf-life. Significant inspection studies showed that the carcases have a limited variety of relatively minor pathological and parasitic conditions that have necessitated condemnations. Waste was, in the main, due to management-related problems such as trauma, contamination and spoilage. Loss of meat for these reasons was minimal however and carcases were generally in good condition, even despite successive years of drought. Trials have shown that the average hot dressed mass of the impala carcase was 15.0kg and it is suggested that, if properly managed, an annual take of 10 percent from the impala population could provide a sustainable production of around 400 tonnes of carcases per year.

Both culling systems could be adapted to suit rural conditions and appropriate technologies and procedures are being developed for these areas, in order that game slaughter can be carried out by local people in co-operation with Government and wildlife personnel. In this way the wildlife resource could be utilised to either increase availability of meat in rural areas to improve standard of nutrition or generate income by selling the meat or even heat-processing it for export.

The Role of the Veterinarian in the Wildlife/Livestock conflict in developing countries

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Wild life, livestock and man have co-existed in harmony with their environment for thousands of years. But in the last 50 years, wildlife and livestock have come more and more into conflict. With the improvement in health and veterinary services, both human and animal populations in developing countries have grown upwards. Game and livestock production projects have multiplied at the expense of wildlife.

So what are the causes of this conflict? The main causes are:

1. Direct competition for land and resources between livestock and wildlife. 2. Possibilities of disease transmission between livestock and wildlife. 3. Predation of livestock and crop damage by wild animals. 4. Irrigation and hydro-electric schemes flooding wildlife habitats. 5. Industries and housing schemes taking over wildlife areas.

The question is, can wildlife and livestock co-exist amidst these conflicts? The answer is 'Yes'. But how do we achieve this?

It is now well established that in developing countries wildlife can be preserved only by utilising it. Rural people need land for food production. Wildlife need this land for survival. Under these circumstances, the rural people will conserve wildlife only if it can produce an economic return. Hence if we can crop wildlife for meat and also use wildlife for tourism etc., thus producing economic benefits for the local economy, then we will have an incentive to conserve wildlife. Otherwise they will consider wildlife as pests.

Recent experiences in Kenya and other countries have shown that wildlife and livestock can co-exist without significant problems and can be managed to produce more economic returns than livestock alone. But there are of course several practical problems.

Veterinarians in developing countries have a unique role to play in resolving the wildlife/livestock conflict because they are the only professionals with the expertise in animal diseases and animal production who understand domestic or wild animals, and are also well respected by pastoralists and livestock farmers because of their professional role in animal health and production. But of course the conflict is multi-faceted and has to be tackled by a multidisciplinary team.

Today there are many Veterinarians in developing countries who have a keen interest in wildlife conservation and so are excellent people for mediating and resolving the wildlife/livestock conflicts and conditions. Veterinarians in developing countries should be open-minded and try to understand not only the viewpoint of the pastoralist or livestock farmer, but also be sympathetic to the cause of wildlife conservation.

Hence all Veterinarians in developing countries should be prepared to shoulder the responsibility of mediating in the conflict between livestock producers and wildlife conservationists and increase the benefits that wildlife can benefit wildlife, livestock and man. Then, Veterinarians can be proud to be "peace-makers" for a better world.
New Anaesthetic Drugs for use in Wildlife
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In the last 10 years there have been some major breakthroughs in the understanding of neurochemistry and physiology. This has led to the development of more refined agonist agents and antagonists acting at various receptor sites in the central nervous system and along both adrenergic and cholinergic pathways. The most important of these drugs relevant to their use in non domestic species are the opiates and the α2 adrenergic agonists and antagonists and the dissociative agents. The benzodiazepines, phentothiazines, thiobarbiturates and butyrophenones continue to be used and refined. The practical use of the drugs alone or in combination as sedatives or tranquillizers, immobilising agents or anaesthetics is discussed in the light of recent developments.

As far as we can see into the future and the new millennium, there may be new receptors in the brain to be discovered which may lead to the "wonder drug" which acts like a light switch but this is unlikely. All future drugs we can expect will be refinements on the present families with greater specificity for receptor sites and therefore less side effects. The most exciting of these are the new α2 agonists and antagonists, the latter showing additional agonist effects against opiates and butyrophenones. The use of different combinations of old and new agents may produce hitherto unknown synergistic effects which will be beneficial and need to be investigated.

The present day lack of detailed physiological knowledge on the effects of the various drugs in a wide range of species makes any judgement on popular drugs and new drugs empirical and potentially dangerous. Care needs to be taken by veterinarians not to change for the sake of change and to critically examine any information in the literature and assess the use of any new agent thoroughly in the species concerned before and whilst using it.

Tick Control on Eland and Buffalo using Flumethrin 1% pour-on through the duncan applicator
IM DUNCAN1 AND N MONKS2
1 Agricura (Pvt) Ltd., PO Box, 2742, Harare, Zimbabwe
2 Department of National Parks and Wildlife Management, Game Ranching Research Station, Mushandike Sanctuary, PB 9036, Mashuwingo, Zimbabwe.

Tick infestation on wild animals in the smaller wildlife parks in Zimbabwe is regarded as a major production restraint and threatens the well being of a large number of wild animals. This is confirmed by work done by Norval and Lightfoot in 1992. Tick control trials in the Game Ranching Research Station of the Mushandike Sanctuary, Zimbabwe, commenced in December 1986 and were completed in May 1989. The two and a half year period spanned three seasons when ticks are the most active in Zimbabwe. During this period flumethrin 1% pour-on (Drastic Deadline, Bayer, Leverkusen) applied initially by hand and subsequently through a specially designed device known as the Duncan Applicator (Agricura (Pvt) Ltd, Zimbabwe) proved highly effective in controlling tick infestation on Eland (Taurotragus oryx) and buffalo (Syrnerus caffer).

Disease of Farmed Crocodiles and Ostriches
CM FOGGIN, Veterinary Research Laboratory, P O Box 8101, Causeway, Zimbabwe.

Crocodiles
Crocodile exports earn Zimbabwe some US$4 million per annum. One of the major constraints to efficient production is disease especially of hatchlings. Adeno-virus infection causes hepatitis, enteritis and pancreatitis in young hatchlings. Pox is common and results in chronic skin lesions.

Septicaemic gram-negative bacterial infection, especially Salmonella, Aeromonas and Edwardsiella, causes heavy mortality often with necrotic enteritis. Parenteral antibiotic treatment is used. Dermatophilus and fungal infection is responsible for devaluing of skins.

Coccidiosis is often fatal; stages of the parasite are seen in intestine, liver and other viscera. Treatment with sulphachloropyrazine is effective. The secerad Buparatocarcis is seen only where fresh fish are fed.

Spinal deformity, "rubber jaw", paresis and tetany are symptoms of calcium deficiency. Vitamin D deficiency causes stenosis and myopathy. Other nutritional problems include gout, anorectic runts and hypervitaminosis A.

Disease outbreaks are usually caused by management lapses. Congenial disease results from poor collection and incubation of eggs. Correct rearing temperature (between 31 and 33°C) is critical and standard daily routines and avoidance of stressful procedures are also important. Attention must also be paid to hygiene and the source of water.

Ostriches
Zimbabwe has about 4000 farmed ostriches, more in the wild. Efficiency of production is generally low with 100 eggs producing around 25 four month-old chicks.

Poor egg production and fertility are caused by incompatibility and nutritional deficiencies of breeders. Incorrect incubation temperature (36°C) and inadequate air flow and turning of eggs are responsible for "dead in shell" and "weak hatch". Egg mass loss during incubation should be 12 to 15%. Bacterial and fungal infection of eggs causes foetal and neonatal mortality. Culling of eggs at two weeks and, frequently, after 41 days should be done because assistance at hatching is often required. Malposition, congenital deformities and oedema of the chick are common.

Poor hygiene in the hatchery results in bacterial umbilical infection. Most infectious diseases occur before eight weeks. E. coli causes enteritis and septicaemia. Klebsiella and Streptococcus spp. are also encountered. Aspergillosis infection of the respiratory system and Candida are major fungal diseases.

The nematode, Libyacystrostrongylus douglasii, and the cestode, Houttuynia struthionis, have largely been avoided by initiating production from eggs or farm-reared chicks. No viral or protozoal diseases have been diagnosed in Zimbabwe ostriches.

Nutritional diseases include gastric impaction with fibres as well as vitamin B complex and mineral deficiencies. Limb deformities are common and are caused by congenital and nutritional factors.

Trauma is responsible for most mortality in older birds. Spontaneous aortic rupture, foreign bodies and mycotoxicosis are also seen.

Crocodile and ostrich farming, which have ensured the survival of these species in Zimbabwe, are dependent on demand for the products in developed nations. The potential market to the year 2001 is believed to be good despite pressure from animal rights movements. More research on nutrition and management systems is required.
Graduate Training in Veterinary Education Within the Commonwealth: Options and Opportunities to maximise contributions to health and welfare.

Prof. E.J.L. Soulsby, University of Cambridge, England

The traditional approach to graduate training in a less developed Commonwealth country is for this to be undertaken at a University or Veterinary Institution overseas. The recipient returning after three years or more with a higher degree (Ph.D.) in a given discipline. Funding for such graduate education is through the National government, a Commonwealth Scholarship, British Council Scholarships or other agencies and occasionally by private funding.

This traditional approach has the advantages that research facilities, equipment and personnel are made available to a graduate, the like of which would not be available in the home country. Strong and permanent associations are forged and help and assistance will continue long after the training period has ended.

The disadvantages are that the training may bear little relationship to the research needs of the home country. The sophisticated environment cannot be re-created in the home laboratory, which leads to a sense of dissatisfaction and disillusionment of the future potential of the training in the home country. Ultimately, the dissatisfaction may lead to the trainee accepting a post overseas (often at a much higher salary than could be obtained at the home institution) or failing to return from training.

Furthermore, such overseas training is usually associated with the acquisition of a research degree and does not address the need for clinical training where a research degree may be inappropriate. Clinical training often does not carry a degree, it would be inappropriate to do so in many cases, but there is a need for the trainee to return to his own country with an appropriate degree or diploma as a mark of his achievement.

Alternatives to the traditional system include Link programmes supported by donor agencies and split Ph.D. programmes.

The Link programme aims to provide post-graduate training in the home country, with research on a topic of particular importance to the home country and the degree of the home country being awarded.

Link programmes usually must be funded by a donor agency to provide funds for a research programme to be established in the recipient veterinary school (e.g. provision of equipment, research supplies etc.) and for travel of trainees and advisors. The Link programme is usually established between two institutions, one in the donor country and one in the recipient country. A preliminary investigation visit to assess needs and potentials is essential for long term planning of the programme which should be established for 3 or 5 years with renewal for further periods subject to satisfactory review. The essential components of a Link programme are that advanced training is undertaken in the home institution proceeded by a period of 9 to 12 months preparative instruction in the Link institution of the donor country. The trainee is then assigned to two supervisors, one in the donor and one in the recipient country. The donor country supervisor visits periodically to assess progress and the recipient country supervisor visits the donor institution periodically to keep up to date with development in his/her subject. Clinical training can be fitted into this programme as required.

To be effective, a strong commitment is required on both sides of the Link; progress should be monitored on an ongoing basis. The major activity should be centred in the recipient institution.

Difficulties encountered include those of recruiting qualified trainees to the recipient institution - there must be employment available at the end of the training period; the home degree may be seen as inferior to the overseas degree and visits by donor institution academic staff may be difficult to sustain since little or no academic credit is acquired by participation in Link programmes.

The alternate is a ‘split’ post graduate programme where an overseas degree is registered but a substantial part of the research is undertaken in the country of the trainee. To achieve this, there must be an institution which is acceptable for such training in the recipient country with adequate research facilities and appropriate supervisors. Usually this will involve an investigative visit to assess the facilities before agreement is reached to operate a ‘split’ programme. The format involves an initial year at the institution in a donor country, followed by two years research in a home institution and a return to the donor institution to write up and complete requirements for the higher degree.

Neither of these formats is entirely suitable for clinical training where a research degree may not be appropriate, but where clinical certificates and diplomas (Board Certification) are the recognised criteria for advanced training. Part of the problem in this respect is that no degree is acquired from clinical training and hence it may not be recognised as a measure of academic achievement by the home institution.

Opportunities for graduate training could be greatly advanced by a close collaboration of the design of training programmes and the acceptance of less traditional approaches that may not entail the acquisition of a degree.
Session II Workshop on Reciprocal Recognition of Degrees  
(Discussion Only)

Session III Workshop on Training of Livestock Assistants

The Training and Deployment of Veterinary Extension Assistants in Zimbabwe
IG Gibson, Veterinary Training Institute, Mazowe, PO Box 8376, Causeway, Harare, Zimbabwe

After a brief historical introduction, the main outlines of the training undergone by Veterinary Extension Assistants (VEAs) at the Veterinary Training Institute, Mazowe, are set out, and explanations given for changes in the emphasis given to different subjects in the curriculum, in the light of experience.

The duties and responsibilities of a VEA are described and comments made on how to assess the effectiveness of the work carried out by a VEA. Attention is drawn to the many difficulties encountered in providing a satisfactory veterinary service to the communal and resettlement farmers and although some suggestions are made as to how these might be overcome it is emphasised that as many of the problems are multi-factorial ones possible solutions will have to be sought after the political, economic and social considerations, as well as the technical ones, have been taken into account.

Realizing that other developing countries may well have similar experiences and difficulties to overcome, it is hoped that this may engender a lively and fruitful discussion.

The “Wasaidizi wa Mifugo” of Kamujini Farmers Centre in Kenya
John Young, ITDG, Myson House, Railway Terrace, Rugby, CV21, 3HT, UK

Intermediate Technology Development Group (ITDG) has been helping a number of organisations in Kenya to establish decentralised animal health programmes for the last 4 years. This paper will focus on one project, at Kamujini Farmers Centre (KFC) in Meru District, and the first 27 animal first-aid workers or “Wasaidizi wa Mifugo” (meaning helpers of livestock) trained there between August 1987 and September 1988.

Kamujini Farmers Centre is a rural training and extension project run by the Catholic Diocese of Meru. It covers an area of great agroecological diversity where agricultural and livestock management practices are rapidly changing due to increasing population pressure.

A detailed socioeconomic study confirmed the central role of livestock as a source of subsistence, cash and important social benefits. Traditional animal healers called Wagaa are still treating animals with a variety of herbal medicines, whose efficacy is diminishing in the face of new disease patterns. Poor access to veterinary products and services was found to be a problem for most livestock keepers.

To address this problem, KFC and ITDG started a programme to make simple veterinary medicines and help more accessible.

To start with, a small shop selling simple animal health products was opened at the centre. Then local communities were asked to select people for training as animal first aid workers. Trainees attended a five day course at the centre covering the common simple diseases and basic animal management. The course was held in the local language, building on the participants existing knowledge and concepts of disease, and while encouraging the continued use of traditional medicines which were still felt to be effective, included the treatment of common diseases such as worms, ticks, foot rot and wounds with a limited range of medicines including anthelmintics, acaricides and wound dressings.

Serious cases requiring ethical drugs would be referred to staff at the centre, or local government veterinary staff. The training was highly participative and all the participants had practical experience of most conditions. After training, the wasaidizi returned to their villages equipped with a simple first aid kit, to provide a first aid service for a price which would enable them to replenish their kits at the centre shop, and still remain with a small profit.

The first wasaidizi were trained in August 1987, and a second batch a year later. Most are still working, and all have attended a second course covering a few more diseases including retained placenta, diarrhoea, and mastitis.

By the end of 1989, the wasaidizi had treated over 6000 animals (roughly 4000 cattle and 2000 sheep and goats) for a variety of diseases, of which the most common were worm - c. 5,000 cases, diarrhoea - c. 130 cases, and blot, constipation, conjunctivitis and coughing - c. 100 cases each. They had earned over KSh 200,000 ($5,500) of which they had spent nearly half on purchasing more medicines. They are popular in the community, and a further batch were trained in June this year.

A similar project in Machakos District, another agricultural area, seems to be working well, but one in Pokot, a pastoral area, was less successful. The large distances and low profit margins may have been a disincentive for the wasaidizi, but possibly of more importance is the cultural preference for the Pokot people to treat their own animals themselves. ITDG is investigating a slightly different approach in other pastoral areas. Small shops run by “wasaidizi” have been established, and an extension programme is training the livestock owners themselves to use the medicines. This may prove to be a more appropriate model for pastoral areas.

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A Student's View of Veterinary Education
ALMOND C M SITIMA - Zambia

This paper deals with the situation in Zambia, but it is possible that there are many similarities with other countries within the Commonwealth.

The Veterinary School in Zambia is situated in Lusaka, the capital city, being established in 1983.

The facilities of the School are what one would expect of a modern veterinary school.

The views expressed in this paper are based on personal experience and consequently are governed by what one hopes to achieve. Consequently the view taken is that of a person who wishes to be a field veterinary.

The general attitude of many Zambians including prospective veterinary students has been affected by factors which include: -

1. Animals have been taken to be creatures that have to withstand harsh condition. This has reduced the awareness of animal requirements.

2. The general culture appreciates animals in functional terms consequently there is little acknowledgement of companion animals.

Various factors influence the veterinary student both during his studies and the environment in which the graduate will work. Some of the factors are: -

i. In developing countries there is lack of manufacturers and suppliers of veterinary medicines and animal feedingstuffs, consequently a veterinarian in a developing country has to be much more imaginative in his approach to supplying medicines and advising on feeding.

ii. The veterinary curriculum in developing countries being based on that used in developed countries tends to neglect the traditional methods of keeping livestock and concentrates on commercial farmers.

iii. Although there has been a rush to develop animal production in Zambia, there has not been a parallel improvement in veterinary services.

iv. The first few graduates from the Zambia Veterinary School have largely ended up in managerial or administrative posts within the Government.

v. Little attention appears to be paid to whether the veterinarians being produced are internationally recognised and meet the demands of Zambian society.

vi. In order to reduce costs, it has been necessary for the veterinary faculty to be located within the existing university infra-structure whereas it would probably have been better located in a mixed farming area.

vii. Although it is essential to rely on aid in setting up the veterinary curriculum, in certain circumstances the strings attached may detract from the benefits.

viii. There appears to be a reluctance to tamper with the imported veterinary curriculum for fear of losing international recognition.

If we consider the above to be deficiencies how can they be remedied. It is suggested that the following should be borne in mind:

1. It is important to realise that veterinary schools in Africa need not follow the same curriculum used in developed countries. More attention should be paid to problems related to animal husbandry in Africa.

2. The needs of the traditional farmers appear to be ignored yet these account for about three quarters of the animal population in Zambia.

3. Training in extension should form an important part of the course in order to develop expertise in dealing with traditional farmers in rural areas.

4. Preventive medicine should be an important part of the course.

5. Graduates sent to rural areas are running veterinary services of the district and it would be beneficial to have some training in management.

6. Computer models are being increasingly used in disease control and it would be advantageous for undergraduates to be able to appreciate the help which these models can give.

Conclusions
The veterinary school in Zambia has achieved much of which it can be justifiably proud, however, it is felt that more could be achieved if the curriculum could be more closely aligned to the needs of society. Veterinary schools in developing countries should aim at producing veterinarians who would be helpful to rural, traditional and commercial farms as well as society as a whole. This would help to achieve the theme of our conference “Animal Health and Production 2001”.

Finally, special thanks go to the various donor agencies supporting the University of Zambia who have made it possible for veterinarians to graduate in their own country.
Resolutions of Pan Commonwealth Veterinary Conference, Harare 10th-14th September 1990

Veterinary Education
1. African Veterinary schools should be encouraged to take the initiative to establish an accreditation scheme among veterinary schools in Africa (not necessarily limited to Africa).

2. The Commonwealth should be encouraged to provide scholarships and fellowships for both under-graduate and post-graduate training for personnel from developing countries.

Training Animal Health Assistants
3. Relevant courses should be modular, job rather than syllabus-oriented, include both production / husbandry and health facets, have a uniform core curriculum with appropriate regional modifications, be conducted in English (where appropriate) for two years with 50% practical training, include the organisation and provision of farmer training and emphasise the inseparability of animal health and welfare.

4. Developed countries should be encouraged to provide grants with an emphasis on courses rather than individuals, and on ensuring that delivery centres are adequately equipped to provide their service effectively.

5. Adequate consideration should be given to the involvement of village communities in personnel selection, the potential role of demonstrably effective traditional healing procedures, and the benefits of close collaboration with NGO’s and centralised government services for effective delivery of Community-based animal health care.

Post-Graduate Training And Continuing Professional Development
6. Encouragement should be given to the expansion of the new technologies for distance learning (eg. satellite broadcasting, down-time television etc.) to developing countries, and the reciprocal production of educational programmes for use within the Commonwealth.

7. The CVA should encourage the development of regional centres for post-graduate and technical training workshops and seminars, and also encourage the flow of visitors from developed countries to undertake research at these centres while contributing to their teaching and training programmes.

Vector Borne Diseases
CVA should seek to implement the following:

8. Encouragement of information exchange between aid agencies and countries to develop an overall strategy towards integrated control of vector-borne diseases, especially involving genetically resistant animals, concentrating on improved diagnostic ability and vaccine delivery while considering the socio-economic impact of the methodologies.

9. Choice of both control strategy and research target invites consideration of both financial and human resources, primary concerns being environment impact, women’s role and targeting the poorer strata of society while encouraging the active involvement of industry at an early stage of research and development.

10. The importance of education and training as key aspects of the approach to vector-borne disease control, directed at all levels, technical, administrative policy making as well as the farmers themselves, leading ultimately to the fundamental question of population control.

Helminthiasis
11. National and regional definition of the helminthiasis problem should be encouraged in terms of mortality and impaired productivity, to facilitate decisions on the necessity for the institution of control measures which should be based on integrated parasite control principles, including the exploitation of genetic resistance to infestation, development of vaccines, stimulation of innate immunity, tactical rather than therapeutic use of chemotherapy and modification of management such as stocking rate, mixed grazing systems, intermediate host control and supplementary feeding. All such approaches should be subject to rigorous cost-benefit analysis and monitoring of efficacy, and be supported by through education and training programmes.

Panzootics and their Control
12. Governments should be encouraged to define and implement those services perceived to be of national importance and foster the privatisation of aspects not included in this category.

13. The initiation of cost recovery for services tendered, and introduction of animal related import/export levies, should be examined to provide funding for the support of government livestock services, which should be staffed at levels commensurate with the actual requirements of the livestock sector.

Village Education Programmes on Livestock Production and Fertility
14. Village education programmes should be instituted via consultation with communal decision makers, based on producers’ animal production goals, and include women, children through the inclusion of animal husbandry in school curricula, and on-farm demonstration of the benefits of relevant interventions.

15a. Improvement of fertility should be fostered through increased herd control with fencing etc., nutritional intervention involving supplementation with crop residues and high protein agroindustrial by-products, especially of lactating cows, and the use of artificial insemination where appropriate, probably excluding oestrous synchronisation but including improved oestrous detection procedures.

15b. There is a need for research on ruminant fertility in small village herds. CVA should explore whether it could obtain support for discrete studies to closely define the present situation with village farming systems.

16. The CVA should encourage governments to review urgently their land tenure, stock ownership and primary produce marketing policies so as to reverse the alarming degrees of land degradation and soil erosion caused by overstocking, and to foster the development of sustainable integrated crop and livestock production systems.

Draught Animal Power
17. The CVA encourages the expansion of research and development of draught animal power technologies, especially
Resolutions

in relation to the interactions between work, nutrition and reproduction/tractation to foster the use of cows for traction, and the development of improved, simple and cheap harnessing methods.

18. Village traction requirements for village and transport should be closely defined to aid decisions on appropriate species utilisation (e.g. Cattle, Donkeys) and their numbers for particular purposes.

Aquaculture

19. The integration of aquaculture into village animal and crop production systems is seen as having great potential for increasing human dietary protein supplies and the CVA supports research on the development of such integrated systems including studies of relevant fish disease, and the wide dissemination of material to promote the adoption of aquaculture, which should be included in veterinary and animal production curricula.

Wild Life Management

20. The CVA encourages the increased involvement of veterinarians in wild life management and conservation. Recommends that government directors of veterinary and wildlife services foster the training and posting of Veterinarians to wild life reserves etc. and that heads of veterinary faculties consider the incorporation of Wild Life Studies in their curricula.

Veterinary Services

21. CVA notes the following needs to maximise veterinary effectiveness:

a. Veterinarians need the skills to be able to understand their farmers’ aims and objectives.

b. Veterinarians need more skills in extension and communication so that they can translate their knowledge into production via the farmer.

c. Veterinarians need better understanding of nutritional demands and how these can be met in all circumstances.

d. Veterinarians need to understand animal management techniques including integration of stock types so as to maximise available feed utilisation and minimise disease exposure while being environmentally sensitive.

e. Research and the application of research should continue to work towards the reduction and eradication of disease with animal reliance on environmentally damaging chemicals.

f. There should be a recognition that education is necessary at all levels including school in order that village farmers appreciate the need for productivity.

g. Systems need to be developed whereby village farmers and those looking after animals including women get direct reward for their efforts.

h. In the short term, increased production is more likely to come from commercial farms. These could be simultaneously used for training village farmers.

General

22. Recognising the importance of women in small holder farming system, the CVA supports the increased participation of female veterinarians in developing country programmes.

23. In view at the multidisciplinary nature of many of the topics considered, the CVA should liaise with the Commonwealth Agricultural and Medical Association to enhance the implementation of its resolutions.

24. These resolutions should be widely disseminated to such organisations as FAO, UNDP, WHO. Commonwealth government bodies and veterinary journals within the commonwealth.

25. The function of relevant government regulatory services should be enhanced by increased focus on the management of information services related to disease and the quantification of the impact of disease incidence on productivity.

26. The CVA secretariat should be asked to publish and distribute an updated directory of animal health assistants.

27. The CVA is encouraged to seek funds to allow increased participation at Pan Commonwealth and regional meetings by personnel from developing countries.

Action taken on the Resolutions

Minutes of the Executive Committee Meeting held on April 29th 1991 at London

Resolution Items 1 & 2 - Veterinary Education

It was agreed that attempts should be made to encourage a meeting of all Deans of Veterinary Schools in Africa with a view to working out an accreditation scheme. In order to stimulate this action it was agreed that the President contact Dr. Peter Msola, Tanzania and Dr. Tom Aire, Nigeria to ask them to try to arrange such a meeting.

ACTION : PRESIDENT

It was also agreed that Dr. Touray should continue with his effort to prepare a directory of veterinary schools and he would again approach the various Council Members and Regional Representatives with a view to obtaining this information.

ACTION : DR. TOURAY

The question of scholarships and fellowships for undergraduates and postgraduates will be discussed with the Director of the Foundation.

ACTION : PRESIDENT

Resolution Items 3, 4 & 5 - Training Animal Health Assistants.

It was noted that the reports on animal health assistant training prepared by the CVA had been completed and
the Commonwealth Secretariat would be asked to publish these.

Some of the animal health assistant schools who had not responded to Dr. Godwin’s request would again be contacted by her for further information.

ACTION: PRESIDENT AND DR. GODWIN

In order to improve veterinary extension training it was agreed that workshops would be set up to train extension workers, particularly at the village level. It was known that the Commonwealth Secretariat were interested in supporting this kind of project and the effort would be made to obtain support from them to set up such workshops.

All Regional Representatives would submit a project on improvement of veterinary extension at village level. Dr. Mews would contact Intermediate Technology Development Group to seek their advice and help and the President would contact the Commonwealth Secretariat with a view to setting up workshops.

ACTION: DR. MEWS AND PRESIDENT

Resolution Item 6 - Postgraduate training

An approach to be made to the pharmaceutical companies, FAO, CTVM and other organisations as appropriate to obtain audio-visual material for distribution within the Commonwealth.

ACTION: SECRETARY

Experts to be identified in African and Asian training schools to explore the possibility of amateur production of training materials.

ACTION: PROJECT COORDINATOR

It was agreed that a budget of £5000 be allocated to books/audio-visual programme to assist in this.

ACTION: TREASURER

Regional Representatives to obtain information regarding postgraduate training centres and laboratories in each country.

ACTION: REGIONAL REPRESENTATIVES

Identify centres and laboratories where students from Commonwealth countries could go for training.

ACTION: REGIONAL REPRESENTATIVES

It was noted that the proposed establishment of a Deans Committee indicated above would help in these projects.

It was agreed that the resolutions of the Harare meeting be republished in the CVA News and comments invited from members asking for suggestions on their implementation and it was also agreed that the Foundation be informed regarding the actions taken on the resolutions.

ACTION: EDITOR

Resolution Items 8, 10, 11, 12 & 13 - Vector Borne Diseases, Helminthiasis, Panzootics and their control

It was agreed that a letter be drafted by CVA and sent to all governments, ministries, veterinary schools, research establishments using items 12 and 13 as a basis for a covering letter. The letter should go out over the signature of the President but would be prepared by the Secretary/ Treasurer, President and Dr. Mews. (It was noted that an extra amount would have to be allocated in the budget to cover this extra postage).

ACTION: DR. MEWS, SECRETARY/ TREASURER & PRESIDENT

Resolution Item 14 - Village Education Programmes on Livestock Production and Fertility

It was agreed that projects and workshops should be directed mainly at improving livestock production at village level, particularly paying attention to the inclusion of women and children in the programmes.

ACTION: PRESIDENT & SECRETARY/TREASURER

Resolution Item 15 a & 15 b - Improvements of village Herds

It was noted that research is required on fertility problems in small village herds and it was agreed that funds would be sought to obtain three experts including Professor Jainudeen, to visit various parts of the Commonwealth to set up workshops on this matter. Professor Jalaludin agreed to contact Professor Jainudeen with view to preparing a joint project to submit to the CVA for consideration.

ACTION: PROFESSOR JALALUDIN & SECRETARY

Resolution Item 16 - Land Tenure etc

This item would be included in the letter to various agencies which will cover items 8-13. It was also agreed that photographs of degradation of land caused by animals should be obtained for publication in CVA News.

ACTION: REGIONAL REPRESENTATIVES

After lengthy discussion on items 14 - 16, it was decided that a recommendation be sent that this matter be discussed at the NGO forum with view to being presented at the CHOGM meeting in Harare.

ACTION: DR. MEWS AND PRESIDENT

It was agreed that CVA encourage governments to promote veterinary and agriculture research carried out in such a manner as to avoid environmental danger.

ACTION: INCLUDE IN LETTER TO GOVERNMENTS
Resolutions

Resolutions Item 17 & 18 - Draught Animal Power
It was noted that there is already a great deal of work going on in various parts of the Commonwealth dealing with draught animal power and it was agreed that CVA should write to the various agencies dealing with this work asking them to provide information for publication in the CVA News. Such agencies may include ILRAD, ILCA, TAWS, ITDG and any such organisations who may be dealing with draught animal power drawing to their attention the CVA’s interest in this matter.

ACTION: SECRETARY/ TREASURER

Resolution Item 19 - Aquaculture
It was agreed that a letter be sent to Deans of Veterinary Schools in all Commonwealth countries encouraging them to include aquaculture in their veterinary curriculum.

ACTION: SECRETARY/TREASURER

Resolution Item 20 - Wildlife Management
Regional Representatives to identify countries in which training in wildlife management was organised, e.g. (U.K.), Tanzania, Zimbabwe etc. It was noted that subsequent to this resolution in Harare a wildlife conference has been organised in India which it was hoped the Foundation would support.

ACTION: REGIONAL REPRESENTATIVES, DR. RAHMAN, SEC/TREASURER

Resolution Items 21a & 21b - Veterinary Services
It had already been agreed that priority should be given to setting up an extension training workshop (see item 3) and it was further agreed that it was preferable to have two workshops, one aimed specifically at veterinary workers and one for extension workers at village level.

ACTION: PRESIDENT

Resolution Item 21c & 21d - Veterinary Services
In the letter to Veterinary Deans mentioned previously it was agreed that CVA concern be expressed in that letter by including a paragraph on the need to strengthen training in nutrition and animal management.

ACTION: PRESIDENT

Resolution Item 21e - Veterinary Services
It was agreed that publicity be given to the CVA concern with environmental pollution and that CVA encourages further research on environmentally sound methods of disease control and production, e.g. controlling soil erosion, and use of resistant breeds of livestock.

This matter to be published in the CVA News as well as to be included in correspondence with research centres.

ACTION: REGIONAL REPRESENTATIVES & EDITOR

Resolution Item 21f - Veterinary Services
Agreed that a letter be sent to Commonwealth Ministers of Education in developing countries drawing to their attention the fact that agricultural science should be included in the school curriculum so that children became conversant with sound methods of land and animal management from an early age.

ACTION: SECRETARY/TREASURER

Resolution Item 21g - Veterinary Services
CVA accepts and supports the recommendation that farmers including women should be able to see direct rewards for their efforts and every effort will be made to implement this in all CVA projects.

ACTION: ALL

Resolution Item 21h - Veterinary Services
CVA supports the training of village farmers in initiating small improved traditional farmers.

These ideas will be promoted in the CVA News.

ACTION: EDITOR

Resolution Items 23-27 - General
The CVA Executive endorsed all these items and stressed that national associations should liaise with other professional associations and advocate formation of professional groups and establish contacts with NGOs.

Dr. Stevenson said that the disease surveillance system existing in the Caribbean should be publicised in the News as an example of what could be done and to stimulate similar action in other areas.

ACTION: DR STEVENSON AND EDITOR

In conclusion it was agreed that the forward plan be based on resolutions of the Harare conference and this would then form part of the budget plan being prepared for submission to the Foundation.

ACTION: SECRETARY/TREASURER & PROJECT COORDINATOR

Note: Suggestions & Comments are invited from readers for the successful implementation of the Resolutions of the Conference.
Welcome to Zimbabwe a country renowned for its climate, beauty and wildlife.

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D.J. Batchelor
President Z.V.A
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Harare International Conference Centre
10 - 14 September 1990  Harare, Zimbabwe

ANIMAL HEALTH AND PRODUCTION - YEAR 2001

The Conference Centre Complex showing the adjoining Sheraton Hotel

Victoria Falls

Organised by – Commonwealth Veterinary Association
Hosted by – Zimbabwe Veterinary Association
CALENDAR

1991

July 1-5

August 10-16
Sixth International Soc Vet Epidemiology and Economics, Ottawa.

August 18-23
XXIV World Veterinary Congress, Rio de Janeiro, Brazil. Enquiries: Congrex do Brasil, Rua do Oviedo, 60, Gr. 414, 20040 Rio de Janeiro, Brazil.

August 20-24
Seventh International Congress for Animal Hygiene, Leipzig, GDR.

September 4 to 7
1st International Conference of Feline Immunodeficiency Virus Researchers, Davis California, USA. Enquiries: Dr. J. Barlough, Dept. of Medicine, School Vet. Medicine, University of California, Davis, CA 95616, USA.

September 9-13
ASAVA Annual Conference, Melbourne. Featuring plastic and reconstructive surgery Speakers: Dr Steve Swain, Auburn University, USA; and Dr. Geoff Robins. Further input from the Australian Veterinary Dental Association, the Australian College of Veterinary Scientists and the Australian Veterinary Nurses Association.

October 2-5

November 8-12
International Seminar on Veterinary Medicine in Wild and Captive Animals, Bangalore, India. Enquiries: S. Abdul Rahman, Organising Secretary, No. 123, 7th Main Road, IV Block (West) Jayanagar, Bangalore-560 011, India.

1992

V International Conference on Goats, New Delhi, India

Instructions to Authors

1. CVA News will publish articles written in English.

2. Articles should be more of a popular nature rather than highly academic.

3. News items of interest with photographs from different regions of the Commonwealth are welcome.

4. Xerox copies of Articles from Scientific journals are welcome.

5. Manuscripts should be type-written double spaced with wide margin.

Annual Subscription for CVA News is 10US Dollars. Kindly send cheque to the Secretary Treasurer.
Victoria Falls and Sunset on the Zimbabwe river