




# Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry

**BOOK OF ABSTRACTS**


36th TVA SCIENTIFIC CONFERENCE

**Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry**




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### **PREFACE**

Once again, the Tanzania Veterinary Association (TVA) has organised the 36<sup>th</sup> Annual Scientific Conference (ASC), which will be held at the Arusha International Conference Centre (AICC) in Arusha-Tanzania. This year, the conference theme is “**Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry**”. The 36<sup>th</sup> ASC has five sub-themes which include: *a) Recent advances and industry responsive disease preparedness and response system; (b) The role of veterinary education in enhancing service delivery; (c) Changing landscape of veterinary governance and extension services delivery system; (d) The role of Science, Technology and Innovation (STI) in livestock development –the contribution of research systems in supporting use of science evidences; and (e) Public-private partnership in livestock development.*

We appreciate various contributors from within and outside Tanzania who submitted high quality abstracts relevant to the main theme and sub-themes of the 36<sup>th</sup> TVA conference. We can guarantee that you will not be disappointed by attending all sessions of the 36<sup>th</sup> TVA Conference, which will be blessed by high calibre scientists and researchers from all over the world. Once again, we have maintained our TVA culture of holding the conference within the elegant Arusha International Conference Centre. Furthermore, TVA has compiled all abstracts in this **Book of Abstracts** that will help you to follow the presentations. We hope that you will find the compilation useful during the conference as well as a dependable reference material for your future endeavours. Your continued commitment to TVA scientific conference and sharing of information/knowledge is instrumental in upholding the vision, mission and core values of TVA. We wish you a pleasant attendance and following of the 36<sup>th</sup> TVA conference.

**Prof Dominic Mukama Kambarage**

**Chairman, TVA**



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# PROGRAMME

## 36<sup>th</sup> TVA Scientific Programme

**Day 1: Wednesday 5th December 2018**

**CONFERENCE OPENING SESSION: SIMBA HALL**

**CHAIR: Dr Emmanuel Swai**

08:00-08:45	Registration	ALL
08:45-09:00	Participants and Invited Guests seated	ALL
09:00-09:15	Welcoming Remarks	TVA Chairman
09:15-09:30	Invitation of the Guest of Honour	TVA Chairman
09:30-10:00	Official Opening of the 36th TVA Conference	Guest of Honour
10:00-10:15	Vote of Thanks	TBI
10:15-10:30	Group Photo	ALL
10:30-11:00	HEALTH BREAK	ALL

**SESSION 1: ZVC/TVLA Arusha**

**CHAIR: . Dr. Henry Ruhinguka & Dr. Obed Nyasebwa**

11:00-12:30	Tour of Exhibition Pavilions	Guest of Honour/TVA Chairman
12:30-13:30	LUNCH BREAK	All

**SESSION 2: SIMBA HALL**



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**CHAIR: Dr. Emmanuel Swai**

13:30-13:50	<b>Key Note Paper 1:</b> One health approach: In recent advances and industry responsive disease preparedness and response system in Tanzania	J. Assenga <i>et al.</i>
13:50-14:10	<b>Key Note Paper 2:</b> The role of veterinary education in enhancing service delivery	D.G. Mpanduji & K. Gillah
14:10-14:30	Sustainable business investment to advance livestock health and productivity in Sub-Saharan Africa: the African Livestock Productivity & Health Advancement (A.L.P.H.A.) initiative	G. Varga et al
14:30-14:40	The WSAVA AFSCAN project – 5 <sup>th</sup> anniversary of a successful network in Africa	M. Day and G. Varga
14:40-15:00	<b>Key Note Paper 3:</b> Changing landscape of veterinary governance and extension services delivery system	B. Masuruli
15:00-15:20	<b>Key Note Paper 4:</b> The role of Science, Technology and Innovation (STI) in livestock development –the contribution of research systems in supporting use of science evidences	E.M. Shirima
15:20 -15:40	Evaluating Zoonotic Viral Sharing Among Bats, Primates, and People in a High Risk Transmission Interface in Southern Tanzania	R.R. Kazwala et al.
15:40-15:50	On-farm diagnostic tests to educate and convince farmers to improve their management	J. Hakker
15:50 - 16:00	Adoption of and willingness to pay for Newcastle disease vaccines by smallholder households in Tanzania	Z. A. Campbell et al.
16:00 - 16:10	Systematic Domestic Dog Vaccination Results in Significant Declines in Rabies Exposures and Human Rabies Deaths	A. Czupryna et al.
16:10-16:20	Supporting Evidence Based Interventions - Causes and extent of reproductive loss and mortality of domestic ruminants in Tanzania (SEBI-Tz)	F. Lankester et al.
16:20 - 16:30	How are sciences, technology, innovation and research contribute to the use of science evidence and the future of livestock?	L. C. Bilihanyuma
16:30 - 17:00	HEALTH BREAK	All

### **SESSION 3: SIMBA HALL**

**Chair: Prof. Eson D. Karimuribo**

17:00-17:10	The trend of antibody titres levels in chickens following vaccination against Newcastle Disease using La sota and I-2 vaccines	Mengele I.J & P.L.M. Msoffe
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17:10-17:20	Participation and its determinants in East Cost Fever immunization by small-scale cattle keepers in Mazabuka district of Zambia	A. Mulenga et al.
17:20-17:30	A serological assay for differentiating Rift Valley Fever (RVF) naturally infected animals from arMP12 $\Delta$ Nsm delvaccinated animals	L.P. Salekwa et al.
17:30- 17:40	Evaluation of the immunogenicity of a recombinant Rift Valley fever vaccine (arMP12 $\Delta$ Nsm21/384) in indigenous species of cattle, sheep and goats.	L.P. Salekwa et al.
17:40- 17:50	Molecular characterization of infectious bursal disease virus recently detected in Dar-es-Salaam, Tanzania	P. Badi et al.
17:50 - 18:00	Intra-farm and inter-farms foot-and-mouth disease (FMD) outbreak(s) investigation: genetic diversity of FMD virus strains recovered in Morogoro, Tanzania	C. J. Kasanga et al.
18:00 -	<b>END OF DAY 1</b>	All
<b>DAY 2: Thursday 6<sup>th</sup> December 2018</b>		
08:30-13:00	TVA Annual General Meeting	TVA Members and Invited Guests only
13:00-14:00	LUNCH	ALL
<b>SESSION 4: SIMBA HALL</b>		
<b>Chair: Dr. E.M. Shirima</b>		
14:00-14:10	Day One Skills: Veterinarians	D. Fleming
14:10-14:20	Importance of an autonomous / independent veterinary council	L. Havinga
14:20-14:30	Scope of practice veterinarians	D. Stoltz
14:30 -14:40	Visitations to tertiary training institutions	L. Westcott
14:40-15:50	VSB Examination	A. Fleming
15:50-16:00	General Discussion	Chair
16:00-16:30	HEALTH BREAK	All
<b>SESSION 5: SIMBA HALL</b>		
<b>Chair: Prof. Maullilo J. Kpanyula</b>		
16:30-16:40	Public Health risk of zoonotic ticks in Abeokuta, Southwest Nigeria	F.A. Akande and B.O. Fagbemi
16:40-16:50	Tanzania Animal Health Perspective on One Health	H.E. Nonga et al.
16:50-17:00	Ornilo: an Emerging Disease Problem?	E.C. Hughes et al.



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17:00-17:10	Epidemiology and Control Strategies of Dog-Mediated Human Rabies in Southern and Eastern Africa	EL Mayenga et al
17:10-17:20	Farmers' knowledge and practices influencing <i>Taenia solium</i> infection in smallholder pigs in Mbozi and Mbeya districts, Tanzania	L. K. Mwemezi et al.
17:20-17:30	A scoping review of <i>Taenia solium</i> taeniosis and cysticercosis in Tanzania provides a research evidence justification for control	H.A. Ngowi et al.
17:30-17:40	Control of porcine cysticercosis in smallholder pig production systems in Tanzania through community-based health education interventions - A review	C. Wilson et al.
17:40-17:50	Human <i>Taenia solium</i> - cysticercosis infection and the Need of Community based health education intervention for sustainable control in Tanzania	G. I. Makingi et al.
17:50 - 18:00	General discussion	All
18:00 -	<b>END OF DAY2</b>	

### **DAY 3: Friday 7th December 2018**

#### **SESSION 7: SIMBA HALL**

**Chair: Prof. Donald G. Mpanduji**

08:30-08:40	Association of Brucellosis with Abortion Prevalence in Humans and Animals in Africa: A Review	Jean-Bosco et al.
08:40-09:50	Evaluation of novel filter paper for storage of foot-and-mouth disease virus in endemic settings in Africa	T. R. Sanga et al.
09:50-10:00	Epidemiology of ectoparasites and gastrointestinal parasites of dogs in Mvomero and Morogoro districts, Tanzania	A.R. Issae et al.
10:00-10:10	Incidences neurological disorders in domestic animals attended at Sokoine University of Agriculture Animal Hospital: a retrospective study 2004-2014	F. Makoga
10:10 - 10:20	Phages implications on Controlling antibiotic resistance and future biotechnology in Animals disease: a review	A.M. Sailen et al.
10:20-10:30	A 12- year retrospective study on pattern and relative frequency of preventable canine diseases in Morogoro	R. Raymond and A.B Matondo
10:30-10:40	General Discussion	Chair
10:40-11:00	HEALTH BREAK	All



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<b>SESSION 8 SIMBA HALL</b>		
<b>Chair: Dr N. Mtui-Malamsha</b>		
11:00-11:10	Review of Peste Des Petits Ruminants occurrence and spread in Tanzania	D. Mdetele et al.
11:10-11:20	Evaluation of the growth rates of Friesian-Boran crossbred calves at Buhuri, Tanga, Tanzania	E.M. Ndaki et al.
11:20-11:30	Validation and comparison of Brucella FPA with RBPT and C ELISA test for Bovine brucellosis in Tanzania	G.Minga et al.
11:30-11:40	Anatomical variation of habitat related changes in scapular morphology	C.Luziga and N. Wada
11:40-11:50	Comparative efficacy of conventional and real time polymerase chain reaction (PCR) assay in the detection of Contagious Pustular Dermatitis (CPD) from clinical samples	J.J. Mwanandota et al.
11:50-12:00	Identification and Quantification of Brominated Flame Retardants in Muscles of Nile Perch from Lake Victoria, Mwanza, Tanzania	D. Dulla et al.
12:00 - 12:10	Phylogenetic comparison of symptomatic and asymptomatic cases of ASF in Tanzania	J. S. Chang'a et al.
12:20 - 12:30	Knowledge, attitude and practice in relation to drug residues in among adult beef consumers in Dodoma region	F. Mgonja et al.
12:30-12:40	Effects of vitamin A supplementation in local free range chickens vaccinated with Newcastle disease vaccine in Wami Dakawa, Morogoro, Tanzania	L.F. Mubila et al.
12:40 - 13:00	General discussion	Chair
13:00-14:00	LUNCH BREAK	
<b>SESSION 9: SIMBA HALL</b>		
<b>Chair: Dr Z.E. Makondo</b>		
14:00-14:10	Molecular Detection and Genotyping of Brucella Species in Cattle and Goat by High Resolution Melt Analysis in Tanzania	S. K, Motto et al.
14:10-14:20	Cyanide levels in sweet cassava varieties and people's perception on cyanide poisoning in Kagera and Morogoro regions, Tanzania	C. B. Mushumbusi et al.
14:20-14:30	Molecular detection of trypanosome species infecting cattle in Kasulu district, Kigoma	Nzalawahe, J.S.
14:30-14:40	Diversity of Two Theileria parva CD8+ T cell Antigen Genes in Cattle and Buffalo derived parasites	I. I. Kerario et al.
14:40-14:50	Prevalence and associated financial losses of fasciolosis in cattle slaughtered at Bukoba Municipal abattoir, Kagera, Tanzania	M. Paul and E. Mkupasi



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14:50-15:00	Skin wounds and welfare problems of working donkeys in Kilosa District	W.H. Kimaro and M.J. Kipanyula
15:00-15:10	The anti-inflammatory potential and hematological changes of peroxicam on formalin-induced inflammation in rats	L. Sejake et al.
15:10-15:20	Status of ectoparasites and haematological parameters of dogs attended at SUA Animal Hospital, Morogoro Tanzania	E. Stephano. and R.M. Maselle
15:20-15:30	Knowledge, attitudes and practices of the community on dogs and the dog parasites of public health significance in Mvomero and Morogoro districts, Tanzania	A.R. Issae et al.
15:30-15:40	The Prevalence of Haemoparasites in Rodents and Shrews Trapped from Domestic and Peridomestic Houses in Morogoro Municipality, Tanzania. A Hidden Public Health Threat	A. A.S. Katakweba
15:40 - 15:50	Parasitic and non-parasitic conditions affecting farmed and wild cichlids in Tanzania: Presentation of cases under investigation	A.B. Matondo and M. I. Mtalika
15:50-16:00	HEALTH BREAK	All

### CONFERENCE CLOSING SESSION: **SIMBA HALL**

**Chair: Prof R.R. Kazwala**

16:00-16:10	Participants and Invited Guests Seated	ALL
16:10-16:45	35 <sup>th</sup> TVA Conference Recommendations	TVA Chairman
16:45-16:50	Invitation of the Guest of Honour	TVA Chairman
16:50-17:00	Official Closing of 35th TVA Conference	Guest of Honour
17:00	END OF 35TH TVA SCIENTIFIC CONFERENCE ( <i>Bon Voyage</i> )	

### POSTER PRESENTATION

1	CYSTINET-Africa: A One-Health Network Fighting Taeniasis/Cysticercosis in Sub-Saharan Africa	H.A Ngowi et al.
2		

### RESERVE LIST

1.	Small Mammals in Fenced Houses as Source of Leptospirosis to Livestock and Pets animals in Morogoro Municipality, Tanzania	A. A.S. Katakweba
2.	Studies on Canine Transmissible Venereal Tumour of dogs in Mvomero and Morogoro municipality, Tanzania	V.L. Ishengoma et al.



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3.	Assessment of coliform bacterial contaminations in raw cow milk from selected dairy farms in Morogoro Municipality, Tanzania	K. Nyalekwa and H.E. Nonga

# ABSTRACTS



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **One health approach: In recent advances and industry responsive disease preparedness and response system in Tanzania**

<sup>1</sup>Nonga, E; <sup>1</sup>Makungu, S; <sup>1</sup>Swai, E; <sup>1</sup>Assenga, J; <sup>1</sup>Bakunama, C

*<sup>1</sup>Directorate of Veterinary Services, Ministry of Livestock and Fisheries,*

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#### **Abstract**

The Directorate of Veterinary Services (DVS) has adopted the One health (OH) approach in implementing Good Emergence Management Programme (GEMP) principles for control of transboundary animal diseases (TADS) in collaboration with key stakeholders (Multi sectoral and donor collaboration). Preparedness control plans for food safety, zoonosis and non-infectious disease emergencies have also adopted the GEMP principles. The DVS is investing in strengthening the disease surveillance system through manpower development, use of advanced data collection and management systems (SILAB, EMAi and AFYADATA), re-tooling with advanced equipment and recent knowledge, review of legislation in response to advancement of the animal production industry. Capacity building of OH rapid response teams (OHRRT) in Arusha and Kagera regions has been done to strengthen multi-sectoral coordination mechanism at sub-national levels. Successful national rapid responses to the rabies outbreak in Moshi district, anthrax outbreak in Monduli district and preparedness activation during the avian influenza outbreak in neighbouring Uganda are excellent examples of the OH approach. The role of the DVS in the OH platform includes; (i) prioritization of zoonotic diseases, (ii) development of surveillance guidelines for priority zoonotic diseases and (iii) development of control strategies for selected diseases. Implementation of GEMP principles through the OH approach has resulted in the following; 70 districts using the EMAi mobile phones system for disease reporting; Two districts using AFYA DATA system for disease reporting through use of mobile phones; interoperability between the Laboratory Information Management System (SILAB) and EMAi; surveillance guidelines for priority zoonotic diseases, control strategies for selected diseases; circulars for disease control through vaccination, dipping campaign using subsidized acaricides and review of legislation. It is envisaged that implementation of the GEMP through OH approach will reduce economic losses that are directly or indirectly attributed to diseases of livestock.

**Key words:** one health approach, disease, preparedness, response



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **The Role of Veterinary Education in Enhancing Quality Animal Health Services in Tanzania**

<sup>1</sup>Gillah, K. and <sup>2</sup>Mpanduji, D.G.

<sup>1</sup>*Chief Executive Officer Livestock Training Agency; <sup>2</sup>Principal, College of Veterinary Medicine and Biomedical Sciences*

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#### **Abstract**

Training of veterinarian and veterinary paraprofessional is a key driver for promotion of animal industry in Tanzania. The training of veterinary professionals is basically delivered at three different levels; the certificate, diploma and degree. Specialized training at master and doctorate level is carried out as prerogative of individuals themselves or prerequisite of the employers. Training by veterinary establishments is regulated by TCU and NACTE while Professional recognition and registration is carried out by the Veterinary Council of Tanzania (VCT). Currently, two government institutions (The College of Veterinary Medicine and biomedical Sciences and LITA) are mandated and contribute to training of large numbers of the veterinary professional's with small number coming from private institutions. Available data indicates the Tanzanian mainland to have an estimated total of 25,654,182 cattle in 26 regions. These animals are served by 908 veterinarians and 1259 veterinary facilities. This figure translates to 25,654,182 cattle herd each veterinarian has to attend. In practice, the number of cattle each veterinarian has to attend is likely to be much higher since not all registered veterinarians are available for clinical work. The calculations from the available data indicate each single veterinary facility is capable of servicing 20,377 cattle leaving alone other species of animals. The livestock data indicates a veterinarian in Tanzania to serve twice the recommended livestock unit of 10,000 by OIE. The veterinary establishments on the other hand are trying to bridge this gap by increasing enrolment of eligible students. However, these efforts comes with unbearable efforts of maintain younger population of instructors, refurbish old infrastructures and equipment and cope with decreased government subvention. The strength the government veterinary establishment facilities have is endowed of experienced workforce, availability of basic infrastructures and good governance systems; It is envisaged the discussions and suggestions put forwards will stimulate further dialogue with key stakeholders on how best the veterinary education can be translated in practice to promote the growth of animal industry in Tanzania.

**Key words:** Veterinary education, Veterinary Council of Tanzania, OIE, livestock, veterinary facilities



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Regulation of the Veterinary Profession and Veterinary Services: A changing Tanzania and changing Profession challenges**

B. Masuruli

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#### **Abstract**

Regulation of the veterinary profession and services in Tanzania started in 1958 in the then Tanganyika for the purposes of overseeing the profession and veterinary services that were expanding. These services were and are playing a vital role in securing public health, promoting economic growth and developing export potential for animals and animal products. After six decades of regulation, Tanzania now boasts to have the second largest herd of cattle on the African continent and has plans to produce more livestock products for industrialization and export. Nevertheless, as of today, veterinary services are still inadequate to meet the demand of the sector. As we mark, sixty years of veterinary regulation in Tanzania, the goal of the veterinary professional in the next six decades should be to strengthen and institutionalize the ability to offer quality services. The profession must understand that, the social, economic, technologic, and political changes that are occurring in society today will shape Tanzania in which veterinarians and veterinary paraprofessionals function. This paper therefore sets out the needs of the profession, areas that it must continue to address so that it remains strong and on the frontline of promoting the growth of the livestock sector, it enjoys a higher level of public recognition and acceptance than at any other time in its history.

**Keywords:** Veterinary Profession, Veterinary Services, Regulation, veterinarians





## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **The Role of Science, Technology, Innovation in Livestock Development – The Contribution of Research Systems in Supporting Use of Science Evidences in Tanzania**

Shirima, E. M.

*Tanzania Livestock Research Institute (TALIRI), P.O. Box 834, DODOMA-TANZANIA;*

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#### **Abstract**

The livestock industry in Tanzania has maintained a steady annual growth rate of over 2.7% during the last decade and the contribution to the National Gross Domestic Product (GDP) of about 6%. It is from these roles, adequate and appropriate attention to livestock issues is expressed in the following initiatives namely: The Tanzania Development Vision of 2025, The National Strategy for Growth and Reduction of Poverty (NSGRP), The National Livestock Policy (NLP) of 2006 and The National Livestock Research and Development Agenda (NLRA) of 2015-2025. The NLRA however, was formulated by the then Ministry of Livestock and Fisheries Development to provide overall guidance to livestock research undertakings as required in the NLP of 2006. In addition, the vision of NLRA, hitherto is to have a research system that shall improve livestock productivity and hence contribute significantly to food security and poverty reduction by 2025, whilst its mission as to develop appropriate livestock technologies that are economically, socially and environmentally friendly to ensure sustainable resource management. The role of livestock research in Tanzania was mandated to the Tanzania Livestock Research Institute (TALIRI) which was established under the Parliamentary Act No. 4 of 2012. The research activities includes; livestock breeding, value addition of livestock products, pasture, forage and range development, animal husbandry aspects, animal health and diseases, socio-economic aspects and local and indigenous knowledge while other functions in Section 5(1b-t). Under Section 5(2) of the Act, TALIRI is also mandated to carry out and promote basic and applied research while Section 5(3) to establish and maintain a system consultation and cooperation with any person, institute or organization with the similar functions. It is from these grounds that, the current paper will discuss the role of science, technology, innovation in livestock development and overwhelming contribution of livestock research systems in supporting use of science evidence-based results in Tanzania.

**Key word:** Evidence-based results; Innovation, Livestock research; Poverty Alleviation



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Evaluating Zoonotic Viral Sharing Among Bats, Primates, and People in a High Risk Transmission Interface in Southern Tanzania**

<sup>1</sup>Kazwala, R.R., <sup>2</sup>Mazet J., <sup>3</sup>Masanja, H., <sup>4</sup>VanWormer L., <sup>2</sup>Bird B., <sup>2</sup>Smith, W., <sup>2</sup>Wolking, D., <sup>2</sup>Laine, J., <sup>1</sup>Sijali, Z., <sup>1</sup>Nonga, H.E., <sup>1</sup>Msigwa, A., <sup>1</sup>Samson A., <sup>1</sup>Simon, W., <sup>3</sup>Mkindi C., <sup>3</sup>Mwakasungula S. <sup>3</sup>Mwamlima, T., <sup>3</sup>Athuman, T., <sup>2</sup>Randhawa N., <sup>2</sup>Ekiri, A., <sup>2</sup>Smith B., and <sup>2</sup>Hoppe I.

<sup>1</sup>Sokoine University of Agriculture, <sup>2</sup>University of California, Davis and <sup>3</sup>Ifakara Health Institute, <sup>4</sup>University of Nebraska

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#### **ABSTRACT**

Viruses traced to bats and non-human primates (NHP) have caused significant human viral hemorrhagic fever epidemics. In Tanzania's Udzungwa Mountain forests, bats and NHP live in close proximity to each other and human communities, creating high-risk interfaces for pathogen spillover. Using a One Health surveillance and capacity building approach, the project team investigated the presence of and risk factors for viral sharing among geographically overlapping bat, NHP, and human populations. Febrile patients were sampled at village-based health clinics, and behavioral surveys were conducted to assess forest and wildlife contact. Bats were captured and sampled in neighboring towns and forests, and fecal samples were collected non-invasively from NHP. Using data on bat movement, high-risk environmental sites were identified and surveillance was performed to sample fruits discarded by foraging bats and assess what species contacted these foods. Family-level PCR screening and confirmatory sequencing identified six coronaviruses and one paramyxovirus from 174 bat specimens collected from 135 bats across five species. Six previously-known coronaviruses and a paramyxovirus were detected, expanding their geographic and host ranges beyond what had been documented, and one new coronavirus was discovered. Viruses were interpreted and ranked according to zoonotic spillover risk, and models were generated to simulate spatio-temporal spread through the human population and to assess behavioral risk factors predicting fever and meningitis syndromes. The high-burden of non-malarial fevers and forest use and wildlife contact risk factors associated with febrile patient syndromes reinforce the need for strengthening viral surveillance of wildlife and human populations. This project trained, equipped, and deployed a professional One Health workforce capable of extending surveillance and detection for viral threats to remote areas and established local capacity for strengthening viral hemorrhagic fever outbreak response, zoonotic disease awareness, and health security around vulnerable hotspots for disease emergence in Tanzania.

**Key words:** Viral sharing, bats, non-human primates, coronaviruses, paramyxovirus



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Sustainable business investment to advance livestock health and productivity in Sub-Saharan Africa: the African Livestock Productivity & Health Advancement (A.L.P.H.A.) initiative**

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*Zoetis Belgium SA, with funding received from Bill & Melinda Gates Foundation*

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#### **Abstract**

Livestock are an essential asset to rural communities, and the health of livestock is critical to achieving food security in regions where there is exceptionally high incidence of livestock and human disease. Sub-Saharan Africa (SSA) has amongst the highest human population growth rates in the world, with five-fold growth in Tanzania projected by 2100. Livestock productivity therefore must be improved – by overcoming existing constraints to the livestock health sector, including: lack of access to quality veterinary medicines and products, poor rural extension services, limited sustainability of diagnostics services, and low education regarding animal health. Zoetis, the global animal health leader, partnered with the Bill & Melinda Gates Foundation through a \$14.4M business development grant with a key focus on sustainable improvement to livestock production in SSA. In the focal countries of Nigeria, Uganda, and now Tanzania and Ethiopia, the African Livestock Health & Productivity Advancement (A.L.P.H.A.) initiative centres around three central pillars: Veterinary Medicines & Services, Training & Education, and Veterinary Laboratory networks. Empowerment of the veterinary profession is a key component of our aim to demonstrate the value of animal health to farmers, particularly through encouraging business acumen and highlighting the importance of correct and responsible use of veterinary medicines. After successful launch activities in Nigeria and Uganda, we seek to continue our approach in Tanzania to focus on partnerships with important distributors, veterinary laboratories, and other key contributors to the supply chain to work towards common goals engineered for future growth and longevity.

**Key words:** Livestock, veterinary medicine, productivity advancement, veterinary profession



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **THE WSAVA AFSCAN PROJECT – 5th ANNIVERSARY OF A SUCCESSFUL NETWORK IN AFRICA**

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#### Abstract

The Foundation of the World Small Animal Veterinary Association (WSAVA F) began the African Small Companion Animal Network (AFSCAN) project in 2014 with the support of Zoetis and numerous other commercial and Association supporters. AFSCAN has four 'pillars' of activity and over the past four years, we have made considerable progress on each of these with a great support of national AFSCAN Ambassadors. The project was borne of recognition of the need for support and capacity-building for the African small companion animal veterinary community. The countries currently participating in the AFSCAN project are Ghana, Kenya, Namibia, Nigeria, Tanzania and Uganda. The four pillars of AFSCAN are: (i) Assisting in the establishment of National Small Companion Animal Veterinary Associations to the point where these associations can become full members of the WSAVA global community; (ii) Providing accessible on-line continuing education to the members of these new associations; (iii) Encouraging and supporting initiatives by the associations for canine rabies control programmes in each country and; (iv) Fostering development of academic companion animal clinical research by the award of clinical research grants and undergraduate studentships. Further supporting mobility through the new twinning programme and the BSAVA and NAVC AFSCAN International Scholarship programmes.

**Key words:** AFSCAN, WSAVA, Small Animal, Veterinary Association



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **On-farm diagnostic tests to educate and convince farmers to improve their management**

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#### **Abstract**

Good management, antibiotic resistance awareness and biosecurity are increasingly important in dairy farming. One of the biggest challenges however as being a farm animal veterinarian, is to educate and convince farmers to change management instead of using drugs to mask mistakes in their management. The confidence of the farmers and the willingness to change management may increase if the veterinarian is able to demonstrate the possibilities for improvement on farm. Improvement of farm management can be achieved by the use of on-farm diagnostic tests. On-farm diagnostic tests make early detection of diseases possible and reduce inappropriate use of antibiotics. Examples of on-farm tests are the ATP meter for monitoring of drinking water quality, the California mastitis test for detection of subclinical mastitis and the ruminal pH test for investigation of feed management. The use of these tests may change the attitude of the dairy cattle farmer from curative thinking towards more preventive thinking.

**Key words:** antibiotic resistance, on-farm tests, diagnostics, management



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Adoption of and willingness to pay for Newcastle disease vaccines by smallholder households in Tanzania**

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#### **Abstract**

Newcastle disease (ND) is considered the greatest threat to poultry in East Africa, yet only 22% of households in Tanzania regularly vaccinate. The behavioral and economic drivers underlying household decisions to adopt or forgo vaccination are not well understood, which are addressed with this study. A cross-sectional survey was administered to 535 households in Arusha, Singida, and Mbeya regions. We measured potential predictors of ND vaccine adoption and administered a contingent valuation activity to determine preferences and willingness to pay for ND vaccines. Eighty percent of households were aware of ND vaccines, 57% had previously vaccinated, and 26% had recently vaccinated. Knowing someone who vaccinated increased the odds of a household previously vaccinating [adjusted odds ratio (AOR): 1.32, 95% CI: 1.1-1.5]. Larger flock size was associated with higher odds of previous vaccination (AOR: 1.03 for a one chicken increase, 95% CI: 1.01-1.05). The willingness to pay (WTP) estimate was 5,853 Tanzanian shillings (\$2.64) to vaccinate ten chickens given the vaccine was protective for three months. Previous vaccination had the largest positive effect size on WTP suggesting smallholders observe benefits from vaccinating. A strong preference for vaccines in conjunction with low rates of vaccination suggests households are facing external barriers when purchasing and administering vaccines such as poor availability of reliable vaccines in rural areas and high transaction costs especially for households with small flock sizes. Encouraging professional-level knowledge within the community and creating conditions conducive to increasing flock sizes may increase adoption.

**Keywords:** Newcastle disease, vaccine delivery, contingent valuation, local chickens



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Systematic Domestic Dog Vaccination Results in Significant Declines in Rabies Exposures and Human Rabies Deaths**

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#### **Abstract**

The rabies virus continues to threaten the lives of thousands people across the world and is responsible for an estimated 60,000 human deaths annually, despite the availability of effective vaccines. Most of these deaths result from the bites of infected domestic dogs. When mass domestic dog vaccination campaigns are implemented consistently and comprehensively to achieve high coverage the incidence of rabies can be effectively controlled. However, often times dog vaccination is limited and the ad hoc culling is undertaken which is both ineffective and counterproductive. Since 2003 to date, free widespread domestic dog rabies vaccination campaigns in Serengeti District in collaboration with the Serengeti District Livestock Office has been conducted. Comprehensive rabies incidences have been compiled through exhaustive contact tracing. The results show that dog vaccination campaigns have steadily improved over time, in terms of the numbers of villages where campaigns have taken place and the total dogs vaccinated. In 2018 over 25,000 dogs were vaccinated, more than double the number vaccinated in 2012. These campaigns have resulted in a demonstrable decrease in dog rabies incidence and human rabies exposures. Less than 3 rabid dogs and less than one human exposure per month have been detected in 2018, compared to over 30 rabid dogs per month and around 20 exposures per month in 2012. No human deaths due to rabies have occurred in the district since 2016. In contrast, surveillance data in the surrounding districts in Mara region show that rabies continues to persist in areas where dog vaccination does not take place and poses a major burden of disease. This work demonstrates that domestic dog vaccination is effective at controlling rabies incidence and can have extremely valuable public health impacts. A website will be designed to communicate evidence about the importance of dog vaccination and surveillance activities as a powerful tool to improve public engagement, as Tanzania moves toward the “Zero by 2030” goal of eliminating human deaths due to rabies by 2030.

**Key words:** Rabies, Tanzania, Domestic dog, Vaccination, Serengeti



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Supporting Evidence Based Interventions - Causes and extent of reproductive loss and mortality of domestic ruminants in Tanzania (SEBI-Tz)**

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#### **Abstract**

Improving productivity of livestock systems by reducing mortality, including reproductive losses, is a priority investment area. However, data on the incidence and aetiology of livestock mortality, reproductive losses, and their impact on productivity in sub-Saharan Africa are inadequate. Such data are required in order to prioritize interventions in an objective way. The overarching objective of SEBI-Tz is to develop intervention strategies to control diseases causing mortality and reproductive loss in livestock in Tanzania. The project will do this by a) collating and analysing Tanzanian mortality and reproductive loss data found in the literature and other data sources; b) screening existing livestock serum samples to determine the range of abortigenic pathogens that livestock are exposed to; c) analysing linked household survey data to determine the frequency with which reproductive losses occur at the household level and to determine whether associations between pathogen exposure and reproductive loss exist; d) establishing a livestock abortion surveillance platform to investigate cases of reproductive loss and to determine the prevalence of abortigenic agents in such cases; e) carrying out an economic assessment to determine the costs associated with reproductive loss and strategies to avoid it; f) designing and evaluating cost-effective and locally appropriate intervention strategies. SEBI-Tz was launched in March 2017 and the first phase will complete in August 2019. We will present preliminary mortality data, cross-sectional household survey data illustrating the impact of reproductive losses across a range of livestock keeping settings, and results emanating from the first year of the abortion surveillance platform.

**Key words:** livestock, mortality, abortion, reproductive loss, Tanzania





## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **How are sciences, technology, innovation and research contribute to the use of science evidence and the future of livestock?**

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#### **Abstract**

This research is about how are sciences, technology, innovation and research contribute to the use of science evidence and the future of livestock development. The research shows development in science and technology are fundamentally altering the way people live, connect, communicate and transact with addresses and promote effectively tech advance, development countries should invest in quality education for youth on livestock development in supporting the use of science evidence and continuous skills, training for workers and managers particularly in livestock education. As well the research shows the contribution of investment climate is crucial, as are the right incentives structure to guide their allocation of resources and to encourage research and development. Successful countries have grown their ability to innovate and learn by doing, by investing public funding to help finance research and development in critical areas. Everyone is involved-big and small, public and private, rich and poor. Research and development in livestock education and investment should be clearly maintained and sustainable livestock project. Also the research shows the linking research and technology transfer as the number of partners and stakeholders expand their effective linkage of livestock research and technology transfer is becoming more complicated. Also the research highlights greater coordination and synergy between research and technology development that will be required if technologies are to be transferred and impact achieved. Also the research discusses the data collection and analysis, methodology including qualitative and quantitative as well as data were collected from volunteers and technological instruments. All in all research, science, technology and innovation are very potential for sustainable future of livestock and development.

**Key words:** Technology transfer, linking research, Livestock development, veterinary education, agriculture community.



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **The trend of antibody titres levels in chickens following vaccination against Newcastle Disease using La sota and I-2 vaccines**

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#### **Abstract**

Evaluation of the Antibody production to protective levels against Newcastle Disease (ND) following vaccination using I-2 and La Sota Vaccines was experimentally conducted on broiler chicken using standard Haemagglutination Inhibition test (HI). Three groups of sixteen broiler chickens each was employed to the experiment staying in a no communicating experimental units. At the age of two weeks chickens were wing tagged and vaccinated, the first group of sixteen was vaccinated using La Sota, the second with I-2 and the third no vaccination was done. The vaccination was done according to manufacturer indications. Blood samples were collected before vaccination and after every two weeks post vaccination. I-2 vaccinated group, HI results before vaccination (X0) found that 56% of the chickens were seropositive (GMT  $\geq 3.00$ ) and 44% were seronegative (GMT  $< 3.00$ ) and 81% of chickens were seropositive at 10<sup>th</sup> week (X5) post vaccination. The number of seropositive and seronegative chickens before and post vaccination found to be significant different ( $p < 0.05$ ). La Sota vaccinated group, the HI results before vaccination (X0) found that 25% of the chickens were seropositive and 69% were seronegative and 100% were seropositive at 10<sup>th</sup> week (X5) post vaccination at the end of the experiment. The number of seropositive and seronegative chickens before and post vaccination was significant different ( $p < 0.05$ ). When the two vaccines I-2 and La Sota were compared using their GMTs, the two vaccines were not significantly different ( $p > 0.05$ ) in trend of antibody protection levels for protecting chickens.

**Keywords:** Geometric Mean Titre, Haemagglutination Inhibition Test, Seroconversion, Seropositive, Seronegative, Protection.



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Participation and its determinants in East Coast Fever immunization by small-scale cattle keepers in Mazabuka district of Zambia**

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#### **Abstract**

Currently 1.4 million cattle are at risk of East Coast Fever out of approximately 3 million in Zambia. A cross sectional study was carried out in Mazabuka district of Zambia from July to September 2015, to assess participation of cattle farmers in, and determine factors affecting their participation in, ECF immunisation by the infection and treatment method. The study involved 224 randomly selected small scale cattle farmers from three veterinary camps in Mazabuka who participated in the second round of 2015 immunisation campaign. Semi-structured questionnaire was administered to farmers to seek information about demographic and socio-economic characteristics, knowledge and experience in cattle rearing, and herd characteristics and management and perceived benefits, costs and challenges of ECF immunisation. Data on immunisation statistics, schedules, coverage, adequacy, vaccine delivery, successes and challenges for 2008 - 2014 were collected from the district veterinary office and the Central Veterinary Research Institute. Descriptive statistics such as frequencies and proportions were computed to establish immunization coverage, participation trend and socio-demographic parameters of cattle farmers. Fischer exact test was used to assess associations between variables at 5% significance level. Logistic regression was run using R software to assess influence of different factors on willingness of farmers to participate in immunization campaign. Majority of participants who were males (94%), had secondary education (49.1%), more than five year experience of keeping cattle (89.3%) and depended on sources other than cattle for their livelihood (47.3%). From 2008 to 2014 vaccination coverage was on average 65% of the target per annum and 97% of the participants appreciated reduction in cattle mortality post immunisation. Willingness to participate in immunisation campaign was influenced by education level (secondary education: OR=27, 95% CI: 2.29-352.71), satisfaction with immunisation service (OR=5.14, 95% CI: 1.04-24.64) and experience of post-immunisation mortality reduction (OR=7.33, 95% CI: 1.26-44.00). Improvement in service delivery quality and monitoring of post immunisation outcome can lead to increased participation of farmers in immunisation campaigns.

**Key words:** East Coast Fever, immunisation, Infection and Treatment Method, Theileriosis, Tick Borne Diseases, Mazabuka



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **A serological assay for differentiating Rift Valley Fever (RVF) naturally infected animals from arMP12 $\Delta$ NSm delvaccinated animals**

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#### **Abstract**

Rift Valley fever virus (RVFV) is the cause of Rift Valley fever (RVF), a significant public health and veterinary problem in Africa and the Arabian Peninsula. An effective vaccine is needed to prevent RVF in livestock, preferably a vaccine with a biomarker to distinguish naturally (virulent) infected from vaccinated animals (DIVA). Therefore, the goal of this study is to evaluate a live attenuated recombinant RVFV vaccine with deleted the non-structural nucleotides deleted from the M RNA segment (NSm) to serve as a biomarker to distinguish RVF vaccinated from animals infected with virulent RVFV. An indirect ELISA was developed using NSm protein as a capture antigen for detecting NSm-antibody in samples from naturally infected and for possible non-detection of NSm antibody in animals vaccinated with the NSm genes deleted RVF vaccine arMP-12 $\Delta$ NSm21/384. Sera samples from animals previously infected with virulent RVFV were obtained from Kenya and Tanzania, and from experimental challenge study in Canada. Also, samples from animals vaccinated with parent RVF MP-12 and the arMP-12 $\Delta$ NSm21/384 vaccine were obtained from virology laboratory at Sokoine University of Agriculture. All sera from animals infected naturally with virulent RVFV or from the challenge study had a geometric mean optical density (OD) reading of 0.88, thus demonstrating that animals were infected with virus containing the NSm antigen induced a detectable antibody response to this antigen. In contrast, animals vaccinated with RVF arMP-12 $\Delta$ NSm21/384 had an OD reading of only 0.17, or negative for antibody, thus demonstrating that animals vaccinated with RVF arMP-12 $\Delta$ NSm21/384 can be distinguished from animals infected with virulent RVFV.

**Key words:** Rift valley fever, DIVA, arMP-12 $\Delta$ NSm21/384, ELISA, NSm



## Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry

### Evaluation of the immunogenicity of a recombinant Rift Valley fever vaccine (arMP12ΔNsm21/384) in indigenous species of cattle, sheep and goats.

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#### Abstract

Rift valley fever virus (RVFV) is enzootic in most of the African countries and the Arabian Peninsula where the virus causes devastating outbreaks of Rift Valley fever disease, especially among domestic ruminants. Efforts to develop a vaccine to prevent RVF includes the use of Reverse genetics to modify an existing live attenuated RVF MP12 vaccine to yield a recombinant vaccine referred to as arMP12ΔNsm21/384 candidate vaccine. The aim of this study was to evaluate this candidate vaccine in small domestic ruminants in Tanzania

Six to nine months old goats (*Capra aegagrus*), calves (*Bos taurus indicus*) and sheep (*Ovis aries*) were vaccinated subcutaneously with one ml of  $1 \times 10^5$  PFU/ml RVF MP-12 and the arMP- 12ΔNsm21/384 candidate vaccines. The control animals consisted of six animals, two of each species which received 1ml of a placebo. Blood samples were collected on days -2, 0, 3, 4, 5, 7, 14, 21, 28, 35, 42 and 67 to determine the possibility of a viremia and to determine the immune response of the vaccinated animals. The immune response was determined by testing sera samples for antibody using a commercial ID-VERT ELISA kit (Montpellier -France) as well as a plaque reduction neutralization test (PRNT). Sera samples obtained within the first one week were tested for virus by RT-PCR and by virus isolation. Animals were observed daily for adverse effects and rectal temperature was recorded at the time of blood collection. All vaccinated animals developed RVFV neutralizing antibodies with titers between 1:10 to 1:2560 with no adverse effect detected in any of the animals. The antibody response of goats to both MP12 and arMP- 12ΔNsm21/384 vaccine was significantly higher than the response observed for sheep and cattle. No viremia detected in vaccinated and control animals. This study demonstrated that the MP-12 and the arMP12ΔNsm21/384 vaccine candidates elicited RVFV neutralizing antibody in indigenous species of cattle, sheep and goats in Tanzania, and therefore warrant further studies to assess the safety and efficacy of these candidates in domestic ruminants.

**Keywords:** Rift valley fever virus, calves, sheep, goats, MP12, arMP12ΔNsm21/384



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Molecular characterization of infectious bursal disease virus recently detected in Dar-es-Salaam, Tanzania**

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#### **Abstract**

Infectious bursal disease (IBD) virus (IBDV) causes an acute and highly contagious immunosuppressive disease in young chickens aged 3-6 weeks. The molecular epidemiology of IBDV in Tanzania has not been consistently studied. This study was undertaken to determine the genotype of IBDV following confirmed IBD outbreak(s) in Dar-es-Salaam. A cross-sectional study that involved collection of bursal of fabricius samples from dead chicken following IBD outbreak(s) was conducted. Analysis of samples was performed by reverse transcription polymerase chain reaction (RT-PCR) targeting the VP2-hypervariable region (VP2-HVR), nucleotide sequencing and phylogeny. The findings of this study revealed that one out of eight samples (12.5%; n=1) was positive for VP2-HVR by RT-PCR and sequencing. A BLASTn search of the detected field virus (TZ/DSM/2018) indicated 96% nucleotide identity to the LUSC 47-2016 strain isolated from chicken in Lusaka, Zambia. The TZ/DSM/2018 virus conserved putative virulence marker amino acids at 222(A), 242(I), 256(I), 294(I) and 299(S) positions, with unique amino acids at positions 263S and 338P. In phylogeny, the TZ/DSM/2018 virus clustered in the same clade with the African very virulent (VV) IBDV (VV-IBDV) genotype. Taken together, this study has revealed the existence of the African VV-IBDV genotype in Dar es Salaam, which is genetically different from the vaccine strain. Further studies are required to unravel the genetic and antigenic characteristics of circulating IBDV strains so that rational IBD control method(s) in Tanzania and neighbouring countries can be recommended.

**Key words:** VV-IBDV, RT-PCR, sequencing, phylogeny, Tanzania



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Intra-farm and inter-farms foot-and-mouth disease (FMD) outbreak(s) investigation: genetic diversity of FMD virus strains recovered in Morogoro, Tanzania**

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#### **Abstract**

Foot-and-mouth disease (FMD) virus (FMDV) is a positive sense single stranded RNA virus that exhibits high mutation rates, which result into genetic variation following subsequent virus replication cycles in host cells. In this study, we investigated the epidemiology and genetic diversity of FMDV strains recovered from cattle following natural FMD outbreak(s) that occurred during 2016 - 2017 in Morogoro. Epithelial tissues and/or fluids were collected from foot and oral vesicular lesions in animals with clinical signs suggestive of FMD in Sangasanga and Msamvu-Mgonja farms. A total of 72 samples (57 from Sangasanga and 15 from Msamvu-Mgonja) were collected from animals with different age groups. Analysis of samples was performed by RT-PCR targeting VP1 of FMDV, sequencing and phylogeny. VP1 nucleotide sequences were analysed by DNASTAR Lasergene and phylogenetic reconstructions performed by Maximum Likelihood and Neighbour-Joining methods. The findings indicated that 48 out of 72 samples (66.7%) contained FMDV genome, with detection rates of 63.2% (n = 36) and 80.0% (n = 12) in Sangasanga and Msamvu-Mgonja farms, respectively. The clinical manifestations and virus detection rates in Sangasanga farm were significantly higher in young animals than in adults. Viruses detected in Sangasanga and Msamvu-Mgonja farms were serotypes A and O, respectively. In-depth genetic and phylogenetic analysis of nucleotide sequences revealed that type A viruses belong to the AFRICA toptype (genotype I), whereas type O viruses fell into the EAST AFRICA 2 (EA-2) toptype, with some nucleotide differences among viruses recovered in different geographic locations with time and space. This study demonstrates the existence of intra-farm and inter-farms genetic diversity of FMDV following natural FMD outbreak(s) in endemic settings in Tanzania. Full genome sequencing of viruses obtained from these outbreaks should be performed so as to understand the basis for genetic diversity of FMDV recovered in discrete epidemiological areas.

**Key words:** FMDV, RT-PCR, phylogeny, genotype/topotype, Morogoro



## Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry

### Public Health risk of zoonotic ticks in Abeokuta, Southwest Nigeria

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#### Abstract

Ticks are obligate blood-feeders that require a host to survive and reproduce and has been said to be second to mosquito in pathogen transmission. Tick-borne diseases are increasingly becoming an important public health issue because of the possibility of acquiring them through tick bite and the presence of ticks in environment poses risk to humans and livestock alike. This study was carried out to determine the presence of ticks in Abeokuta environment and to screen harvested ticks for some zoonotic pathogens. Ticks were gathered from ten different spots in Abeokuta Ogun state using the cloth dragging method. The gathered ticks were morphologically identified to genus level using stereo microscope and grouped based on their developmental stages. Harvested ticks were screened for 5 pathogens of Public Health importance namely *Anaplasma*, *Babesia*, *Borrelia*, *Ehrlichia* and *Rickettsia* by Polymerase Chain Reaction (PCR) using extracted DNA from the ticks. Conserved region of each pathogen was targeted using two primer sets for each. A total of 357 ticks were gathered from the environment, the environments were areas where cattle are being grazed. Using their morphology; 19 (5.3%) of ticks were of the genus *Amblyomma*, 274 (76.6%) were of the Genus *Rhipicephalus* (sub genus *Boophilus*), and 64 (17.9%) were of the Genus *Rhipicephalus*. Using the developmental stages; 44 (12.3%) of the ticks were adults, 304 (85.2%) were larvae and 9(2.5%) were nymphs. Pathogen prevalence in the harvested ticks was 20.73%. PCR analysis revealed that 2 (0.56%) of ticks were positive for *Coxiella* and *Rickettsia*, 28 (7.84%) for *Anaplasma*, 29 (8.12%) for *Coxiella*, 7 (1.96%) ticks were positive for *Coxiella* and *Anaplasma* and 8 (2.25%) ticks were positive for *Rickettsia*. None of the ticks had *Babesia* and *Borrelia*. With the presence of *Anaplasma*, *Coxiella* and *Rickettsia* in the harvested ticks, the risk of acquiring infection from bite of ticks by humans and livestock is very high in the study areas and the possibility of transfer into other areas through movement of goods and services involved in global trade portend danger. Importance of co-infection in the harvested ticks and the dangers they pose in disease transmission to animal and humans are of great public health concern which require Public awareness and education.

**Key words:** Ticks, zoonosis, public health, vector





## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Tanzania Animal Health Perspective on One Health**

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#### **Abstract**

Tanzania is among the four nations listed globally with mega-biodiversity status, alongside Brazil, Indonesia and Congo. Animal health causes severe impacts to human health through exposure to zoonotic diseases due to unique biodiversity that provides avenue for high interactions and subsequent spill-over of pathogens across species. Animal health also causes impacts on production and productivity of livestock which results in decreases food security and it can affect national economies. Animal health can also affect the environment. One Health Approach is an integrative effort of multiple disciplines working locally, nationally, and globally to attain optimal health for people, animals, and the environment. The approach focuses on zoonoses, emerging diseases, emerging health related problems (drug resistance, toxins, pollution etc), environment health and comparative medicine. One Health Approach is important because new disease drivers are emerging due to raise in global population leading to increase in frequency of interaction between people, their domestic animals and wildlife and opportunities for new diseases to emerge. The government of Tanzania has developed one health strategic plan which create and maintain active collaboration among sectors for the prevention and control of zoonotic diseases, antimicrobial resistance and other public health events to ensure there is timely preparedness and coordinated response in the event of occurrence of zoonotic diseases, antimicrobial resistance and other public health events. There is the need collaborate to address health from an integrated perspective and uphold our mission to improve the well-being of the United Republic of Tanzania by promoting collaboration in addressing One Health country priorities. Combined efforts of the Ministry of livestock and fisheries; Veterinary research and academic institutions; international organizations like FAO, OIE and other OH line Ministries are needed to address these challenges.

**Key words:** One health, animal health, perspective, zoonoses



## Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry

### Ormilo: an Emerging Disease Problem?

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#### Abstract

A neurological disease of small ruminants, known locally as *ormilo*, has been reported as a growing concern amongst livestock keepers in Tanzania. This preliminary study was carried out in affected communities to characterise the clinical disease and investigate its aetiology. From a household census carried out in four pastoralist villages (n=480 households), 95% of households had reported cases of neurological disease in the previous year. The individual-level 12-month period prevalence ranged from 11-34%, equivalent to the loss of about 10,000 small ruminants in four villages over a one-year period. Neurological examinations of affected animals (n=74) identified proprioceptive deficits and weakness as the most common clinical signs, with disease observed in animals as young as 2 months old. Brain cysts were detected in 82% of affected animals examined at post mortem (n=32), and confirmed as *Taenia multiceps* through PCR diagnosis. The practice of feeding small ruminant brains to dogs was identified as an important risk factor for the disease, irrespective of whether households owned dogs or not. This study demonstrates that cerebral coenurosis (caused by *T. multiceps*) is a major cause of small ruminant neurological disease in these communities and highlights the urgent need for further investigation into the disease burden, the impacts on pastoral livelihoods and food security, and potential control measures for this emerging disease concern.

**Key words:** *Ormilo*, Coenurosis, *Taenia multiceps*, Risk factors, small ruminants



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Epidemiology and Control Strategies of Dog-Mediated Human Rabies in Southern and Eastern Africa**

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#### **Abstract**

Rabies is a neglected zoonotic viral disease caused by Lyssa-viruses and affects all terrestrial mammals globally. Children are most at higher risk and transmission occurs through dog bites. Although the disease is 100% preventable by vaccinating dogs and provision of PrEP and PEP in human, rabies continues spreading into new reservoirs and territories, causing significant health and economic burden due to human suffering and control costs. Risk factors, ecology and dynamics of rabies epidemics are imperfectly understood. The purpose of this paper was to review and describe the epidemiology, control and elimination strategies of dog-mediated human rabies in Southern and Eastern Africa. Systematic literature review was used to collect and analyze rabies data obtained from Southern and Eastern Africa Rabies Group, Pan-African Rabies Control Network, World Organization for Animal Health) and World Health Organization databases. It has been established that rabies is endemic, under reported and inconsistently reported in Southern and Eastern Africa. Its control is limited by human, socioeconomic, animal, epidemiological misperceptions, vaccines, financial resource, government and policy related factors. Rabies control strategies including prevention of rabies in dogs and human have been implanted to reduce impacts in humans and animals. **Conclusion:** Vaccinating 70% of dog population can eliminate rabies in dogs and protect human as well.

**Key words:** Rabies, epidemiology, risk-factors, control strategies



## Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry

### Farmers' knowledge and practices influencing *Taenia solium* infection in smallholder pigs in Mbozi and Mbeya districts, Tanzania

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#### Abstract

*Taenia solium* has been reported to be endemic in the southern highlands of Tanzania. Based on Ag-ELISA, prevalence of *T. solium* cysticercosis in pigs was reported to be about 31% in 2008 and 17% in 2015 in Mbeya and Mbozi districts of Mbeya and Songwe regions, respectively. This study aimed to estimate the current status of the disease in pigs and understand farmers' knowledge and practices influencing disease occurrence and transmission. *T. solium* cysticercosis in pigs was determined by tissue slicing while a questionnaire survey assessed farmers' knowledge and practices. A total of 890 households were surveyed and 282 pigs examined. Only 18.5% of respondents knew *T. solium* taeniosis in humans, 32% of whom did not know how the infection is acquired. Also, 61.2% of respondents who had seen cysts in meat were not aware that consumption of the meat could cause cysticercosis. More than 90% of latrines were not enclosed and 45% of them were accessible to pigs. Twenty nine pigs (10.3%) had *T. solium* cysts, seven of them had non-viable cysts (five with both viable and non-viable cysts and two with non-viable cysts only). About a half (51.8%) of the pigs had light infection burden (0-100 cysts), 14% had moderate infection (101-1000 cysts) and 33.3% had heavy burden (>1000 cysts). The study revealed low levels of farmers' knowledge and risk practices which may contribute to perpetuation of the disease. Improvement in the local knowledge of the disease epidemiology is suggested for inclusion in future control programs.

**Keywords:** Knowledge, practices, *Taenia solium*, smallholder, pigs



## Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry

### A scoping review of *Taenia solium* taeniosis and cysticercosis in Tanzania provides a research evidence justification for control

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#### Abstract

A scoping review of 50 scientific literature published between 1995 and 2018 provides broad evidence of *Taenia solium* taeniosis and cysticercosis (TSTC) burden and potential for control in Tanzania. Prevalence of taeniosis of 2.3% - 5.2% was estimated based on copro-antigen ELISA while human cysticercosis of slightly >16% was estimated based on serum antigen ELISA (Ag-ELISA) or IgG Western Blot. Neurocysticercosis contributed significantly to epilepsy in adults. Farm prevalence of porcine cysticercosis were 6.0% - 17.4% (lingual examination), 1.5% - 33.3% (Ag-ELISA) and incidence rates of 25 per 100 pig-years (lingual examination) and 69 per 100 pig-years (Ag-ELISA). Slaughter-slab prevalence ranged from 0% - 18.2% (routine meat inspection). Lacking latrines and watering pigs with river or pond waters were associated with high prevalence of porcine cysticercosis. A systematic review study found that, for the year 2012 the number of DALYs per thousand person-years for NCC-associated epilepsy was 0.7 (95% UI, 0.2–1.6). Around 5 million USD (95% UI, 797,535–16,933,477) were spent due to NCC-associated epilepsy and nearly 3 million USD (95% UI, 1,095,960–5,366,038) were potentially lost due to porcine cysticercosis. Three rounds of annual treatment of school-age children with praziquantel significantly reduced prevalence of taeniosis in children and adults as well as porcine cysticercosis. A health education intervention reduced porcine cysticercosis incidence by approximately 43% with no improvement in pig confinement or use of latrines. A single dose of oxfendazole 30 mg/kg body weight eliminated *T. solium* cysticerci in pig musculature but not in the brain. A one-health approach is mandatory to the elimination of TSTC in Tanzania. There is a potential for integration of the control of TSTC with other neglected tropical diseases, including schistosomiasis.

**Key words:** taeniosis, cysticercosis, one-health, ELISA



## Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry

### Control of porcine cysticercosis in smallholder pig production systems in Tanzania through community-based health education interventions - A review

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#### Abstract

Porcine cysticercosis (PC) is an infection caused by the larval stage of a zoonotic tapeworm *Taenia solium*, and is one of the tropical neglected zoonotic diseases known to pose a serious economic losses and public health risk among smallholder pig production communities. *Taenia s.* was declared potentially eradicable by the International Task Force for Disease Eradication in 1992, but the parasite still exists in endemic areas of Tanzania due to the number of reasons including: environmental sanitation and hygiene practices are inadequate, economic constraints, free range pig management and lack of knowledge on the transmission of the parasite in endemic areas. Different strategies have been implemented for the control of *T. solium* infections in endemic areas. These include treatment of infected humans, vaccination of pigs, general improved sanitation and indoor pig rearing, pork inspection and public health education. However, these strategies have not been effective in current PC endemic areas. Health educational intervention if properly designed and delivered have been shown to bring changes conducive to control and eventually elimination of the disease in infected societies through improving the knowledge and practices in the targeted societies. Some educational interventions have shown significant reduction in the prevalence of PC, significant changes in knowledge and some practices related to transmission of *T. solium*. A study on Health Education Intervention in Mbulu demonstrated the value of Health Education in reducing the incidence rate of PC in Mbulu district by 43% and significantly improved the pig farmers' knowledge and attitudes towards *T.solium* control (P < 0.001). Current evidence does support the elimination of *T. solium* in the foreseeable future. Investigators should follow international recommendations on the conduct of community-based randomized control trials to provide more valid estimates of the effect and cost effectiveness of this alternative control strategy for cysticercosis.

**Keywords:** *Taenia solium*, Porcine cysticercosis, Community-based health education intervention trials, Smallholders, pig



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Human *Taenia solium*- cysticercosis infection and the Need of Community based health education intervention for sustainable control in Tanzania**

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#### **Abstract**

*Taenia solium* is a neglected zoonotic cestode transmitted between human and pigs, causing serious disease and financial burden in countries where the parasite is endemic. Sub-Saharan Africa is estimated to have between 1.90 and 6.16 million people infected with *T. solium*. The risk of human *T. solium* infection in Tanzania is high as the prevalence of porcine cysticercosis is reported to be 6.0% -17.4% by lingual examination and 1.5% - 33.3% by Ag-ELISA, also pig production has significantly grown and pork consumption is becoming popular throughout the country. The prevalence of human cysticercosis in general public in Mbulu and Mbozi district was found to be 16.3% and 15%, respectively and neurocysticercosis reported in about 16.2% of people with epilepsy in northern zone of Tanzania. This indicates that the disease is highly endemic in the country requiring revisiting the practiced control strategies. Control measures in place like meat inspection and health education have failed to control or eliminate the parasite in the country. Studies have demonstrated strong association between *T. solium* infection and some social practices such as improper sanitary, inability to recognize infected human and insufficient knowledge on parasite transmission. This suggests that health education intervention could play a pivotal role in preventing and controlling the infection. For instance, a study conducted in Mexico reduced the prevalence in pig cysticercosis from 5.2% to 1.2% and human taeniosis from 0.78% to 0.51%. In Mbulu, Tanzania a drop of 43% in porcine cysticercosis prevalence and an increase in community disease knowledge were reported. The reported positive impacts of health education interventions piloted in some endemic countries lacked sustainability. One of the reasons for that could be inadequate community participation. To ensure sustainability in controlling the parasite, community engagement in developing and implementing the health education intervention programme using One Health approach is the way forward.

**Keywords:** Human; *Taenia solium*; Prevalence; Health education, sustainability, one health



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Association of Brucellosis with Abortion Prevalence in Humans and Animals in Africa: A Review**

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#### **Abstract**

Brucellosis is a worldwide zoonotic disease suspected to be the cause of abortions which remain largely undiagnosed in both humans and animals. A review of literature was performed to elucidate the contribution of brucellosis to abortions in humans, livestock and wildlife in Africa. A total number of 18 published articles associated brucellosis to abortions observed in humans and livestock in some parts of Africa. The contribution of brucellosis to abortions in humans was less reported in the literature compared to livestock; and no report was done in wildlife in Africa. The association of brucellosis to abortions in Africa was mostly based on bacteriologic, serologic or molecular techniques and *Brucella abortus biovar*3 seemed more associated to abortions in cattle. The isolation and molecular characterization of *Brucella* species could advance the assessment of the contribution of brucellosis to abortions in Africa, focusing much in humans. The epidemiologic approach based on case-control comparisons could elucidate more about the contribution of brucellosis to abortions in Africa. The economic impact evaluation of abortions due to brucellosis could justify implementation of eradication programs of this disease in Africa, such as occupational and food hygiene in humans; with a vaccination and culling in animals.

**Key words:** Brucellosis, abortion, livestock, zoonosis





## Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry

### Evaluation of novel filter paper for storage of foot-and-mouth disease virus in endemic settings in Africa

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#### Abstract

Foot-and-mouth disease (FMD) is a highly contagious viral disease that infects cloven-hoofed mammals such as cattle, sheep, goats, pigs and various wildlife species. It is caused by FMD virus (FMDV), an RNA virus classified into *Picornaviridae* family and *Aphthovirus* genus. Poor storage and shipment of suspected clinical samples can compromise the ability to detect and characterize FMDV in countries where the disease is endemic resulting in the loss of valuable virological and epidemiological data. This study was conducted to evaluate a method for storage of FMDV onto novel filter paper for later nucleic acid amplification and sequencing. The suitability and performance of the filter paper for keeping virus genome was evaluated by testing the stability of FMDV RNA spotted onto the paper and stored at either room temperature, 4°C, -20°C or -40°C for 2, 4, 6, 8, 10 or 12 weeks. The stability of FMDV was tested by reverse transcription polymerase chain reaction (RT-PCR) and sequencing of the VP1 coding region of the virus. Assessment of genomic stability was performed by nucleotide sequence alignment using Clustal Wallis method. The results revealed that FMDV RNA was stable on novel filter paper stored at room temperature and at 4°C for up to 10 weeks, whereas at -20°C and -40°C the storage time could go beyond 12 weeks. Furthermore, sequence alignment showed 100% nucleotide identity between FMDV RNA eluted from filter paper and that of epithelia tissues stored at -80°C irrespective of the tested storage condition and storage duration. These findings indicate that the novel filter paper is capable of storing FMDV RNA for extended period of time without degradation hence providing a reliable source of viral RNA for molecular characterization. Further studies are required to validate and deploy the novel filter paper for diagnosis of FMD and other viral diseases in endemic settings in Africa.

**Key words:** FMDV, viral RNA, filter paper, RT-PCR, sequencing



## Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry

### Epidemiology of ectoparasites and gastrointestinal parasites of dogs in Mvomero and Morogoro districts, Tanzania

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#### Abstract

Dogs are the earliest animals to be domesticated by humans worldwide although poor management practiced in developing countries predisposes dogs to diseases. A cross sectional study was conducted between October 2017 and January 2018 to assess the epidemiology of parasitic infestations in dogs of Mvomero district and Morogoro Municipality. A total of 400 dogs were examined for ectoparasite infestations and sampled for laboratory identification using standard identification keys. Faecal samples were also collected from all the study dogs for coprological analysis of gastrointestinal parasites. It was found that majority (83.8%) of the dogs were infested with ectoparasites namely ticks, fleas, mites and lice. It was further found that 76.8% of dogs were infested with intestinal parasites and some of them were zoonotic parasites namely *Ancylostoma* (60.5%), *Uncinaria* (22%), *Toxocara* (11.5%), *Toxascaris* (6.3%), *Ascaris* (3.8%), *Taenid* (6%), *Dipylidium* (1.8%), *Cryptosporidium* (15.5%), *Isospora* (8%), *Cyclospora* (4.3%) and *Entamoeba* (3%). Dogs of Mvomero district were more ( $P < 0.05$ ) infested with parasites than those of Morogoro Municipality. Risk factors for parasitic infestations which were found to be statically significant ( $P < 0.05$ ) included age, location of origin, management and housing system, lack of routine deworming and feeding system. It was concluded that dogs in Morogoro are overburdened with high infestation of parasites which is against the animal welfare. Therefore, comprehensive approaches are required on dog management practices in the study areas and other areas in Tanzania in order to safeguard the health of dogs are recommended.

**Key words:** dogs, diseases, parasites, risk factors



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Incidences neurological disorders in domestic animals attended at Sokoine University of Agriculture Animal Hospital: a retrospective study 2004-2014**

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#### **Abstract**

Neurological disorders are diseases of brain, spinal cords and nerves that connect them. A retrospective study was conducted to establish the incidences of neurological disorders in animals attended at SUA Animal Hospital from 2004 to 2014. Using hospital records, the number of cases in different species, diagnostic method and adherence to the suggested control measures were analyzed. Collected data were analyzed by Microsoft excel 2010 and descriptive statistics. The overall incidence of neurological disorder was 10.5%, *Canine* specie had the largest proportion of the neurological suspected cases, contributing 93.30% of all cases. The highest incidence of neurological disorder was observed in 2011 with canine distemper being reported at the highest frequency and rabies ranking the second. This study has observed that, only small proportional of cases at SUA Animal Hospital (1.7%) were confirmed. This study suggests neurological disorder to be considered as among serious threat to the health status and welfare of the animal and can lead to serious economic losses through decreased productivity of affected animals. It is therefore recommended that well established diagnostic facilities, equipment for managing neurological conditions and vaccination for vaccine preventable neurological disorder should be encouraged.

**Key words:** Neurological disorders, SUA, domestic animals, hospital records



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Phages implications on Controlling antibiotic resistance and future biotechnology in Animals disease: a review**

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#### **Abstract**

Phages are bacterio-specific viruses (Bacteriophages). Involved in the origin of life and evolution, constituting a major part of the biosphere, they are promising as a sustainable, ecological and intrinsically cheap antibacterial. They have been proposed as alternatives to antibiotics for many antibiotic resistant bacterial strains. Phages can be used as biocontrol agents in agriculture and petroleum industry. Moreover phages are used as vehicles for vaccines both DNA and protein, for the detection of pathogenic bacterial strain, as display system for many proteins and antibodies. Phages are diverse group of viruses which are easily manipulated and therefore they have potential uses in biotechnology, research, and therapeutics. The aim of this review article is to enable the wide range of researchers, scientists, and biotechnologist who are putting phages into practice, to accelerate the progress and development in the field of biotechnology. A possible solution to concerns regarding the use of phage therapy is the use of phage enzymes such as endolysin and VAPH instead of whole phage. Using phage proteins instead of whole phage potentially avoids many of the problems of using a constantly reproducing particle, such as horizontal gene transfer and environmental containment issues. Conclusively Phage therapy is an exciting rediscovered field that will surely provide countless benefits to science, agriculture, veterinary science, and medicine, including offering a possible solution to counteract the increased prevalence of antibiotic-resistant pathogens. The potential of using phage therapy, the use of phage cocktails, or the use of phage protein products may be the best areas for successful phage treatment of infections.

**Keywords:** Phage therapy, Antibiotics resistance, Vaccine, Biocontrol, Infection.



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **A 12- year retrospective study on pattern and relative frequency of preventable canine diseases in Morogoro**

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#### **Abstract**

A retrospective study was undertaken to determine the occurrence and relative frequency of canine cases attended at the university animal hospital located at Sokoine University of Agriculture (SUA). The study involved examination of canine cases recorded for the past 12 years starting from 2005 to 2016. A total of 2,288 canine cases were evaluated and grouped based on disease condition matching with the hospital records. The top five most frequently cases were found to be worm infestation (19%), parvo viral diarrhoea (15%), wound (13%), canine distemper (7.7%) and bacterial diarrhoea (7.6%). Worm infestation showed a high and steady occurrence; parvo viral diarrhoea and canine distemper cases were on the increasing trend whereas rabies and canine transmissible venereal tumour were on the decreasing trend. Interestingly, majority of cases reported were those which can be prevented through adequate veterinary care such as vaccination, routine deworming, and sanitation. The findings in this study call for further follow-up studies and re-assessment of the current strategies used in disease control in order to have a comprehensive understanding in the existing gaps which limit progress in the control of some diseases identified in this study.

**Keywords:** Parvovirus, Rabies, Canine Distemper, Diarrhoea, Transmissible Venereal Tumor



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

Review of Peste Des Petits Ruminants occurrence and spread in Tanzania

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### **Abstract**

Peste des petits ruminants (PPR) is an important trans-boundary animal disease of small ruminants. Mostly affecting younger animals resulting into reduction of flock size, breeding animals in the herds, making livestock keeper's poor, threatening the food security and sustainable livelihood of livestock keepers across Africa, the Middle East and Asia. Since its introduction in Tanzania in 2008 to date PPR has caused significant losses and continue to cause losses among animal producers and government as the disease has become endemic in the country. The study reviewed published, unpublished publications and reports from different sources in relation to important events and timeline of PPR spreading from its introduction in Northern Tanzania in 2008. It has outlined outbreaks, cases reported and confirmed by laboratory tests from 2008 to date. The generated information resulted into understanding of trend of disease spreading in the country and risky factors associated with PPR spreading in Tanzania. Importance of Cross border communities and quality Veterinary services on limiting spreading of PPR within the country and across-borders. Therefore this study shows the importance of understanding the epidemiology of PPR, disease reporting systems improvements, laboratories capacity building and inter laboratory cooperation for efficient and timely diagnosis of diseases. Moreover is the importance of Strengthening cross-border surveillance activities and adherence to OIE, FAO and WTO guidelines in livestock movement, border control and timely management of disease outbreaks as requirements for live animals and animal product trade.

**Keywords:** PPR, transboundary, spreading and surveillance



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Evaluation of the growth rates of Friesian-Boran crossbred calves at Buhuri, Tanga, Tanzania**

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#### **Abstract**

Livestock plays a great role in improving livelihood to communities worldwide. However, the livestock sector in developing countries faces major challenges including low production breeds, diseases, and poor quality feeds. Indigenous cattle, e.g., Boran, Tanzania shorthorn zebu, are resistant to diseases compared to the exotic breeds, e.g., Friesian. Thus, crossing between these breeds might result in a disease-resistant offspring with improved production and reproduction performances. Nevertheless, no reports exist on the quantification of these crossbred regarding growth and production parameters. Therefore, the present study aimed to assess the growth rate of the crossbred calves of Holstein-Friesian and Boran. Natural mating was employed; cattle were grouped into Friesian cows + bull; Friesian cows + Boran bull; Boran cows + bull groups until cows became pregnant. During the gestation, cows were maintained as per farm protocol. After calving, the calves were maintained in respective groups, managed as per farm protocol, and their body weight monitoring recorded on calving day followed by a monthly interval. All the analysis were done in IBM SPSS Statistics version 25. Descriptive statistics, explore, and ANOVA was employed to establish statistically significant differences between the groups. The crossbred calves (Friesian-Boran) had a higher growth rate ( $P < 0.001$ ) compared to Friesian and Boran's calves. In contrast, the Boran's calves had a higher growth rate than Friesian calves. Our preliminary findings showed that the F1 crosses grew faster than the Friesian and indigenous Boran calves. Therefore, crossing between these breeds can improve the production performance of the offspring.

**Keywords:** Holstein-Friesian, Boran, Crossbred, Calves, Growth rate



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Validation and comparison of *Brucella* FPA with RBPT and C ELISA test for Bovine brucellosis in Tanzania**

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#### **Abstract**

Brucellosis is a highly contagious zoonosis caused by *Brucella* species and affecting domestic and wild mammals. Cattle are the among of animals affected. The diagnosis relies predominantly on laboratory test such as RBPT, C ELISA and other serology test. RBPT and C ELISA are commonly used in Tanzania. FPA information was missing in Tanzania despite its ability of being rapid test, selection of vaccinated and infected and identification of *Br* species. The aimed of this study was to validate and comparison of *Br* FPA with RBPT and c ELISA test for Bovine brucellosis. A total of 50 Serum samples from cattle farm which were infected with *Brucella* in kagera region were obtained. The FPA kit was used for testing. RBPT and C ELISA (Svanovir kit) test were used for comparison at CVL, Dar es salaam. 44 samples tested positive and 6 tested negative by FPA, 41 samples were positive and 9 tested negative to RBPT and 43 samples were positive as per the C ELISA test as a confirmatory used whereas 7 sample tested negative. The sensitivity of the FPA test shown (100%) similar to C ELISA and Specificity (85%). S19 vaccine infection was detected based on cutoff of mP values; above 60 mP value where by 3 samples were positive. FPA had shown potential to overcome limitations of detection of bovine brucellosis there by enabling the selection of appropriate eradication and control program.

**Key words:** Brucellosis, Rose Bengal plate agglutination test, Competitive enzyme linked immunosorbent assay, Fluorescence polarization assay.





## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Anatomical variation of habitat related changes in scapular morphology**

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#### **Abstract**

The mammalian forelimb is adapted to different functions including postural, locomotor, feeding, exploratory, grooming and defense. Comparative studies on morphology of the mammalian scapula have been performed in an attempt to establish the functional differences in the use of the forelimb. In this study, 66 fresh bone specimens, representatives of all major taxa from rodents, sirenians, marsupials, pilosa, cetaceans, carnivores, ungulates, primates and apes, in their normal physiological conditions were analyzed. Parameters measured included scapular length, width, position, thickness, area, angles and index. Structures included supraspinous and infraspinous fossae, scapular spine, glenoid cavity, acromium and coracoid processes. Images were taken using computed tomographic (CT) scanning technology (CT-Aquarium, Toshiba and micro CT- LaTheta, Hotachi, Japan) and measurement values acquired and processed using Avizo computer software and Canvas™ 11 ACD systems. Statistical analysis was performed using Microsoft Excel 2013. Results obtained showed that there were similar morphological characteristics of scapula in mammals with arboreal locomotion and living in forest and mountainous areas but differed from those with leaping and terrestrial locomotion living in open habitat or savannah. The cause for the statistical grouping of the animals signifies presence of the close relationship between habitat and scapular morphology and in a way that corresponds to type of locomotion and speed. The morphological characteristics of the scapula and functional interpretation of the parameters in relation to habitat of each taxon is discussed in detail.

**Keywords:** Mammalian, Scapula, Morphology, CT analysis



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Comparative efficacy of conventional and real time polymerase chain reaction (PCR) assay in the detection of Contagious Pustular Dermatitis (CPD) from clinical samples**

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#### **Abstract**

Contagious Pustular Dermatitis (CPD) is a disease of economic and public health importance in rural and poor communities who traditionally keeps sheep and goats. The causative agent of CPD is Contagious Pustular Dermatitis virus (CPDV) which is a prototype Parapoxvirus (PPV) under the family poxviridae. CPD is a neglected zoonotic disease that causes a severe exanthematous dermatitis that afflicts humans, domestic animals and small wild ruminants. A sensitive and accurate method for the diagnosis of CPDV infection is important to ensure appropriate disease management to reduce economic losses. Conventional PCR targeting *gIF1L-2* gene was compared with a minor groove binder-based quantitative real-time PCR assay targeting *b2f* gene in detecting Parapoxviruses. Sensitivity of both assays was tested by making tenfold serial dilution of one of the positive samples. Specificity test was done by exposing the two assays to positive samples of lumpy skin disease and African swine fever disease concomitantly with positive samples of parapox virus. The test results were compared and data were analysed. Detection rate (DR) of Real-time PCR was higher (83.33%) compared to conventional (77.08%). Sensitivity of Real time PCR was higher than conventional PCR when compared in tenfold dilution in which amplification was still observable up to dilution of  $10^{-7}$  while conventional PCR amplification was detected only up to  $10^{-2}$ . Both assays showed specificity by lack of cross reactivity with lumpy skin, and African swine fever virus. The agreement between Real-time PCR and conventional PCR tests combinations showed slight absence of reproducibility as Kappa coefficient value was 0.086957. Real time PCR was sensitive and specific in testing CPDV compared to conventional PCR but both assays were able to detect CPDV in sheep and goat hence both assays can support CPD control in sheep and goat.

**Key words:** Contagious Pustular Dermatitis virus and conventional PCR real time PCR, zoonotic disease



## Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry

### Identification and Quantification of Brominated Flame Retardants in Muscles of Nile Perch from Lake Victoria, Mwanza, Tanzania

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#### Abstract

A study to investigate the occurrence of Brominated Flame Retardants (BFR) in Nile perch (*Lates niloticus*) muscles was conducted in three landing sites along Lake Victoria in Mwanza Tanzania. The study aimed to identify and quantify specific BFRs in Nile perch muscles and their potential human health risks which could result from consumption of such products. Fish samples were collected from landing sites and were handled in cool boxes and transported to Nyegezi Fish Quality Control Laboratory for extraction, cleanup, separation and analysis. Extracts were injected in the Gas Chromatographic device at the temperature of 250°C. The BFR congeners were detected using Electron Capture Detector (ECD). The study showed that the Brominated Flame Retardants (BFR) were present in different concentration in the fish samples investigated. The levels detected were below the Maximum Acceptable Concentration (MAC) which is recommended by Swedish National Food Administration (2003). The Maximum Acceptable Concentrations for BFR range from 0.6 mg/kg to 250 mg/kg, while the observed concentrations in fish muscles ranged from 50.13 µg/kg to 297 µg/kg. Based on information obtained from fish consumers in Mwanza city which were obtained through questionnaires, the average Nile perch fish consumption per person was 0.29kg/day. This means that the quantity of BFR consumed ranged from 14.54µg/kg to 86µg/kg per person per day which was below the maximum acceptable concentration of BFR recommended which range from 0.6mg/kg to 250mg/kg. This study concludes that Nile perch muscles from Lake Victoria are still fit for human consumption as the levels of Brominated Flame Retardants are below the Maximum Acceptable Concentration recommended to date.

**Key words:** Brominated Flame Retardants, Nile perch, Lake Victoria, Maximum Acceptable Concentration



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Phylogenetic comparison of symptomatic and asymptomatic cases of ASF in Tanzania**

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#### **Abstract**

The study was conducted to determine molecular characterization of the ASFV strains from samples collected during 2015-2017 outbreaks in Tanzania and analyze their relatedness with previously reported Tanzanian and foreign isolates. Thirty-five clinical samples from four outbreaks were screened using classical PCR; fifteen from symptomatic and twenty from asymptomatic ASF cases. Sequencing was successful done to seventeen samples (15 symptomatic and 2 asymptomatic). ASFV was detected in twenty one samples; fifteen from symptomatic and six from asymptomatic pigs. Phylogenetic analyses based on part of the p72 and the complete p54 (E183L) genes revealed symptomatic and asymptomatic ASFVs belonged to genotypes IX and II respectively. The CVR profiles of the p72 genotype IX and genotype II isolates differed between each other and from those previously published Tanzanian sequences. ASFV isolates from symptomatic pigs identify genetically distinct viruses circulating simultaneously in the country, indicating a prolonged persistence of this virus type in the region. However ASFV circulating within the pig population without clinical signs provide support that, sub-clinical infected pigs may be responsible for persistence of the virus in endemic areas.

**Key words:** African swine fever, pigs, genotype, genetic relatedness



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Knowledge, attitude and practice in relation to drug residues in among adult beef consumers in Dodoma region, Tanzania**

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#### **Abstract**

The safety of food of animal origin is of concern in the developing countries. Some of the antimicrobial agents that are used for the treatment of animal diseases seems to occur in the animal products. The knowledge, attitude and practice in relation to OTC residues in beef among residents in Dodoma Region, Tanzania was evaluated. A cross sectional study included interviewing 254 randomly chosen respondents using was conducted. Fifty two percent of the respondents were not aware of drug residues, 57% never heard about drug residues in food of animal origin such as milk and meat, 35% know residues can be harmful to human and 61% did not know if animals are treated with antimicrobial drugs when they were sick. Only 27% of the respondents knew common antimicrobial agents that cause residues in animal meat and milk and were able to mention. Majority of respondents (74%) did not know any method for the prevention of antimicrobial residues. Fifty six percent of the age group of 20-35 years purchased meat from butcheries. Secondary school (68.4%) and College (52.9%) respondents purchased meat from butcheries compared to informal (23.8%) and primary (49.2%) respectively that purchased meat locally within the villages. Majority of informal (66.7%) and primary (47.6%) respondents purchased meat locally within the villages. The differences were strongly significant  $p < 0.0001$ . Women (57.1%) used one hour to prepare meat. Age group 20-35 years (88.1%) prepared meat by cooking. Age group of 36-45 years prepared meat for 1 hour and 2 hours. College respondents (68.8%) barbecuing meat compared to smoking and freezing. The results in this study indicate that respondents had low knowledge and awareness on antimicrobial use and drug residues. This might be due to low level of education of respondents as majority of them had informal and primary education. Many of the drug respondents were not aware of the drug residues and did not know antibiotic residues can have effects in human health. Community based health education and promotion on antimicrobial use and preventing drug residues is highly recommended to this population.

**Key words:** knowledge, attitude, practice, residues in beef, residents, Dodoma Region, Tanzania.



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Effects of vitamin A supplementation in local free range chickens vaccinated with Newcastle disease vaccine in Wami Dakawa, Morogoro, Tanzania**

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#### **Abstract**

Vitamin A is required for normal growth, reproduction and maintenance of epithelial cells chicken's tissues. In this study, the effect of vitamin A supplementation in chickens immunized with Newcastle disease virus vaccine (strain I-2) was investigated in free range local chickens in Wami-Dakawa, Morogoro region. A total of 40 chickens were divided into four groups with ten birds each namely, Group I, II, III and IV. Group I was treated vaccination and vitamin A, group II were neither vaccinated nor supplemented with vitamin A, group III were vaccinated only and group IV were supplemented with vitamin A only. There were significant increase ( $p < 0.05$ ) in immune response in vaccinated chickens supplemented with vitamin A supplement compared to chickens in other three groups. Therefore, this study suggests that vitamin A should be supplemented to scavenging local chickens during vaccination programme to increase immunization efficiency in the local chickens.

**Key words:** Newcastle virus disease, I-2 vaccine, scavenging local chickens,



## Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry

### Molecular Detection and Genotyping of *Brucella* Species in Cattle and Goat by High Resolution Melt Analysis in Tanzania

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#### Abstract

Brucellosis is a zoonotic disease causing significant public health and economic burden in Tanzania. Even though research on brucellosis have been conducted still there is inadequate information describing *Brucella* species which are circulating in the country that contributes to failure of disease control. The objective of the study was to detect and differentiate *Brucella* species circulating in bovine and goat by testing serum samples submitted at Central Veterinary Laboratory from different parts of the country. A total of 619 samples received for molecular detection of *Brucella* between year 2017 and 2018. 17.4% of total sample amplified positive using PikoReal Real-Time PCR System. Twenty samples were placed on High Resolution Melt (HRM) analysis for *Brucella* species genotyping with specific primers to detect *Brucella abortus*, *Brucella melitensis*, *Brucella canis*, *Brucella suis*, *Brucella neotoma*. Out of 17.4% positive sample, only 20 samples were subjected on HRM analysis for genotyping, 5% of samples detected *B. abortus*, 5% *B. neotoma* and 70% was multi-infection of either *B. abortus* or *ovis*, *B. melitensis* or *B. neotoma* while *B. canis* and *B. suis* were not detected. 20% of positive *Brucella* samples could not be genotyped by species specific primers used in the study. Therefore, further studies should be conducted to find other *Brucella* species that may be circulating in the country.

**Keywords:** HRM Analysis, Genotyping, Strains, Primers, zoonosis.



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Cyanide levels in sweet cassava varieties and people's perception on cyanide poisoning in Kagera and Morogoro regions, Tanzania**

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#### **Abstract**

Cassava, a renowned crop for its growth advantages over other crops, carries cyanide a potential poison to humans. In some localities in Tanzania, people habitually consume raw cassava tubers whose toxicological status is not established. Cases of cyanide poisoning and indicators of it have been reported particularly in Kagera and Morogoro regions. This study was launched to quantify cyanide in fresh tubers of so called "sweet" cassava varieties and to gauge people's perception on cyanide poisoning in Kagera and Morogoro regions. The study employed cross-sectional research design to identify 52 cassava varieties and to get people's perception on cyanide poisoning in the study area through administration of questionnaire to 386 participants. Of the identified varieties, 12 were sampled and 66 cassava tubers were analyzed using alkaline titration method to determine their cyanide levels. The study findings showed that cyanide levels in the tubers were above the internationally accepted level in human consumables (ranging from 20 to 227mg/kg) and thus unfit for human consumption in their raw state. Some sweet varieties were found to be wrongly classified as sweet because their cyanide content was above 50 mg/kg. The inconsistency of cyanide level in tubers of similar variety showed that a variety can exist in both sweet and bitter forms, making the categorization of varieties into sweet and bitter varieties misleading. On average, 79% of the participants were found unaware of the presence of cyanide in cassava, its poisoning effects, and methods for cyanide depletion and identifying poisonous cassava. The habit of consuming raw cassava tubers was thus found to be mostly cultivated by lack of awareness. This work recommends, among many others, that the public should be sensitized on the issue of cyanide in cassava and its poisoning effects; and should avoid consuming raw cassava tubers as preventive measures against cyanide poisoning.

**Keywords:** Cassava tuber, cassava variety, sweet cassava, cyanide levels, cyanide poisoning, people's awareness.





## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Molecular detection of trypanosome species infecting cattle in Kasulu district, Kigoma**

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#### **Abstract**

Trypanosomiasis in livestock is the major impediment to livestock farming and it limits the full potential of agricultural development in Tanzania. This study was undertaken to determine the trypanosomes species infecting cattle in Kasulu district by PCR using the ITS1 primers that identify trypanosomes to the level of species and subspecies. Blood was collected from the jugular vein into vacutainer tubes containing EDTA and stored at 4°C in a cool box and carried back to the laboratory. At the laboratory blood sample from the vacutainer tubes was applied onto Whatman FTA cards and left to dry and then stored in sealed plastic bags at room temperature, followed by DNA extraction and PCR analysis. A total of eleven cattle (11%) out of 100 examined cattle were infected with trypanosomes. Of the infected cattle, six (54.5%) and five (45.5%) were infected with *Trypanosoma vivax* and *Trypanosoma congolense* forest type respectively. This study has revealed that Animal trypanosomiasis is prevalent among cattle population in Kasulu district, and infected cattle were only found in villages bordering Malagarasi forest reserve that harbor large tsetse populations.

**Keywords:** Trypanosomes, Cattle, Tanzania



## Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry

### Diversity of Two *Theileria parva* CD8+ T cell Antigen Genes in Cattle and Buffalo derived parasites

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#### Abstract

*Theileria parva* is a tick-transmitted protozoan parasite that causes East Coast fever (ECF). ECF is the most important tick borne-disease (TBD) that causes significant economic losses in cattle in Tanzania. Cattle immunization using Muguga cocktail has been recommended as an effective method for controlling ECF in pastoral farming systems in Tanzania. Despite the success of this method, several studies have shown that indiscriminate deployment of this vaccine may introduce new strains to unvaccinated cattle through recombination. Moreover, immunity provided through immunization is partially strain specific. Therefore, the control of ECF in Tanzania is still a challenge due to inadequate epidemiological information. This study was conducted to assess genetic diversity of *T. parva* isolates from cattle and buffalo using Tp1 and Tp2 genes recognized by CD8+ T-cells which are key players in immunity induced by infection and treatment method (ITM) and under evaluation as candidates for inclusion in a subunit vaccine. The partial sequencing of the Tp1 gene and the full length of the Tp2 gene from 130 *T. parva* isolates exhibited extensive polymorphisms in both loci, including the epitope-containing regions. Results for sequence analysis showed that the overall nucleotide polymorphism ( $\pi$ ) was 0.7% and 13.5% for Tp1 and Tp2, respectively. The Tajima's D and Fu's Fs test showed a negative value for both Tp1 and Tp2 genes, indicating deviations from neutrality due to a recent population expansion. The study further revealed a low to high level of genetic differentiations between populations and high genetic variability within populations suggesting the existence of random mating. Although new epitopes were identified in the samples from the seven populations, most samples possessed several epitopes in antigens that were identical to those in the *T. parva* Muguga reference stock, which is the main component of the widely used live vaccine cocktail. Therefore, different strategic planning and cost-effective control measures should be implemented based on the level of diversity of *T. parva* parasite in order to reduce losses caused by ECF in the study areas.

**Keywords:** East Cost fever, Epitope, Muguga Cocktail, nucleotide polymorphism, Tajiam's D, Fu's Fs



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Prevalence and associated financial losses of fasciolosis in cattle slaughtered at Bukoba Municipal abattoir, Kagera, Tanzania**

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#### **Abstract**

Fasciolosis is usually a chronic parasitic disease causing direct and indirect economic losses on livestock production, particularly sheep and cattle worldwide and is an emerging neglected zoonotic nematode in endemic areas. This study was conducted to determine the prevalence of bovine fasciolosis and estimate its financial losses in Bukoba Municipal abattoir in Kagera region through retrospective and prospective meat inspection data. Meat inspection records regarding livers inspection for the past 5 years from September 2012 to September 2017 was retrieved and analyzed. Routine meat inspection was performed to all cattle slaughtered in the facility in October, 2017. Primary inspection by visual and palpation of the organ was performed followed by secondary inspection by incision to visualize the liver parenchyma and bile ducts. Results show that a total of 34,826 cattle were slaughtered and inspected for the period of 5 years (2012 - 2017) with fasciolosis prevalence of 31%. Retrospective results showed similar infection trends being high in October. On the other hand, in prospective study a total of 541 cattle were slaughtered and inspected with fasciolosis prevalence of 66%. The estimated annual direct economic loss was US\$ 58,918.9 equivalent to US\$ 4,909.9 in the study area. From this study it is concluded that bovine fasciolosis is highly prevalent in the study area causing significant financial losses through liver condemnation and weight loss. In addition, it imposes public health risk in the area. Therefore strategic treatment of cattle in the study areas should be considered.

**Key words:** Bovine, fasciolosis, nematode, liver condemnation, economic loss, Kagera, Tanzania



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Skin wounds and welfare problems of working donkeys in Kilosa District**

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#### **Abstract**

Skin wounds are common problems encountered in working animals. They are regarded as one of preventable welfare ailments in working animals worldwide. In Tanzania, donkeys are used in various activities such as carrying loads (i.e. water, bricks, harvests etc), drought animal as well as means of transport. The study was carried out between June and October 2018 covering villages in Dumila, Ilonga, Mkwatani and Msowero wards, as well as, Kilosa town. A total of 217 donkeys were examined. Using visual and physical examination, the type of wounds, location and status were evaluated. Possible causes were also elucidated depending on the activity of the animal. The observation showed that abrasions were the most common type of wound in working donkeys (70%) in Kilosa. The abrasive wounds were distributed on the cranial brisket, along the dorsum, withers, dorsal and ventral aspects of the tail, ventral inguinal and abdominal regions, cranial sternal region and caudal stifle region. Other minor wounds were lacerations on the thigh or distal hind limbs and facial area. The wounds were caused by ropes used to hang loads and pulling the animal, biting as well as human brutality. These results reveal that poor harnessing and lack of knowledge on animal welfare aggravated the condition of working donkeys in Kilosa District. Capacity building on proper harness and handling is recommended to the communities using donkeys for livelihood activities.

**Keywords:** wound, donkey, Kilosa



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **The anti-inflammatory potential and hematological changes of piroxicam on formalin-induced inflammation in rats**

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#### **Abstract**

The aim of this study was to determine whether formalin reliably provokes paw inflammation and whether piroxicam reduces this inflammation and whether the drug has any effect on hematological and biochemical parameters. Thickness of rat left paws was measured prior to and post injection with 0.1 ml of 10% formalin or water for injection subcutaneously. The effect of piroxicam was assessed following intraperitoneal injection of the drug at 20 mg/kg (1 ml). After 4 hours of injections, the left paw diameters were measured. Rats were then humanely sacrificed, decapitated, blood samples collected in vacutainer tubes containing Ethylenediaminetetraacetic acid and subsequently analyzed by automatic blood analyzer. Formalin induced a significant swelling and redness on the paws ( $p < 0.05$ ) that was significantly ( $p < 0.05$ ) reduced by piroxicam. Formalin elevates the levels of lymphocytes, monocytes and thrombocytes while depressing those of neutrophils, mean corpuscular volume (MCV) and mean cell hemoglobin (MCH). On the other hand, piroxicam significantly counteracts the effect of formalin on lymphocytes and thrombocytes (reduced to normal levels) and neutrophils (abrogates the suppression) but has no effect on monocytes, MCV and MCH. It is concluded that piroxicam is a potential anti-inflammatory drug with both local and systemic effect.

**Key words:** Inflammation, formalin, piroxicam, haematology, rats



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Status of ectoparasites and haematological parameters of dogs attended at SUA Animal Hospital, Morogoro Tanzania**

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#### **Abstract**

A cross-sectional study was conducted from November to January 2016 to establish the status of ectoparasites and haematological parameters in dogs attended at Sokoine University of Agriculture Animal Hospital. A total of 45 dogs sent at the hospital for different purposes were randomly selected and inspected for ectoparasites. Blood samples were also collected from the dogs and analysis of haematological and biochemical parameters i.e Packed cell volume (PCV), haemoglobin concentration (Hb), Mean corpuscular haemoglobin concentration (MCHC) and serum bilirubin concentrations, namely Total serum bilirubin (TsB), indirect bilirubin (IsB) and direct bilirubin (DsB), respectively were analysed. Inspection of dogs for ectoparasites infection revealed that, 19 dogs (42.2%) were infested with ectoparasites, out of which 12 dogs (26.7%) were infested with fleas, 3 (6.7%) infested with ticks and 1 (2.2%) had both ticks and fleas. Twenty dogs (44.4%) had their PCV values below the reference values, while one dog (2.2%) had its PCV values above the normal range. Fifteen dogs (33.3%) had their Hb below the reference values while two dogs (4.4%) had their Hb above the reference values. Thirteen dogs (28.9%) had their MCHC below the reference value while 1 (2.2%) had its MCHC above the reference value. A total of 13 dogs (28.9%) had the total serum bilirubin concentration (TsB) above the reference value. All dogs with ectoparasite infestations had lowered levels of Hb, PCV, and MCHC with corresponding elevated level of bilirubin indicating a correlation between ectoparasite infestation with anemia. Revelation of the problem of anemia in dogs via screening of dogs brought at SUA animal hospital indicates the importance of routine evaluation of erythrocytic parameters in veterinary clinics in the diagnosis and treatment of anemia. Routine evaluation of erythrocytic parameters can assist in sorting out the common causes of anaemia which will help in diagnosis and hence treatment. Further, concerted efforts should be made to educate dog owners to embrace modern disease control programs and specifically the need for routine dipping of their dogs.

**Key words:** dogs, haematological parameters, ectoparasites, anaemia



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Studies on Canine Transmissible Venereal Tumour of dogs in Mvomero and Morogoro municipality, Tanzania**

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#### **Abstract**

Canine transmissible venereal tumour (CTVT) is a contagious tumour that is naturally transmitted between dogs by the allogeneic transfer of living tumour cells during coitus. A cross-sectional study was conducted in Mvomero and Morogoro Municipality between September and November 2017 in order to determine the prevalence of CTVT and level of people's awareness on the disease. The knowledge and interventions in reference to CTVT were evaluated using a structured questionnaire, whereas the status of the disease in animals was investigated through clinical examination. A total of 200 respondents were interviewed and 300 dogs were examined. Results on questionnaire showed that, most of the respondents had their dogs managed freely as stray dogs. Majority of the dog owners had one to five dogs and practiced haphazard breeding. It was further established that majority of the respondents knew CTVT as a disease of bleeding in dogs and had seen dogs affected by the disease suggesting that the disease is common in the study areas. Nevertheless, the real cause and treatment was not clear to most of the dog keepers. Based on clinical examination of dogs, the prevalence of CTVT in dogs was 12%, with Mvomero district having more cases of CTVT, 23 (15.4%) than Morogoro Municipality which had 13 (8.6%). In Mvomero district, Dakawa ward had the highest number of CTVT cases 12 (8.1%). Furthermore, it was found that male dogs were more affected by CTVT (15.3%) as compared to female dogs (8.7%). Also, all CTVT infections were observed in households where the dogs were freely roaming about and freely breeding. To conclude, this study shows that magnitude of CTVT was high in the study area and poor knowledge and misconception on clinical presentation, spread, and treatments the disease prevail. Therefore deliberate measures aimed at minimizing the problem need to be taken.

**Key words:** TVT, dogs, respondents, bleeding



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **The Prevalence of Haemoparasites in Rodents and Shrews Trapped from Domestic and Peridomestic Houses in Morogoro Municipality, Tanzania. A Hidden Public Health Threat**

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#### **Abstract**

A total of 70 rodents were captured from Morogoro municipality to determine the prevalence, relative abundance and diversity of haemoparasites. Two rodent species were trapped with *Rattusrattus* being the most dominant species, followed by *Mastomysnatalensis* after trapping them with Sherman and locally made live traps. Blood samples were collected from the captured animals, smears were made and screened for infectious agents of public health importance including; *Babesiasspp.*, *Plasmodium spp.*, and *Bacillus spp.* Three blood protozoan species were found infecting the rodent population namely, *Plasmodium spp.* (n=6/70, 8.57%), *Babesia* (n=5/70, 7.14%) and *Bacillus spp.* (n=2/70, 2.86%). The relative abundance of the *Rattus rattus* was estimated to be (n=60/70, 85.7%) while that of *Mastomys natalensis* was (n=10/70, 14.3%). The diversity of haemoparasites in the study area was 1.01. *Plasmodium spp.* infections were observed almost similar in both sexes. However, infections were higher in sub-adult rats. Malaria remains a serious health threat and yet a vaccine is not available. Every year, many people suffer from malaria and die as a consequence of the disease, mostly children in Africa under the age of five. The public health implications of these findings require communitywide rodents control strategies with strong emphasis on community participation in order to prevent rapid spread of rodent population.

**Keywords:** Relative abundance, Prevalence, Diversity, Haemoparasites, Rodents, Malaria, Public health.





## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Parasitic and non-parasitic conditions affecting farmed and wild cichlids in Tanzania: Presentation of cases under investigation**

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#### **Abstract**

Infectious fish diseases are among the known contributing factor in reduced productivity of fish farming enterprises. Despite of the growing importance of global fish farming industry, research in fish and other aquatic stocks relevant to Tanzania is limited. This paper presents preliminary results of the ongoing investigation on fish mortalities which occurred in fish farms in Kilosa and Kibaha Districts. The paper also present preliminary results of formalin fixed samples received from otherparts of Tanzania. In all the samples; branchitis, gill deformity, and intracellular chlamydia like organisms were the major findings regardless of the source. Other findings include encysted trematode metacercaria in different anatomical location accompanied with variable pathomorphological changes to the host tissues. Interestingly, in all cases mortalities ceased after replenishment of water supply suggesting that either poor water quality was the main predisposing factor or aggravated the observed disease conditions. Therefore maintenance of water quality and or water replacement is recommended as the first intervention measure where poor water quality is strongly suspected to be associated with mortalities in fish farms. Further studies on the pathobiological characteristic of the observed infectious organisms will provide more insights on the suspected relationships between the environmental factors in one hand and progression of the observed pathological changes in fish.

**Key words:** Metacercaria, Fish, Chlamydia, Tilapia, Pathology



## Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry

### **CYSTINET-Africa: A One-Health Network Fighting Taeniasis/Cysticercosis in Sub-Saharan Africa**

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#### **Abstract**

*Taenia solium* is the most important food-borne parasite globally, leading to significant human morbidities and agricultural losses, notably in Sub-Saharan Africa (SSA). Cysticercosis Network of Sub-Saharan Africa (CYSTINET-Africa) is a one-health network funded by the Germany Federal Ministry of Education and Research to fight *T. solium* cysticercosis/taeniasis (TSCT) in SSA through North-South and South-South collaboration in research and capacity building. The network consists of a multi-disciplinary team of six institutions (Sokoine University of Agriculture, Tanzania; National Institute for Medical Research, Tanzania; University of Zambia, Zambia; Eduardo Mondlane University, Mozambique and two institutions at Technical University of Munich). This 5-year project started officially in October 2016, aiming at (1) Estimation of prevalence and co-infections of TSCT/neurocysticercosis (NCC) in large-scale community based studies in Tanzania, Mozambique and Zambia, (2) Evaluation of the pathomechanisms involved in the development of symptomatic NCC in immunocompetent and immunocompromised individuals as well as pathomechanisms involved in different treatment responses in people with symptomatic NCC on standard treatment in longitudinal studies in Tanzania and Mozambique, (3) Establishment of an experimental pig model for *T. solium* cysticercosis for human and veterinary research needs as well as investigation of pig breed susceptibility to *T. solium* in Zambia and (4) Development, evaluation and implementation of a locally adapted health education intervention package for the prevention and control of TSCT in Tanzania. CYSTINET-Africa will link human, animal and community health with respect to zoonotic diseases at various levels. A rapid expansion of this network and its activities as well as its linkage with similar initiatives are envisaged.

**Key words:** CYSTINET-Africa, One Health, cysticercosis/taeniasis, neurocysticercosis



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Small Mammals in Fenced Houses as Source of Leptospirosis to Livestock and Pets animals in Morogoro Municipality, Tanzania**

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#### **Abstract**

The goal of this study was to determine the prevalence of leptospirosis in small mammals in Morogoro municipality specifically in fenced houses keeping livestock and pets. The mammals were trapped using Sherman traps, box traps and Havaharts. The captured mammals were anaesthetized by diethyl ether, blood was drawn from the heart puncture by using 5ml syringe, transferred into eppendorf tubes then centrifuged at 4000rpm for 5minutes to obtain sera. Microscopic agglutination test (MAT) was performed using serovars namely Sokoine, Kenya and Lora on sera samples, in which wells of U-shaped micro titer plates were filled with 50 $\mu$ l Phosphoborate saline (PBS) in which the first well was filled with 90 $\mu$ l, followed by 10 $\mu$ l of sera in the first well, serially diluted to the fourth well, then 50 $\mu$ l of live leptospira antigen was added in each well. The mixture was incubated at 30°C for two hours. Agglutination test results were examined under dark field microscope. Seventy (70) small mammals were trapped and only two species namely *Rattusrattus* and *Mastomys natalensis* were identified. From the MAT test, 16 (10 *R.rattus* and 6 *M. natalensis*) sera samples showed positive results with respect to a particular serovar. The results show *R.rattus* to have high prevalence than *M. natalensis*. The overall prevalence was 22.9% whereby serovars Sokoine had 11.4%, Kenya 5.7% and Lora 5.7%. Small mammals shed leptospire to the environment and feed containers of livestock and pet animals through their urine. In turn leptospire get access to livestock and pet animals and develop the disease. Control of small mammals that are reservoirs of leptospire is very important and this control will reduce the burden of leptospirosis in livestock and pets

**Key words:** Small mammals, livestock, pets, fenced houses, leptospire



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Knowledge, attitudes and practices of the community on dogs and the dog parasites of public health significance in Mvomero and Morogoro districts, Tanzania**

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#### **Abstract**

Dogs are the earliest animals to be domesticated by humans but in developing countries, dogs are poorly managed. A cross sectional study was conducted between October 2017 and January 2018 to assess the community knowledge, attitudes, practices on dogs and the dog parasites of public health significance in Mvomero and Morogoro districts, Tanzania. The structured questionnaire was administered to 200 dog keepers, 100 in each study district. It was established that 59% of dog keepers had fair to good knowledge on management of dogs, majority (64.5%) have experience of more than three years with one and three number of dogs. Purpose of keeping dogs was security although respondents reported dog bites. The general dog management was poor. On dog health, majority of the respondents (87%) knew dog zoonotic diseases in particular rabies. Veterinary services reported to provided to dogs were vaccination mostly in Morogoro Municipality as compared to Mvomero ( $P < 0.05$ ). Some respondents felt dogs are dangerous and nuisance animals in the society. Majority of dogs were free roaming. Majority (59%) of respondents had fair to good knowledge on management of dogs and 58% of respondents poorly managed their dogs and 78% of respondents were observed to have bad experiences on dog management. A significant difference ( $P = 0.007$ ) between attitude of respondents towards dogs in showed majority of respondents in Mvomero district showed negative attitude toward dogs as compared to Morogoro Municipality. Most of the dogs were managed under free range and some community members were beating and inhumane killing of roaming dogs. It was concluded that dogs in Morogoro dogs are poorly managed under poor hygienic condition, rarely get veterinary services, which is against animal welfare. The knowledge on dog diseases is low. Therefore, integrative approaches on creating public awareness on dog management practices in the study areas and other areas in Tanzania in order to safeguard the health of dogs and humans is recommended.

**Key words:** dog management, diseases, knowledge, attitudes, practices



## *Veterinary Profession as a Catalyst for Transformative Change of the Animal Industry*

### **Assessment of coliform bacterial contaminations in raw cow milk from selected dairy farms in Morogoro Municipality, Tanzania**

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#### **Abstract**

Milk quality depends on many parameters including microbial status which mainly originate from the lactating animal itself. Secondary sources of microbial contaminations occur along the milk production chain. Unhygienic harvesting, handling and processing of raw cow milk affect its microbial quality. Microbial contaminations in milk cause spoilage and milk-borne diseases in humans. The current cross-sectional study was conducted to assess the levels of coliform bacterial contaminations in raw cow milk collected from different dairy farms in Morogoro Municipality. A total of 20 farms with lactating dairy cattle were visited and 20 raw cow milk samples were collected for coliform bacteria analysis using standard procedures. East African Standards for coliform count were used to ascertain for raw cow milk coliform contaminations. Before sampling, some basic information on milking, milk handling, storage and processing were gathered through a questionnaire. It was found that the mean cattle herd size from which the sample was taken was  $48 \pm 8$  with mean lactating cows in the herd being  $15 \pm 28$ . The general status of coliform bacteria in milk indicated that the contamination rate was 95%. The average total coliform count was  $8.1 \pm 8.2$  (log TCC cfu/ml). The assessed farm activities including type of milking, containers used in milking and storage, occurrences of mastitis and milk storage conditions significantly contributed to coliform bacterial contamination in raw cow milk. It was concluded that almost all the raw cow milk assessed were heavily contaminated with coliform bacteria which implies that either the cows had bacterial infections or there was unhygienic practices in the process of milking, milk handling and storage. This calls for the need of education to the farmers on hygienic way of handling milk along the value chain so as to minimize unnecessary contaminations which can be of public health significance.

**Key words:** Raw cow milk, coliforms, Morogoro



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# NOTES