...improving the livelihoods of Kenyans

50 Years of Excellence

Golden Jubilee

50TH ANNIVERSARY CELEBRATIONS OF THE KENYA VETERINARY ASSOCIATION AND THE COMMONWEALTH VETERINARY ASSOCIATION AND THE KENYA VETERINARY ASSOCIATION, COMMONWEALTH VETERINARY ASSOCIATION AND UNIVERSITY OF NAIROBI, FACULTY OF VETERINARY MEDICINE JOINT INTERNATIONAL SCIENTIFIC CONFERENCE

The Joint KVA, CVA And UON-FVM International Scientific Conference

PROGRAMME & BOOK OF ABSTRACTS

APRIL 26-29, 2017

Safari Park Hotel, Nairobi, Kenya.

Theme:

'Veterinary Contribution to Sustainable Livelihoods and Growth in Developing Economies'.

CVA

UNIVERSITY OF NAIROBI

50TH ANNIVERSARY CELEBRATIONS OF THE KENYA VETERINARY ASSOCIATION AND THE COMMONWEALTH VETERINARY ASSOCIATION AND THE KENYA VETERINARY ASSOCIATION, COMMONWEALTH VETERINARY ASSOCIATION AND UNIVERSITY OF NAIROBI, FACULTY OF VETERINARY MEDICINE JOINT INTERNATIONAL SCIENTIFIC CONFERENCE

APRIL 25-29, 2017

SAFARI PARK HOTEL, NAIROBI, KENYA.

Program for the Joint International Scientific Conference comprising the 51st Annual Scientific Conference/Annual General Meeting for the Kenya Veterinary Association (KVA) , 16th East, Central, Southern African Regional Meeting of Commonwealth Veterinary Association and 10thBiennual University of Nairobi, Faculty of Veterinary Medicine Scientific Conference and the 17th World Veterinary Day Celebrations.

TABLE OF CONTENTS

Word from the KVA Chairman- Dr Kahariri Sam

The Kenya Veterinary Association is proud to host the Joint KVA, CVA and UON-FVM International scientific conference which also serves as a key landmark to the KVA and CVA Golden Jubilee celebrations. The theme of this International Scientific Conference is **'' 50 years of Veterinary Contribution to Sustainable Livelihoods and growth in developing economies''.** This is 51st KVA annual scientific conference since inception in 1967. This event is aimed at creating awareness on the critical role played by the animal resource industry in supporting the livelihoods of the communities and the development of the economies. The advancement of Science in the industry and the dissemination will be a key pillar in the regional development and integration.

On behalf of the Kenya Veterinary Association, I wish to take this opportunity to welcome both the Local and International delegates to this auspicious event that has attracted high quality presentations targeting key areas including and not limited to; Food Safety and security, Animal Welfare for sustainable livelihoods, Governance in the Animal Resource Industry, Food Security, Trade in Animal and Animal products.

The zeal and dedication of the organizing committee in planning this event is acknowledged with a lot of gratitude. KVA has also continually enjoyed the kindness of the partners who made their contributions towards making this event what it is. I therefore take this opportunity to express my sincere gratitude's to all the stakeholders for their commitment to improving the livelihoods of the Kenyan people.

Welcome to the KVA/CVA Anniversary Celebrations

Come on an awe-inspiring KVA/CVA Golden Jubilee Celebrations to Kenya in April 2017 that promises to be precedent setting in the history of the Veterinary profession in the Commonwealth. This historical event will welcome veterinarians, para-veterinarians, policy makers, stakeholders and their families from Kenya and around the world to Kenya's premier city in the sun.

The theme aims to fulfil a global need for veterinary services to drive the animal resources agenda and sets the scene for a varied, stimulating, multi session scientific and professional programme, to cater for the diverse needs of the veterinary profession. Kenya hopes to show case to the world the veterinary role in food security, safety, disease control in communities served by the veterinary profession and continuing professional development needs among other issues.

The Celebrations will be held in various venues, climaxing in the Scientific Conference at Safari Park, Nairobi and World Veterinary Day Celebrations in Kajiado. The social and accompanying persons programme will include day trips in and around the city and the countryside with a scheduled excursion of international participants to Nairobi National Park. On behalf of the KVA/CVA I invite all stakeholders to sample the diverse program that we have put in place. On behalf of the Organizing Committee I wish to thank the KVA and the CVA leadership for giving us an opportunity to organize this auspicious occasion. For the main Organizing Committee and Thematic Committee Members, please accept an acknowledgement for your selfless role.

Thank you

Dr Christopher Wanga, MBS

Chairman of the Kenya Veterinary Association and Commonwealth Veterinary Association 50th Anniversary Celebrations.

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PAST KVA CHAIRMEN

YEAR	CHAIRMAN	YEAR	CHAIRMAN
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1967/68	Dr. Sakwa F.O.	1992/93	Dr. Kamau J.N.
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1969/70	Dr. Ndeti J.K.	1994/95	Dr. Kahiu I.G.
1970/71	Dr. Ndeti J.K.	1995/96	Dr. Kahiu I.G.
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1975/76	Dr. Murithii D.	2000/01	Dr. Varma V.S.
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1979/80	Dr. Masiga W.N.	2004/05	Dr. Wahome R.G.
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1990/91	Dr. Varma V.S.	2016/18	Dr. Kahariri S.

50TH ANNIVERSARY CELEBRATIONS OF THE KENYA VETERINARY ASSOCIATION AND THE COMMONWEALTH VETERINARY ASSOCIATION AND THE KENYA VETERINARY ASSOCIATION, COMMONWEALTH VETERINARY ASSOCIATION AND UNIVERSITY OF NAIROBI, FACULTY OF VETERINARY MEDICINE JOINT INTERNATIONAL SCIENTIFIC CONFERENCE

Theme: Veterinary Contribution To Sustainable Livelihoods And Growth In Developing economies

Day 1: Wednesday, 26th April 2017

Time/Date			
7:30	**Registration**		
	Session1: Governance and Emerging challenges in Animal resource industry		
8:30	Introductions and Climate Setting.		
8:45	Keynote Presentation: OIE Twinning Program Veterinary education - ***Wakhusama S***		
9:15	Adressing Governance challenges for a successful Veterinary Practice in Kenya - ***Wanga C***		
9:30	Projected impact of extreme climatic changes on livestock production in Kenya - ***Otieno V.***		
9:45	The Mergers and Organizational Structure Effect on Decision-Making and Performance of Employees: The Case of KALRO - ***Mochabo K.***		
10:00	Combating Antimicrobial Resistance: Professional Responsibilities **- *Azegele A.***		
10:15	Promoting and protecting animal welfare in Africa - **Tennyson W**		
10:30	Discussion		
10:45	**Tea Break**		
	Session 2		
11:15	***Keynote Presentation: The Role of Veterinary Services in Food security - Rugalema Gabriel, FAO***		
11:35	***Keynote Presentation 2: The Role of Veterinary profession in the realisation of Sustainable Development Goals- Mbithi PMF, UON***		
12:05	***Discussion***		
	Official Opening Ceremony: session Chair Dr Christopher Wanga		
12:20	***Dr Kisa Juma Ngeiywa, OGW- Director of Veterinary Services*** ***Prof. Kiama Gitahi - Principal, College of Agriculture and Veterinary Sciences, UON*** ***Prof Peter Mbithi - Vice Chancellor, University of Nairobi*** ***Dr. Peter Thornber, President, Commonwealth Veterinary Association*** ***Dr. Samuel Kahariri - Chairman, Kenya Veterinary Association*** ***Dr. Andrew Tuimur - Principal Secretary, State Department of Livestock*** ***Mr. Willy Bett, EGH - Cabinet Secretary, Ministry of Agriculture, Livestock and Fisheries*** ***His Excellency,Uhuru Kenyatta, CGH, President of The Republic of Kenya and Commander in Chief of the Kenya Defense Forces***		
12:45	Group photo		
13:00	**Lunch**		
	Session 3A: Trade in Animal and Animal products		***Session 3B: Food Security 1***
14:00	Keynote Presentation: Facilitating trade in Animal and Animal products- ***Mphumuzi Sukati***	14:00	Keynote Presentation. Evaluating new vaccines and antibacterials for the treatment and control of CBPP in Africa - ***Angie Colston***
14:30	Under the skin: donkeys in crisis - ***Alex Mayers***	14:30	Controlling East Coast Fever - ***Odede Rezin***
14:45	Pig traders' networks on the Kenya-Uganda border highlight potential for mitigation of African swine fever virus transmission and improved ASF disease risk management - ***Kasiiti JL***	14:45	An evaluation of economic returns from East Coast Fever control through Infection and Treatment Method at household level in Nandi and Uasin Gishu Counties of Kenya - **Sitawa R**
15:00	Donkey Slaughter in Kenya which way forward, the Brooke perspective - ***Theuri S.***	15:00	Establishing a national syndromic surveillance in livestock and wildlife in Kenya - ***Kemunto N.***
15:15	Discussion	15:15	Discussion
15:30	**Tea Break**		
	Session 4A; Food Animal Practice 1		***Session 4B: Food Security 2***
15:45	Keynote: Challenges in Farm animal veterinary practice in the urban areas:Nairobi City and its environs - ***Gakuya D***	15:45	Bacterial contamination of stored table eggs from commercial chickens fed garlic meal additive - ***Oladede OA***
16:15	Observations on cattle dairy breeds in pakistan; need to curb unseen economic losses through control of mastitis and endemic diseases - ***Kenyanjui M***	16:15	Epidemiological studies on Parasitic infections of commercial quails in Nigeria - *Adelabu D*

16:30	Prevalence, risk factors and control strategies of rabbit coccidiosis and mange in Kiambu and Nyeri counties, Kenya - ***Ken Ogolla***	16:30	The Economics of Livestock Production Systems and Livestock Insurance Policies - ***Kiama J.***
16:45	Epidemiological Analysis of Passive Surveillance Data: A case of FMD Occurrence in Nakuru - ***Nyaguthii DM***	16:45	Efficacy of Encapsulated 3, 4, 5 – Trihidroxybenzoic Acid (THB), Gallic Acid, in the Control of Coccidiosis in Broilers - **Gilfillan C.**
17:00	Case report: The Case of Multiple pregnancy and farrowing in a sow - ***Wahome R .***	17:00	Insects as feed: Gendered Knowledge Attitudes and Practices Among Poultry and Pond Fish Farmers in Kenya - ***Waithanji E.***
17:15	Caprine babesiosis: haematological and serum proteins profile of red Sokoto goats in Ibadan, Oyo State Nigeria - ***Jeremiah OT***	17:15	Genetic Relationships Of Indigenous Goats Reared By Pastoralists In Kenya Based On Mitochondria DNA Sequences - ***Kibegwa F***
17:30	Discussion	17:30	Discussion
17:45	Poster presentation	17:45	Poster presentation

Day 2: Thursday, 27th April 2017

Time/Date			
	Session 5A: One Health 1		***Session 5B: Welfare of Working Equids in Africa(CVA)*** ***Session Chair: Dr. Henry Magwisha***
8:30	Keynote presentation: Real-time Disease Surveillance in Livestock and Wildlife in Kenya - ***Kariuki Njenga***	8:30	Keynote:The importance of donkeys to African Communities and current issues and challenges - ***Mike Baker***
9:00	One Health and Cancer: a comparative study of human and canine cancers in Nairobi - ***Kelvin Momanyi***	8:55	World Organisation for Animal Health (OIE) Global Animal Welfare Standards for Working Equids - ***Rahman***
9:15	An assessment of Knowledge, attitudes and practices on meat hygiene in butcheries in urban and peri-urban Nairobi, Kenya - ***Masudi SP***		
9:30	An analysis of the causes of poultry condemnations at a Nairobi slaugherhouse, Kenya (2011-2014) - ***Mwimali M.***	9:20	Welfare issues in working equids, particularly donkeys : Indicators and Management - ***Bedan Mazruli***
9:45	A pilot study to investigate the potentialfor developing syndromic surveillance system based on meat inspection records in Western Kenya - ***Ogola J.***		
10:00	Emerging cases of rabies in various wildlife species in Kenya between 2010 - 2016 - ***Mijele D.***	9:45	The importance of working horses in Africa - ***Mithigi Elijah***
10:15	Comparative genome analysis of *Campylobacter jejuni* isolates from wild birds - ***Anselme Shyaka***	10:15	Peri-urban donkey welfare status in the East and Horn of Africa region - ***Onyango S.***
10:30	Discussion	10:30	Discussion
10:45	**Tea Break**		**Tea break**
	Session 6A: One Health 2		***Session 6B: Small Animal Practice(CVA)*** ***Session Chair: Olantunji Nasir***
11:00	One Health Vaccinology for Emerging Infectious Diseases - ***Warimwe G.***	11:00	Keynote: Importance of CPD in Small Animal Practice and Challenges in operating a sustainable practice - ***Royson***
11:15	Knowledge, Attitudes and Practices Regarding Anthrax among Community Members, Health and Veterinary Workers in Maragua, Kenya - ***Chacha IN***	**11:30**	Outline of the CVA's Continuing Professional Development Program - ***Jeff Cave***
11:30	The Vicious Worm: the Swahili Version of the *Taenia solium* taeniosis/cysticercosis health education tool - ***Owiny M.***	**11:55**	World Small Animal Veterinary Association (WSAVA) activities, priorities and collaborations -***Shane***
11:45	Epidemiology of Animal Bites and Rabies Post-Exposure Prophylaxis administration in Kilifi, Kisumu, Kitui, Machakos and Nandi Counties- Kenya, 2011 – 2016 - ***Ngugi J.***	**12:15**	CPD uptake in Kenya - ***Mbugua***
12:00	Antimicrobial resistance patterns of pathogens isolated from bovine mastitis cases between 2010 and 2014 at Central Veterinary Laboratories Kabete, Kenya - ***Leonida NO***	**12:30**	Responsible Dog Ownership - **Omondi R**

12:15	Patterns of Antibiotic Resistance to Escherichia coli (E. coli) Isolated from Milk Samples Submitted at Kenya Central Veterinary Laboratory (CVL), 2011-2015 - ***Omolo J.***	**12:40**	A retrospective study of canine and feline hemoplasmosis in Kenya - **Mulwa NN**
12:30	Beyond zoonoses: proposal to institutionalize one health in Nigeria using the Kenyan zoonotic disease unit model - ***Babalobi O.***		***Discussion***
12:45	***Discussion***	**12:50**	
13:00	**Lunch**		
14:00	***KVA AGM & Excursions***		
15:30	**Tea Break**		
15:45	***Excursions***		
19:00 - 21:00	***Sponsored Dinner***		
	Day 3: Friday, 28th April 2017		
Time/Date			
	Session 7A: Wildlife		***Session 7B: Animal Welfare for Sustainable Llivelihoods***
8:30	Keynote presentation: Landscape Conservation and Communities - **Kate Atema**	8:30	Humane and Sustainable Farming- Ensuring the Welfare of Broiler Chicken Through Legislation - ***Yamo V***
9:00	Organization of the Olfactory Mucosa and Olfactory Bulb in Fossorial Rodents: The East African Mole Rat (Tachyoryctessplendens) and the Naked Mole Rat (Heterocephalusglaber) - ***Onyono PN***	9:00	Strategies to guarantee sustainable donkey welfare among the rural livelihoods - ***Oloo V.***
9:15	Review of tuberculosis in wild carnivores - ***Chege S.***	9:15	Assessing a sustainable agro-vet model with equine focus in Kenya - ***Kithuka J.***
9:30	Management of Anthrax outbreak in a wildlife population; Lake Nakuru National Park 2015 - ***Lekolool I.***	9:30	Improving husbandry and care of working donkeys in a pastoral set up: A case study of Kajiado county, Kenya - ***Muthusi J.***
9:45	Comparison of the pathogenesis of Trypanosoma bruceigambiense infection in African green monkey (Chlorocebusaethiops) and Syke (Cercopithecus imitis) monkey - ***Mwangangi DM***	9:45	Evidencing impact radio has on donkey welfare improvements - **Nkatha M.**
10:00	Incidences of ectoparasites outbreak in Kenya's free ranging wildlife populations in the recent past - ***Gakuya F.***	10:00	Discussion
10:15	Incidences of ectoparasites outbreak in Kenya's free ranging wildlife populations in the recent past'- ***Mijele D.***	10:15	
10:30	**Tea Break**		
	Session 8A: Pharmacology, Ethnoveterinary Medicine and Antimicrobial Resistance		***Session 8B: Livestock Production, Nutrition and Production Systems:***
11:00	Keynote presentation: AU-IBAR- Vet medicine regulation on the continent - Which way forward? - **Wabacha J**	11:00	Treatment And Control Of Theileria Infection In Cattle In Africa - ***Cloete J***
11:30	Comparison of *Salmonella* Serotypes and Antibiotic Resistance Patterns in Livestock in Korogocho and Viwandani, Kenya, with those of Human fecal and Environmental Samples from the Same Area - ***Cianjoya M***	11:30	Reproductive performances of dairy cows in smallholder production system in Meru - ***Muraya Joan***
11:45	Dioxin induces Ahr-dependent robust DNA demethylation of the *Cyp1a1* promoter via Tdg in the mouse liver - ***Amenya HZ***	11:45	Factors associated with weight gain in dairy calves/heifers on small holder dairy farms in Kenya - ***Makau D***
12:00	Antimicrobial resistance in zoonotic Campylobacter isolated from informal settlements in Nairobi - ***Chepkwony M.***	12:00	Sperm characteristics and testicular pathology of wistar strain albino rats fed graded levels of pigeon pea (*cajanus cajan*) diet - ***Soetan KO***

12:15	Mitigative effects of Moringa oleifera against liver injury induced by artesunate-amodiaquine antimalarial combination in wistar rats - ***Okumu MO.***	12:15	Social Factors and Diseases Influencing Quail Production in Nyeri County, Kenya - ***Chege LM.***
12:30	In-Vivo Anthelmintic Activity of the Ethanol Extract of Allium Cepa (Onion) Against Mixed Gastro Intestinal Helminth Infestations in Dogs - ***Orengo K.***	12:30	Prevalence and risk factors associated with parasitic infections of farmed fish in central Kenya - ***Murugami JW***
12:45	Discussion	12:45	Discussion
13:00	**Lunch**		
	Session 9A; Food Animal Practice 2		***Session 9B: Biotechnologies and Innovations in the Animal Resource Industry***
14:00	The impact of climate change on small ruminant farming in nigeria-mitigation plans for sustainability - ***Afusat Jubrir***	14:00	Keynote: Technological innovations for improving livestock production in developing Countries- ***Bett B, ILRI***
14:15	Control of gumboro disease using vaxxitek hvt+ibd vaccine in poultry - ***Mandieka J.***	14:15	Molecular Epidemiology of Trypanosomes among selected Wildlife populations in Kenya - ***Mutinda M.***
14:30	Seroprevalence of porcine cysticercosis and associated risk factors in pigs slaughtered in abattoirs in Thika, Kiambu county, Kenya - ***Nguhiu PN***	14:30	Efficacy of TSOL18 vaccine in control of porcine cysticercosis in Busiacounty, Kenya - ***Njanja JC***
14:45	Innovation to Control Trypanosomiasis- **Cyrille C, CEVA**	14:45	Molecular Amplification of ITS-2 and ETS Regions of Haemonchus placei in Some Breeds of Nigerian Cattle - ***Jeremiah OT***
15:00	Prevalent conditions causing lameness in sheep and the associated risk factors in Kajiado County, Kenya - ***Nguhiu JM***	15:00	Assisted Reproductive Technologies for Decision Support in Reproductive Management of Dairy Cattle in Kenya: What are the Prospects - ***Nakami WN***
15:15	Clinico-haematological features of bovine dermatophilosis in indigenous breeds of cattle in Ibadan, Nigeria - ***Jeremiah OT***	15:15	Sources of Professional Information for Kenyan Veterinary Surgeons and Veterinary Paraprofessionals ***Chepkwony M.***
15:30	**Discussion**	15:30	**Discussion**
15:45	**Tea Break**		
16:00	**Closing ceremony**		
	Session Chair: Dr Josiah Mandieka **DrMwenda Mbaka- Chairman, Kenya Veterinary Board** **Dr. Bernard Mugenyo - CEC Agriculture and Livestock, Nairobi County** **Prof Rahman- Commonwealth Veterinary Association** **Dr Kisa Ngeiywa- Director of Veterinary Services** **Dr. Samuel Kahariri - Chairman, Kenya Veterinary Association** **Dr. Andrew Tuimur - Principal Secretary, State Department of Livestock** **H.E Dr. Evans Kidero - Governor, Nairobi County**		
16:45	Departure		

19:00 - 21:00	
	Day 4: Saturday, 29th April 2017
	Programme for World Veterinary Day
	Theme: Antimicrobial Resistance-From Awareness to Action
8:30	**Field Day & Livestock Exhibition** **Procession in Kajiado Town** **Exhibition at the main site – KCB Grounds, Kajiado County.** **Field day – Vaccinations, Clinical work and Extension services in 5 stations of Kajiado County.** **Guests to tour field day sites**
11:30	***Public Baraza@ the main site – KCB Grounds, Kajiado Town*** ***Viewing of the exhibition by the Chief Guest*** ***Entertainment*** ***Invited guests*** ***Dr. Mwenda MBAKA (Chairman, Kenya Veterinary Board)*** ***Dr. Kisa J.Z. NGEIYWA (Director of Veterinary Services)*** ***Dr. Andrew TUIMUR (BVM) – Principal Secretary, State Department of Livestock, Ministry of Agriculture, Livestock and Fisheries*** ***GUESTS OF HONOUR*** ***His Excellency David NKEDIANYE MGH – Governor, Kajiado County*** ***Mr Willy BETT, Cabinet Secretary, Ministry of Agriculture, Livestock,Fisheries and Blue Economy*** ***Refreshments*** ***Vote of thanks***
16:00	***Departure***

ORAL SESSION ABSTRACTS

Projected Impact of Extreme Climatic Changes on Livestock Production in Kenya (ID#25)

Vincent O. Otieno[1*] and Beatrice A. Abutto[2]

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Climate changes, as suggested by some Global Climate Models (GCMs) can impact the economic viability of livestock production systems worldwide. This is particularly true in the vast semi-arid areas of Kenya, where irrigation is underdeveloped, and the rains fall within a limited period of time. In addition, surrounding environmental conditions directly affect mechanisms and rates of heat gain or loss by all animals.

This study looked at how rainfall distribution will respond to the warming climate forced by anthropogenic emissions of greenhouse gases (GHGs) by the mid of 21st century under two emission scenarios (RCP4.5 and 8.5) of the fifth phase of the coupled model intercomparison project (CMIP5), and its ultimate effect on livestock production.

The number of wet/extreme wet days are extracted using 75/95 percentile threshold while the number of dry/extreme dry days are extracted using 25/5 percentile minimal. The response is highly localized and seasonal over Kenya. Over the southern part of Kenya, the number of extreme wet days is projected to increase during December-January-February (DJF). However during March-April-May (MAM), the number of wet days is projected to decrease by the middle of the 21st century over southern part of Kenya. Over western parts of Kenya, the number of wet days is projected to decrease during MAM and during October-NovemberDecember (OND) seasons as the number of dry days increase. This might impact negatively on the livestock activities in the region. Nonetheless, over eastern region, the number of wet days is expected to increase, an indication of likely increased livestock production activities towards the semi-arid region. Over the northern part, significant increase/decrease in the number of wet/dry days is projected during September-October-November (SON) season. However the number of extreme wet days is projected to increase during MAM, June-JulyAugust (JJA) and SON seasons while the number of extreme dry days is expected to remain relatively the same in all the seasons. For livestock production activities, causes of rain failure might be considered in terms of delayed onset of rains, an early withdrawal, or short but intense rainfall events separated by long dry spells. We have only looked at the aspect of the changes in distribution of rains. Other aspects also need to be documented for right choice of livestock production for optimum output.

Key Words: Extreme climate, anthropogenic, livestock production.

The Mergers and Organizational Structure Effect on Decision-Making and Performance of Employees: The Case of KALRO (ID#27)

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Sustained agricultural growth is critical to uplifting the living standards of citizens as well as generating rapid economic growth (GoK, 2010). Briefly, The Kenya Agricultural and Livestock Research Organization (KALRO) was formed in 2013 by the Kenya Government through the Kenya Agricultural and Livestock Research (KALR) Act of 2013. In creating KALRO, the Government restructured agriculture and livestock research by merging the
Kenya Agricultural Research Institute (KARI), Tea Research Foundation of Kenya (TRFK), Kenya Sugar Research Foundation (KESREF) and Coffee Research Foundation (CRF), into a dynamic, innovative, responsive and well-coordinated system driven by a common vision and mission that contributes effectively to national development, in line with the second Medium Term Plan of Kenya Vision 2030 (KALRO, 2015). The mainstreaming of the agriculture industry is towards 2030 Vision three pillars (economic, social and political) through policy, legal and regulatory reforms, the new KALRO organizational structure need to be reexamined alongside the performance / motivation of employees. In mergers, it is recommended that there should be a thorough analysis (SWOT) however much they are championed globally, by the Organization for Economic Cooperation and Development (O.E.C.D). This study therefore, intends to group the staff population into three strata which include; non-management / lower level, middle level and top level management. These will further be stratified by Research Institutes. From each stratum the study will use simple random sampling to select 35 respondents for the study. It is expected that the results generated on the merger of four research institutes to form KALRO will inform policy on the ideal organizational structure for better internal decision-making and overall performance of the Organization. The specific objectives will be: 1) To determine effect of the mergers on decision-making and performance of KALRO; 2) To determine effect of the organizational structure on decision-making and performance of KALRO employees; 3)To determine and make recommendations on the most appropriate staff structure to effectively and efficiently undertake the mandate of agriculture and livestock research in Kenya.
Key words: Decision-making, Mergers, Organizational-structure, Performance, Strategy

Sources of Professional Information for Kenyan Veterinary Surgeons and Veterinary Paraprofessionals (ID#14)

Chepkwony Maurine Cherotich; Momanyi Kelvin; Fevre Eric.

The need for evidence-based veterinary medicine practice forces veterinary surgeons and veterinary paraprofessionals to remain in touch with latest developments in the veterinary sector although the flood of unreliable data remains a challenge. Overcoming this needs identification of accurate information sources and selective acquisition of scientifically valid information. This study sought insight into the information seeking behavior of veterinary professionals in Kenya. The objectives were to identify accessible, reliable, relevant and preferred sources and channels of information used by veterinary professionals and to understand what influences their preferences. A survey monkey was disseminated to Kenyan veterinary surgeons and veterinary paraprofessionals in Kenya through recognized channels such as email, yahoo groups, and Google groups.

Majority of respondents reported to seek information/training with a variety of factors motivating them. The leading reason was personal interest where respondents attend costly meetings in spite of sponsoring themselves. Conferences were the most popular method used by Kenyan veterinarians to obtain professional information, followed by peer reviewed journals and online courses (any figures?). Google and yahoo groups are the biggest avenue through which the Kenyan veterinary professional discovers upcoming conferences. The Kenya Veterinary Journal was reported as the most read journal, the FAO the most consulted website followed by Merck Veterinary Manual online with the latter reported to

provide beneficial information on disease prevention. Keeping updated with professional information is one of the leading reasons why the Kenyan veterinary professional consults their preferred sources.
Key words: Veterinary surgeons, Veterinary paraprofessionals, Professional information, conference, journal, electronic.

The Global Demand for Donkey Skins and Its Effects on Welfare and Livelihoods (ID#48) Alex Mayers, Faith Burden
The Donkey Sanctuary, Sidmouth, UK, EX10 0NU

The objective of this research project was to establish the extent of the global donkey hide trade, and the consequences on animal welfare and livelihoods of the people who depend on them. This is the first global insight into the donkey trade. A literature review and interviews with key animal welfare partners around the world revealed were analyzed and revealed serious issues for equine welfare, livelihoods and, potentially, the species as a whole. China's donkey population has nearly halved in the last 20 years suggesting a highly unsustainable trade that is conservatively estimated at 4 million donkeys per year. Entrepreneurs are now looking for donkeys worldwide to satisfy the growing demand. This demand has been fuelled by increased demand for luxury products including ejiao, a Traditional Chinese Medicine (TCM) ingredient made using donkey hides.
Despite their essential role in livelihoods and community resilience donkeys are largely invisible in livestock policies, livelihoods and humanitarian projects. Findings indicate that donkeys are frequently stolen from owners across Africa and illegally slaughtered in the bush for their skins. Elsewhere, donkeys are bought at less than current market value and are transported in inhumane conditions to recently built slaughterhouses. In the short term donkey owners are facing their livelihood being stolen and donkey prices that have increased up to tenfold within a few years leaving them without the means to replace animals they depended on.
This demand risks the welfare of donkeys, the communities who live with them, and, within a few decades, perhaps the species as a whole. Recommendations include a halt to the trade in donkey skins until the impact of the trade can be shown to be both humane for donkeys and sustainable for the communities that rely on them.
Key words: donkeys, hides, ejiao, TCM, livelihoods, welfare, equine, farms, slaughter.

Pig Traders' Networks on the Kenya-Uganda Border Highlight Potential for Mitigation of African Swine Fever Virus Transmission And Improved ASF Disease Risk Management (ID#32)

Jacqueline Kasiiti Lichoti, Jocelyn Davies, Yiheyis Maru, Philip M. Kitala, Samuel. M. Githigia, Edward Okoth, Salome. A. Bukachi, Sam Okuthe and Richard P. Bishop.
Social network analysis, a tool useful for understanding value chains and improving disease control policies, was used to analyze pig trader networks on the Kenya-Uganda border. A sample of 33 traders were interviewed about their experiences with trade and African swine fever (ASF), analyzed the networks generated in purchasing pigs and selling pork and their potential contribution to modulating dissemination of ASF-virus. Traders were aware of ASF clinical signs and the risk of trade transmitting ASFV. Most avoided buying pigs from ASF outbreak villages or sick pigs but their experiences indicated inadvertent purchase. Traders had early knowledge of outbreaks since they were contacted by farmers who heard rumors and wanted to sell their pigs. Individual traders bought pigs in up to nine villages, and up to six operated in a village. Although each trader typically spanned within 5 km, their networks comprising movements of pigs from source villages to slaughter slabs and retail outlets then to pork consumers, linked up indirectly across the 100kmx50km study area and revealed trade pathways across Kenya-Uganda. ASF could potentially spread across this area and beyond through sequential pig and pork transactions.

The risk of ASFVspread by traders was compounded by their use of poorly constructed slaughter slabs with open drainage, ineffective or non-existent meat inspection services, lack of insecurity in the value chain and sales of potentially infected pork to customers who were unaware of the risks to their pigs.
Limitations on government capacity, together with the strong self-interest that established traders have in reducing the disruption and financial losses that outbreaks cause, highlight the importance of governments and traders codeveloping an approach to ASF control. Formation of trader organizations/common interest groups warrants government support as an important step in engaging traders in developing and implementing effective approaches to reduce ASF outbreaks.

Preliminary Findings Of A Study On Slaughter Of Donkeys And The Implications On The Welfare Of Donkeys And Livelihoods In Kenya(ID#58)

Samuel Theuri, James Kithuka, Vincent Oloo and Fred Ochieng (Brooke East Africa, P.O. Box 4322000100, Nairobi Kenya)

Donkey slaughter is receiving considerable interest amongst donkey owning communities, animal welfare stakeholders and general public due to its potential; public health hazard, decimating donkey populations, catalyzing thefts, welfare issues along the slaughter value chain and loss of community livelihoods. This paper reflects on donkey slaughter practices from Brooke's perspective. Donkey is a valuable asset that provides multiple functions to a household; earns money for household use and saves owners time and money. Lifetime value of a donkey in its contribution to community and household livelihoods is estimated to be worth more than being sold for their meat or hides. Since 2016 two donkey export slaughter facilities (Naivasha and Mogotio) have been licensed. With combined capacity to slaughter about 400 donkeys per day, this translates to approximately 124,800 donkeys in a year. Preliminary data from a study conducted in selected parts of Kenya.report indicate increased incidences of theft, and inhumane slaughter of donkeys in authorized facilities and carcasses with missing skins In Narok, Kajiado and Nakuru counties, 847 thefts and carcasses were reported in 3 months (January to March 2017). This donkey slaughter trend is worrying from socio-economic perspective. The donkey slaughter coupled with Kenyans/ Chinese aggressive business behaviors is a dilemma that requires urgent debate in search for sustainable interventions. Some countries have banned export of donkey skin, Burkina Faso,
Niger, Chad, and Senegal in Africa and Pakistan in Asia. The policy, legislation and socioeconomic environment on trade in donkey skin require urgent review to protect the welfare of donkeys and the livelihoods of the society re-evaluated. Although slaughter of donkeys is legal in the country, theft and inhumane slaughter of donkeys in unauthorized facilities in an unacceptable act punishable by law. Owners and government needs to enhance donkey security. Unauthorized slaughter of donkeys sold to unsuspecting people has legal and public health implications Enforcement of existing regulations including movement permits, slaughter standards, traceability and proof of ownership of donkeys and their products before slaughter and processing them for export initiated and enforced, and owner sensitized on the lifetime value of donkeys and on responsible ownership. There are opportunities for public awareness and advocacy for review of existing policy and legislative frameworks to protect the welfare of donkeys and ensure sustainable livelihoods of society in Kenya

Keywords: livelihood, licensed export, traceability, banned, animal welfare

Evaluating New Vaccines And Antibacterial For The Treatment And Control Of CBPP In Africa (ID#59)

Angie Colston (GALVmed)
CBPP control had proven extremely difficult given the limitations of available vaccines and antimicrobials. The current vaccines used for CBPP in Africa have limited efficacy and have not prevented the continued spread and impact of the disease. Standard control methods that have been

successfully used in other parts of the world rely on isolation and culling of infected animals. However limited veterinary surveillance and limited budgets for compensation mean that this is not a viable option in many parts of Africa. The need for a new and/ or improved vaccine in Africa is therefore critical. Antimicrobials were not approved for treatment and control of CBPP, but despite this, some antimicrobials (principally oxytetracycline) were widely and sometimes inappropriately used against CBPP and other cattle diseases. Existing antimicrobials are often of very variable quality. Two recent developments prompted a re-evaluation of certain specific antimicrobials in the treatment and control of CBPP. Firstly, detailed epidemiological modeling indicates that an antimicrobial of proven high efficacy against CBPP used in conjunction with current vaccines would be highly effective in control of CBPP, much more than either vaccine or antimicrobial use alone. Secondly, the novel third generation macrolide antimicrobials (adopted widely in European Union/United States of America during the last ten years for treatment of bacterial and mycoplasma (non-CBPP) respiratory diseases in cattle, have the potential to be highly effective in the treatment of CBPP. GALVmed has undertaken a program of work to demonstrate proof of concept (PoC) for efficacy of novel antimicrobials compared to conventional antimicrobials and new vaccines that could be used to control of CBPP.

A Review on the Vaccination Method to Control East Coast Fever in Kenya (ID#20)

Odede Rezin Ochieng

East Coast fever is a tick-borne protozoan disease causing significant losses in cattle in Eastern coast of Africa and is endemic in 11 countries including Kenya, Uganda, Tanzania, Malawi, Zambia, Mozambique, Zimbabwe, South Sudan, Burundi, Rwanda and Democratic Republic of Congo. The disease kills at least one million cattle each year with an estimated cost of at least 1 billion Kenya shillings. The disease affects cattle and its severity is influenced by agro-ecological zone, livestock production system, breed and age. The losses associated with ECF includes, treatment costs, production losses, abortions, reduced growth rates and death of animals. ECF control has been through tick control by weekly acaricide dipping or spraying with variable levels of success. Dipping and spraying is very costly and labor intensive thus poorly done leading to acaricide resistance despite acaricides being a threat to the environment. Vaccination is the best and most secure means of controlling ECF and is based on the infection and treatment method. Marekebuni vaccine is approved for dairy areas while Muguga cocktail vaccine is approved for both pastoral and dairy areas and thus the most commonly used. Validation studies for Marekebuni are ongoing for pastoral areas. Successful cattle vaccination is dependent on observation of proper procedure, vaccine handling, cold chain management, animal selection, vaccine administration and diligent follow up for four weeks after vaccination.. The immunity against ECF is cell mediated thus a constant challenge by Theileria parva is vital to ensure sustained lifelong immunity. The farmers must thus be advised to reduce dipping regime to three weekly intervals after the fourth week from vaccination to ensure lifelong immunity. The objective of this paper is to review is the usage of vaccination method to control ECF in Kenya.

Understanding Gumboro Disease(ID#21)

Dr. Odede R.O. (BVM, Msc Animal nutrition and feed science)

Gumboro or infectious bursal disease is a highly contagious and fatal viral disease of chicken caused avibirnavirus called infectious bursal disease virus. Infectious bursal disease virus (IBDV) is a pathogen of worldwide importance to the poultry industry. IBDV destroys B lymphocytes in the bursa of fabricius in young chickens of 3 – 6 weeks of age, causing both mortality and immunosuppression. The pathognomic clinical signs of virulent form include sudden onset with white chalky diarrhea, trembling, vent picking and anorexia with high morbidity and mortality (up to 60%). Mortality peaks and declines within 7-10 days and the dead birds are very dehydrated and very stiff. Higher morbidity and mortalities

are registered due to immunosuppression leading to secondary infection by *E. coli*, salmonellosis, coccidiosis, infectious bronchitis among other diseases. Carrier state has not been established among recovered birds but the virus can persist in poultry litter for months (Indicate the approximate number of months). Antibiotic treatment is often counterproductive due to the compromised liver and kidney functions. Successful control is through judicious biosecurity measures, vaccination and proper clean out between flocks. This control measures are hampered by poor farming practices and the poultry business environment leading to multiage flocks, suboptimal housing, poor quality vaccines and vaccination and poor clean out procedures. Vaccination of breeders and commercial birds confers immunity against the disease if proper procedure is followed and the right program observed. Timing of the vaccination is influenced by levels of maternal antibodies titres in day old chicks which depends on the maternal antibody titres in the parent stock. Depending on the level of disease challenge in the environment, either mild, intermediate or intermediate plus/hot strains of Gumboro vaccine can be used. The best combination in this environment is use of intermediate vaccine for primary vaccination and intermediate plus vaccine as secondary vaccination. The main cause of death in Gumboro disease is dehydration from effects of fever. To save affected birds from death, efforts should be directed at hydration of the birds to preserve kidney function and aid thermoregulation, support liver function and boost the birds' immunity. Good survival rates up to 80-90% have been recorded from use of electrolytes and liver protectants. Administration of antibiotics as is traditionally advocated leads to massive deaths.

Establishing a National Syndromic Surveillance in Livestock and Wildlife in Kenya(ID#61)

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Syndromic surveillance is an approach in which disease indicators are monitored in real-time or near real-time to detect outbreaks of diseases earlier than would otherwise be possible with routine surveillance methods. Syndromic surveillance involves collection of health-related data that precede diagnosis and signal a sufficient probability of a case or an outbreak to warrant further public health response. In Kenya, detection of infectious disease outbreaks in animal populations is low with the existing systems and often late. Further, the reporting system often excludes events in wildlife and private animal health professionals who provide the bulk of veterinary services. We therefore plan to implement a national electronic syndromic surveillance to enhance real-time reporting and early detection of disease events in livestock and wildlife.

Nine syndromes in livestock (abortion, sudden death, hemorrhagic syndrome, GIT infections, oral and foot lesions, neurologic signs, respiratory signs, cutaneous/skin lesions and animal bites) and nine syndromes in wildlife (death, severe emaciation, diarrhea, respiratory signs, cutaneous/skin lesions, oral/foot lesions, limping and drooling of saliva, Loss of fear and aggression tendencies, blindness and growths) have been defined in the system. Animal health professionals (veterinarians, animal health assistants) in public and private practice have been recruited at sub-county level and will be reporting on the livestock syndromes to the county and national level at the Directorate of Veterinary Services (DVS). Wildlife veterinarians and scientists have been recruited nationally and will be reporting on the

wildlife syndromes to the head veterinarian Kenya Wildlife Services (KWS) and national level at the DVS.

The reporting is electronic through a mobile based system called the Kenya Animal Biosurveillance System (KABS). KABS has a unique mobile application that allows surveillance officers to enter data directly from the field using a standardized surveillance form which is are aggregated to a centralized database. The application also allows surveillance officers to send routine surveillance data to the national level.

Data submitted are assimilated into a common integrated display, called the KABS Analyst WorkStation. The KABS Analyst Workstation is a web-based tool, with user-permissioned access, that provides an easy-to-use display for monitoring and analysis of data to determine baselines and trends. The county and national officials permissioned to view the integrated data can visualize it geospatially on maps and temporally on charts and graphs. The system also provides prompt feedback to the surveillance officers. The submitted data can be downloaded at the county and national level for further analysis.

The syndromic surveillance system will initially be deployed in Nakuru and Makueni Counties for the livestock component and nationally for wildlife with eventual roll out in the whole country. The KABS system will allow surveillance officers and government animal health officials to quickly discern the animal health status in domestic animals and wildlife populations across different geographical areas and provide an early warning information to assist in decision-making and response during a disease event.

Observations on Cattle Dairy Breeds In Pakistan; Need To Curb Unseen Economic Losses through Control of Mastitis and Endemic Diseases(ID#65)

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In October 2005 a devastating earthquake caused extensive damage among populations in Pakistan administered Kashmiri Region and parts of North Western Frontier. In addition to the loss of more than 87`000 human lives and 70`000 injured, many livestock namely buffaloes, cattle and goats were lost. This eroded the livelihoods of families that solely relied on livestock and agriculture for their economic survival.
The International Committee of the Red Cross together with the German Red Cross (ICRC/ GRC) and the Kashmiri authorities formulated a project that sought to restore the livelihoods of the most vulnerable households to a level comparable to before the earthquake. The project adapted an agro-vet and microeconomic approach, part of which included the provision of a milking cow and calf.

This report indicates that antibiotics and homoeopathic medicines provide similar levels of protection against mastitis [(39)]. Preventive measures like vaccinations, disinfectant footbaths and reducing stress

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during the critical time of calving goes a long way towards improving the overall health of the dairy cows[(4)]. Although milking is in many cases still done by hand, premilking and post-milking hygienic procedures, such as udder washing and drying greatly decrease prevalence of mastitis. Key words: Dairy cattle, breed colorations, mastitis, Pakistan

Prevalence, Risk Factors and Control Strategies of Rabbit Coccidiosis and Mange in Kiambu and Nyeri Counties, Kenya(ID#60)

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The aim of the present study was to determine the prevalence and risk factors associated with rabbit coccidiosis and mange in Central Kenya. Additionally, the study assessed the farmers' management practices that influence the control strategies of rabbit coccidiosis and mange in the study area. Questionnaires were used to collect data from 97 rabbit farmers and 27 agroveterinary outlets from Kiambu and Nyeri Counties. Fecal samples and skin scrapping were collected for determination of prevalence of coccidia and mange infections. From the result, the prevalence of coccidiosis and mange were 79.8% and 49.5%,(refer to comment 1) respectively. Inefficient and irregular cleaning methods (74.2%) and poor housing structures (10.5%), were the major risk factors associated with coccidiosis and mange infections. The majority of farmers reported treating coccidiosis using sulphachloropyrazine (22%) and potentiated sulphamethoxazole (15%). The most common drugs used by farmers against mange were ivermectin (25%) and sevin® (16%). Non-chemotherapeutic methods used in management of the diseases included the ethnoveterinary use of *Aloe vera* against coccidiosis and liquid paraffin against mange, respectively. The study concluded that there is indiscriminate use of drugs in management of coccidiosis and mange that may contribute to development of resistance if urgent measures are not taken. Further studies are recommended to test the efficacies of the identified drugs and determine specific dosage regimes against rabbit coccidiosis and mange in Kenya.

Key words: *Aloe vera*, Central Kenya, Farmers, Ivermectin, Treatment.

Epidemiological Analysis of Passive Surveillance Data: A Case of FMD Occurrence in Nakuru County, Kenya(ID#49)

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Passive surveillance data on animal diseases is increasingly being accumulated in Kenya. This may be due to increased capacity for surveillance of diseases, better record keeping and better communication of outbreaks to laboratories. However, most of these data is only used to inform response measures for current outbreaks. Epidemiological analysis of accumulated passive surveillance data of animal diseases

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holds great potential in uncovering disease trends both temporally and spatially and flaws if any on the passive surveillance mechanisms in place. In addition, it may expose new knowledge gaps to inform research and provide critical information for formulation of control programs.

Passive surveillance data were obtained from the National Foot and Mouth Disease (FMD) laboratory covering the isolation of the Foot and Mouth disease virus in Nakuru County for the period 2010 – 2016. Foot and Mouth Disease outbreaks occurred every year. Four serotypes (A, O, SAT -1 and SAT-2) were isolated with outbreaks with different serotypes occurring simultaneously. Serotypes O and SAT -1 caused outbreaks throughout the study period while A caused only occasional outbreaks. There was no significant association between month of isolation ($p=0.64$) or season with isolation ($p=0.79$). However, there was significantly more sample collection during the dry season than in the wet season ($p=0.02$). Sub counties with the highest positivity were on livestock trade routes.

This shows that FMD is still a major concern in Nakuru County with different serotypes in circulation. In addition, data on temperature and rainfall patterns may inform high risk climatic conditions for outbreaks. The effect of livestock movements in FMD outbreaks in Kenya needs to be further investigated.

Keywords: Data, Passive surveillance, Foot and Mouth Disease, Nakuru, Kenya

The Case of Multiple Pregnancy and Farrowing In a Sow(ID#44)

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It was reported *t*hat, on September 20, 2016, a gilt was observed to be on heat and as was custom, at that farm, it was taken to the boars' pen for mating over a period of three days. She was a large white gilt aged about one year, having six pairs of teats. Although no actual mating was observed, by any of the workers or the owner, it was assumed that she was mated. The date on which she was taken to the boar pen was recorded on a board posted inside her pen.
A week or so later, the sow was once again observed to be on heat, and was returned to the boar's pen for another three-day mating session. The date on which she was taken to the boar pen was not recorded. Likewise, there was no record of observed actual mating.
On January 4, 2017, signs of imminent farrowing were observed on the sow, and later that day she farrowed a litter of 17 live piglets. She was unable to yield any milk. On that observation, the piglets were fostered with another sow, which had farrowed a few days earlier. The piglets were also fed artificially with a milk replace, placing it down the throat with a syringe. Five (5) of the seventeen piglets died within the first week of life, but the rest were surviving at the date of making this report. On January 21, 2017, the sow was observed to manifest signs of imminent farrowing. She was closely observed by, the workers and the attending veterinarian. She farrowed one more litter of twelve live piglets. Three subsequently died. Three days later, these authors visited the farm, and observed the sow was suckling (with some assistance) a litter of 21 piglets. The litter consisted of two obvious size classes corresponding to their ages, the older litter weighed approximately 5kg and the younger one about 1.2kg. This cases is of interest because the authors have no previous experience or reading of such a case. An attempt at explanation of how it became possible should be debated in a forum of veterinarians; anatomical and physiological challenges abound to make it credible.

Caprine Babesiosis: Haematological and Serum Proteins Profile of Red Sokoto Goats in Ibadan, Oyo State Nigeria(ID#36)

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This study was conducted to evaluate some hematological and total serum protein changes in Red Sokoto goats which were naturally infected with *Babesiaovis*. One hundred and sixtynine (169) apparently healthy Red Sokoto goats of both sexes were used for this study from Bodija Municipal Abattoir, Ibadan Nigeria. Whole and coagulated blood samples collected were screened for the presence of the parasite using microscopic examination of Giemsa stained blood smears. Haematological parameters [the packed cell volume (PCV), total red blood cell counts (RBC), Hemoglobin concentration, total white blood cell counts (WBC) with the leukocyte differentials] and serum biochemical parameters [the total serum protein, total serum bilirubin level, total serum albumin and globulin level]were determined using standard laboratory techniques. Sixteen goats (9.47%) were positive for *Babesiaovis* while 153 goats (90.53%) were negative. Significant decrease ($P < 0.05$) was observed in the mean values of PCV, RBC, Hb and concentration level of serum total protein in *Babesiaovis*infected goats(22.0±3.9%, $20.23±3.86x10^6$ /µL,9.20±3.05g/dL, 18.88±4.62g/dL)compared to the non-infected ones (28±9.5%, $20.81±5.48x10^6$ /µL, 7.45±1.05 g/dL, 23.27±4.21g/dL). Conversely, there was a significant increase ($P < 0.05$) in WBC count, WBC differentials and concentration level of serum total albumin, globulin and bilirubin proteins in goats naturally infected with *Babesiaovis* compared to the non-infected animals. Caprine babesiosis is very low in goats. Also, anemia is the most commonly found hematological pointer for babesiosis in Red Sokoto goats and the high bilirubin level during this infection is indicative of liver damage and erythrocyte haemolysis due to the presence of the intraerythrocytic organism *Babesiaovis in* the blood of affected animals.
Keywords: Red Sokoto goats, Haematology, Total Serum proteins, *Babesiaovis*, Babesiosis.

Bacterial Contamination of Stored Table Eggs from Commercial Chickens Fed Garlic Meal Additive(ID#43)

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Table eggs from poultry farms sometimes take weeks before consumption during which period they are either in-transit to consumers or are stored until purchased. Microbial contamination during this period being the cause of spoilage, determines the shelf-life of eggs. Garlic is known to possess antimicrobial activities. Its potential at improving the shelflife of table eggs was investigated.

Three hundred and fifty-one Isa Brown pullets separated into four groups A, B, C and D of 90, 81, 90 and 90 birds, were placed on garlic-meal feed additive at 0.125%, 0.25%, 0.5% and 0%, respectively. At 53 week-old, sixty eggs/group were kept at room temperature (27^{o}C), from which 8 eggs/group were selected on the day of lay, and weekly for 4 weeks. One milliliter of vortex mixed albumin and yolk

pooled from 4 eggs was diluted 1:10, inoculated on Plate Count Agar-PCA, Salmonella-Shigella AgarSSA, Eosin-Methylene Blue Agar-EMBA and Saborand Dextrose Agar-SDA by pour plate method in duplicates and incubated at 36^{o}C for 72 hours. Discrete colonies were sub-cultured in Nutrient agar and identified using colony/cellular morphology and biochemical characteristics.

There was no growth in all groups until 2 weeks of storage when groups A, C and D had counts of 75, 0 and 0 cfu/ml in EMBA, 100, 125 and 225 cfu/ml in PCA and 0, 25 and 25 cfu/ml in SSA, respectively. At 3 weeks, all groups had bacterial growths except B, while at 4 weeks, all groups had bacterial growths with B having a load of 25.5 cfu/ml on PCA only. Bacterial load was highest in control group D throughout the study period. *Escherichia coli, Enterobacter cloacae, Klebsiella pneumonia, Stenotrophomonas maltophilia* and *Citrobacter amalonaticus* were isolated.
Garlic-meal in feed of chicken layers at 0.25% delayed bacterial egg contamination, thereby prolonging the shelf-life and reducing the possibility of food poisoning in consumers, as well as, egg wastage with associated economic loss.
Keywords: Commercial chicken layers, garlic meal, table eggs, shelf-life.

Epidemiological Studies on Parasitic Infections of Commercial Quails in Nigeria(ID#42)

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This study on the epidemiology of parasitic infections in commercial quail was carried out in the six southwestern states of Nigeria. Twenty five quail farms were sampled between the months of April to October 2014. Pooled fecal samples were collected from the quail farms and examined for gastrointestinal parasites while blood samples were collected and examined for presence of haemoparasites. On each farm visited, the farmers were interviewed to obtain vital information concerning their flock. Type of housing and the condition of the houses, the environment of the farm, presence of other birds in the farm and presence of other epidemiological factors in the farm that may support parasite development and transmission were recorded. The samples collected from each of the farm were brought to the laboratory for parasitological analysis. Out of the twenty five farms sampled, twenty three were positive (92%) for gastrointestinal parasitic infections. Four genera of parasites identified were the nematodes: *Capillaria* spp, *Ascaridia galli*, *Heteraki* spp. and a protozoan, *Eimeria* spp. Age, housing, management system and presence of other animals are identified as risk factors for parasitic infections in commercial quail.

Key words: Parasite, Quail, Epidemiology, Southwestern Nigeria.

Economics of Livestock Production Systems and with Livestock Insurance Policies(ID#46)

Dr Jane Kiama

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This introduces the sustenance of many livelihoods when all stakeholders of this value chain share a common one stop shop system service in all production systems of upgraded livestock commercial rearing.. Challenges that when intervened made this system better. This also is in line with Kenya vision 2030-on its Economic pillar on Agriculture, has its objectives and effective adherence to livestock insurance covers which ensures that all animal health practices are observed.

Animal health plan is one of the good monitoring system that can improve the health, the animal welfare and the productivity of their animals through animal health planning which is a continuous improvement method that encourages the development of health building and disease control measures appropriate to the particular farm circumstances leading to a system that is progressively less dependent on veterinary medicines without jeopardizing welfare and thus great production due to low economies of scale of that production system. Every production system must have that breakeven point where the point of making profits is checked against a certain number of flock or produce in every system mostly based by its market. Every Livestock Management has Livestock managers who are responsible for running the business of poultry farms, dairy farms, cattle ranches or other livestock-related agribusinesses. They must have daily keep accurate financial records supervise workers and ensure proper care and feeding of animals.

Agribusiness is that profitable livestock production system that earns an income for every invested livestock production. Production systems on disease surveillance have critical point measures on biosecurity, that is achieved when both disinfection and vaccinations programs are done. Disease surveillance must be checked on both horizontal and vertical transmissions of every possible disease entry point and should have daily report surveillance on a critical analytical system done by the appointed veterinary professional. These production systems will encourage and achieve this by collecting interested farmers to form cooperative society's platforms or be in groups of that production type. where farmers access by credit extension all farm inputs, loans, the market of their products, seasonal trainings, extension livestock services, provision of Livestock Insurance, Farm Gate Market services, Banking facilities, Credit based veterinary services, local or Export Market Facility and an Office team service within their local area all services as One Stop Shop service provider. This is achieved when all stakeholders make a lasting agreement to provide services, market products and pay off on monthly check offs.

This will uplift farmers from low income to high income by financing them through Banking systems on their projects i.e. cage purchasing and 4 and ½ months pullets or purchase of cattle, pigs for them at break-even point. It will also greatly imparts economic status of every value chain partner when the livestock insurances covers are included to cover all risks . It bridges this large capital intensive project by putting it as one stop shop for all services. A Project that has a value addition services that gives a monthly income to the farmer. It's an employment creation to the youth and others-farmers'.

These combined efforts of all value chain providers will achieve this**.**

An Evaluation of Economic Returns from East Coast Fever Control Through Infection and Treatment Method at Household Level in Nandi and Uasin-Gishu Counties of Kenya(ID#38)

Rinah Sitawa[1], Stephen G. Mbogoh[2], Joseph M. Gathuma[1], and Salome Kairu[3]

Kenya has a vibrant small-scale based dairy industry that plays an important economic and nutrition role in the lives of many people, ranging from farmers to milk traders ("hawkers"), milk processors, and consumers. However, the high incidence of tick-borne livestock diseases in Kenya is a major challenge to the dairy industry. East Coast Fever (ECF) is one of these diseases, and the ECF Infection and Treatment Method (ECFIM) is a novel strategies that is being promoted to control ECF in Kenya. This study evaluated the economic returns from the adoption of ECFIM vaccine by small-scale dairy producers in a high potential dairy producing area of the Rift Valley region of Kenya.

A cross sectional study of a sample of 330 randomly selected households from two counties in that region.

- What types of data were collected from these households?
- How were these data analyzed?
- How were the economic returns estimated?, was there any modeling work?

Shows that the ECF-vaccinating households realized an overall net economic return of Kshs 44,575 (about US$ 450) per cow per year while the ECF non-vaccinating households realized a net loss of Kshs 9,975 (about US$ 100) per cow per year. The Odds Ratio estimate in this study actually shows that ECF non-vaccinated dairy animals are twice more likely to die from the ECF disease than the vaccinated dairy animals.

Key words: Tick-borne Livestock Diseases, East Coast Fever, Control Methods, Infection and Treatment Method, Economic Returns.

Insects as Animal Feed: Gendered Knowledge, Attitudes and Practices among Poultry and Pond Fish Farmers in Kenya (ID#52)

Waithanji Elizabeth, Affognon D. Hippolyte, King'ori Sarah, Diiro Gracious, Dorothy Nakimbugwe and Fiaboe Komi K.M.

A gender study of knowledge, attitudes and practices (KAP) among poultry and pond fish farming communities from Kisii, Nakuru and Kirinyaga counties in Kenya was conducted to establish insect feed technology interventions likely to reduce the cost of poultry and pond fish feeds while benefiting women and men equitably.

Qualitative data were collected through 16 sex and enterprise type disaggregated focus group discussions constituted by 153 farmers - 86 women and 67 men. Of these, eight were poultry farmer groups and eight, pond fish farmer groups.

Gender issues were more clearly defined in poultry than fish enterprises because smallholder poultry farming is more established than pond fish farming in all three counties. Men and women poultry and fish farmers knew of many insects fed raw to chicken and fish. Men stated that insect based feeds fed chickens would be bigger and women affirmed that they would be tastier than other protein fed chicken. This means that insects for feed technologies are acceptable to men and women poultry farmers. Women spent more time than men every day doing poultry and fish production activities. This time poverty challenge can be addressed by introducing interventions that save time for women when introducing insects for feed technologies.

Gender norms confine women to the homestead making women a better target group for technology interventions to farm insects at the homestead. It might, therefore, be more useful to pilot gender insect for feed technology interventions with poultry than fish farmers. Both men and women should be targeted for interventions in wild insect harvesting technologies per their traditional gender wild insect harvesting roles. Surplus insects farmed and harvested can be sold to commercial feed processors.

Key words: Insects, feeds, technology, benefits, gender, Kenya

Genetic Relationships Of Indigenous Goats Reared By Pastoralists In Kenya Based On Mitochondria DNA Sequences(ID#2)

Dr. Felix Matura Kibegwa

Indigenous goats (*Capra hircus*) form an integral component of the livestock sector in Kenya. However, these indigenous goat breeds have not been accurately described. Therefore, there is threat of erosion of unique genotypes such as those associated with adaptability and disease resistance, through indiscriminate crossbreeding. The Kenyan goats classification based on phenotype/morphology identifies three breeds: Small East African (SEA) goats, the Galla goat and crosses of SEA and the Galla. This study was therefore carried out to analyze mitochondrial DNA variation and establish the possible maternal lineages of indigenous goat breeds in Kenya. To this end, we sampled goats from two main geographic regions of Kenya with pastoralist communities, the Maasai and Somali/Boran. DNA was extracted from whole blood and polymerase chain reaction amplified using primers flanking a fragment of mtDNA control region. The sequences derived were analyzed both within Kenya goat populations and also compared with phylogeographic related datasets.

The results showed that there were 54 polymorphic sites in a 481-bp sequence and 29 haplotypes were determined. The mean haplotype diversity and nucleotide diversity were 0.981±0.006 and 0.019±0.001, respectively. The phylogenetic analysis in combination with goat haplogroup reference sequences from GenBank showed that all goat sequences were clustered into two haplogroups (A and G), of which haplogroup A was the commonest in the two populations. A very high percentage (99.90%) of the genetic variation was distributed within the regions, and a smaller percentage (0.10%) distributed among regions as revealed by the analysis of molecular variance (AMOVA). We concluded that the high levels of intrapopulation diversity in the two goat populations and the weak phylogeographic structuring suggested that there existed strong gene flow among goat populations probably caused by extensive transportation of goats in history.

Key words: Indigenous goats; Mitochondrial DNA control region; Phylogenetics

One Health and Cancer: A Comparative Study Of Human And Canine Cancers In Nairobi (ID#17)

Kelvin Momanyi, Anne Korir, Erastus Mutiga

Introduction: Globally, cancer is a devastating diagnosis with an increasing burden in both humans and dogs and ranks as the number three killer among humans in Kenya.
Objective: This study aimed to provide comparative information on cancers affecting humans and dogs in Nairobi-Kenya.
Methodology: Dog data collection was by cancer case finding from five veterinary clinics and two diagnostic laboratories, whereas the human dataset was from the Nairobi Cancer Registry covering the period 2002-2012. Analysis was achieved using IBM SPSS Statistics® v.20 (Dog data) and CanReg5 (human data).

Results: A total of 15,558 human and 367 dog cancer cases were identified. In humans, females had higher cancer cases 8993 (an age-standardized rate of 179.3 per 100,000) compared to 6565 in males (122.1 per 100,000). This order was reversed in dogs where males had higher cases 198 (14.9 per 100,000) compared to 169 (17.5 per 100,000) in females. The incident cancer cases increased over the 11-year study period in both species. Common cancers affecting both male humans and dogs were: Prostate, respiratory tract, lymphoma, and liver & biliary tract, whereas, in females, they were: Breast, lip, oral cavity, and pharynx, liver and biliary tract and lymphoma, respectively, per 100,000.
Conclusion: The commonality of some of the cancers in both humans and dogs fortifies that it may be possible to use dogs as models and sentinels in studying human cancers in Kenya and Africa. We further infer that developing joint animal-human cancer registries and integrated cancer surveillance systems may lead to accelerated detection of the risks of cancer in Africa.
Key words: Africa, cancer, cancer registry, comparative oncology, Kenya, Nairobi, One Health

An assessment of knowledge, attitudes and practices on meat hygiene in butcheries in urban and peri-urban Nairobi, Kenya(ID#18)

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Introduction: The demand and consumption of beef is high due to the increasing population and urbanization in developing countries, Kenya included. There is a significant risk of beef contamination during handling at various stages including at butcheries. However, knowledge, attitude and practices (KAP) on meat hygiene at the butcheries in Kenya is poorly understood. This study was designed to determine the knowledge, attitudes and practices of butchers in Nairobi area with regard to beef hygiene.
Methodology: Information was gathered using a structured questionnaire and observation of 30 beef selling butcheries in Nairobi area (10 each in Kangemi and Uthiru, 4 in Westlands and 6 in the Central Business District (CBD)). Kangemi and Uthiru were classified in this study as peri-urban while Westlands and CBD were classified as up markets.
Results & Discussion: Of the 30 butcheries, only 46.67% (14/30) sold beef only while 53% (16/30) sold beef in different combinations with mutton, poultry, fish, pork or offals. The main risk factors identified were handling money concurrently with meat at 93.3% (28/30); handling phones frequently at 86.67% (26/30) despite most (70%) being aware that the phone could harbor microorganisms; using one knife for offal and meat without cleaning at 33.33% (10/30). In addition, 60% of the butchers/respondents were not aware that it was possible to contaminate meat through saliva. On the positive side, most of the butcheries had access to toilets (66.6%) and all reportedly washed their hands with soap and water after visits despite having water challenges. Twenty percent (6/30) of the respondents had expired health certificates.
Conclusion**:** This concludes that risky hygienic practices in meat handling still exist in Nairobi County. These pose risks to the health of consumers. Therefore, training butchers on the proper hygiene practices should be conducted to improve meat hygiene. Keywords: Meat hygiene, KAP, Butcheries, Peri-urban, Urban, Nairobi

An Analysis Of The Causes Of Poultry Condemnations At A Nairobi Slaugherhouse, Kenya (2011-2014)

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A four year retrospective study was conducted in a Nairobi based slaughterhouse to evaluate the magnitude and prevalence of poultry losses caused by disease and pathological lesions. Linear regression analysis for the study of time trend and Kruskal-Wallis H test for investigation of differences were used as statistical methods. A total of 21,549,233 broilers were delivered to the plant for slaughter in the four year period starting 1st of January 2011 to 31st of December 2014. As a result of official veterinary inspection 405,778 (1.88%) birds were condemned due to ascites, emaciation, dead on arrival, imperfect bleeding, overscalding, mutilations and skin lesions. The calculation of the condemnation risk was based on quarters of the years. The number of broilers slaughtered increased across the four years and so was the risk of condemnations. Ascites and pre-slaughter mortality were the most frequent causes of condemnations accounting for 92.74% of all condemnations. The increase in the risk of condemnation due to emaciation across the study period from 0.07% to 0.23% was significant (p=0.02). There were no trends in time for the ascites, DOAs (dead on arrival) and the other causes of rejection. Majority of the condemnations occurred during the coldest season which comes in the third quarter of the years. Most of the condemnations were due to disease and transport-related. These calls for improved disease control and prevention measures as well as animal welfare during handling prior slaughter. The results could serve as baseline data in the poultry industry for future comparison. Keywords: Condemnations, poultry, slaughter.

A Pilot Study To Investigate The Potential for Developing Syndrome Surveillance System Based On Meat Inspection Records In Western Kenya (ID#54)

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[3] Institute of Infection and Global Health, University of Liverpool, Liverpool, United Kingdom [4] International Livestock Research Institute, Nairobi, Kenya Surveillance activities involve the collection, analysis and interpretation of large volumes of health related data. These data are then used to evaluate the effectiveness of disease control and prevention measures, monitor changes in infectious agents, support health planning and identify high risk populations or areas for targeted interventions.

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In most cases, the data that are used to inform epidemiological decisions are based on government surveillance data, health surveys and disease registries. Desire for improvement of early detection of diseases has led to the development of various innovative surveillance systems including syndromic surveillance. The main objective of syndromic surveillance is to use indirect health measurements to identify diseases and conditions early before diagnosis is confirmed. This in turn allows for the mobilization of a rapid response, thereby reducing morbidity and mortality in the population of interest. The motivation of this project is to assess the possibility of using slaughterhouse data to enhance the coverage and efficiency of the surveillance system in Kenya.

Two slaughterhouses in Bungoma County in Western Kenya were selected to participate in the syndromic surveillance pilot project. These facilities form part of the slaughterhouses that have been selected for the lab based surveillance activities being implemented in the ZooLinK(Zoonoses in livestock in Kenya) project. A hand held device that captures all the relevant information on daily slaughtered animals and condemnations was issued to the meat inspectors at the two facilities, and these devices are linked directly to a custom-designed database. The meat inspectors will use these devices to record data (including any relevant photos) of animals slaughtered over a 6-month period. The data will be transformed into a time-series and visualized using various real-time and interactive visualization tools to detect temporal trends and potential outbreaks. The acceptability of the system will also be assessed through discussions with relevant stakeholders.

Key words: Syndromic, surveillance and slaughterhouses

Comparative Genome Analysis of *Campylobacter Jejuni* Isolates from Wild Birds (ID#51)

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The ubiquity of *Campylobacter jejuni* in the environment and most importantly in wild birds, make the risk associated to human infection more complicated. In fact, apart from wellestablished pathways, such as the consumption of contaminated animal products and water, other possibilities are being discovered. They include contamination of environment by domestic and wild animal feces that trigger human infection via recreational water use or direct contamination in playgrounds. *C. jejuni* has a small genome, and live mainly as commensal organisms in the gastrointestinal tract of various mammalian and avian hosts. Nevertheless, this commensal organism is the major cause of food-borne bacterial gastroenteritis in humans worldwide. *C. jejuni* has been isolated from diverse animal, human and environmental sources including wild birds. Factors prompting the ability of some *C. jejuni* strains to colonize particular

hosts or persist in specific environmental niches are not well understood. Moreover, reasons behind its virulence in humans and not in the majority of other hosts are unclear.
Using comparative genomic sequencing on 8 isolates from wild birds, we have identified modifications in the hypervariable regions that may be responsible for surface exposure change allowing adaptation to their niche. Moreover, prophage-like elements were identified in isolates from crow, contributing to the accessory genomes of those strains. Lastly, the ironuptake system seems to be impaired, as some genes were found missing or with low homology to others identified in other strains. We have also identified a number of tools acquired by isolates from wild birds, including a T6SS in one isolate from crow, tetracycline resistance-encoding gene in 3 isolates from crow and a FHA domain protein in pigeon samples. All together, we suggest that genomic divergence observed constitutes evidence of adaptation necessary for wild bird colonization.

World Organization for Animal Health (OIE) Global Animal Welfare Standards for Working Equids (ID#71)

Sira Abdul Rahman

Executive Director and Past President
Commonwealth Veterinary Association

Animal welfare was identified as a strategic priority for the OIE since 2001, under the mandate given by the members. This was done because of the historic role of the OIE in protecting animal health which is a key component of animal welfare. The OIE AWWG was established in 2002 to coordinate and manage the animal welfare activities of the OIE. Since May 2005, the World Assembly of OIE Delegates (representing to date 180 Member Countries and Territories) have adopted Eleven animal welfare standards in the OIE Terrestrial Code, the latest being Welfare of Working Equids, and; Three in the OIE Aquatic Animal Health Code. They are:

- Introduction to the recommendations for animal welfare (2003)
- Transport of animals by land (2005)
- Transport of animals by sea (2005)
- Transport of animals by air (2005)
- Slaughter of animals for human consumption (2005)
- Killing of animals for disease control purposes (2005)
- Control of stray dog populations (2009)
- Use of animals in research and education (2010)
- Animal Welfare and Beef Cattle Production Systems (2012)
- Animal Welfare and Broiler Chicken Production Systems (2013)
- Animal Welfare and Dairy Cattle Production Systems (2015)
- Welfare of Working Equids (2016)

In developing countries, working animals, equids, cattle and buffalo, play an important role in many sectors, agriculture, transport of goods and people. 1 billion people mainly the poor, depend directly on animals for their livelihoods. Little recognition of their role has been given by governments and donor organisations. Working animals suffer health and welfare problems Only a few organisations such as the Donkey Sanctuary, The Brooke, SPANA etc. are dedicated to improving their welfare through veterinary care and the provision of training and education to animal owners and the public, notably to children.

The standards adopted focus specifically on horses, donkeys and mules. The standards set out guidelines on various aspects of their lives to make sure they have good welfare. Recommendations relate to food and water provision, shelter, prevention and treatment of disease, handling, equipment, behavior and general workload. They even extend to care at the end of their working lives.

The OIE Member countries will be responsible for enforcing them alongside the OIE's other standards for animal welfare .The OIE is constantly striving to help Member Countries to achieve progress in the implementation of the OIE's standards through building technical and scientific capacities and the improvement of veterinary governance. The OIE has developed several capacity-building programmes for Member Countries. Support in the animal welfare domain includes specific training programmes for the animal welfare national focal points, Global animal welfare conferences, publications, and the development of regional strategies. Starting with the Asia, Far East and Oceania region in 2012, the OIE through its Regional Representations has supported the development of Regional Animal Welfare Strategies (RAWS) as a means to support implementation of the OIE animal welfare standards by Member countries. The details vary from region to region but the overall objective of RAWS is to provide an agreed framework and guidance for countries, through the development of agreed Action Plans.

Improvement in the welfare of working animals, through provision of veterinary care and technical advice on health and husbandry is a priority of member countries of OIE. The member countries are encouraged to consider working animals in Government policy development and implementation and recognising their role on people's livelihoods. It is envisaged that there will be Increase recognition by Governments of the critical links between working animals and livelihoods to ensure that policies promoting working animal welfare are enacted and implemented.

CVA's Continuing Professional Development Program (ID#73)

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The Commonwealth Veterinary Association (CVA) has been traditionally well served by the CVA book and journal program, the CVA study fund, CVA projects, guest lectureships, training workshops, and regional and pan commonwealth conferences. Great changes have occurred during the past 48 years and will continue to occur particularly in relation to information technology, the provision of foreign aid, and the needs of veterinarians throughout the commonwealth. This provides the CVA with an opportunity but also a challenge in capturing new opportunities and ensuring relevance into the future.

Keywords: Commonwealth Veterinary Association, education, continuing professional development, information technology

Welfare Issues In Working Equids In Tanzania, Particularly Donkeys: Indicators And Management(ID#74)

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The challenges of Private Practice in a Developing Country (ID#75)

Roy Aronson

There are less feet through the doors of veterinary practices worldwide. In some areas the drop is as much as 35%. There are more retail outlets and many more vets. There is therefore more competition between vets worldwide. We have to take a different view and modify our practice methods.

Monitoring your practice is critical, Innovation is critical and adding value is critical. This discussion explores methods new and old to try and turn your practice into a profitable entity.
Don't aim to increase your turnover but rather to improve your profitability and cash flow. Turnover is vanity, profit is sanity, and cash flow is reality.

Addressing governance challenges for a successful Veterinary Practice in Kenya (ID#76)

Dr Christopher Wanga, MBS
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State Department of Livestock, Ministry of Agriculture, Livestock and Fisheries

TheVeterinary Practice whether public or private is critical for the development of animal resources.The practice ensures that animal and public health is guaranteed as well as the sustainability of livestock based rural livelihoods. The practice focusses onanimalhealth,production,welfare,foodsafetyandtradeamongotherconcernsinlivestock,wildlife,aquaticandcompanionanimals. The practice cannot be fulfilled without appropriate regulatory framework and the necessary means to enforce the corresponding legislation that enables delivery of services.
Animal health services are integral to the prevention, control and eradication of animal diseases that occasion huge economic losses and adversely impact livelihoods.The health of animals is among gtheleadingprioritiesinanimalproductivityandatallstagesofproductionmustbeguaranteed.Due to inadequate focus on animal health,enterprises involving food animals have low returns on investment resulting in high poverty levels in animal producing areas. The country has many suitable laws that aim to support the delivery of Veterinary Services however the current constitution does not facilitate their implementation before review. Support for enforcement of these laws is necessary as wereviewandupdatethelawsinordertoaddresscontemporarychallengesandachieveconformit ywiththeConstitutionandrelevantinternationaltreatiesratifiedbyKenya. Good governance is a key to enhancing agricultural production and income generation, in addition to improving public health,

poverty reduction and animal welfare worldwide. In order to unlock the potential in the development of the livestock, wild and domestic animals and aquaculture the veterinary practice must play its role .

Peri-Urban Donkey Welfare Status in the East and Horn of Africa Region (ID#1)

Solomon C. Onyango[5], David O. Oduori[1], Josiah M. Ojwang[1]

resources. This in turn has led to overpopulation; In 2015 Africa's population is reported to have increased by 30 million and by mid century, annual increases will exceed 42 million people per year, the total population then has been projected at 2.4 billion. This comes to 3.5 million more people per month, or 80 additional people per minute. Consequently there has been an increase in demand for affordable services, unemployment and inadvertently a more intimate interaction between man and animals. Overtly, animal welfare and public health have been compromised at the cost of urbanization. Working equines are believed to bear the 'short end of the stick' in the context of animal welfare in rapidly developing Africa. This short communication is aimed at highlighting the key donkey welfare challenges in the East and Horn of Africa, highlighting the progress made so far and potential entry points at regional, national and field level.

Desktop review was used to obtain the information. It was deduced that very little effort has been put towards research, resource allocation and education on donkeys. Donkey welfare problems range from unavailable veterinary care, to neglect, evidenced by poor harnessing, intentional infliction of injury among others. There is therefore an urgent need for organizations, institutions and governments to work together to address these gaps. This could be tackled by addressing thematic areas that include; research, socio-cultural-economic values, policy and legislative frameworks, advocacy /awareness, training, education, partnership and networking.

Keywords: animal welfare, donkeys, Africa.

One Health Vaccinology for Emerging Infectious Diseases (ID#10)

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Recent outbreaks of MERS, Ebola and Zika virus have highlighted the public health impact of emerging infectious diseases, the bulk of which involve zoonotic transmission. The impact of these diseases has further been magnified by the lack of licensed vaccines or treatments, though several networks and initiatives (e.g. the WHO R&D Blueprint) have now been formed to promote rapid development of interventions against select priority emerging diseases. Where zoonotic transmission is involved a 'One Health' approach, in which the same countermeasure is co-developed for humans and the respective animal reservoir(s), is an attractive strategy that may more effectively help contain or limit the impact

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Animal welfare in Africa is at its infancy, the concept is still viewed as foreign, a prerequisite for trade and not a characteristic of good husbandry. Sustained population growth, urbanization and development in the continent have put considerable pressure on natural

of disease outbreaks. Using Rift Valley Fever as a case study I will discuss the application of One Health to vaccine development and reflect on lessons learnt from past emerging infectious disease outbreaks.

Continuing Professional Development (Cpd) Uptake In Kenya

Prof. Susan Mbugua

In the early years of the development of the veterinary profession in Kenya the number of veterinarians was very low and the area covered large. Veterinarians were expected to attend to all sick animals at all times. They were expected to treat all animals for all diseases. There was no time for going back to class.

Burnout and lack of professional improvement led to poor performance and, there were complaints. These complaints plus developments elsewhere in the world led the government to act. It made it compulsory to attend CPD courses for renewal of the annual practice license. The number of veterinarians had increased appreciably.

In 2011 the relevant Act, entrenching this in the law of the land, was enacted. Since then the numbers of those attending the CPD courses has increased every year since 2013 when the Kenya Veterinary Board started enforcing the law.

The veterinarians and paraveterinarians have themselves come to value the knowledge they gain in these courses as the client has become more knowledgeable especially in this era of internet.

Knowledge, Attitudes and Practices Regarding Anthrax among Community Members, Health and Veterinary Workers in Maragua, Kenya(ID#9)

Isaiah Nchagwa Chacha, Samuel M. Arimi, Andrew G. Thaiyah

Introduction: This study was conducted to assess knowledge, attitudes and practices regarding anthrax to provide baseline information which will assist to design interventions.

Methods: A cross sectional survey and key informant interview were conducted among head of households, health and veterinary workers in Maragua Sub-county in August and September, 2014. Administered questionnaires were used to collect data from household members. Systemic sampling was used to obtain participants' knowledge, attitudes and practices. Questions were scored and descriptively analyzed using Excel spreadsheet then exported to GenStat Discovery Edition 4.

Results: A total of 293 community members were recruited in this study. The overall level of knowledge was 77.9% of all community members regarding cause, transmission, symptoms and prevention of the disease in both humans and animals. Of the interviewed community members, 75.1% thought that anthrax is a very serious disease in the area and they preferred awareness through baraza(29.0%) followed by radio (20.4%), Community Health Workers (19.7%), church (8.8%), and other forms (22.1).Most participants (88.4%) kept animals with 82.6% in zero-grazing units. Majority (73.8%) would inform to the veterinary department cases of sudden death while the rest will either burry without informing or consume the carcass.

Conclusion: This study revealed above average knowledge of anthrax in the study area by community members on cause, transmission, signs and control. There was good attitude towards its control due to the great scale of impact encountered. Practices were the major risk factors of anthrax outbreak. Skinning

of a suspected carcass, consumption of anthrax related meat, failure to vaccinate their livestock and poor disposal of carcasses contributed to anthrax transmission.

Keywords: Anthrax, Attitudes, Kenya, Knowledge, Maragua, Practices.

The Vicious Worm: The Swahili Version of the *Taenia Solium* Taeniosis/Cysticercosis Health Education Tool(ID#47)

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Introduction: *Taenia solium* is a zoonotic parasite that contributes to a substantial public health and economic burden in endemic areas. As lack of knowledge is among the major risks for the spread of the parasite, a health education tool was developed. In order to use and increase the impact of the health education tool "The Vicious Worm" in communities where English is not always spoken, the need of a translated version of the tool was recognized. The aim of this project was to develop a new version of "The Vicious Worm" tool, in Swahili. The program provides information on transmission, diagnosis, treatment, risk factors, prevention and control of *T. solium* taeniosis/cysticercosis and targets different stakeholders across different sectors and disciplines.

Methodology: "The Vicious Worm" is an open access computer based education tool for *T. solium* taeniosis/cysticercosis. The educational materials included in "The Vicious Worm" are illustrated short stories, videos, scientific texts and policy and information sheets. The information is displayed using an interactive map showing a village, a town, and a city addressing three levels of stakeholders. For this project the education material of the English version was systematically translated, formatted and implemented in the new version.

Results: The beta version is now available and can be downloaded for free through the homepage theviciousworm.org and we welcome everyone to test it and participate in its evaluation.

Conclusion: With the new version of "The Vicious Worm" the local communities at risk of getting Cysticercosis and both medical and veterinary practitioners will have an effective tool for disseminating information on the vicious worm, *T. solium*.

Key Words: Cysticercosis, Taeniosis, Health education tool, Computer programme

Epidemiology of Animal Bites and Rabies Post-Exposure Prophylaxis Administration in Kilifi, Kisumu, Kitui, Machakos and Nandi Counties- Kenya, 2011 – 2016(ID#62)

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Background: An estimated 2% of the world population is bitten annually by animals. Animal bites reports especially dog bites are useful indicators for assessing the risk of rabies virus transmission and need for rabies post exposure prophylaxis (PEP). Kenya is implementing a national rabies elimination strategy, characterizing animal bites will underscore the potential risk of rabies infection posed by animal bites. We aimed to describe the incidence of animal bites, patient characteristics and rabies PEP administration.
Methods: We reviewed animal bite records from outpatient medical records and anti-rabies vaccine (ARV) registers of 15 health facilities across the counties. A case was defined as a record of an animal bite in registers. We collected demographic and exposure variables. Data was managed and analyzed using Ms. Excel and descriptive and associative statistics calculated with Epi Info 7.
Results: A total of 6,872 records were analyzed, median age of cases was 23 years(IQR=31); Males were 3,768 (54.9%) and age < 15 years were 2,366 (35%). Dogs accounted for 93% (6360/6,835) of bites of which 72% (4904/6,835) were by domesticated dogs and 21% (1,456/6,835) from ownerless/stray dogs. There were 86% (4,332/5,038) bites on limbs, of which 66.4% (3,345/5,038) were on the legs and thighs. Head/face had 4.2% (210/5,038) of the bites with 36% being in children <15 years. The median time from bite to seeking medical care (n=5,115) was 0 day (Q1=0; Q3=3 days). Most (87%) cases received rabies PEP, of which 3,023(57.3%) got at least two-doses. The T-value was 5.28 (P value <0.001) between mean ages of males and females.
Conclusion: Of the study participant's children <15 years bore great burden of dog bites mostly on head/face and owned dogs accounted caused more cases. Vaccination campaigns aimed at the domesticated dogs and enhanced public health education targeting children <15 years will significantly contribute towards rabies elimination. Key words: Animal bite, PEP, rabies transmission, ARV

Antimicrobial Resistance Patterns of Pathogens Isolated From Bovine Mastitis Cases between 2010 and 2014 at Central Veterinary Laboratories Kabete, Kenya(ID#3)

Leonida N. Osoro

Bovine mastitis is the inflammation of the parenchyma of the mammary glands. It is usually caused by bacterial and fungal agents. The aim of this study was to determine the pathogens isolated as well as their antimicrobial resistance pattern, in cases of bovine mastitis. A total of 534 samples were submitted to the Central Veterinary Laboratory, Kabete between 2010 and 2014. Samples were from various dairy breeds of cattle reared peri-urban Nairobi where majority practice small scale farming. The samples were subjected to microbiological culture and examined for growth after incubation at 37 °C for 24-48 hours leading to identification of 915 pathogens. In vitro antimicrobial susceptibility testing was done using the Kirby-Bauer disc diffusion method. Descriptive statistics and analysis of linear trend were performed to assess the rate of isolation of the pathogens and antimicrobial resistance rates of the pathogens. *Escherichia coli* (26.0%), *Staphylococcus epidermidis* (24.8%), *Staphylococcus aureus* (14.0%), *Pseudomonas aeruginosa* (9.9%), *Bacillus subtilis* (9.3%) were identified as major pathogens causing mastitis. Highest resistances were noted towards Sulphamethoxazole, Ampicillin and Cotrimaxazole antimicrobials across the major pathogens isolated. The findings show that some pathogens exhibit high resistance rates to the antimicrobials which can be attributed to their frequent use in the dairy industry. The results revealed Sulphamethoxazole had a linear trend in proportions towards increased antimicrobial resistance with *E. coli* ($p<0.001$), *Staphylococcus epidermidis (*$p=0.007$), *Staphylococcus aureus* ($p<0.001$) and *Klebsiella aerogenes (*$p=0.007$) in the 5-year period. However, the other antimicrobials tested did not show any trend in antimicrobial resistance.

The study provides up-to-date information on mastitis in Kenya and the need for prudent use of antimicrobials by veterinarians for effective mastitis control to avoid any emergence of such resistant bacteria.
Key words: Bovine, Mastitis, Pathogens, Antimicrobial, Resistance

Patterns of Antibiotic Resistance to *Escherichia Coli (E. coli)* Isolated From Milk Samples Submitted At Kenya Central Veterinary Laboratory (CVL), 2011-2015(ID#63)

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Introduction: *E. coli* is often used as a marker of fecal contamination and its isolation in milk may indicate possible presence of entero-pathogenic and/or toxigenic bacteria constituting a public health hazard. Antibiotics are used in food animals for disease therapy and for promoting growth. Improper use can result in antimicrobial resistance (AMR) which can spread to humans via food chain. In Kenya, 86% of milk is consumed raw through informal markets. This study examined AMR patterns from isolates obtained from milk samples.

Methods: We reviewed bacteriology register at CVL in which bovine milk samples from which *E.coli* was isolated and antimicrobial susceptibility test (AST) wasdone.AST was done using diffusion discs containing ampicillin, kanamycin, tetracycline, streptomycin, gentamycin, co-trimoxazole and sulfamethoxazole. Data management and analysis was done using Ms. Excel and Epi Info 7.We calculated proportions for resistance against individual antibiotics and we used chi-square statistic to determine difference in *E. coli* AMR patterns and p-value≤ 0.05 was considered statistically significant.

Results: *E.coli* was isolated from 372 samples from which resistance was observed in 263 (73%) for ampicillin, 260(63%) sulfa-methoxazole, 187(52%) co-trimoxazole, 47(13%) streptomycin, 31(9%) tetracycline, 19(6%) kanamycin and eight (2%) in gentamycin. Significant difference was observed in AMR patterns for ampicillin (χ^2=12.15, pvalue=0.01); sulfa-methoxazole (χ^2=23.4, p-value<0.001) and gentamycin (χ^2=14.14, pvalue=0.007) whereas no significant difference was observed in AMR patterns against other antibiotics during the period under review.
Conclusions: The study highlights varying patterns of *E.coli* AMR against commonly used drugs for treating bovine. There exists potential of spillover of such drug resistant pathogens into human population through food chain since milk in Kenya is mainly consumed raw. AMR surveillance in livestock and their products should be enhanced, coupled with prioritization of effective regulation on antibiotic use in livestock by regulatory bodies. Key Words: Antimicrobial resistance, Escherichia coli, Bovine, Kenya

Beyond Zoonoses: Proposal To Institutionalize One Health In Nigeria Using The Kenyan Zoonotic Disease Unit Model(ID#4)

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Introduction: From 2006 to2009, Nigeria successfully ran a collaborative joint Avian Influenza Control Project (AHIP), involving the Federal Ministries of Health and Agriculture as major stakeholders. Building on this, the Nigeria Centre for Disease Control (NCDC) was created in 2011 and the author commissioned by the NCDC Project Director to write a Concept paper towards the establishment of a One Health Nigeria (OHN)coordinating Office under the NCDC; to institutionalize One Health in the Public health system of Nigeria through specific, concrete, measurable and results-driven activities within five years; by facilitating collaboration and cooperation among identified stakeholders. Six years on, the OHN Coordinating Office is yet to take off due to Government apathy and lack of cooperation between the Federal Ministries of Health and Agriculture.

Methodology: The Kenyan Zoonotic Disease Unit ZDU, an OH Coordinating Unit established by the Kenyan government in August 2012, has been described as a successful OH model for coordination between human and animal health sectors that can probably be adopted in other settings. OHN is such a setting. However OH is not just about zoonotic diseases and emerging infectious diseases. It also includes international trade, food safety and security, livestock livelihood and poverty reduction issues which impact negatively on people's well-being, safety and livelihoods. OH approach places disease dynamics into the broader context of sustainable agriculture, socio-economic development, environment protection and sustainability, whilst recognizing that adequate nutrition is essential for health. Expected results:
i. Adoption of One Health in Nigeria's Health policy, ii. Joint Animal-HumanEnvironment Early Warning System for health threats, iii. Joint Surveillance of emerging risks at the human–animal–ecosystems interface.
Conclusion: OHN will need the support of the US Department of State's Biosecurity Engagement Program and the Food and Agricultural Organization of the United Nations to actualize the above proposal.
Key Words: Beyond Zoonosis, Proposal, Institutionalize, One Health Nigeria, Kenya Zoonotic Diseases Unit, Biosecurity Engagement Program, Food and Agricultural Organization.

A Retrospective Study of Canine and Feline Hemoplasmosis in Kenya(ID#22)

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Hemoplasmosis is a blood-borne pathogen with a worldwide distribution. It is caused by an obligate erthrocytic pathogen that affects a wide range of mammalian species including cats and dogs. Recently, increased prevalence has been noted in canine and feline patients presented at the Small Animal Clinic, University of Nairobi. Scanty or no information exists on prevalence, clinical presentation and management of canine and feline hemoplasmosis in Kenya. This retrospective study was conducted to determine its clinical presentation and management.

Amongst 154 cases that were retrospectively viewed, 46.1% were canine and 53.9% were feline. Canine breed predilection showed the German shepherd dog was the most affected at 49.2% (29/59). The lowest incidence was observed in Boxer, Great Dane and Chihuahua at 1.7%. The common clinical signs in dog were; anorexia 42.3%, lymphadenopathy 36.6%, pounding heart 7.0% and dehydration 7.0%. Tick and flea infestation was seen in 66.7% and 33.3% of the cases respectively. Concurrent infections occurred in 60% of the cases. In cats, lymphadenopathy 31.3% and anorexia 21.7% was observed. Breeds of cat affected were Domestic Short Haired Cat (87.8%) and Domestic Long Haired Cat (12.2%). Concurrent infections occurred in 28.9% of the cases.

A blood smear was used as a confirmatory test. In management of canine hemoplasmosis the following drug(s) were used: Imidocarb dipropionate (53.8%) and Imidocarb dipropionatelong acting oxytetracycline (25%). In felines Imidocarb dipropionate 78.2% and Imidocarb dipropionateenrofloxacin 45.8% were used.

This study indicated increased occurrence of hemoplasmosis in dogs and cats presented at the Small Animal Clinic, University of Nairobi.

Key words: Canine, Feline, Hemoplasmosis, Clinical presentation, Management.

Organization of the Olfactory Mucosa and Olfactory Bulb in Fossorial Rodents: The East African Mole Rat (*Tachyoryctessplendens*) and the Naked Mole Rat (*Heterocephalusglaber*)(ID#39)

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Optimal functioning of the olfactory system is critical for survival of fossorial rodents particularly because their visual system is in most cases rudimentary or lacking. This study examines the structure of the olfactory mucosa (OM) and olfactory bulb (OB) of two fossorial rodents namely, naked mole rat (NMR) and East African root rat (EARR) using classical histology and morphometry. Notable species variations were observed in ethmoturbinate (ET) complexity, volume ratio of OB to the whole brain (WB), thicknesses of the olfactory epithelium (OE) and the various layers of the OB and orientation of structures in the lamina propria of the OM. The ethmoturbinates of the NMR, were fairly simple structures comprising a tongue-like structure that lay dorsomedially and a broad discoid/ flap-like structure that projected rostrally into the cavity from the ethmoid bone. In the EARR however, elaborate branching of the ETs, which were mainly confined posteriorly on the medial and lateral sides of the nasal cavity, served to increase the surface area of the olfactory region. When correlated with the WB, the volume of the OB was greater ($p< 0.05$) in the EARR than in the NMR (OB :WB volume was 4.24×10^{-2}in EARR and 3.92×10^{-2} in NMR). Thicknesses of the various OB layers were also greater in the EARR than in the NMR.

Interestingly though, the thickness of the OE was higher in the NMR (97.56 ± 6.08 µm) than in the EARR (79.49 ± 5.72 µm). Results of this study suggest that olfactory structures of the two species of rodents have evolved differently based on their olfactory functional needs visà-vis ecological and behavioral factors. This information may help to validate recent findings of behavioral studies which demonstrate that fossorial rodents show a tendency towards enhanced sense of smell.

Key words: Structure, Olfactory structures, Fossorial rodents, Naked mole rat, East African root rat

Review Of Tuberculosis In Wild Carnivores(ID#8)

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Tuberculosis in mammals is a chronic infectious disease caused by organisms of the Mycobacterium tuberculosis complex, of which *Mycobacterium bovis* is a member. Its ability to infect a wide range of livestock and wildlife species, as well as humans, highlights its global public-health and socio-economic significance. Bovine tuberculosis caused by *M. bovis* has been classically thought as a disease of cattle; however, it has a wide range and has been reported in ruminant species as well as carnivores. Screening for mycobacterium species in wildlife is complicated by difficulties of obtaining quality samples, the need for multiple captures and lack of species-specific validated diagnostic tests. The status of some wild carnivores as either being maintenance or spillover hosts has been determined. The maintenance hosts may act as reservoirs for infection of livestock or other wildlife species. For example the badger has been classified as a maintenance host of bovine tuberculosis.

Management Of Anthrax Outbreak In A Wildlife Population; Lake Nakuru National Park 2015(ID#41)

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Anthrax is an infectious disease caused by *Bacillus anthracis*, a gram-positive, rod-shaped bacterium that can be found naturally in soil and commonly affects domestic and wild animals around the world. The disease is enzootic in many parts of Kenya and humans can become infected through direct or indirect contact with sick animals. High mortalities of buffaloes in Lake Nakuru National Park (LNNP) were reported by the park management in the beginning of July 2015. Samples were collected from carcasses of four buffaloes and one white rhino and analyzed at Regional Veterinary Laboratory, Nakuru. *Bacillus anthracis*, the causative agent of anthrax was identified as the cause of the mortalities. Approximately six hundred and seventy buffaloes died as a result of the disease posing a challenge due to the negative effect on biodiversity and threat on endangered population of rhinos and Rothschild giraffe in the park. Other species affected in this outbreak were impala, warthog, waterbuck and eland. Emergency outbreak response measures were instituted to stop further spread of the disease and reduce soil contamination and prevent new outbreaks. These included vaccination of endangered wildlife species, scavenger control, carcass incineration and deep burying.

Keywords: Anthrax, *Bacillus anthracis*, buffaloes, endangered, Lake Nakuru, wildlife

Comparison of the pathogenesis of *Trypanosoma brucei gambiense* infection in African green monkey (*Chlorocebusaethiops*) and Syke (*Cercopithecus imitis*) monkey(ID#45)

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Sleeping sickness is an important disease of man caused by *Trypanosoma brucei hodesiense* and *T.b. gambiense*. An animal model of *T.b. gambiense* has remained elusive for many years. Recent studies with *T.b. gambiense* isolate KETRI 2565 infections in *Mastomysnatalensis* resulted in high and persistent parasitaemia. In the current study, four Sykes (*Cercopithecus imitis*) and four vervet monkeys (*Chlorocebusaethiops*) were infected by intravenous injection with approximately 10^5 parasites of this strain. Parasitaemia, clinical signs and sampling for blood and cerebrospinal fluid (CSF) were done at regular intervals up to 200 days post infection, or when the animal was at extremis and thus euthanised. The mean pre-patent period was 4.9 days with a range of 4–6 days post infection in both species. Parasites were observed in the CSF at 42 and 104 days in two vervets and at 28, 56 and 84 days in three sykes. The most prominent clinical symptoms in the animals were lymphadenopathy, splenomegally, inappettance, weight loss, anemia, occular oedema, sleepiness and increased white cells in the CSF, which is comparable with symptoms of sleeping sickness in humans. *T. b. gambiense* strain KETRI 2565 could therefore become a useful isolate for developing an animal model of *T.b. gambiense* sleeping sickness. Key words: *T. b. gambiense*, parasitaemia, clinical signs, CSF, animal models

Incidences Of Ectoparasites Outbreak In Kenya's Free Ranging Wildlife Populations In The Recent Past(ID#53)

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Free-ranging wildlife species are susceptible to infection by external parasites. The infections can be self-limiting and the animal recovers without clinical intervention or may require clinical intervention and control measures depending on degree of infestation and in extreme cases are fatal and cause mortalities. In this paper we report three external parasites outbreaks that have occurred in the past 5 years: 1) A putative filariosis outbreak in both black and white rhinos at Meru National Park in Kenya. Four (4) black and five (5) white rhinos were affected by various degrees of filarioid-like lesions, while apparently all sympatric wild and domestic animals were free from filarial worm. Affected rhinos were captured and successfully treated. Comparison between the epidemiological aspects of white and black rhinoceros filariosis and the possible relations between this outbreak and annual seasons, the presence of ox-peckers and other host species are discussed. 2") An outbreak of traumatic cutaneous myiasis caused by Old World screw worm, *Chrysomyia bezziana* and blowfly, *Lucilia* sp. in free-ranging common elands (*Taurotragus oryx*). The infestation affected males and females of different age classes, and had a negative impact on individual fitness as well as the overall health. Severely affected individuals were euthanized, while others were clinically treated, and apparently recovered. This study indicates that myiasis-causing flies still in Kenya and they can cause severe clinical outbreaks of cutaneous myiasis in wild animals. The zoonotic potential of these parasites in Kenya are either unknown or neglected. iii) Finally we report several incidences of severe mange infestation in cheetahs

(Acinonyx jubatus) in Maasai Mara, treatment and control measures instituted and research opportunities.

Key words: Filariosis, wildlife, free-ranging, mange, *Taurotragus oryx, Chrysomyia bezziana, Acinonyx jubatus,* cutaneous myiasis

Emerging Cases Of Rabies In Various Wildlife Species In Kenya Between 2010 – 2016(ID#40)

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Rabies is an acute encephalitis, caused by RNA viruses in the genus *Lyssavirus, family Rhabdoviridae.* It has a worldwide distribution; except in British Isles, Australia and New Zealand. Rabies is one of the oldest zoonotic diseases first described in hunting dogs in 2,300BC. Virtually every mammal is susceptible to rabies but, the natural disease occurs predominantly in domestic and wild carnivores. Humans are a dead-end host for rabies virus; infection in humans is lethal with just one reported case of survival following infection. Sporadic cases of rabies in Kenya have caused mortalities to various wildlife species including lions, hyenas, jackals, wild dogs, zebras and white-tailed mongoose. In this study we report data on recent incidences of rabies in wildlife species in Kenya from 2010 to 2016 including the risk of transmission to human and some of the control measures undertaken to prevent spread to wildlife populations in Kenya. Some of the recent rabies cases reported in wildlife include lions of Maasai Mara, hyenas in Tsavo, Laikipia and Marsabit, zebra in Chyullu hills, and white-tailed mongoose in Tsavo among other cases. So far there is no documented evidence of wildlife-to-wildlife transmission of rabies in the world and the Kenyan cases of rabies in wildlife are mainly dog-mediated. Control of rabies in our wildlife conservation areas will largely depend on the control strategies in domestic dogs and cats.

Keywords: Rabies, *Rhabdoviridae,* white-tailed mongoose, lions, hyenas, jackals

Strategies To Guarantee Sustainable Donkey Welfare Among The Rural Livelihoods(ID#57)

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There are more than 1.8 million working donkeys in Kenya, supporting the livelihoods of more than 3 million people both in urban and rural areas. Brooke Hospital for Animals East Africa is an affiliate of Brooke UK- an equine charity whose mission is to transform the lives of vulnerable working horses, donkeys and mules around the world. We relieve their immediate suffering and create lasting change by working with people, communities and organizations. The welfare issues faced by donkeys include but not limited to the following, body mutilations, lesions, abnormal hoof- shape, diseases and injuries, eye problems, parasites, poor body condition, overworking. Our work revolves around the factors that influence the welfare of the donkeys which is led by the humans-mainly owners and users who causes the welfare issues either by commission or omission. Our three main interventions are community engagement which involves capacity building of owners/users that are then organized into groups/associations/saccos to change their knowledge, attitudes and practices on good donkey welfare and husbandry practices. Secondly Brooke EA is involved in sustainable veterinary health service

provision as it is a challenge to donkeys; in this a lot of effort is put in bridging knowledge gaps and practice of service providers on donkey health and welfare while engaging with training institutions to include donkeys in their trainings. Finally, we are engaged in matters relating to animal welfare national and county laws and policies review and formulation as well as local, national, regional and international level lobbying to increase recognition and resources to donkeys. For Brooke East Africa to achieve the three ways of working we work through a partnership model through which the projects are implemented by a number of partners who mainstreaming donkey welfare into their existing organizations' strategies ensuring donkey welfare improvement beyond the Brooke.

Assessing A Sustainable Agro-Vet Model With Equine Focus In Kenya(ID#69)

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Following structural adjustment programmes of late 1980s; the Government of Kenya privatized animal health services in 1991 to improve the efficiency of delivery of veterinary services. Privatization was however effected before the establishment of alternative suppliers outside the private sector and enactment of policies and standards that could assure the quality of animal health services provided. Since the public sector withdrew from providing animal health service, there has been an explosive development of retail drug outlets in most parts of the country offering drugs, insecticides and other veterinary inputs. Little is known about their numbers, organizations, structures and capacities for effective delivery of these services. Brooke East Africa has been supporting equine animal welfare projects in Kenya now for over a decade through three main domains namely; changing knowledge, attitudes and practices of donkey owners and users; strengthening equine health service provision and advocating for favorable policy change and allocation of resources to donkeys. While strengthening health service provision, Brooke East Africa has increasingly noted that various cadres of animal health service providers do not use equine specific drugs majorly because of unsatisfactory access from various agro-vets either they own and run or are owned by other service providers. Donkey owners also are not able to access equine drugs, services including advice from the available agro-vets. Brooke East Africa further recognizes that for sustainable equine health services and drug supply to donkey owners, various stakeholders require to mainstream equine medicines into the already existing privatized agro-vet business model in Kenya. The paper provides an assessment of an agro-vet model with an equine focus and designed to ensure sustainability.

Key words: Brooke, Agro-vets, Donkeys, animal health

Improving Husbandry And Care Of Working Donkeys In A Pastoral Set Up: A Case Study Of Kajiado County, Kenya (ID#55)

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Introduction: Donkeys play a very important role in supporting livelihoods of communities in Kenya. In Kajiado County they serve the vital function of transporting goods. Nevertheless, the donkey is still among the most abused animal, receiving no reward after several days' work. Over the past three years, the Kenya Veterinary Association in partnership with the Brooke has capacity build donkey owners and users on different aspects of donkey welfare and best husbandry practices. The goal of this survey was to determine the impact of this capacity building among the donkey owners and users in Kajiado County.

Methodology: A baseline survey was carried out on August 2013 and annual follow-ups undertaken to assess change on the different husbandry aspects. The last follow up data was collected in 2016through structured questionnaires administered to 196 donkey owners and users in three randomly selected locations. This was followed by focused group discussions to characterize donkey husbandry practices in Kajiado County.

Results: Descriptive data analysis and proportional profiling was carried out and it was found that donkey keeping is majorly a responsibility of women forming over 58%. Donkeys are left to graze freely when not in use mainly in shrub lands and wastelands. 63% (123/196) of donkey owners were observed to use proper methods to handle/control their donkeys while at work. Majority of the owners (90%, 176/196) practiced self-treatment when their donkeys were sick or wounded. The human wildlife conflict was mentioned to be on the rise by 90% of the participants and owners have been forced to keep livestock either in enclosures or in shelters.

Conclusions: The project intervention strategies were geared towards improving donkey welfare and took cognisance of husbandry and management practices and the underlying attitudinal and socioeconomic drivers in the community.

Keywords: donkey welfare, donkey husbandry, pastoral system, socioeconomic contribution

Evidencing Impact Radio Has On Donkey Welfare Improvements(ID#67)

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Radio messages are used to increase social awareness and complement Brooke's work on improving donkey welfare with this is a useful tool for increasing visibility in readiness for *'Grant ready initiative'* radio would be adversely efficient for brand development. Brooke EA ran a weekly radio program over three years (2013-15), aired in two national radio stations, the Kenya Broadcasting Corporation (KBC) and Citizen Radio with coverage across Kenya and neighboring countries. The main goal of the radio program was to share information on the best practices aimed at changing knowledge, attitudes and eventually practices of donkey owners and users. In 2016, an assessment of the radio was conducted and the end of project report showed that Radio remains the number one medium for information amongst Kenyans, Most preferred radio stations were vernacular language stations, a high percentage preferred short infomercials aired throughout the day, a total 69% of respondents stated that they listen to radio daily and 30% frequently(every other day) , Of those interviewed 75% said they did not know about Brooke East Africa but know about its partners. The respondents recommended infomercials which allow for interactive call back and short text messaging (SMS).A pilot was been conducted with an expected outcome of increasing awareness and visibility of proper donkey welfare in 3 counties of Nakuru, Kajiado and Kitui by May 2017.

Short infomercials (less than 60seconds) designed to address the owners' and users' awareness and ultimately behavior change that will lead to an improvement of identified welfare issues from SEBWAT were aired throughout the day in local languages on three leading local radio stations in these counties (Kameme FM in Nakuru, Mayian FM in Kajiado and Musyi FM in Kitui).

Embracing the fact that radio needs a substantial amount of time to change behavior of people, the pilot was only expected to reveal 50% listeners recognize Animal Welfare messages and 50% listeners recognize Brooke EA by May 2017. Key learnings of the pilot are expected to advice on future program design and productions of radio so that it may have greater impact to improving the welfare of the donkeys. Projections on radio programming have been inserted in the MYPB plans FY 17/18.

Comparison Of *Salmonella* Serotypes And Antibiotic Resistance Patterns In Livestock In Korogocho And Viwandani, Kenya, With Those Of Human Fecal And Environmental Samples From The Same Area(ID#11)

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Background: Being a multi-host zoonotic pathogen, it is important to understand the epidemiology of *Salmonella Spp* in various hosts so as design effective control strategies.

Methodology: Livestock fecal samples from randomly selected livestock-keeping households and archived *Salmonella* species from human fecal and drinking water from Korogocho and Viwandani were taken through sero-grouping & typing and antibiotic sensitivity testing. Resistant isolates were further tested for resistance genes by PCR.

Results: *Salmonella* were isolated from 5 out 801 (0.62%) of the livestock sampled. Four of the five livestock isolates and the drinking water isolate were identified as *Salmonella* Typhimurium . Human isolates were serotyped as *S.* Typhi , *S.* Paratyphi *C, S.* Heidelberg , *S.* Newport and one in serogroup C_2-C_3 that couldn't be identified further.

All the livestock isolates were susceptible to the antibiotics tested in this study. The drinking water isolate however had multiple drug resistance to; ampicillin, amoxicillin/clavulanic acid, tetracycline, chloramphenicol, nalidixic acid and ciprofloxacin. Likewise, eighty percent (12/15) of the human isolates were resistant to at least two antibiotics.

Sixty percent (9/15) of the isolates were resistant to ampicillin and amoxicillin/clavulanic acid and were all positive for the bla_{TEM} (consensus) gene. Significant resistance was also observed towards kanamycin (53%), nalidixic acid (26.7%) and trimethoprim/sulphamethoxazole (26.7%). Integron class 1 genes identified were also identified from 3 out of 13 (23.1%) resistant isolates

Conclusions: *Salmonella* serotypes and antibiotic susceptibility patterns isolated from livestock, drinking water and humans were different. More studies are however required to understand how these different populations interact.

Key words: *Salmonella* serotypes, antimicrobial resistance, urban slums, Nairobi

Dioxin Induces Ahr-Dependent Robust DNA Demethylation Of The *Cyp1a1*promoter Via Tdg In The Mouse Liver(ID#15)

Hesbon Z. Amenya, Chiharu Tohyama and Seiichiroh Ohsako

The aryl hydrocarbon receptor (Ahr) is a highly conserved nuclear receptor that plays an important role in the manifestation of toxicity induced by polycyclic aromatic hydrocarbons. As a xenobiotic sensor, Ahr activates drug metabolizing enzymes involved in chemical biotransformation. The activated Ahr cooperates with co-activator complexes to induce epigenetic modifications at target genes. Thus, it is conceivable that 2,3,7,8tetrachlorodibenzo-*p*-dioxin (TCDD), a potent Ahr ligand, may elicit robust epigenetic changes *in vivo* at the Ahr target gene cytochrome P450 1a1 (*Cyp1a1*). A single dose of

TCDD administered to adult mice induced Ahr-dependent CpG hypomethylation, changes in histone modifications, and thymine DNA glycosylase (Tdg) recruitment at the *Cyp1a1* promoter in the liver within 24 hrs. These epigenetic changes persisted until 40 days post-TCDD treatment and there was *Cyp1a1* mRNA hyperinduction upon repeat administration of TCDD at this time-point. Our demethylation assay using siRNA knockdown and an *in vitro* methylated plasmid showed that Ahr, Tdg, and the ten-eleven translocation methyldioxygenases Tet2 and Tet3 are required for the TCDD-induced DNA demethylation. These results provide novel evidence of Ahr-driven active DNA demethylation and epigenetic memory. The epigenetic alterations influence response to subsequent chemical exposure and imply an adaptive mechanism to xenobiotic stress.

Key words: dioxin, *Cyp1a1*, active DNA demethylation, epigenetic memory

Antimicrobial Resistance In Zoonotic Campylobacter Isolated From Informal Settlements In Nairobi(ID#16)

Chepkwony Maurine Cherotich; Co-authors: Kang'ethe Erastus; Fevre Eric; Oluga Gabriel.

Surveillance of antimicrobial resistance in *Campylobacter* shows important levels of resistance globally. One cause of the high level of resistance is the use of these drugs in livestock treatment. Resistance prevalence data are an important starting-point for assessing the risk associated with antimicrobial resistance. This study aimed at investigating the antimicrobial resistance of zoonotic Campylobacter isolated from livestock in Korogocho and Viwandani informal settlements. The objectives were to investigate antimicrobial usage in the community, to identify phenotypic antimicrobial resistance and resistance genes present in the isolates. This was a cross sectional study with questionnaires to livestock keepers and livestock sampling and laboratory investigation of antimicrobial resistance in the confirmed zoonotic Campylobacter isolates.

Zoonotic *Campylobacter* are important pathogens in livestock in Korogocho and Viwandani informal settlements in Nairobi. The high resistance pattern to antimicrobials especially the first line of treatment of *Campylobacter* infections in humans (macrolides and quinolones) seen in the results of this study may be explained by lack of prudent usage of antimicrobial usage on livestock at farm level in the study area. Seventy percent of livestock were treated by owners compared to 5.1% treated by professional veterinarians. The trend seen in this study agrees with reports of rampant use of antimicrobials in livestock in Kenya. This situation is further emphasized by the 63.8% who buy the antibiotics from agro vets compared to only 2.7% of the households that get their livestock examined and medication prescribed by a veterinarian. This study recommends education of the public on zoonoses, antimicrobial resistance and prudent use of antimicrobials.

Key words: zoonotic Campylobacter, antimicrobials, prevalence, antimicrobial resistance.

Mitigative Effects Of *Moringa Oleifera* Against Liver Injury Induced By ArtesunateAmodiaquine Antimalarial Combination In *Wistar* Rats (ID#29)

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Artesunate-amodiaquine (AS-AQ) is a combination currently in use for malaria therapy. Its adverse effects include liver damage, neurotoxicity, agranulocytosis and haemolytic anemia. These effects have been shown to be due to free radicals generated by the drug. Plants with antioxidant effects may thus alleviate the adverse effects of AS-AQ. The objective of the current study was to evaluate the protective capacity of *Moringa oleifera (MO)* leaf extracts against liver degradation caused by high doses of ASAQ.
Leaves of *MO* were obtained from the Kibwezi farm, University of Nairobi and extracted with water (AQ) and aqueous-methanol combination (AQ-ME) (20:80 v/v). These extracts were then qualitatively screened for phyto-pharmacological compounds. Hydroxyl, hydrogen peroxide and iron (II) chelation *in vitro* assay models were used to determine the radical scavenging potential of the leaf extracts. Results of these assays informed the decision of which extract to be used in *vivo* studies involving rats. Acute oral toxicity of the selected extract was performed using the limit test dose of the up and down procedure and a safe dose selected for the hepatoprotective study. Physico-clinical changes, levels of aspartate amino transferase (AST), alanine amino transferase (ALT), total bilirubin (TB) and pathological examination of rat liver sections were used to evaluate the *in vivo* hepatoprotective effects of the selected leaf extract against AS-AQ intoxication.

The phytochemical screening indicated that alkaloids, cardiac glycosides, flavonoids, phenolics, saponins, tannins and ascorbic acid were present in both extracts. The *in vitro* radical scavenging potential of the AQ-ME extract was found to be superior to the AQ extract. The LD_{50} of the AQ-ME extract was found to be >2000mg/kg. A 1000mg/kg dose of this extract lowered AST significantly ($p<0.05$), to levels comparable to the standard hepatoprotectant, silymarin and phosphatidylcholine (Siliphos®). Serum ALT and TB were also lowered but this was not statistically significant $(p>0.05)$.

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The 1000mg/kg dose also reduced hepatocyte degeneration in rats treated with four times the clinical dose of AS-AQ. This study suggests that the hepatoprotective activity of the leaves of *MO* may have some relation to its radical scavenging properties. These leaves may thus be useful in mitigating free radical initiated disease conditions.

Keywords; *Moringa oleifera*, hepatoprotective capacity, artesunate-amodiaquine, liver

Efficacy Of Encapsulated 3, 4, 5 – Trihidroxybenzoic Acid (THB), Gallic Acid, In The Control Of Coccidiosis In Broilers(ID#34)

Dr Charles Gilfillan BSc(Agric) BVSc(Hons)

Coccidiosis is a devastating disease of poultry that costs the poultry industry billions of dollars annually. Coccidiosis is caused by the *Eimeria* protozoan parasite. The *Eimeria* parasite invades the intestinal cells resulting in necrosis of the intestine which leads to poor feed conversion, reduced growth and mortality in severe cases. Coccidiosis is currently controlled via the use of ionophore and chemical anticoccidial medications that are included in the feed. The emergence of drug resistant strains of coccidia has increased the need for the development of alternative control strategies. 3, 4, 5 – Trihidroxybenzoic Acid (THB), also known as gallic Acid, extracted from *Quercus infectoria* (Oak) gall nut powder has been shown to be effective in controlling coccidiosis in broilers. The anticoccidial efficacy of THB is enhanced via encapsulation within a lipid matrix, thus ensuring the sustained release of THB along the length of the intestine to target the various *Eimeria* parasites at their specific site of infection in the chicken's intestine. The efficacy of encapsulated THB to control coccidia in broilers has been shown via commercial trials on broiler farms in India. THB has also been shown to be compatible with drugs like iamulin. Data from the field trials on commercial broiler farms in India have also shown that supplementation with encapsulated THB has a positive effect on body weight and feed conversion ratio in broilers.
Key words: Coccidiosis, broilers, *Eimeria*, drug resistance, natural anticoccdial alternative, encapsulated, 3, 4, 5 – Trihidroxybenzoic Acid (THB), Gallic Acid, sustained release, compatibility.

***In-Vivo* Anthelmintic Activity Of The Ethanol Extract Of *Allium Cepa* (Onion) Against Mixed Gastro Intestinal Helminth Infestations In Dogs(ID#56)**

Orengo Ken

Background: Prevalence of animal diseases is one of the major livestock production constraints in Kenya with high impacts on livelihoods due to related economic losses affecting food security in the country. The use of synthetic drugs for disease management has challenges; this makes the use of medicinal plants for treatment a rational alternative. Helminths of zoonotic importance in dogs in Kenya include *Toxocara canis*, *Ancylostoma caninum* and *Dipylidium caninum* which are commonly found in intestines of dogs and can cause infestation in human beings.
Objective: This study was designed to evaluate the *in-vivo* efficacy of ethanol extracts from bulbs of *A. cepa* against common gastrointestinal helminths of dogs.
Materials and methods: Fifteen puppies of mixed sexes, aged between 8 and 10 weeks, with an average weight of 2.2kg were divided into three groups of 5 animals each; Group 1 was treated with the extract (how much of the extract was given, and how was the dosage level chosen?), group 2 was given the recommended dose of a commercial anthelmintic while group 3 was given distilled water (was the extract dissolved in distilled water?), all as single treatments. Fecal samples were obtained from each puppy a day before treatment (day 0) and on days 1, 3, 5, 7, 10 and 14 post treatment for determination

of eggs per gram (EPG). Anthelmintic efficacy was determined by calculating the percentage fecal egg count reduction (%FECR) using the pretreatment and post treatment EPG counts. Whole blood was collected from each puppy on days 0, 7 and 14 to determine changes in the hematological parameters. Two puppies from each group were then randomly selected and sacrificed for postmortem examination and for collection of intestinal contents for parasitological. Results: There was a percentage fecal egg count reduction of 47% for hookworms and a negligible reduction for scared worms (at what timepoint(s)? This may be important in understanding the efficacy of the extract). There was a significant drop in WBC (P=0.035) 7 days after treatment and a significant increase in RBC (P=0.04) and HGB (P=0.001) 14 days after treatment. The changes in hematological parameters when compared between the treatment and control groups were significant (P<0.05) 7 days after treatment for WBC, RBC, HGB and HCT, and 14 days after treatment for MCHC. Revise this paragraph for clarity. In the former sentence, fewer hematological parameters are mentioned (together with their pvalues) than in the latter sentence. Please indicate all values and their trends. There were no signs of toxicity or behavioral changes after oral administration of the *A. cepa* ethanol extract (what about the significant hematological changes? *A. cepa* is known to be hematotoxic to dogs and some of these changes may have arisen from this toxicity) at 6mg/kg please state this dose and rationale in the materials and methods section above. Conclusions: The 47% efficacy against hookworms observed in treated puppies was due to the anthelmintic properties of the crude ethanol extract of *A. cepa*. This is supported by the hematological changes that occurred as a result of administration of the extract. But the hematological changes could as well have been compensatory in response to *A. cepa*-induced hematotoxicity…
Key words: Allium cepa, anthelmintic activity, gastrointestinal helminths.

Reproductive Performances Of Dairy Cows In Smallholder Production System In Meru(ID#12)

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A cross sectional study was conducted to observe the factors affecting the productive performance of dairy cattle from eastern rural areas of Kenya. Two hundred (200) farms from Naari dairy society in Meru were randomly selected and visited. Structured questionnaires through interviews were used for data collection and animals received a physical examination during the farm visit. A mixed model with random effects for farm was fit to express the coefficients with 95% confidence intervals to determine associations between average daily milk yield and the relevant explanatory variables.
The majority of farmers (87%) kept between 1 to 4 cows (mean = 1.4). The most and least common breed of cow was Holstein-crosses, producing an average of 6.8 kg/day and the Zebu producing 5.0 kg/day respectively. Cows younger than three years produced significantly more milk than cows in all other age groups. There was a significant difference for milk averages in animals that were fed daily meal in the last month of gestation from those that were not fed any. Cows that had a previous history of mastitis also produced significantly (p – value?) more milk on average than those that had no such history, though the association was weak. There was also high within-farm variability.
We conclude that, even though small holder daily dairy? farmers in Kenya have made attempts in improving the genotypes of their animals, the milk production is still below average of their genetic potential. Better feeding practices and avoiding inbreeding were the major challenges, and advice on these challenges would lead to better yields.

Management Factors Associated With Weight Gain In Dairy Calves/Heifers On Small Holder Dairy Farms In Kenya(ID#13)

Makau Denis

Common challenges in smallholder dairy farms are associated with inadequate feeding, water availability, inadequate knowledge and technology on feed conservation and nutritional management of dairy animals. This study was carried out to determine the management factors associated with weight gain in dairy calves and heifers in smallholder dairy farms (SDF) in Meru County, Kenya.

A total of 321 calves and heifers (a census) were sampled from 200 randomly selected farms from the 500 farms selling milk to the Naari Dairy Cooperative Society in Naari sub-location in Buuri constituency. Physical exams, pregnancy checks and heart girth measurements were done on the animals. Farmers were also interviewed between May and August 2015 to answer management questions. Descriptive statistical analysis and mixed model regression was done using STATA 13.1 for identification of significant factors ($P<0.05$) associated with daily weight gains.

The observed average age of animals in this study was 12.5 ± 9.5 months. ADG of calves and heifers in SDF in Naari was 443 ±375 g day^{-1}. In the final linear mixed model, gender of principal farmers (coefficient 0.07 male and 0.02 female), higher education level of both the woman and man farmers (coefficient 0.06 and 0.09 respectively), improved floor type for calf pens (coefficient -0.086), and supplementing forages given to calves/heifers with hay were significantly associated with increased average daily weight gain (coefficient -0.053). There was a positive correlation between ADG and primary land size ($p= 0.186$). There were significant interactions observed: disease and breed $p<0.0005$, disease and calf pen floor p=
0.016 and the man and woman's level of education ($p<0.0005$).
General performance of animals in these farms was lower than benchmarked standards recommended for optimum dairy production (750-900g per day) but within normal range for the region. It was recommended that basic diets be supplemented with hay, and housing for calves to have wooden or concrete floors for better performance of calves and heifers.

Key words: smallholder dairy farms, calves, heifers, average daily weight gain, Kenya Sperm

Characteristics And Testicular Pathology Of Wistar Strain Albino Rats Fed Graded Levels Of Pigeon Pea (*Cajanus Cajan)*Diet(ID#19)

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Effects of feeding graded levels of pigeon pea seed diets on the sperm characteristics and testes of wistar strain albino rats was investigated. Thirty male Wistar rats weighing between 100g and

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120gwereassigned into six groups (A-F) of 5 rats each. Group A was fed 10% pigeon pea, group B: .20% pigeon pea, Group C: 30% pigeon pea, Group D: 40% pigeon pea, Group E: 100% pigeon pea, while Group F rats served as the control being fed with commercial rat concentrates feed. All the rats were given 30g of feeds per day for 14 days with water *ad libitum*.
The motility scores were between 32.00±3.74 and 87.00±3.00 with the control group F having the highest score ($P<0.05$). Group D rats (treated 40% pigeon pea) had a significantly higher ($P<0.05$) values (76.00±6.96) than groups A, B, C, and E of which mean percentage motility ranges between 34.00±7.48 and 32.00±3.74.Group E treated 100% pigeon pea had the lowest mean percentage motility of 32.00±3.74. This value was significantly lower than the mean values of groups D and F rats. This same trend was observed for the sperm percentage liveability and sperm count across the groups there were no lesions observed in the histology of the testis of all the animals in the various groups (A to F).
It was concluded in this study that feeding of pigeon pea to rats at 10%, 20%, 30% and 100% is spermatotoxic having severe negative effects on their sperm motility, liveability and sperm count. Although it induced no testicular pathology and its 40% inclusion level in rat feeds is relatively safe, it must be incorporated with caution into animal feeds, especially the male animals to be used for breeding.

Key words: Pigeon pea, Wistar rats, Testes, Semen

Social Factors And Diseases Influencing Quail Production In Nyeri County, Kenya(ID#30)

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Quail farming is important because it contributes to food security, employment and income of farmers. There is limited information on constraints influencing Quail farming in Kenya although diseases cause decreased production and economic losses. Despite introduction of Quail farming in Nyeri County the production is still low. The objective of the study was to assess social factors and diseases influencing quail farming. A descriptive survey was used and a sample size of 169 quail farmers was selected randomly from five wards. Data was collected from respondents using questionnaires and interview schedules and analyzed using Statistical Package for the Social Sciences. The results show that 57.9 % of quail farmers were middle aged males who had practiced quail farming for less than 12 months. Majority (97%) of quail farmers used chicken feeds and 62.8% of the farmers did not use feed supplements. Most (89.6%) of the quail farmers kept quails for income generation purposes The common diseases affecting Quails were coccidiosis, enteritis, bronchitis, conjunctivitis and helminthiases It was concluded that in order to promote the development of quail farming, there is a need to factor in women when formulating government policies. and specifically formulate feeds for quails. Despite the quail farmers being aware of the nutritive value of quails eggs, there is low consumption of quail eggs due to traditional belief that quails are pets for children .Information on nutritive value of quails should be provided in order to enhance local consumption of quail's eggs. The findings of the study will be useful to the farmers, and other stakeholders,

Key words: social factors, diseases, quails

Prevalence And Risk Factors Associated With Parasitic Infections Of Farmed Fish In Central Kenya(ID#66)

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A study to determine the prevalence and risk factors associated with parasitic infections in farmed fish was undertaken in Kiambu and Kirinyaga counties in central Kenya between October 2016 and March 2017. Questionnaires, complimented with direct observations were administered to fish farmers to assess management practices and types of fish predators encountered. A total of 526 live fish comprising of 440 tilapia (83.7%) and 76(14.4%) catfish were purchased from fish farmers in the study areas. Of these 396(75.3%) were from earthen ponds, 120 (24%) from liner ponds and 10 (1.9%) from concrete ponds. Eyes, skins, gills, muscles, stomachs and intestines of the fish were examined for parasites using dissecting and compound microscopes.

Monogenean flukes, *Dactylogyrus* spp. (3.1%) in the gills, and *Gyrodactylus* spp. (1.1%) in the gills and skin, and digenean flukes, *Clinostomum*spp. (3.6%) in the muscles and *Diplostomum*spp. (12.2%) in the eyes, were among the parasites observed. Others were the larval stages (L_3) of the round worm *Contracaecum* spp. (2.1%) in the abdominal cavity and
Acanthocephal spp. (0.1%) in the small intestines. Fish from earthen ponds (26.5%) had significantly higher infection with flukes ($p < 0.05$) than those from liner ponds (0.0%) with *Diplostomum* spp. being the most common (16.1%). Increased presence of snails was accompanied by a higher prevalence of digenean fluke infections in earthen ponds. *Clinostomum* spp. was isolated from tilapia only while, *Contracaecum* spp. was isolated from catfish only. *Dactylogyrus* and *Gyrodactylus* spp. were found in both catfish and tilapia.

Presence of predatory birds (herons, egrets, hammerkop, cormorants, kingfisher and ibis), snails and overgrown vegetation were observed in many of the farms visited. These, together with use of earthen ponds can influence the occurrence of parasites in fish. Control of parasitic infections by drainage of water, pond treatment after harvesting, control of snails (i.e., by clearing of vegetation in and around the ponds) and predatory birds, improved awareness of fish diseases, diagnosis and treatment by stakeholders is recommended. Further studies should be undertaken to determine the economic and zoonotic importance of the fish parasites recorded in central Kenya.

Key Words: *Contracaecum*, *Dactylogyrus*, *Diplostomum*, Fish parasites, Zoonosis

The Impact Of Climate Change On Small Ruminant Farming In Nigeria-Mitigation Plans For Sustainability(ID#31)

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The semi intensive management system which is the most common system practiced by small ruminant farmers in Nigeria is forage-based, relying on rainfall for the maintenance of pastures for feed. Availability of feed is paramount to a sustainable livestock production. Maintaining feeds and feeding amongst other climate change mitigation plans will be of benefit to the rural poor and particularly women and children who depend on these animals as their main source of livelihood and poverty alleviation. There have been seasonal variations on the availability, quantity and quality of the pasture which is strongly dependant on rainfall and with a direct proportional influence on the performance of animals. The variation in climate over time with associated increase in temperatures, decrease rainfall reliability and increase in severity of extreme climate events with resultant effect on pasture will further impede the performance of small ruminant. This paper exposes a negative impact of climate change on

the current and most practiced system of small ruminant production in Nigeria. Therefore the need for a call of an immediate action plan on the mitigation strategies of the highlighted impact and a climate smart approach for the rural poor using Nigeria as a case study. Climate change cannot be halted, and a poor nutrition leads to poor health and production of a viable socioeconomic animal.

Keywords- Climate change, Forage, Mitigation, Nigeria, Small-ruminants

Effect Of Vaxxitek Hvt+Ibd Vaccine On The Size Of The Bursa Of Fabricious In Broiler Birds(ID#23)

Mandieka JM; BVM, MSc and Cilliers, J; DVM,PhD

In a vaccine trial carried out in broiler birds, 150,000 day old chicks were vaccinated using Vaxxitek HVT+IBD (please define abbreviations at first appearance in text)vaccine while the control group was vaccinated using an antigen+antibody complex vaccine after which live weight gain for each group was measured at day 21 and at slaughter day 33/34 of age. Also the weights of the Bursas of Fabricious were recorded at slaughter. The birds that were vaccinated using Vaxxitek HVT+IBD vaccine as well as their respective Bursas were found to be heavier than those vaccinated using the control vaccine.

The trial concluded that the use of Vaxxitek HVT+IBD vaccine in broilers at day old result in birds with significantly heavier bursas as opposed to those vaccinated using the control vaccine. Vaxxitek HVT+IBD vaccine therefore contributes to the production of much heavier birds at slaughter which in turn translates into better return of investments (was this weight increase due to the bursa? If so, what is the actual weight difference between the vaccinated and control groups? This is because the bursa is usually 10% of the total bodyweight of the birds and its increase in weight, even two fold, can result in minimal change in total bodyweight).

Vaxxitek HVT+IBD is a live vector vaccine, with Turkey Herpes virus (HVT) as a carrier, allowing expression of viral protein-2 (VP2) of the IBD virus. HVT induces immunity against Mareks Disease, while VP2 is the main immunogenic component common to all known IBD strains.
Infectious Bursal disease (IBD) and Mareks's (MD) are viral diseases affecting poultry worldwide and both cause significant damage to the chicken's immune system causing immunosuppression, poor carcass quality, higher production cost, poor performance and death.

Seroprevalence Of Porcine Cysticercosis And Associated Risk Factors In Pigs Slaughtered In Abattoirs In Thika, Kiambu County, Kenya (ID#28)

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Taenia solium is an important food-borne pathogen worldwide and is emerging as a serious public health risk in both rural and urban communities where pigs are raised and consumed. Adult tapeworms are found in the intestines of humans while the developmental larval forms occur in the muscles and organs constituting cysticercosis of pigs and humans. Neurocysticercosis represents the most severe form of this disease and has been reported to be a major cause of late stage acquired epilepsy. Cysticercosis has a worldwide distribution, mainly related to poor hygiene and sanitation and consumption of infected pork. Humans acquire an intestinal tapeworm by eating raw or undercooked meat infected with cysticerci or water contaminated with faeces containing eggs. Pigs get infected through consumption of food and contaminated with human faeces containing eggs. In recent years pork consumption has increased with the opening up of pork eating centers. Pig cysticercosis has previously been reported in Kenya, however, there is scarce data on the occurrence of the disease, as well as on the risk factors for Transmission, in key production and consumption areas including Thika. Objectives of this study were 1) to determine the seroprevalence of porcine cysticercosis 2) to evaluate the efficiency of current meat inspection procedures and 3) to determine associated risk factors for occurrence of the disease in pigs. Pigs slaughtered in selected abattoirs in Thika were included in the study. A systematic random approach was used to select a total of 300 pigs. The source of the slaughter pigs was derived from the movement permits, the breed, sex and estimation of age was done at ante mortem examination. The slaughter and meat inspection processes were carried out by the slaughter house personnel and the investigators only observed and received the outcome of the inspection. Blood samples were collected from each identified pig at slaughter, processed and analyzed using purified *Taenia solium* antigen ELISA commercial kit. The results showed that none of the pigs in this study had any visible cysts but 2.72% the pigs were seropositive with optical density values greater than 1.000. This result is significant in that the traditional inspection procedures were not able to detect any cysts while there was evidence of viable cysts as per the ELISA test which could pose public health risk. Key Words: Porcine cysticercosis, Antigen ELISA, Serolo-prevalence, Pig abattoir surveys

Prevalence Of Conditions Causing Lameness In Sheep And The Associated Risk Factors In Kajiado County, Kenya(ID#33)

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A cross-sectional study was carried out in 10 farms, involving 1,916 sheep under free-range grazing system in Kajiado County, Kenya, with the objectives of determining: the prevalence of conditions causing lameness; and the associated risk factors predisposing the sheep to lameness. The 10 farms were purposively selected from three sub-counties of Kajiado County. All 1,916 sheep were subjected to general locomotion scoring and 117 of them were diagnosed lame. These were further examined closely for specific causes of lameness. Data on the causes of lameness, location of lesions, affected limbs and affected claws were recorded and the lesions photographed. Data on animal-level and farmlevel risk factors for lameness were collected either by use of questionnaires and interviews or direct observations made by the investigator.

Overall prevalence of lameness among the 1,916 sheep was 6.1% (n=117). The prevalence of individual conditions causing lameness was: 3.8% (n=72) for sole erosion , 3.2% (n=61) for overgrown claws and 1.6% (n=30) for tick-bite dermatitis . Other conditions causing lameness such as cracked hooves, interdigital dermatitis, shelly hoof, foot rot and trauma had less than 1% prevalence, each. Of the 117 lame sheep, lameness in94% (n=110) was from foot conditions, 6% (n=7) from proximal limb

conditions, 43.6% (n=51) from hind limb conditions, 23.1% (n=27) from forelimb conditions and 33.3% (n=39) from both hind and fore limb conditions, simultaneously. The animal-level factors significantly associated with higher locomotion scores were the number of limbs with lesions (χ^2 =11.15, p = 0.004), the specific affected limbs - whether fore or hind (χ^2 = 9.20, p = 0.010), the specific affected claw - whether medial or lateral (χ^2 = 16.98, p = 0.05) and the type of lesion (χ^2 = 4.71, p = 0.030). The farmlevel factor significantly associated with higher locomotion scores was presence of traumatic objects in the grazing grounds (χ^2 = 11.01, p < 0.001). It was concluded that the prevalence of lameness in sheep under free-range grazing system in the semi-arid Kajiado County was low due to minimal farm-level risk factors. Similar studies in high potential wet areas of Kenya would be pertinent for purposes of comparison.

Key Words: Sheep, foot conditions, locomotion scores, risk factors, free-range.

Clinico-Haematological Features Of Bovine Dermatophilosis In Indigenous Breeds Of Cattle In Ibadan, Nigeria(ID#35)

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Bovine dermatophilosis is one of the most important skin diseases of cattle in Nigeria, with no specific treatment and low efficacy of treatment with high level of reoccurrence. This study evaluated the clinical and hematological profiles in generalized bovine dermatophilosis. Fifty dermatophilosis-infected cattle in Akinyele International cattle market and Bodija Abattoir locations were studied clinically and their blood samples taken for hematological analysis. Ages of sampled cattle were estimated using dentition technique. Hematological parameters such as PCV, Hb, RBC, WBC, MCV, MCH, MCHC, Lymphocyte and
Neutrophils were evaluated using standard laboratory procedures .The level of severity of the skin condition was classified based on body condition scoring system. The hematological profiles for different breeds, sexes, ages and level of severity among the indigenous cattle, were subjected to a Oneway Analysis of Variance (ANOVA) with no level of significance established at p < 0.05. White Fulani had the highest cases of dematophilosis (66%). Cows (86%) were more infected than bulls. Cattle within age range of 2-2½years (38%) showed clinical signs of dermatophilosis more than other age groups. The hematological values were highest and best in mild infection compared to severe dermatophilosis infection in all the breeds sampled. Cattle within age range of 3-3½years had the highest values of hematological parameters. Sokoto Gudali breed appeared to have the highest values for most hematological parameters, while Kuri breed had the least values. Infected cows appeared to have the best hematological profile.
Therefore, there is variation in susceptibility to dermatophilosis among different breeds, age groups and sexes of Nigerian cattle. The haematologyin dermatophilosis is found to vary with age, sex, severity of infection and breed of cattle.
Keywords: Clinical, Hematological profile, Bovine, dermatophilosis.

Molecular Epidemiology Of Trypanosomes Among Selected Wildlife Populations In Kenya(ID#70)

The African trypanosomes comprise of a group of important pathogens affecting human, livestock and wildlife populations. Livestock trypanosomes have caused huge economic losses in Kenya in the past. Confirmed reports have indicated that wildlife populations are susceptible to trypanosomes, although it is not clear which species are circulating in different geographical regions in Kenya. This study therefore

aimed at determining the molecular epidemiology and genetic characterization of trypanosomes circulating among the highly endangered black rhino *Diceros bicornis* and the white rhino (*Ceratotheriu simum),* and buffaloes (*Syncerus caffer)* captured from Meru, Maasai Mara, Solio, Mugie and Tsavo ecosystems in Kenya. The study utilized molecular tools, where DNA was extracted and an ITS genus specific PCR done followed by a species specific for *T. vivax, T. Congolense, and T. brucei.*

In this survey a total of 120 animals were sampled in which 52% black rhino, 6% white rhino and 15% buffalo were found to be infected by a one, two or three species of trypanosomes. The results emphasize that rhinos and buffaloes harbor a great burden of trypanosomes in tropical ecosystems. The black rhinos have high infection rates of 6%, *T. simiae* Tsavo, 10% *T.congolense*, 10% *Trypanozoon*, 9 % *T. simiae* and 7% *T. vivax*. The Buffaloes in Maasai Mara have *Trypanozoon* only while their counterparts in Meru harbor *Trypanozoon, T. vivax, T. congolense* Savannah, *T. simiae* Tsavo and *T. godfreyi.*The results from these investigations will give useful impetus about the prevalence and distribution of the African trypanosomes amongst the selected populations.

Efficacy Of TSOL18 Vaccine In The Control Of Porcine Cysticercosis In Busia county, Kenya(ID#26)

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were distributed to 60 voluntary farmers and exposed to natural infection with *T.solium*. An efficacy validation protocol involved two vaccination regimes with TSOL18 and oxfendazole (Group I; *n*=60) and oxfendazole treatment only (Group II; *n*=60) at an interval of 6 months. Treatment was carried out to 12 months of age. A control group (III; *n*=60) was administered with a placebo (n=59). The vaccine dose was 200 µg and oxfendazole at 30 mg/Kg. The farmers managed the pigs and kept written records of all activities until the day of necropsy at six months post second vaccination. The TSOL8 vaccine offered 100% protection against *T. solium.* Fourteen pigs, positive for *T. solium* on lingual examination and one negative control were necropsied for total cyst examination. Of these pigs, one from Group I had a degenerated cyst while 2 from Group III had viable cysts. One pig that tested positive on Ag ELISA after first vaccination was negative for cysts at necropsy while all the three that had cysts were negative on Ag ELISA. The lingual examination and Ag ELISA test still remained unreliable as demonstrated by necropsy examination. Cysts of *T. hydatigena* were not found in all carcasses

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A field evaluation of the efficacy of TSOL18 vaccine for the control of *Taenia solium* in Kenya was conducted in Busia County for validation. One hundred and seventy nine naïve pigs' aged1-3 months

examined. From this study it was concluded that the TSOL18 vaccine is an efficacious easy method for control of *T. solium* and that *T. hydatigena* is not present in pigs.
Keywords: efficacy of TSOL18 vaccine, *Taenia solium*, field trials, pig production, Kenya

Molecular Amplification of ITS-2 and ETS Regions of *Haemonchus placei* in Some Breeds of Nigerian Cattle(ID#37)

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Haemonchosis caused by *Haemonchus placei* is responsible for huge losses of cattle in SubSaharan Africa. Molecular techniques have proven to be useful for examining the taxonomic status of the parasite, especially where morphological characters are unreliable. Also, the microscopic identification of larval stage 3 (L3) in fecal cultures is not only time-consuming but also requires experienced microscopists. In this paper, we describe the molecular amplification of the internal transcribed spacer 2 (ITS-2) and external transcribed spacer (ETS) regions of the rDNA of adult *H. placei* worm samples by polymerase chain reaction (PCR) using species specific primers [5′-ACG TCT GGT TCA GGG TTG TT-3′ and 5′-TTA GTT TCT TTT CCT CCG CT-3′] (5′-ACC ACA GGG ATA ACT GGC TTG TGGC-3′ and 5′-AGC TCC AGA ATT ACC GCA GTT-3′) respectively. Adult *H placei* worm samples were obtained from the aromas of fifteen bulls and twenty cows of White Fulani (15), Sokoto Gudali (9), Red Bororo (4), Kuri (2), cross between White Fulani and Sokoto Gudali (4), and a cross between White Fulani and Red Bororo breeds, at an International cattle market in Ibadan, Nigeria. The occurrence of haemonchosis in Nigerian cattle varies with breeds with no sex predisposition. All the samples were positive for the presence of the parasite rl DNA in all the breeds of cattle yielding 320bp and 400bp bands for the two spacer regions.. Therefore, *H placei* is a distinct species of bovine worms and the PCR assay may be used as a rapid confirmatory diagnostic tool in cases of bovine haemonchosis. Key words: Cattle, *Haemonchus placei*, Polymerase chain reaction.

Assisted Reproductive Technologies for Decision Support in Reproductive Management of Dairy Cattle in Kenya: What are the Prospects?(ID#50) Nakami W.N*and Tsuma V.T.

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The human population is expected to double in Africa by 2030, and with it a consequent rise in demand for livestock products. Utilization of assisted reproductive technologies (ARTs) enables rapid availability of animals with the desired traits and may provide a faster method of increasing farm productivity. Despite the impact ARTs have had on livestock productivity in the developed countries, uptake of the technologies has been low in Africa, yet this is where there is dire need for livestock products.

This study evaluates and describes the knowledge, attitude and practices of dairy cattle sector stakeholders on use of assisted reproductive technologies in decision support for reproductive management of dairy cattle in Kenya. The study subjects interviewed through questionnaires were dairy farmers and animal health practitioners from all parts of Kenya. The questionnaires had questions related to demographic characteristics of the respondents, knowledge, attitude and practices in relation to the reproductive management aspects and use of assisted reproductive technologies in reproductive management in dairy farms.

The dairy industry stakeholders were adequately knowledgeable on technologies such as artificial insemination. In contrast, there a limited knowledge in some of the technologies such as progesterone detection kits, use of hormones and embryo transfer. Overall, a larger proportion of respondents indicated that the assisted reproductive technologies would be important in reproductive management and they would use them. The relatively low levels of awareness, higher levels of education and a willingness to use the assisted reproductive technologies in reproductive management of dairy cattle strengthens the logic of improving productivity through application of these technologies.

Key words: Dairy cattle, assisted reproductive technologies, knowledge, attitude, practices

Treatment And Control Of Theileria Infection In Cattle In Africa(ID#72)

Cloete J

The presentation takes a look at the commercial use of buparvaquone in the treatment of *Theileria* infection in cattle in Africa.
Referring to therapy of clinical cases of theileriosis, buparvaquone in laboratory studies; cattle studies with infected animals; the safety factor of Butalex and the value add to cattle owners.

POSTER PRESENTATIONS ABSTRACTS

Coast To Hinterland: Sero-Positivity And Epidemiology Of Human Brucellosis In Tana River, Mandera And Makueni Counties-Kenya, 2012-2015(ID#P1)

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Background: Brucellosis is a zoonotic disease that causes debilitating health condition in humans. Its epidemiology in Kenya is not well characterized. We characterized the epidemiology and seropositivity of human brucellosis in Tana River, Mandera and Makueni counties.

Methods: We retrospectively reviewed all laboratory-confirmed human brucellosis cases at sub-county hospitals in three counties (Tana River, Mandera and Makueni counties) in 2012– 2015. We used World Health Organization (WHO) suspect and probable case definitions for inclusion of patients. Diagnosis of brucellosis was done using serum tube agglutination test (SAT) to classify patients as positive or negative. We abstracted information on demographic characteristics and test results. We analyzed data using Microsoft Excel and Epi-Info. We calculated descriptive statistics for categorical and continuous variables and we calculated odds ratio (OR), 95% confidence interval (CI) and chi square (χ^2) to compare seropositivity with demographic characteristics. P-value ≤ 0.05 was considered statistically significant.
Results: A total of 1806 records were analyzed with an overall sero-positivity of 48% (860/1806). Among the positives, seropositivity in Mandera was 76% (656/905); 17% (144/424) in Makueni and 7% (60/477) in Tana River. This difference in sero-positivity among facilities in the three counties was statistically significant (χ^2= 483; p-value< 0.001). Females accounted for 68%

(588/1163) of positive cases and in males it was 32% (272/860); (OR= 1.40; CI: 1.15-1.70). Age-group <15 years accounted for 10% (83/818) positive cases; 23% (186/818) in 15-24 years; 39% (316/818) in 25-44 years and 28% (233/818) in>44 years; (χ^2= 12; p-value=0.008).

Conclusion: This study highlights differences in sero-positivity of brucellosis in various regions differing by age-group and sex. This could be due to different socio-cultural practices which may impact on any prevention and control measures. Enhanced public health education and targeted interventions with one health approach by relevant government bodies is highly recommended for effective prevention and control of brucellosis. Key words: Brucellosis, Sero-positivity, Epidemiology.

Treatment Of Foot Injury In A Captive Asian Elephant (Elephus Maximus)(ID#P2)

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A female Asian Elephant aged 46 years, exhibited limping. Closer examination revealed redness, injury and pain on palpation of the left foot. Two days later, the sole was affected and similar lesions appeared on the right leg. The elephant was normally confined in an enclosure and not allowed excessive walks in the open. . Swabs for aerobic and anaerobic bacterial culture and antibiotic sensitivity test were taken from lesions on both feet.

Intramuscular injection with antibiotic and analgesic was administered for 5 days. Oral vitamin supplementation was given with food daily. The feet were thoroughly washed with potassium permanganate solution and betadine solution applied . Calendula ointment was also applied to enhance healing. Dressing powder made from a mixture of Turmeric, Boric acid, Zinc sulphate, Sulphur and Metronidazole powders was applied daily after cleaning the foot. Decameli oil prepared from plant resin dicameli, garlic, camphor and neem oil was applied on the foot to prevent infection. The elephant was confined from excessive walking and in a dry environment with hay and rice straw for treading on. Weight-bearing was observed after a week of treatment.

Foot problems are commonly encountered in captive elephants and it can be concluded that the probable cause for foot injury is excessive wetness on the feet exacerbated by monsoon season. Dry environment should therefore be provided to reduce the probability of foot lesions.

Influence Of Some Fish Farmer Management Practices On The Prevalence Of Farmed Tilapia And Catfish Parasites In Nyeri County, Kenya (ID#P3)

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The objective of the study was to asses the influence of some fish farmer management practices on the prevalence of fish parasites in farmed tilapia and catfish in Nyeri County, Kenya.
A questionnaire was administered on 117 fish farmers to asses' fish pond types, fish species kept, fish culture practices, fish pond water sources as well as fish pond drainage and treatment after harvesting. Most farmers used earthen ponds (63/117; 53.8%) where most (73/117; 62.4%) practiced tilapia fish monoculture. Most farmers (74/117; 63.2%) sourced water for their fish ponds from rivers and most of them (90/117; 76.9%) did not drain their ponds after harvesting.

A total of 366 live fish comprising of 89 (24.3%) catfish and 277 (75.7%) tilapia were purchased from 15 fish farmers between August 2014 and November 2015. One hundred and fifty eight (43.2%) fish were from liner ponds while (56.8%) were from earthen ponds. Eyes, skins, gills, muscles, stomachs and intestines of the fish were examined for parasites using dissecting and compound microscopes. Of the 366 fish sampled, 115 were infected with one species of ecto- or -endoparasite in the gills, skin, muscle, eye or gastro-intestinal tract, an overall prevalence rate of 31.4%. Parasitic infection rate was significantly higher ($p < 0.05$) in tilapia (67.8%) relative to catfish (32.2%) and there was no significant difference ($p > 0.05$) in overall fish parasite infestation rates between earthen (52.2%) and liner (48.8%) ponds.
Nearly 15% (57/366) of fish examined had the gill monogenean flukes (*Dactylogyrus spp.*), 8.2% had the digenean fluke, *Clinostomum* spp. in the muscles, 2.7% had leeches on the gills and 1.9% had *Diplostomum* spp. in the eyes. Other parasites identified were *Trichodina* spp. (1.4%), *Acanthocephala* spp. (0.8%), *Contracaecum* spp. (0.5%), *Gyrodactylid spp.* 0.5% and *Paracamallanus* spp. (0.5%), respectively.
The prevalence of liner pond parasitic infection was relatively similar between catfish (56.4%; 31/55) and tilapia (43.6%; 24/55). However, in earthen ponds, there were significant differences ($p<0.05$) between catfish (10%; 6/60) and tilapia (90%; 54/60).
This study reports that fish farmer management practices influence prevalence of parasites in farmed fish. It also reports the occurrence of monogenean and digenean flukes, the protozoa Trichodina *spp*., Leeches, nematodes and an *Acanthocephalan* spp. in farmed fish in Nyeri County. These parasites may affect the health and quality leading to condemnation at inspection and death of fish in extreme cases.

Key Words: Acanthocephalan, condemnation, fish parasites, flukes, infestation, leeches, nematodes, protozoa, sub counties

PARTNERS

Faculty Of Veterinary Medicine- University Of Nairobi

The Faculty of Veterinary Medicine is one of the constituents of the College of Agriculture and

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The faculty is comprised of five (5) teaching departments namely; Department of Veterinary Anatomy and Physiology, Deptartment of Veterinary Pathology, Microbiology and Parasitology,

Department of Animal Production, Department of Public Health, Pharmacology & Toxicology and Department of Clinical Studies. The faculty has a large Veterinary Farm which is used for teaching good farming practices.

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In addition to training in the various programmes staff andstudents participate in outreach and community services in conjuction with the various stakeholders. Staff and students in the faculty are also involved in consultancies and research projects on issues involving animal resource industries and its interaction with human and environment health under the one health concept for sustainable development.

The Faculty of Veterinary Medicine appreciates the contribution of other partners in the hosting of this joint International conference.

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In Kenya, there are over 1.8 million donkeys, two-thirds of which play a major role in Kenya's economy especially in rural poverty reduction through transport and tillage.

The Brooke has been funding animal welfare programs in Kenya since 2001 through partnership with KENDAT in Embu; VSF-B in Garissa; Farming Systems Kenya in Nakuru; Animal Welfare and Public Health in Kisumu and Homabay; Kenya Veterinary Association in Kajiado; Vetworks in Narok and CARITAS in Kitui and Tharaka-Nithi. , the Brooke is currently reaching approximately 219,000 donkeys,

In 2013, the Brooke established its East Africa regional office in Nairobi for closer management, development and further expansion, Contacts: The Brooke – East Africa, 5th Floor, Taj Towers, Upper Hill. P.O. Box 43220 – 00100, Nairobi, Kenya. Mobile: +254 700 307 709. www.thebrooke.org.

DONKEY SANCTUARY

The Donkey Sanctuary was founded in 1969 by Dr Elisabeth Svendsen MBE. It is only through her amazing devotion to donkeys and hard work that the Sanctuary grew to the international charity it is today.

Our Mission is to transform the quality of life for donkeys, mules and people worldwide through greater understanding, collaboration and support, and by promoting lasting, mutually life-enhancing relationships. We hope to see a world where donkeys and mules live free from suffering, and their contribution to humanity is fully valued.

During the last 25 years, The Donkey Sanctuary Kenya has made profound difference to the lives of donkeys and people all over the country. This is down to the drive and beliefs of our wonderful Founder, our staff, volunteers, and of course our fantastic supporters and partners worldwide, however there is still much to do to improve the health and welfare of donkeys in Kenya. To this end we are going to provide technical support, participatory training and educational programs geared towards enhancing ability of the communities to address and manage their own donkey welfare challenges using the local resources they have. Contacts:
The Donkey Sanctuary Kenya, P.O. Box 24203 – 00502, Nairobi, Kenya. Tel: + 254 (020) 2679265

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IFAW's mission is to rescue and protect animals around the world.

We rescue individuals, safeguard populations, and preserve habitat.

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Guiding ideas

Our vision: Our vision is a world where animals are respected and protected.

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- Conservation decisions should be guided by ecological sustainability and biological sustainability, the precautionary principle within an ethical framework for animals.

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Box 40596 – 00100 Nairobi, Kenya. Tel: +254 (20) 420 6000, Office Mobile: +254 (722) 209840 or +254 (734) 330044 Email: info@coopers.co.ke

IGAD

The purpose of this strategy is to provide a strategic and integrated framework for regional cooperation in the IGAD priority areas of intervention. The IGAD secretariat has facilitated the development of the Strategy as part of its core role. The Strategy is based on best knowledge at time of writing, as well as on previous and existing work, and has been developed in consultation member states, development partners and non-state actors. It is a whole-of-region and multi-stakeholder Strategy intended to provide a focus for regional cooperation and to improve integration and coordination of planning and activities, particularly between sectors and across geographical boundaries. The Strategy is intended to guide existing and forthcoming plans relevant to regional cooperation and to improve integration, and strategies that are region-wide in scope.

The Intergovernmental Authority on Development (IGAD) in Eastern Africa was created in 1996 to supersede the Intergovernmental Authority on Drought and Development (IGADD) which was founded in 1986 to mitigate the effects of the recurring severe droughts and other natural disasters that resulted in widespread famine, ecological degradation and economic hardship in the region. Djibouti, Ethiopia, Kenya, Somalia, Sudan and Uganda - took action through the United Nations to establish the intergovernmental body for development and drought control in their region. Eritrea became the seventh member after attaining independence in 1993 and in 2011 South Sudan joined IGAD as the eighth member state.
With the new emerging political and socio-economic challenges, the assembly of Heads of State and Government, meeting in Addis Ababa in April 1995, resolved to revitalize IGADD and expand areas of cooperation among Member States. The new and revitalized IGAD was launched during the 5th Summit of IGAD Assembly of Heads of State and Government held on 25-26 November 1996 in Djibouti. The Summit endorsed the decision to enhance regional cooperation in three priority areas of food security and environmental protection, economic cooperation, regional integration and social development peace and security.

Vision: IGAD to be the premier Regional Economic Community (REC) for achieving peace and sustainable development in the region.
Mission: Promote regional cooperation and integration to add value to Member States' efforts in achieving peace, security and prosperity.

NORBROOK
Norbrook Kenya Limited is a subsidiary of Norbrook Pharmaceuticals Worldwide with the company headquarters in Newry, Northern Ireland (UK).
Norbrook Kenya Limited is proud to be associated with Kenya veterinary association as a Gold sponsor. Norbrook is committed to providing farmers with high quality animal Health products. With world class facilities, which are licensed by major governmental regulatory authorities worldwide, Norbrook manufactures a comprehensive. Range of own-brand products and contract manufactured products.

Norbrook remains a world leader in Pharmaceutical Manufacture, Research and

Development, with production facilities on 4 continents with Norbrook Kenya limited on the African continent. The sales and distribution offices are located in over 150 countries with over 200 pharmaceutical products registered worldwide. Our staff count is upwards of 2,000 employees worldwide.

Norbrook is ready to meet the challenges of providing cost effective, high quality pharmaceuticals for our customers, backed by professional and dedicated sales and marketing support teams. The sun never sets on Norbrook in its relentless pursuit for excellence.

Contacts: Old Limuru Road, Kiruri P.O. Box 1287-00606, Sarit Center Nairobi Tel +254 020 201456/7 Fax + 254 020 2019456 E-mail:sales@norbook.co.ke

METROVET

Contacts: Greenhouse, Suite 11, 2nd Floor, Adams Arcade, P.O. Box 1606-00100 Nairobi, Tel: +254 (722) 516365, +254 (752) 040299, +254 (735) 921030 Email: metrovet@nbnet.co.ke

VET CARE KENYA LTD

Vetcare Kenya Limited was established following the need for quality veterinary medicine and services. It is recognized for its commitment to the productions of high quality veterinary products both locally and internationally. With the changing times, the company has invested in technology and makes consistent research and development of its products for the promotion of better animal health. Vetcare Kenya Limited has grown over the years with stability fueling confidence from the available market. The company conforms to the standard laid down by International standard for both manufacturing and services. Solid management practices together with enthusiastic commitment, forms the foundation for its continued advancement on the domestic and international markets.

Vetcare Kenya Limited manufactures a wide range of products for treating ailments in all domestic animals in the following formulations:

Injectables
Water Soluble Powders
Oral Liquids
Feed Additives

ULTRAVETIS EA LTD

Ultravetis is a company, which was incorporated in November 2000 to take over Novartis Animal Health (former Ciba-Geigy) business in East Africa, after Novartis closed their subsidiary office here in East Africa due to some global changes.
Our Mission is to provide innovative, safe and competitive agricultural inputs through modern technology that will continuously improve agricultural production in Eastern Africa and beyond, while focusing on community, and giving value to our shareholders, customers and employees.

To meet the various requirements of our customers, we have several products all dynamic and effective for specific uses. All our products are attractively packed and in different quantities best suited for individual, retail and wholesale usage. Our product range has growth with time, we started off with 2 in 2002 (acaricides & hygiene) and now having a portfolio of 8 (acaricides, hygiene, nutrition, dewormers, poultry, antibiotics, pet food, seeds) to date.

To complement our quality products we offer excellent back-up services both technical and after sales follow-ups. This is important not only for the farmer/end user but also for us, in the area of optimal provision and improvement of our products.

To practically demonstrate our strong focus on the community, we hold several field days throughout the East African region, demonstrating and creating an awareness of our products. We also cater for the professionals in the veterinary world, including government officials, shop/agro-vet owners and distributors, by organizing countrywide Professional Group meetings. In addition we hold Counter Sales Training Courses, which enable the shop owners and attendants to know specifically the advantages of our quality products.

CONTACTS: Ultravetis East Africa Limited, Nanyuki Road, Off Lunga Lunga Road, Industrial Area, P.O. Box 44096, 00100 NAIROBI, Tel/Mob: 254 - 020 2358205, (0) 735 333666, 733 666640, 722 207888, Fax: 254 - 020 – 2358204, Email: info@ultravetis.com, Website: www.ultravetis.com

BAYER

Its mission is "Animal Health: to protect animals while benefiting mankind". In this capacity, Bayer Animal Health is among the leaders worldwide. It has attained this leadership position by continuously researching and developing products for animal health and pest control since 1919. A responsible relationship between humans, livestock and companion animals requires ensuring the health of animals. Bayer Animal Health protects millions of farm animals by offering effective, safe animal health care products. The role that companion animals such as dogs, cats and horses play as they accompany man through life is growing in significance. Keeping this close relationship healthy is not just an obligation to man's animal companions; it also protects humans from the transmission of disease pathogens.

Bayer Animal Health is represented in well over 100 countries and in all major markets worldwide. This customer proximity and the knowledge of the special needs and problems of each particular country and region enable Bayer to rapidly communicate experiences from the field in order to offer targeted, expert advice and deliver comprehensive information. Global partnerships and customer-oriented solutions and services are its goals.

Bayer Health care (BHC), a division of Bayer East Africa Ltd, combines the global activities of the divisions Animal Health, Pharmaceuticals, Consumer Care and Medical care. Our products enhance well-being and quality of life by diagnosing, preventing and treating diseases, to maximize our commitment to sustainable medical health development; we provide innovative products, medical solutions and stewardship through product lifecycle management.
Contract: East Africa Ltd., P.O. Box 30321-00100 GPO Nairobi, Tel: +254 20 8600 424,
Mobile: +254 714 065 274, Fax: +254 20 8600 010,
Email: animalhealthexports@bayerhealthcare.com,
Web: http://www.bayeranimalhealth.co.za

KEMIN

Our company: Kemin - Inspired Molecular Solutions.
Kemin provides "inspired molecular solutions" specifically developed to provide nutrition and health benefits for humans and animals. Committed to feed and food safety, Kemin maintains top-of-the-line manufacturing facilities where approximately 500 specialty ingredients are made for the global feed and food industries as well as the health, nutrition and beauty markets. A privately held, family-owned and operated company, Kemin has more than 1900 employees and operates in more than 90 countries

with manufacturing facilities in Belgium, Brazil, China, India, Italy, Singapore, South Africa and the United States.
Contact details: Office: 08610 KEMIN (08610 53646) Tel: +27 11 206 8000 Fax: +27 11 206 8001 Website:www.kemin.com Email: janica.nhlapo@kemin.com Address: South Africa Office Twenty One Industrial Estate 5 Purlin Road, Sterkfontein X11 (Off Olifantsfontein - R21) 1665 South A.

COSMOS
Contacts: Cosmos Limited, P.O. Box 41433 – 00100 Nairobi, Kenya. Tel: +254 (20) 5507709, Fax: +254 (20) 550680 / 532948, Cell No: +254 (722) 333834 / +254 (733) 666834, Email: info@cosmos-pharm.com Website: www.cosmos-pharm.com

ULTIMATE VETSERVE LTD

Ultimate Vetserve Ltd is a veterinary company that has been in operation for almost two decades now. Our mandate is to source and supply quality vaccines, drugs and equipment from credible firms at affordable prices and avail them while in excellent condition. We offer high quality products and equipment which include avian, large and small animal vaccines, vaccination equipment, dewormers, antibiotics, multivitamins, disinfectants, flea & tick control products for pets (Frontline & NexGard) and many other products. We also offer professional consultancy services and farm visits as well as provide training on good animal husbandry techniques. Our mission is to assist livestock and poultry farmers produce quality animal products into the industry and also to promote excellent animal welfare. Our core values are quality, affordability, reliability and efficiency. We serve markets all over and around Kenya.

Location:We are located at Ultimate house, Oloolua Road, Ngong town from where we are able to reach our clients efficiently and effectively.

Contact: Address: P.O Box 1436 – 00502, Nairobi. Tel: +254241542, 0202430331 Email: ultivet@nbnet.co.ke

Companies we represent: Merial, Immunovet, MCI and Biovac.

KENYA ANIMAL GENETIC RESOURCES CENTRE (KAGRC)

The Kenya Animal Genetic Resources Centre (KAGRC) formally known as Central Artificial Insemination Station (CAIS) was established by Kenya Gazette Notice Number 557 of 19th June 1946 with the objective of controlling venereal diseases and genetic improvement of exotic dairy Cattle. The current mandate of KAGRC is to produce, preserve, and conserve, animal genetic material (semen embryo, tissues and live animals) and rear breeding bulls for provision of high quality disease free semen to meet the national demand and for export.

In order to meet its mandate, KAGRC works in close collaboration with other breeding organizations such as the Kenya Stud Book, the Dairy Recording Services of Kenya and the Livestock Recording Center. Together, these organizations implement the Contract Mating and Progeny Testing Programmes. The organization also works closely with the breed societies as well as individual and institutional farms which provide herds for the breeding program. KAGRC is situated 15 km from City Centre (West of the Nairobi City), and has its Headquarters in Lower Kabete in Nairobi and has land capacity of about 358 Acres, 124 bulls in the stud.

Contacts: Head Office, P.O. Box 23070-00604, lower Kabete, Nairobi, Kenya. Tel: +254 (20) 2064018 / 2064027. Mobile: +254 (728) 899767 / +254 (0737) 540670 Email: info@kagrc.co.ke Website: www.kagrc.org

KENYA VETERINARY VACCINES PRODUCTION INSTITUTE (KEVEVAPI)

The Kenya Veterinary Vaccines Production Institute (KEVEVAPI) is a state corporation in the Ministry of Agriculture, Livestock and Fisheries. It was incorporated on 5th March 1990 under the State corporation act cap 446 of the laws of Kenya.

VISION: A globally recognized institute in the production and supply of high quality and affordable veterinary vaccines and services.

MISSION: To produce safe, efficacious and affordable veterinary vaccines through undertaking research, providing information, marketing and distribution for improvement of the livestock industry.
MANDATE: To coordinate and undertake production of veterinary vaccines in the country
To market and distribute veterinary vaccines locally and abroad
To undertake research with respect to vaccine development and production */alone or in collaboration with other institutions
To develop and produce chemicals, media and laboratory materials for use in the production of vaccines and other veterinary products

To provide information in the field on the suitability and effectiveness of veterinary vaccines. KEVEVAPI has a great role to play in one of vision 2030 flagship projects which entails production of clean animals for international trade.

Contacts: Head Office, Road A off Enterprise Road, Embakasi, P.O. BOX 53260 00200 Nairobi, Kenya. Tel: +254 (20) 3540071 / (20) 2174418. Mobile: +254 (724) 651895 Email: vaccines@kevevapi.org Website: www.kevevapi.org

BIMEDA

Formerly known as Assia Pharmaceuticals Limited, Bimeda Limited has been in operation in Kenya since 1968 and it has been one of the largest distributors of Veterinary Pharmaceutical products. Assia was distributing both Human and Animal Health products and was a subsidiary of Teva group of Israel which is an international company with manufacturing and marketing plants mainly in the U.S and Europe.

In March 2009, Assia was divested to Phibro Animal Health Corporation, an American manufacturer and marketer of Animal Health Pharmaceutical and nutrition products. During this period, the decision was taken to specialize in Animal Health products, thus the name changed to Assia Animal Health Limited in May 2009.

Bimeda Limited acquired Assia Animal Health Limited from Phibro in March 2011. Bimeda is a world leader in Animal Health with its headquarters in Dublin Ireland and develops and manufactures a wide range of high quality Veterinary products which are sold in five continents and more than seventy five countries worldwide.

Bimeda Limited is one of the largest Veterinary Pharmaceutical distributors and manufacturers in Eastern and Central African region with offices spread in Kenya, Uganda, Rwanda, Burundi, S. Sudan and Tanzania. Bimeda Limited office in Nairobi serves as a distribution center both for Kenya and the wider East African region and its market share is one of the largest in the Animal Health Pharmaceutical

sector. The product range is comprised primarily of Bimeda products and Assia branded products; some product lines are produced locally in Kenya.

Contacts: Bimeda Limited, Funzi Road off Enterprise Road, Industrial Area, P.O. Box 30620 – 00100, Nairobi, Kenya. Tel: +254 20 6537622-6. www.Bimeda.co.ke

KCB FOUNDATION

Contact: KCB Foundation| KCB Head Office, Kencom House, Moi Ave 8th Floor| P.O. BOX 4840000100 Nairobi| Tel: +254 20 3270000 / 851000 / 2852000 Ext 11311| Website: kcbbankgroup.com

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