FACULTY OF VETERINARY MEDICINE

FVM 3RD ANNUAL INTERNATIONAL SCIENTIFIC CONFERENCE AND SOCIAL RESPONSIBILITY 2025

THEME

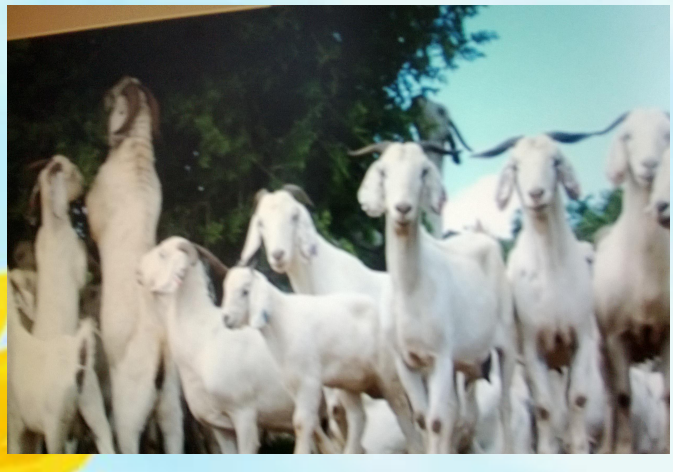
Advancing animal resource sub-sector through research and innovation in a dynamic landscape.

VENUE:

Wangari Maathai Institute, Upper Kabete & Virtually via Zoom platform

DATE:

OCTOBER 22-25, 2025



Conference programme & Abstracts

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Address: 728 Waterdam Road, Pittsburgh, PA, USA 15317 /
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ABOUT THE CONFERENCE

The Faculty of Veterinary Medicine, University of Nairobi, will hold its 3rd Annual International Scientific Conference during the University of Nairobi's 2025 Research and Innovation Week. The theme of this Conference is: "**Advancing animal resource sub-sector through research and innovation in a dynamic landscape**". This conference aims to bring together experts from various fields to share best practices and the latest advancements in Veterinary Science, animal health and production, wildlife, fisheries and aquaculture management, through conference presentations and exhibitions.

The research findings to be presented in this conference fall into the the following 8 sub-themes:

1. Animal disease surveillance and epidemiological research
2. Drugs and antimicrobial resistance research
3. Animal diseases, re-emerging zoonoses, and one health
4. Fisheries and aquaculture management
5. Wildlife, animal welfare and community engagement
6. Innovations in veterinary diagnostics, vaccines, and practice
7. Livestock value chains, food and feed safety
8. Innovations in livestock production and feeding

A total of 50 papers are expected to be presented in the three-day period of the conference, including 47 oral and 3 poster presentations. Of the 47 oral presentations, 10 will be by guest speakers. Most of the presenters are from Kenya, but a few others are from Ethiopia, Tanzania, Ghana, Egypt and Uganda. Oral presentations will be done either physically or Virtually at Wangari Maathai Institute, the conference venue. The three posters will be displayed at a designated area in the conference venue. You are welcome to view these posters at your convenient time within the conference period. Presenters will be on site to explain their research.

Ladies and Gentlemen, the animal resource sub-sector has a number of challenges including inadequate feeds, lack of appropriate genetics, infectious diseases, lack of vaccines for some diseases, inadequate diagnostics, rapid development of antimicrobial resistance, environmental pollution, loss of biodiversity and declining resources for research as well as for investment in the sub-sector infrastructure development. These challenges negatively impact on food security, safety of animal source foods and human health. It is expected that the papers to be presented in this conference will give insights to some of these challenges and suggest ways to mitigate some of them. The presentations will be a platform for researchers to disseminate their research findings and innovations that can be applied to solve some of the current challenges in the sub-sector. The conference will also bring together students, researchers and industry partners to exchange ideas and develop meaningful and fruitful research collaborations to advance animal resource sub-sector.

Prof. Jackson N.Ombui
Chair, FVM Scientific Committee

WELCOME REMARKS

Welcome Remarks from the Dean, Faculty of Veterinary Medicine, University of Nairobi.

On behalf of the University of Nairobi and Faculty of Veterinary Medicine, I take this singular opportunity to welcome each of you to the Faculty of Veterinary Medicine's 3rd Annual International Scientific Conference and Corporate Social Responsibility. I wish to thank each one of you for sparing your valuable time to joining us in the scientific discourse that will take place in this important period of the University of Nairobi academic calendar. This international scientific conference is among the many activities organized across the University of Nairobi to mark the annual research and innovation week that is dedicated to showcase the research and innovations associated with the University of Nairobi and its research partners. In addition to this International Scientific conference, the Faculty has organized a corporate social responsibility activity to interact with farmers in the community surround the this campus.

This year's conference theme "Advancing animal resource sub-sector through research and innovation in a dynamic landscape" is crucial for harnessing the great potential of the animal resource sub-sector for nutritional security, health and well-being of the people and for economic development of our nations. Over 45 papers touching on various sub-themes will be presented by various researchers, students and guest speakers who I must commend for the great effort they have put in the preparation of the papers. More important in this year's scientific conference is the participation of international researchers who will be sharing their research works from their respective countries. We welcome their participation and hope to build solid international research networks that are vital in harnessing global animal resources for the benefit of mankind. I am therefore confident that the presentations will enrich your scientific knowledge that is necessary to advance your careers in the animal resource industry. The Faculty of Veterinary Medicine is committed to developing human capital and generate new knowledge and innovations that are necessary to advance the animal resource sub-sector to produce enough food to feed current and future generations and produce adequate resources for economic development.

The University of Nairobi recognizes the support of our esteemed strategic partners that has enabled us to organize this important event. Participants are invited to visit the stands mounted by our partners for valuable information on their activities and possible areas of research and economic collaboration.

I wish all participants fruitful deliberations, inspiring and productive engagement.

Thank you and welcome once again.

Prof. John D Mande
Dean, Faculty of Veterinary Medicine.University of Nairobi.

CONFERENCE PROGRAMME

DAY 1	**WEDNESDAY OCTOBER 22, 2025**
Time	**Activities-**
7-30-8.30am	Arrival and Registration
8.30-9.00am	Housekeeping
9.00-11.00am	Opening Ceremony
	Dean FVM -Welcome Remarks
	Guest of honor (VC, University of Nairobi)
11.00-11.30	Health Break
ORAL PRESENTATIONS	
SESSION 1	**Animal Disease Surveillance and Epidemiological Research**
Session chair	**Dr. Joshua Onono**
Rapporteur	**Dr. Dominic Ochwang'i**
11.30 -11.50am	**Keynote**: From data to decisions: Harnessing integrated animal health early warning systems for timely action - ***by Dr Sophycate Njue***
11.50 -12.05pm	Pastoralists' preferences during livestock disease reporting and response in northern Kenya: a participatory study- ***By Derrick Sentamu***
12.05 -12.20pm	Prevalence and species diversity gastrointestinal nematodes in sheep kept under pastoral systems in Njoro ward, Nakuru county -***Felix Kiprotich***
12.20-12.35pm	Prevalence and risk factors of sub-clinical mastitis in dairy cattle in Nyeri County, Kenya. *By* ***Mathew Kiplimo***
12.35 -1.00pm	Plenary Q&A
1.00 -2.00 pm	Lunch Break
SESSION 2	**Drugs and antimicrobial resistance research**
Session Chair	**Prof. George C. Gitao**
Rapporteur	**Dr. Sharon Mbindyo**
2.00 - 2.20pm	**Keynote:** Genes to Practices: Genomics of AMR at interfaces and the social ecology of use- ***by Dr Dishon Mulo***i
2.20 - 2.35 pm	Antibacterial activity of *Echinops Kebericho* against *Staphylococcus aureus*, *Escherichia coli* and *Salmonella:* An In-Vitro Study- ***by Dr. Addis Mekonnen***
2.35 - 2.50 pm	Identification and in silico characterization of non-nucleoside rdrp inhibitors of FMD virus using high throughput structure based virtual screening and AI and ml techniques - ***Dr. I.O Mapenay***
2.50 - 3.05 pm	Prevalence of hemoparasite infections and use of antibiotics for treatments in cattle in coastal Kenya- ***by Dr. Joel Nyamweya***
3.05- 3.20 pm	Prevalence and antimicrobial resistance of E*scherichia coli* pathotypes from post weaning piglets in Nyeri County, Kenya- ***by Emma Mugo***
3.20 -3.35pm	Antimicrobial resistance patterns of salmonella isolated from eggs, raw milk cheese and yoghurt - ***Dr. Addis Mekonnen***
3.35 -3.50pm	Phytochemical profiles, antioxidant and hematinic activities of *Hibiscus acetosella* leaf extracts on 2,4-Dinitrophenylhydrazine-Induced Anaemia in Wistar Rats – ***By Willy Nzulu Kisoi***
3.50 -4.00 pm	**CEVA presentation**
4.00-4.30 pm	**Plenary Q&A**
4.30- 4. 50pm	**Health break**

DAY 2	**THURSDAY 23 OCTOBER 2025**	
7.45-8.20 am	Registration of participants	
SESSION 3	**Animal Diseases, Re-emerging Zoonoses and One Health**	
Session chair	**Prof. Peter K. Gathumbi**	
Rapporteur	**Dr. John Kimani**	
8.30 -8.50 am	**Keynote:** Sustainable control of *Taenia solium*- ***by Dr. Lian Thomas***	
8.50-9.05 am	Prevalence and risk factors associated with zoonotic gastrointestinal parasites of dogs in Kitui central sub-county Kitui county Kenya.-***Richard Kihara.***	
9.05 -9.20 am	Sero-prevalence of Q-Fever Infection Among Cattle In West Omo Zone, Ethiopia: A Neglected Tropical Emerging Zoonosis- ***by Mekonnen Addis***	
9.20-9.35 am	Prevalence of canine rabies in Nairobi County, Kenya: A 6-year retrospective study. ***-by Angel Mwangi***	
9.35-9.50 am	Evaluation report on animal rabies surveillance system in Kenya (2019-2024) ***by Mumbua Mbithi***	
9.50-10.05.am	Molecular detection and genetic characterization of *toxoplasma gondii* in donkeys in Kirinyaga and Meru counties, Kenya – by ***Dr. Fredrick Obonyo***	
10.05-10.30 am	Plenary (Q&A)	
10.30-11.00 am	**Health Break**	
SESSION 4	**Fisheries and Aquaculture Management**	
Session Chair	**Dr. Callen Onura**	
Rapporteur	**Dr. Joel Ochieng**	
11.00-11.20 am	**Keynote:** Aquaculture development in Kenya: Challenges and future prospects **- by *Dr. Mary Opiyo***	
11.20-11.35 am	An insight into heavy metal levels and effects on the reproductive performance of *O.niloticus* within Lake Victoria, Kenya - ***Tobias Owiti***	
11.35-11.50am	Prevalence of gastrointestinal helminths in farmed and wild Tilapia species: A Comparative study from Mbeya Region and Lake Rukwa, Tanzania.- ***Adili Mbembela***	
11.50-12.05 pm	Levels, determinants and effects of polychlorinated biphenyls and organochlorine pesticides in fish in Lake Victoria, Kenya- ***Joseph Okal***	
12.05 -12.25 pm	Aquaculture practices and fish welfare knowledge of fish farmers in Kisumu County, Kenya.**- *Annah Mudamba***	
12.25 - 12.45pm	Advancing the welfare of farmed fish in Egypt and Kenya- ***Faisal Quresh***	
!2.45-1.00 pm	**Plenary (Q&A)**	
1.00 2.00 pm	**LUNCH**	
Session 5	**Wildlife, Animal Welfare and Community Engagement**	
Session chair	**Dr. Catherine Kaluwa**	
Rapporteur	**Dr. Felix Kibegwa**	
2.00-2.20 pm	**Keynote**: Integrating indigenous knowledge and science diplomacy for sustainable wildlife, apiculture and aquaculture ***-Dr. James Njogu***	
2.20- 2.35pm	Shaping the future of nature based travel: The nexus between biodiversity, tourism and Innovation - ***Dr, Peter Njoroge (Key)***	
2.35 -2.50pm	Land use practices and their implications on avifauna in Masai Mara Ecosystem - ***Prof. Muchane Muchai***	

2.50-3.05 pm	Diurnal time budget in relation to De Brazza's monkey (*Cercopithecus neglectus*) feeding behavior in western Kenya- ***by Jennifer Wanyingi***
3.05- 3.20 pm	Dispersal ecology of the vulturine guinea fowl at Mpala Ranch, Laikipia, Kenya - **by *Anne Namaemba.***
3.20-3.40 pm	Effect of altitudinal gradient, vegetation and soil properties on macro-fungi species richness, density, diversity and distribution in Abardare's Forest, Kenya- ***by Mary Muchane***
3.40-3.55pm	**Keynote:** Welfare of working animals- ***by Dr. Brian Joseph.***
3.55- 4.15pm	Welfare challenges among donkeys working in Ngurubani town in Mwea East Sub-county, Kirinyaga county- ***by Jane Njuguna.***
4.15- 4. 40 pm	Plenary (Q&A)
4.45 -5.00 pm	**Health break -close for the day**
DAY 3	**FRIDAY OCTOBER 24, 2025**
7.45-8.20 am	**Registration**
Session 6	**Innovations in Veterinary Diagnostics, Vaccines and Practice**
Seesion chair	**Prof. Samuel Githigia**
Rapporteur	**Dr. Rodi Ojoo**
8.30- 8.45 am	**Keynote Speaker:** Zoonotic arbovirus surveillance and blood meal analysis in mosquito species from Isiolo County, Kenya ***-by Hussein Abkallo***
8.45- 9.00 am	Development of CRISPR-CAS-based diagnostic tools for *Theileria parva*, *Babesia bigemina* and A*naplasma marginale* infections in cattle - ***by Robert Muriuki***
9.00-9.15 am	Assessing tissue responses in pigs challenged with three different doses of the highly virulent AFSV strain- **by *Justine Mabuka***
9.15-9.30 am	Prevalence of tick-borne hemoparasites and associated vectors in dairy cattle in Githunguri sub-county, Kiambu county ***-by Mark Ngere***
9.30-9.45 am	Prevalence and diversity of *Coccidia spp*. in sheep in Machakos county, Kenya ***- By Fiona Mwendwa***
9.45-10.00	Participatory assessment of challenges faced by small ruminant producers in pastoral areas of Laikipia, Kenya- ***by Ngotho-Esilaba,***
10.00-10.30 am	**Plenary Q&A**
10.30 -11.00am	**Health Break**
SESSION 7	**Livestock Value Chains, Food and Feed Safety**
Session chair	**Dr. Isaac Mapenay**
Rapporteur	**Dr. Daniel Muasya**
11.00-11.10am	**VetNOW Presentation**
11.10-11.30pm	**Keynote:** Effects of application of SPS measures on safety of animal source foods- ***by Evans Muthuma***
11.30-11.45pm	Prevalence and risk factors associated with the colonization of *Escherichia coli* and *Campylobacter spp*. in chicken in Murang'a County, Kenya - ***by Luciano Achieng***
11.45-12.00pm	Indigestible foreign materials in Ghana's ruminant value chain: stakeholders' perspectives on impacts and mitigation - ***by Acheampong Selina*** ,
12.00 -12.15pm	Knowledge, attitudes and practices influencing *E.coli* contamination of raw

	milk in dairy farms in Narok county, Kenya- ***Eric Eshitera***
12.15- 12.30 pm	Occurrence of Crimean-congo hemorrhagic fever, tularemia and Rift Valley Fever in pastoralist systems in Africa.- by ***Dr. Dickson Machira***.
12.30-1.00pm	Plenary (Q&A)
12-50- 2.00pm	Lunch Break
SESSION 8	**INNOVATIONS IN LIVESTOCK PRODUCTION AND FEEDING**
Session chair	**Dr. Tequiero Abuom**
Rapporteur	**Dr. Lucy Njagi**
2.10-2.30 pm	**Keynote:** Semen collection, processing and artificial insemination in goats in Kenya **- *Dr. Paul Juma***
2.30-2.45 pm	Black soldier fly larvae meal as an alternative protein source for optimizing poultry production and egg nutritional quality - ***Linus Wamai.***
2.45- 3.00 pm	Insect-based feed efficiency gains upregulate the expression of growth and immune related genes in ross 308 broilers - ***by Victor Rotich***
3.00-3.15 pm	Improving rumen digestibility through maize stover and hay treatment with molasses-maize flour yeast for beef cattle - ***by Kiprono Toror***
3.15-3.35 pm	Brooke East Africa Presentation
3.35-3.55pm	Animal health and biological threat reduction WOAH,s support to Kenya -***By Dr. Ian Peter***
3.55 -4.30 pm	**Plenary (Q&A)**
4.00 - 4.40pm	**CLOSING CEREMONY - END OF CONFERENCE**

DAY 4	**SATURDAY OCTOBER 25, 2025**
9.00 am-4.00pm	**Field Day/CSR Activity- Ndumbuini Chief's Camp**

POSTER PRESENTATIONS-	
1	Effect of marikebuni vaccine on feeding and reproductive success of *Rhipicephalus appendiculatus* - ***by Peninah Njoroge***
2	Assessment of *Taenia saginata* and other enteric parasites in Narok County, Kenya -***by David Obiero***
3	Prevalence, diversity and risk factors associated with tick-borne hemopathogens of calves in smallholder dairy farms in Nandi County, Kenya - ***Benson Rukwaro***

PARTNERS

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GUEST SPEAKERS

1. **Dr. Sophycate Njue:** From data to decisions: Harnessing integrated animal health early warning systems for timely action.
2. **Dr Dishon Muloi:** From genes to Practices: Genomics of AMR at interfaces and the social ecology of use.
3. **Dr. Lian Thomas:** Sustainable control of *Taenia solium*
4. **James Njogu**: Integrating indigenous knowledge and science diplomacy for sustainable wildlife, apiculture and aquaculture
5. **Dr. Peter Njoroge**:Shaping the future of nature based travel: The nexus between biodiversity, tourism and Innovation.
6. **Brian Joseph:**_ Welfare of working animals in sub-Saharan Africa
7. **Dr. Evans Muthuma:** Role of SPS measures in facilitation of international trade in livestock products and challenges faced. A case of Kenya
8. **Dr Hussein Abkallo:** Zoonotic arbovirus surveillance and blood meal analysis in mosquito species from Isiolo county Kenya
9. **Dr. Paul Juma:** Semen collection, processing and artificial insemination in goats in Kenya
10. **Dr. Ian Peter Busuulwa:** Animal Health and biological threat reduction: WOAH's Support to Kenya..

ABSTRACTS

SUB-THEME 1

ANIMAL DISEASE SURVEILLANCE AND EPIDEMIOLOGICAL RESEARCH

DR. SOPHYCATE NJUE (Guest speaker)

Data to decisions: Harnessing integrated animal health early warning systems for timely action

ABSTRACT

Background: Animal diseases in East Africa region significantly impact livelihoods, food security, public health, and trade. Delayed detection hinders timely and effective interventions. Advances in digital technology, remote sensing, and predictive data analytics have led to the development of Integrated Animal Health Early Warning Systems (IAHEWS), which support proactive, data-driven approaches to enhance disease preparedness and response. This study examined the design and implementation of IAHEWS in East Africa, focusing on their effectiveness in improving timely and accurate disease detection and response, and their role in mitigating the risks and impacts of zoonoses and Transboundary Animal Diseases (TADs).

Methods: The study employed a mixed-methods approach to assess the structure and effectiveness of IAHEWS. It included a desk review of existing Early Warning System (EWS) frameworks, analysis of data from mobile phones and digital reporting tools, surveillance databases, Geographic Information Systems (GIS), climate models, and disease risk models. Qualitative insights were gathered through interviews with veterinary and public health stakeholders, Non-Governmental Organizations (NGOs), Community Animal Health Workers (CAHWs), and farmers. These data were triangulated to evaluate risk prediction accuracy, alert responsiveness, and system performance using metrics such as data integration and forecasting model effectiveness.

Results: The IAHEWS combining mobile phone and digital reporting tools, climate forecasts, GIS mapping, and risk modelling improved detection of disease trends, hotspot identification, and outbreak prediction. In Somalia, pilot projects enabled timely alerts for camel diseases and *Peste des Petits Ruminants* (PPR), leading to timely targeted responses. However, limited mobile phone network connectivity, fragmented data sharing, and weak cross-sector coordination hindered full implementation. The IAHEWS offer a scalable solution to strengthen resilience against emerging and re-emerging diseases, support One Health goals, and foster sustainable livestock development. Their success depends on cross-border and cross-sectoral collaboration, investment in digital infrastructure, and strong policy frameworks for inclusive and interoperable data governance.

Conclusion: This work responds to the urgent need for timely disease detection and coordinated action. The IAHEWS promotes proactive disease management, strengthens evidence-based decision-making, enhancing pastoral resilience, food security, trade stability, and epidemic preparedness in climate-sensitive, and high-risk areas.

Keywords: Predictive analytics, Animal health, digital-innovation

DERRICK NOAH SENTAMU

Pastoralists preferences during livestock disease reporting and response in northern Kenya: A participatory study

Derrick Noah Sentamu[1*], Raphael Lotira Arasio[1,2,3], Dennis N. Makau[1,4], Joshua Orungo Onono[1].

[1]Department of Public Health Pharmacology and Toxicology, Faculty of Veterinary Sciences, University of Nairobi, P. O. Box 29053, - 00625, Kangemi, Kenya.

[2]Department of Land Resource Management and Agricultural Technology, Faculty of Agriculture, University of Nairobi, P. O. Box 29053, - 00625, Kangemi, Kenya.

[3]German Institute for Tropical and Subtropical Agriculture (DITSL), Steinstrasse 19, 37213 Witzenhausen, Germany.

[4]Department of Biomedical and Diagnostic Sciences, University of Tennessee, Knoxville, TN 37996, USA.

*Corresponding Author DerricK Sentamu (Email: sentsderrick@gmail.com)

ABSTRACT

Background: Livestock disease surveillance is important in early detection and control of diseases. In resource constrained settings, passive surveillance is predominately used, a system that relies heavily on the community to share information on livestock disease events for eventual response by relevant stakeholders. This study aimed to describe the passive surveillance system, documenting key reasons/criteria considered when reporting and responding to diseases.

Methods: The study was conducted in Marsabit county in Northern Kenya with pastoralists between 1/8/2023 – 30/11/2023 and 1/6/2024 – 30/8/2024. Through 27 FGDs, participatory epidemiology tools including matrix scoring and pairwise ranking were used to profile the stakeholders and utilization of different methods with respective criteria for livestock disease reporting and response and further understand their utilization overtime using timelines with proportional piling.

Results:The disease reporting ecosystem in Marsabit was most influenced by livestock owners (median rank = 9/10), friends and traditional healers (median rank = 7/10) and Elders' council and Private AHWs (median rank = 6/10). Disease reporting was primarily through mobile phones (median rank = 4/5) with their usage increasing markedly between 2001 to

2024. Livestock disease response was most frequently offered by livestock owners, friends and agrovets/private practitioners, with median ranks of 9/10, 7/10 and 6/10, respectively. Pastoralists responded to disease events mostly by themselves, using synthetic drugs (median = 8/10) and this practice had increased overtime from before the 1980s to 2024. The pastoralists' decisions to report a disease event were largely influenced by accessibility of the stakeholder or method of reporting, perceived technical knowledge of the recipient, cost friendliness and affordability, while ability to provide quick response, credit facilities for services, having technical knowledge and affordability were important criteria for their choice in the process of disease response.

Conclusion: This study highlights the central role livestock owners play in disease reporting and response in under served areas of pastoralist northern Kenya, with a limited role played by public/government animal health services providers. The results suggest that veterinary services delivery systems should be reviewed with input from community stakeholders to improve surveillance, disease reporting and response. This integration would enhance livestock disease surveillance and protect pastoralists' livelihoods.

Key words

Pastoral systems, livestock, participatory epidemiology, disease surveillance

FELIX KIPROTICH

Prevalence and species of diversity gastrointestinal nematodes in sheep kept under pastoral systems in Njoro ward, Nakuru county, Kenya.

Felix Kiprotich[1], and Patrick Juma[1]

1. Department of Animal Health and Production, Mount Kenya University

Corresponding author: Felix Kiprotich, Email; kiprofeliz@gmail.com

ABSTRACT

Background: Gastrointestinal nematodes (GINs) significantly affect sheep production in Kenya's pastoral systems. This study assessed the prevalence, species diversity, and control practices of GINs among sheep in Njoro Ward, Nakuru County.

Methods: A cross-sectional survey was conducted in Mau Narok, Nessuit, Likia, and Ndeffo sublocations. Using Mugenda and Mugenda (2003) sampling formula, 32 farmers were selected from a population of 320, with two sheep sampled per farm, totaling 64. Fecal Egg Counts (FEC) were performed using the McMaster technique to determine parasite load and species identification. Structured questionnaires evaluated farmer awareness and deworming practices. Data analysis was done using Microsoft Excel. Regression analysis was also done to explore the relationship between deworming frequency and parasite burden.

Results; The findings revealed a high prevalence 73.4% of GINs. The dominant species was *Haemonchus contortus* (59.6%), followed by *Trichostrongylus spp.* (23.4%) and *Oesophagostomum spp.* (17.0%). While 81.3% of farmers were aware of GINs, only 65.6% dewormed regularly, and just 28.1% rotated anthelmintics. Regression analysis showed a

strong negative correlation (R^2 = 0.998, r = -0.999) between deworming frequency and FEC, indicating that more frequent deworming reduces parasite load.

Conclusion: It was concluded that GINs are highly prevalent in Njoro Ward, with inadequate control practices contributing to the burden. Enhanced extension services, regular fecal monitoring, and promotion of rotational grazing and anthelmintic rotation are recommended to improve control. These findings offer critical insights for veterinary health programs, farmer education, and policy development to enhance small ruminant productivity in pastoral areas. K**ey words:** Gastrointestinal nematodes, sheep and Njoro ward

DR. KIPLIMO MATHEW

Prevalence and risk factors of sub-clinical mastitis in dairy cattle in Nyeri county, Kenya

Kiplimo Mathew[1,2], Lucy Njagi[1], Maina Ngotho[2] and Christine Mbindyo[1]

[1]University of Nairobi, Department of Pathology, Microbiology and Parasitology P. O. Box 29053-00625, Kangemi, Nairobi, Kenya.

[2]Jomo Kenyatta University of Agriculture and Technology P.O Box 62000-00200, Nairobi.

ABSTRACT

Background: The dairy cattle industry in Kenya is primarily driven by small-and-large holder farms and accounts for 80% and 20% of the country's milk production respectively. However, mastitis is the major challenge in the sector and causes substantial financial losses and welfare concerns. Clinical and sub-clinical Mastitis, particularly caused by antibiotic resistant *S. aureus*, is a growing concern in small-scale dairy farms. The aim of this study was to identify prevalence and risk factors associated with occurrence of sub-clinical mastitis in Nyeri County, Kenya.

Methods: This was a cross-sectional that involved 400 lactating dairy cattle selected from 100 farms spread across the three sub-counties. Sub-clinical mastitis was determined by using California Mastitis test (CMT). Conventional culture of 200 CMT -positive milk samples, biochemical, Matrix Assisted Laser Desorption/Ionization Time of Flight (MALDI-TOF) mass spectrometry tests and Polymerase Chain Reaction (PCR) were done to identify bacterial isolates. Antimicrobial susceptibility test of the isolates was performed using the Kirby-Bauer disc diffusion method, and PCR was used to screen for antimicrobial-resistant genes for *Staphylococcus* species. A pretested structured questionnaire was administered to 100 dairy farmers to collect information farm demographic characteristics, farmer knowledge attitudes and practices (KAPs) on disease management, antimicrobial use, environmental hygiene, medical waste and animal welfare practices. Logistic regression models was used to assess significant risk factors for subclinical mastitis.

Results: Based on CMT, the prevalence of subclinical mastitis was 39% (39/100) at the farm level, 12.5% (50/400) at the cow level, and 12.5% (200/1597) at the quarter level, respectively. On the basis of bacterial culture, the prevalence of subclinical mastitis was 89.7% (35/39) at the farm level, 88% (44/50) at the cow level, and 62% (124/200) at the quarter level. Coagulase-negative *Staphylococcus* (CoNS) was the most prevalent mastitis pathogen at 70% (96/136), followed by *Staphylococcus* aureus (*S. aureus*) at 23% (32/136),

with the least being *Acinetobacter baumannii* at 1% (1/136), and *Corynebacterium bovis* at 1% (1/136). Among the CoNS, the most common species were *S. chromogens* (52%) and *S. epidermidis* (20%), and the least was *S. xylosus* at 5%. The pathogens displayed significant resistance to the commonly used antibiotics, especially tetracycline and ampicillin. Farm management related factors such as primary education of the dairy farmer (OR=1.712, P=0.049), farms which employed workers to attend to dairy cattle (OR=1.733, P=0.004), self-administration of drugs to sick animals (OR=1.006, P=0.001) and failure to keep treatment records (OR=1.283, P=0.008) were statistically significant factors for occurrence of subclinical mastitis in Nyeri county. Equally, cow-level factors such as parity (>3) (OR=4.048, P=0.043), mid lactation stage (OR=0.970, P=0.031), previous exposure to mastitis (OR=1.451, P=0.019) and Friesian breed (OR=1.721, P=0.001) were associated with higher probability of being infected with sub-clinical mastitis

Conclusion: These findings highlight the need to enhance farmer's knowledge to promote judicious antimicrobial use, and refine husbandry practices to improve dairy cattle health and productivity in Nyeri County.

Keywords: Subclinical mastitis, antimicrobial use, risk factors, Nyeri County

DR. BENSON RUKWARO

Prevalence, diversity and risk factors associated with tick-borne hemopathogen infection of calves in smallholder dairy farms in Nandi county, Kenya

Benson Rukwaro[1,2]*, Sylvia Cheptoo[2,6], Erhan Yalcindag[3], Lina González Gordon[3], Joseph Samuel Kimatu[2,8], Joseph Wasonga[2,7], Benedict E. Karani[2], Gideon Ndambuki[2], Susan Migeni[2,7], Jesse Kagai[5], Linus Eric Kiprotich[5], Nelson Saya[5], Deepali Vasoya[4], Getrude Nangekhe[2], Peter Karuri Gathumbi[1], Robert Maina Waruiru[1], Barend Mark Bronsvoort[3], Elizabeth Anne Jessie Cook[2]*

[1]*Department of Veterinary Pathology, Microbiology & Parasitology, The University of Nairobi, Nairobi, Kenya*

[2]*The Centre for Tropical Livestock Genetics and Health (CTLGH), International Livestock Research Institute (ILRI), Nairobi, Kenya*

[3]*The Centre for Tropical Livestock Genetics and Health (CTLGH), Roslin Institute, University of Edinburgh, East Bush Campus, EH25 9RG, UK*

[4]*UK Dementia Research Institute at University of Edinburgh, Hugh Robson Building, George Square, Edinburgh EH8 9XD, UK*

[5]*Mazingira Centre, International Livestock Research Institute (ILRI), Nairobi, Kenya*

[6]*Jomo Kenyatta University of Agriculture and Technology (JKUAT), Nairobi, Kenya*

[7]*Amref International University (AMIU), Nairobi, Kenya*

[8]*Department of Public Health, Pharmacology and Toxicology, The University of Nairobi, Nairobi, Kenya*

ABSTRACT

Background: Tick-borne haemopathogens (TBHs) significantly impact livestock production and impose substantial economic losses on livestock owners. The epidemiology of these pathogens, including *Theileria*, *Anaplasma*, *Babesia* and *Ehrlichia* species, has not been well documented in smallholder farming systems, such as the dairy systems in Nandi County, Kenya. This study investigated the prevalence, diversity and risk factors associated with TBHs infection of calves aged ≤12 months in dairy smallholder farms within Nandi County.

Methods: A cross-sectional study was conducted between September and December 2023 where a total of 579 calves were sampled from 448 farms listed in the Africa Dairy Genetic Gain (ADGG) database at ILRI. Blood samples were collected from the calves and processed for both microscopy (blood smears) and molecular analysis using the haemabiome (deep amplicon sequencing) tool to identify TBHs. Data on individual calves and farm-level factors were collected using closed-ended questionnaires administered to individuals responsible for their management. Descriptive analysis was performed for both categorical and continuous variables. A mixed-effects regression model was used to determine the association between molecular positivity, packed cell volume and various risk factors with the farm serving as a random effect.

Results: The findings indicated a slight to fair agreement between microscopy and haemabiome diagnostic method. Over 76% (76.3%; 440/577) of calves were infected with at least one TBH with prevalence of *Anaplasma* being 73.7% followed by *Babesia* (9.9%), *Theileria* (1.4%,) and *Ehrlichia* (0.7%) species, respectively. Identified species per genera were *A. platys* (57.2%), *A. marginale* (55.1%), *A. boleense* (3.6%), *A. phagocytophilum* (1.6%), *A. bovis* (0.2%), *E. minasensis / E. Canis* (0.7%), *T. parva* (1%), *T. taurotragi* (0.5%), *T. mutans* (0.3%), and *B. bigemina* (9.9%). Among infected calves, those with single, double and triple infections were 181 (31.4%), 214 (37.1%) and 42 (7.3%), respectively. A multivariable model assessing risk factors for *A. marginale* infections indicated that male calves were less susceptible [AOR=0.6, 95% CI=0.4-1.0] compared to female calves. Additionally, *A. marginale* and Holstein Friesian calves were significantly associated with lower packed cell volume (PCV) levels compared to other TBHs.

Conclusion: The findings show that TBHs including *Anaplasma*, *Babesia*, *Ehrlichia* and *Theileria* species were highly prevalent in the study area with high co-infection rates. In addition, the study showed that microscopy alone is not effective in assessing the level of infection with TBHs. The study recommends strategic and comprehensive application of acaricide to prevent tick infestation of calves to reduce infection with TBHs.

Keywords: *Anaplasma, c*alves, Deep Amplicon sequencing, *h*aemopathogens, risk factor, Microscopy

SUBTHEME 2

DRUGS AND ANTIMICROBIAL RESISTANCE RESEARCH

DR. DISHON MULOI

Genes to Practices: Genomics of AMR at interfaces and the Social Ecology of use

Dishon M Muloi - Guest Speaker

International Livestock Research Institute and University of Liverpool

ABSTRACT

Antimicrobial resistance (AMR) poses a profound threat to global health, food security, and sustainable livelihoods. The talk is structured into two themes: studies on AMR transmission at One Health interfaces, and patterns and determinants of antibiotic use in livestock systems. I will share insights from the use of bespoke genomic methods to shed light on bacterial and resistance patterns across host populations, and the ecological and social factors shaping these relationships. Secondly, I will highlight efforts to quantify antibiotic use in livestock systems and to understand the socioeconomic determinants of access and decision-making.

DR. ADDIS MEKONNEN

Antibacterial activity of *Echinops kebericho* against S*taphylococcus aureus, Escherichia coli* and *salmonella:* An *in-vitro* study

Mekonnen Addis and *Ufaysa Gensa*imma

University, Jimma, Jimma Ethiopia;

Corresponding author E-Mail: mekonnenaddis2010@yahoo.com, Cell: 0912112251

ABSTRACT

Background: Traditional medicines are an important means of health care and are sources of therapeutics for 70% of human and 90% of livestock in developing countries. *Echinops kebericho* is an endemic plant to Ethiopia and is used to treat several diseases. Antimicrobial resistance among bacteria to conventional antimicrobials has become a serious challenge globally, and is a threat to the successful treatment of several ailments. The antibacterial activity of *E. kebericho* against *S. aureus*, *E. coli* and *Salmonella* bacteria has previously not been reported. The objective of this study was to evaluate the antibacterial activities of aqueous and ethanol based crude extracts of the plant against these bacteria.

Methods: The 70% ethanol and aqueous extracts of *E .kebericho* were prepared by maceration of the plant material and extraction using in vitro susceptibility test was done using filter paper disc diffusion method. The extract was prepared at concentration of 25, 50, and 100 mg/ml.

Key results: The least susceptibility was observed for the aqueous extract with the inhibition zone of (7.67±0.57 mm) at 25mg/ml concentration against *E .coli*. Salmonella was highly susceptible (16.00±1.00 mm) to aqueous extract at concentration of 100 mg/ml. The 70% ethanol extracts of *E. kebericho* showed smaller zone of (8.00±0.57 mm) against *Salmonella* at 25 mg/ml, while the larger inhibitory zone was observed against *S. aureus* (15.00±1.00 mm) and *E. coli* (13.33± 0.57 mm) at concentration of 100 mg/ml.

Conclusion and Recommendations: The inhibitory activity against the tested bacteria suggests *E. kebericho* root extracts could help alleviate AMR challenges we face and threatens us all currently. An *in vivo* study using laboratory animals should be conducted to test the safety, efficacy, dosage and toxicity of the extract so as to validate its antibacterial activity and strong awareness has to be created among the population to conserve medicinal plants for sustainable use.

Keywords: *Antibacterial, Echinops kebericho, Escherichia coli, Salmonella, Staphylococcus aureus*

DR. ISAAC M. OLE-MAPENAY

Identification and *in-silico* characterization of non-nucleoside *rdrp* inhibitors of FMD virus using high throughput structure based virtual screening and AI and ml techniques.

Isaac M. Ole-Mapenay[1] and Monica W Maichomo[2]

1, Department O Public Health Pharmacology and Toxicology, University Of Nairobi, P.O. Box 29053, Kangemi Nariobi, Kenya.

2. Kenya Agricultural and Livestock Research Organization, P.O. Box 352, Kikuyu Kenya

Corresponding author: Dr. I.O Mapenay, Email: imapenay@uonbi.ac.ke

ABSTRACT

Background: Foot-and-mouth disease virus (FMDV), an economically important pathogen of cloven hoofed livestock, is a positive-sense, single-stranded RNA virus classified in the Picorna viridae family. The RNA-dependent RNA polymerase (RdRp) of RNAviruses is highly conserved. Compounds that bind to the RdRp active site can block viral replication. The objective of the study was to identify natural compounds with antiviral activity against FMDV. using computer Assisted Drug Discovery (CADD) tools.

Materials and Methods: The study involved use of a combined High-throughput, structure based virtual screening (HTSBVS), molecular docking and In-silico ADMET techniques to identify potential inhibitors targeting FMDV RdRp (3Dpol). A cryo-EM structure of RdRp from FMD virus (ID 2E9Z) was used to identify novel bioactive compounds from the MCULE database.

Results: From 100,000 compounds, we identified 14 hit-to-lead molecules whose binding energies were lower than – 6.9 Kcal/mol. The top hit candidate showed the lowest binding energy of -9.2 Kcal/mol following site directed (focused) docking using Auto Dock Vina. These ligands obtained from the high throughput workflow were further screened for toxicity, drug-likeness (druggability) and pharmacokinetics. Finally, three (3) bioactive molecules were identified and their in-vitro antiviral activity ranged from 0.01 t0 1.0 µM.

Conclusion: Conclusively, we identified potential FMDV RdRp inhibitors that effectively bound within the enzyme active site. These compounds might be beneficial for FMDV or other picornavirus treatment and serve as useful leads for identification of new antiviral agents. In-vivo assays of the top lead compounds identified should be further undertaken to determine their ability to block viral replication.

Keywords: foot-and-mouth disease virus (FMDV); RNA-dependent RNA polymerase (RdRp); 3D polymerase (3Dpol); virtual screening; antiviral agent

DR. JOEL NYAMWEYA

Prevalence of hemoparasite infections and use of antibiotics for treatments in cattle in coastal Kenya

Joel Nyamweya[1], Ndichu Maingi[1], Ng'ang'a Chege[1], Collins Ngetich[2], Milton Owido[2], and Naftaly Githaka[2]

[1]Department of Veterinary Pathology, Microbiology and Parasitology, Faculty of Veterinary Medicine, University of Nairobi
[2]International Livestock Research Institute, Nairobi, Kenya
Corresponding Author: Dr.Joel Nyamweya <jllinda74@yahoo.com>

ABSTRACT

Background: Trypanosomiasis and tick-borne infections of cattle are endemic in Kenya and there is suspected improper treatment of these infections in the coastal region due to limited information on the prevalence of infection of cattle in the region. This information is important in creating awareness on drivers of possible antimicrobial resistance (AMR) and in combating the problem. The aim of this study was to establish the prevalence of vector borne hemoparasites infection of cattle and the treatment regimens used by farmers in Lunga Lunga Sub-county, Kenya.

Methods: A total of 393 cattle whole blood samples was collected from 99 farms in Lunga Lunga Sub-county, Kwale. Quantitative PCR (qPCR) was used to determine the presence of these infections through amplification of the 18S rDNA gene of the hemoparasites. Structured questionnaires were administered to 99 cattle owners to establish the use of antimicrobials for treatment of these infections.

Key results: Prevalence of hemoparasites was: - *Theileria. parva* was 41.2%, *Babesia bigemina* 31.8%, *B.bovis* 18.3%, *Anaplasma marginale* 39.2%, *A.centrale* 6.9%, *Ehrlichia ruminantium* 4.3%, *Trypanosoma congolense* 33.6%), *T.vivax* 16.8% and *T.theileri* 6.4%). Co-infection with one or more parasites was observed in 66.8 % of the cases, Oxytetracycline based antibiotics were used by 36.4% of farmers to symptomatically treat the tick-borne diseases and trypanosomiasis unawares of their efficacy. In addition, 36.4% of farmers used a combination of penicillin, streptomycin and oxytetracycline, while, 6% of the farmers used combination of penicillin and streptomycin with tylosin to treat these infections. Thirty seven percent of farmers used Buparvaquone for treatment of ECF together in combination with other antibiotics. Only a paltry 14% of the farmers observed the correct dosages for the antibiotics/drugs used and only 27% observed the recommended withdrawal periods for milk and meat post treatment.
Conclusions: The current findings reaffirm the endemicity of vector-borne hemoparasites in cattle within Lunga Lunga Sub-county. The use of antibiotics for treatment of these infections without clear knowledge of the cause of infection is prevalent and the practice is a major risk factor for the development and spread of AMR. These findings call for interventions to ensure proper antimicrobial stewardship in cattle in the Sub-county.

Key words: *hemoparasites, cattle, prevalence, AMR.*

DR. EMMA MUGO

Pig management practices and risk of occurrence of antibiotic resistant *Escherichia coli* pathotypes in piglets in Nyeri, County, Kenya

Emma Mugo[1], Jackson N. Ombui[1], Joshua O. Onono[1] Maina Ngotho[2] and Johnson N Gitahi[1]

1 Department of Public Health, Pharmacology and Pharmacology and Toxicology, Faculty of Veterinary Medicine, University of Nairobi.

2. Department of Animal Sciences, Jomo Kenyatta University of Agriculture and Technology

Corresponding author: Emma Mugo; Email: *emymugoh0@gmail.com*

ABSTRACT

Background: Pig rearing plays a vital role in alleviating poverty and socio-economic condition of rural farming communities in the developing countries. However, poor management practices and disease outbreaks often threaten productivity. Post weaning diarrhea in piglets associated with *Escherichia coli* infection will particularly lead to increased antimicrobial use in an effort to maintain their health and growth performance. The objective of this study was to identify *E. coli* pathotypes associated with piglets, their antimicrobial resistance patterns and management practices that pose a risk to occurrence of antibiotic resistance.

Materials and Methods: A cross sectional study was carried out involving 100 pig farms in Nyeri county. A multistage sampling approach involving purposive sampling to determine the sub-county and wards from where the study was to be conducted, and random sampling to select pig farms from which fecal samples were collected. Four sub-counties were selected on the basis of high pig population in each region. At the ward level, households with a minimum of four pigs at the age of four months and below were randomly selected to participate in the study. A structured questionnaire was used to collect from farmers information on antimicrobial use and pig management practices, while rectal swabs were taken from piglets aged ≤4months to isolate and characterize associated *E. coli* pathotypes and their antimicrobial resistance patterns.

Results: Findings documented substantial non-compliance with farm biosecurity measures and prudent use of antibiotics. Most farmers (66%) did mass treatment of all pigs once a disease with GIT symptoms was suspected, 21% self administered the antibiotics and 58% indiscriminately threw away to the environment expired drugs. Pathogenic *E. coli* isolates were found in 172/400 (43%) of the total isolates. The pathotypes isolated included enteropathogenic *E. coli* (EPEC) 14.7%, Enterohemorrhagic *E. coli* (EHEC) 5.5%, Enterotoxigenic *E. coli* (ETEC) 6.5%, Diffusely adherent (DAEC) 2.5%, Enteroinvasive *E. coli* (EIEC) 0.75%, and Enteroaggregative *E. coli* (EAEC) 13%. The isolates were resistant to penicillin (100%), tetracycline (59.69%), erythromycin (17.05%), amoxicillin clavulanic acid (13.95%) and trimethoprim sulfamethoxazole (13.18%). *Escherichia coli* was highly

susceptible to ciprofloxacin (96.12%) and gentamycin (97.67 %). Multidrug resistance was found in 81 (47.09%) of the isolates obtained.

Conclusion: *E. coli* pathotypes resistant to a number of antimicrobial agents were found to be circulating in study pig farms probably due to low farm biosecurity and inappropriate use of antimicrobial agents. It is recommended that animal health practitioners prioritize training of farmers on appropriate biosecurity measures and in prudent use of antimicrobial agents.

Key words: *Escherichia coli* pathotypes, Antimicrobial resistance, piglets, Nyeri county

DR. ADDIS MEKONNEN

Antimicrobial sensitivity patterns of S*almonella* isolates from eggs, raw milk, cheese and yoghurt from Mizan-aman, Ethiopia

Mekonnen Addis and *Behailu Yigzaw*

Jimma University, Jimma, Ethiopia ; E-Mail:mekonnenaddis2010@yahoo.com,

ABSTRACT

Background: *Salmonella* are the leading cause of food borne diseases in the world and infections in humans are usually contracted from meat, eggs, milk, fruits and vegetables. The objective of this study was to determine the prevalence of *Salmonella* and evaluate the antimicrobial resistance pattern of the isolates from eggs, raw milk, cheese and yoghurt collected at Mizan-Aman town, Ethiopia.

Methods: A cross sectional survey was done, in which a total of 400 samples were collected from and analyzed. Isolation and identification of *Salmonella* was done as per the protocol of ISO (11290-1:2003). Antimicrobial resistance pattern profiles of the isolates were carried out using minimal inhibitory concentration for 10 antimicrobials using Kirby-Bauer test for antimicrobial susceptibility evaluation.

Key results: The overall prevalence of *Salmonella* in this study was found to be 5%. The prevalence of *Salmonella* was shown to be 10%, 2%, 5% and 3% among eggs, raw milk, cheese and yoghurt, respectively. There was statistical significant difference ($p<0.05$) in the prevalence of *Salmonella* among sample types. From the total isolates 70% of them showed multi drug resistance. 90% and 50% of the isolates were resistant to ampicillin and tetracycline, respectively. All isolates from raw milk and cheese were resistant to ampicillin. Ceftriaxone was resisted by isolates from raw milk and cheese.

Conclusion and Recommendations: Eggs, raw milk, cheese and yoghurt were found to be contaminated with *Salmonella* and the isolates were resistance to one or more antimicrobials. Occurrence of *Salmonella* in these food items and their AMR is of public health concern particularly the treatment of infections with Salmonella. A more extensive survey on the prevalence of *Salmonella* along food lines in the study area needs to be undertaken, the genetic mechanisms of AMR in these bacteria studied and judicious use of antimicrobials adopted.

Keywords: *Antimicrobial-resistance, Ethiopia, Mizan Aman, Prevalence, Salmonella*

WILLY NZULU KISOI

Phytochemical Profiles, Antioxidant and Hematinic Activities of *Hibiscus acetosella* Leaf Extracts on 2,4-Dinitrophenylhydrazine-Induced Anaemia in Wistar Rats

Willy Nzulu Kisoi[1*], Kenneth Ogila[1], Albert W. Nyongesa[2], Juliah A. Khayeli[1], Evans N. Nyaboga[3]

[1]Department of Zoology, Jomo Kenyatta University of Agriculture and Technology, P.O. Box 62000 - 00200, Nairobi, Kenya

[2]Department of Veterinary Anatomy and Physiology, University of Nairobi, P.O. Box 30197 - 00100, Nairobi, Kenya

[3]Department of Biochemistry, University of Nairobi, P.O. Box 30197 - 00100, Nairobi, Kenya

***Corresponding Author:** Willy Nzulu Kisoi, Department of Zoology, Jomo Kenyatta University of Agriculture and Technology, P.O. Box 62000 - 00200, Nairobi, Kenya. Email: willynzulu@gmail.com

ABSTRACT

Background: Anaemia affects nearly 1.74 billion people globally, with accompanying increased risk of mortality and severity of morbidity in developing countries. Conventional treatments possess side effects, and, as well, unaffordable to large affected populations. Medicinal plants have the potential to ease this burden and act as alternative sources of managing anaemia, and with less side effects. *Hibiscus acetosella* is a medicinal plant that has been used traditionally to manage several ailments from fever and even anaemia. This study evaluated the phytochemical composition, antioxidant capacity, and hematinic activity of ethanolic and aqueous extracts of *Hibiscus acetosella* on 2,4-dinitrophenylhydrazine-induced anaemia model in Wistar rats.

Methods: Phytochemical analysis on extracts was done by Gas Chromatography-Mass Spectrometry. Anaemia was induced in rats through administration of 2,4-dinitrophenylhydrazine (2,4-DNPH) at 40 mg/Kg b.w. for 7 days followed by oral administration of *Hibiscus acetosella* extracts at 100, 200, 400 mg/Kg b.w. for 28 days. Hematological parameters (RBC, HGB, HCT, MCV, MCHC, MCH) and oxidative stress markers (CAT, GSH, MDA) were measured in blood serum.

Results: Phytol, squalene and 2-Methoxy-4-vinylphenol were revealed in extracts. The 2,4-DNPH significantly reduced ($p < 0.05$) HCT, RBC and HGB, but significantly increased MCH, MCV and MCHC levels. Ethanolic extract treatments significantly increased ($p < 0.05$) RBC, HCT and HGB. Similarly, MDA levels were significantly elevated ($p < 0.05$) in the negative control rat group, while ethanolic extract (400 mg/Kg b.w.) significantly increased ($p < 0.05$) the GSH and CAT levels.

Conclusion: *Hibiscus acetosella* extracts exhibit potent antioxidant and hematinic activities, which may be ascribed to phytochemical compounds present. The findings complement its ethnomedicinal use in oxidative stress and anaemia management. Further research on the mechanistic link between secondary metabolites and antihematinic potential will lend more

insights into formulation of this plant in the treatment and management of anaemia and related conditions.

Keywords: Anti-anaemic; antioxidant; haemolytic anaemia; *Hibiscus acetosella*; reactive oxygen species; oxidative damage; 2,4-dinitrophenylhydrazine

SUBTHEME 3

ANIMAL DISEASES, RE-EMERGING ZOONOSES, AND ONE HEALTH

LIAN THOMAS- Guest speaker

The Sustainable Control of *Taenia solium*

ABSTRACT

Taenia solium, the pork tapeworm, is a neglected zoonotic parasite with profound implications for human and animal health in East Africa. Despite being a leading cause of preventable epilepsy through neurocysticercosis, *T. solium*remains under-recognized due to diagnostic challenges, fragmented surveillance, and systemic barriers to healthcare access. This presentation explores the parasite's epidemiology, risk factors, and socio-ecological drivers of endemnicity, highlighting insights from field studies in Uganda and Kenya. I will discuss the importance of context in designing control strategies, integrating gender and governance considerations, and evaluating economic trade-offs. Finally, the session introduces the SUSTAIN-Uganda project, which combines a randomized controlled trial, modelling, and process evaluation to test feasible, cost-effective, and scalable approaches for integrated control of *T. solium*.

DR. RICHARD KIHARA

Prevalence and risk factors associated with zoonotic gastrointestinal parasites of dogs in Kitui central Sub-county Kitui Kenya.

Richard Kihara[1]. Amos Mbugua[1], Samuel M Githigia[2], Nichodemus M. Kamuti[2], Beatrice M. Munde[2]
[1]Jomo Kenyatta University of Agriculture and Technology. Department of Medical Laboratory Sciences.
[2]University of Nairobi. Department of Veterinary Pathology, Microbiology and Parasitology.
Corresponding author: Richard Kihara. Email address –kihararichie@gmail.com

ABSTRACT
Background: Dogs are popular pets around the world and have always had a close relationship with humans. In the last decade, Kenya has seen an increasingly significant interaction between dogs and humans. Today, pets are often considered family members. Although dogs bring many advantages to humans, they are associated with many potentially zoonotic organisms of parasitic origin. They circulate in various dog–human and dog–animal cycles. Kitui Central Sub-County is known for having a high number of dogs. This study was designed to establish the prevalence of zoonotic gastrointestinal (GIT) parasites in dogs, Risk factors involved, Knowledge, attitudes, and practices (KAP) of dog owners regarding dogs rearing and deworming as well as prevalence of zoonotic GIT parasites in humans.

Methods: A cross-sectional design was used. One-hundred-and-ninety (190) dogs and humans were sampled from October 2024 to December 2024 using a proportional stratified sampling technique across the five administrative wards of Kitui Central Sub-County. Dogs were picked through a random sampling procedure. A dog fecal sample and a corresponding human sample of the dog owner or handler were collected in every homestead visited. Fecal analysis for zoonotic GIT parasites was conducted at the University of Nairobi parasitology laboratories. Additional data on KAP was collected by use of questionnaires

Results: A prevalence of 76/190 (40.0%) zoonotic GIT parasites was detected in dogs faecal samples in this study. Kyangwithya East (KE) ward had the highest percentage prevalence, 25/45 (55.55%). Ancylostoma caninum was the most prevalent, 39/76 (51.3%). Non zoonotic oocysts (Cytoisospora and Eimeria) accounted for 13/76 (17.1%). Higher prevalence of zoonotic GIT parasite was observed in roaming dogs 38/50 (76.0%) compared to those with approximately 12 hours access to outdoor environment 32/128 (25%) and those always confined 6/12 (50.0%). Dogs that were dewormed every 3 months had the lowest prevalence of 9/51 (15.3%) compared to those dewormed every 6 months, 17/37 (45.9%). On knowledge of Dogs GIT parasites, 182/190 (95.7%) were not aware, only 8/190 (4.3%) were aware. The number of human faecal samples positive for GIT parasites were 42/190 (22.1%). Protozoan GIT parasites(E histolytica and G. lamblia) were the most prevalent.
Conclusion: Zoonotic dogs' GIT parasites are prevalent in Kitui Central. The study highlights existing gaps in their prevention, control practices, and knowledge. It recommends further one-health community campaigns on the role of dogs in transmission of GIT parasites.

Keywords: Dogs, Gastrointestinal parasites, Zoonosis

DR. ADDIS MEKONEN

Sero-prevalence of Q-fever infection among cattle in West Omo zone, Ethiopia: A neglected tropical emerging zoonosis

Mekonnen Addis and Wondimagegn Demissie

Corresponding author: Mekonnen Addis: Jimma University, Jimma, Ethiopia; E-Mail: mekonnenaddis2010@yahoo.com, Cell: 0912112251

ABSTRACT

Background: Q fever caused by *Coxiella burnetii* is an emerging and neglected tropical zoonotic disease. Infection in cattle can cause abortion and infertility; however, there is little epidemiological information regarding the disease in dairy cattle in Ethiopia in general and the West Omo Zone in particular. The objective of this study was to determine the sero-prevalence and risk factors of *C. burnetii* infections in cattle in in the region.

Methods: A cross-sectional study was conducted in the study area from February 2022 to December 2022, during which blood samples were collected from 461 cattle. Sera from the blood samples were tested for the presence of antibodies against *C. burnetii,* using an indirect ELISA to identify potential risk factors for *C. burnetii* seropositivity, a multivariable random effect logistic regression analysis was used.

Key results: An overall seroprevalence of 8.86% and 25% *C. burnetii* was found at the animal and herd levels, respectively. Seropositivity at the animal level was significantly associated with age, herd size, management system, access of cattle to dogs, cats, and mice, accessibility of cattle to wild animals, presence of ticks on cattle and history of abortion. A herd-level analysis identified several risk factors for *C. burnetii* infection, including the management system, agro-ecology, herd size, and accessibility of cattle to dogs, cats, and mice.

Conclusion and Recommendation*: Coxiella burnetti* infections are prevalent in cattle in **the** West Omo Zone in Ethiopia and a number of risk factors are significantly associated with the infections. Awareness creation on the cause, modes of transmission, risk factors, effects of the infections, prevention and control in both animals and human should be done among the livestock owners and other stakeholders

Keywords: *Coxiella burnetii*, seroprevalence, risk factors, cattle, West Omo

DR. ANGEL NANGIRA MWANGI

Prevalence of canine rabies in Nairobi County, Kenya: A 6 -year retrospective study

Angel Nangira Mwangi
Faculty of \Veterinary Medicine , University of Nairobi

Email: **drnangiramwangi@gmail.com**

ABSTRACT

Background: Rabies is a deadly zoonotic disease that causes an estimated 59,000 human fatalities worldwide each year with 25,000 (42%) of these mortalities occurring in Africa. 2,000 (8%) of African mortalities are from Kenya. In 2015, the disease ranked as one of the top five priority zoonotic diseases in Kenya and a National Action Plan to eliminate rabies was developed. Despite this prioritization, the strategic plan was not implemented due to lack of funding and lack of comprehensive data on the disease burden and its impacts at both national and county level. Being a notifiable disease, all suspected rabies cases in the county are notified to the Director of Veterinary services and a sample, sent to the Central or Regional Veterinary Laboratories for confirmation. The primary objectives of this study are to assess the prevalence of canine rabies in Nairobi county and to recognize trends in disease occurrence.

Methods:. A 6 year retrospective study was carried out using available data at the directorate of veterinary services on confirmed cases of rabies in Nairobi county. Data on all samples of suspected rabies cases originating from Nairobi County was obtained from the available case files.The information on date of submission, administrative location of origin, sample type, test done and test results were captured for each sample submitted on an Excel sheet. Data of the confirmed rabies cases was analyzed using Microsoft Excel to determine the prevalence, and spatial trends of the disease in the county.

Key results: Results revealed that 89/157(56.7%) of canine samples submitted were positive for rabies. There was an increasing trend in the occurrence of the disease in the county with a sharp two-fold increase in the number of positive cases from 2023 to 2024. Ninety 90% of the confirmed cases originated from two main sub-counties namely, Langata and Westlands, which are predominantly resided in by middle and upper class residents. This combined with the complete absence of positive confirmed cases from low-income densely populated informal settlements suggests that there is a likelihood of underreporting.

Conclusion and recommendation: With the increasing numbers of confirmed rabies cases in the county, intervention efforts must be put into place focusing on the geographic hot-spots of disease and under reported areas in order to realize a rabies-free future, not just for animals but also for humans within the county.

Key words: Rabies, zoonoses and public health

DR. MUMBUA MBITHI

Evaluation report on animal rabies surveillance system in Kenya (2019-2024)

Mumbua Mbithi[1], A. Mwatondo[2]

[1]Directorate of Veterinary Services; [2]Field of Epidemiology and Training Programme

Corresponding author: Mumbua Mbithi -email**:** **mbithimumbua97@gmail.com**

ABSTRACT

Background: Rabies is a major public health concern in Kenya, causing an estimated 523 human deaths annually, mostly from dog-transmitted infections. Despite this burden, there is limited documented evidence of prior evaluations of the rabies surveillance system, highlighting a critical gap in understanding its effectiveness. This evaluation sought to analyse rabies surveillance data and assess the key system attributes.

Methods: The evaluation was conducted using the Centers for Disease Control (CDC) guidelines for assessing public health surveillance systems. A retrospective review of animal rabies data from SILAB For Africa (SILABFA) was carried out for the period 2019-2024. The evaluation focused on five key attributes: simplicity, flexibility, acceptability, timeliness, and stability. Data was collected through semi-structured questionnaires and shared with stakeholders, including veterinarians and laboratory technologists. Data was abstracted from SILABFA, cleaned, and analyzed using Microsoft Excel. Descriptive analysis was performed to assess trends over time and geographical distribution of rabies cases over time.

Results: Out of a total of 509 samples from suspected rabies cases recorded in the review period, 344(68%) were confirmed positive rabies cases. Nairobi County reported the highest number of confirmed cases, with a total of 111(32%) cases, with Kiambu 28(8%) cases, Nakuru 28(8%) cases and Makueni 26(8%) cases reporting high numbers. Canines (dogs) were the most affected species, accounting for 180 cases (52%), followed by bovines (cattle) with 107 cases (31%). Ten stakeholders participated in the interview and their responses on the attributes were as follows; simplicity in 4(40%), flexibility 8(80%), acceptability 6(60%), timeliness 7(70%) and stability the downtime was 5(50%).

Conclusion: From the evaluation we noted a high proportion of confirmed rabies cases among suspected samples, with Nairobi, Kiambu, Nakuru, and Makueni counties reporting the highest burden likely due to their proximity to diagnostic laboratories while underreporting remains a concern in more remote areas due to challenges like transportation, limited staff, and resource constraints. Canines were the most affected species, and although the surveillance system showed strengths in flexibility and timeliness. Notable gaps in simplicity, acceptability, and stability highlights the need for strengthened surveillance capacities and enhanced stakeholder engagement to improve rabies diagnosis and control in Kenya.

Key words: Rabies surveillance system, Evaluation report, Kenya

DR. FREDRICK O. OBONYO

Molecular detection and genetic characterization of *Toxoplasma gondii* in donkeys in Kirinyaga and Meru counties, Kenya

Fredrick O. Obonyo[1,2*], Ndichu Maingi[1], Samuel M. Githigia[1], Kevin O. Ochwedo[3], Anne A. Owiti[4], and Evans N. Nyaboga[4]

[1]Department of Veterinary Pathology, Microbiology and Parasitology, University of Nairobi, P.O. Box 29053, Kangemi 00625, Kenya
[2]Department of Animal Science, Meru University of Science and Technology, P.O. Box 972, Meru 60200, Kenya
[3]Department of Entomology, Plant Pathology and Nematology University of Idaho 492 W Taylor Ave, Apt 6, Moscow
[4]Department of Biochemistry, University of Nairobi, P.O. Box 30197, Nairobi 00100, Kenya

*Corresponding author: fobonyo@must.ac.ke

ABSTRACT

Background: *Toxoplasma gondii* is an intracellular protozoan parasite of zoonotic concern and economic importance in humans and animals, respectively. The parasite has a broad range of intermediate hosts including donkeys. Although Kenya is major donkey breeding area with a well-developed donkey industry, there is scarcity of information on *T. gondii* infections in donkeys. This study investigated the presence of *Toxoplasma gondii* in donkeys in Kirinyaga and Meru Counties of Kenya using molecular tests and genetic diversity analysis of the obtained DNA samples.

Methods: A total of 363 blood samples were collected from donkeys in Meru and Kirinyaga Counties, and 96 samples that were previously seropositive for *T. gondii* using indirect ELISA were screened using nested PCR. The screening was based on the amplification of the internal transcribed spacer 1 (ITS-1) gene followed by DNA sequencing and phylogenetic analysis. Genotyping was performed on 15 selected positive samples using multilocus nested polymerase chain reaction-restriction fragment length polymorphism (Mn-PCR-RFLP) with eight genetic markers (’SAG 2, 5’SAG 2, Alt. SAG 2, SAG 3, GRA 6, C29-2, BTUB, and L358).

Results: *Toxoplasma gondii* DNA was detected in 36.5% (35/96) of the blood samples. The sequences obtained in this study exhibited 98.2-99.5% homology with those deposited in GenBank. Phylogenetic analysis demonstrated that the obtained sequences are conserved in Kenyan donkeys and clustered with those of infected animals from other regions of the world. Eighteen distinct *T. gondii* haplotypes were identified to be circulating in donkeys in Kirinyaga and Meru counties, Kenya. The *T. gondii* DNA samples exhibited high haplotype diversity (Hd: 0.915) and limited genetic diversity (π = 0.01027) suggesting little genetic differentiation in the population. PCR-RFLP of *T. gondii* DNA-positive samples revealed three different genetic combinations that consisted of alleles I, II and III, indicating the dissemination of atypical genotypes in donkeys in Kirinyaga and Meru Counties, Kenya.
Conclusions: This is the first study to genetically characterize *T. gondii* infections in donkey populations in Kenya. The study has demonstrated that *T. gondii* is widespread in donkeys from

Kenya and could be a possible source of infection in humans. Additional studies are needed to determine the distribution patterns of *T. gondii* haplotypes and genotypes in donkeys in other geographical areas in Kenya and assess the risk of zoonotic transmission of the parasite through the consumption of donkey meat.

Key words: Donkeys, Genotypes, ITS-1 gene, Kenya, *Toxoplasma gondii*

DR. DAVID OBIERO

Assessment of *Taenia saginata* and other enteric parasites in Narok county, Kenya -

David Obiero Oduori*[1, 2], Philip Mwanzia Kitala[1], Timothy Muthui Wachira[1], Erastus Mulinge[3], Tabitha Irungu[3], Eberhard Zeyhle[4], Robert Ofwete[5], Sarah Gabriël[6] and Peter Baaro Gathura[1]

[1]Department of Public Health Pharmacology and Toxicology, University of Nairobi, P.O. Box 29053-00625, Nairobi, Kenya;
[2]Department of Animal Health and Production, Maasai Mara University, P.O. Box 861-20500
Narok, Kenya;
[3]Kenya Medical Research Institute, P.O. Box 54840 00200, Nairobi, Kenya;
[4]Meru University of Science and Technology, P.O. Box ,972-60200, Meru, Kenya;
[5]Amref Health Africa, P.O. Box 30125, 00100, Kenya;
[6]Department of Translational Physiology, Infectiology and Public Health, University of Ghent, Salisburylaan 133, 9820 Merelbeke, Belgium.

***Corresponding author:** D.O. Oduori, Email: dr.obiero@gmail.com

ABSTRACT

Background: The epidemiology of *Taenia saginata* taeniasis in Kenya remains poorly understood due to limited available data and the large chronological gaps between existing reports. Infections nonetheless persist and impact the development and optimization of the beef industry. This study aimed to estimate the occurrence of human taeniasis in Narok County, Kenya.

Methods: Screening for other enteric parasites was also carried out. Stool samples were subjected to microscopy, copro-antigen enzyme-linked immunosorbent assay (copro-ELISA) and multiplex polymerase chain reaction (PCR), targeting the cytochrome c oxidase subunit 1 gene.

Results: A single sample tested positive on copro-ELISA (0.3 %, 95% CI, 0-1.6, *n* = 360); all samples tested negative on PCR and copromicroscopy. Microscopy (*n*=361) additionally identified *Entamoeba histolytica/dispar/moshkovskii* at a prevalence of 15.5 % (95 % CI, 12.1-19.6), *Giardia* spp. at 5.3 % (95% CI, 3.4-8.1), *Hymenolepis* spp. at 1.1%, (95% CI, 0.4-2.8) and hookworm at 0.3 %, (95% CI, 0-1.6). Grazing livestock near the homestead (<2

km) (AOR = 0.07, 95% CI 0–0.36, p = 0.011) and formal education (AOR = 0.06, 95% CI 0.01–0.50, p = 0.014) were both associated with lower odds of *Giardia* spp. infection.

Conclusions: Our findings indicate a remarkably low prevalence of human taeniasis in the study population. However, the detection of other pathogenic zoonotic intestinal parasites highlights a persistent public health challenge. These results emphasize the need for a One Health approach to strengthen food safety and hygiene interventions.

Key words: Taeniasis, intestinal parasites, prevalence

SUBTHEME 4

FISHERIES AND AQUACULTURE MANAGENT

DR. MARY OPIYO - Keynote Speaker

Kenya Marine & Fisheries Research Institute, National Aquaculture Research Development & Training Center, P.O. Box 451-10230, Sagana, Kenya

Aquaculture development in Kenya. Challenges and future prospects

ABSTRACT

Aquaculture represents the fastest-growing food-producing sector worldwide and is increasingly acknowledged for its contributions to income generation and the provision of protein-rich food, particularly in developing countries. In Kenya, fish demand continues to increase due to population growth and a shift toward healthier dietary preferences. However, the supply of fish remains inadequate because of declining natural fish stocks. As a result, aquaculture is emerging as a strategic approach to enhance food and nutrition security, create rural employment, and alleviate pressure on wild fisheries by bridging the gap between fish demand and supply. Freshwater aquaculture, primarily involving Nile tilapia (*Oreochromis niloticus*) and African catfish (*Clarias gariepinus),* constitutes most production, with pond-based systems being most common. In 2023, freshwater aquaculture production reached 33,423 MT, valued at 9.9 KES billion. Despite the availability of extensive coastal and inland water resources, the mariculture sector and intensive high-technology systems remain underexploited.

The sector encounters significant challenges that impede sustainable growth. Major obstacles include limited availability of quality seed (fingerlings and broodstock), high and inconsistent costs of fish feed, insufficient technical and managerial capacity among small-scale farmers, inadequate extension and research support, weak policy and regulatory frameworks, and poor infrastructure such as cold storage, hatcheries, and market access. Environmental constraints, including water quality issues and climate variability, further complicate development. The expansion of intensive culture systems, particularly cage systems, also presents fish health challenges due to crowding, which requires increased monitoring by fish health professionals.

The outlook for aquaculture in Kenya is favourable if comprehensive interventions are implemented.

Opportunities exist in enhancing local seed production and feed manufacturing by adopting more intensive and efficient systems such as cage culture, recirculating aquaculture systems, and integrated multitrophic aquaculture. Additionally, advancements in fish postharvest technologies, including value addition and cold-chain facilities, are also necessary. Further progress depends on strengthening capacity building and extension services, fostering public-private partnerships and implementing supportive governmental policies. Increased investment in research together with rising domestic demand and export potential, provides a robust foundation for sector expansion. Achieving this potential necessitates addressing technical, infrastructural and institutional barriers, as well as promoting innovation and policy alignment to establish a scalable and resilient aquaculture in Kenya.

Keywords: Aquaculture, fish, Kenya, production,

TOBIAS OWITI ODHIAMBO

An insight into heavy metal levels and effects on the reproductive performance of *O. niloticus* within Lake Victoria, Kenya

***Tobias Owiti Odhiambo[1,2], Jane Mburu[2], Evalyne Mwihia[2], Wilson Jere[1]**

[1]Department of Aquaculture and Fisheries, Lilongwe University of Agriculture and Natural Resources- Malawi

[2]Faculty of Veterinary Medicine and Surgery, Egerton University- Kenya

P.O. BOX 536-20115

*****Corresponding E-mail: owititobias6@gmail.com

ABSTRACT

Background: Lake Victoria plays a significant role in economic sustainability of surrounding countries by providing aquatic products that serve as a quality protein source, creating opportunities for trade, employment gas transportation and a tourism hub. Increased levels of heavy metals affect fish productive physiology, and research has shown that consumption of fish products with high levels of heavy metals have harmful effects on both humans and animals. Studies documenting the impact of heavy metal levels on the reproductive performance of *O.niloticus* within Lake Victoria were not accessible or were not present by the time this study was conducted. This study determined levels of selected heavy metals and their effects on reproductive performance of Nile Tilapia (*Oreochromis niloticus*) in Lake Victoria, Kenya.

Methods: A cross-sectional study was conducted across six sites comprising caged and wild fish, collecting a total of 282 fish and six water samples. Water quality parameters , heavy metal concentrations (Pb, Cd, Cu, Zn, Cr, and Fe) in water and fish tissues (liver and muscle),

and reproductive performance indicators including body weight, gonad weight, fecundity and gonadosomatic index (GSI), were analyzed.

Results: Results revealed significant variation in water conductivity (p = 0..035) and salinity 1(p = 0 .019). Heavy metal analysis showed elevated concentrations of Pb and Cd in both liver and muscle tissues, significantly exceeding the levels of the same metals in water (p < .01). The liver had the highest levels of all heavy metals compared to muscle and water however, Cd. Zn concentrations had significant variations across sites (p=0.049). Essential metals (Fe, Zn, and Cu) were more associated with caged fish, while non-essential metals (Pb and Cd) were higher in wild fish. No significant differences in reproductive traits were observed across sites, except for body weight, which was significantly higher in wild fish compared to those caged (p < 0.001). However, the GSI was significantly higher in caged fish (p = 0 .0008). Spearman correlation analysis confirmed a significant negative association between Pb levels and GSI (r = –.66, p = .028), while other metals showed weak negative or no correlation with reproductive indices. The results showed elevated levels of Pb and Cd in fish based on compared to WHO standards.

Conclusion; In conclusion, *O. niloticus* in Lake Victoria bioaccumulates heavy metals in vital tissues, particularly the liver. These metals and especially Pb adversely impact fish reproductive functions. These findings highlight the ecological and public health risks of heavy metal contamination in aquatic ecosystems and recommend NEMA to conduct regular environmental monitoring and improve waste management around the lake.

Keywords: Nile Tilapia, heavy metals, reproductive performance, Lake Victoria

ADILI MBEMBELA

A comparative study of the prevalence of gastrointestinal helminths in farmed fish from Mbeya region and Lake Rukwa, Tanzania

Adili Mbembela1*, Eliezer Mwakalapa[1] and Everlyn Mwihia[2]

1 Mbeya university of science and technology P.O.Box 131 Mbeya, Tanzania

2 Egerton university, P.O.Box 536 - 20115, Egerton-Njoro, KENYA

*CorrespondingAuthor- Adili Mbembela; E-mail: adilimbembela.am@gmail.com

ABSTRACT

Background: Aquaculture represents one of the fastest-growing food production sectors globally, contributing significantly to food security and economic development across numerous developing nations including Tanzania, However, the intensification of tilapia production faces significant challenges from parasitic diseases, with gastrointestinal tract (GIT) helminths being among the most common parasitic agents affecting aquaculture production worldwide, alongside their potential zoonotic threat. The aim of this study was to investigate the prevalence of gastrointestinal helminths in farmed and wild tilapia fish in Mbeya region and lake Rukwa Tanzania.

Methods: The cross-sectional study which involved the stratified random sampling of 314 fish in two strata of Mbeya region (five wards) and Lake Rukwa (two sites) was conducted to investigated the GIT helminths in tilapia. Fish samples were collected for GIT helminths analysis and water quality was measurement. A questionnaire was administered to farmers for purposes of collecting data on management practices. Collected fish samples were taken to MUST and SUA helminthology laboratory for parasitological study. Qualitative and quantitative eggs analysis involved fecal floatation's technique and MacMaster method while isolated worms were stained with lactophenol blue for gross microscopic identification

Results: The study revealed the overall prevalence of 20.06% (63/314) of gastrointestinal helminths. Farmed fish had ahigher prevalence (22.43%) compared to wild tilapia (15%) though they were not significantly different (p = 0.171). Morphological analysis identified adult nematode (*Contracaecum* spp) and helminths eggs (nematode *Capillaria* spp and cestode *Diphyllobothrium* spp) across the infected fish. The eggs dominated assemblages (82.5% of all infections) and mixed infections with both eggs of Capillaria spp and Diphyllobothrium spp occurred sporadically making 3.9% of all eggs infections cases, while adult worms (*Contracaecum* spp) were relatively low (17.5%). Among infected fish, egg per gram (EPG) counts ranged from 100 to 15,600 eggs per gram fecal material. Males fish had higher prevalence of 20.6% which was not significantly (p = 0.492) different compared to 17.8% prevalence in females. (at. Larger fish (mean weight105.9g ± 67.8) showed elevated infection probability (48.5% greater) than small fish (71.3g ± 48.2). Among farmers, prevalence ranged from 0% to 93.3. Mixed-effects modeling revealed management practices shape helminths outcome in tropical aquaculture.

Conclusions: The 20.06% overall prevalence embodies the collective struggles of hundreds of farmers seeking sustainable livelihoods through tilapia production. The findings demand strategic reorientation from technology-focused to management-focused helminths control approaches.

JOSEPH OKAL

Levels, determinants and effects of polychlorinated biphenyls and organochlorine pesticides in fish in Lake Victoria, Kenya

Okal Joseph[1], Mtethiwa Austin[2], Mwihia Evalyn[3], & Mburu Jane.[4]

[1.]Department of Aquaculture and Fisheries Sciences, Lilongwe University of Agriculture and Natural Resources/ Egerton University, ondurujoe@gmail.com.

[2.]Department of Aquaculture and Fisheries Sciences, Lilongwe University of Agriculture and Natural Resources.

[3.]Department of Veterinary Parasitology, Microbiology and Pathology, Egerton University.

[4.]Department of Veterinary Surgery, Theriogenology and Medicine, Egerton University.

ABSTRACT

Background: Organochlorine pesticides (OCPs) and polychlorinated biphenyls (PCBs) are Persistent Organic Pollutants (POPs) known for their persistence, bioaccumulation and toxicity. Although their production and use were restricted under the Stockholm Convention

(2004), residues persist in aquatic environments, including Lake Victoria, due to legacy contamination and possible ongoing inputs. This study assessed concentrations of selected OCPs and PCBs in muscles of *Oreochromis niloticus* from Lake Victoria byinvestigating their determinants of pollution, and evaluating the associated hepatic histopathological lesions.

Methods: One hundred and fifty-four Nile tilapia were purposively sampled from six highly anthropogenic sites in Siaya County, Kenya, including both cage aquaculture and wild-caught fish. Fish liver samples were harvested and fixed in 10% neutral buffered formalin, and processed using standard histological methods and examined for lesions. Lesion severity was scored as mild (2), moderate (4), or severe (6). Muscle tissue was pooled (n = 36) and analysed for α-HCH, γ-HCH, trans-chlordane, PCB-77, PCB-81, PCB-156, PCB-167, and PCB-169 using gas chromatography–mass spectrometry (GC-MS). Determinants of pollution were identified using structured questionnaires administered to fishermen and fisheries/agrovet personnel.

Results: Mean concentrations (ng/g wet weight) ± SD were α-HCH (0.1342 ± 0.0643), γ-HCH (0.0354 ± 0.0251), trans-chlordane (0.0305 ± 0.0442), PCB-77 (0.0055 ± 0.0044), PCB-81 (0.0091 ± 0.0034), PCB-156 (0.0075 ± 0.0028), PCB-167 (0.0074 ± 0.0041) and PCB-169 (0.0078 ± 0.0020). No significant differences in concentrations were observed across locations, culture systems or sex, suggesting localized but widespread exposure. Correlations between contaminant levels and morphometric variables ranged from moderately negative to strongly positive. The most common hepatic lesions were congestion (77.3%), cellular infiltration (27.3%), nuclear alterations (19.5%), and vacuolar degeneration (14.9%). Congestion severity differed significantly by location ($p = 0.0071$) and culture system ($p = 0.0196$) but not by sex ($p = 0.108$). Major identified pollution determinants included agricultural activities (animal and crop farming) and direct waste disposal. Pesticides in use included organophosphates, pyrethroids and carbamates, were as well as banned compounds such as chlorpyrifos and emamectin benzoate.

Conclusion: Detected contaminant levels, concurrent hepatic lesions and identified pollution determinants underscore the need for sustained monitoring of POPs levels, ecological and health effects, and ongoing pollution sources to safeguard public health.

Keywords: Organochlorine Pesticides; Polychlorinated Biphenyls; Nile tilapia, Histopathology; Lake Victoria.

DR. ANNAH MULAMBA

Aquaculture practices and fish welfare knowledge of fish farmers in Kisumu County, Kenya

Annah Mudamba, Joshua Onono, Peter Gathura and Tequiro Abuom

Faculty of Veterinary Medicine University of Nairobi

Corresponding author: Dr. Annah Mudamba (annahmudamba@gmail.com)

ABSTRACT

Background: Aquatic ecosystems and fisheries play a vital role in food security and livelihoods worldwide, yet fish welfare remains understudied as an aspect of sustainable aquaculture and fisheries management. Fish welfare encompasses fish's physical and psychological well-being, including their health, nutritional status, environmental conditions, behavioral freedom and humane handling throughout capture or farming operations. While growing global attention has focused on animal welfare in terrestrial farming, limited studies exist on fish welfare and especially the level of awareness of fish farmers in Africa.

Objective: To review and identify fish welfare concerns in Africa and assess aquaculture systems used by fish farmers in Kisumu and their level of knowledge regarding fish welfare

Methodology: The study employed a mixed-methods approach, combining a systematic literature review (SLR) with observation and qualitative data collection. The SLR focusing on peer-reviewed articles from 2000–2023. Farming systems were identified through observations, while farmer knowledge and practices were determined from stakeholders through focus group discussion and key informant interviews.

Results: The systematic literature review of 69 papers revealed growing research on fish welfare in Africa in the period 2000- 2023, across 26 African countries. It identified key fish welfare concerns and barriers across Africa. Wild fish studies (84%) mainly addressed unsustainable fishing and pollution, while aquaculture studies focused on health and nutrition. Barriers identified included weak governance, poverty, high input costs and limited access to knowledge and resources.

In Kisumu, aquaculture activities were dominated by cage farming of tilapia with 8–10-month production cycles and use of commercial feed. Farmers showed moderate welfare awareness which included monitoring of feeding and behavior and avoiding overstocking. However, major gaps still exist in disease detection with 75% of respondents relying on increased fish mortality as evidence of disease, no evidence of practicing humane slaughter through fish stunning and 63% of respondents disposing dead fish directly into the lake.

Conclusion: The study highlights key gaps and opportunities in fish welfare across Africa. Findings support targeted interventions, capacity building and policy reforms to enhance sustainable fish production and improve animal welfare. It is recommended that regional collaborations be strengthened to harmonize fish welfare standards and that awareness campaigns be implemented to promote best practices among stakeholders. This work offers actionable insights to improve livelihoods, environmental sustainability, and food safety.

Key words: Fish welfare, aquaculture, wild fish, Africa

FAISAL QURESHI

Advancing Farmed Fish Welfare in Egypt and Kenya Using One Health and One Welfare Approaches

Authors: Wasseem Emam[1,2] and Faisal Qureshi[1]

Affiliation of Authors:
[1]Ethical Seafood Research (UK, Kenya, Egypt)
[2]Faculty of Veterinary Medicine, Complutense University of Madrid in Spain

Corresponding Author and Email Contact:
Faisal Qureshi, Email: faisal@ethicalseafoodresearch.com

ABSTRACT

Background: Fish farming is rapidly expanding in Africa, with Egypt and Kenya emerging as key hubs of tilapia aquaculture. Despite this growth, fish welfare remains poorly understood and rarely integrated into farming practices, leading to ethical, environmental, and economic challenges. Ethical Seafood Research (ESR) applies One Health and One Welfare frameworks to improve farmed fish welfare while supporting sustainable aquaculture development.

Methods ESR conducted multi-stakeholder focus groups and workshops with aquaculture practitioners in Egypt's Nile Delta and Kenyan counties. Using the Tilapia Welfare App, farmers, extension officers, and government officials were trained to assess fish welfare indicators, focusing on water quality, husbandry practices, crowding, and slaughter methods. Data were collected from thousands of farm assessments across both countries.

Key Findings In Egypt, over 250 aquaculture practitioners and 300 farmers were trained, resulting in more than 4,000 welfare assessments across 1,000+ farms, covering around 15% of the national tilapia sector (260 million fish). Early results indicate measurable improvements in welfare scores with repeated monitoring. In Kenya, 30 fisheries extension officers and County Directors were trained within the first months of rollout, already yielding promising welfare assessments and farmer engagement. Identified gaps included lack of water quality monitoring, inadequate record keeping, and poor harvest practices, while opportunities included strong farmer willingness to learn and adopt new technologies.

Conclusions: Incorporating welfare into African aquaculture through One Welfare approaches can significantly improve both fish well-being and farmer livelihoods. Training, monitoring, and access to simple tools such as water quality testing can drive sector-wide improvements. We recommend scaling training programs, expanding welfare monitoring technologies, and exploring farmer-led certification schemes to embed fish welfare into sustainable aquaculture policy and practice in Africa.

Keywords Fish welfare, aquaculture, One Welfare, tilapia, Egypt, Kenya, sustainable aquaculture, water quality, farmer training.

SUBTHEME 5

WILDLIFE, ANIMAL WELFARE, AND COMMUNITY ENGAGEMENT

DR. JAMES G. NJOGU (Guest speaker) –

Integrating indigenous knowledge and science diplomacy for sustainable wildlife, apiculture, and aquaculture in Africa

Highlight of the speech: The sustainable management of wildlife, apiculture, and aquaculture is critical to achieving food security, biodiversity conservation, and inclusive economic growth across Africa. This keynote will explore the intersection of indigenous knowledge systems and science diplomacy as transformative tools for advancing innovation and resilience in the animal resource sub-sector. Drawing on UNESCO's global programmes and frameworks, including the Local and Indigenous Knowledge Systems (LINKS) initiative, the Man and the Biosphere (MAB) Programme, and the Science, Technology and Innovation (STI) policy interface, the address will highlight how culturally grounded practices and international scientific collaboration can inform evidence-based policies, empower communities, and foster regional integration.

Through existing UNESCO related case studies among others, including own research on entitlement rights, personal experience and strategic insights, the presentation will demonstrate how integrating traditional ecological knowledge with modern scientific approaches can enhance ecosystem stewardship, improve livelihoods, and support climate adaptation. It will also underscore the role of science diplomacy in building trust, mobilizing keynote will calls for a renewed commitment to knowledge co-production, capacity building, and multi-stakeholder engagement to unlock the full potential of Africa's animal resource landscape.

MUCHANE MUCHAI

Land use practices and their implications on avifauna in Masai Mara ecosystem

Muchane Muchai

Department of Clinical Studies, Faculty of Veterinary Medicine, University of Nairobi, P. O. Box 29053-00625, Nairobi, Kenya.
Corresponding author Email: mmuchai@uonbi.ac.ke

ABSTRACT
Land use changes threaten biodiversity globally. Yet, little is known about the ecological consequences of this change. The density and species richness of avifauna communities were assessed in three major land use types present within protected and agricultural landscapes in Masai Mara Ecosystem (MME). The three land uses were: natural grassland savannah and woodland inside and outside protected area and farmland systems in adjacent agricultural landscapes. We carried out bird surveys during short rain, wet rainy season and dry season in both the dry Masai-Mara National Reserve and wet Masai Mara triangle using DISTANCE transect sampling. Data on short rain and wet rainy season were pooled in the analysis of density and species richness because they did not differ from each other for the two response categories. A total of 4293 individual birds representing different bird species were recorded. Species richness differed significantly across the three habitats (ANOVA: $F=15.1$, $df=2$, $P<0.05$). Woodland had the highest species richness (117 in dry season/97 in wet season), followed by grassland (78 in dry season/80 in wet season) while farmlands (48 in dry season/40 in wet season) had the lowest. There was no difference in overall mean densities between paired grassland/woodland plots in and out of protected areas, seasons and region ($p>0.05$ in all cases). The study supports the need for conservation strategies that extend beyond solely relying on protected area networks and embraces a landscape approach to conservation. Understanding the response of species to land-use changes will help in recommending appropriate conservation and management strategies.

Key words: Avifauna, Natural Grassland Savannah, Woodland, Agricultural landscapes, Masai Mara Ecosystem, Land use.

JENNIFER N WANYINGI

Diurnal time budget in relation to De brazza's monkey (C*ercopithecus neglectus*) feeding behavior in western Kenya

Jennifer N. Wanyingi[1*], Robert Chira[1], Muchai Muchane[2], Nathan Gichuki[1]

[1]Department of Conservation Biology, Chiromo campus, University of Nairobi, Kenya
[2]Department of clinical studies, Kabete campus, University of Nairobi, Kenya.

[*]Corresponding author: jenywanyi@gmail.com

ABSTTRACT

Background: Activity budget of primates among their various species has been studied extensively, revealing that it is affected by foraging strategies, sex, and environmental influence. Foraging patterns is a species feeding choice after consideration of their environmental risk and resource availability. De brazzas' monkey are shy and arboreal frugivores whose foraging strategies determines their survival and reproductive success. This study focused on evaluating their diurnal time budget and foraging behavior in Western Kenya.

Methods: Scan sampling was used to record group activity budget while focal sampling was used to record an individual's age, sex, feedings including occurrences food manipulation, social interactions including gesture, vocalizations, interaction with others, plant species and part consumed. The study then evaluated whether activity varied with group, age and plant species.

Results: Foraging accounted for 37% of time budget while resting had 38%. There was reduced movement in the late afternoon compared to morning at 56.52% (n=78 of 138) and resting at 46.15% (n=60 of 138). Among the plants consumed, De brazzas' monkey foraged on *Ficus exasperata* more at 47.2% (n=50 of 106) while *Syzygium guineense* and *Musa balbisiana* were the least selected each at 0.7% (n=1 of 106), with low evenness of plant distribution, J^1=0.29. Based on age feeding behavior, the juveniles fed more on *Polyscias kikuyuensis* while the *Sapium ellipticum* was consumed by females and juvenile with males foraging more on *F. exasparata*. Additionally, *F. exasperata* was consumed more in the morning 57.8%(n=26 of 45) than in afternoon.

Conclusions: Overall, foraging differed according to age and sex with *F.exasperata* plant consumed by all ages. Foraging demands and local extraction of *F. exasperata* leads to foraging on alternative plants that may not meet their nutritional demands, so possible management action to encourage community to plant more of this species, as well as protecting regenerating seedlings.

Key words: De Brazza's monkey, feeding, behavior, Western Kenya, budget.

ANNE NAMAEMBA

Dispersal ecology of the vulturine guinea fowl at Mpala Ranch, Laikipia County, Kenya

***Anne Euniter Namaemba[1], Damien Farine[2], Titus Ndhiwa[1] and Titus Adhola[1]**

[1]Department of Clinical Studies, Faculty of Veterinary Medicine, University of Nairobi,Kenya

*Corresponding author: Anne namaemba: Email:namaembaanne@gmail.com

ABSTRACT

Background: Natal dispersal is crucial in determining population structure, genetic diversity, and demographic dynamics in wildlife, however, it is not well-known in terrestrial birds. This research investigated the patterns and drivers of natal dispersal in vulturine guineafowl (*Acryllium vulturinum*), a social, ground-dwelling bird at Mpala Ranch in Laikipia, Kenya.
Methods: Using daily, long-term observational data, the study examined sex-biased dispersal, the influence of group composition, the dispersal distances, and the importance of rainfall in determining dispersal patterns.

Results: The results revealed a female-biased dispersal pattern, with 100% of recorded dispersal events comprising females and no males. This aligns with the avian female-biased dispersal patterns and male philopatry, particularly in species with cooperative social systems. A generalized linear model indicated that the number of juveniles in the natal group increased the dispersal decisions, while the group size and the number of adult males or females did not affect dispersal decisions at all. Dispersal distances varied extensively, with a mean of 2.58 km (range: 0.4–19.6 km), showing both local and long-distance movement strategies. Directional analysis revealed no constant orientation of dispersal routes, hence the birds were flexible in settlement decisions. Finally, Cox proportional-hazards survival models revealed rainfall as a major predictor of dispersal timings, with each additional millimeter of rainfall increasing the hazard of dispersal by approximately 8.7%.

Conclusion: These findings emphasize the relationship between social structure and environmental variability in shaping dispersal decisions, while providing valuable insights about the movement ecology of vulturine guineafowl.

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MARY MUCHANE

Effect of altitudinal gradient, vegetation and soil properties on macro-fungi species richness, density, diversity and distribution in Aberdare's forest, Kenya

Mary N. Muchane[1*], Muchane Muchai[2], Kelvin M. Waithaka[1] and Susan Njuguini Kabacia[1],

[1] Botany Department, National Museums of Kenya, P.O Box 40658, 00100 Nairobi, Kenya
[2] Department of Clinical Studies, Faculty of Veterinary Medicine, University of Nairobi, P. O. Box 29053-00625, Nairobi, Kenya.
*Corresponding author: Email: mmurethi@yahoo.com or mnyawira@museums.or.ke

ABSTRACT

Background: Macrofungi exerts profound biological and economic impacts in ecosystems. Yet, little ecological information exists to help in development of effective conservation strategies of macrofungi. This study -investigated the macrofungi density, diversity and their distribution pattern along altitudinal and vegetation gradient in the Aberdare Forest.
Methods: Macrofungi species richness, density, distribution and soil properties were sampled in low altitude mixed forest, bamboo forest and moorland.

Results: A total number of 163 macro-fungi species from Basidiomycota and Ascomycota distributed across 34 families and 78 genera were documented. Members of Mycenaceae (23) had the highest number of species followed by Agaricaceae (16), Psathyrellaceae (15), Strophariaceae (11), Polyporaceae (11), Omphalotaceae (9), Hygrophoraceae (7), Tricholomataceae (62), Bolbitaceae (6) and Tricholomataceae (6). Other families had 5 or less species. The saprophytic macrofungi colonizing forest litter (41%), wood debris and stump (39%) and soil organic matter (18%) dominated the macrofungi communities. Vegetation along the elevation gradient influenced the macrofungi. Macrofungi species richness and density were highest (p=0.02) in low altitude mixed forest, and lowest in moorland. Species diversity within the three vegetation zones did not differ significantly. However, vegetation type and soil parameters significantly affected macrofungi distribution and species diversity, and explained 35% of the variability. Soil organic carbon level was highest (p=0.001) in moorland and lowest in low altitude mixed forest. There was a negative relationship between soil organic carbon and macrofungi species richness and diversity. Soil electric conductivity (EC) was highest (p=0.001) in bamboo forest and lowest in moorland, and had positive correlation with density of *Mycena* and *Hemimycena* species.

Conclusion: This study reveals that management and conservation effort of macrofungi should focus on low altitude mixed forest prone to human interference, while also maintaining ecological health of bamboo and moorland forests.

Key Words: Macrofungi, Vegetation, Species Richness, Density, Aberdare Forest.

DR. BRIAN JOSEPH (Guest Speaker)

Welfare of working animals

ABSTRACT

Smallholders are responsible for approximately eighty percent of global agricultural production and depend primarily on working animals, particularly bovids and equids, in environments where economics and terrain do not favor mechanization. Despite the worldwide advancement of farm mechanization, working animals continue to provide more than 50% of the world's agricultural energy for traction, and their use is prevalent in Africa, Asia, and South America. Consequently, animal power is essential to alleviate human burden and increase tillage capacity. As a result of a lack of available human training and veterinary care, many working animals suffer from physical issues, including chronic pain, dehydration, heat stress, lameness, and skin pathology. The quality of human-animal interactions, including those involving draught animals during transportation and slaughter, is a critical factor in maintaining productivity and promoting good animal and human welfare. The use of working animals must continue to be promoted in rural, marginal areas of productivity where low inputs are feasible, and the energy of animals can be obtained at low cost by feeding them harvest residues and byproducts.

WECHABE SIMIYU

Welfare challenges among donkeys working in Ngurubani town in Mwea East Sub county, Kirinyaga county.

Wechabe Simiyu[1*] and Jane Njuguna[2],

[1]Ripple Effect Kenya Email: **Emmanuel.wechabe@rippleeffect.org**

[2]Jane Njuguna, AHA, Kirinyaga County Government. Email ***janenjuguna85@gmail.com***

*** Corresponding author**

ABSTRACT

Background: Donkeys play a crucial role in the livelihoods of communities in Ngurubani town, Kirinyaga County. They are the primary means of transport for rice from the Mwea Tebere Irrigation Scheme, providing an all-weather service in areas inaccessible by vehicles. Despite their value, donkey welfare remains critically neglected. Issues such as overworking, poor harnessing, malnutrition, and limited veterinary care persist. This study highlights how strategic research, and innovation can improve donkey welfare and, by extension, rural resilience and productivity. The aim of this study is to determine welfare challenges facing working donkeys in Ngurubani town and identify community-driven solutions.

Methods: Four focus group discussions comprising of 10-15 participants were held with donkey owners and users, including local leaders, farriers and animal health service providers. A participatory tool—"If I Were a Donkey"—was used to generate empathy and gather experiential insights.

Results: Discussions revealed that major welfare challenges include wounds (82%), overloading (67%), overworking (61%), lameness (58 %) and poor harnessing (59%). Underfeeding (30%) and lack of shelter (15%) were also reported.

Conclusion: In Ngurubani town, donkeys are an integral part of the transport system for rice and construction industry, yet their welfare is ignored as reflected by the poor working conditions, nutrition, health and shelter by users and owners as well as stakeholders like the local government. Welfare organizations, county veterinary department and policy makers should consider enacting policies to protect the welfare of donkeys in Ngurubani town in Mwea East Sub-county and the entire Kirinyaga County.

Keywords: animal health service providers, community driven solutions, donkey welfare, farriers

DR. DICKSON MACHIRA

Occurrence of Crimean-congo hemorrhagic fever, Tularemia and Rift Valley Fever in pastoralist systems in Africa

Dickson Machira Nyaguthii [1,2*], Joshua Onono Orungo[2], Peter Kimeli[2], Eric Fevre[1,3], Daniel Nthiwa [1,4] , Mathew Muturi[5], Michael E. von Fricken [6,7], David Redding [8], Ellen Carlin[9], Victor Ofula[10], Dino Martins [11], Francesco Fava [12], and James Hassel [1,6]

[1]Animal and Human Health Department, International Livestock Research Institute, Nairobi, Kenya

[2]Faculty of Veterinary Medicine, University of Nairobi, Nairobi, Kenya

[3]Institute of Infection, Veterinary, and Ecological Sciences, University of Liverpool, Liverpool, United Kingdom

[4]Department of Biological Sciences, University of Embu, Embu, Kenya

[5]Zoonotic Disease Unit, State Directorate of Veterinary Services, Nairobi, Kenya

[6]Smithsonian's Global Health Program, Washington, DC, USA

[7]One Health Center of Excellence, College of Public Health and Health Professions, University of Florida, Gainesville, FL, USA

[8]Natural History Museum, London, United Kingdom

[9]Parapet Science & Policy Consulting, Washington, DC, USA

[10]Kenya Medical Research Institute, Nairobi, Kenya

[11]Turkana Basin Institute, Stony Brook University, Stony Brook, NY, USA

[12]Department of Environmental Science and Policy, Università degli Studi di Milano, Milan, Italy

Corresponding author: Dickson Machira Nyaguthii - machira.dickson@gmail.com

ABSTRACTS

Background: Pastoralism is a predominant livestock production system practiced in areas with harsh environmental conditions. The system is characterized by low investment in animal health, with increased risk of outbreaks of animal diseases including zoonoses such as Crimean-Congo hemorrhagic fever (CCHF), Rift Valley fever (RVF) and Tularemia which may be spread through livestock product value chains.

Methods: A scooping review was undertaken to establish the occurrence of RVF, CCHF and Tularemia in pastoral systems in Africa. Published papers on the three diseases were searched from PubMed, Web of Science, Scopus and Google scholar databases using predetermined search terms. Abstracts and titles of studies were downloaded from the search databases and duplicates removed. After eligibility for inclusion was examined, full texts of the included articles were downloaded and data extracted including publication details, laboratory methods and measures of disease occurrence with the studies also being grouped according to livestock value chain nodes. Random effects models were fitted to pool the study prevalences.

Egger's test and symmetry of funnel plots were used to investigate publication bias. A random forest algorithm was used to determine relevant moderators of prevalence followed by a mixed effects model to examine relevance of selected moderators.

Results: RVFV was the most studied pathogen (22/34; 64.7%) followed by CCHFV (10/34; 29.4%) with 2/34 (5.9%) papers found describing the occurrence of tularemia in pastoral settings in Africa. Pooled prevalence for RVFV was highest in humans 29% (95% CI: 7% - 69%), then camels 19% (95% CI: 7% -43%) and lowest in goats at 6% (95% CI: 4% – 10%). CCHFV prevalence was highest in camels at 48% (95% CI: 8% – 91%) and lowest in humans at 6% (95% CI: 2% – 19%). Prevalence was highest in livestock farms for RVFV 13% (95% CI: 10% – 16%) and CCHFV 15% (95% CI: 4% – 44%). Females were more likely to be positive 5.20 (95% CI: 3.09 – 8.76 $p<0.01$) than males while animals in mixed herds were more likely to be positive for RVFV (33.34 (95% CI: 0.72 – 1548.64, $p= 0.0734$).

Conclusions: This review provides evidence that CCHFV, RVF, and *F. tularensis* pathogens are endemic in pastoral areas. RVFV showed the highest pooled prevalence in humans while CCHFV was most prevalent in camels. Evidence of *F. tularensis* was found and there is a need for further epidemiological studies on the pathogen, including in animals and vectors, to have a better understanding of its occurrence in Africa. Finally, enhanced surveillance for these pathogens along livestock value chain nodes to mitigate risk of their spread to connected farms is warranted.

Keywords: Zoonotic; Systematic Literature Review; Pastoralism; Rift Valley fever; Crimean-Congo hemorrhagic fever

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SUBTHEME 6

INNOVATIONS IN VETERINARY DIAGNOSTICS, VACCINES, AND PRACTICE

DR. HUSSEN ABKALLO - Guest speaker

Zoonotic arboviruses surveillance and bloodmeal analysis in mosquito species from Isiolo County, Kenya

Hellen Akengo[1,3], Francis Mulwa[2], Edith L. Chepkorir[2], Betty Chelangat[2], James Mutisya[2], Richard Nyamota[1], James Akoko[1], Steven G. Nyanjom[3], Joel Lutomiah[2], Bernard Bett[1], **Hussein M. Abkallo[1]**, ✉.

[1]Health Program, International Livestock Research Institute (ILRI), Nairobi, Kenya
[2]Centre for Viral Research, Kenya Medical Research Institute (KEMRI), Mbagathi Way, Nairobi, Kenya
[3]Department of Biochemistry, Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya
Corresponding author ✉ **H.Abkallo@cgiar.org**

ABSTRACT

Background: Zoonotic arboviruses transmitted by mosquitoes pose serious health and economic risks globally and cause severe diseases in animals and humans which may manifest as febrile illness, hemorrhagic fever, or even death. The risk of these arboviruses spreading into new regions is increasing with globalization and climate change hence the need to understand their transmission patterns and diversity especially in endemic regions. Regions like Isiolo County in Kenya, are known for hemorrhagic fever outbreaks, but in-depth arbovirus surveillance data is limited. This study investigated the transmission dynamics of zoonotic arboviruses and the mosquito vector-host interactions in Isiolo county.

Methods: Mosquitoes were collected from different habitats in Isiolo County. The mosquitoes were morphologically identified, pooled into 1,170 pools, and then screened for arboviruses using multiplex PCR combined with high-resolution melting (PCR-HRM). Blood meal analysis was performed using cytochrome b and 16S rRNA vertebrate mitochondrial gene markers.

Results: The most abundant mosquito species morphologically identified were *Culex univittatus* (10,949), *Culex annurlioris* (2,516), *Anopheles gambiae* (2,272), and *Aedes tricholabis* (485). Out of the 1,170 mosquito pools screened, PCR-HRM was able to identify 593 pools (50.7%) positive for bunyaviruses (49.6%), alphaviruses (20.9%), flaviviruses (23.1%), and Rift Valley Fever virus (3.0%) across multiple mosquito genera. Blood meal analysis revealed mosquito feeding patterns across wildlife, livestock, and humans which revealed the complex vector-host interactions that facilitate arbovirus transmission cycles.

Conclusion: The findings emphasize the need for integrated One Health surveillance in anticipating and mitigating zoonotic outbreaks.

Keywords: arboviruses, mosquito vectors, Rift Valley fever, Isiolo County, Kenya, viral ecology, zoonotic diseases, surveillance, vector-borne diseases

DR. ROBERT MURIUKI

Development of CRISPR-CAS-based diagnostic tools for *Theileria parva*, *Babesia bigemina* and *Anaplasma marginale* infections in cattle

Robert Muriuki[a, b] Maingi Ndichu[a], Samuel Githigia[a], Nicholas Svitek[b]

[a] University of Nairobi, Faculty of Veterinary Medicine, P.O. Box 29053, Nairobi, Kenya
[b] International Livestock Research Institute (ILRI), P.O. Box 30709, Nairobi, Kenya

Corresponding author: Robert Muriuki (R.Muriuki@cgiar.org**),**

ABSTRACT

Background: East Coast fever, anaplasmosis, and babesiosis are economically significant cattle diseases in tropical and subtropical regions. Diagnosis of these infections primarily relies on observing clinical signs, microscopic examination of blood for the pathogens, and serological tests such as ELISA. However, these tests lack the sensitivity needed for early detection, and antibody based serological tests cannot confirm active infections. Molecular methods, such as the nested PCR and real-time PCR, offer higher sensitivity and specificity, but their costs limit application in resource-limited settings. This study aimed to develop and test innovative CRISPR-Cas-based pen-side diagnostic tools for the sensitive and specific detection of *Theileria parva*, *Anaplasma marginale* and *Babesia bigemina* infections in cattle.

Methods: Parasite detection was achieved using programmable guide RNAs targeting pre-amplified regions of the p104 gene for *Theileria parva*, the major surface protein 5 (MSP5) gene for *Anaplasma marginale*, and the rhoptry-associated protein 1a (RAP1a) gene for *Babesia bigemina*. These gene regions were amplified via Recombinase Polymerase Amplification (RPA) at a constant temperature for 20 minutes, followed by CRISPR-Cas12a-mediated detection incubated for 1 hour. Results were visualized using a 6-carboxyfluorescein (FAM)-Biotin lateral flow strip. The *T. parva*-specific Cas12a assay was optimized using DNA extracted from cultured *T. parva* Muguga-infected lymphocytes (TpMs), and its specificity was validated against closely related *Theileria* species, including *T. mutans* and *T. lestoquardi*. The *A. marginale* and *B. bigemina* specific assays were optimized using DNA extracted from dissected tick salivary glands infected with the respective pathogens.

Key results: All three tests demonstrated high specificity, showing no cross-reactivity with closely related pathogens. They also exhibited excellent sensitivity; the *T. parva*-specific test detected as few as 0.3 parasites/µl of blood, while the *A. marginale* and *B. bigemina*-specific tests each detected a minimum of 100 copies of the MSP5 and Rap1a genes, respectively.

Conclusions: Three individual CRISPR-Cas12a based pen-side tests were optimized and validated as effective tools for diagnosing *T. parva*, *B. bigemina* and *A. marginale* infections

in cattle. The tools are highly sensitive and specific providing reliable alternatives for the diagnosis of these infections. The tests offer several advantages such as being very user-friendly as they are easy to perform and interpret, they are rapid, with results achievable under 2hrs, they are field friendly doing away with expensive equipment associated with traditional diagnostic testing.

Keywords: CRISPR-CAS-based, diagnostic tools, hemoparasites, cattle

DR. JUSTINE MABUKA

Assessing tissue responses in pigs challenged with three different doses of the highly virulent African Swine Fever virus (Ghana2021) strain

Justine T. Mabuka[1], Chacha Gati[1], Karanja D. Njuguna[1], Peter K. Gathumbi[1], Christine Mutisya[2], Josiah Odaba[2], Faith Koech[2], Stella Lodompui[2], Rose Ojuok[2], Jane Pole[2], Manuel Borca[3], Douglas Gladue[3], Jorge Martinez[4] and Anna Lacasta[2].

Author affiliations: [1]Department of Veterinary Pathology, Microbiology and Parasitology, University of Nairobi, Kenya;
[2]Health Program, International Livestock Research Institute, Nairobi, Kenya;
[3]U.S. Department of Agriculture, Agricultural Research Service, Plum Island Animal Disease Centre, Greenport, New York, USA; and
[4]Departament de Sanitat i Anatomia Animals, Universitat Autonoma de Barcelona, Bellaterra, Spain.
Corresponding authors: Prof Peter K Gathumbi (gathumbi@uonbi.ac.ke) and Anna Lacasta (a.lacasta@cgiar.org).

ABSTRACT

Background: African swine fever (ASF) is a disease that globally threatens pork production, with severe economic consequences. The development of a robust, reliable and reproducible challenge model is critical for evaluating the efficacy of candidate ASF vaccines under controlled conditions. This study aimed at establishing a standardized ASF challenge model that mimics natural infection dynamics, with respect to clinical and tissue responses to support assessment of vaccine performance.
Methods: Naïve pigs (n=15) were randomly allocated into three equal groups and intramuscularly infected with low, medium and high doses of the highly virulent Ghana2021 strain in the Animal Biosecurity Level 2 unit at ILRI. A standardized scoring criteria was used daily to assess disease progression and those that attained the predetermined humane end point were euthanized, and standardized necropsy performed to determine gross and histopathological lesions. Tissue samples were taken for histopathology and for viral loads determination. Gross and histopathology lesions were assessed for severity and intensity using numerical scores (0 - normal; 1 - mild; 2 - moderate and 3 - marked). A quantitative polymerase chain reaction (qPCR) test was used to determine the viral load. Data on clinical signs, gross and microscopic lesions, and tissue viral load were compared using descriptive statistics, Kruskal-Wallis Test (one-way ANOVA) at 95% confidence interval.
Results: All the pigs infected with the virus manifested moderate (score 2) to severe (score 3) clinical signs, namely: fever, dyspnea, vomiting, diarrhea and anorexia but there were no

significant differences ($p>0.05$) between the groups. . Gross lesions consistent with African swine fever, were not significantly different ($p>0.05$) between dose levels. Moderate (score 2) to severe (score 3) lymphocytolysis, haemorrhage and congestion consistently occurred in lymphoid organs, but there was no significant difference ($p>0.05$) between the dose levels. The viral load was lowest in the mesenteric lymph node ($\pm 10^{5.7}$ GEC/g) in the medium dose group and the highest in the spleen ($\pm 10^{10.26}$ GEC/g) in the high dose group. However, lesion scores and viral loads were not significantly different ($p>0.05$) in respective organs tested between the dose levels ($p>0.05$).

Conclusion: Responses in pigs infected with the low, medium and high doses of the ASF virus were equivalent in terms of clinical signs, gross and microscopic lesions and viral load in tissues. This study recommends the low dose (10^2 HAD_{50}) of Ghana2021 virus as the minimum dose that elicited a robust tissue response and can be adopted in experimental model for vaccine efficacy and cross-protection studies.

Key words: Highly virulent AFS virus, pig challenge, tissue response, low, medium and high doses

MARK NGERE

Prevalence of tick-borne hemoparasites and associated vectors in dairy cattle in Githunguri Sub-county, Kiambu County.

Mark S. Ngere[1] **Maingi N**[1] **and Chege J. N**[1]

[1]*Department of Veterinary Pathology, Microbiology and Parasitology, Faculty of Veterinary Medicine, University of Nairobi, P.O. Box 29053-00625, Kangemi, Nairobi, Kenya*
*Corresponding author: Mark S. Ngere (mcsamuelngere@gmail.com)**,**

ABSTRACT

Background: Ticks-borne diseases (TBDs) cause significant production loses and welfare concern in livestock. These diseases are transmitted by ticks and sometimes biting flies found in animal environment. The presence of these vectors in animal environment is responsible for the occurrence of TBDs in a given area. Dairy farming in Githunguri sub-county in Kiambu County is an important activity, with many farmers relying on it for their livelihoods. However, there is limited data on the prevalence of TBDs and vectors responsible for transmission of these diseases despite reports of occurrence of these diseases in the sub-county. The aim of this study was to determine the prevalence of various tick-borne diseases and that of vectors responsible for transmission of the disease to dairy cattle in Githunguri sub-county, Kiambu County.

Methods: A cross-sectional survey was conducted, where 402 dairy cattle were randomly selected from 113 dairy farms in the sub-county. Blood samples from 402 dairy cattle were aseptically obtained and ectoparasites were collected from 11(2.7%) animals for parasitological analysis. Microscopy was used to examine Giemsa stained blood smears for hemoparasites, while ectoparasites were identified using their various unique morphological features.

Key results: Among the 402 blood samples examined, 32.1% (129) were positive for tick-borne parasites (TBPs). *Anaplasma marginale* was the most prevalent parasite (22.4%), followed by *A. centrale* (6.2%) and *Babesia* (0.7%). Tick infestation was only observed on 11 (2.7%) of the sampled cattle, with *Rhipicephalus (boophilus) decoloratus* (97.8%) being the most common species. Further investigation on other ectoparasites that are mechanical vectors for TBPs revealed that among 441 biting flies collected in 63 selected farms, *Stomoxys spp*. (95.2%) were the most prevalent. The species of Stomoxys observed were *S. calcitrans* (63.3%), *S. niger* (23.8%) and *S. sitiens* (8.2%). *Musca domestica* [n = 21, (4.8%)] was also identified alongside the biting flies, suggesting a high risk of mechanical transmission of TBD pathogens in the area

Conclusion: The prevalence of ticks was low, but prevalence of TBPs was high, as was the prevalence of biting flies particularly *Stomoxys spp*, suggesting that the biting flies may be transmitting some of the hemoparasites in the study area. The presence of hemoparasites in

dairy cattle and their biological (ticks) and mechanical (flies) vectors underscores the need for implementation of integrated control strategies.

Key words: Tick borne hemoparasites, dairy cattle, ticks and biting flies, vectors

FIONA MWENDWA

Prevalence and diversity of *coccidia spp.* in sheep in Machakos County, Kenya

Fiona Mwendwa and Kamuti N. Mutinda

Faculty of Veterinary Medicine, University of Nairobi, Kenya

Corresponding Author Fiona Mwendwa:muthiorafiona@students.uonbi.ac.ke

ABSTRACT

Background: Coccidiosis, caused by *Eimeria* species, remains a significant parasitic disease impacting sheep production globally, particularly in developing economies where it contributes to substantial economic losses. Understanding the local *Eimeria* species helps in guiding appropriate anthelmintic selection and management practices, which can directly improve livestock health and productivity, thereby addressing real-life challenges of food security and economic stability for sheep farmers. This study aimed to determine the prevalence of *Coccidia* infection and morphologically identify the *Eimeria* species prevalent in sheep populations within Camp Koki Village Farm, Machakos County, Kenya.

Methods: A cross sectional study was conducted in Camp Koki Farm and a total of 111 fecal samples were collected per rectum and transported to the Parasitology Laboratory for analysis. These samples underwent standard parasitological examinations, including McMaster techniques to analyze samples and quantify oocysts per gram of feces. Morphological identification of *Eimeria* oocysts was performed using microscopy, focusing on distinct characteristics such as shape, size, and internal structures to differentiate between species.

Key Results: The investigation revealed that the overall positive samples were 67.6% (75/111), number of positive adults was 68.9% (62/90), positive lambs were 61.9% (13/21), positive males were 65% (13/20) and positive females were 68.1% (62/91). Several *Eimeria* species were successfully identified based on their characteristic oocyst morphology with *Eimeria parva* being the most prevalent at (36%), followed by *Eimeria bakuensis* (18%), *Eimeria ovinoidalis* (15%), and *Eimeria weybridgensis* (15%). *Eimeria marsica* (12%), while *Eimeria ahsata* was at (3%). These findings confirm the endemic nature of coccidiosis in the study population.

Conclusions: The high prevalence and diversity of Eimeria species identified underscore coccidiosis as a significant health challenge for sheep farmers in Machakos County. This research provides essential baseline epidemiological data crucial for developing targeted and effective control strategies.

Keywords: Coccidiosis, *Eimeria*, Sheep, Prevalence, Kenya

DR. ROSMARY NGOTHO-ESILABA

Assessment of challenges faced by small ruminant producers in pastoral areas of Laikipia, Kenya

Ngotho-Esilaba, R.N.[1*], Ombui, J.N.[2], Onono, J.O.[2] & Lindahl, J.F.[3].

Author affiliations

[1] Veterinary Sciences Research Institute-Muguga, Department of Livestock, Kenya Agricultural and Livestock Research Organization, Nairobi, Kenya.

[2] Veterinary Epidemiology and Economics, Department of Public Health, Pharmacology and Toxicology, Faculty of Veterinary Medicine, College of Agriculture and Veterinary Sciences, University of Nairobi, Nairobi, Kenya.

[3] Department of Medical Biochemistry and Microbiology, Infection and Immunity, Uppsala University, Uppsala, Sweden.

* Corresponding author.: E-mail addresses:Rosemary.Ngotho@kalro.org; r.esilaba@gmail.com

ABSTRACT

Background: Pastoralism is both a cultural practice and an economic activity for people living in arid and semi-arid lands of Kenya. In these areas, extreme drought events have negatively impacted on pastoral livelihoods and threatened pastoralism, while affecting employment, family incomes, and livelihood security. The aim of this study was to identify and prioritize challenges faced by livestock farmers in pastoral and agropastoral Laikipia County, as well as their mitigation strategies that can be recommended for intervention.

Methods: The study was done in Laikipia county, a semi-desert area with wildlife reserves and nature conservancies. Pastoralism is a major economic activity of the inhabitants of this county. Four sites were selected from Laikipia North, Laikipia East and Laikipia west sub-counties for this study. Participatory epidemiology techniques including focus group discussions with pastoralist groups and key informant interviews with veterinary and animal health experts were used to identify challenges faced by pastoralists. Proportional piling, matrix scoring and pairwise ranking were used to rank and prioritize challenges and mitigation strategies.

Results: Participants ranked diseases as the most important challenge they faced. Other highly ranked challenges included lack of pasture and water due to frequent drought periods and conflicts with wildlife. The most important small ruminant diseases identified were Contagious Caprine pleuropneumonia, Sheep & Goat pox, Helminthiases and Heartwater. Participants ranked highest the provision of affordable veterinary drugs and vaccines, followed by deployment of animal health service providers at the grassroots, as the most important strategies to mitigate against small ruminant diseases.

Conclusion: The challenges faced by pastoralists in Laikipia County in order of priority are animal diseases, inadequate pasture and water due to frequent drought conditions and conflict with wildlife. To address disease challenges, pastoralists prioritized affordable drugs and vaccines and access to animal health service providers as important mitigation strategies.

Keywords: Pastoralists, Laikipia County, Production challenges, Small ruminant diseases

PENINAH WAITHIRA NJOROGE

Effect of marikebuni vaccine on feeding and reproductive success of R*hipicephalus appendiculatus*

Peninah Waithira Njoroge*[1] Florence A. Oyieke[2], Wolfgang Richard Mukabana[3] and Monicah W. Maichomo[4]

Authors: *corresponding and presenting author
1. Faculty of Science and Technology, Department of Biology, University of Nairobi, P.O.BOX 30197 Nairobi, Kenya. E-mail: peninahwaithira902@yahoo.com
2. Faculty of Science and Technology, Department of Biology
University of Nairobi, P.O.BOX 30197 Nairobi, Kenya. E-mail: foyieke@uonbi.ac.ke,
3. Faculty of Science and Technology, Department
of Biology University of Nairobi, P.O.BOX 30197 Nairobi, Kenya. E-mail: rmukabana@uonbi.ac.ke
4. Kenya Agricultural & Livestock Research Organization
(KALRO), Veterinary Science Research Institute, P.O. Box 32 Kikuyu, Kenya. E-mail: monicah.maichomo@kalro.org

ABSTRACT

Background: East Coast Fever (ECF) is a tick-borne disease of economic importance in bovines caused by *Theileria parva,* a protozoan parasite transmitted transstadially by a three-host tick, *Rhipicephalus appendiculatus.*The control of ECF requires integrated pest management, including vaccine development. Marikebuni vaccine is a live parasite vaccine used to immunize cattle against ECF using an infection and treatment method. This study investigated the effect of this vaccine on *Rhipicephalus appendiculatus* feeding and reproductive success.

Methods: The study utilized three groups of ECF naïve calves, each having three calves aged between 3-12 months. The groups consisted of Marikebuni vaccine-immunized calves and non-immunized controls. The "immunized group", received 1 ml of Marikebuni vaccine and a long-acting oxytetracycline blocking agent at 30ml/kg body weight. The "Control Group 1" received uninfected tick material and the blocking agent while the "Control Group 2" received the uninfected tick material only. The two control groups were used in order to isolate the effect of Marikebuni vaccine itself, and the blocking agent and also establish the natural baseline response of the calves without the vaccine antigens or blocking agents. Uninfected adult *Rhipicephalus appendiculatus* were counted and weighed before and after application to the calves. Incubation of ticks was done at 27-28 ºC optimum temperature and 80% -85% humidity. Linear regression, binary logistic regression model and ANOVA at $p<0.05$ using R software analyzed the data. The number of ticks that fed successfully, and their mean blood meal weight indicated the feeding success of *R. appendiculatus*. The mean egg mass weight, number of egg batches and clutch sizes of eggs indicated oviposition success. The number of live larvae hatched determined the egg viability.

Results: The outcomes of this study showed that the number of successfully fed adult female ticks (OR = 1.05; p-value = 0.93); and the adult female tick blood meal weight (OR = 0.32, p

value = 0.48; F = 3.26, p-value = 0.11) did not differ significantly between *R. appendiculatus* that fed on immunized calves and those that fed on controls. Clutch sizes of eggs (OR = 1.0, P-value = 0.40) and number of egg batches (OR = 0.08, p-value = 0.35) did not differ significantly between the groups. A significant negative relationship between the unfed tick weight and the amount of blood imbibed by the tick after feeding on immunized calves was however recorded (β = 0.4918, R2 =0.7261, F (1, 7) = 22.21, p = 0. 0.002176). The egg mass weight of these ticks was also significantly reduced compared to the controls (F = 7.993; p-value = 0.023). The number of live larvae that hatched successfully did not differ significantly between the immunized and control groups (OR = 0.99; p-value = 0.33).

Conclusions: The vaccine therefore indirectly leads to some degree of vector control. Further research could explore the vectorial capacity of *R. appendicutus* that feeds on Marikebuni vaccine-immunized cattle.

Keywords: East coast fever, *Theileria parva* Marikebuni vaccine, *Rhipicephalus appendiculatus*

SUBTHEME 7
.
LIVESTOCK VALUE CHAINS, FOOD AND FEED SAFETY

DR. EVANS MUTHUMA (Guest speaker)

Effects and challenges of application of Sanitary and Phytosanitary(SPS) measures on safety of animal source foods

Head, Veterinary Public Health and Animal Products Division, Directorate of Veterinary Services, State Department of Livestock Development, Ministry of Agriculture and Livestock Development Kenya

Email evansmuthuma@gmail.com or evansmuthuma@kilimo.go.ke

ABSTRACT

In spite of increasing liberalization of global trade, market access to animal source foods is determined by a wide range of regulatory measures, generally referred to as Sanitary and Phyto-Sanitary (SPS) measures. This is driven by need to protect the countries from invasion of diseases and pest as well as demand by consumers for quality and safe products. The SPS measures are the foundation for domestic consumer health and safe trade, as they have the critical function of protecting countries from risks to public health and to animal and plant life and health. These measures include; relevant laws, decrees, regulations, requirements for inspection, quarantine, treatment, import licences, testing and certification and approval, sampling procedures, packaging and labeling.

Kenya is a founder member of World Trade Organization (WTO), since 1st January 1995 and has implemented the WTO/SPS Agreement, resulting in international markets access of various livestock and livestock products. In 2016, the country ratified the East African Community (EAC) protocol on SPS measures to promote trade in food and agricultural commodities and strengthen the application of harmonized approach to implementation of SPS measures. The country is endowed with the resources to implement the SPS measures such as public and private laboratories, efficacy trial centres, border inspection points, animal source foods processing facilities, policies, laws and regulations -Constitution of Kenya, Vision 2030, Bottom up Economic Transformation Agenda among others, trained animal health and laboratory personnel.Kenya has adopted standards and guidelines from international organization such as Codex Alimentarius Commission, World Organization for Animal Health and International Standards Organization which are used by regulatory agencies to promote safety of animal source foods. However, weak capacities to enforce the SPS measures throughout the animal source food chain, leads to occurrence of food borne illnesses which place consumer health at risk while negatively affecting domestic and international food trade.

Challenges in implementation of sanitary measures include; limited resources and technical capacity, poor infrastructure such laboratories, inadequate holding grounds/quarantine facilities, inadequate stakeholder's knowledge and awareness, emerging and re-emerging livestock diseases, weak enforcement of laws/regulations, informal animal source food markets, complex/stringent international standards, multiple regulatory government agencies and poor coordination among agencies.

DR. LUCIANO A. ACHIENG

Prevalence and risk factors associated with the colonization of *Escherichia coli* and C*ampylobacter* sp. in chicken in Murang'a county, Kenya

Luciano A. Achieng [1], Daniel W. Wanja[2], Getrude P. Shepelo G [3,] Felix M. Kibegwa [4], George C. Gitao[1], Charles D. Kato [5], Christine M. Mbindyo [1]

[1]Department of Veterinary Pathology, Microbiology and Parasitology, Faculty of Veterinary Medicine, University of Nairobi, P.O. Box 29053-00625, Nairobi
[2]Department of Veterinary Pathology, Microbiology and Parasitology, Faculty of Veterinary Medicine and Surgery, Egerton University, P.O. Box 536-20115, Njoro-Egerton, Kenya
[3]Department of Clinical Studies, Faculty of Veterinary Medicine, University of Nairobi, P.O. Box 29053-00625, Nairobi
[4]Department of Animal Production, Faculty of Veterinary Medicine, University of Nairobi, P.O. Box 29053-00625, Nairobi
[5]School of Biosecurity, Biotechnical and Laboratory Sciences, College of Veterinary Medicine, Animal Resources and Biosecurity, Makerere University, P. O. Box 7072, Kampala, Uganda

Corresponding author: Luciano Achieng (achiengluciano@gmail.com)

ABSTRACT

Background: Poultry farming represents a crucial component of Kenya's economy, contributing approximately 1.8% to the national Gross Domestic Product (GDP). Nonetheless, the intensification of poultry production has led to increased disease burdens, elevated morbidity and mortality rates. While many of these diseases directly affect bird health, Colonization of gastrointestinal tract of birds with foodborne pathogens such as *Campylobacter* sp. and *Escherichia coli* without causing clinical illness poses a significant public health challenge to poultry product consumers.This study was undertaken to determine the prevalence and risk factors associated with the occurrence of *Campylobacter* spp. and *Escherichia coli* among poultry farms in Murang'a County, Kenya.

Methods: Cloacal swab samples were collected from 340 smallholder poultry farms across four sub-counties of Murang'a County. Bacterial culture and isolation was conducted using standard microbiological techniques and isolates were identified using matrix-assisted laser desorption/ionization–time of flight mass spectrometry(MALDI-TOF). Semi-structured questionnaires were also administered to all 340 poultry farmers to assess risk factors associated with the two enteric bacteria. Data were analyzed using logistic regression models to estimate odds ratios (ORs) and evaluate the strength of associations between husbandry practices and bacterial colonization.

Results: *Escherichia coli* was isolated from 99.4% (338/340) of the sampled farms, while *Campylobacter* isolation rates were 62.9% (215/340), with 36% (123/340) attributed to *Campylobacter jejuni* and 25.3% (86/340) to *Campylobacter coli*. The predominant production system was free-range/backyard 48% (163/340), followed by semi-intensive 41% (138/340) and intensive systems 11% (38/340). Indigenous (*Kienyeji*) breeds dominated 66.5% (226/340), followed by mixed/improved *Kienyeji* 27.6% (94/340) and layers 5% (17/340) and broilers 0.9% (3/340). Critical biosecurity gaps were observed, with only 6% (21/340) of farms having functional foot baths, while 94% (319/340) lacked foot baths filled with disinfectant. Age segregation was practiced on 51% (176/340) of farms, and 54% (184/340) reported efforts to restrict wild animal entry. However, 38% (130/340) of farms allowed unrestricted visitor access to poultry areas. In terms of hygiene practices, 41% (138/340) of households reported cleaning the poultry house weekly, while 61% (209/340) and 95% (322/340) cleaned feeders and drinkers weekly, respectively. Overall, 44% (148/340) of poultry house floors were rated as clean, whereas 2% (6/340) were found to be very dirty—wet, slippery, and unhygienic. In the univariate logistic regression analysis, chicken breed (OR=0.042, p=1.470), hand washing (OR=0.263, p=0.250), production type (OR=2.046, p=0.248) and visitor access (OR = 4.866, p = 0.173) were associated with *Escherichia coli* colonization, while age-based chicken separation (OR = 1.366, p = 0.168), education level (OR=0.808, p=0.144), poultry house hygiene (OR = 1.347, p = 0.006) and chicken breed (OR=1.093, p=0.025) were identified as relevant factors for *Campylobacter* spp. colonization. All variables met the inclusion threshold ($p < 0.25$) for entry into the multivariate logistic regression model. In the final model, flock size (OR = 1.117, p = 0.008), poultry house hygiene (OR = 1.347, p = 0.006), and education level (OR = 1.375, p = 0.037) were significantly associated with *Campylobacter* colonization. For *E. coli* colonization, significant predictors included flock size (OR = 1.468, p = 0.041) and visitor access (OR = 1.168, p = 0.049).

Conclusions: The findings reveal that larger flock sizes and visitor access are significantly associated with an increased risk of *E. coli* colonization in poultry. For *Campylobacter* spp., larger flock sizes, poor poultry house hygiene, and higher education levels of poultry farmers were significant risk factors. These results underscore the critical influence of poultry husbandry practices on bacterial colonization. Implementing robust biosecurity measures, regulating access to poultry environments, and maintaining high hygiene standards are essential strategies to reduce the prevalence of these pathogens and safeguard both animal and public health.

Keywords: *Campylobacter*, *Escherichia coli*, poultry, Murang'a County, public health

SELINA ACHEAMPONG

Indigestible foreign materials in Ghana's ruminant value chain: Stakeholders' perspectives on impacts and mitigation

Authors: Acheampong Selina, Ofori Linda Aurelia and Abaidoo Robert Clement

Department of Theoretical and Applied Biology, Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana
Corresponding author: Selina Acheampong: celynahacheamping@gmail.com

ABSTRACT

Background: Consumption of Indigestible Foreign Materials (IFMs) by ruminants poses a complex problem to the livestock industry which causes serious pathological disorders, huge economic losses and negative environmental effects. The study sought to determine the perception and awareness of stakeholders in the ruminant value chain of Ghana concerning IFMs.

Methods: The survey considered stakeholders such as farmers, traders, butchers, veterinary and environmental health officers on the causality, impact and mitigation of IFMs.

Results: The results show that irresponsible disposal of waste is wide spread with 80 percent of the stakeholders admitting to engaging in wrong waste management practices. This is a direct indicator of contaminating animal feeding environment where majority of identified places in the surveys exhibited traces of waste materials, which are likely to be consumed by the animals. As a result, a coherent relationship was cited by stakeholders between the ingestion of IFMs and various adverse effects, among them, high animal mortality and carcass condemnation, low live weights and escalated veterinary spending. These difficulties are additionally increased by the fact that the secondary environmental consequences of soil contamination and disease-carriers development occur. Although stakeholders proposed effective mitigation mechanisms like increasing screening of feeds, regulatory action and education of people, little compliance has been adopted with prohibitive charges and lack of financial gains being the major deterrents.

Conclusions: In this study, the importance of a multi-pronged strategy to reduce the occurrence of IFMs was brought up. The optimized strategy necessitates an incorporation of effective policy amendments, informative focused community education programs and formulation of stable economic incentives. Although the results are in line with worldwide trends, they identify the most critical vulnerable spots and the points of intervention in the context of the ruminant industry in Ghana.

Keywords: Indigestible Foreign Materials (IFMs), ruminants, stakeholder perceptions, waste management, mitigation strategies.

DR. ERIC ESHITERA

Knowledge, attitudes and practices influencing *Escherichia coli* contamination of raw milk in dairy farms in Narok county, Kenya.

Authors: Eshitera E. E., [1,2]*, Aboge, G. O. [2], Gathura, P. B. [2], Mwihia W., E.[3], Mainga, A. O.[2] and Onono, J. O.[2]

[1]Department of Animal Health and Production; School of Natural Resources Tourism and Hospitality; Maasai Mara University, Kenya; P.O Box 861-20500, Narok, Kenya.
[2]Department of Public Health, Pharmacology and Toxicology; Faculty of Veterinary Medicine; University of Nairobi, Kenya; P.O Box 29053 - 00625, Kangemi, Nairobi, Kenya.
[3]Department of Veterinary Pathology, Microbiology and Parasitology; Faculty of Veterinary Medicine and Surgery; Egerton University, Kenya; P.O Box 536-20115, Egerton, Nakuru, Kenya.

Corresponding author: Eric Eshitera; eshitera@mmarau.ac.ke

ABSTRACT

Background: Milk is a vital food component, supplying affordable, animal source nutrition especially to the poor. However, nutritional richness and unhygienic practices predispose transmission of pathogenic microorganisms including *E. coli* to consumers of dairy products. This study aimed to assess the knowledge, attitudes, and practices (KAP) among dairy farmers in Narok county that may increase the risk of *E. coli* contamination in raw milk.

Methods: A cross-sectional study was carried out in Narok county between July 2022 and March 2023. Data were collected from 268 dairy farmers using a pretested semi-structured questionnaire, administered through face-to-face interviews. Concurrently, 283 household milk samples from the 268 farms were collected for *E. coli* isolation. KAP and prevalence data were analyzed using Pearsons' chi square test. Prevalence and odds ratios at 95% confidence interval were determined.

Results: Overall, most respondents demonstrated minimal knowledge (73.2%), poor attitude (69%) and practices (75.3%) impacting *E. coli* contamination of milk. All (100%) respondents understood that washing hands before milking reduced the risk of contamination of the milk. A few others (22.7%), did not believe washing udders mitigates contamination of milk. Most (92.4%) respondents did not remove manure from the animal shelters regularly. Knowledge of sources of bacterial contamination OR = 0.37, 95% CI (0.17 - 8.00), and the respondents' level of education OR = 0.37, 95% CI (0.19 - 0.70) were significantly associated with lower odds for *E. coli* contamination. Chi square test revealed statistically significant association ($X^2 = 5.02$, $p = 0.025$) between knowledge of source of contamination and *E. coli* isolation rates.

Conclusion: The study identified significant gaps in knowledge, attitudes, and practices among dairy farmers in Narok county, which may contribute to the risk of *E. coli* contamination in raw milk. To mitigate *E. coli* contamination of raw milk in dairy farms we recommend education of dairy farmers to change negative attitudes and practices.

Key words: Raw milk, Knowledge, Attitudes and Practices, *E. coli*, Narok.

SUBTHEME 8

INNOVATIONS IN LIVESTOCK PRODUCTION AND FEEDING

DR. PAUL JUMA (Guest speaker)

Semen collection, processing and artificial insemination in goats in Kenya

ABSTRACT

Goat production plays a critical role in Kenya's livestock sector, contributing significantly to household nutrition, income, and food security. However, genetic improvement in goats has remained slow due to reliance on uncontrolled natural breeding, inbreeding, and limited access to superior sires. Innovations in semen collection, processing, and artificial insemination (AI) present an opportunity to accelerate productivity, enhance disease control, and expand farmer access to improved genetics.This presentation highlights advances in semen collection methods, laboratory processing, and semen preservation techniques suited to resource-limited systems. Emphasis is placed on quality evaluation, the use of extenders, and innovations in short-term chilled and cryopreserved semen storage. It explores AI protocols in goats, challenges of estrus synchronization, and the adoption of field-friendly AI kits. The integration of reproductive technologies with improved feeding systems is also underscored, given the direct influence of nutrition on semen quality and conception rates.

Drawing on the Kenyan context, the paper examines current initiatives by research institutions, government departments, and private sector actors in promoting AI in goats. It also outlines opportunities in currently available tools for estrus detection, farmer training, and genomic technologies that can transform goat breeding programs. Key policy, infrastructural, and capacity-building gaps that hinder scaling up AI services in Kenya are also addressed.By leveraging innovations in semen collection, processing, and AI alongside improved feeding strategies, Kenya has the potential to position itself as a leader in small ruminant reproductive biotechnology in Africa. These interventions can unlock higher milk and meat yields, improve resilience of goat populations, and strengthen the contribution of goats to national food security and livelihoods.

LINUS WAMAI

Black soldier fly larvae meal as an alternative protein source for optimizing poultry production and profits.

Linus K. Wamai[1], , Leonard M. Munga[2] , Isaac M. Osuga[3] , Shaphan Y. Chia[1] ,Jonathan M. Munguti[4], Sevgan Subramanian[1] , Michael K. Kidoido[1] , Janice C. Ghemoh[5] , Charles M. Mwendia[6] , and Chrysantus M. Tanga[1]

[1.] International Centre for Insect Physiology and Ecology (*ICIPE*), P.O. Box 30772-00100, Nairobi, Kenya

[2.] Department Animal Science, Kenyatta University, P.O. Box 43844-00100, Nairobi, Kenya

3/ Department of Animal Sciences, Jomo Kenyatta University of Agriculture and Technology, P.O. Box 62000–00200, Nairobi, Kenya

4 Kenya Marine and Fisheries Research Institute, P.O. Box 451-10230 Sagana, Kenya

5 Centre for African Bio-Entrepreneurship (CABE), P.O. Box 25535-00603, Lavington, Nairobi, Kenya

6 Department of Biochemistry and Molecular Biology, Faculty of Science, Egerton University, P.O. Box 536 Egerton, Kenya *lwamai@icipe.org

ABSTRACT

Background: The escalating costs of conventional protein sources continue to constrain poultry profitability across Africa. Insects such as black soldier fly (*Hermetia illucens* L., HI) larvae have been shown to be very nutritious, with 40–56% crude protein (CP), 25–40% fat level, and a good balance of amino acids and minerals. The larvae meal has been reportedly shown to successfully replace fish and soybean meals (fully or partially) in the diets of layers. Despite the extensive work done on insect-based feed globally, the majority of the studies have focused on substituting fish or soybean meals. No information exists on substituting soybean and sunflower cake, which are the most used plant-based protein sources in laying hen diets by smallholder poultry farmers.

Methods: This study evaluated the effects of replacing soybean meals and sunflower cake with *Hermetia illucens* larvae meal (HILM) at four inclusion levels (25%, 50%, 75%, and 100% protein substitution) in diets for 210 Isa Brown layers under commercial farm conditions. The birds were weighed on a weekly basis by placing them on an electronic weight weighing balance. Weekly records of body weight gain, feeding consumption, and daily number of eggs laid in each cubicle were recorded. The FCR for growers was expressed as a ratio of average daily feed intake (ADFI) and average daily weight gain (ADG), while in layers it was expressed as a ratio of feed intake to the egg mass. The profit margin was calculated using the difference between production profits and feed costs.

Results: Our results showed that chicks (12.37 g/bird) and layer hens (2.02 g/bird) fed diets with 75% HILM inclusion levels had significantly higher average daily weight gain. For the chicks and layers, the lowest ADFI (g/bird) and FCR (g/g) were recorded for birds subjected to diets with 75 and 100% inclusions of HILM compared to the growers' fed diets with 50% HILM. Significantly higher egg production was observed for layer hens fed diets containing

75% of HILM throughout the first (87.41%) and second (83.05%) phase production cycles. Farmers had higher profit margins when birds were fed diets containing 75% of HILM (approximately US$ 1.83 and $5.98 per bird), which mirrored the return on investment estimated at 63.95% and 33.36% per bird in pullets and layer hens, respectively.

Conclusion: Therefore, HILM is regarded as an alternative and profitable protein source for chicken-layer production, offering promising opportunities for scaling up production and expanding markets for smallholders in Sub-Saharan Africa.

Keywords: *Hermetia illucens*, insect-based feed, sustainable poultry production, egg nutrition, smallholder profitability

VICTOR ROTICH

Insect-based feed efficiency gains upregulate the expression of growth and immune related genes in ross 308 broilers

Victor K. Rotich[1,2], Isaac M. Osuga[2], Mathew G. Gicheha[2], Shaphan Y. Chia[1], Jandouwe Villinger[1], Anderson N. Maina[3], Jinhua Xiao[4], Dennis Beesigamukama[1] and Chrysantus M. Tanga[1*]

[1]International Centre of Insect Physiology and Ecology ICIPE, P.O. Box 30772-00100, Nairobi, Kenya

[2]Department of Animal Sciences, Jomo Kenyatta University of Agriculture and Technology, P.O. Box 62000-00200, Nairobi, Kenya

[3]Food Security and Safety Niche Area, Faculty of Natural and Agricultural Sciences, North-West University, P Bag ×2046, Mafikeng, 2745, South Africa

[4]College of Life Science, Nankai University, Tianjin, 300071, China

Correspondence: Email: rotichvictor1996@gmail.com

ABBSTRACT

Background: This work investigated the effects of black soldier fly (*Hermetia illucens* L.) larvae meal (BSFLM) on growth- and immune-related gene expression in Ross 308 broilers.

Methods: Birds were fed diets containing soybean meal (SBM), fishmeal (FM), combinations with BSFLM, or BSFLM alone. Growth, organ weights, immune genes [interleukin-2 (IL-2), interleukin-6 (IL-6), tumor necrotic factor alpha (TNF-α), interferon-gamma (IFN-γ)] and growth-related genes [chicken growth hormone (cGH), insulin growth factor 1 (IGF-1)] expression were measured.

Key results: Our results demonstrate that birds fed FM+BSFLM had significantly higher final liveweight, average daily weight gain (ADG), and low feed conversion ratio. Birds fed FM+BSFLM showed highest carcass weight, while the SBM-only group yielded the lowest. Average daily feed intake (ADFI) differed significantly, and birds fed SBM+BSFLM had the highest. The IL-2, IL-6, TNF-α, IFN-γ, IGF-1 and cGH gene expressions were significantly

upregulated in the liver and spleen of birds fed diets containing BSFLM. Growth-related genes (cGH) positively correlated with live weight, body weight gain, and ADG.

Conclusion: Insect-based diet upregulates the expression of genes associated with protein synthesis, muscle hypertrophy, better feed efficiency, cell proliferation and adaptive immunity, leading to improved productivity and overall well-being of the birds.

Keywords: Poultry feed alternatives, Insect-based ingredients, immune response, gene expression

KIPRONO TOROR

Improving rumen digestibility through maize stover and hay treatment with molasses-maize flour yeast for beef cattle

Author: Kiprono Toror

Affiliation: Toror Animal Feeds

Email: tororbush2@gmail.com Phone: +254 700 584 914

ABSTRACT

Background: In response to the rising cost of commercial feeds and seasonal forage shortages, this study investigated the use of locally available resources to improve feed quality for beef cattle. The focus was on enhancing rumen digestibility and promoting fattening through the treatment of maize stover and milled hay using a yeast fermentation method.

Methods: A mixture of molasses and maize flour was used to culture yeast over a three-day fermentation period. The solution was prepared using a ratio of 1:3 molasses to water, then mixed with maize flour and allowed to ferment in a sealed container at ambient temperature. The resulting yeast-rich solution was then uniformly applied to chopped maize stover and hay before ensiling. The main aim of the treatment was to enhance microbial activity in the rumen by improving the palatability and nutritional value of fibrous crop residues.

Results: Farmers reported increased feed intake, better body condition scores, and improved weight gain in beef cattle fed with the treated stover-hay blend. Moreover, this method proved to be cost-effective, requiring only locally available inputs and minimal labor.

Conclusions: These findings highlight the potential of low-cost yeast-based treatments to transform agricultural by-products into high-value livestock feed. Scaling up such innovations can significantly enhance feed efficiency, reduce dependency on commercial rations, and boost the profitability of smallholder beef enterprises.

Keywords: maize stover, molasses, maize flour, yeast fermentation, beef cattle, feed digestibility

IAN PETER BUSUULWA (Guest Speaker)

Project Officer – Biological Threat Reduction, World Organization for Animal Health (WOAH)

Animal Health and Biological Threat Reduction: WOAH's Support to Kenya

ABSTRACT

Recent global health crises such as the COVID-19 pandemic and African swine fever outbreaks have exposed critical gaps in emergency preparedness and response systems, particularly in addressing biological threats arising from natural, accidental, or deliberate events. With over 75% of emerging infectious diseases in humans originating from animals, and 80% of potential bioterrorism agents being zoonotic, the animal health sector plays a pivotal role in global biosecurity.

The World Organization for Animal Health (WOAH) is addressing these challenges through its Biological Threat Reduction (BTR) strategy, which emphasizes prevention, detection, and response within veterinary systems. Supported by Global Affairs Canada's Weapons Threat Reduction Program, WOAH is implementing the *Fortifying Institutional Resilience Against Biological Threats (FIRABioT)* project. This initiative strengthens both internal and Member Country capacities—particularly in Africa—to respond to biological emergencies, with a focus on four key areas: Disease Intelligence, Sustainable Laboratories, Emergency Management, and Veterinary Legislation. This presentation highlights WOAH's ongoing support to Kenya under the FIRABioT project.

World Organisation for Animal Health

BIOGRAPHY OF GUEST SPEAKERS

Dr. Sophycate Wanjiru Njue, PhD
Independent Consultant | Veterinary Epidemiologist | Digital Innovation Advocate in Animal Health Email: swnjue@gmail.com,

Keynote topic: ***From data to decisions: Harnessing integrated animal health early warning systems for timely action.***

With over **28 years of leadership in animal health and livestock development** across the Governments of Kenya and Somalia, Food and Agriculture Organization of the United Nations, and other multiple international collaborations, Dr. Sophycate Wanjiru Njue is a trailblazer in advancing animal resource management through science, innovation, and strategic partnerships.

A **PhD holder in Veterinary Epidemiology and Economics** from the University of Nairobi, Dr. Njue has pioneered groundbreaking work in **disease surveillance, epidemiological research, and early warning systems**. Her expertise bridges field epidemiology with cutting-edge technology, integrating predictive analytics, Geographic Information Systems (GIS), mobile data collection, and climate modelling to transform disease detection and response in the Horn of Africa.

She has led **multi-million-dollar livestock programs** for the Government of Somalia in collaboration with FAO Somalia, managing diverse teams and overseeing initiatives that protect livelihoods, enhance trade, and safeguard public health. Her innovations include the establishment of epidemiological information management units, community-embedded disease surveillance networks, and the Predictive Livestock Early Warning System (PLEWS), which have saved millions of animals, and secured export markets.

Dr. Njue's work has directly contributed to Somalia's progress in the global PPR control pathway, strengthened cross-border surveillance through IGAD and AU-IBAR, and built lasting institutional capacity for governments, universities, and veterinary networks. Her research such as the published *Sero-prevalence study on the effectiveness of Peste des Petits Ruminants (PPR) vaccination in Somalia* is widely referenced in the field.

A respected **One Health advocate**, she has represented FAO and national governments in high-level forums with WHO, WOAH, UNICEF, IGAD, USAID, the World Bank, and the European Commission, consistently championing evidence-based, integrated approaches to animal health and food security. Her work on **Integrated Animal Health Early Warning Systems (IAHEWS)** has demonstrated how combining climate forecasts, geospatial data, and real-time field reports can revolutionize outbreak prediction and response thereby enhancing food security, trade stability, and pastoral resilience in climate-sensitive and high-risk areas.

Other notable contributions by Dr. Njue's, range from pioneering pilot projects in Somalia that delivered timely alerts for camel and PPR diseases, to advocating for cross-border, multi-sectoral data sharing. Her approach embodies the 2025 conference theme **"Advancing the animal resource subsector through research and innovation in a dynamic landscape"** by sharing practical insights on harnessing integrated animal health early warning systems for timely, coordinated action in a changing climate and an increasingly interconnected world.

DISHON M MULOI (BVM, MSc, PhD)

Molecular Epidemiologist,

ILRI and Liverpool UK
Muloi, Dishon (ILRI) <D.Muloi@cgiar.org>

Key note topic
Genes to Practices: Genomics of AMR at interfaces and the Social Ecology of use.

Dison Muloi his a molecular epidemiologist and a veterinarian with the International Livestock Research Institute in Nairobi, Kenya and an adjunct fellow at University of Liverpool, UK. His research interests focus on the application of genomics approaches in understanding and preventing transmission of antimicrobial resistance (and infectious disease) within and between human, animal, and environment interfaces. He is currently working on various large-scale surveillance projects investigating the epidemiology of AMR and AMU across One Health interfaces in urban and rural settings in East and Southern Africa and South East Asia. He holds a PhD in Molecular Epidemiology from the University of Edinburgh, UK, as well as veterinary and master's degrees from the University of Nairobi, Kenya.

Dr. Mary A. Opiyo, Ph.d

Principal Research Scientist - Aquaculture

Kenya Marine and Fisheries Research Institute (KMFRI)

Dr. Opiyo is a Principal Research Scientist (Aquaculture) at Kenya Marine and Fisheries Research Institute (KMFRI). She holds a PhD in Fisheries Science from Kenyatta University and an MSc in Aquaculture from Moi University, Kenya. She is also an African Food System Fellow at Wageningen University and Research. Dr. Opiyo has 16 years of experience in aquaculture research and development in Kenya. She mainly works to increase the productivity and resilience of smallholder fish farmers in rural areas. Her research focuses on commercialization of aquaculture, seed production, hatchery management, sustainable fish feed ingredients, fish health and nutrition, and climate-smart aquaculture technologies for smallholder fish farmers. She has published 65 scientific papers in SCI-indexed journals, 40 conference proceedings, and 19 value-use books and book chapters. Dr. Opiyo is a member of professional bodies, including the World Aquaculture Society (WAS), Sustainable Aquaculture Research Networks in Sub-Saharan Africa (SARNISSA), African Women in Science and Engineering (AWSE), and the Mentoring Network of African Women in Academia (MTAWA). She has implemented 21 aquaculture research and development projects with organizations such as the London International Development Centre (LIDC), Flemish Interuniversity

Council (VLIR-UOS), Association for Strengthening Agricultural Research in East and Central Africa (ASARECA), VicRes-IUCEA, and WIOMSA. These projects received funding from institutions like UK Research and Innovation, DfID, the European Union (EU), SIDA, and the World Bank. Dr. Opiyo has been a member of various national, regional, and continental task forces. She has contributed to the development of standards, guidelines, strategies, and policies in aquaculture.

Email: mopiyo@kmfri.go.ke
Alternate email: marybede@gmail.com
Research gate link: https://www.researchgate.net/profile/mary_opiyo
Google scholar link: https://scholar.google.com/citations?user=rhnt9h0aaaaj&hl=en

Dr Lian Thomas BSc(Hons), MSc, DVM, PhD, MRCVS

Lecturer in One Health & Food Systems,
Deputy Director, MSc One Health
Division of Global Agriculture and Food Systems, University of Edinburgh
Theme Lead for Neglected Zoonoses in the One Health Centre in Africa (OHRECA), International Livestock Research Institute
Tel +254 (0) 71103-3280, Email. Lian.thomas@ed.ac.uk,

Keynote topic: Sustainable control of Taenia solium

Dr Lian Thomas is a lecturer in One Health and Food Systems at the University of Edinburgh and holds a joint appointment with the International Livestock Research Institute in Nairobi, Kenya where she is currently based and leads a research group on neglected zoonoses within the BMZ funded 'One Health Research Education & Outreach Centre in Africa'.

Originally from the north coast of Cornwall, Lian studied veterinary medicine at St. Georges University in Grenada, West Indies and undertook research for her MSc in Uganda in conjunction with Makerere University. She obtained a PhD in in veterinary epidemiology also from the University of Edinburgh, hosted by ILRI.

Her PhD field work took her to Kenya in 2010 and she has remained in the region ever since, living in Kenya, Zimbabwe and Zambia but also collaborating on projects in Ethiopia, Malawi, Uganda and Nigeria. Her research focuses on the sustainable control of neglected zoonoses and spans field epidemiology, economic analysis and qualitative research on the context, barriers and drivers for disease transmission, surveillance & control. She is passionate about the application of One Health principles to complex challenges and supporting early car eer professionals to embrace these principles. She is a trustee of the Soulsby Foundation for One Health which supports early career researchers with grant funding for One Health projects.

DR. JAMES GICHIAH NJOGU, (PhD, HSC)

Ag. Secretary General/CEO, Kenya National Commission for UNESCO ; Email: jgichiah@unesco.go.ke

Keynote topic: Integrating Indigenous Knowledge and Science Diplomacy for Sustainable Wildlife, Apiculture, and Aquaculture in Africa.

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Dr. James Gichiah Njogu, is a seasoned environmental and natural resource management expert with over 20 years of experience in leadership, policy development, and international diplomacy. Currently serving as the Ag. Secretary General/CEO of the Kenya National Commission for UNESCO, Dr. Njogu has played a pivotal role in advancing Kenya's engagement in UNESCO's thematic areas, including education, natural sciences, and cultural heritage. He holds a PhD in Environmental Studies (Social and Behavioural Sciences) from the University of Amsterdam, and has previously held senior positions at the Kenya Wildlife Service, Ewaso Ngiro South Development Authority, and the African Centre for Technology Studies. His work has significantly contributed to the designation of key World Heritage Sites and the strengthening of multilateral environmental agreements.

Dr. Njogu's expertise lies at the intersection of indigenous knowledge systems, biodiversity conservation, and science diplomacy. He has led numerous initiatives that integrate community-based resource management with global conservation frameworks, including his leadership in the Kenya Lake System and Gede Ruins World Heritage nominations. His strategic vision and negotiation skills have positioned him as a key figure in international forums such as UNESCO, IUCN, and Ramsar, where he has championed African perspectives on sustainable development. A published scholar and advocate for inclusive conservation, Dr. Njogu brings a wealth of experience in stakeholder engagement, capacity-building, and policy innovation—making him a vital contributor to the dialogue on harmonizing indigenous wisdom with scientific approaches for sustainable wildlife, apiculture, and aquaculture in Africa.

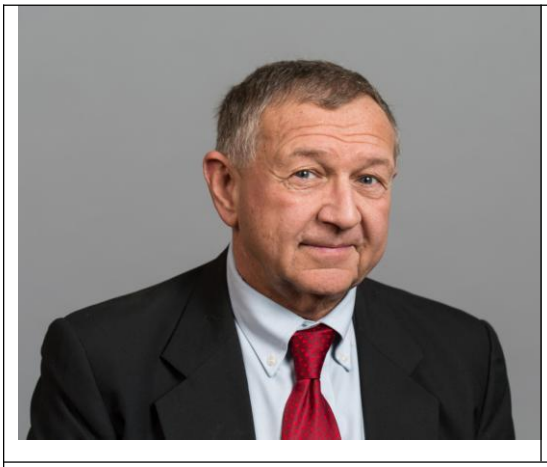
Dr Peter Njoroge (PhD)
Head of the Zoology Department and Senior Research Scientist at the National Museums of Kenya (NMK).

Email: peter.njoroge2306@gmail.com,

Topic: Topic: Shaping the Future of Nature-Based Travel- The Nexus between Biodiversity, Tourism and Innovation

Dr. Njoroge has vast research experience on threatened species having worked in the past to conserve the Seychelles Magpie Robin and Hinde's Babbler among others. He completed his PhD studies at the University of Reading (UK) and is currently running various projects ranging from habitat conservation, species distributions, eco-agriculture and ecosystem services as incentives for conservation in Kenya. He has interests in working at the interface between conservation science and on-the ground application of the research results through local communities and citizen science

He is co-founder of the citizen science-based Kenya Bird Map project- the premier database for bird occurrence in Kenya. He has experience working in projects related to the management of impacts of development projects to natural capital, having conducted numerous EIAs and biodiversity inventories for energy projects and large-scale agricultural enterprises in Kenya. He has published numerous articles and sits on several management boards of Wildlife conservation NGOs.



Brian E. Joseph, DVM MFAS CertAqV

760 484-8994

Global Animal Health Consultant and LifeStock Int'l Board Member

alt email brianjoseph522@gmail.com

Keynote topic: Welfare of working animals in Sub-Saharan Africa

Brian Joseph Biography

Brian Joseph graduated from San Diego State University with a BS in Zoology in December 1977, from the University of California, Davis with a DVM in June 1984, and completed his Master's in Fisheries and Aquatic Sciences at the University of Florida in December 2020. Brian retired as a Major in the U.S. Army Reserve Veterinary Corps, after ten years leading missions focused on public health and disease control in animals in Afghanistan, Africa, the Alaskan Arctic, Central America, and the Middle East. He continues to work globally through LifeStock Int'l, recently completing a farmer and veterinarian training initiative in Iraq and Kurdistan. He most recently participated in Khaan Quest 2025, where he trained members of the Mongolian Armed Forces for participation in UN Peacekeeping Operations in Sudan. He serves on the Board of Directors for LifeStock International and the Protect Wild Dolphin Alliance. His primary interests include inspiring a more equitable world, mitigating climate change, enhancing food security, and reducing armed conflict. Dr. Joseph has published in several professional journals, is a frequent speaker at conferences and universities, and recently published his first two books, I Wish the Rainbow Bridge Had Visiting Hours and I Wish the Rainbow Bridge Had Fewer Paw Prints. Brian is currently drafting his third book, which concerns the ten years he spent in the Army Veterinary Corps.

Dr. Evan Muthuma (BVM MSc.)

Deputy Director of Veterinary Services and Head of Veterinary Public Health and Animal Products Division. Directorate of Veterinary Services, State Department of Livestock Development, Ministry of Agriculture and Livestock Development Kenya

Email evansmuthuma@gmail.com or evansmuthuma@kilimo.go.ke

Keynote topic: Role of SPS measures in facilitation of international trade in livestock products and challenges faced. A case of Kenya

Dr. Evans Muthuma is a veterinary surgeon with Masters degree in Veterinary Public Health. He has 25 years of experience as a food safety and trade veterinarian in-charge of design, approval, licensing and commissioning of animal source food processing facilities. He represents the Directorate of Veterinary Services at the National Codex Committee. He has trained locally and internationally on food safety, risk analysis and food trade negotiations. He participates in the development of veterinary policies, laws, regulations standards, guidelines and procedures used in the country.

Dr. Paul Juma, BVM, MSc (Theriogenology), PhD (cand.).

Principal Extension Services Officer at the Kenya Animal Genetic Resources Centre (KAGRC Email: paulvetjuma@gmail.com,

Keynote topic: Semen collection, processing and artificial insemination in goats in Kenya

Dr. Paul Juma is a seasoned veterinary surgeon and animal-reproduction specialist with more than 20 years' experience shepherding Kenya's livestock and genetic-resources agenda, through trainings, from field stations to the national stage. Currently Principal Extension Services Officer at the Kenya Animal Genetic Resources Centre (KAGRC), he steers nationwide capacity-building and stakeholder-engagement programmes that boost uptake of advanced breeding technologies and KAGRC products. His leadership has modernized farmer outreach—digitizing training databases, championing social-media channels, and delivering record numbers of field days and informs the Centre's marketing.

Hussein Abkallo, a biotechnologist at the International Livestock Research Institute (ILRI), employs CRISPR/Cas9 and Synthetic Biology to develop live-attenuated vaccines for livestock diseases, with several candidates now in trials. His work leverages gene editing to strengthen food security, address climate vulnerabilities, and support sustainable livelihoods. He actively mentors MSc and PhD students while training African scientists in cutting-edge gene editing techniques. A leading advocate for genome editing in Africa, Hussein collaborates with stakeholders to shape policy and broaden public understanding. He co-authored the landmark article 'Making Genome Editing a Success Story in Africa' in *Nature Biotechnology*. In addition to his gene editing work, Hussein is advancing research on zoonotic arboviruses, applying molecular surveillance tools to inform the design of pandemic preparedness strategies. Hussein currently heads the ILRI Biosciences laboratories *ad interim*, and previously held a Royal Society Newton International Fellowship at the University of Edinburgh, UK. He holds a PhD and MSc in Medical Sciences from Nagasaki University, Japan, and a BSc in Biomedical Sciences from Maseno University, Kenya.

Hussein Abkallo, Ph.D., MRSB.
Scientist (Molecular Biology) | Health Program and Head of Biosciences Laboratories (*ad interim*) International Livestock Research Institute | ilri.org
Office: +254 20 422 3497 | Mob: +254 721 732 731

Keynote topic: Zoonotic arbovirus surveillance and blood meal analysis in mosquito species from Isiolo county Kenya

IAN PETER BUSUULWA

Project Officer – Biological Threat Reduction
World Organization for Animal Health (WOAH)
Email: I.busuulwa@woah.org,

Keynote topic: Animal Health and Biological Threat Reduction: WOAH's Support to Kenya

Ian Peter Busuulwa is a Project Officer – Biological Threat Reduction at the World Organisation for Animal Health (WOAH) based at the WOAH Sub-Regional Representation in Nairobi, Kenya. In his role, Ian supports the implementation of activities relevant to WOAH's Biological Threat Reduction Strategy in Africa and facilitates the coordinated engagement of the animal health sector in the G7 Global Partnership's Signature Initiative to Mitigate Biological Threats in Africa (SIMBA). Ian holds a BSc in Biotechnology from Makerere University and an MSc in Biotechnology from KIIT University. He has extensive experience in science policy and communication, particularly in the areas of biosafety, biosecurity, and the bioeconomy.

MEMBERS OF THE SCIENTIFIC CONFERENCE ORGANIZING COMMITTEE

SNO.	NAME OF STAFF MEMBER	ROLE
1	Prof. John Demesi Mande	Dean, FVM
2	Prof. Samuel Maina Githigia	Assoc. Dean/Faculty Convenor
3	Prof. Samuel Muchane Muchai	Convenor
4.	Dr. Felix Matura Kibegwa	Assist. Convenor/Member Sci. Committee
5	Prof. Jackson Nyarongi Ombui	Chair, Scientific Committee
6	Prof . George Gitao	Member, Scientific Committee
7	Prof. Peter Karuri Gathummbi	Member, Scientific Committee
8	Dr. Lucy Wanjiru Njagi	Member Scientific Committee
9	Dr. Sharon Nthenya Mbindyo	Member, Scientific Committee
10	Dr. John Muturi Kimani	Member Scientific Committee
11	Dr. Callen Nyangate Onura	Member, Scientific Committee
12	Dr. Joshua Orungo Onono	Chair Resource Mobilization Committee
13	Dr. Isaac Ole Mapenay	Member,Resource, Mobilisation Committee
14	Ms Roseline Mongina Mose	Member Resource mobilisation Committee
15	Dr. Ambrose Kipyegon Ngeno	Member Resource Mobilisation Committee
16	Dr. Joel Winyo Ochieng	Member Resource Mobilisation Committee
17	Dr. Rodi Omondi Ojoo	Member Resource Mobilisation Committee
18	Dr. Bominic Omosa Ochwangi	Membe Resource Mobilisation Committee
19	Dr. Tequiero Abuom Okumu	Chair,, CSR Committee
20	Dr. Peter Kimeli	Member CSR Committee
21	Dr. Daniel Wambua Muasya	Member, CSR Committee
22	Mr. George Muchiri Karimi	ICT support
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24	Mr. Martin Kinuthia Waringa	Website support
25	Mr. Ephantus Murimi Nyaga	Website support
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University of Nairobi

FACULTY OF VETERINARY MEDICINE
P. O BOX 30197-00100, Nairobi, Kenya
Phone : +254-020- 4916009

Email: Dean_vet@uonbi.ac.ke