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President's Column



Dr. S. Abdul Rahman

The year 2012 has been an especially busy year for the CVA featuring an Officers Meeting and Two Regional Conferences being held in the Canada/Caribbean and Asian regions respectively.

An Officer's Meeting was held in London, where the CVA Work Plan was finalised following the Recommendations and Resolutions of the 5th Pan Commonwealth Veterinary Conference in Accra, Ghana in 2011. The priority of the work plan is to focus on Continuous Professional Development of Veterinarians. Taking immediate action on the implementation of this objective Dr. Jeff Cave, CVA Councillor Australia and Dr. Sam Okech, former President, Uganda Veterinary Association prepared a scoping paper and following this the CVA has appointed Dr. Chris Daborn, an experienced British Veterinarian in Tanzania as its Technical Advisor on CPD. A Pilot CPD Programme involving the ECS African Region is being prepared for implementation this year.

The Regional Conference in Trinidad from 6th to 9th Nov was staged conjointly with the 27th Biennial Caribbean Veterinary Medical Association Conference. The CVA component of the conference was a Disaster Training Workshop which was supported by World Society for Protection of Animals (WSPA).

CVA in collaboration with Karnataka Veterinary, Animal and Fisheries Sciences University (KVAFSU), Bidar and Veterinary Council of India (VCI) and supported by many international and national organizations organized the 17th Asian Regional Meeting and Conference on Rabies at Bangalore, India. The theme of the conference on "Strengthening Rabies Diagnosis and Dog Population Control in the Indian Subcontinent" reflects the urgent need to diagnose Rabies for effective control and also strengthen the Dog Population Management without inhumane culling.

Dog Population Management is a very contentious issue with many agencies involved and one of the other reason for the prevalence of Rabies in the subcontinent is a disorganized and lopsidedly dog control programme without intersectoral cooperation.

At the recently concluded Global Conference on Rabies Control at Incheon, Korea organized by the World Animal Health Organization (OIE), it was demonstrated that the only solution to an effective Rabies Control and Prevention was the elimination of Rabies at source i.e. the dog. The Resolutions at the end of the Conference have recommended that Governments, Donor Organizations and NGO's be mobilized at the global level with the guidance of WHO, OIE, FAO to continue to invest in Dog Rabies Prevention and Control.

For any effective disease control programme, early diagnosis is of paramount importance and with the advance of technology newer diagnostic methods for Rabies diagnosis are available. It is very important that the Veterinarians who are the sentinels of zoonotic diseases be adequately equipped with the knowledge and expertise to diagnose Rabies at the source. The conference addressed all these issues with the involvement of Rabies experts from all over the world and representing National and International organizations.

The additional highlights of the Conference included the organization of the Workshop on Direct Rapid Immunohistochemistry Test (DRIT) for Rabies Diagnosis and the inauguration of a dedicated Rabies Diagnostic Laboratory at the Veterinary College, Bangalore, India which has been set up by funding from Crucell Holland bv and implemented by CVA at the Veterinary College, Bangalore. This Laboratory will be unique and first of its kind in the Indian sub continent solely dedicated for Rabies Diagnosis and Rabies Research in animals and will end the dependency of veterinarians on non veterinary institutions. The CVA has also taken up a Research Project on Monoclonal Antibodies against Rabies Virus in collaboration with Crucell and Veterinary College, Bangalore.

Successful regional CVA Council meetings were also convened at each location and these permitted discussions to be undertaken on regional issues and needs.

All of us look forward to the Australasia/Oceania Regional Meeting to be held in Nadi, Fiji from 2-6 September 2013 and enjoy the Fijian hospitality.

I must recognise the sterling support I have received during my first year in office from the Programme Director Dr. Bob McCracken, Treasurer Dr. Peter Thornber, Secretary Dr. Karen Reed, and Past President Dr. Richard Suu Ire on one hand and all Regional Representatives on the other.

In closing, I do wish each one of you and your respective families warm season's greetings. May 2013 be a joyous as well as a successful year.

January 2013

S. Abdul Rahman
President

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Knowledge, Attitude And Control Practices Of Tsetse Flies And Trypanosomiasis Among Agro-Pastoralists In Rufiji Valley, Tanzania

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Abstract

A study was conducted to determine the knowledge, attitude and practices of agro-pastoralists against tsetse and trypanosomiasis control in Rufiji District. A questionnaire of 26 both closed and open-ended questions was administered to probe on Knowledge, Attitude and control Practices against tsetse and trypanosomiasis. A total of 371 farmers who own various sizes of herds of cattle and practice communal grazing in four villages within Rufiji Valley namely Siasa, Kiwanga, MUYUYU and Muhoro were interviewed. Results showed that 98% (364/371) mentioned tsetse as a source of disease in livestock and identified preferred tsetse habitats as forests (64.2%), bush (32%), thickets (1.9%) and watering points (1.9%). Of 252 respondents (8.3%) associated tsetse bites with abortion, (11.1%) emaciation, (2.8%) bleeding, (5.6%) fever, (2.8%) dull hair coat, (10%) death and 69.4% diseases in livestock. Regarding control practices of tsetse and trypanosomiasis, 60% (210/350) used trypanocides; 2% used insecticides; and 38% integrated both trypanocides and insecticides. The proportion of using trypanocides were diminazene aceturate (84.8%), ethidium (5.7%), novidium (5.7%) and isometamedium chloride (3.8%); whereas for insecticides included alphacypermethrin 76.6%, cypermethrin 6.4% and 17% didn't remember the name of the insecticides they used. The frequency of insecticide application ranged from daily to twice per year. Although the disease caused some economic impact through cost of trypanocides, insecticides and direct effects such as abortions, emaciation, and death; majority of farmers did not mention trypanosomiasis as a threat because the disease is treatable.

Keywords: Tsetse, *Trypanosoma*, *Glossina*, livestock, trypanosomiasis, pastoralists, knowledge, attitudes, practices, Tanzania

Abbreviations:

CBPP	Contagious Bovine Pleuropneumia
ECF	East Coast Fever
AAT	African Animal Trypanosomiasis
DALDO	District Agricultural Livestock Development Officer
KAP	Knowledge, Attitude and Practices
GPS	Geographical Positioning System
DVO	District Veterinary Officer
T&T	Tsetse and Trypanosomiasis

Introduction

African Animal Trypanosomiasis (AAT) represents a major constraint in livestock production in Sub-Saharan Africa, and it is considered the most important vector-borne cattle disease transmitted by tsetse in this region (Leak, 1999). The disease is of economic importance as it is characterized by increased calf mortality including still births, stunted growth and reduced weight gain especially in males, and reduced milk production (Rowlands *et al.*, 1999).

Tsetse fly transmits trypanosomes, which cause a disease commonly known as nagana (in livestock) and sleeping sickness (in human). Unlike sleeping sickness, nagana can occur in tsetse free areas because it can be transmitted mechanically by biting flies (Leak, 1999). Tsetse flies thrive in fertile areas which could otherwise be used

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for agro-pastoral activities, but tsetse infestation restricts its use. Rufiji Valley is one of the tsetse infested areas and livestock farming has not been practiced for many years due to tsetse and trypanosomiasis; hence traditionally the district had no pastoralists and the natives of this area are not livestock keepers (Mwilawa, 2003). Therefore, livestock farming is a new activity in the area.

In 2003, the district was estimated to have about 5,000 heads of cattle (including 4,000 indigenous cattle from migrating pastoralists), 300 dairy cattle and 7,000 goats (Mwilawa, 2003). In the recent years, there has been relocation of pastoralists and agro-pastoralists with their large herds of cattle from other places in search for pasture and water. Population pressure coupled with land tenure to investors and other crop producers, has necessitated the use of even marginal grazing land for cultivation resulting into overgrazing and ultimate migration of people to other regions (Ngailo, 2011; Malele *et al.*, 2011a). Examples of pastoralists include the Maasai from Arusha Region of northern Tanzania to migrating to Morogoro Region in the east, resulting into intense conflicts with crop farmers (Malele *et al.*, 2007). Other group is Wasukuma from around Lake Victoria migrating southwards. Since 2001 many pastoralists have moved to Rufiji from various places of Tanzania. Following the eviction of pastoralists from the southern highlands (Ihefu plains) of Tanzania in 2007 (Ngailo, 2011), the number of cattle in Rufiji Valley increased to about 140,000 heads (DALDOs Report February 2009).

The influx of animals in the area was faced with inadequate veterinary services infrastructures. There is paucity of knowledge on how the pastoralists perceive and attempt to overcome the effects of tsetse flies and trypanosomiasis in the newly farmed areas of Rufiji Valley of Tanzania. As of now there are few counterpart reports on human trypanosomiasis conducted by Kinung'hi *et al.* (2006) and Sindato *et al.* (2008). This study was therefore carried out to assess the knowledge, attitude and control practices of tsetse flies and trypanosomiasis among agro pastoralists in tsetse infested areas in order to design better and sustainable control of T&T in tsetse infested areas.

Materials and Methods

Study area

The study was conducted in four villages of Rufiji Valley of Tanzania. The study area lies between latitude 7°S and 8°S south of Equator and 38°E and 39°E east of Greenwich. The selected villages were: Siasa with GPS S07° 59 200' and E 038° 39 498' located west of Utete the District capital of Rufiji, Kiwanga village S08° 12 607' and E 039° 10 565' bordering Kilwa District of Lindi Region, Muyuyu village S07° 56 116' and E039° 05 391'; and Muhoro village S08° 05 200' and E039° 11 211' (Fig.1). All four villages are known to have suitable environment that favours tsetse flourishing.

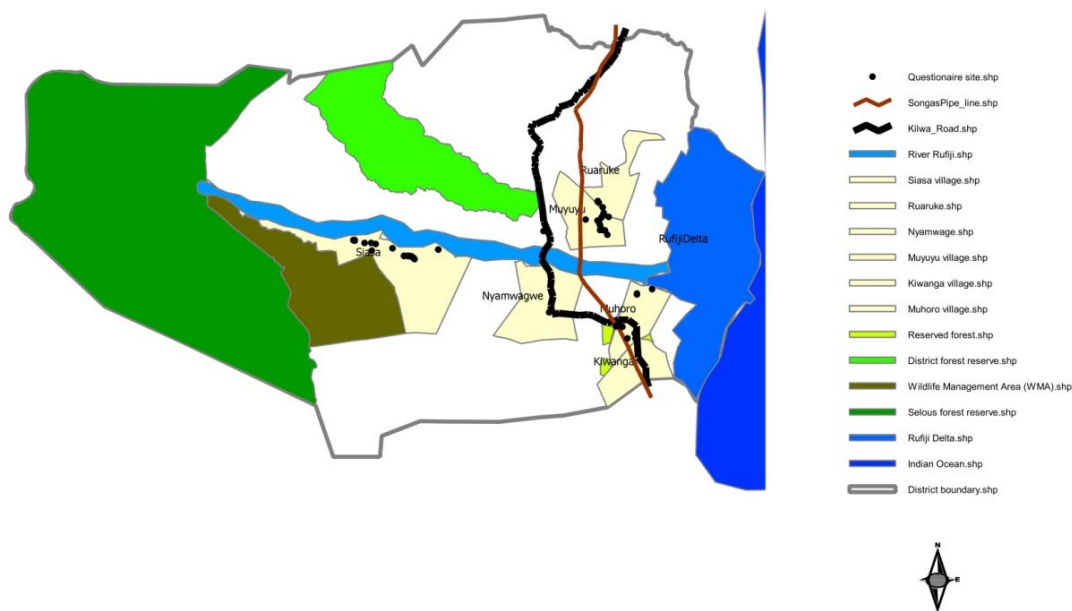


Fig.1. Rufiji Valley and villages where interviews were conducted

Selection Criteria

Farmers for interview were those who own cattle and practice communal grazing. Farmers were supposed to have cattle herds that are taken to the communal grazing land. Farmers who have only small ruminants (sheep and goats) and those who graze their animals around their homestead were excluded from the study. The reasons for exclusion are that cattle grazing around homestead are seldom bitten by tsetse flies; and regarding small ruminants, farmers do not pay special attention to a sick sheep or goat as compared to cattle because of the economic hierarchy.

Structured Questionnaire Survey

The interviews were conducted in the national language, Kiswahili. Interviews were conducted at Siasa a village conjoined with Selous game reserve/ protected area hence with high tsetse fly population, Kiwanga, Muyuyu and Muhoro villages (Fig.1). The questionnaire was developed to cover the general understanding of tsetse & trypanosomiasis problem in the area. It contained a total of 26 both closed and open-ended questions to enable respondents to report freely and give reasons for certain answers. The questionnaire was divided into 3 sections, which included; A) Knowledge, B) Attitude and C) control Practices. The Knowledge section probed the farmer's knowledge on tsetse fly, causes of nagana, and clinical signs of the disease. On attitudes, they were asked to rank the problem of nagana as compared to other animal diseases they encounter. The section on control Practices dwelled on: trypanocidal drugs/insecticides used, source of drugs/insecticides, their frequency of use, prices, and any suggestions livestock farmers had towards the tsetse and trypanosomiasis control. Most questions were asked in an open-ended manner and in most cases the informant was a member of the household involved in taking care of the cattle.

Questionnaire Administration

The study was conducted during the dry season in the month of October in 2009. The DVO was the centre point of the district livestock activities. The interview was preceded by a baseline study on the type, abundance and infection rate of tsetse flies in the area (Malele *et al.*, 2011b). Before administration, the questionnaire was pre-tested and some questions adjusted. Most interviews took place in the morning to enable livestock farmers attend to their farm/livestock duties during the remaining hours of the day. On average each questionnaire was completed within 30-45 minutes. Each farmer was asked

independently preferably at his home stead. Few farmers who were met outside their home stead were also interviewed.

Data Analysis (Data Entry, Coding and Analysis)

Questionnaire answers were entered in Statistix spreadsheet. Long answers were coded. Frequency of each answer was executed and summary recorded. Comparisons of proportions were conducted using Chi-square test whereas means were compared using non parametric statistics. The significance level was pre-set at 5% with confidence interval of 95%. The Statistix (2000) software for Windows version 7 was used for data entry and analysis.

Results

A total of 371 farmers from the four villages were interviewed as follows: Siasa 119, Kiwanga 105, Muyuyu 98, and Muhoro 49. It was noted that not all interviewees were able to answer all questions. Livestock keepers who had raised livestock for many years took longer time to answer the questions. Some farmers did not answer all questions because of various reasons such as having no evidence of the container/pack of the drug and at the same time had lost the memory of the name of a chemical product. In general, livestock keepers co-operated well and they seemed willing to spend more time with the enumerators.

Knowledge on the disease (nagana) and its vector

All 371 (100%) farmers said they knew tsetse fly, and 364 (98%) said the fly bite has intense pain to human and their livestock. Farmers indicated that diagnosis of diseases is done through clinical signs. Clinical signs attributable to tsetse bites in cattle include sick animal syndrome, emaciation, abortion, fever, lackluster hair coat, pica, lameness, agalactia, anorexia, diarrhoea, grinding teeth and death. However, only 252 respondents managed to list few deleterious effects caused by tsetse fly bites including abortions 8.3% (21), death 11.1% (28), emaciation 11.1% (28), bleeding 2.8% (7), fever 5.6% (14), lackluster hair coat 2.8% (7), and disease 69.4% (175).

Two hundred seventeen 217 out of 273 (79.5%) respondents mentioned tsetse flies being the transmitters of nagana in their animals whereas 56 (20.5%) respondents were not able to associate the tsetse fly with the disease in their livestock. Various sites were mentioned as the preferred places of tsetse flies as shown in Table 1 below.

Places where tsetse are found	Frequency	Percent (%)
Forest	238	64.2
Bush	119	32.0
Thickets	8	2.2
Watering point	6	1.6
TOTAL	371	100

Attitude towards AAT and other animal diseases of economic importance in the area

When farmers were asked if they knew that trypanosomiasis is economically important disease only 28 out of 336 (8.3%) said they do know. In fact, 117 farmers ranked the economic importance of cattle diseases in the following decreasing order: CBPP 63 (53.8%), ECF 35 (29.9%), fasciolosis 12 (10.3%), and lameness 7 (6%).

Control Practices against AAT

Results on control practices of AAT among the 350 agro pastoral farms showed that 60% preferred to use trypanocides, 2% used insecticides whereas 38% integrated both trypanocides and insecticides. Of the trypanocides, diminazene aceturate was commonly used (84.8%) for treatment and prophylaxis while the common insecticide for baiting animals was alphacypermethrin (Paranex®) (76.6%). The most popular frequency of baiting animals was once per week (40%) followed by twice per month (32%) and twice per week (10%). Most insecticides and trypanocides were found in local veterinary shops 44/53 (83%) which are privately owned and the rest 9/53 (17%) obtained the trypanocides and insecticides from other sources than local veterinary input shops. Majority of farmers indicated that prices for trypanocides ranged from

Trypanocide	Number of Farms	Percent (%)
Diminazene aceturate	297	84.8
Ethidium	20	5.7
Homidium chloride (Novidium®)	20	5.7
Isometamedium chloride	13	3.8
TOTAL	350	100

US \$ 1 (41.4%) – 1.25 (13.8%) for isometamidium chloride (various manufacturers); and US 0.5 to US\$ 1 for diminazene aceturate (various manufacturers). When asked about the average frequency of administering trypanocides only 96 interviewees responded, 50% said once per month followed by twice per month (25%). Detailed results are presented in Tables 2 and 3.

The government is subsidizing the insecticides/ acaricides by 40%. The market price of subsidized insecticides ranged from US\$ 20 – US\$ 25 per litre. The most frequently used insecticide was alphacypermethrin (Paranex®), which was used by 268/350 farmers (76.6%)

Frequency of trypanocide administration	Number of farms	Percent (%)
1/week	6	6.25
2/month	6	6.25
1/month	48	50
2 month interval	24	25
3 month interval	12	12.5
TOTAL	96	100

followed by cypermethrin (Cyberdip®) 22/350 (6.4%) whereas 60/350 (17%) did not know the name of insecticides they were using despite the fact that containers for reference were available. Few farmers (52) made suggestions on what need to be done to manage T&T in the area; 40.4% wanted the government to support T&T control activities through various ways (Table 5).

Discussion

This study demonstrated that all interviewed agro-pastoralists were knowledgeable about T&T. This could be owing to the fact that farmers relocated in Rufiji Valley have migrated from T&T endemic areas and therefore imply that they have dealt with T&T before in their career (Muangirwa & Sikay, 1994). Majority of respondents managed to identify the fly and correctly mentioned the clinical signs of AAT except for pica, lameness, diarrhoea, bleeding and grinding teeth, which could have represented other diseases.

Table 5
Suggestions by Farmers (n=300)

Suggestions made by Farmers on T&T Control	Frequency	Percent (%)
Increased Government support on T&T control	21	40.4
Increased Government subsidy on insecticides	11	21.2
Government should supply trypanocides	9	17.3
Use of traps	6	11.5
Government to engage in T&T control	3	5.8
Improved livestock extension service	2	3.8
TOTAL	52	100

The study demonstrated that drug therapy against trypanosomiasis is the main control method that has fostered livestock owners migrate into tsetse-infested areas without fear of losing their animals (Galaty, 1986). Although it is perceived by Rowlands *et al.* (1999) that T&T is a major constraint to cattle keeping, trypanosomiasis was ranked fourth out of five mentioned diseases and infirmities. Only 8.3% of the respondents indicated that the disease was of economical importance. The proportion of farmers signifying trypanosomiasis to be economically important is lower than expected when compared to other diseases like CBPP (53.8%), ECF (29.9%), and fasciolosis (10.3%). The main reason could be due to the readily availability of insecticides and trypanocides and it may well be that AAT is not a threat to their livestock because the disease is treatable when compared to survival rate of cattle suffering from CBPP or ECF.

However, diagnosis of diseases was entirely based on clinical signs and most of farmers were able to mention the common but non-specific clinical signs of trypanosomiasis as were the case with West African livestock keepers (Grace *et al.*, 2009). Diagnosis of diseases through clinical signs alone without laboratory confirmation is frequently liable to many misdiagnoses; in the study area disease diagnosis was entirely through clinical signs signifying the importance of bringing laboratory services to the area.

In the study area animal treatment is done by farmers themselves, similar situation in the pastoral communities was observed in Eastern province of Zambia by Van den Bossche *et al.* (2000). This practice is likely to result into misuse of trypanocides as reported by Roderick *et al.*

(2000) who pinpointed the misuse of trypanocides among Maasai pastoralists. Use of trypanocides in the area is a common practice due to high tsetse challenge in the area. Baseline study conducted by Malele *et al.* (2011b) demonstrated that the apparent density varied with place from 0.86 (Muhoro), 3.3 (Siasa), and 5 (Kiwanga). The infection rate by dissection method was 6.6% whereas by species specific PCR in 82 tsetse flies showed that all flies were infected with 1-5 species of trypanosomes whereby single species infection was observed in 14% and 86% had two to five species. However, the tsetse fly infection rates were *T.simiae* (92.7%), *T.brucei* (70.7%), *T.vivax* (48.8) and *T.congolense* (32.9%). In such high prevalence of *T.simiae* it may well be impossible to raise pigs in the area.

The tendency of haphazard treatment of animals with trypanocides and antibiotics on suspicion of trypanosomiasis or tick borne diseases is in agreement with observation reported by Muangirwa *et al.* (2001). This scenario is common in areas where there are inadequate veterinary service providers. Invariably, correct use of trypanocides is important in order to offset drug resistance in the area and this will be possible only if treatment is preceded by laboratory confirmation and prescription. However, ease and convenience to access trypanocides and insecticides from local suppliers makes the use of the two as the easiest option for T&T management but make them easy prey to resistance.

Moreover, diminazene aceturate is a curative drug thus it should not have a defined frequency of administration but in the Rufiji Valley is wrongly used as a prophylactic drug. In addition, the worst scenario would be if the trypanocides are applied on under dosage then there is a danger of speeding up the development of multiple drug resistant trypanosomes as reported in Ghibe Valley, southwest Ethiopia by Codjia *et al.* (1993). In such situations pastoralists need to be educated on the danger of resistant strains.

This study noted a too frequent usage of insecticides against T&T. The common practice was by baiting animals every week (40%) followed by the ideal frequency of every 14 days interval (32%) as shown in Table 4. The mentioned insecticides are synthetic pyrethroids (SP), which are recommended by manufacturers to be applied every fortnight. In that regard, the study has

demonstrated that only 32% of the farmers follow manufacturer’s recommendations. Furthermore, SP insecticides when applied sufficiently after a while tend to reduce the tsetse population as noted by Leak *et al.* (1996). Pastoralists in the study area have large herds of cattle of 100 to 300 but still they use knapsack sprayers on selected animals and not for the whole herd, which might not be sufficient and effective. Partial utilisation of insecticides will not control the flies as observed by Rowlands *et al.* (2001). In this case, partial application of insecticides for control of tsetse flies may not kill the ticks that are permanently found on the body of the animals and hence defeating the purpose of government subsidy.

Table 4
Frequency of insecticide application
(n = 350)

Frequency of insecticide application	Number of farms	Percent (%)
7/week (daily)	11	2.3
4/week	8	2
3/week	14	4
2/week	35	10
1/week	140	40
6/month	6	1.8
3/month	21	6
2/month	112	32
Seasonal (2/year)	3	0.9
TOTAL	350	100

Dipping of animals in pastoral communities may seem to be the appropriate practice because it is cheap to run. Buying and using a knapsack sprayer can be expensive for livestock keepers with few cattle, it is imperative to facilitate and motivate pastoralists to contribute to the dipping option. Unfortunately, willingness of farmers to engage themselves in tsetse control by insecticides treated targets is not very much appreciated. It was also interesting to note that 17% of respondent never knew the name of the insecticide they used to bait their animals. Dipping is the most efficient option of controlling other vectors like ticks, mange and fleas than spraying since the whole body of an animal gets wet and the concentration of acaricide remains uniform for whole herds. However, lack of operational plunge dips in the study area justifies farmer’s choice to hand spraying as a method of insecticide/acaricides application for the control of tsetse flies and trypanosomiasis.

Conclusion

Despite the fact that AAT demonstrated to cause remarkable economic loss through cost of trypanocides, insecticides, abortions, emaciation, reduced milk production and death, majority of pastoralists did not consider trypanosomiasis to be a threat. The reason could be the chronic nature of the disease that is treatable. Furthermore, farmers may be feeling comfortable because both trypanocides and insecticides are readily available at affordable subsidized price of US\$ 0.5 to US \$ 1.25 per sachet/tablet and US\$ 20 – 25 per litre.

Competing Interests

The authors declare that they have no competing interests.

Authors’ Contributions

IIM, HBM, KAM and ENK conceived the study, designed and coordinated the study; IIM, HBM, performed data analysis and drafted the manuscript. KAM, EAL, GKK, LAK, JMJ and NKL participated in the field work. EAL, HSN drew the map of the sampling sites. All authors read and approved the final version of the manuscript.

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References

- Codjia V., Mulatu, W., Majiwa P.A., Leak, S.G., Rowlands, G.J., Authie’, E., D’Ieteren, G.D. and Peregrine, A.S. 1993. Epidemiology of bovine trypanosomiasis in Ghibe valle, southwest Ethiopia. 3.Occurrence of *Trypanosome congolense* resistant to diminazene, isometamedium and homidium. *Acta Tropica* **53** (2): 151-163
- Galaty, J.G. 1986. Pastoral and agro-pastoral migration in Tanzania: factors of economy, ecology and demography in cultural perspective. In: J.W. Bennett and J.R. Bowen (eds). *Production and Autonomy: Anthropological Studies and Critiques of Development*. New York, University Press of America, p 163-183.

Grace, D., Randolph, T., Affognon, H., Dramane, D., Diall, O. and Clausen, P. H 2009. Characterization and validation of farmers' knowledge and practice of cattle trypanosomiasis management in cotton zone of West Africa. *Acta Tropica* **111** (2), 137 – 143.

Kinung'hi, S.M., Malele, I.I., Kibona S.N., Matemba L.E., Sahani J.K. 2006. Knowledge, attitudes and practices on tsetse and sleeping sickness among communities living in and around Serengeti National Park, Tanzania. *Tanzania Health Research Bulletin* **8** (3), 168 – 172.

Leak SGA.1999. Tsetse Biology and Ecology. Their Role in the Epidemiology and Control of Trypanosomiasis. CAB International, Oxford, pp. 98-100.

Leak, S.G., Peregrine, A.S., Malatu, W., Rowlands, G.J. and D'leteren. 1996. Use of insecticide-impregnated targets for the control of tsetse flies (*Glossina* spp.) and trypanosomiasis occurring in cattle in an area of south-west Ethiopia with a high prevalence of drug-resistant trypanosomes. *Tropical Medicine for International Health* **1** (5): 599-609

Malele, I. I; Kapange, L. A; Mashenga, G. A; Ringi, D; Macha, A. & Msangi, A. 2007. Assessment of vector and animal African trypanosomiasis (AAT) at Twatwatwa in Kilosa Tanzania. *Tanzania Veterinary Journal* **24:2**, 122-128.

Malele, I. I., H. Nyingilili & A. Msangi .2011a. Factors defining the distribution limit of tsetse infestation and the implication for livestock sector in Tanzania. *African Journal of Agricultural Research* Vol. 6(10), pp. 2341-2347

Malele, Imna I., Henry B Magwisha, Hamisi S Nyingilili, Kamilius A Mamiro, Elipidius J Rukambile, Joyce W Daffa, Eugene A Lyaruu, Lupakisyo A Kapange, Gideon K Kasilagila, Nicodemus K Lwitiko, Halifa M Msami & Elikira N Kimbita 2011b. Multiple *Trypanosoma* infections are common amongst *Glossina* species in the new farming areas of Rufiji district, Tanzania. *Parasites & Vectors* 2011, **4**:217.

Muangirwa, C.J., Kimaro E.E, Mujuni P., Assey T., Lugembe K.M, Sikay, M., and Mwitumba A. 2001. Distribution of tsetse flies in Mara Region, north western Tanzania and appraisal of community based intervention. *In: Proceedings of the 26th Meeting of the OAU/STRC Ouagadougou, Burkina Fasso, 2001*, pp 398 – 406

Muangirwa, C.J and Sikay, M. 1994. Forecasting of likelihood of tsetse control through community participation of Maasai pastoralists in Selela are, northern Tanzania. *TPRI Miscellaneous Report*, No. **1064**: 40 – 52

Mwilawa, A. J. 2003. Environmental management and Biodiversity Conservation of Forests, woodlands and wetlands of the Rufiji Delta and Floodplains: Assessment of Potential Rangeland Resources in Selected areas towards Designing a Livestock Development Strategy in Rufiji District:

Ngailo, J. A. 2011. Assessing the effects of eviction on household food security of livestock keepers from the Usangu wetlands in SW Tanzania. *Livestock Research for Rural Development* **23** (3), 2011

Roderick, S., P. Stevenson, C. Mwendia and G. Okech. 2000. The use of trypanocides and antibiotics by Maasai pastoralists. *Tropical Animal Health Production* **32** (6): 361-74.

Rowlands, G.J., W. Mulata, Leak, S.G.M., Nagda S.M. and D'leteren, G.D. 1999. Estimating effects of tsetse control on livestock production: A case study in south-west Ethiopia. *Tropical Animal Health and Production* **5**: 279-294

Rowlands, G.J., Leak, S.G., Mulati, W., Nagda, S.M., Wilson, A. and D'leteren, G.D. 2001. Use of deltamethrin 'pour-on' insecticide for the control of cattle trypanosomiasis in the presence of high tsetse invasion. *Medical Veterinary Entomology* **15** (1): 87-96

Sindato, C., Kimbita E.N. and S.N. Kibona. 2008. Factors influencing individual and community participation in the control of tsetse flies and human African trypanosomiasis in Urambo District, Tanzania. *Tanzania Journal of Health Research* **10** (1), 20 – 27

Van den Bossche, P., Doran, M. and Connor, R. 2000. An analysis of trypanocidal drug use in the Eastern province of Zambia. *Acta Tropica* **75** (2), 247 – 258.

At this Season our thoughts turn gratefully to all those who have made our progress possible

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A VERY HAPPY AND PROSPEROUS NEW YEAR 2013

Biotechnological Applications In Animal Health And Disease

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Biotechnology is the application of science and engineering to the direct or indirect use of living organisms, parts or products of living organisms in their natural or modified forms.

In another sense Biotechnology can be considered as the “Industrial exploitation of biological systems or processes” and it is largely based upon the expertise of biological systems in recognition and catalysis.

The discovery of genetic engineering techniques such as recombinant DNA technology was responsible for the current biotechnological boom. The optimization of any industrial - scale process using a living organism involves a major effort to improve the genetic characteristics of that organism.

Modern Biotechnology is defined in Article 3 of the ‘Cartegena Protocol’ under the convention of Biological Diversity as:

The application of:

- a) In vitro nucleic acid techniques , including recombinant deoxyribonucleic acid (DNA) and direct injection of nucleic acid into cells or organelles
- b) Fusion of cells beyond the taxonomic family that overcome natural physiological reproductive or recombination
- c) Barriers and that are not techniques used in traditional breeding and selection.

The state of the art in animal biotechnology includes two major fields:

1. Genetic engineering of micro-organisms and molecules including cell engineering (Hybridomas) to produce desired end products such as vaccines, gene probes, monoclonal antibodies and growth promoters.
2. Manipulation of reproductive process

The mammalian cell fusion technique which has brought the most immediate biotechnological pay-off is the formation of hybrid-myeloma which enables the production of monoclonal antibodies (MAbs). MAbs have been used extensively to unveil the relationship between parasite and host in four main ways viz.,

- i. To probe for antigenic determinants
- ii. To examine antigenic variability in parasite population
- iii. To detect expression of cloned DNA in various vectors
- iv. To type parasites

Further, in recent years MAbs against bacteria and parasites have been used very successfully in classification for diagnostic purposes. MAbs have been used as structural probes and the recognition of specific antigens and parts of antigen that can elicit a protective response which has been exploited in the preparation of vaccines.

The possible applications of monoclonal antibodies include, diagnostic test kits, prevention and treatment of infections, elimination of drugs and toxins, manipulation of physiological processes, such as regulation of growth and reproduction.

The introduction of recombinant DNA and hybridoma technology has revolutionized research on the development of vaccines. Biotechnology offers new strategies for the well defined engineering of vaccines.

The ability to clone the genes coding for the immunogenic proteins and determine their nucleotide sequence has allowed the determination of the amino acid (a.a) sequence (primary structure) of these proteins. Once the primary a.a sequence is known algorithms can be used to predict the location of the immunogenic regions (epitopes) on a protein by different methods.

Once it is known which of the proteins are evolved in inducing immunity and if the nucleotide sequence of the encoding gene is available, a number of ways are open to design “biotech vaccines” such as: killed/inactivated and live vaccines.

The main drawbacks of present day live vaccines are possibility of containing adventitious agents or other cells, chances of reversion to virulent state. Need for refrigeration temperature for storage and limited shelf life. The alternative to live vaccine is also not free from setbacks and has its own drawbacks, which include potential hazard to personnel working with large amount of infective agents, need to ensure complete inactivation, presence of cellular debris and limited shelf life.

The other important factor contributing considerably in reducing the efficacy of conventional vaccines is the vaccination programmer. It is not sufficient to restrict the vaccination programmer to susceptible animals alone, but it should be extended to carrier wild animals. Hence newer approaches are imperative in controlling the disease. If wild animal carriers are suspected the strategy has to change to a bait vaccine with a considerably long shelf life and thermo stability.

The trial and error method of vaccine production used to develop vaccines previously does not find a place in Biotechnology. The conventional vaccines were produced without much knowledge of the parasitic immunogen, pathogenicity of the disease and immunological processes responsible for induction of immunity; whereas, all the biotechnologically designed vaccines are developed only after extensive research on the above three areas. With the help of number of tools like monoclonal antibodies which are used in the epitope mapping of the antigen to in those epitope(s) responsible for inducing immunity and vaccines developed by cloning the gene(s) coding for immunogenic proteins.

The modern biotechnologically designed vaccines can be classified into 2 major categories.

- A. Killed vaccines / inactivated vaccines: (Innocuous) subunit vaccines
 - Recombinant DNA vaccines
 - Synthetic peptide vaccines
 - Anti-idiotypic vaccines.
- B. Live vaccines
 - Deletion mutant vaccine
 - Reassortment vaccine

- Chimeric gene products
- Live vectored vaccines

A. Killed/Inactivated Vaccines

Conventional Subunit vaccines

Subunit vaccines are defined as vaccines that are made up of components of infective agents. Usually protection to animal diseases is provided by a single immunogenic protein of the pathogenic agent or a combination of immunogenic proteins. In conventional subunit vaccines, recombinant DNA technology is not involved. The classical examples for conventional subunit vaccines are pili vaccine for *E. coli*, tetanus toxoid and the vaccine for Aujeszky’s disease consisting of 2 surface glycoproteins.

The incorporation of immunostimulating complexes (ISCOM) was a development in conventional subunit vaccines wherein the immunogenic proteins are absorbed onto an adjuvant - Quil A, giving rise to complexes carrying the protein in multimer form on their surfaces. Though the developed vaccines are good, the production of ISCOMs is not very easy. The vaccines developed using ISCOMs include Equine Herpes Virus-1. and Feline leukemia virus and a good number of other vaccines are under trial.

The commercially available subunit vaccines against parasites include those for *Babesia canis*, *B.rossi* for dogs, *Eimeria* species for chicken, *Leishmania donovani* for dog and *Boophilus microplus* for cattle (Bowmann, 2009).

Recombinant DNA Vaccines

Recombinant DNA technology is the application of techniques used to isolate and analyze genes that are responsible for immunogenic moieties and inserting such foreign DNA into living organisms. This concept is vastly exploited in vaccinology and a number of vaccines have been developed. In recombinant DNA technology first the gene coding for an immunologically important protein is identified, then it is inserted and expressed into a variety of biological systems which can then be grown in culture yielding high quantities of immunogenic protein or proteins thereof. The polypeptides thus produced form the basis for a subunit vaccine. The genes encoding immunogenic proteins can be identified by a number of methods, which include;

- Direct selection by complementation
- Screening from a genomic library

- Reverse genetics and monoclonal antibody screening.
- Pepsan method
- Mimotope method

One of the methods called PEPSCAN doesn't predict but directly identifies the epitomes on a protein. This method involves the sequential synthesis of short overlapping sets of peptides corresponding to the sequence of the protein on plastic pin supports. It is followed by determination of reactivity of each peptide with particular antibody by ELISA. The biological relevance of epitopes can be determined by injecting synthesized peptides into animals and analyzing whether the animal's antiserum recognizes the protein and neutralises the agent. This method is ideal for detecting linear epitopes.

Another novel approach is mimotope approach. In this method a series of paired amino acids are used to probe a monoclonal antibody for binding activity. The pair showing low activity is gradually built up using further amino acids until a maximum antigen/antibody interaction is achieved. This method is used to create antigenic peptides with very high affinities for the selected monoclonal. This method is ideal for detecting complex antigenic sites.

Cloning Vectors

The 3 common cloning vectors used as expression systems are:

- Plasmid vectors
- Bacteriophage vectors
- Cosmid vectors

Plasmids

Plasmids are closed circular, double stranded DNA molecules that replicate independent of that chromosome. A number of plasmid vectors are available for insertion of foreign genome. An ideal plasmid vector used in recombinant DNA technology should have a selectable marker, multiple cloning sites and a selection system to differentiate between clones

Bacteriophage Vectors

Bacteriophages are viruses that affect bacteria. The bacteriophage genome is about 50 kb long. About 60% of

the genome is necessary for normal lytic growth. Except the part of genome that is concerned with lysogeny all other parts can be replaced with foreign DNA cosmid vectors.

Cosmid vectors

Cosmids are vectors into which the cos sequences from bacteriophage have been inserted. Cosmids generally carry an antibiotic resistance marker and a plasmid origin of replication and therefore can replicate in *E.coli*. like normal plasmids if introduced into them by transformation.

Expression vectors

A number of expression systems are being used to produce recombinant vaccines and they include:

- Prokaryotic systems such as bacteria.
- Eukaryotic systems such as yeast, mammalian cells, insect cells. algae and filamentous fungi.
- Virus vectors - vaccinia. Herpes. Adeno etc..

(i) Prokaryotic Systems

The most commonly used bacterial expression system is the bacteria *E.-coli*. By inserting the gene into a plasmid vector, host cells are transformed. Bacteria producing desired polypeptides are identified, selected and cultured. Then polypeptide is extracted from host cells, concentrated, purified and used as basis for a vaccine.

The gram positive bacteria such as *Bacillus subtilis*, and *Staphylococcus aureus* are potentially better expression system than the gram negative organisms which have been engineered to secrete some proteins into the growth medium The drawback with the gram positive *B. subtilis* is the extracellular proteases production which can affect the stability of secreted proteins. Mutants lacking this activity have been developed now. A number of other secretion vectors have been constructed which can function as plasmids upon integration into chromosomes.

The drawback of prokaryotic expression system is the incorrect folding since the prokaryotic cells have different mechanisms for processing and trafficking, in addition to signal sequences, glycosylation sites and disulphide bonds which occur in many candidate vaccine proteins resulting in toxicity, insolubility or rapid degradation within the bacterium.

(ii) Eukaryotic systems

The advantages of yeast as expression vector are that it can be produced in a large scale easily and that it is not harmful to human beings and animals. The yeast and fungi are able to glycosylate proteins and perform processing effectively in contrast to bacteria which is essential for production of antibodies to certain antigens where these steps are mandatory.

However, the possibility of overglycosylation of proteins by yeast cannot be overruled, and this may influence immune responses to the specific subunit proteins being produced, since the degree of glycosylation can influence immunogenicity of a variety of proteins. The first human recombinant vaccine for Hepatitis-B was developed in *Saccharomyces cerevisiae*. *Pichia pastoris* is the other variety of yeast used as vector. It has been found that the level of production of foreign protein in *P. pastoris* has been increased approximately to 400 mg/lb.

(iii) Insect cell

The highly novel expression vector is the Baculo virus (Autograph California nuclear polyhedral virus - AcNPV) in ovarian cells of *Ipodoptera frugiperda* insect. Some of the genes such as genes coding for the polyhedron are not essential for virus replication and the high efficiency promoter of the polyhedron gene is used to drive the transcription of a foreign gene.

Another advantage is that the synthesized protein can either be made to remain within the cell or be secreted into the culture medium, incorrect post translational modification of the synthesized proteins is the main drawback with this system. Hence, loss of certain degree of immunogenicity is inevitable. Some of the pathogens that are expressed in these systems include Influenza virus HA, FMDV capsid protein, rabies virus nucleoprotein and Blue tongue virus capsid protein to name a few.

(iv) Mammalian cell

The main idea behind using mammalian cells as expression vector is that they are the natural choice for a variety of animal pathogens. However, the yield of foreign protein is relatively low compared to yields obtained in bacteria and yeast. Another disadvantage of using mammalian cells for vaccine production is the oncogenic potential of cell lines and difficulty in bulk production.

In spite of all these drawbacks the level of glycosylation is appropriate and the end products obtained are as desired. SV40, adeno and retro viruses are commonly used to carry genetic information. The mammalian cell line commonly used for expression is Chinese hamster ovary (CHO) cell line.

The wide range of protein systems expressed in mammalian cells include Influenza virus HA, VSV glycoprotein and HIV-I glycoprotein to name a few.

(v) Virus Vectors

Large DNA viruses are the best candidates for use as expression vectors. One such potential candidate is the Vaccinia virus. Since the virus has a large genome and even if large quantities of DNA are deleted, still the virus can replicate and hence is commonly used.

The genes coding for Rinderpest proteins were successfully expressed in Vaccinia virus and the resultant vaccine was found to be effective. To a certain extent Herpes and Adeno viruses are also used. However, these vectors have certain drawbacks.

(vi) Plant Cell Expression

Recent studies have shown that plants may provide a useful expression system for mammalian proteins. To express a foreign gene it is necessary to splice a plant promoter, terminator and generally a regulatory- sequence onto cloned cDNA.

Selectable markers may also be incorporated to facilitate identification of recombinants and the expression hosts can either be plant cell culture or whole plants. Some mammalian proteins including antibodies and serum albumin have been successfully expressed in plant cells.

III. Synthetic Peptide Vaccines

Sub unit vaccines can also be produced by chemical synthesis of short polypeptides. Much improvement has been made on the solid phase peptide synthesis which reduces the production cost.

Monoclonal antibodies and sequencing of genome are essential in synthetic peptide vaccine production.

The feasibility of synthetic peptide vaccine for Foot and Mouth Disease has been studied. However, the problems of antigenic plurality of the FMDV pose a great threat in production of such a vaccine. The epitome on

the virus has to be conserved before a single broad spectrum polypeptide vaccine can be developed. Conserved regions on a number of viruses have been identified. However, the effective delivery of such a vaccine into animal system is dependent on carriers and appropriate adjuvant.

IV. Anti-idiotypic Vaccines

Development of anti-idiotypic vaccines are based on the network theory of Jerne. The antigen combining site of antibody idiotype can function as antigen and therefore elicits antibodies directed against that idiotype thus termed as anti-idiotypic antibodies. Some anti-idiotypic antibodies recognize only antibodies, whereas others have the same tertiary configuration as the antigen to which the first antibodies are evoked and mimics the behavior of the antigen and give rise to antibodies that are directed against the original antigen and thus act as vaccine.

Based on this concept a number of anti-idiotypic vaccines have been developed for FMD, N.D. Parvo viruses and rabies.

The vaccine potential against idiotype antibodies was investigated and proved to be of protective nature in trypanosomiasis (Zanetti et al., 1987) and experimental anti idiotype vaccines have been found to induce specific antibody which binds to the original antigen or organism and in other systems protective immunity has been demonstrated on challenge.

Since anti-idiotypic antibodies mimic the original antigen, they are actually not identical to it and can stimulate an alternative immune response. This concept can thus be exploited in vaccine development.

Anti-idiotypic vaccines are safe to prepare and can be made available in large quantities. Anti-idiotypes can also mimic non protein structure such as carbohydrates which cannot be produced directly by gene cloning. However, development of anti-idiotypic vaccine is very costly.

Defined Antigen Vaccines

A major advantage of live vaccines is that during invasion, tissue penetration and development, a whole range of antigens is presented and generally a solid protection and humoral and cellular immune response is stimulated. However, a major disadvantage is always that shelf life is short and insufficient attenuation may lead to pathogenic effects and the spread of the parasite. On the

other hand subunit vaccines contain only a small number of defined antigens but are safe in that no viable parasites are administered and development and reproduction cannot occur.

These vaccines may consist of complete or incomplete polypeptide copies of native protein antigens expressed by recombinant DNA methods or antigenic epitopes produced entirely synthetically. Purified antigens are known to induce antibody production but little T cell responses. Sufficient quantities of antigen for these vaccines can be produced by recombinant DNA technology and advancement in monoclonal antibody technology, protein chemistry and immunochemistry. Genetic engineering has enabled the production of highly effective and experimental defined antigen vaccines.

A few recombinant antigen vaccines have been produced against animal parasites. Non-living exoantigens of *Babesia canis* were released as a vaccine for dogs in France (Pirodog). Soluble exoantigens have also been tried against cattle babesiosis in Venezuela. Non-living extracts or excretory secretory products of *Taenia ovis*, *T. saginata*, *E. granulosus*, *Taenia solium* especially from the in vitro activated oncospheres have shown good results in immunization of specific hosts. (Lightowers and Rickard, 1988). Practical application of these findings has been made possible by isolating the host protective antigens and using the mRNA of these for cDNA cloning and subsequently produce sufficient quantities of the antigens by recombinant DNA technology.

The emergence of novel or concealed antigens as candidate vaccine antigens has led to considerable strides in vaccine production against parasites

especially the ticks. Concealed antigens of the gut of parasites as those of the internal organs or peritrophic membrane have been found to be highly effective in the induction of artificial immunity. The usefulness of novel antigens is felt wherein immunity can be induced against a certain parasite in young animals at an age when naturally acquired immunity does not occur. Eg. *Haemonchus contortus*. Eg. Contorin - a component associated with membrane extracted from the gut of *Haemonchus contortus* and subsequently H11 (H11OD) - a heavily glycosylated 110kDa integral membrane protein of intestinal microvilli of adult *H. contortus* was isolated. Antigens from membrane of midgut of adult female *Boophilus microplus* have been successfully exploited for vaccine production.

However, exposed or natural antigens are of potential value as vaccines because elevated response against them can circum-vent the immunosuppression and subversion of immune respon-sive parasites.

Peptide vaccines are those which include identification and synthesis of a specific parasite peptide which will stimulate T cells and incorporation of such epitopes along with B cell epitopes in vaccine antigens. Construction of recombinant virus vectors to be used as live vaccines expressing recombi-nant peptides is then essential.

B. Live Vaccines

(i) Deletion Mutant Vaccine

Deletion mutant vaccines can be developed for bacteria and viruses that carry genes that are non essential for replication. Deletion mutant vaccines have been developed for Aujeszky's disease virus (ADV). ADV genome consists of DNA which is of approximately 150 kb. The mature virion contains 50 proteins. The virulence of Aujeszky's disease virus is controlled mutagenically.

It was found that ADV can replicate even if it does not express gill. gx. gP63 and gL indicating that these coding genes are not essential. The non essential gill, gP63, gL and TK enzyme play a role in virulence. A deletion mutant has been constructed by deleting non essential virulent genes. Such vaccines are safe and as immunogenic as conventional vaccines. Another advantage is that the antibodies produced against these vaccines are different from that produced against wild type virus. Hence it is possible to differentiate between vaccinated and potential disease carriers.

Live vaccines are preferred against parasites because they result in protective immunity which is long lived and both humoral and cellular responses are induced. The concept of infection - treatment method is based on induction of infection with virulent parasites with subsequent drug treatment in order to induce immunity to re infection e.g. Babesiosis, Theileriosis. Coccidiosis. Live vaccines are very effective but potential-ly dangerous as they can revert to the virulent forms or cause infections in immunocompromised or genetically suscep-tible animals and are also difficult to manufacture and deliver.

However, they are more effective than non-living - antigens. Live attenuated vaccines have been produced and extensively used against many parasites such as

Dictyocaulus, Ancylostoma, Theileria, Toxoplasma etc. These vaccines have been found to induce significant immunity to reinfection as it occurs in the natural infec-tions.

The main advantage of live attenuated vaccines is their effectiveness compared to non-living antigens. The live vaccines cited previously have been found to raise the level of immunity to a desirable extent which has not been sur-passed by experimental immunization with non-viable para-sites or crude parasite extracts.

After much research towards attenuation of parasites, x-ray irradiation was found to be a good method. The mechanism of this method is unknown. It has been speculated that irradiation induces abnormalities in protein structure producing highly immunogenic molecules, which in their normal configuration are only weak immunogens. However, they still have to be common enough to native antigens to stimulate an immune response that is able to interact with antigens from normal organisms.

Besides modified antigen conformation, additional modes of action have been discussed, such as prolonged exposure of particular antigens, induction of specific cytokines and dynamics of cell mediated responses.

(ii) Reassorting Vaccines

These type of vaccines are developed for viruses that have segmented genome like Rota and influenza viruses, in which the genetic information resides on 8-10 RNA segments. When cell cultures are infected simultaneously with two different virus types, through a process of recombination, viruses may emerge that carry for instance one segment of RNA of one virus type and some RNA segments of the other virus type. This reassorting of genes is applied in the production of influenza virus vaccines. A suitable screening procedure is highly essential since it is an empirical approach.

(iii) Chimeric Gene Products

Once a vaccine strain has been selected, it is possible to introduce foreign genes into the strain in order to produce a multivalent vaccine; the attenuated host strain will act as delivery vehicle for heterogenous antigens. Organisms attenuated by genetic manipulation are not the only potentially useful bacterial system for the delivery of foreign antigens. *Mycobacterium bovis* (BCG) has also been used as a delivery vehicle for foreign antigen.

Likewise in picorna virus, the sequences coding for epitopes from a variety of bacterial pathogens have been incorporated. Animals upon exposure to these chimeric constructs will produce antibodies against both. The major impediment being the size of genetic material that can be incorporated into picorna viruses.

(iv) Live Vaccinia Vectored Vaccines

The main advantages of such live vaccinia vectored vaccines are high level of immunity since it is a replicating vaccine, potential to be used as multivalent vaccine, relative physical stability, no need for cold-chain after freeze drying, ideally suitable for third world countries, no possibility of reverting back to virulence because it is genetically stable and it is cheap and easy to produce and easy to administer.

The major drawbacks are chances that Vaccinia, eczema and encephalitis may occur in immuno compromised host, possibility of infection to man from vaccinated animals and from products and the Vaccinia vectored vaccine may infect new hosts if the expressed foreign protein is involved in virus absorption and penetration.

Diagnosis Through Biotechnology

(1) Monoclonal Antibodies

The detection of antigen causing disease by using the antibodies lacked specificity due to the usage of polyclonal serum and antigenic plurality of viruses like Infectious bronchitis, FMD, Blue Tongue etc. The scenario took a volte-face since the first production of monoclonal antibodies by Nobel laureates Kohler and Milstein in the year 1975. Since then the specificity of antigen detection became more reliable.

Monoclonal antibodies are produced against a variety of specific antigenic determinants and not against whole antigen. Apart from this, some antigenic determinants are not only unique to the species but to the strains and sub strains. Hence strain differentiation could be made possible. Monoclonal antibodies are widely used in number of enzyme immuno assays for detection of antigen.

A number of developments have taken place in monoclonal antibody production which include:

- Bi-specific antibodies
- Construction of chimeric antibodies
- Monoclonal antibodies with effectors functions

(2) Nucleic Acid Probes

A probe in a broad chemical or biological sense is a molecule having a strong interaction only with specific targets and having a means of being detected following the interaction.

Variety of probes are available for various purposes, the important being protein probes and nucleic acid probes. The NA probes as their name suggests make the diagnosis of disease beyond the surface of cells and their products, to the genetic material there by making it a confirmatory diagnosis. In nucleic acid probes it is the genes that are directly involved and not the products of cell or organism, hence it is the most intimate and most irrefutable form of diagnosis. Number of probes have been used in infectious disease diagnosis since 1970.

The most important point in diagnosis is the differentiation between the pathogenic strain and vaccine strain or a virulent strain. Most of the serological tests fail to satisfy this criterion, whereas it is made possible with nucleic acid probes. Nucleic acid probe based diagnosis is based on hybridization (specific binding) between labeled either with radioactive (hot probes) or non radioactive substances (cold probes) and nucleic acid in the test sample. Hybridization occurs when the nucleotide sequences between probe and nucleic acid in test sample are complementary.

These probes are commonly used to: Detect infectious organisms which exhibit antigenic plurality or show symptoms which are indistinguishable with some other disease. They can detect genetical error, determine the sex of the embryo and for verification of pedigree. They can also monitor physiological changes induced by introduction of new genetic material.

(3) Polymerase Chain Reaction (PCR)

Polymerase Chain Reaction is a method which is able to amplify femtograms (10⁶ micrograms) of Deoxyribo Nucleic Acid to micrograms of DNA in a few hours. The amplified DNA can then be detected by common hybridization procedures. However, polymerase chain reaction can detect genes from which the sequence is at least partly established. Either DNA (or) RNA (cDNA) can be used as template for amplification.

One of the important constraints in Polymerase Chain Reaction is that, it can amplify genes whose sequence information is already available. The solution to counter this being flanking the unknown

DNA sequence with known DNA sequence, this step is very essential since sequence information is mandatory to fix the oligonucleotide primer sites. Flanking sequences for priming are added by ligation or by homopolymerising with terminal transferases. These approaches are termed as anchored Polymerase Chain Reaction, One sided Polymerase Chain Reaction or RACE. This procedure is ideal for cDNAs and bacterial genome which require a less specific amplification procedure. Another approach is using a degenerated pool of primers based on protein sequences, it is possible to create tolerant Polymerase Chain Reaction (for degenerate primer pools) or a stringent Polymerase Chain Reaction (for specific amplification) by adjusting the reaction conditions and position of the mismatch between primer and template, provided the amino acid sequence is evolutionarily conserved in a particular protein..

Yet another development in Polymerase Chain Reaction is the whole genome Polymerase Chain Reaction wherein primer sites are ligated to genomic DNA fragments.

Inverse Polymerase Chain Reaction is another method used for analysis of sequences that flank a known region. The ability of Polymerase Chain Reaction to amplify informative sequences from a single template has important implications for the analysis of genetic recombination and the construction of genetic maps.

Nucleic acid probe technology is being increasingly used by diagnosticians and researchers because it offers distinct advantage over other systems in that the lack of expression of a major antigen or a spontaneous mutation that changes a key biochemical reaction will rarely result in such a major change in the nucleic acid composition of the organism that it would produce a false probe test. Further the advancement in molecular biology has made the use of nucleic acid probes for the detection of organisms that are not readily cultured or biochemically identified. It enables the differentiation of pathogenic from a virulent strains, in the identification of antibiotic gene and also for the detection of latent infection.

These probes are useful in epidemiological studies, typing schemes and rapid culture confirmation. The genomic map can be used to diagnose and predict genetic diseases. Further saturation of the map with genetic markers may enhance the utility of the normal map in diagnosing genetic diseases by linkage analysis.

(4) Transgenic Animals & Disease Resistance

The term transgenic was used for the first time by Gordon and Ruddle in 1982 to describe animals harboring new genes within the genome. The first transgenic animal was developed by Jaenisch and Mintz in 1974 who developed transgenic mice by micro injection of SV40 DNA into blastocoel of mice. Later Jaenisch in 1976 developed the first transgenic mouse line by infection of mouse embryo with Moloney leukemia retrovirus.

Transgenic animals are developed by introducing foreign DNA into a fertilized egg before the egg has divided, there by all the cells of the embryo will have foreign DNA including germ line.

Thus after the development of an adult animal the foreign DNA can be transmitted to any progeny. However, introduction of foreign gene into a developing embryo will result in a chimeric animal.

The most important point in development of transgenic animals are that all somatic cells and germlines in particular should carry foreign gene construct. Hence they should be given to undivided fertilized or at least at 2 cell stage embryo.

Following are six major steps involved in development of any transgenic animals.

- Cloning of the gene construct
- Preparation of foreign DNA solution
- Oocyte and embryo preparation
- Transfer of foreign DNA into embryo
- Transfer of injected embryos into suitable foster animals
- Transgene detection in newborns

The main aspect of transgenic fowl production is access to the newly fertilized ovum in the chicken, which is very difficult to access since it is located on the surface of a yolky mass that is migrating down the magnum of the oviduct where the albumen is formed.

The fertile eggs are infected with foreign DNA just before incubation at a stage where development has taken place in the oviduct for about a day, in other words the blastoderm of the fertile eggs should be infected with foreign DNA. The most important point in the

development of transgenic fowl is that all somatic cells and germ line in particular should carry foreign gene construct.

(5) DNA Fingerprinting

DNA Fingerprinting has been widely used in forensic medicine for various purposes like identification of individuals in crimes to ascertain paternity etc.. Now this technique is increasingly finding a place in veterinary medicine for differentiation of strains such as to differentiate between virulent and attenuated organisms and between field isolates and reference strain.

(6) Blotting Techniques

Southern Blotting is a technique in which the DNA is separated in the Agarose Gel Electrophoresis is transferred to Nitrocellulose membrane and the fragment of interest is identified through autoradiography or enzyme substrate reaction with a suitable probe labeled with a radioactive material or non radio active material. This technique was developed by the notable molecular biologist E.M. Southern of Edinburgh University It is noteworthy to mention that the subsequent techniques of transferring RNA and protein by same principle were named as Northern Blot and Western Blot respectively.

The purpose of this technique is to detect and characterize specific DNA sequences. The DNA is fragmented by restriction end nucleases and the fragments are separated by agarose gel electrophoresis. The DNA is then denatured in the gel and transferred to a nitrocellulose filter. This is incubated with ³²P labeled probe, which is a DNA base sequence complementary to the DNA to be detected in the test material. The unbound probes are washed off and the position of the probe attached with complementary base is then detected by autoradiography.

Western Blotting techniques are used in identification of specific immunological proteins which are of diagnostic significance and such type of identification gives concrete evidence about the infection. Western Blot involves separation of proteins in gels by denaturing or non denaturing one or two dimensional or by isoelectric focusing followed by electrophoretic transfer of the separated polypeptides to an immobilizing matrix or membrane (nitrocellulose). Thus formed replica can be probed for specific proteins by antisera or ligands or oligonucleotides or lectins using I₂₅ protein A.

The use of radioactive materials is now increasingly being replaced by non radioactive materials.

(7) In situ Hybridization

In situ hybridization is an important technique associated with the cytogenetic studies, in situ hybridization is an efficient tool to localize nucleic acid sequence in a fixed cell preparation by means of complementary reassociation with a homologous labeled DNA or RNA sequence widely used in chromosomal DNA. RNA transcripts, viral nucleic acid detection, genomic expression etc. in situ hybridization studies are commonly used to determine the distribution, frequency and intracellular localization of viral nucleic acid in tissue samples infected naturally with viruses.

Animal production and health offers prospects for both present and future rewards for developed and developing countries. In contrast to the futuristic gene transfer possibilities, real benefits for economically important domestic animals are emerging from the production of reagents needed for accurate diagnosis, treatment and prophylaxis of diseases with a substantial impact on the economics of animal production.

In conclusion, the developments in biotechnology have opened up exciting possibilities for increasing animal production, detecting diseases, immunoprophylaxis and stimulating research in animal science.

References

- Biotechnological Innovations in Animal Productivity (1992). Biotechnology by Open Learning. Butterworth-Heinemann Publ.
- Biotechnology Focus 1. Edited by Finn. R.K and P.Prave (1988). Hanser Publishers, Munich, Vienna. New York.
- Bowman D.D. (2009). Georgi's Parasitology for Veterinarians 9th Edition Saunders Elsevier St. Louis Missouri.
- Crittenden, L.B and D.W. Salter. "Expression and mobility of Retroviral inserts in the chicken germ line". Transgenic Models in Medicine and Agriculture. Editor Robert B.Church. Wiley-Liss Publication, New York.
- DNA Probes. George H. Keller and Mark M. Manak (1993). M. Stockton Press.
- DNA-Protein interaction - Principles and Protocols (1992). Edited by Geof Kneale, G. Humana Press Inc.
- Essential Immunology (1994). Ivan M. Roitt. Blackwell Scientific Publications, London.

Genes in Medicine, Istvan Rasko and C. Stephen Downes (1995). Chapman & Hall. London.

Immunoassays for Veterinary Food Analysis (1986). Morris. B.A., M.N. Clifford and R Jackman. Elsevier Applied Science Publishers Ltd, England.

Immunochemical Protocols (1994). Edited by Margaret M. Manson. Humana Press Inc.

In situ Hybridization Protocols (1994). Edited by Andy Choo. K.H. Humana Press Inc.

Mackenzie, A. (2005). Biotechnology Applications in Animal Health and Production, OIE Scientific and Technical Review 24(1) April.

Mallick, B.B. (1996). Biotechnological Advances in the Improvement of Livestock Proceedings, III Annual Convention of ISVIB, College of Veterinary Science, Tirupati, South India.

Nucleic Acids (1984). Edited by John M. Walker. Humana Press inc.

Padmanaban V.D Biotechnology - Past, Present and Future Dr. P. Richard Masillamony Oration of ISVIB.

PCR Protocols - Current Methods and Application (1993). Edited by Bruce A. White Humana Press.

PCR Technology. Henry A. Erlich (1989). M. Stockton Press.

Surveillance Study On Highly Pathogenic Fish Rhabdovirus, The Spring Viraemia Of Carp Virus In Goldfish (*Carassius auratus*) Breeder Farm In Sri Lanka

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Abstract

Spring Viraemia of Carp (SVC), caused by Spring Viraemia of Carp Virus (SVCV), is an important disease that causes significant economic losses in food fish and ornamental fish of cyprinid species in many countries. It is an acute haemorrhagic and contagious disease listed by Office International des Epizooties (OIE) as a notifiable disease. The SVCV is considered as a biological control agent with experiencing devastating effects due to wide trade of ornamental fish species internationally. Connotation of outbreaks followed the introduction of fish imported from an Asian production facility of unknown SVC-status emphasize the requirement of strict quarantine regulations. Active surveillance carried in the main Government fish breeder farm, where breeding ornamental cyprinid species goldfish (*Carassius auratus*) is an initiative to find out SVCV status in Sri Lanka. The data received from the present surveillance brought, the inference that the farm could be free for SVCV.

Key words: Spring Viraemia of Carp Virus, Surveillance, goldfish (*Carassius auratus*)

Introduction

Spring Viraemia of Carp Virus (SVCV) or Rhabdovirus carpio is the causative agent of the fish disease, Spring Viraemia of Carp (Fijan *et al.*, 1971). The disease is generally associated with high mortality; often approaching 70% in young fish (Ahne *et al.*, 2002). Spring Viraemia of Carp infection have been recorded from the cyprinid species; common carp (*Cyprinus carpio carpio*), koi carp (*Cyprinus carpio koi*), crucian carp (*Carassius carassius*), silver carp (*Hypophthalmichthys molitrix*), bighead carp (*Aristichthys nobilis*), grass carp (white amur) (*Ctenopharyngodon idella*), goldfish (*Carassius auratus*), orfe (*Leuciscus idus*), and tench (*Tinca tinca*) (OIE, 2009). Cyprinid fishes are raised as food fish (common carp) in many countries, and have also been bred as ornamental fish (koi and goldfish) (Barbara *et al.*, 2002).

Outbreaks of Spring Viraemia in carp have been first described in Europe in 1930s (Wolf, 1988). Consequently the disease has been recorded from the western Independent States of the former Soviet Union (Belarus,

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Georgia, Lithuania, Moldova, Russia and the Ukraine) (Dixon, 2006). In 2002, SVC was reported for the first time in two separate sites in the USA (Dikkeboom *et al.*, 2004; Goodwin, 2002), and detection of the virus in carp in the People's Republic of China was confirmed in 2004 (Liu *et al.*, 2004). The disease has also been recorded in goldfish imported into Brazil (Alexandrino *et al.*, 1998).

The ornamental fish industry transfers large quantities of fish between countries. The most widely traded species internationally are goldfish (*Carassius auratus*) and koi carp (*Cyprinus carpio koi*) and both species have been implicated in trans-boundary transfer of viral diseases. The ornamental fish trade is suspected in the first introduction of the OIE notifiable disease: spring viraemia of carp (SVC) to the USA (Ariel, 2005). The first isolation of Asian isolates of Spring Viraemia of Carp Virus from koi carp *Cyprinus carpio koi* and goldfish *Carassius auratus* was reported in UK from China (People's Republic of China) during routine import checks of ornamental fish in 1998 (Miller *et al.*, 2007). Further SVCV was detected on a large koi farm in the USA in 2002 (Shivappa *et al.*, 2008). The USA isolate was 98% identical to isolates associated with koi and goldfish imported from China (Goodwin, 2009). It has been found that each outbreaks of Sping Viraemia of Carp followed the introductions of fish imported from an Asian production facility of unknown status of Sping Viraemia of Carp or imported from Asian countries known to have Spring Viraemia of Carp (Miller *et al.*, 2007). The trans-boundary transfer of diseases demands strict health certification for ornamental fish trade causing growing concern over the status of ornamental fish.

In Sri Lanka, aquaculture remains the fastest growing segment of livestock and fishery industry and has been grossed Rs. 979 million in ornamental fish exports in 2009 (DCSS, 2012). Spring Viraemia of Carp Virus is a biological control agent in Australia and new quarantine regulations require that Sri Lankan exports comply with the Australian quarantine standards. Therefore, the present active surveillance was conducted to establish a farm or population free status of Spring Viraemia of Carp Virus in goldfish (*Carassius auratus*) for international export from Sri Lanka.

Materials and Methods

Ornamental fish species goldfish (*Carassius auratus*) were collected from the main Government goldfish breeder farm during the period from 21.02.2012 to 21.11.2012. Sample size was determined with 95% confidence interval and 2% prevalence. Accordingly, 150 apparently healthy fish were tested twice a year.

Viral RNA extraction and RT- PCR Procedure

Viral RNA was extracted from kidney, spleen, gill and encephalon of 5 pooled fish samples using the RNeasy Mini Kit (Qiagen, Germany). All procedures were carried out according to the manufacturer's guidelines. Extracted RNA were stored at -70°C until use. Amplification of a 714 bp fragment of SVCV cDNA was performed using primer sequences; Forward (SVCV F1) 5'-TCT-TGG-AGC-CAA-ATA-GCT-CAR*-R*TC-3' and Reverse (SVCV R2) 5'-AGA-TGG-TAT-GGA-CCC-CAA-TAC-ATH*-ACN*-CAY*-3'. Reverse transcription reaction was performed at 37°C for 1 hour in a 20 µl volume consisting of 1 × M-MLV RT reaction buffer (Promega, USA) containing 1 mM dNTP (Promega, USA), 100 pmol SVCV R2 primer, 20 units M-MLV reverse transcriptase (Promega, USA) and 1/10 of the total RNA extracted.

PCR was performed in a 50 µl reaction volume 1 × PCR buffer - MgCl₂ free (Sigma, USA) containing 2.5 mM MgCl₂ (Promega, USA), 200 µM dNTPs (Promega, USA), 50 pmol each of the SVCV R2 and SVCV F1 primers, 1.25 units of Taq DNA polymerase (Promega, USA), and 2.5 µl reverse transcription reaction mix. The reaction mix was subjected to 35 temperature cycles of: 1 minute at 95°C, 1 minute at 55°C and 1 minute at 72°C followed by a final extension step of 10 minutes at 72°C. Amplified DNA (714 bp) is analysed by agarose gel electrophoresis.

Semi nested assay was performed using primers: Forward (SVCV F1) 5'-TCT-TGG-AGC-CAA-ATA-GCT-CAR*-R*TC-3' and Reverse (SVC R4) 5'-CTG-GGG-TTT-CCN*-CCTCAA-AGY*-TGY*-3'. The second round of PCR was performed in a 50 µl reaction volume 1 × PCR buffer - MgCl₂ free (Sigma, USA) containing 2.5 mM MgCl₂ (Promega, USA), 200 µM dNTPs (Promega, USA), 50 pmol each of the SVCV R4 and SVCV F1 primers, 1.25 units Taq DNA polymerase (Promega, USA), and 2.5 µl of the first round product. The reaction mix was subjected to 35 temperature cycles of: 1 minute at 95°C, 1 minute at 55°C and 1 minute at 72°C followed by a final extension step of 10 minutes at 72°C. Amplified DNA (606 bp) was analysed by agarose gel electrophoresis (OIE, 2009).

Results

A total of 300 fish in 5 pooled samples were tested and all the tested samples were negative for Spring Viraemia of Carp Virus by RT-PCR. Figure 1 depicts the un-generated product using a single round amplification and Figure 2 depicts generated product in the second round of amplification of the positive control of SVCV.

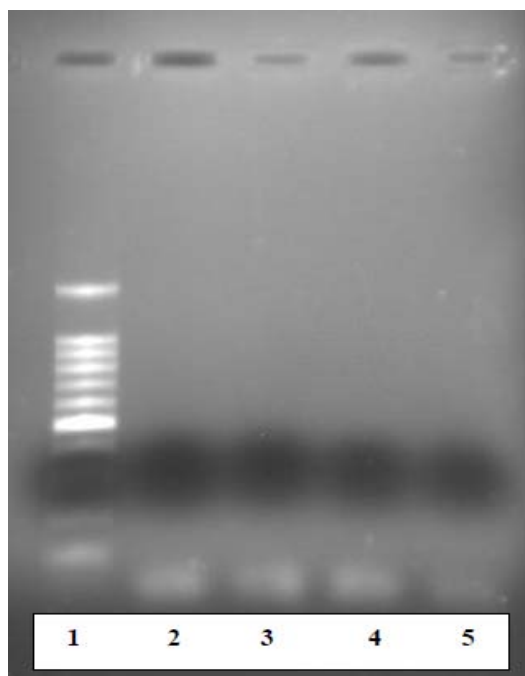


Fig. 1. Agarose gel electrophoresis of 1st round PCR of SVCV

Lane 1 represents 100 bp DNA ladder
 Lane 2 represents positive control of SVCV
 Lane 3 represents negative control (DNA/RNA free water)
 Lane 4 represents samples
 Lane 5 represents samples

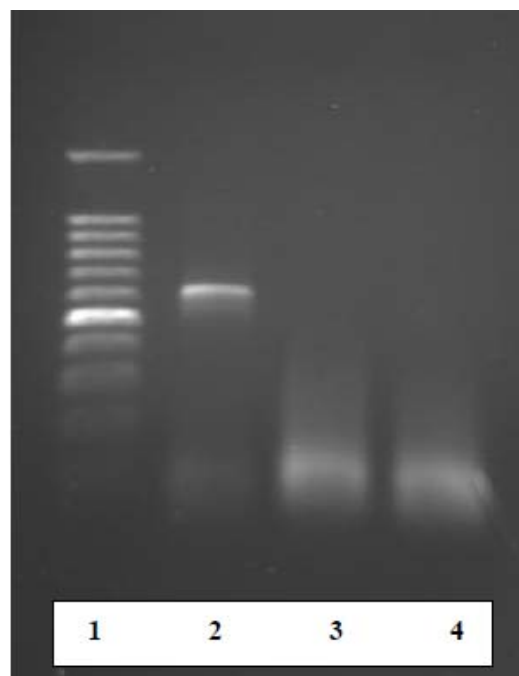


Fig.2. Agarose gel electrophoresis of 2nd round PCR of SVCV

Lane 1 represents 100 bp DNA ladder
 Lane 2 represents positive control of SVCV (606 bp)
 Lane 3 represents negative control (DNA/RNA free water)
 Lane 4 represents samples

Discussion

The Spring Viraemia of Carp Virus has been isolated from outbreaks of disease in more than 30 countries (Miller, 2007). Phylogenetic analysis has identified 4 distinct genogroups with the classification of Asian isolates within group Ia. Moldovan, Ukrainian and Russian isolates to genogroups Ib and Ic, while isolates presumably from the UK and other European countries in genogroup Id (Stone *et al.*, 2003). This active surveillance by PCR is more important to find out the SVCV status in the farm and to identify the genogroup if positive. Hence, molecular epidemiology has become an important tool in disease surveillance and investigations of outbreaks, due to its ability to trace and identify possible infection sources (Ostroff 1999). Results of the 1st step PCR showed absence of product at the band size 714 bp of the positive control and that was avoid using semi nested assay (Stone *et al.*, 2003).

Ornamental fish suppliers to the global market emphasize the need of surveillance hence it offers a comprehensive assurance of quality and fish health status. Moreover, the necessity has been raised to detect the infection early and to curtail the further spreading (Lio-Po *et al.*, 2009).

Asia represents >90% of the world aquaculture production (Bondad-Reantaso *et al.*, 2005). The market share for the ornamental fish export in Asia was 56.3% and which was the highest in 2003 (Ramachandran, 2006). Sri Lanka exports ornamental fish to USA, Japan and European Union holding the 2.94% market share and it emphasize the importance to have safe trade for the sustainability of the ornamental fish industry and to be a leading supplier, promoting disease free status with the competitors.

Conclusion

From the data it can be inferred that the main Government goldfish breeder farm could be free for SVCV. However, for regulatory purposes farm should obtain two years of negative SVCV results to consider free and to retain that free status farm must continue to have annual SVCV testing.

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References

- Ahne, W., Bjorklund, H.V., Essbauer, S., Fijan, N., Kurath, G. and Winton, J.R. 2002. Spring viremia of carp (SVC). *Dis. Aquat. Org.* **52**: 261-272.
- Alexandrino, A.C., Ranzani-Paiva, M.J.T. and Romano, L.A. 1998. Identificación de viremia primaveral de la carpa (VPC) *Carrassius auratus* en San Pablo, Brasil. *Revista Ceres*, **45**: 125–137.
- Ariel, E. 2005. Ornamental fish as trans-boundary vectors of viral diseases. In P. Walker, R. Lester and M.G. Bondad-Reantaso (eds). *Diseases in Asian Aquaculture V*, pp. 103-112. Fish Health Section, Asian Fisheries Society, Manila.
- Barbara, D.P., Allen, C.R., Ruth, E.K., Roy, Y. and Ruth, F.F. 2002. Spring Viremia of Carp. Fact Sheet VM-142, Department of Fisheries and Aquatic Sciences, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. <http://www.aces.edu/dept/fisheries/education/ras/publications/Update/Spring%20Viremia%20of%20Carp.pdf>
- Bondad-Reantaso, M.G., Subasinghe, R.P., Arthur, J.R., Ogawa, K., Chinabut, S., Adlard, R., Tan, Z., Shariff, M. 2005. Disease and health management in Asian aquaculture. *Vet Parasitol* **132**:249–272.
- Department of Census and Statistics Sri Lanka (DCSS), 2012. Quantity and value of exports of fish and fishery products 2005-2009. www.statistics.gov.lk/abstract2010/chapters/Chap5/AB5-36.pdf
- Dikkeboom, A.L., Radi, C., Toohey-Kurth, K., Marquenski, S.V., Engel, M., Goodwin, A.E., Way, K., Stone, M. and Longshaw, C.B. 2004. First report of spring viremia of carp virus (SVCV) in wild common carp in North America. *J. Aquat. Anim. Health*, **16**: 169–178.
- Dixon, P.F. 2006. Datasheet on spring viraemia of carp. In: *Aquaculture Compendium*. CAB International, Wallingford, UK, Online at www.cabicompendium.org/ac and CD.
- Fijan, N., Petrincic, Z., Sulimanovic, D. and Zwillenberg, L.O. 1971. Isolation of the causative agent from the acute form of infectious dropsy of carp. *Vet. Arch. Zagreb*, **41**: 125-138.
- Goodwin, A.E. 2002. First report of spring viremia of carp virus (SVCV) in North America. *J. Aquat. Anim. Health*, **14**: 161–164.
- Goodwin, A.E. 2009. Spring Viremia of Carp Virus (SVCV): Global Status of Outbreaks, Diagnosis, Surveillance, and Research. *Isr.j.aquac.* - Bamidgeh, **61**: 180-187.
- Lio-Po, G., Amar, E., Pena, L.D.L., Orozco, Z.G., Faisan, J., Suarnaba, V. and Tubo, D.B. 2009. Surveillance of emerging fish viral pathogens in some Southeast Asian countries. *Isr.j.aquac.* - Bamidgeh, **61**(3): 208-214.
- Liu, H., Gao, L., Shi, X., Gu, T., Jiang, Y. and Chen, H. 2004. Isolation of spring viraemia of carp virus (SVCV) from cultured koi (*Cyprinus carpio koi*) and common carp (*C. carpio carpio*) in PR China. *Bull. Eur. Assoc. Fish Pathol.*, **24**: 194–202.
- Miller, O., Filler, F.J., Gebreyes, W.A., Lewbart, G.A., Shchelkunov, I.S., Shivappa, R.B., Joiner, C., Woolford, G., Stone, D.M., Dixon, P.F., Raley, M.E. and Levine, J.F. 2007. Phylogenetic analysis of spring viremia of carp virus reveals distinct subgroups with common origins for recent isolates in North America and UK. *Dis. Aquat. Org.* **76**: 193-204.
- OIE. 2009. OIE Manual of Diagnostic Tests for Aquatic Animals. World Organization for Animal Health. http://www.oie.int/fileadmin/Home/eng/Health_standards/aahm/2010/2.3.08_SVC.pdf
- Ostroff, S.M. 1999. Emerging infectious diseases 1997–1998: the role of molecular epidemiology. *Mem Inst Oswaldo Cruz* **94**:1–3.
- Ramachandran, A. 2006. Prospects of marketing the indigenous ornamental fishes of Kerala. Faculty of Marine Sciences, Cochin University of Science and Technology, Cochin, India. http://shodhganga.inflibnet.ac.in/bitstream/10603/2658/13/13_chapter%207.pdf
- Shivappa, R., Kozlowicz, S., Rolland, J., Corsin, F., Way, K. and Levine, J. 2008. Spring viremia of carp in the United States of America: evaluation of current diagnostics, pp. 143-156. In Bondad-Reantaso, M.G., Mohan, C.V., Crumlish, M. and Subasinghe, R.P. (eds.). *Diseases in Asian Aquaculture VI*. Fish Health Section, Asian Fisheries Society, Manila, Philippines. 505 pp
- Stone, D.M., Ahne, W., Denham, K.D., Dixon, P.F., Liu, C.T.Y., Sheppard, A.M., Taylor, G.R., Way, K. 2003. Nucleotide sequence analysis of the glycoprotein gene of putative spring viraemia of carp virus and pike fry rhabdovirus isolates reveals four genogroups. *Dis Aquat Org* **53**:203–210.
- Wolf, K. 1988. *Fish Viruses and Fish Viral Diseases*. Cornell University Press, New York.

Animal Welfare

WSPA Campaign for Animal Protection in India

73% of Indians think the treatment of animals is a serious challenge in our society, according to new research released today by WSPA. The research was unveiled as we launched our campaign for animal protection in India; and on the day we announced the successful completion of our work to help end bear dancing in India.

The statistics highlight just how strongly people in India believe that animals need protection. 87% of Indians agree that animals have as many rights as people – more than anywhere else in the world.

Speaking at the launch event, WSPA CEO Mike Baker, said: “It is inspiring to see that animals matter to people in India. At WSPA, we know that animals also matter to the planet – protecting them is vital to any successful response to the biggest issues of our time, from disasters and climate change, to stable food supplies and good health. It gives me great pleasure to help launch our campaign for animal protection in India, building on the successes we have already achieved here. The welfare of animals affects us all, and protecting them cannot wait.”

WSPA has protected animals around the globe for more than 30 years and is working in more than 50 countries, creating positive change by exposing cruelty and pioneering sustainable solutions. Solutions like its alternative livelihoods programme, implemented with the

Wildlife Trust of India, to help end the cruelty of bear dancing.

WSPA’s role in helping to end the practice of bear dancing was acknowledged today by the Government of India, as it launched a new National Bear Conservation and Welfare Action Plan, also contributed to by WSPA.

Speaking alongside Mike Baker at the WSPA launch, Gajender Sharma, Country Director, WSPA India, said: “As we close our alternative livelihoods programme, WSPA India is launching its campaign for wider animal protection. We will be working in collaboration with government, communities and organisations to improve animals’ lives, from stopping the pain of individual animals caught up in disasters, and supporting dog vaccination as the only effective rabies response, to putting animals at the heart of farming.”

Protecting Animals In India Cannot Wait

The words "Animals matter to the planet - protecting them is vital to any successful response to the biggest issues of our time, from disasters and climate change, to stable food supplies and good health", marked the commencement of a panel discussion held to flush out the new research released in November by the World Society for the Protection of Animals (WSPA) in New Delhi.



L-R: Gajender Sharma, Major Gen. R.M. Kharb, Dr. Chinny Krishna, Mike Baker, Emily Reeves



At the launch of the campaign

The research, commissioned by WSPA and undertaken by prominent research agencies GlobeScan and TNS Global brought to light that 73% of Indians think that the treatment of animals is a serious challenge in our society. The statistics also highlighted just how strongly people in India believe that animals need protection. 87% of Indians agreed that animals have as many rights as people - a number more than anywhere else in the world. Realising the need of the hour, WSPA launched a campaign to protect animals in India on the same day when the Indian Minister of Forests and Environment, Jayanti Natarajan launched the National Bear Action Plan.

Mike Baker, the CEO of WSPA, while sharing the research made his passionate call for action, "The welfare of animals affects us all, and protecting them cannot wait." Other panelists who fleshed out these findings with live examples comprised Major Gen. R.M. Kharb, Chairman, Animal Welfare Board of India (AWBI), Dr. Chinny Krishna, Vice Chairman AWBI and Emily Reeves, Director of Programmes, WSPA (Asia Pacific).

"This campaign is necessary as human-animal conflicts are increasing and animals usually loose in these. Also, enforcement of animal protection laws in India is a big grey area," said Maj. Gen. Kharb.

Dr. Krishna substantiated the same: "India had the finest animal protection laws in the world. But their implementation is woefully poor. Indians believe that every life is sacred. And yet what we do to animals should shame us."

The panel discussion concluded with the hope that cruelty to other animals could also be brought to limelight and collaborative efforts could bring about sustainable change for animals as well as humans. As Ms. Reeves highlighted, "Collaborative efforts which had led to the end of the cruel practice of bear dancing could also come into play for the protection of animals in general such that we live in a world where animals matter."

This collaborative approach was highlighted in the address made on behalf of the President of Commonwealth Veterinary Association, Dr. Abdul Rahman who said that it was "heartening to note that WSPA which has been active in India will be spearheading many more animal welfare activities through its India office and the Commonwealth Veterinary Association will be a partner in these activities."

WSPA Celebrates Protection of Bears in India

India has launched a world-class National Action Plan to help prevent cruelty to bears and protect vulnerable populations in the wild. During the launch of the National Bear Conservation and Welfare Action Plan (NBCWAP), The Minister for Environment and Forests, The Hon. Jayanti Natrajan also thanked WSPA for its contribution to reducing bear dancing in India. The strategy will help protect bear populations in the 26 states where they are found in the wild and tackle the illegal trade in bear body parts and bear cubs, reducing human-bear conflicts, retaliatory bear killings, and habitat loss. It will also prevent the re-emergence of the brutal practice of bear dancing. With the plan underway, WSPA is proud to announce the completion of 17 years of bear welfare work in India and the successful closure of our alternative livelihoods programme with partners the Wildlife Trust of India (WTI). This project has empowered Kalandars – the traditional dancing bear owners – to take on new careers of their choice, providing stable incomes for their families while releasing their bears from lives of misery. With five sons and four daughters, Sher Ali struggled to support his large family on the minimal wage he earned from performing with his bear. Moving from village to

village meant his children could not attend school. After handing over his bear, Sher purchased four acres of land with our support. He now raises two crops every year, his children attend classes and he says he no longer wants to keep bears or has any desire to perform with them.

The project has had a 100 per cent success rate, with none of the final 50 Kalandars – some of the last to surrender their bears and most resistant to changing their livelihoods – returning to the cruel practice. Three quarters of participants continue to earn above average wages after 12 months in their alternate careers.

Before the end of bear dancing, over a hundred bear cubs were poached from the wild every year. Cubs had their teeth knocked out and their noses pierced with hot needles. Nose rings were used to train the bears to dance with their owners who would move from village to village performing for income.

WSPA has also worked with WTI to develop and deliver anti-poaching and surveillance training to over

400 Government forestry staff and volunteers to prevent bears from being taken from the wild. The Government will maintain and expand this training as part of the new NBCWAP. In addition, the NBCWAP will provide a valuable framework for the ongoing work that is needed to ensure bears are protected in India.

Rescued dancing bears are being cared for in life long care centres managed by Wildlife SOS, International Animal Rescue, and Free the Bears in partnership with the Indian Government. These centres provide a safe home for 395 bears, receiving world-class veterinary care and husbandry as they recover from the many physical and psychological scars left after their lives of torture as dancing bears. These sanctuaries are part of a broader programme of work by Wildlife SOS that has helped to end bear dancing in India.

Speaking at the International Conference on Bear Research & Management (IBA) in New Delhi, WSPA CEO Mike Baker said it was a day of celebration for all those who have worked to protect bears in India: "Bears here in India have finally been recognized as the magnificent creatures they are. No longer are they viewed as commodities and treated cruelly for entertainment. They are truly protected in their natural environment, taking their rightful place alongside other treasured wild animals such as tigers and elephants."

Gajender Sharma, Country Director, WSPA India, added: "Working with WTI we have increased awareness of animal welfare issues in remote communities and empowered Kalandars to move into jobs that do not inflict cruelty on animals. The lives of the bears have been transformed forever and so too have the lives of the Kalandars and their families."

With our programme to protect bears in India complete, we will be expanding our campaign for wider animal protection . Find out more.

~ WSPA India, Nov 26, 2012

Joining forces to save dogs in China

The World Society for the Protection of Animals (WSPA) and the China Animal Disease Control Center (CADC) have signed an exciting agreement to work together on a four-year project to save at least 500,000 dogs from being needlessly culled in response to rabies.

Preliminary research indicates that tens of thousands of dogs are culled annually due to rabies in China, especially in the southern and eastern provinces. But, as research has proven again and again, culling dogs does not stop rabies.

As this deadly disease continues to spread to the north and west of the country, the risk of even more dogs being needlessly killed increases. Through our global Collars Not Cruelty campaign, WSPA is calling for an end to this brutal killing by promoting the only effective and sustainable solution to rabies: mass dog vaccination.

Now, with the China Animal Disease Control Center as partners, we can make real inroads to protecting animals' lives in China.

Phase One: Making the Case Against Cruelty

The first phase of this project will focus on researching and identifying opportunities to demonstrate the effectiveness of vaccination to control rabies in China, including setting up pilot mass dog vaccination programmes and intervening in selected areas where culling for rabies control has been carried out.

The results of this work will form the foundation of a compelling business case to support the Chinese government in adopting this humane approach nationally.

~ WSPA International, Jan 15, 2013

H5N1 hits Bangladeshi Poultry Farm

Livestock officials in Bangladesh reported that H5N1 avian flu has struck another commercial farm in Dhaka division, according to a report to the World Organization for Animal Health (OIE).

The outbreak began in the middle of December in Gazipur district, and killed 8,509 birds. Officials culled

the farm's remaining 144,968 poultry to prevent disease spread. The source of the outbreak hasn't been determined. The country's last H5N1 outbreak in poultry occurred in October 2012 and also involved a commercial farm in Gazipur district.

~ CIDRAP News, 5 Feb 2013

WSPA's education programme wins award

WSPA India has won the 'Best Outreach Programme on Animal Welfare' award, for our 'First Concepts in Animal Welfare' programme run in New Delhi, at the annual welfare awards ceremony organised by the Federation of Indian Animal Protection Organisations (FIAPO).

The award ceremony was a part of the India for Animals Conference, held in Goa (16 - 18 November). This annual event brings together animal protection activists and organisations at a national level to celebrate animal protection across India. Around 200 delegates from 100 animal welfare organizations, including some international participants, regularly attend this annual event.

The judges were of the unanimous opinion that the outreach efforts of FCAW project were commendable.

The FCAW programme emphasises the importance of animal welfare knowledge in becoming responsible global citizens, integrating animal welfare education into the existing curriculum of 5-16 year olds.

Gajender K. Sharma, Country Director of WSPA India, who received the award on behalf of our education team said: "It is great to see that the animal welfare education is valued here in India - this programme is helping us to make animals matter. The year 2012 began with the FCAW programme being endorsed by UNESCO and it is ending with this award. This inspires us to reach out to more schools, teachers and children in 2013."

~ WSPA India, Nov 17, 2012

9th AREB Meeting

The 9th Asian Rabies Expert Bureau (AREB) Meeting was held from 1-5 October 2012 at Yogyakarta, Indonesia.

Dr. S. Abdul Rahman, President, CVA who is also the President of Association for Prevention and Control of Rabies in India (APCRI) was invited to give a keynote lecture on "*The One Health Approach towards Rabies Elimination in Asia*" and a presentation on "*Rabies situation and rabies control and elimination program in India - An animal health perspective*".

It's official: animals matter in Costa Rica

There is cause for celebration in Central America, with the government of Costa Rica giving official backing to a Universal Declaration on Animal Welfare (UDAW). This longstanding WSPA initiative works to encourage every United Nations member state to recognise that animals can feel and suffer, and should be protected from mistreatment.

It's a long-term goal but one with momentum. With Costa Rica's official backing, there are now 44 nations across the world supporting a UDAW, from Serbia to the Seychelles, Belgium to Bolivia. In addition, over 2 million individuals have joined the public campaign: Animals Matter.

More than just a document

Alfio Piva, Vice-President of the Republic of Costa Rica, ratified government support for a UDAW in capital city San José. He was joined by Provincial Mayor Johnny Araya Monge, who also signed his name to endorse the Declaration.

At a public meeting held in a local community library, Mr Piva stated: "This is not just a document. It's a matter of respect, of love and of solidarity with animals, who do have the capacity of feeling agony and suffering. So it should not seem strange when we uphold the premise that human beings have an ethical responsibility to animals."

This official endorsement is the culmination of Costa Rica's positive engagement with the campaign for a UDAW: in 2008 then-President Óscar Arias backed Animals Matter and became the one millionth personal signatory in support of a Universal Declaration on Animal Welfare to be adopted by the United Nations.

Seeing the funny side

The same public event also closed the UDAW cartoon initiative, which gathered a wide sample of international graphic humour to promote a Declaration.

With more than 340 cartoons by 179 artists from 48 countries, this event proved the inspirational power of WSPA's vision: a world where animal welfare matters and animal cruelty has ended.

~ WSPA International, Nov 28, 2012

3rd OIE Global Conference on Animal Welfare

The 3rd OIE Global Conference on Animal Welfare was held from 6-8 November 2012 at Kuala Lumpur, Malaysia. The conference was attended by over 300 delegates from all over the world. The conference was inaugurated by Dr. Bernard Vallat, Director General of OIE. Dr. S. Abdul Rahman, President of CVA and Chairman of the OIE Animal Welfare Working Group attended the conference. The following recommendations and resolutions were finalised at the conference.

Recommendations considering that:

- Global improvements in animal health and welfare are components of economic and social development and that a progressive implementation of OIE standards on animal welfare, adapted to the economic situation and capacities of Member Countries must be promoted;
- animal health is a key component of animal welfare;
- one of the objectives of the OIE is to facilitate safe international trade in animals and animal products;
- the OIE is the global reference organisation for the elaboration of international standards for animal health and welfare;
- the OIE Strategic Plans have included animal welfare since 2001 and that the current Strategic Plan contains provisions for integrated actions, coordination and planning on terrestrial and aquatic animal welfare at the national, regional and global level;
- the OIE has described Veterinary Services' responsibilities for animal welfare in the Terrestrial Animal Health Code (Terrestrial Code) and included appropriate references in the OIE PVS Tool (Performance of Veterinary Services);
- a large majority of OIE Member Countries have already nominated national focal points for animal welfare;
- some private sector specifications for animal welfare are not consistent with the OIE standards;
- OIE regional strategies, based on global animal welfare standards, represent a shared vision between government and the private sector, built upon collaboration between interested parties, including animal health, public health, industry (production, transport and processing), academic and research sectors;
- animal welfare standards should be democratically and transparently adopted and based on both



Dr Bernard Vallat at the inaugural speech

science and practical experience, bearing in mind the production systems and uses of animals of each Member Country and the relevant environmental, regional, geographic, economic, cultural and religious aspects;

- science should be the basis for the preparation of international standards and these should be appropriately evaluated and validated taking into account the different characteristics and contexts relevant to the Member Countries;
- the need to promote scientific research, capacity building, education and communication in the animal welfare area;
- the ongoing work of the OIE in reinforcing the capacity of Veterinary Services and Aquatic Animal Health Services, using the OIE PVS Pathway, standards on veterinary legislation, the OIE Terrestrial Code and the OIE Aquatic Animal Health Code (Aquatic Code) in general
- the global initiative of twinning programmes for OIE Collaborating Centres, Veterinary education establishments and Veterinary Statutory Bodies, based on the successful global initiative for twinning of veterinary laboratories;
- the OIE is working with global private sector organisations to harmonise public and private animal welfare standards;
- a number of important and relevant topics and issues were identified at the 3rd OIE Global Conference on Animal Welfare including the critical importance of communities and their leaders and religious leaders in raising awareness and support for implementation of OIE animal welfare standards.

□

International News

Work of GARC Founder Deborah Briggs recognised with Encore.org Purpose Prize Fellowship

Deborah Briggs, a founding member of the Global Alliance for Rabies Control (GARC), was today announced as a Purpose Prize Fellow. This year's Purpose Prize Fellows were selected from over 800 nominees and are finalists for the prestigious Purpose Prize, which awards 5 recipients \$100,000.00 in recognition of their efforts in social entrepreneurship.



Dr Deborah Briggs

power of this approach, perhaps most effectively in our work on the island of Bohol in the Phillipines. This island of more than a million people used to have a significant rate of rabies deaths, but after just three years of working with the community we have been able to eliminate rabies in the dogs of Bohol, dramatically changing the life chances for the whole population."

Dr Briggs, Executive Director of GARC, was recognised for her continuing work in fighting the scourge of rabies worldwide. Rabies is the most lethal of all infectious diseases and kills one person every ten minutes, yet it is also 100% preventable. Dr Briggs and GARC work around the world to educate local communities, empower them to take responsibility for rabies prevention and bring together experts to share knowledge and advance our understanding of this overlooked and much misunderstood disease.

The Purpose Prize was established by Encore.org to raise awareness of the impact of those over 60 who have dedicated the second half of their life to making a positive impact on society. "Purpose Prize fellows are using their passion and experience to help solve some of society's steepest challenges," said Marc Freedman, founder and CEO of Encore.org and author of *The Big Shift*. "They represent a growing wave of people in their 60s and beyond who are using their knowhow to change the world, while shifting perceptions of what is possible in this stage of life."

Dr Briggs is acknowledged as a global expert on rabies, having worked on the disease with both the Centers for Disease Control (CDC) in the USA and the World Health Organization. In response to what she saw as a pressing need for a dramatic change in the approach to rabies education and prevention, in 2006 she left her position at the CDC to establish GARC. "It seemed to me that there were many challenges to be overcome in the fight against rabies and that the best way to overcome these was to use my years of experience to bring people together and work directly with the communities affected," said Dr Briggs. "The years since have demonstrated the

Dr Briggs spoke of her feelings on becoming a Purpose Prize Fellow, "I am delighted and proud to have received this prestigious accolade, not just personally, but in recognition of the incredibly important work done by everyone involved in GARC. I hope that it will help to raise awareness of the need for this vital work to continue, and hope that it might also inspire other scientists in the second half of their careers to use their years of experience to help change the world for the better in whichever way they can."

6th Pan Commonwealth Veterinary Conference at Kuala Lumpur, Malaysia in 2015

The venue of the 6th Pan Commonwealth Veterinary Conference has been selected as Kuala Lumpur, Malaysia in 2015. Dr Abdul Rahman, President, CVA visited Kuala Lumpur on 9 November 2012 and had discussions with the Executive Committee of Veterinary Association Malaysia (VAM) and the Dean of Universiti Putra Malaysia.

The President of VAM, Dato' Dr. Vincent Ng In Hooi and the President-Elect Dr. Paul Chelliah who is also the CVA Councillor of Malaysia have assured all support to CVA in the organisation of this conference.

Commonwealth News

Sir Anand Satyanand appointed Chair of the Commonwealth Foundation

The Commonwealth Secretary-General, HE Kamallesh Sharma, today announced The Right Honourable **Sir Anand Satyanand** from New Zealand as Chair of the Commonwealth Foundation. Appointed by Heads of Government, Sir Satyanand will serve an initial term of up to two years.



Sir Anand Satyanand

Sir Satyanand served as Governor-General of New Zealand from 2006-2011 having previously completed two five-year terms as one of New Zealand's Parliamentary Ombudsmen.

Sir Satyanand said: 'I am delighted to be appointed as Chair of the Commonwealth Foundation and I look forward to leading the Foundation's role of encouragement for the efforts of civil society organisations and professional groupings.'

As Chair of the Foundation, Sir Satyanand will preside over meetings of its Board of Governors, represent the Foundation at intergovernmental meetings and events, and serve as an ambassador for the Commonwealth Foundation, promoting the Foundation's vision and values.

Vijay Krishnarayan, Commonwealth Foundation Director said: 'We are honoured to welcome Sir Anand Satyanand as the Commonwealth Foundation's new Chair. His background and experience will be real assets to the Foundation and help advance its agenda of citizen participation and inclusion in governance systems.'

Bangladesh rejoins Commonwealth Foundation

The Commonwealth Foundation is delighted to announce that the Government of Bangladesh has decided to renew its membership with immediate effect.

Commonwealth Foundation Director, Vijay Krishnarayan, said: "The Commonwealth Foundation welcomes Bangladesh in to membership of the Commonwealth Foundation. We see this as a re-affirmation of Bangladesh's commitment to the Commonwealth's principles and priorities. In particular it highlights the importance that the Government of Bangladesh places on a plural, independent and effective civil society that is able to contribute fully to making development and democracy sustainable."

The Foundation looks forward to continuing collaboration with colleagues in both Dhaka and the mission in London in preparation for the Partners' Forum at the forthcoming 10th Women's Affairs Ministerial Meeting, 15-17 June 2013. The theme of the meeting is 'Women's Leadership for Enterprise'.

The High Commissioner for Bangladesh in London, H E Mohamed Mijarul Quayes said: "The Commonwealth Foundation is unique in its capacity for promoting effective networking and knowledge sharing among the civil society in the Commonwealth. Bangladesh can be rightly proud of its strong civil society that has played an active role in making a difference in socio-economic development as also in mainstreaming empowerment, inclusion and gender in the public discourse. With Bangladesh's re-entry into the Commonwealth Foundation, we look forward to enhanced interaction of our civil society with their colleagues across the Commonwealth for the common good of our peoples".

As a Foundation member country, civil society organisations based in Bangladesh may now benefit from the Foundation's grants programme. For more details, visit our website.

~ Commonwealth Foundation

CVA Officers Meeting London

An Officer's Meeting was held in London, where the CVA Work Plan was finalised following the Recommendations and Resolutions of the 5th Pan Commonwealth Veterinary Conference in Accra, Ghana in 2011. The priority of the work plan is to focus on Continuous Professional Development of Veterinarians. Taking immediate action on the implementation of this objective Dr. Jeff Cave, CVA Councillor Australia and Dr. Sam Okech, former President, Uganda Veterinary Association prepared a scoping paper and following this the CVA has appointed Dr. Chris Daborn, an experienced British Veterinarian in Tanzania as its Technical Advisor on CPD. A Pilot CPD Programme involving the ECS African Region is being prepared for implementation this year.



At the Officers Meeting

L-R: Drs Peter Thornber, Karen Reed, Abdul Rahman, Richard Suu-ire and Bob McCracken

The officers also discussed the signing of a MOU with OIE and the affiliation of new Associate members, Humane Society International (HSI) and Compassion in World Farming (CIWF).

The President briefed the members of the Rabies project in India contracted through Crucell and CVA to the Bangalore Veterinary College. This project which is funded through Crucell Laboratories provides CVA with a further link to others interested in rabies such as Merial and OIE. In addition the strong links with WSPA and OIE would be helpful in planning addition projects on Rabies and Disaster Management in Africa and Asia.

The Officers also discussed the difficulties which CVA was facing due to the current economic climate and the need to focus on ways to improve membership and finances.

The amended CVA constitution which was approved by Executive Council Meeting was reviewed and it was agreed by the Officers to incorporate it into the CVA Handbook of 2013.

CVA Officers visited Commonwealth Foundation and met Ms. Myn Garcia, Deputy Director and briefed her on the activities of the association especially the projects which were being funded by CF. Ms. Myn assured the officers of the support and encouragement of the CF to the CVA.



CVA Officers at the Commonwealth Foundation

L-R: Drs Bob McCracken, Abdul Rahman, Ms. Myn Garcia, Richard Suu-ire and Peter Thornber

CVA Officers also visited World Society for the Protection of Animals (WSPA) and met Mr. Mike Baker, Chief Executive Officer of WSPA. Various issues pertaining to animal welfare in the Commonwealth countries such as dog population management, disaster management, farm animal welfare and most importantly control of zoonotic diseases such as Rabies were discussed. Future collaboration between WSPA and CVA in the production of the CVA journal and partnership in projects and regional meetings was also discussed. Mr. Mike Baker assured the officers of WSPA's continued support to CVA.

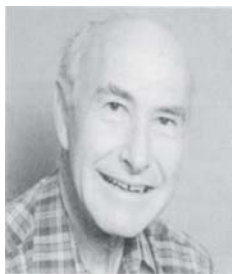


CVA Officers at the WSPA

L-R: Drs Peter Thornber, Mr. Mike Baker, S. Abdul Rahman, Richard Suu-ire and Bob McCracken

Dr Brian Derbyshire Retires from the CVA Book Programme

After two decades, **Dr. Brian Derbyshire** has decided that it is time to retire from being the Coordinator of the CVA Book Programme. Dr Derbyshire coordinated the program from the Ontario Veterinary College at the University of Guelph, Canada assisted by Mr Jim Brett, the College Librarian.



Dr. Brian Derbyshire

During the past two decades the program has been a flag ship of the CVA. Dr. Derbyshire's unassuming hard work has benefitted numerous veterinarians throughout the Commonwealth. His work has been greatly appreciated not only by the

CVA but also by numerous other National Veterinary Associations. As an acknowledgement of his work Dr. Derbyshire was awarded **Honorary Life Membership of the CVA** in 2011 making him one of just three people to have been given the award.

The CVA wishes Dr. Derbyshire a prosperous and peaceful retired life.

Dr. Jeff Cave will now coordinate the program from Australia. Dr. Derbyshire's contribution will be sorely missed.

Chris Daborn - Joins the CVA CPD Programme As Technical Advisor

Dr. Chris Daborn, a British veterinarian and long term resident of Africa, has joined the Commonwealth Veterinary Association [CVA] as a Technical Advisor to assist launch the CVA Continual Professional Development [CPD] programme. Chris qualified from London RVC in 1974 and after one year in general practice in the UK has worked the subsequent 38 years in or for overseas livestock development - mostly in Africa. He has experienced periods as a government, private, academic, research, NGO and latterly as a consultant veterinarian. Key career moments have been the seven years as supervisor of the MSc Course in Tropical Veterinary Medicine at the Centre for Tropical Veterinary Medicine [CTVM], Edinburgh University and accreditation, by the OIE, as a Performance of Veterinary Service [PVS] and Gap-Analysis expert. Chris was presented in 2010 with the Trevor Blackburn Award by the British Veterinary Association in recognition of his work for overseas veterinary services.



Dr. Chris Daborn

The majority of people in Africa are dependent, to a greater or lesser extent, on livestock for their livelihood and, in many cases for their very survival. Chris recognises that this presents the veterinary profession in Africa with the important challenge of providing livestock keepers [subsistence through to commercial] with sustainable and quality veterinary services that encompass marketing, production and health. Since 2007 Chris has undertaken a number of individual country PVS and Gap Analysis assessments, including North and South Sudan which has the largest livestock population in Africa, learning much of the range and extent of the resource challenges the

various Veterinary Services face. He remains absolutely and increasingly convinced of two core observations: "The livestock production potential of Africa is enormous - it could be the animal protein safe of the world", and, given the resources, "There are available and applicable approaches and techniques for veterinarians to extend and enable livestock keepers realise universal and significant gains in continent wide livestock productivity, and that "protein safe" status".

The increasing recognition of Africa's livestock production potential makes this is a good time as ever to advocate for strategically applied and substantial livestock sector programme funding to strengthen the capacity of public / private / community partnerships to deliver quality veterinary services throughout the continent. To achieve this Chris comments that "We, the veterinary profession in Africa, need to significantly sharpen up our act in terms of our competency and effectiveness for which we critically need to undertake accessible and affordable Continuing Professional Development [CPD]". Many countries in Africa are now seeking to establish a CPD programme to raise the standards of practice by both veterinarians and veterinary para-professionals, who are themselves actively looking for CPD to improve their career prospects and levels of remuneration. Chris has set his course, for the foreseeable future, towards the aim of guiding the CVA CPD programme contribute to a more informed and effective veterinary professions competent to deliver an improved quality of veterinary service throughout Africa and the wider Commonwealth.

Book & Journal Programme



Dr. Jeff Cave

The CVA Book Programme is coordinated by Dr. Jeff Cave

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The CVA Book Programme is coordinated by Dr. Jeff Cave in Australia. Books are donated by veterinarians in Australia and New Zealand, all of whom are thanked for their generosity, without which the programme would not exist. They are available for distribution free of charge to graduate veterinarians, but not undergraduate veterinary students, in CVA member countries in good standing. Priority is given to requests from institutional libraries, such as veterinary schools and veterinary associations, and requests from individuals are met as funds permit. Postgraduate students are encouraged to submit their requests through the librarian at their institution, to

ensure that the books will be widely available. Because of budgetary constraints and steeply rising mailing costs, the number of books which can be shipped is normally restricted to up to 30 titles for institutions, and up to 5 titles for individual veterinarians in any one year. Individual veterinarians are encouraged to share their books with colleagues in their area if possible.

Requests for books should indicate the required subject areas and/or preferred titles where possible, and they should include the mailing address to which the books should be sent. The latter should be abbreviated as much as possible in order that it may be accommodated in the limited space provided on the customs declaration. It is suggested that those wishing to submit a request should first obtain a copy of the current inventories of books available by contacting, preferably by e-mail, Dr. Cave (see above for contact information). Shipments are made by surface mail, and may take several months to reach their destination. The recipients are requested to acknowledge the safe arrival of the books.

During the period 2012, from Australia and New Zealand, 424 books were sent to 17 different countries as follows: Uganda 84, East Timor 43, Papua New Guinea 41, India 36, Nigeria 36, South Africa 36, Swaziland 26, Ghana 23, Belize 22, Mozambique 17, Trinidad and Tobago 14, St Vincent 11, Kenya 9, Tanzania 9, Zambia 9, Niue 5 and Zimbabwe 3. The current inventory in Australia and New Zealand comprises over 500 titles. Multiple copies of many titles are held. Most of the books were published during the last 20 years; older texts, for which more recent editions are available, are discarded each year. Most areas of veterinary medicine are covered.

January 2013

JEFF CAVE
 Coordinator – CVA Book Programme

CVA-CPD Pilot Program in East Africa

The Commonwealth Veterinary Association (CVA) is pleased to announce the launch of its Continuing Professional Development (CPD) pilot program on 1 January 2013. The program is a result of agreements made between the CVA and Veterinary Associations in Tanzania, Kenya, Uganda and Ethiopia, and the Veterinary Faculty of Khartoum, Sudan.

The results of the pilot program will be used to inform a proposal to deliver a major CPD Support Program, potentially to the rest of the Commonwealth, in 2014.

In addition to attendance at formal events, such as lectures and conferences, eLearning will be promoted, and the program will also trial the use of CDs, DVDs and online information for self-study, research and higher qualifications.

If you have any feedback, ideas or information about existing materials that are readily available, or could be adapted for the purposes of the program, please contact Jeff Cave at Jeff.Cave@dpi.vic.gov.au or Chris Daborn at tvsh@habari.co.tz



The Fund

This fund has been established by the Commonwealth Veterinary Association (CVA) in conjunction with the Commonwealth Foundation to honour the contributions made by Mr. John Anderson and Dr. L.P.E. Choquette in establishing and promoting the activities of the Commonwealth Veterinary Association.

Financial support to match the funds contributed by the Commonwealth Veterinary Association and the several national and local veterinary associations throughout the Commonwealth may be provided by the Commonwealth Foundation.

1. Purpose

Its purpose is to provide financial assistance to:

1. Veterinarians who are members in good standing of their respective national associations to undertake short term study visits to schools, institutions or to undertake short term study courses in veterinary medicine, animal production or related areas in other Commonwealth countries.
2. Animal Health Assistants recommended by the appropriate CVA Council Member and Regional Representative, to undergo further short-term training at a school or institution in another Commonwealth country. It is expected that such visits will promote professional and para-professional contacts and provide grantees with new knowledge and expertise in their respective fields of interest. Study proposals which will directly benefit the rural poor and disadvantaged will receive sympathetic consideration. All proposals will be expected to describe how they will benefit the home institution, veterinary organization and community. The visit is also expected to result in a broadening of cultural experience and horizons and to promote Commonwealth understanding.

2. Guidelines

1. Grants will be limited to persons with field experience and not holding senior positions.
2. The awards are not normally available for University academic or research staff.
3. Preference will be given to related regions with 'south-south' movements being encouraged. In exceptional cases, visits to institutions outside the regions qualifying under south-south arrangement will be considered as long as the cost of the visit does not exceed the allocated fund award (Aus \$ 3000). In exceptional circumstances and where approved by the President grantees may receive training in a non-Commonwealth country within that Region.
4. The study period should be preferably between 2-3 weeks.
5. Awards will normally be distributed equally amongst Regions, however, on occasion, the President may authorize additional awards to a particular Region in any one year.
6. The study visits will be financed at a maximum of Aus \$ 3000 including a prepaid air ticket for the least expensive and most direct route.

7. Grants are provided only for periods of concentrated study or training on a particular topic or activity and cannot be made for attendance at conferences, meetings etc., nor to underwrite a tour of visits to a number of institutions.
8. A report must be submitted to the Secretary CVA within three months of the completion of the study visit. At the completion of the study visit, the participant must receive a letter of release, which should clearly indicate duration of stay, and satisfactory completion of course. The letter should also confirm that at the time of departure, the participants have not left any debts unsettled. This requirement must be conveyed by the Regional Representative or Programme Director to the host institution before arrival of participant.
9. It will be necessary for the host institution to agree to assist in arranging suitable accommodation etc. affordable by the applicant.
10. Grantees will be expected to give one or two lectures at the host institution or veterinary association on aspects of animal health and production activities in their home country. These lectures should emphasize how their studies in the host country will benefit the rural poor and disadvantaged as well as their impact upon the environment.
11. These lectures and the discussions of topics, both professional and social, with the staff of the host institution or veterinary association will serve to further the aims and objectives of the Commonwealth Veterinary Association.

3. Applications

- i) There is a set Study Application Form/Application. Forms are available from the CVA Secretary, or through the CVA Website.
- ii) Applications should be submitted to the appropriate Regional Representative for processing, at least 6 months prior to the proposal visit.
- iii) The applicants should provide the following:
 - a) A complete curriculum vitae to the Regional Representative
 - b) Two passport size photographs
 - c) A letter of acceptance from the person who will supervise the study program in the host country
 - d) Evidence that the study has the support of his/her home institution or national association

4. Administration

- i) The Study Application Form with supporting documents must be sent to the appropriate Regional Representative
- ii) The Regional Representative will review the application and make a recommendation to the Secretary, CVA.
- iii) The Secretary, CVA will make a recommendation to the CVA President, who will make the final decision.
- iv) The Secretary, CVA will then inform the Regional Representative who will inform the candidate.

Last date of submission of request to Council Members/Reg. Rep. is 30th Oct. 2013. RRs to submit their recommendations before 30th Nov. 2013 to the Secretary, CVA.



17th Asian Regional Meeting and Conference of Commonwealth Veterinary Association

The 17th Asian Regional Meeting and Conference of the Commonwealth Veterinary Association was held at Bangalore from 28-31 January, 2013.

The theme of the Conference was "**Strengthening of Rabies Diagnosis and Dog Population Control in the Indian Sub-continent**".

This conference was organised jointly by the Commonwealth Veterinary Association and Veterinary College, Bangalore, Karnataka Veterinary, Animal and Fisheries Sciences University (KVAFSU) and supported by Indian Veterinary Association (IVA), Veterinary Council of India (VCI), Karnataka Veterinary Council (KVC), World Organisation for Animal Health (OIE), Global Alliance for Rabies Control (GARC), World Society for Protection of Animals (WSPA), Association for Prevention and Control of Rabies in India (APCRI), Crucell Holland by Netherlands and Dogs Trust International.

The Conference was inaugurated on Monday 28th January 2013 by Lt. Gen. (Dr.) Narayan Mohanty, President, Veterinary Council of India (VCI). Dr. C. Renukprasad, Vice Chancellor, Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar, Maj. Gen. (Retd.) Dr. R.M. Kharb AVSM, Chairman, Animal Welfare Board of India, Min. of Environment and Forests, Govt. of India, Dr. Dharmendra Sinha, Secretary General, Indian Veterinary Association and Director, Institute of Animal Health & Production, Dept. of Animal Husbandry, Govt. of Bihar and Dr. V. Chandrashekar Murthy, President, Karnataka Veterinary Council (KVC), were the Chief Guests at the Conference.

Dr. S. Abdul Rahman, President, Commonwealth Veterinary Association presided over the function. Dr. A. Sivasothy, Regional Representative, CVA Asian Region, Dr. T. Sreenivas Reddy, President, Karnataka Veterinary Association, Dr. S. Yathiraj, Dean, Bangalore Veterinary College, Dr. H.M. Jayaprakasha, Registrar, KVAFSU, Bidar were also on the Conference Dias.



Dignitaries on the Dias

L-R: Drs K. Isloor, S. Yathiraj, N. Mohanty, S. Abdul Rahman, C. Renukprasad, R.M. Kharb, Dharmendra Sinha, and V. Chandrashekar Murthy



Lighting the lamp at the Conference

L-R: Drs K. Isloor, S. Yathiraj, N. Mohanty (lighting the lamp), S. Abdul Rahman, Dharmendra Sinha, R.M. Kharb and C. Renukprasad

Over 200 delegates from India and abroad attended the conference. The countries represented were Afghanistan, Australia, Bangladesh, Nepal, Sri Lanka, Thailand, United Kingdom and USA in addition to delegates from India.



Dr. N. Mohanty delivering his inaugural address



*Session - The Reality of Rabies: Setting the Scene
L-R: Drs B.J. Mahendra and S. Abdul Rahman*



*Session - Rabies and Dog Population Control
L-R: Drs Charan Kamla Singh and S. Yathiraj*



*Session - Rabies Diagnosis: Key to Successful Control
L-R: Drs Jack Reece and Thomas Mathew*

The Scientific Programme was divided into three sessions namely, 1. The Reality of Rabies: Setting the Scene; 2. Rabies and Dog Population Control and 3. Rabies Diagnosis: Key to Successful Control - Country Reports.

The following were the presentations:

- *NGO's Role in Rabies Control* - Maj. Gen. (Retd.) Dr. R.M. Kharb, India
- *Translating Rabies Research Into Practical Policies & Paradigm Shifts* - Dr. Charles Rupprecht, USA
- *Role of Veterinarians in Rabies Control* - Dr. S. Yathiraj, India
- *Elimination of Human Rabies in India - Proposed National Programme* - Dr. Veena Mittal, Dr. Mala Chhabra and Dr. R.L. Ichhpujani, India (presented by Dr. B.J. Mahendra)
- *Controlling Rabies By Mass Vaccination Without Inhumane Culling Of Dogs* - Dr. Joanna Tuckwell, Australia
- *Dog Population Management In The Indian Sub-Continent* - Dr. Elly Hiby, UK
- *New Diagnostic Tools For Rabies In Animals* - |Dr. Anthony R. Fooks, UK
- *Intersectoral Collaboration In Rabies Control* - Dr. G. Sampath, India
- *Future Opportunities In Canine Immuno-Contraception* - Dr. C.E. Rupprecht, USA
- *Impact Of Dog Population Management Interventions On Human And Animal Rabies In Sri Lanka -Retrospective Review Over Three Decades* - Dr. P.A.L. Harischandra, Sri Lanka

Section of the Audience



Panel Discussion and Conference Participants



At the Panel Discussion

*L-R: Dr. Jack Reece,
Dr. Elly Hiby,
Dr. Charan Kamal Singh,
Dr. S. Yathiraj,
Dr. R.M. Kharb,
Dr. S. Chinny Krishna,
Dr. J.F. Reece,
Dr. S. Abdul Rahman,
Dr. Anthony R. Fooks,
Dr. M.L. Satyanarayana,
Dr. B.J. Mahendra and
Dr. Joanna Tuckwell*



Participants at the Conference

- *Dog Population Management In India With Special Reference To Rabies Control* - Dr. J.F. Reece, India
- *Concepts of Animal Birth Control* - Dr. S. Chinny Krishna, India
- *Red Collar Campaign in Bangladesh* - Dr. Dananjaya Karunaratna, Bangladesh
- *Control Of Rabies Through Oral Vaccination Of Dogs* - Dr. S. Kilari, India
- *Success Of Animal Birth Control Programme To Control Rabies - A Case Study Of Bangalore, India* - Dr. S.A. Parviz Ahmed Piran, India

Also the Country Reports from India, Pakistan, Sri Lanka, Bangladesh, Afghanistan and Nepal were also presented.

This programme also coincided with the Inauguration of the dedicated Rabies Diagnostic Laboratory on Monday 28th January 2013 at the Veterinary College, Bangalore. This state-of-the-art laboratory built at a cost of US\$ 200,000 has all facilities for early diagnosis of Rabies in canines and is the first of its kind in the Indian subcontinent.

CVA Rabies Project in India

The Commonwealth Veterinary Association through Dr. S. Abdul Rahman, President was contracted by Crucell Holland by a private company of Netherlands which is engaged in research development, manufacturing and testing of vaccines and proteins to combat infectious diseases to test its rabies antibody product which is under development termed "CL184 consisting of CR57 and CR4098 antibodies. CVA with its experience in the successful implementation and completion of Rabies projects in Africa and Asia was approached to carry out a rabies surveillance, animal brain rabies confirmation, sequencing and neutralization analysis services in India. This project was presented to the Officer's at the meeting in London in July and the same was approved and Dr. S. Abdul Rahman, President was authorised to take suitable action to implement this project in India.

The CVA in turn approached the Bangalore Veterinary College affiliated to Karnataka Veterinary Animal, Fisheries Sciences University, Bidar and a Memorandum of Understanding was signed between the CVA and KVAFSU for the implementation of this project.

Due to lack of proper laboratory space and equipment at the Veterinary College it was agreed that Crucell would fund KVAFSU through CVA for the setting up of a dedicated Rabies Diagnostic Laboratory exclusively for Rabies work at the Veterinary College, Bangalore and Dr. S. Yathiraj, Dean of the College was entrusted with the planning and building of the laboratory. The laboratory was completed and inaugurated on 28th February 2013. The Laboratory has been named as "**CVA-Crucell-KVAFSU Rabies Diagnostic Laboratory**".

The project entitled "Human Monoclonal Antibody Combination for Post Exposure Prophylaxis of Rabies-Evaluation versus Indian Natural Rabies Virus Strains" has been started under the direction of Dr. Wilfred Marissen, Project Director Crucell, Dr. S. Abdul Rahman, President CVA, Dr. S. Yathiraj, Dean, Bangalore Veterinary College and Dr. K. Isloor Associate Professor of Microbiology. Rabies positive brain samples have been collected from many parts of the country and isolation work is being undertaken. Veterinary Colleges of Chennai, Bombay, Manuthy, Pookode, Anand, Bikaner, Tirupathi, Gannavaram and Hissar will also be involved in the project.

Compulsory microchipping in England: a giant leap for dogs

Veterinary associations have hailed the introduction of compulsory microchipping for all dogs in England as a giant leap forward for dogs and their owners.

Defra has announced that from 6 April 2016 all dogs will be required to have a microchip, giving owners over 3 years to comply with new legislation that will be drafted by Defra.

The British Veterinary Association (BVA) and British Small Animal Veterinary Association (BSAVA) have long campaigned for microchipping to be compulsory for all dogs and both associations are members of the Microchipping Alliance, which has brought many organisations together to lobby for new legislation.

Microchipping is a safe and effective way to permanently identify a dog and, through registration on a database, the dog can be linked to its owner and quickly reunited if it goes missing.

Compulsory microchipping will significantly reduce the number of lost and stray animals being kept by local authorities and charities at enormous cost.

Commenting, BVA President Peter Jones, said:

"The introduction of compulsory microchipping is a giant leap for dogs and their owners and is something that vets have long campaigned for. Microchipping is a safe and effective way to link dogs to their owners and is an essential part of responsible ownership.

"Microchipping is a small cost in terms of dog ownership with veterinary practices offering microchipping for around £15-£20 or for free as part of a practice promotion. Dogs Trust and other rehoming charities are also offering free microchipping at their centres and through local authorities."

~ BVA and BSAVA News Release, 6 Feb 2013

CVA-Crucell-KVAFSU Rabies Diagnostic Laboratory Inaugurated

The CVA-Crucell-KVAFSU Rabies Diagnostic Laboratory which is the state-of-the-art laboratory built at a cost of US\$ 200,000 with financial support from Crucell Holland by Netherlands was inaugurated by Hon'ble Vice Chancellor of KVAFSU Dr. C. Renukprasad, Vice Chancellor, Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar (KVAFSU) in the presence of Dr. S. Abdul Rahman, President, CVA, Mr. Arvind R. Jannu, IAS, Principal Secretary to Government, Animal Husbandry and Fisheries Department, Govt. of Karnataka, Dr. H.R.V. Reddy, Director of Research, KVAFSU, Dr. S. Yathiraj, Dean, Bangalore Veterinary College and Dr. Nagesh Board Member (KVAFSU). Dr. H.M. Jayaprakasha, Registrar (KVAFSU) presided over the function.

This Laboratory has all facilities for early diagnosis of Rabies in canines and is the first of its kind in the Indian subcontinent.



CVA-Crucell-KVAFSU Rabies Diagnostic Laboratory at Veterinary College, KVAFSU, Bangalore



*Inauguration of the Laboratory
L-R: Dr. S. Yathiraj, Dr. S. Abdul Rahman, Mr. Arvind R. Jannu, Dr. H.M. Jayaprakasha, Dr. C. Renukprasad, Dr. Nagesh, and Dr. H.R.V. Reddy*



Unveiling of the Foundation stone of the laboratory at the Veterinary College by Dr. C. Renukprasad

The delegates attending the conference were taken around the laboratory and explained the proposed activities which would be undertaken.

Study Finds Evidence Of Mammal That Can Smell In Stereo

Most mammals, including humans, see in stereo and hear in stereo. But whether they can also smell in stereo is the subject of a long-standing scientific controversy. Now, a new study shows definitively that the common mole (*Scalopus aquaticus*) - the same critter that disrupts the lawns and gardens of home owners throughout the eastern United States, Canada

and Mexico - relies on stereo sniffing to locate its prey. The paper that describes this research, "Stereo and Serial Sniffing Guide Navigation to an Odor Source in a Mammals," was published in the journal Nature Communications.

~ Medical News Today, 7 Feb 2013

The CVA-Crucell-KVAFSU Rabies Diagnostic Laboratory



Dr. Mohanty with other participants at the laboratory



Dr. Isloor (centre) explaining the function of -80°C Deep Freezer for the long-term preservation of the brain samples



Dr. Yathiraj explains the BioSafety Cabinet to Dr. Mohanty



Dr. Charles Rupprecht, GARC (second from right) at the laboratory



Dr. Isloor (centre) explaining the function of High Speed Centrifuge to Mr. Arvind Jannu



R-L: Drs. Tony Fooks, UK Representing OIE, Elly Hiby (Dog Trust), Deuti Gurung (Nepal) and Rathnamma (India)

CVA DRIT-Workshop on Rabies Diagnosis

The Commonwealth Veterinary Association in collaboration with Veterinary College, KVAFSU, Bangalore and supported by the Veterinary Council of India (VCI) organised a two-day Workshop on Diagnosis of Rabies using “Direct Rapid Immunohistochemical Test” (DRIT). The VCI requested all the veterinary colleges of the country to nominate veterinarians engaged in Rabies Diagnosis to participate in the Workshop. There was a huge response and a total of 40 participants from various veterinary colleges of country and veterinarians sponsored by the Government of Karnataka through Karnataka Veterinary Council participated in the Workshop. The Workshop was conducted by Dr. Lillian A. Orciari, Center for Disease Control and Prevention, Atlanta, USA and Dr. K. Isloor, Dept. of Microbiology, Veterinary College, Bangalore.



DRIT Workshop Participants

L-R (sitting): Drs K. Isloor, S. Yathiraj, Lillian A Orciari, S. Abdul Rahman and A. Sivasothy



Dr. Lilian Orciari demonstrating the collection of brain sample from Foramen Magnum of dog



Studying the Protocol for dRIT

L-R: Nidhi Srivastava Varsha Sharma, Sreedevi, Dhanalakshmi



L-R: Dr. Charan Kamal Singh (Ludhiana), Dr. S.R. Garg (Hissar) Dr. Gunaseelan (Chennai) performing dRIT



Dr. Isloor (second from Right) demonstrating dRIT

L-R: Drs Varsha Sharma, Sreedevi, Dhanalakshmi, Isloor and Manoharan

17th Asian Regional Meeting of CVA

The 17th Asian Regional Meeting of CVA was also held on Wednesday, 30th January 2013 and CVA Councillors from Sri Lanka, Bangladesh, Afghanistan and India in addition to the Vice President and Secretary of Nepal Veterinary Association participated for the first time. Nepal has joined CVA as an Associate Member.

Dr. Rahman welcomed all the members and briefed them about the various programmes which the CVA is implementing in various parts of the Commonwealth. He stressed the need for active participation of all Councillors in the submission of projects, especially on CPD and Rabies which are of great importance in the region. He also briefed them about the CVA Book and Journal Programme and the Study Fund and requested the Councillors to avail these benefits.



At the Council Meeting

L-R: Drs. Sital Kaji Shrestha, Banshi Sharma, Sayed Gul Safi, S. Abdul Rahman, S. Yathiraj, A. Sivasothy, Md Akhthar Hossain, ADN Chandrasiri



Dr. S. Yathiraj welcoming the Regional Representative of Asian Region Dr. A. Sivasothy



Asian Regional Members with CVA President

L-R: Drs. Sital Kaji Shrestha, Sayed Gul Safi, ADN Chandrasiri, S. Abdul Rahman, A. Sivasothy, Md Akhthar Hossain, Banshi Sharma

17th FAVA Congress, Taipei

The 17th Federation of Asian Veterinary Associations (FAVA) Congress was held at the Grand Hotel, Taiwan, from 4 to 6 January, 2013. The theme of the conference was "*Asian Veterinarians for Global Health*". Over 200 delegates from all parts of Asia and other countries attended the conference.

The Scientific programme covered topics on: Animal Welfare, Transboundary Animal Diseases, Zoonosis, Public Health, Food Safety, Companion Animal Medicine - Internal Medicine, Surgery, Imaging, Nutrition, Food Animal Medicine - Swine, Poultry, Ruminant and Aquatic Diseases, Pharmacology / Toxicology, Wild life and Laboratory Animal Medicine, and Veterinary Education.

The FAVA Council Meeting was also held on the 7th and members from Afghanistan, Nepal, India, Thailand, Phillipines, Vietnam, Australia, Mongolia, Japan, South Korea, and Indonesia participated. Dr. S. Abdul Rahman, President CVA attended the meeting representing India. The CVA Councillors who attended the meeting were Dr. Shane Ryan from Singapore who is also the President-Elect of FAVA, Dr. Safi Gul from Afghanistan and Dr. Sital Shrestha from Nepal.

The meeting was also attended by the President of Australian Veterinary Association (AVA) Dr Ben Gardiner and President of Veterinary Association of Malaysia Dr. Vincent Ng In Hooi.

New CVA Councillor of Sri Lanka

Dr. A.D.N. Chandrasiri has been nominated as the CVA Councillor of Sri Lanka thus replaces Dr. A. Sivasothy.

Dr. Chandrasiri graduated in 1978 and had Masters in Animal Science in 1987 from Agricultural University of Norway and obtained PhD from University Putra Malaysia in 1997.



Dr. A.D.N. Chandrasiri

Dr. Chandrasiri started his career as Veterinary Surgeon and moving on to the ladder as Director General of Department of Animal Production And Health.

Dr. Chandrasiri is actively involved in many national and international associations, committees as member and chairman.

Dr. Chandrasiri is currently the President of Sri Lanka Veterinary Association.

New CVA Councillor of Bangladesh

Dr. Md. Akhtar Hossain has been nominated as the CVA Councillor of Bangladesh thus replaces Dr. Md. Emran Hossain Khan.

Dr. Akhtar graduated in 1974 and completed his Masters in 1975 and obtained PhD in 1984 from Royal Veterinary College, University of Edinburgh, United Kingdom.



Dr. Md. Akhtar Hossain

Dr. Akhtar started his career as Lecturer and moved up on the ladder to Head of the Department of Surgery and Obstetrics, Bangladesh Agricultural University for 3 terms. He also served as Dean, Faculty of Veterinary Science, Bangladesh Agricultural University and become the Vice Chancellor of Bangladesh Agricultural University.

Dr. Akhtar is currently the President of Bangladesh Veterinary Association.

Nepal Veterinary Association joins CVA as Associate Member

The Nepal Veterinary Association (NVA) has joined CVA as an Associate Member. With this membership the number of countries in Asian Region rises to six (6).

The NVA's has the following Executive Committee.

Dr. Bimal Kumar Nirmal	President
Dr. Banshi Sharma	Vice Chairman
Dr. Sital Kaji Shrestha	General Secretary
Dr. Jeevan Adhikari	Secretary
Dr. Hari Prasad Suwal	Treasurer

Members

Dr. Peetambar S Kushawaa
 Dr. Mukul Upadhyay
 Dr. Sita Acharya
 Dr. Lekhraj Dahal
 Dr. Ashesh Bhattarai
 Dr. Mogal Prasad Shah
 Dr. Tapendra Psd Bohara
 Dr. Hem Raj Awasthi

A delegation of Nepal Veterinary Association led by Dr. Banshi Sharma, Vice President attended the 17th Asian Regional Meeting of CVA from 28-31 January 2013 and participated in the CVA Council Meeting. The delegates comprised of Dr. Sital Kaji Shrestha, General Secretary and Dr. Deuti Gurung, Member NVA.



Nepal Veterinary Association Delegation presenting a memento to Dr. Rahman

L-R: Drs Banshi Sharma, Deuti Gurung, S. Abdul Rahman, Sital Kaji Shrestha

Australasia Oceania

New CVA Councillor of Malaysia

Dr. Paul Chelliah, President Elect of Veterinary Association of Malaysia (VAM) has been elected as the CVA Councillor of Malaysia.



Dr. Paul Chelliah

At the Annual General Meeting of Veterinary Association Malaysia (VAM) held on September 21, 2012, the following office bearers were elected.

President	Dato' Dr. Vincent Ng In Hooi
President Elect	Dr. Paul Chelliah
Vice President	Dr. Nadzariah C. Abdullah
Hon. Secretary	Dr. Rahmat Sheriff
Hon. Treasurer	Dr. Chee Liung Wun

15th Australasia/Oceania Commonwealth Veterinary Association Regional Conference

The 15th Australasia/Oceania Regional meeting and conference of Commonwealth Veterinary Association will be held in Nadi, Fiji from 2nd to 6th September, 2013. The theme of the conference has been chosen as “*Sustainable Animal Health and Production in Australasia / Oceania: The Role Of Veterinary Education, Disease Control, Food Safety And Security And Animal Welfare*” which reflects the priority needs of the region.

The scientific programme will include topics such as Sustainable Animal Health and Production, Animal Production and Nutrition and Genetics, Livestock and Climate change in the Pacific Island Region, Veterinary Education in the Region, Zoonosis & Disease Control, Animal Welfare, Aquaculture, Food Safety, Food Security, Biosecurity and Trade in Livestock and Livestock Products, Environmental Issues and Companion Animal Medicine with relevant subjects such as common diseases of cats and dogs [viruses, internal/external parasites etc] in the region, dog management including

in the PICs [with Govt/Local Government views] and in indigenous areas such as in Australia, companion animal welfare perspectives [including input by AW Societies]. A special Continuing Education program on gastrointestinal tract medicine and surgery will also feature.

Please contact the following for more information;

Dr Jeff Cave, Australia
jeff.cave@dpi.vic.gov.au

Dr Helen Beban, New Zealand
Helen_Beban@colpal.com

Dr Robin Yarrow, Fiji
yarrow@connect.com.fj

Bushfires hit Australian wildlife hard

Experts from the Australian Veterinary Association (AVA) are warning of serious long-term impacts of bushfires on Australian wildlife. With more than 300 blazes currently remaining uncontrolled across New South Wales, Victoria, Tasmania and Central Australia, wildlife expert and spokesperson for the AVA, Dr Robert Johnson, says that many Australian species will be affected along with thousands of people.

“Fires don’t just threaten people, their homes and livestock, there are also many unseen victims such as small animals that make homes in bushes, hollow logs, trees and underground. Some species such as birds may be able to escape more easily than others but will be affected once they try to return to their preferred habitat. This can occur for months after a bushfire.”

“And unfortunately some species, such as koalas, wombats and echidnas are already under threat from other factors such as habitat destruction and predation by feral animals.”

Vets are warning rescuers not to put their own life at risk when rescuing an animal. “Extra care should be taken with venomous or aggressive animals. If you find injured or orphaned wildlife call your nearest wildlife rescue organisation or your local vet,” Dr Johnson said.

Veterinarians across fire affected areas are working with wildlife rescue groups, and treating pets, horses, wildlife and livestock in the aftermath of the fires.

~ AVA Media Release, 09 January 2013

Canada Caribbean

CbVMA 27th Biennial Conference

New CVA Councillor of Cayman Islands

Dr. Kanyuira Gikonyo has been nominated as the new CVA Councillor of Cayman Islands.



Dr. Kanyuira Gikonyo

Dr. Kanyuira Gikonyo earned a BSc. in Animal Science from the University of Maryland, a DVM from Tuskegee University and a Master's Degree in Public Health from Emory University. Dr. Gikonyo first worked as an Associate Veterinarian at a small animal veterinary clinic in Atlanta, Georgia, USA he later relocated to Antigua and Barbuda where he worked as a veterinarian in the private sector and for the government. His current tenure is as a Veterinary Officer with the Cayman Islands Department of Agriculture. He holds membership in the Cayman Islands and the Caribbean Veterinary Medical Associations.

The 27th Caribbean Veterinary Medical Association Conference was held at Port of Spain, Trinidad from 6-9 November 2012. The Scientific Programme featured regionally and internationally renowned speakers where for three days, leading experts in the veterinary profession delivered information on important veterinary topics that spanned the range of species and the diversity of interests in veterinary medicine. They all spoke under the theme "*Building Bridges, Advancing Veterinary Medicine and Animal Welfare in the Caribbean*". The CVA component of the conference was a Disaster Training Workshop which was supported by World Society for Protection of Animals (WSPA).

A CVA Regional Meeting was also held on 9 November 2012 under the chairmanship of Curtis Padilla, Regional Representative, Canada/Caribbean Region and was attended by the following CVA Councillor Drs Gus Reader (Barbados); Kanyuria Gikonyo (Cayman Islands); Wintorph Marsden (Jamaica); Isabelle Paquet-Durand (Belize); Claude De Allie (Grenada); Michelle Mellowes (Trinidad and Tobago). Various issues pertaining to the region were discussed especially the possible support of CVA to the region.

2012 CVMA Convention, Montreal

The 64th Annual CVMA Convention was held from 11-14 July 2012 at Montreal. This meeting offered practitioners from coast to coast a multi-species continuing education programme and attracted approximately 640 participants.

CVMA's 64th Annual General Meeting

Some 216 CVMA members and invited guests participated in this Annual General Meeting, which included an overview of the CVMA's services provided to the profession and to members over the past 12-months. The following are the name of CVMA's Executive Members for the period Jul 2012 to Jul 2013.

Dr. Jim Fairles (President);
 Dr. Jim Berry (President-Elect);
 Dr. Jean Gauvin (Vice President);
 Dr. Nicole Gallant (CVMA Executive Member);
 Dr. Lloyd Keddie (Immediate Past President);
 Dr. Barry Stemshorn (Treasurer, Ex-Officio) and Mr. Jost am Rhyn (Executive Director, Ex-Officio).



2012 CVMA Council and Guests

L-R (Back-row): Ms. Crystal Riczu, Drs James, Fairles, Gordon Krebs, James Berry, Troy Bourque, Jean Gauvin, Barry Stemshorn, Douglas Roberts, Rob Ashburner, Greg Harasen, Ron DeHaven (AVMA), Mr. Josh am Rhyn, Ms. Emily Vellekoop.

L-R (Seated): Drs Ron Dumphy, Kevin Millar, Ms. Michele Moroz, Drs. Lloyd Keddie, Rene Carslon (AVMA), Troye McPherson, Nicole Gallant and Diane Frank

~ CVJ, Vol 53, Oct 2012



Announcement

The Commonwealth Veterinary Association Launches a Pilot Continuing Professional Development Programme in 3 Commonwealth and 2 Associated Countries

The Commonwealth Veterinary Association [CVA] is pleased to announce that it has agreements with the Veterinary Associations of Tanzania, Kenya, Uganda and Ethiopia and the Veterinary Faculty of Khartoum, Sudan to pilot a Continuing Professional Development Programme [CPD], commencing 1st January 2013. The CVA will use the results of the pilot programmes to inform a proposal to deliver a major CPD support programme, prospectively in partnership with OIE, EU, WSPA and other organisations, in 2014

E-Learning in key subject areas inclusive of Recent Advances in Veterinary Medicine and Surgery, Veterinary Governance, One Health, Animal Welfare and SPS Standards will be promoted by the CVA CPD programme to complement attendance at more formalised CPD events such as lectures or conferences. A peer reviewed or self administered assessment mechanism will be used to grade the uptake of the materials [accessed online or via pre-recorded media such as CDs, DVDs, flash drives], leading to the award of an appropriate number of CPD points.

The interest and consequent experience of colleagues in the following approaches to undertaking CPD will be trialled by the pilot programme:-

- Assisted reference access for authorship of a clinical case history, paper or review.
- Assisted reference access for critical review/analysis of key policy areas inclusive of: Veterinary Governance, One Health, Animal Welfare and SPS Standards.
- Accessing CPD modules that can be accumulated for certificate, diploma or further degree courses.
- Developing E-Learning CPD materials into formats suitable for cascading from Veterinarians to Veterinary-para professionals to Frontline Veterinary Staff.

The CVA-CPD programme would be pleased to receive views, ideas and offers of collaboration from organisations and colleagues willing to assist us in delivering the above or suggested alternative E-Learning approaches. Any information on existing materials that are readily available, or that could be adapted, for purposes of the CVA CPD programme would be gratefully received.

Please contact;

Jeff Cave, CVA CPD Programme Coordinator (Jeff.Cave@dpi.vic.gov.au) or Chris Daborn, Technical Advisor CVA CPD programme (tvs@habari.co.tz) with any feedback or requests for further information.

30th Scientific Conference of Tanzania Veterinary Association

Tanzania Veterinary Association (TVA) held its 30th scientific conference at Arusha International Conference Centre (AICC), Arusha Tanzania from 11th -13th December 2012. The conference was well attended with more than 200 scientists of various disciplines focused on animal and human health. The theme of the conference was "The contribution of the veterinary profession to the improvement of animal and human health" and the sub-themes were: (i) One health approaches on the control of zoonoses (ii) Contribution of biomedical research in human and animal health (iii) Food inspectorate systems for enhanced food security and safety, and (iv) Antimicrobial resistance as a global challenge to the veterinary profession.

The conference was well attended due to the fact that TVA works closely with other associations within the livestock sector such as Tanzania Society of Animal

Production (TSAP) and Tanzania Veterinary Paraprofessional Association (TAVEPA) in promoting scientific exchange of knowledge and experiences amongst livestock stakeholders from within and outside the country. For example, the following countries were represented: Kenya, Mozambique, Uganda, United Kingdom (UK), United States of America (USA) and Zambia.

The TVA-TSAP-TAVEPA partnership is also instrumental in engagement of policy makers, planners and other stakeholders for the interest of national livestock development. A total of 59 scientific papers, both oral and posters, were presented within two and half days. The first half of the second day was used to hold the Annual General Meeting (AGM) where the animal handling, diseases control, veterinarian's welfare and conduct were discussed and recommendations drawn.



Front Line L-R: TVA Member; Dr Henry Magwisha, TVA Honorary Secretary; Dr Ponela Mlelwa, Registrar of Veterinary Council of Tanzania; Prof. Dominic Kambarage, TVA Chairman; DC-Arumeru, Guest of Honour; Prof. Rudovic Kazwala, Immediate Past Chairman TVA; Dr Peter Njau, DVS; TVA Member; Invited participant

Contagious Bovine Pleuro Pneumonia Outbreak in The Gambia

Background

Contagious Bovine Pleuro Pneumonia (CBPP) is a bacterial disease caused by *Mycobacterium mucoides sub spp mucoides*. It is highly infectious, contagious, and one of the most important diseases of cattle in Sub-Saharan Africa. In the West Africa sub region, this disease is considered as the most important Transboundary Animal Disease (TAD) in cattle. Affected cattle manifest difficult breathing, lose condition and high mortalities. The mortality rate of the disease is between 30 to 80%. Naïve herds can experience losses up to 80%.

CBPP was last reported in The Gambia in 1971, but its four decade long history of absence was broken by reports reaching the Animal Health and Production Services (AHPS) in August 2012 of a suspected outbreak of cases in some villages within Niamina Dankunku District, Central River Region South, about 250 km from the Capital city of Banjul and on the south bank of the River Gambia. A team from AHPS was immediately dispatched to conduct some epidemiological investigations and collect sera from suspected cattle. Out of 19 sera samples tested at ISRA LNERV laboratory at Dakar, Senegal, 11 were seropositive for CBPP. Another team comprising of staff from AHPS and FAO visited the outbreak site in early September 2012 to collect more information as well as samples of lungs and lymph nodes tissues that led to the isolation of *Mycoplasma mucoides sub spp mucoides* at ISRA LNERV lab from a seropositive cattle and confirmation of a CBPP outbreak. The exact source of the outbreak is not known, however there exist an unregulated trade in cattle with Mali and Mauritania where the disease is prevalent.

This outbreak led to the death of 251 cattle (50.9% mortality rate) in 13 cattle herds in four villages within Niamina Dankunku District (epicenter of the outbreak), more than 500 cattle deaths in this district, unknown number of cattle deaths in Niamina West and Sami Districts, and 150 cattle deaths in Upper River Region. At this high mortality rate, the outbreak if it continues to spread could cause the death of 50% (200,000) of the national cattle herd which is currently estimated at 390000

heads in 2011. In recognition of the severity of the outbreak, to raise awareness and solicit support from development partners, international organizations and other stakeholders to compliment Government's effort in response to the reemergence of CBPP, The Gambia Government declared a **National Animal Health Emergency** effective 8th November 2012. "In response to this emerging crisis, the Government of The Gambia is mobilizing all available emergency funds for immediate action to contain and control the outbreak, and hereby calls on the international community, development partners, NGOs and other stakeholders to assist in effectively addressing the situation to prevent it from spreading to other parts of the country and beyond. The Government is also taking immediate actions to enhance the capacity of veterinary services to put in place adequate measures for effective, sustainable and progressive control and eradication of the disease" exert from the declaration.

A Rapid Response Team under the aegis of the Ministry of Agriculture has been put in place to coordinate and monitor the national action plan for the control of the CBPP outbreak.

Actions taken thus far after the CBPP outbreak confirmation

- Farmer sensitization through focus group discussions with herd owners and herds men at village level in Niamina Dankunku District and in Upper River Region
- Countrywide Disease Surveillance at herds, abattoirs, watering points and livestock markets intensified
- Reported to FAO, OIE, USDA APHIS/ USAID and AU-IBAR
- Emergency Action Plan with detail budget to contain the disease and prevent further spread developed

- The following **Five Point Strategic Action Plan** to control the disease countrywide was developed:
 - i) Country wide mass vaccination of the entire national herds (390,000 heads of cattle) against CBPP at no cost to farmers (using the T144 Lyophilized CBPP vaccines with PANVAC Quality Control Certificate) starting with Central River and Upper River Regions;
 - ii) Strengthening the diagnostic and serological surveillance capability of the Central Veterinary Laboratory to enhance diagnosis and sero surveillance of the disease and to conduct countrywide serological surveillance to determine current Prevalence of the Diseases;
 - iii) Capacity building for Disease Surveillance Officers at field level for intensification of clinical surveillance and build capacity of meat inspection personnel for intensification of surveillance for the disease at abattoir level;
 - iv) Country wide sensitization campaign using community and national radio, posters and other communication media as part of a national communications and awareness programme directed at sensitizing the population to the disease, its clinical signs and control and the need for vaccination; and
 - v) Development of a 5 Year National Strategy and Action Plan for Control of the Disease (Emergency Preparedness Plan)
- Elaborate detail budget for implementation of the Strategic Action Plan
- Drew Resource Mobilization Plan to raise funds for implementation of the Strategic Action Plan
- Set up, inaugurate and sensitize a National Rapid Response Team on CBPP to be responsible for the overall national coordination
- Development of clear, concise and easy to understand messages for countrywide dissemination
- Undertook field trips to all the regions in the country to form a Regional Rapid Response team for each region
- Held information sharing meetings with the Veterinary Services of Senegal which led to the development of harmonized strategies for the control of CBPP
- Established contacts with LNERV for supply of good quality CBPP vaccines
- Vaccination teams formed in all the regions
- Procurement of logistics for the vaccination in progress
- A country wide mass vaccination campaign against CBPP will be embarked upon as soon as the logistics and vaccines are in place.

~ **Dr Kebba Daffeh**
Deputy Director, Animal Health & Production Services
Department of Agricultural Services
The Gambia

New CVA Councillor of The Gambia

Dr. Arss Secka has been nominated as the new CVA Councillor of The Gambia by replacing Dr. Sulayman Sonko.



Dr. Arss Secka

Dr. Secka is a gentle man born in Farafenni town in The Gambia on 17th June 1967. He graduated with a DVM degree in 2001 at the University of the Philippines, MSc in 2006 from the Institute of Tropical Medicine in Belgium, and then a PhD degree from University of Antwerpen, Belgium in 2010.

Positions held include Principal Research Officer at the NARS of The Gambia from 2001 to 2006, a Research Associate at International Trypanotolerance Centre (ITC) in The Gambia from 2006 to 2010, and then presently a Research Scientist since 2011. He has accumulated research experience on Cattle Trypanosomosis, Cysticercosis and Small Ruminant nutrition.

Activities of the Gambia Veterinary Association in 2012

On-going Activities

1. Capacity Building

The Gambia Veterinary Association signed a Memorandum of Agreement (MOA) in April 2010 with the Regional Project for Sustainable Management of Endemic Ruminant Livestock in West Africa (PROGEBE) with the objective of implementing series of training programmes for the project in the Gambia. PROGEBE which is also being implemented in Guinea, Senegal and Mali aims to preserve and strengthen in a sustainable manner the genetic traits of Endemic Ruminant Livestock species (N'dama Cattle, Djallonke Sheep and West African Dwarf Goats) for their increased productivity and exploitation within an enabling physical and institutional environment. From

2010 to present, 641 livestock farmers (including 255 women) were trained, on animal health and production, small ruminant housing, feeding, management and micro enterprise development.

2. Workshops, Consultancies and Part-time Lecture

The association has been represented at various local workshops and other events that have some bearing on livestock matters. Two association members attended the Stakeholders and Experts Planning Workshop for The Development of a Ten Year Strategic Plan for International Trypanotolerance Centre, held on 6-8th June 2012, at Kairaba Beach Hotel in Banjul, The Gambia.



Women farmers at the training session



Training on the production of mineral blocks



Livestock technicians and trainers during practical session



Many consultants who came to The Gambia to work on veterinary or livestock issues met some association members to seek their opinions as well as information and advice on very critical issues. In 2011, five association members met with a team of four consultants from FAO who were on mission to conduct need assessment of the former department of livestock services and revitalization of International Trypanotolerance Centre (ITC). The three hour long meeting was conducted at the Gambia Veterinary Council office, Abuko, The Gambia. There was a consensus on the need and urgency for the Gambia government to re-establish a veterinary department with a unique chain of command, institute the training of home grown veterinarians by establishing a faculty of veterinary medicine at the University of the Gambia, and accelerate the efforts of revitalizing ITC.

Two members of the association are offering part-time lectures since 2006 at the newly established University of The Gambia to assist students at the undergraduate level pursue courses on Animal Health and Production as well supervise thesis work of some graduating students.

3. Donations

In cognizant of the hardship endured by both human and livestock due to the 2011 crop failure in The Gambia, the association, in July 2012, has donated to the farming community through the Ministry of Agriculture 8000 boli of Albendazole and 800 mineral blocks (produced by the very farmers trained by GVA in the PROGEBE programme).

Planned activities

World Rabies Day Celebration

The association is currently planning to celebrate the World Rabies day, the 28th September 2012, in order to increase the awareness of the general public on a zoonotic disease that claims the life of 55,000 people annually around the world. Envisaged activities for the celebration of this day will include free vaccination of dogs and cats against rabies, radio talk, symposium, and a match past.

Brief Report on Activities Of Nigeria Veterinary Association

The association has been on the fore front for appointment of Veterinarians into Nigeria Army. Only recently, some Vets recently recruited into the short service officers cadre completed their training with one of them becoming the best officer for the set. We recently after years of pressure got the National Agency for Food, Drugs Administration and control to create a Veterinary Directorate. World Veterinary day was celebrated Nationally by the Association and the association is in the fore front of advocacy for proper running of abattoirs in the country. Our National congress is coming up in the November in Ado Ekiti, Ekiti State, South west Nigeria.

Wild Dog Conservation Project gets Vaccine Boost

Efforts to conserve the painted dog (*Lycaon pictus*) population in the Hwange National Park, Zimbabwe, have been boosted by the vaccination of hundreds of local domestic dogs against rabies and canine distemper, following a donation of vaccine by MSD Animal Health.

Rabies and distemper are described as 'an ever-present threat' to the painted dogs and the best way of protecting them from disease is to vaccinate local domestic dogs. The recent vaccination drive formed part of the wider conservation initiative being coordinate by the UK-based charity Wildlife Vets International (WVI) and the Zimbabwe-based Painted Dog Conversation (PDC) charity. PDC works closely with the local African communities and government to protect and increase the range of and number of painted dogs in Zimbabwe. The two charities have collaborated to provide mobile veterinary clinics in the Hwange National Park and, following the donation of vaccine by MSD Animal Health, approximately 800 domestic dogs were recently

vaccinated against rabies and distemper, and treated for worms, ticks and fleas, in just six days.

During the latest effort, vet and TV presenter Steve Leonard, who is a patron on both PDC and WVI, visited Hwange National Park to help with the vaccination programme. 'These clinics are exactly what modern conservation should be all about - helping communities and wildlife together', he said. 'Vaccination protects the people, their pet dogs and also the wildlife - especially the painted dogs - so every is a winner'.

John Helps of MSD Animal Health added: 'It would be ideal to eliminate rabies from the world, and while this has not yet been an achievable goal elsewhere, this African project certainly provides a valuable and effective model for similar initiatives in other rabies-endemic countries that wish to prevent the disease'.

~ Veterinary Record, Oct 20, 2012

UK Mediterranean

New BVA President

Mr Peter Harlech Jones was elected as the new President of British Veterinary Association (BVA).



Mr Peter Harlech Jones

Born and raised in North Wales Mr. Jones left the Sir Huw Owen School in Caernarfon to attend University in Liverpool after which he returned to Wales for a spell in mixed practice followed by small animal practice in London, then Ontario in Canada, and back to west London. After several years in practice he joined the pharmaceutical industry and spent the next 18 years in the animal health business both in the UK and overseas. Returning to the UK from the USA in 1995 Mr. Jones joined the European institutions and was appointed the first head of the Veterinary Division at the newly created European Medicines Evaluation Agency (EMA) in London.

Mr. Jones last post before semi-retirement in 2008 was as head of the global animal health industry association, the International Federation of Animal Health (IFAH) in Brussels. In this role he worked closely with the World Association of Animal Health (OIE), and the Food and Agricultural Organization of the UN, and served as a member of the OIE working parties on antimicrobial resistance and guidelines for vaccination for the control of Avian Influenza.

Within the BVA Mr. Jones has served on the Veterinary Policy Group and as chair of the Medicines Group. He has been secretary and chairman of the Association of Veterinarians in Industry, and participates in the work of the Federation of Veterinarians of Europe (FVE).

Seeing Practice to Mutual Benefit

Two final-year veterinary students from the Liverpool Vet School have just completed a period of seeing practice in India. **Josie Cocks** and **Fran Haddock** arranged the placement at Help in Suffering, an Indian Animal Welfare Charity based in Jaipur, Rajasthan in June 2011, when

they were both in the third year of their veterinary studies. As a charity, Help in Suffering relies on donations, but is determined that veterinary students should not have to pay to see practice with it. Instead, the two students spent their fourth year fundraising for the charity – with Fran running in a half marathon and both students baking buns and cakes to sell and raise money.



Josie Cocks and Frank Haddock with staff from the Help in Suffering charity in India

They spent four weeks in Jaipur during which they experience in veterinary skills and in Indian life. ‘We have had an amazing time’, they said. ‘We have learned a lot and the Help in Suffering staff have been so welcoming and kind’.

~ **Veterinary Record, Oct 6, 2012**

Peter Jinman becomes FAWC's new chairman

Dr Peter Jinman, Council Member and Past-President of RCVS, has been appointed the new Chairman of the Farm Animal Welfare Committee (FAWC).



Dr Peter Jinman

The FAWC is an expert committee of the Department for Environment, Food and Rural Affairs and the Devolved Administrations in Scotland and Wales.

Established in 2011, it provides advice to Defra and the Devolved Administrations in Scotland and Wales on the welfare of farmed animals.

Peter has spent most of his working life in practice in Herefordshire, and is also a past-President of the British Veterinary Association. He replaces Professor Christopher Wathes, who retired as FAWC Chairman at the end of 2012.

~ **RCVS News 4 February 2013**

Journal of Commonwealth Veterinary Association

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- Gibson KT, Hodge H, Whitem T. Inflammatory mediators in equine synovial fluid. *Aust Vet J* 1996; 73: 148-151.
- Peterson ME, Randolph JF, Mooney CT. Endocrine diseases. In: Sherding RG, Editor. *The Cat: Diseases and Management*. 2nd edn. Churchill Livingstone, New York, 1994: 1403-1506.
- Rhodes AP. Infectious bovine keratoconjunctivitis vaccination. In: *Proceedings of the 23rd Seminar, Sheep and Beef Cattle Society*, New Zealand Veterinary Association, June 1993.
- Australian Veterinary Association. Tethering of sows and sow stalls. In: Greenwood PE, editor. *Members' Directory and Policy Compendium*. 1997: B5.
- Where do we stand on manpower? [editorial] *Vet Rec* 1995; 137: 1.
- Homberger FR. Mäusehepatitis-Virus. *Schweiz Arch Tierheilkd* 1996; 138:183-188.
- Council of Docked Breeds. The case for docking. <http://www.cdb.org>. 1992. Retrieved 15 October 2001.

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Articles of general interest, experiences in treating of clinical cases, country reports, success stories in animal production, using innovative approaches and where possible enhancing the contribution of women and also using sustainable methods are also encouraged.

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~ Editor, JCVA

CALENDAR OF EVENTS

2013

38th Annual World Small Animal Veterinary Association (WSAVA) Congress, Auckland, New Zealand. **6-9 March**

BSAVA World Congress, The ICC/NIA, Birmingham, UK. **4-7 April**

AVA Annual Conference, Cairns, Australia. **26-31 May**

65th CVMA Convention, Victoria, BC. **10-13 July**

15th CVA Regional Meeting of Australasia/Oceania Region, Nadi, Fiji. **2-6 September**

31st World Veterinary Congress, Prague, Czech Republic. **17-20 September**

2014

BSAVA World Congress, The ICC/NIA, Birmingham, UK. **3-6 April**

38th Annual World Small Animal Veterinary Association (WSAVA) Congress, Cape Town, South Africa. **16-19 September**

2015

6th Pan Commonwealth Veterinary Conference, Kuala Lumpur, Malaysia. (Date to be announced).

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