

33rd TVA SCIENTIFIC CONFERENCE



**Conference on Modernization of
the Livestock Sector Through
Improved Animal Health**



BOOK OF ABSTRACTS



Ministry of Livestock and
Fisheries Development



BOOK OF ABSTRACTS

Conference on Modernization of the
Livestock Sector Through Improved
Animal Health



TANZANIA VETERINARY ASSOCIATION

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COMMITTEES

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(EXCO) OFFICIALS**

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| Treasurer | Dr Niwaeli J. Mtui-Malamsha |
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| Ordinary Member | Dr SinareYusufu Sinare |
| Ordinary Member | Dr Kaini Kamwela |

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| TVJ Assistant Editor | Dr Wahabu H. Kimaro |
| Circulation Manager | Dr PastoryDulla |
| Zonal Representatives | East, Central, Northern, Lake, Western, Southern Highlands & Southern |

The 30th TVA SCIENTIFIC CONFERENCE ORGANISING COMMITTEES

| COMMITTEE | MEMBERS |
|---------------------------|--|
| 1. Scientific Committee | 1. Prof Esron D. Karimuribo (Chair) 2. Dr Zachariah Makondo 3. Dr WahabuKimaro 4. Dr Solomon Nong'ona 5. Dr Gabriel M. Shirima |
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| 3. Exhibition Committee | 1. Dr PastoryDulla (Chair) 2. Dr ObedNyasebwa 3. Mr. SalimMselem |
| 4. Registration and Logistics | 1. Dr Niwaeli J. Mtui-Malamsha (Chair) 2. Dr S. Ndibalema 3. Dr Michael Madege 4. Dr Obed Nyasebwa |

PREFACE

Tanzania Veterinary Association (TVA) is a professional association that works closely with other associations such Tanzania Society of Animal Production (TSAP) and Tanzania Veterinary Paraprofessional Association (TAVEPA) in promoting scientific dialogues/exchange of knowledge and information amongst members and other stakeholders from within and outside the country. The TVA-TSAP-TAVEPA partnership is also instrumental in the engagement of policy makers, planners and other stakeholders for the interest of national livestock development. It has been a tradition of organising TVA Annual Scientific Conferences and General Meetings in December of each year. We are happy to, once again, unite TVA members and other non-members in this year's TVA conference whose main theme is “**Modernization of the Livestock Sector Through Improved Animal Health Delivery System**” and the sub-themes of: (i) Modernization of the Veterinary Structure; (ii) The Existing Partnership Between Private and Public Sectors; and (iii) The Partnership Between Research and Extension Sectors. We are delighted to extend our tradition of producing a Book of Abstracts, which is an important document summarizing different presentations that will be delivered during the 33rd TVA Conference. The 2015 TVA Book of Abstracts is the fourth in series since production of the first compilation in 2012. We thank all who contributed to production of this issue, including those who submitted abstracts for this year's TVA Scientific Conference. We hope that you will find the compilation useful during the conference as well as a dependable reference material for your future endeavours. Your continued commitment to TVA scientific conference and sharing of information/knowledge is instrumental in upholding the vision, mission and core values of TVA.

Prof Dominic Mukama Kambarage

Chairman, TVA

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33rd TVA Scientific Programme (1-3 Dec 2015)

| Day 1: Tuesday 1st December 2015 | | |
|---------------------------------------|---|----------------------------------|
| CONFERENCE OPENING SESSION: MBAYUWAYU | | |
| CHAIR: Dr A. Hayghaimo | | |
| 08:00-08:45 | Registration | ALL |
| 08:45-09:00 | Participants and Invited Guests seated | ALL |
| 09:00-09:10 | Welcoming Remarks | TVA Chairman |
| 09:10-09:15 | Invitation of the Guest of Honour | TVA Chairman |
| 09:15-09:45 | Official Opening of the 33rd TVA Conference | Guest of Honour |
| 09:45-09:50 | Vote of Thanks | TBI |
| 09:50-10:15 | Group Photo | ALL |
| 10:15-10:45 | Tour of Exhibition Pavilions | Guest of Honour/ TVA Chairman |
| 10:45-11:00 | HEALTH BREAK | ALL |

| SESSION 1: MBAYUWAYU | | |
|-----------------------|--|------------------|
| CHAIR: Prof J. Malago | | |
| 11:00-11:30 | Key Note Paper 1: Modernization of the Veterinary Structure in Tanzania | B. Masuruli |
| 11:30-12:00 | Key Note Paper 2: Animal Health Services in Tanzania: What do frontline staff on the ground say? | N. Mtui-Malamsha |
| 12:00-12:30 | Key Note Paper 3: How to Modernise Veterinary Services in Tanzania | L.M. Mavika |
| 12:30-13:00 | Key Note Paper 4: Status of Extension Services and Animal Health Practices in Tanzania | L. Nsiima |
| 13:00-14:00 | LUNCH BREAK | |



| SESSION 2: MBAYUWAYU | | |
|-----------------------|---|--------------------------|
| CHAIR: Prof SI Kimera | | |
| 14:00-14:15 | Regional status on African Swine Fever in Eastern Africa: The Need for Joint Control Efforts | S. Nong'ona et al. |
| 14:15-14:30 | Molecular Epidemiology of Africa Swine Fever Outbreaks in Tanzania | D. Mdetele <i>et al.</i> |
| 14:30-14:45 | Understanding Perceptions of Zoonosis Among Pastoralists of Northern and Coastal Areas in Tanzania: Implication for Zoonoses Awareness Creation and Control | Mangesho et al. |
| 14:45-15:00 | Pastoralist Awareness About Diseases of Public Health and Economic Importance at the Livestock-Wildlife Interface Area | H. Sadiki et al. |
| 15:00-15:15 | Strengthening Livestock Health and Pastoral Nutrition: A Case Study in Pawaga and Idodi Divisions | M.I. Mwanzalila et al. |
| 15:15-15:30 | General Discussion | Chair |
| 15:30-16:00 | HEALTH BREAK | |

| SESSION 3: MBAYUWAYU | | |
|----------------------|---|-----------------------|
| Chair: Dr R. Tetey | | |
| 16:00-16:15 | Seroprevalence of Bovine Brucellosis in Dairy and Traditional Cattle Herds in Kibaha District, Tanzania | A.R. Bachana et al. |
| 16:15-16:30 | Sero-epidemiology of Human Brucellosis Among Healthy Individuals in Southern Part of Ethiopia: Calling Attention to Out-of-Sight Zoonotic Disease | B. Workalemahu et al. |
| 16:30-16:45 | Knowledge and Perceptions on Brucellosis in Humans and Animals: A Case Study of Iringa Municipality | S. Nong'ona et al. |
| 16:45-17:00 | Investigating an Emerging Disease of Sheep and Goats: A Case Study in Pawaga and Idodi Divisions in Iringa | A. Msigwa et al. |



| | | |
|-------------|--|--------------------|
| 17:00-17:15 | Explaining Pastoralist Abandonment of Their Kilosa Village Named Mufilisi (Bankruptcy): Blood Parasites Unlikely Responsible for Morbidity and Mortality | R.S. Silayo et al. |
| 17:15-17:30 | Recurrence and Challenges of Tick-Borne Diseases in Cattle at Mivumoni, Pangani-Tanzania | H. Sadiki et al. |
| 17:30-17:45 | The Need for Developing Cheaper Strategies for Controlling Tsetseflies in Collaboration with Livestock Keepers | K. Ngongolo et al. |
| 17:45-18:00 | General Discussion | Chair |
| 18:00 | END OF DAY 1 | |

DAY 2: Wednesday 2nd December 2015

| | | |
|-------------|----------------------------|-------------------------------------|
| 08:30-12:30 | TVA Annual General Meeting | TVA Members and Invited Guests only |
| 12:30-14:00 | LUNCH | ALL |

SESSION 4: MBAYUWAYU

Chair: Dr E. Rukambile

| | | |
|-------------|--|--------------------|
| 14:00-14:15 | Effect of Resin From <i>C. Swynnertonii</i> on White Blood Cells and Selected Haemopoietic Organs in Albino Rats (<i>Rattus rattus</i>) | G.G. Bakari et al. |
| 14:15-14:30 | Ovariectomy, Ovariohysterectomy and Orchidectomy in African Giant Pouched Rats | C.W. Werema et al. |
| 14:30-14:45 | Analysis of Haematological Parameters in the Mole Rat (<i>Heliophobias argenteocinereus</i>) | W.H. Kimaro et al. |
| 14:45-15:00 | Isolation and Molecular Characterization of Pathogenic <i>Leptospira</i> spp from Human, Domestic and Wild Animals in the Katavi-Rukwa Ecosystem, Tanzania | J.A. Asenga et al. |



| | | |
|-------------|---|----------------------|
| 15:00-15:15 | Clinicopathological Information on Suspected Cases of leptospirosis in Dogs submitted to the Animal Hospital of Sokoine University of Agriculture in Morogoro, Tanzania | E.E. Barnabas et al. |
| 15:15-15:30 | General Discussion | Chair |
| 15:30-16:00 | HEALTH BREAK | |

SESSION 5: MBAYUWAYU

Chair: Dr Z.E. Makondo

| | | |
|-------------|---|----------------------|
| 16:00-16:15 | Antimicrobial Resistance and Genotypic Diversity of <i>Campylobacter</i> Isolated from Pig, Dairy and Beef Cattle in Tanzania | I.P. Kashoma et al. |
| 16:15-16:30 | Multidrug Resistant <i>Salmonella</i> Isolates from Food and Animal Products in Pastoral Zones of Tanzania: Prevalence and Molecular Characterisation | J.J. Medardus et al. |
| 16:30-16:45 | Removal Efficiency of Faecal Pathogenic Bacteria in Domestic Wastewater Stabilization Ponds in Morogoro, Tanzania | O.J. Mhongole et al. |
| 16:45-17:00 | Economics of Manure Disposal and Utilization in Morogoro Municipality, Tanzania | A. Kangondo et al. |
| 17:00-17:15 | Health Risks and Biosecurity Measures in Pig Production in Urban and Peri-urban Areas of Morogoro Municipality, Tanzania | C.J. Henjewe et al. |
| 17:15-17:30 | Characterisation of <i>Escherichia coli</i> in Healthy Cattle and Animal Waste Handlers in Tanzania | B.P. Madoshi et al. |
| 17:30-17:45 | Determinants of Demand for Private Fodder Delivery Services in Northern Zone, Tanzania: A Case of Arumeru and Moshi Rural Districts | U.F. Titi et al. |
| 17:45-18:00 | General Discussion | Chair |
| 18:00 | END OF DAY 2 | |



| DAY 3: Thursday 3rd December 2015 | | |
|-----------------------------------|--|----------------------|
| SESSION 6: MBAYUWAYU | | |
| Chair: Dr I.P. Kashoma | | |
| 08:30-08:45 | An Overview on the Village Chicken Keeping Practices at Sanza Ward in Singida Region and Proposed Areas of Intervention | E. Rukambile et al. |
| 08:45-09:00 | Poultry's Potential for Livelihood Improvement in Pastoral Households: Evidence from Pawaga and Idodi Divisions, Iringa Rural District, Tanzania | C. Gustafson et al. |
| 09:00-09:15 | The Role of Private Traders on Aflatoxin Management in Poultry Feeds: Case Study in Morogoro Municipality | B.A. Temba et al. |
| 09:15-09:30 | An Epidemiological Survey of Porcine Cysticercosis in Nyasa District, Ruvuma Region, Tanzania | S.M. Shonyela et al. |
| 09:30-09:45 | Reduction of Serological Marker of Active Infection to Hepatitis E Virus on Swine farm in Ghana | R.K. Tetley et al. |
| 09:45-10:15 | General Discussion | Chair |
| 10:15-11:00 | HEALTH BREAK | |

| SESSION 7: MBAYUWAYU | | |
|---------------------------|---|----------------------|
| Chair: Prof A.P. Muhairwa | | |
| 11:00-11:15 | Tablet Based Survey as a Tool to Collect Data on Livestock: Evidence from Tanzania | M. Rahija et al. |
| 11:15-11:30 | Finnish Perspectives on Global Biothreat Preparedness: Interagency Collaboration and One Health | S. Nikkari |
| 11:30-11:45 | Enhancing Delivery of Diagnostic and Advisory services to Rural-Based Livestock Keepers: Application of e-Based SUAVetDiag System | E.K. Batamuzi et al. |



| | | |
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| 11:45-12:00 | Evaluating Factors Influencing Pregnancy Rates in Mpwapwa Breed Recipient Cows After Transfer of Frozen-Thawed Embryos | N.L. Kanuya et al. |
| 12:00-12:15 | Productive and Reproductive Performance of Holstein Friesian Dairy Cows at Kitulo Livestock Multiplication Unit, Tanzania | I.P. Kashoma et al. |
| 12:15-12:30 | Population Genetic Variation of Theileria parva Isolates in Cattle and Buffaloes: Is it a Threat to the Current Control Methods of East Coast fever? | E. Rukambile et al. |
| 12:30-12:45 | Molecular Characterisation of Recently Isolated Foot-And-Mouth Disease Viruses in Tanzania | Sallu et al. |
| 12:45-13:00 | General Discussion | Chair |
| 13:00-14:00 | LUNCH BREAK | |

| CONFERENCE CLOSING SESSION: MBAYUWAYU | | |
|---------------------------------------|--|-----------------|
| Chair: Prof R.R. Kazwala | | |
| 14:00-14:10 | Participants and Invited Guests Seated | ALL |
| 14:10-14:25 | 33rd TVA Conference Recommendations | TVA Chairman |
| 14:25-14:30 | Invitation of the Guest of Honour | TVA Chairman |
| 14:30-15:00 | Official Closing of 33rd TVA Conference | Guest of Honour |
| 15:00 | END OF 33RD TVA SCIENTIFIC CONFERENCE (Bon Voyage) | |



| POSTER PRESENTATION | | |
|---------------------|--|-----------------------|
| 1 | Impact of Brucellosis on Animal and Human Health in Mikumi-Selous Ecosystem, Morogoro-Tanzania | R.R. Mwakapuja et al. |

| RESERVE LIST | | |
|--------------|---|-------------------------|
| 1 | Epidemiological Study of Bovine Brucellosis in Smallholder Dairy Cattle in Lushoto and Rungwe Districts, Tanzania | R. Mfuno <i>et al</i> |
| 2 | Vibrio Cholerae in Vegetables and Fish Raised in Wastewater Irrigated Fields and Stabilization Ponds During a Non-Cholera Outbreak Period in Morogoro, Tanzania | Y.M.G. Hounmanou et al. |
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ABSTRACTS



MODERNIZATION OF THE VETERINARY STRUCTURE IN TANZANIA

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ABSTRACT

The livestock in Tanzania is a very valuable national asset conservatively estimated a worth \$ US 9 billion for the stock alone. This estimate at the 25.8 million cattle at an average of \$ 300 would be worth this much, while the average cattle price may be less \$ 300. There are also 2.4 million pigs, 16.7 million goats and 8.7 million sheep as well as 68 million chicken to be added to the Tanzanian livestock population. Regardless of this immense potential, livestock activities contribute only 7.4% to the country's Gross Domestic Product (GDP), while the annual growth rate of the sector is low, recorded at 2.2%. The production coefficients are also low. In general, the Tanzania livestock sector has remained underdeveloped due to the existing capacity of the Tanzanian veterinary systems that is inadequate to meet present, let alone future demands of the sector. Deficiencies in the quality and quantity of services provided are substantial. Development of the livestock Sector therefore requires modernization of the national veterinary services that is responsive to evolving needs of diverse livestock sectors and within the institutional national capacity to deliver.

Key words: Veterinary systems, national veterinary services, services delivery, livestock sector, Tanzania

ANIMAL HEALTH SERVICES IN TANZANIA: WHAT DO FRONTLINE STAFF ON THE GROUND SAY?

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ABSTRACT

Any policy or institutional reform aimed at improving farmer access and utilization of public livestock services must consider the incentives and disincentives, opportunities and challenges faced by officers on the ground. Indeed, livestock officers are the ones ultimately tasked with providing frontline services, thereby reaching the farmers' door-steps and providing advice and services related to livestock. This paper discusses the findings from a rapid appraisal where a total of 415 Village and Ward Livestock Field Officers and; 62 District Veterinary Officers (DVOs) and District Extension Officers (DEOs) from Morogoro, Dodoma, Iringa and Tanga regions were interviewed. The gathered data presents a mix of quantitative and qualitative data on the tasks undertaken by livestock field officers; the distribution of their working hours across the different tasks and across locations; their major means of communication with farmers; their interaction with peers and with their administrative and technical supervisors; and the major challenges they face. The results not only provide an unprecedented insight into the work of livestock field agents, but also suggest that their on-the-job performance is influenced by their cross working between the public and the private sector. A pilot study addressing this challenge is currently under implementation by Ministry of Livestock and Fisheries Development and London School of Economics and Political Science.

Key words: animal health services, extension agents; incentives and disincentives, private and public sectors.



EXTENSION SERVICES AND ANIMAL HEALTH PRACTICES ACROSS A NATIONALLY REPRESENTATIVE SAMPLE OF TANZANIAN LIVESTOCK KEEPERS

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ABSTRACT

A review of the public livestock service delivery system in Tanzania based on data from the 2012/13 National Panel Survey (NPS) is presented. The NPS is a nationally representative multi-topic household survey, implemented on a regular basis by the National Bureau of Statistics (NBS). It includes one of the largest sets of questions on livestock at household level throughout Africa, which represents an unprecedented opportunity to investigate, with statistical accuracy at country level, the utilization of livestock services by different typologies of livestock keepers and their adoption of selected animal health practices. The data shows that just over a third of rural livestock keepers adopt recommended animal health practices: about 38%, 35% and 36% vaccinate their animals, treat their animals against internal parasites and use preventive measures against external parasites, respectively. As only 20% of rural livestock keepers are found to utilize animal health services, this is hardly surprising. Increasing access and utilization of public services, that is, the adoption of existing animal health practices by most farmers, is anticipated to generate major benefits. Basic calculations show that the net annual income per live animal is 17 USD for livestock keepers that utilize livestock services versus 12 USD for those that do not utilize extension services.

Keywords: animal health services; vaccination; external and internal parasites; National Panel



REGIONAL STATUS ON AFRICAN SWINE FEVER IN EASTERN AFRICA: THE NEED FOR JOINT CONTROL EFFORTS

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ABSTRACT

African swine fever (ASF), is a highly contagious and deadly hemorrhagic disease of domestic pigs caused by African swine fever virus. The ASF has been occurring in Africa for more than 100 years and was diagnosed for the first time in 1910s in Kenya along Rift Valley, there then spread to entire Eastern and Central Africa. Lack of vaccine and the epidemiological information, social behavior of the pig keepers and animal traders as well as ASF virus characteristics associated with transmission cycles has led to the difficulties of controlling and eradicating the disease. To date, the disease has killed many pigs in Tanzania, Kenya, Uganda and Burundi causing tremendous economic losses to smallholder farmers who depend mostly on pig production. The formation of ASF Working Group (ASF WG) is an outcome of a meeting that was held in Mombasa-Kenya in July 2012 and another meeting held Dar es Salaam-Tanzania in January 2015. The group will be a tool to coordinate member countries in controlling the disease based on prevailing situation and research-based evidence, implementation of various control strategies as well as strengthening epidemiologic disease intelligence. The ASF WG will also collaborate with different international institutions (AU-IBAR, FAO, ILRI, SVA-Sweden) and national and regional higher learning institutions such as the university of Nairobi, Sweden, Makerere, Kampala and Sokoine University of Agriculture. The overriding objective of the RVF WG is to come up with an action plan which will be a guiding framework for countries to adopt during disease mitigation and control. Part of the framework activities include developing control plans, modalities for the selection of regional diagnostic laboratories, establishing protocols for sampling at the field level, data collection, specific reports on ASF, harmonized surveillance of ASF and developing preparedness and contingency plans. The ASF WG will further serve as a platform for scaling out control of ASF and other TADs in the region in line with Global Eradication agenda. Given the nature of the disease and the lack of a vaccine, its containment requires a joint effort between farmers, experts, district, regional, national and international agencies and hence the justification for establishing ASF WG that will guide the development of road map for the control.

Key words: African Swine fever, Eastern Africa Working Group, collaborative control efforts.



MOLECULAR EPIDEMIOLOGY OF AFRICA SWINE FEVER OUTBREAKS IN TANZANIA

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ABSTRACT

Molecular epidemiological study was carried out from the African Swine fever (ASF) outbreaks which occurred between 2001 – 2013 by retrieving 32 sequenced isolates out of 57 isolates of ASFV P72 gene from the gene bank. The sequences were aligned by Mega 6 computer programme, using Bioedit programme the phylogenetic tree were generated and used for analysis. Newly sequenced virulent isolate identified three clusters, one suggesting derived from a sylvatic transmission cycle, another from domestic pig cycle and the last one is mixed sylvatic cycle and domestic pig cycle. Also it has been realized that the one from sylvatic cycle was more severely virulent compared to others. Therefore it is recommended that for control of ASF under this circumstance it need breaking of the cycles, more importantly the sylvatic cycle by improving husbandry in domestic pig.

Key Words: Molecular Epidemiology, ASF, Outbreaks and Tanzania

UNDERSTANDING PERCEPTIONS OF ZOONOSSES AMONG PASTORALISTS OF NORTHERN AND COASTAL AREAS IN TANZANIA: IMPLICATION FOR ZOONOSSES AWARENESS CREATION AND CONTROL

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ABSTRACT

Suspected zoonoses are reported among pastoral communities in Tanzania. Few studies conducted show low awareness and knowledge on zoonoses among pastoralists. There is still paucity of articulate analyses about how they understand zoonoses in relation to their socio-economy, cultural and their wider ecology. A study was carried out, between May 2014 and February 2015, to assess knowledge and perceptions on zoonoses among pastoralists in northern (Ngorongoro), and coastal (Kibaha and Bagamoyo) districts of Tanzania. Mixed methods were used including ethnographic interviews, participatory epidemiology and group discussions. It was found that the concept of zoonotic disease is recent and there is no word exists to describe it. Pastoralists from the northern zone possessed relatively higher understanding on the existence of a number of zoonoses than their coastal districts' counterparts. There was a strong resistance to the idea that livestock products are or can be sources of pathogens that cause human disease. Understanding of zoonoses was framed in two ways: a local "syndromic" framework, whereby specific symptoms of a particular ailment in humans concurred with symptoms in animals, and the biomedical framework, where a case definition is supported by diagnostic tests. While the knowledge about zoonosis is increasing there is still reluctance by some to accept the risk associated with consumption of some animal based products, for example the link between tuberculosis and milk. Even though some preventive practices were known for some diseases, entrenched cultural behaviors and habits related to food were strongly defended. Whether these traditions increase or decrease the risk of acquiring food borne infections is not examined in this study. These findings suggest how health trends are perceived, and how epidemiology and biomedicine are shaping pastoralists health perspectives and in the process transform people's conceptualization of life and health of the physical and socio-political body.

Key words: Understanding zoonoses, ethnographic interviews, Ngorongoro, Kibaha and Bagamoyo districts, Tanzania



STRENGTHENING LIVESTOCK HEALTH AND PASTORAL NUTRITION AND LIVELIHOOD: A CASE STUDY IN PAWAGA AND IDODI DIVISIONS, IRINGA RURAL DISTRICT, TANZANIA

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ABSTRACT

In developing countries, pastoralists depend on livestock for food security, wealth, income and cultural prestige. In villages bordering Ruaha National Park in Iringa region, pastoral communities face a number of challenges to their livelihoods, which are exacerbated by environmental changes. Increasing human populations and decrease in surface water availability in the area have contributed to problems in accessing pasture, water for livestock, domestic and agricultural uses and increases the potential for water-borne disease transmission. The Health for Animals and Livelihood Improvement (HALI) Project, an international collaboration between Sokoine University of Agriculture (SUA) and researchers from the United States conducted an education intervention project on livestock health, and human nutrition and livelihoods with 196 pastoralist households and 18 Livestock and Agriculture Extension Officers. Both reported that animal diseases were major challenges for pastoralists' livelihoods and human nutrition. Considering community priorities, project researchers worked with government veterinarians, health clinics and the extension system to design and deliver education materials to 413 pastoralists and 18 Livestock and Agricultural Extension Officers. Participants were very interested in the education and have requested additional rounds of education each year. The project is tracking outcomes of the education intervention on animal health and human nutrition and livelihoods through annual household surveys. The project intends to continue with more surveys to evaluate the longer-term impact of education and conduct additional education workshops.

Key words: water and pasture availability, food security, livelihood, education intervention, HALI Project, Iringa.



SEROPREVALENCE OF BOVINE BRUCELLOSIS IN DAIRY AND TRADITIONAL CATTLE HERDS IN KIBAHA DISTRICT, TANZANIA

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ABSTRACT

A cross-sectional study was conducted between October 2014 and February 2015 in Kibaha District of Tanzania to establish the seroprevalence of bovine brucellosis and identify risk factors associated with it in traditional cattle (n=46) and dairy cattle herds (n=3). A total of 388 serum samples were collected from 330 traditional and 58 dairy cattle. Sera were screened for the presence of brucella antibodies using Rose Bengal Plate Test (RBPT) antigen and all positive samples were confirmed using c-ELISA test. Potential herd-level risk factors for bovine brucellosis were recorded using structured questionnaire. Individual animal and herd level seroprevalence was 5.9 % (95% CI: 3.6 – 8.3%) and 34.7% (95% CI: 20.9 – 48.5%), respectively. Seroprevalence was relatively high in traditional cattle where 5.9% prevalence was recorded compared to dairy cattle where there was no dairy animal tested positive. There was a substantial agreement between the RBPT and C-ELISA (kappa = 0.73) (P=0.001), hence the use of only c-ELISA results for analysis. History of abortion (P=0.001, OR=6.8), breed type (P=0.001, OR=8.3) and source of animal (P=0.027, OR=6.2) were significantly associated with the disease. It was also observed that 85% of people from 42 herds in agro-pastoral communities were not aware of the zoonotic risks of bovine brucellosis. It is concluded that brucellosis infection is a problem more in traditional cattle than in the dairy cattle in Tanzania. Vaccination of young female calves (3-6 months of age), screening of cattle at livestock market level to identify positive reactors and increased farmers awareness are recommended for better control of the disease in the study area.

Key words: Brucellosis, seroprevalence, traditional and dairy cattle, Kibaha, Tanzania.



SERO-EPIDEMIOLOGY OF HUMAN BRUCELLOSIS AMONG HEALTHY INDIVIDUALS IN SOUTHERN PART OF ETHIOPIA: CALLING ATTENTION TO OUT-OF-SIGHT ZONOTIC DISEASE

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ABSTRACT

Human brucellosis is a neglected condition in Ethiopia and is often out of sight and control despite its public health significance. The majority of the Ethiopian population is agrarian with an integrated extensive animal husbandry. This study was conducted to determine the sero-epidemiology of brucellosis among apparently healthy individuals in the Southern Part of Ethiopia. A cross-sectional study was conducted from January-March 2014 among apparently healthy individuals in the southern region of Ethiopia. Serum samples collected from humans (n=254) were used to screen for agglutinin reactive to stained antigen of *Brucella abortus*. Standard tube titrations were done for reactive samples to determine the titer levels. Structured questionnaire was also employed to gather data on potential risk factors for *Brucella* infection that includes exposure of an individual to cattle and consumption of animal products. Standard binary logistic regression and exact logistic regression analyses were used to determine the association of potential risk factors for *Brucella* sero-positivity. Based on analysis of the presence of *Brucella* agglutinins, the seroprevalence of brucellosis was 10.6% (95% confidence interval [CI]: 7.0%, 14.0%). The average serum agglutination titer level was found to be 1:37 (range <1:20-1:80). The sero-positivity was significantly associated with being a farmer by occupation (odds ratio [OR]: 3.68 [95% CI: 1.58, 8.58]), availability of ruminant animals at home (OR: 2.91 [95% CI: 1.12, 7.58]), current contact with cattle (OR: 2.61 [95% CI: 1.04, 6.55]), and having ever assisted abortion of cattle (OR: 2.81 [95% CI: 1.02, 7.79]). Human exposure to *Brucella* species is common in the southern part of Ethiopia. Being a farmer, possession of cattle and history of contact with cattle were associated with higher odds of *Brucella* sero-positivity. These call a veterinary and public health intervention in the region.

Key words: Human brucellosis, seroprevalence, risk factors, southern Ethiopia

INVESTIGATING AN EMERGING DISEASE OF SHEEP AND GOATS: A CASE STUDY IN PAWAGA AND IDODI DIVISIONS, IRINGA RURAL DISTRICT, TANZANIA

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ABSTRACT

Circling disease, an emerging livestock disease of concern in Pawaga and Idodi divisions, Iringa Rural District, Tanzania, has severe impacts on the health of small ruminants in pastoralist communities. As goats and sheep play important role as sources of income and food in many households in developing countries, losses due to circling disease also affect pastoralists' livelihoods. During household surveys and focus group discussions held in Pawaga and Idodi divisions, communities identified and reported a circling disease in their goats and sheep that was associated with rapid health deterioration and death. Working with pastoralist households, livestock and agricultural extension officers, and district and regional veterinary officers, we aim to determine the cause(s) of circling disease in order to develop appropriate education on preventing and/or treating this condition. A total number of 52 households with affected and healthy animals (72 goats and 40 sheep) participated in the study when postmortem examination, sampling of blood for serum as well as collection of brain tissue samples were carried out. Cysts were observed in the brains of 38 animals with signs of circling disease and 15 healthy animals. Additional diagnostic tests are being performed at Sokoine University of Agriculture to rule out tick-borne diseases and other potential causes of circling behavior. Fecal samples from 42 dogs were collected to assess the shedding of *Taenia* sp tapeworm eggs, as larval stages of these parasites have potential to form cysts in the brains of small ruminants. The research process and results will not only provide livestock health answers to communities, but also strengthen local community and government stakeholder relationships.

Key words: circling disease, veterinary investigation, Pawaga and Idodi, Iringa



EXPLAINING PASTORALIST ABANDONMENT OF THEIR KILOSA VILLAGE NICKNAMED MUFILISI (BANKRUPTCY): BLOOD PARASITES UNLIKELY RESPONSIBLE FOR MORBIDITY AND MORTALITY

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ABSTRACT

Land conflicts involving crop and animal farmers in Tanzania are a recurring problem addressed by designating villages solely for livestock or crop production. One of the designated livestock villages is Ihombwe nicknamed Mufilisi on account of perceptions that raising cattle in the village eventually leads to bankruptcy. A prominent sign in resident cattle is severe pica. In this paper we report on a questionnaire study and screening of cattle for blood and gastrointestinal parasites to determine their possible involvement in causation of pica and herd stagnation/decline. Blood samples were collected from 33 cattle at Ihombwe as well as from 27 cattle at a neighbouring village of Kikwalaza that were screened for blood parasites. Faecal samples from the same animals were screened for gastrointestinal parasites. Additionally, a pre-tested structured questionnaire was administered to heads or their representatives in selected households from which samples were collected. The results showed that all animals were negative for blood- as well as gastrointestinal parasites but there was anaemia-indicative haematological changes in animals from both villages that did not however statistically differentiate Mufilisi samples from Kikwalaza samples except for lower PCVs for Kikwalaza samples. In the questionnaire study, 95% of respondents incriminated diseases specifically trypanosomoses, ECF and CBPP as pointed out by 54.5, 50.0 and 13.6 percent of respondents respectively as causes of animal deaths. It is concluded that currently parasitic diseases are likely not involved in causation of pica at Mufilisi, but that their role in the past cannot be ruled out and currently soil and pasture mineral deficiencies (reported elsewhere) are more likely linked to the pica and the village abandonment. The importance of nutrition in livestock production is therefore highlighted.

Key words: Kilosa, pastoralist cattle, blood and gastrointestinal parasites, pica.

RECURRENCE AND CHALLENGES OF TICK-BORNE DISEASES IN CATTLE AT MIVUMONI, PANGANI-TANGA

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ABSTRACT

Cattle population in Tanzania is estimated to be 25 million. Cattle dominate the livestock industry but their contribution to the national gross domestic product is still low. The most significant constraints on the development of the livestock industry include poor nutrition and husbandry, genetic limitations, uncoordinated marketing and disease control, specifically tick-borne diseases (TBDs) mainly East Coast Fever (ECF). In Tanga coastal area, tick activity is common throughout the year with a higher challenge recorded between July and September. The use of acaricides as a prevention and control strategy for ticks and TBDs is constrained by their high cost, low efficacy and tick resistance. The frequency and intensity of application of acaricides is geared towards prevention of disease transmission rather than reducing tick damage. Tanga-based Vector and Vector-Borne Diseases Research Institute owns and operates a 5,300 ha Mivumo farm located in Pangani district with a current herd size of 260 cattle, 85 goats and 38 sheep. Between June and October 2015, the farm experienced an increased morbidity and mortality in cattle due to TBDs despite routine cattle dipping and timely prophylactic interventions. A total of 60 cattle were clinically diagnosed with ECF during this period of which, 10 (16.7%) died. Five of the died cattle (50%) were relapsing cases. We share our experience and efforts made by farm management to intervene the problem hence improve the herd health and increase the farm herd size, suggesting the efficacy tests of the commonly used acaricides as well as acting as a wakeup call for organs that are responsible of researching on and registering acaricides in the country to retrospectively routinely monitor the efficacy and residual effects at the consumer end point.

Key words: Mivumoni farm, Cattle, Tick & TBDs, Acaricides, Efficacy



THE NEED FOR DEVELOPING CHEAPER STRATEGIES FOR CONTROLLING TSETSE FLIES IN COLLABORATION WITH LIVESTOCK KEEPERS

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ABSTRACT

Tsetse flies have great economic implications to livestock productivity and public health. They are well known vectors for sleeping sickness in man and trypanosomosis in livestock animals. Different efforts have been employed in controlling tsetse flies; however most of strategies seem to be costful for livestock keepers to afford. Methods for controlling tsetse flies among others, includes: the use of insecticides spraying, clearing bushes, slaughter of wild animals, trapping and the use of Sterile Insect Technique. Most of the techniques are expensive, not environmental friendly and difficult to be adopted by livestock keeper. Also the top down approach on implementing these methods has contributed to the unwillingness of livestock keepers to adopt them. This calls upon developing cheaper control strategies using down-up approach and can be adopted by livestock keepers. This technique involves livestock keepers finding the way of dealing with tsetse flies in their areas without requiring high financial support from the government or any donors. Some studies have shown that, restricted insecticide application is cheaper. However there is still a need to explore the local communities techniques used for controlling tsetse flies in Tanzania. This paper highlights and motivates scientists to find the affordable user-friendly opportunities available for controlling tsetse flies in Tanzania.

Key words: Cheaper strategies, Controlling Tsetse, Livestock keepers, Tanzania.



EFFECT OF RESIN FROM C. SWYNNERTONII ON WHITE BLOOD CELLS AND SELECTED HAEMATOPOIETIC ORGANS IN ALBINO RATS (RATTUS RATTUS)

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ABSTRACT

Commiphora swynnertonii is among the most popular medicinal plants used by pastoralists in Tanzania. The effect of resin from this plant on white blood cells (WBC) and haematopoietic organs was studied in albino rats. Forty adult rats were randomly assigned to four groups: G1, G2, G3 and G4 each with 10 rats. G1 acted as control while G2, G3 and G4 received oral doses of 50, 100 and 200 mg resin per kg body weight, respectively for 34 days consecutively. Blood samples for differential and total WBC counting were collected before treatment and on day 7, 14, 28 and 34 after treatment. Two rats from each group were humanely sacrificed before treatment and on day 14 and 34 after treatment. Sternum, liver and spleen samples from sacrificed rats were collected for assessment of any effects of the resin on haematopoietic organs. Results showed a significant increase ($p < 0.05$) in WBC counts starting from day 7 after treatment, followed by a severe decrease ($p < 0.05$) in WBC counts by day 34 after treatment. Also there was significant increase in percentages of lymphocytes and monocytes while the percentage of neutrophils decreased toward the end of experiment. There were no significant differences ($p > 0.05$) between varying doses of the resin on the WBC count. Cellularity of sternal bone marrow increased significantly compared to spaces occupied by adipocytes. In particular there were increases in different developmental stages of granulocytes, erythroblasts and all megakaryocytic series. Small patches of erythropoietic series and lymphoblastic cells were observed in the liver and spleen respectively of the rats which received resin. It is concluded that short term oral administration of C. swynnertonii resin to rats significantly stimulated the haematopoietic system whereas a prolonged exposure was associated with remarkable decrease in blood cell numbers probably due to presence of saponins which are known to act as natural detergent leading to haemolysis of cells.

Key words: Commiphora swynnertonii, WBC, haematopoietic organs, experimental rats.



OVARIECTOMY, OVARIOHYSTERECTOMY AND ORCHIDECTOMY IN AFRICAN GIANT POUCHED RATS

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ABSTRACT

Small animals such as mice, rats and guinea pigs make up more than 90 percent of animals used in biomedical research centers. Attributable to their small sizes, low cost, ease in handling, and ability to breed in captivity make these animals ideal for laboratory experiments. Surgical sterilization of rodents is increasing in order to prevent unwanted pregnancies, to prevent and stop urine spraying, and to discourage territorial aggression. Veterinarians are very familiar with procedures for castration and spaying common domestic animals. However, the surgical procedure, preoperative treatments, anaesthesia and postoperative care for ovariectomizing, ovariohysterectomizing and orchidectomizing rodents are unfamiliar to most veterinary practitioner and researchers. The objective of study was to provide surgical description for the ovariectomy, ovariohysterectomy and orchidectomy in African/Giant Pouched Rats. A total of eighteen, 12 females and 6 males, healthy adult rats with 900 grams mean body weight were used in this study. All animals were first sedated by intramuscular injection of 5.0 mg/kg Xylazine Hydrochloride, aseptically prepared surgical incision site, and anesthetized with intramuscular injection of 50.0 mg/kg Ketamine Hydrochloride. Ovariectomy and Ovariohysterectomy were performed through ventro-midline abdominal approach, whereas, Orchidectomy was performed at about 2 cm cranial to the animals scrotal sac. All animals recovered well after seven days and were returned to their normal duties without any difficulties. Therefore, this study demonstrated that surgical sterilization of African/Giant Pouched Rats is safe, simple and can be performed by veterinary practitioners in public, private and biomedical research facilities.

Key words: Ovariectomy, Ovariohysterectomy, Orchidectomy, African giant pouched rats.

ANALYSIS OF HAEMATOLOGICAL PARAMETERS IN THE MOLE RAT (HELIOPHOBIAS ARGENTEOCINEREUS)

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ABSTRACT

Blood parameters are used as important diagnostic tools in both human and veterinary medicine. However, studies show that variations in blood parameters exist across animal species. In the rat hematological parameters vary between species, age, sex, strain, as well as, health status of the animal. Limited information is available on the blood parameters of the mole rat. Therefore, this study was carried out to establish the standard haematological parameters of mole rat (*Heliophobius argenteocinereus*). Five healthy mole rats were captured in the wild during dry and wet seasons. The blood sample was collected and analyzed for both red and white blood cells parameters. The average values for Hb concentration was 12 g/dL, RBC count was 5.16/ μ L and the PCV was 38.8%. The value for WBC count was 5.62×10^3 / μ L; differential counts were: Neutrophils 74%; Monocytes 21%; Eosinophils 4%; and Basophils 1%. These findings revealed that the mole rat of the species *Heliophobius argenteocinereus*, has its specific values of blood parameters different from other subterranean species of mole rats.

Key words: blood, Hb concentration, RBC, WBC, Mole rat



ISOLATION AND MOLECULAR CHARACTERIZATION OF PATHOGENIC LEPTOSPIRA SPP FROM HUMANS, DOMESTIC AND WILD ANIMALS IN THE KATAVI-RUKWA ECOSYSTEM, TANZANIA

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ABSTRACT

Leptospirosis is a worldwide zoonotic disease caused by pathogenic strains of *Leptospira* spp. Rodents, livestock and wildlife are considered potential sources for human infection, however there is limited epidemiological evidence in areas with major wildlife-human interaction in Tanzania. Epidemiological, cultural and molecular-based studies were carried out in the Katavi-Rukwa Ecosystem. A cross sectional study was carried out to establish the prevalence of *Leptospira* spp. in humans, domestic ruminants and wild animals. EDTA blood samples were collected from humans (n=267); cattle (n=1,103); goats (n=248); buffaloes (n=38); zebra (n=2) and lions (n=2). Kidney tissue were also collected from rodents (n=207) and shrews (n=11). Rodents and shrews kidney tissue were cultured. *Leptospira* DNA was extracted from EDTA blood and pure isolates for Polymerase Chain Reaction (PCR). PCR products were sequenced and compared with other nucleotide sequences at GenBank using BLASTn. The detection rate of leptospiral DNA in humans, cattle, goats and buffaloes were 12.4%, 19.5%, 7.7% and 10.5%, respectively. The cultures of kidney homogenate from rodents and shrews revealed that 2.9% rodents and 9.1% shrews were infected. Sequencing identified different *Leptospira* spp isolates from rodents, goats, cattle and humans; and the similarity of the isolates to those at GenBank ranged from 97-100%. Phylogenetic analysis based on 16S rRNA gene sequences showed three major clusters. Results from this study confirmed that rodents, shrews, cattle, goats and buffaloes are potential reservoirs of *Leptospira* spp and hence could play a role in the maintenance and propagation of the leptospirosis in the Katavi-Rukwa ecosystem, Tanzania.

Key words: leptospirosis, molecular detection, isolation and characterization, Katavi-Rukwa Ecosystem



CLINICOPATHOLOGICAL INFORMATION ON SUSPECTED CASES OF LEPTOSPIROSIS IN DOGS SUBMITTED TO THE ANIMAL HOSPITAL OF SOKOINE UNIVERSITY OF AGRICULTURE IN MOROGORO, TANZANIA

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ABSTRACT

A preliminary study was carried out to establish basic diagnostic information on the suspected cases of leptospirosis in dogs reported in and around Morogoro municipality, Tanzania. The study involved sick dogs that were submitted to the Animal Hospital of Sokoine University of Agriculture (AHSUA) for clinical examination and management as well as dog carcasses that were brought for pathological examination at Veterinary Pathology Postmortem Laboratory. Additional data were obtained from sick dogs attended in the field upon calls by dog owners around Morogoro municipality. A total of 21 dog cases were included in the study. The results showed that the majority of cases occurred during the rainy season. It was further observed that the disease equally affected adult male and female dogs of local and cross breeds. The major presenting clinical signs were anorexia, lethargy, distended abdomen, polyuria, bloody faeces, yellow-discoloration of skin and mucous membranes as well as dehydration. A course of clinical disease ranged from 1 to 7 days, with the majority of dogs dying within 3 days. The dogs were generally in fairly good body condition. Hyperproteinemia, increased levels of serum gamma glutamyl transpeptidase, aminotransferases and alkaline phosphatase were observed in the affected dogs. The main pathological findings included generalised icterus, effusions in peritoneal and thoracic cavities, haemorrhages on cavity membranes and into gastrointestinal tract, yellowish nodular fibrotic liver, histological degenerative changes of the liver and kidney, bile duct hyperplasia, haemorrhage as well as passive pulmonary and renal congestion. Serological testing of suspected cases indicated positive reaction to *Leptospira* spp infection. The present study has provided the basic diagnostic information for canine cases suspected of leptospirosis, which may be useful to clinicians working in the field. Although there were *Leptospira* seropositive cases, isolation of *Leptospira* spp responsible for the disease remain to be a confirmatory step to undertake.

Key words: clinical cases, postmortem examination, suspected leptospirosis, dogs around Morogoro, Tanzania.



ANTIMICROBIAL RESISTANCE AND GENOTYPIC DIVERSITY OF CAMPYLOBACTER ISOLATED FROM PIG, DAIRY AND BEEF CATTLE IN TANZANIA

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ABSTRACT

Foodborne Campylobacter infections pose a serious threat to public health worldwide. However, the occurrence and characteristics of Campylobacter in food animals and products remain largely unknown in Tanzania. The objective of this study was to determine the prevalence, antibiotic resistance, and genetic profiles of Campylobacter isolated from feces of pigs and, dairy and beef cattle in Tanzania. Overall, 30% of 864 samples were positive for Campylobacter, which were detected in 32.5%, 35.4%, and 19.6% of the pig, dairy, and beef cattle samples, respectively. Multiplex PCR analysis identified 64.5% and 29.3% of all the isolates as *C. coli* and *C. jejuni*, respectively. The majority (91.9%) of isolates from pig samples were identified as *C. coli*, while *C. jejuni* accounted for 65.5% of the isolates from cattle. Antimicrobial susceptibility testing using the disk diffusion assay and the broth microdilution method revealed resistance to: ampicillin (70% and 76%), gentamycin (1.8% and 12.6%), streptomycin (65.8% and 74.8%), erythromycin (41.4% and 48.7%), tetracycline (18.9% and 23.4%), and ciprofloxacin (14.4% and 7.2%), respectively. Resistance to nalidixic acid (39.6%), azithromycin (13.5%) and chloramphenicol (4.5%) was determined using the disk diffusion assay only, while resistance to tylosin (38.7%) was quantified using the broth microdilution method. Multilocus sequence typing of 111 Campylobacter isolates identified 48 STs (26 *C. jejuni* and 22 *C. coli*) of which 7 were novel (6 *C. jejuni* and 1 *C. coli*). This study revealed the high prevalence, genetic diversity and antimicrobial resistance of Campylobacter in important food animals in Tanzania, which highlights the urgent need for the surveillance and control of Campylobacter in this country.

Key words: prevalence, antibiotic resistance, genetic profiles of Campylobacter, domestic animal feces



MULTIDRUG RESISTANT SALMONELLA ISOLATES FROM FOOD ANIMALS AND ANIMAL PRODUCTS IN PASTORAL ZONES OF TANZANIA: PREVALENCE AND MOLECULAR CHARACTERISATION

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ABSTRACT

Food animals are major sources of human salmonellosis. In sub-Saharan Africa non-typhoidal Salmonella serotypes are the common causes of human bacteraemias. Despite the public health implication of non-typhoidal Salmonella, very little information is known regarding the magnitude of antimicrobial resistance and mechanism of multidrug resistance in Tanzania. The aim of this study was to determine the prevalence, antimicrobial resistance, the phenotypic and genotypic relatedness of non-typhoidal Salmonella isolates recovered from food animals. A cross-sectional study was carried out in a large pastoral region of Tanzania with large population of livestock. Salmonella isolates were recovered from 64 (4.2%) of the total of 1,540 samples from apparently healthy animals, animal products, floor swabs and sewage. Salmonella isolates were detected in 5.2% (n=496), 3.7% (n=818) and 3.8% (n=104) of the swine, cattle and chicken, respectively. Four Salmonella isolates were recovered from the abattoir floor swabs and one isolate from sewage. Of 64 Salmonella isolates, 61 belonged to Salmonella enterica subsp. enterica and 3 were S. enterica subsp. salamae. The predominant serotypes were Salmonella I 8,20:i:- (32.8%), S. Hadar (10.9%), S. Colindale (6.3%), S. Anatum (6.3%) and S. Heidelberg (6.3%). The three S. Heidelberg isolates belonged to the phage type 19, the most frequently encountered phage type among human sporadic cases and in outbreak cases, whereas, one S. Heidelberg isolate did not conform to any recognized phage type and was considered atypical. Of 64 Salmonella isolates, about 35.9% were resistant to at least one antimicrobial, whereas, 82.6% were multi-drug resistant (MDR) Salmonella. About 8.7% of the MDR Salmonella isolates were found to also carry integrons (int1) and 100% of int1-positive isolates contained resistance gene cassettes known as aac(3)-Id-aadA7 showing high rate of MDR. The PFGE DNA fingerprint patterns have strongly indicated that the majority of Salmonella isolates were clonal which indicates the high significance of informal traditional sector as an important source of foodborne pathogens in the food chain and the entry of pathogens to the pastoralist communities. This is of great public health concern particularly since unpasteurized milk and undercooked meat consumption is a common phenomenon in these communities.

Keywords: MDR Salmonella, Pastoralists, Animal products, Antimicrobial resistance, Public health



REMOVAL EFFICIENCY OF FAECAL PATHOGENIC BACTERIA IN DOMESTIC WASTEWATER STABILIZATION PONDS IN MOROGORO, TANZANIA

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ABSTRACT

This study assessed the removal efficiency of faecal pathogenic indicator bacteria in Mafisa and Mzumbe domestic wastewater stabilization ponds in Morogoro, Tanzania during October 2013 to April 2014 period. A total of 125 wastewater samples from effluent inlets and subsequent anaerobic, facultative and maturation ponds were collected and analyzed for *E. coli*, extended spectrum beta-lactamase (ESBL) producing *Escherichia coli* and *Salmonella*. Enumeration of *E. coli* was done using petri film select *E. coli* plates while ESBL producing *Escherichia coli* was screened with cefotaxime supplement. *Salmonella* was enumerated and isolated as per modified ISO 6579:2002 (E) with some modification. There were no differences in *E. coli* (5.08 log cfu/mL) concentrations in water entering in the anaerobic ponds in both wastewater treatment units. The removal efficiency of *E. coli* at Mafisa and Mzumbe varied from 51% and 83% during the rainy season to 100% during the dry season, respectively. Total removal of *E. coli* from October 2013 to April 2014 averaged 85% in Mafisa and 89% in Mzumbe wastewater stabilization ponds. *E. coli* concentration in effluent discharged from the two systems during October to February was well below 1 log cfu/mL. Likewise ESBL producing *Escherichia coli* were completely removed from 4.72 log cfu/mL to 0 log cfu/mL. *Salmonella* were removed from 3 log cfu/mL in inlet effluent to zero in the final effluent. Exceptional was observed during the rainy season in the months of March and April. The bacteriological quality of treated effluent in this study meets the WHO guidelines for safe use of wastewater in agriculture.

Key words: removal efficiency, indicator bacteria, *E. coli*, *Salmonella*, wastewater, Tanzania.



ECONOMICS OF MANURE DISPOSAL AND UTILIZATION IN MOROGORO MUNICIPALITY, TANZANIA

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ABSTRACT

The objective of this study was to evaluate the alternative economic uses of animal manure in Morogoro Municipality, Tanzania. Specifically, the study aimed to: (i) characterize manure production, disposal and use practices and; (ii) analyze the costs and benefits associated with alternative manure use. The study involved 118 livestock keepers from four wards of Morogoro Municipality namely Kilakala, Bigwa, Mazimbu and Mkundi. Descriptive statistics and analysis of costs and benefits associated with manure use were computed. The study revealed that cattle produced more manure per animal per day (20 kg), while in total chickens produced the largest quantity of manure amounting to 142.4 Million kg per year due to the large number of chickens compared to other animals. Most of the manure produced in Morogoro Municipality was economically used for crop production and a very small amount used for biogas production. Manure was directly spread on crop farms or stored in heaps for future use. The net benefits per annum varied from one alternative use to another with manure trade being the most beneficial use of animal manure in the study area. The findings suggest that manure directly and indirectly benefits the users by increasing their income, reduce environmental pollution and improve nutrition. It was recommended that local government and other stakeholders should increase awareness to farmers on economic value of manure as well as designing appropriate manure handling and practices.

Key words: alternative economic uses, manure, cost and benefits, Morogoro municipality.



HEALTH RISKS AND BIOSECURITY MEASURES IN PIG PRODUCTION IN URBAN AND PERI-URBAN AREAS OF MOROGORO MUNICIPALITY, TANZANIA

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ABSTRACT

A cross-sectional study was conducted in 13 wards of Morogoro municipality, Tanzania, from October 2014 to January 2015, to assess possible health risks associated with urban and peri-urban pig production and identify available biosecurity measures. A total of 282 pig farmers were randomly chosen from purposively selected streets and they were interviewed using a structured questionnaire to measure respondents' knowledge on the diseases that have affected pigs on their farms. The survey also assessed husbandry systems and practices, animal waste management as well as biosecurity measures practised by the farmers. Twelve key informants were interviewed on the subject; qualitative data were subjected to content analysis and association between variables were assessed for statistical significance at a critical probability of $P < 0.05$. Data from questionnaire were analysed using the Statistical Package for Social Sciences (SPSS). The study revealed that 48.6% of respondents were not aware of health risks associated with pig production. Approximately 9.2% reported to wear local protective gears (wrapping plastic bags on hands and local shoes known as Yeboyebo) while 19.1% did not have any protective gears. Only 0.4% generated biogas out of the manure. Animal quarantining was practised by 68.4%, presence of screening was 20.6%, while veterinary service was accessible to 66.3% of the farmers interviewed. Poor animal wastes disposal is becoming a major challenge to public health. Farmers should be advised and trained to generate biogas out of the manure, livestock officers should be supported with transport to ensure timely delivery of veterinary services to all the livestock keepers especially those who reside at the peripheral areas.

Key words: health risks, biosecurity measures, pig production, Morogoro municipality



CHARACTERISATION OF ESCHERICHIA COLI IN HEALTHY CATTLE AND ANIMAL WASTE HANDLERS IN TANZANIA

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ABSTRACT

Escherichia coli is among of the abundant commensals in the gastrointestinal tract of warm-blooded animals and birds. It is generally harmless with a few exceptions which cause disease conditions in human such as bacteremia, meningitis and urinary tract infection. Cattle regularly shed *E. coli* in the environment; therefore handling of cattle wastes creates related potential risks into humans regarding plasmid and resistance gene transmission among themselves. The current study characterised 185 *E. coli* isolated from healthy cattle and animal waste handlers using a PCR-based Enterobacterial Repetitive Intragenic Consensus (ERIC PCR) and Whole genome sequence (WGS) analysis. The ERIC PCR identified sixty six clusters distributed as: 36 clusters (cattle-specific), 14 clusters (human-specific) and 16 (clusters shared between humans and cattle). The WGS sequence revealed that three clusters were allocated in the isolates using SNPs; eight (8) plasmid major groups; virulence factors and resistant genes.

Key words: *Escherichia coli*, characterisation, Repetitive Intragenic Consensus, Whole genome sequence, resistance.



DETERMINANTS OF DEMAND FOR PRIVATE FODDER DELIVERY SERVICES IN NORTHERN ZONE, TANZANIA: A CASE OF ARUMERU AND MOSHI RURAL DISTRICTS

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ABSTRACT

Livestock production is one of the major economic activities carried out by the majority of farmers which contributes to improved household income and nutrition in Northern Tanzania. A study was carried out in two districts of Moshi Rural and Arumeru in Northern Tanzania to assess determinants of demand for private fodder delivery services in the study area. Purposive sampling and simple random sampling were used to draw 140 livestock keepers from two divisions namely Poli and Hai East in Meru and Moshi rural district respectively. Four villages were then selected purposively based on their potential in livestock production. Both descriptive and quantitative analytical tools were employed to analyze the data. Logit regression model was used to determine factors influencing the demand for private fodder delivery services. It was found that, about 80% of the respondents were engaged in farming activities including both crop cultivation and livestock keeping. The findings from the model showed that, the demand for private fodder delivery services were influenced by fodder price, farm size and number of cattle kept. Demand for private fodder delivery services was reported by 94% of the interviewed respondents. Fodder scarcity was the major challenge faced by livestock farmers in Meru and Moshi rural district, 54% of the respondents claimed to face fodder shortage particularly during the dry season. This means that the existing actors for fodder delivery do not meet the market demand for the fodder. This paper suggests that, formulated policies on livestock sector development should be in line with fodder improvement including reserving land for commercial fodder planting. Also emphasize should be given on growing of different drought tolerant fodder varieties with high nutritive value.

Key words: Private fodder delivery, Scarcity, Demand, Livestock, Northern Tanzania.

AN OVERVIEW ON THE VILLAGE CHICKEN KEEPING PRACTICES AT SANZA WARD IN SINGIDA REGION AND PROPOSED AREAS OF INTERVENTION

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ABSTRACT

Village chicken keeping practices by households in Sanza Ward of Singida Region was studied in May 2014 as part of baseline research activities in a food and nutrition security project. Pre-tested structured questionnaires were administered to 234 households, targeting equal numbers of male and female respondents. Just over half (51.7%) of the households were keeping chickens, of which 53.5 % were identified as being owned by the male household heads and 38.5% by female household heads. The remaining owners (8%) were children of both sexes and other family members. High mortality due to diseases was mentioned to be the main obstacle to village chicken raising (55.8%). More than half of households (62.8%) which were currently keeping chickens or which had kept chickens within the previous 12 months reported providing supplementary feed. Areas which were reported to be used for housing chickens overnight were the bedroom (37.4%), chicken house (36.7%), kitchen (20.4%) and outside, with no specific area (2.7%). Consumption, sale and other uses of chickens by households are reported. Options for promoting poultry raising and cost-efficient improvement of general chicken management including disease control, housing and feed supplementation in the study area are discussed.

Keyword: Keeping chicken, production obstacles, Sanza Ward, Singida Region, Tanzania.



POULTRY'S POTENTIAL FOR LIVELIHOOD IMPROVEMENT IN PASTORAL HOUSEHOLDS: EVIDENCE FROM PAWAGA AND IDODI DIVISIONS, IRINGA RURAL DISTRICT, TANZANIA

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ABSTRACT

Poultry production has the potential to provide an important nutritional and financial resource for households throughout the world. Flocks of chickens can be raised simply and inexpensively, providing access to animal-source protein in eggs and meat as well as a source of income through the sale of eggs, meat or live birds. Importantly, women, who in many societies allocate more resources to pro-household ends such as health and education, tend to control the production and use of poultry products and revenue. Recognizing this, many governmental bodies and NGOs are promoting the production of local poultry as a way to combat poverty for villagers. We investigated the production of chicken and chicken products in pastoralist households in Iringa Rural district to examine differences in characteristics and outcomes for households that do and do not raise poultry, including important development-relevant results as nutrition status of women and infants, school attendance and dietary diversity. We also studied the constraints to poultry production among households that do raise chickens including disease burden and predation. Low investments in vaccination for high-risk chicken diseases hint at the complexity of the choice environment, indicating a need for human capital development and training. Evidence from our on-going work with pastoralist communities in Iringa Region suggests that poultry could play an important role in improving lives, provided that the proper combinations of human capital and health infrastructure exists.

Key words: poultry production, pastoralists, characteristics and outcomes, Women, Iringa Rural district

THE ROLE OF PRIVATE TRADERS ON AFLATOXIN MANAGEMENT IN POULTRY FEEDS: CASE STUDY IN MOROGORO MUNICIPALITY

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ABSTRACT

Mycotoxin occurrence is a subject of big concern in food and feed safety. A cross sectional survey study was conducted in Morogoro municipality to assess the position of private traders of poultry feeds on risk management of mycotoxins, particularly aflatoxin B₁. In the study 25 individuals who included compounded feed processors, uncompounded (raw) feed processors and feed sellers were interviewed. 340 samples of 9 different types of compounded and uncompounded poultry feeds were analysed for risk factors and aflatoxin B₁ occurrence. Despite knowing that poultry feeds can go bad, none of the interviewed feed traders knew about toxins produced by fungi in the feeds. Sorting and drying is occasionally done to the feeds in their commercial chain but storage conditions and duration and packaging pose a great risk of mycotoxins contamination. 54% of "on market" animal feeds had moisture content above 15% with maize bran being the leading feed material sold with high moisture content. 98% of the tested samples were contaminated with *Aspergillus flavus*, of which 96% tested positive for aflatoxin B₁ production. Aflatoxin B₁ as analysed by ELISA was found in 68% of the feed samples and of the positive samples 73% had levels higher than the 5 ppm which is the maximum tolerable level as per FAO/WHO regulations. The findings of this study suggest that private traders occupy a position at the poultry feed chain important for management of mycotoxins occurrence and exposure.

Key words: Private traders, poultry feeds, maize bran, mycotoxins, Morogoro municipality.



AN EPIDEMIOLOGICAL SURVEY OF PORCINE CYSTICERCOSIS IN NYASA DISTRICT, RUVUMA REGION, TANZANIA

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ABSTRACT

Porcine cysticercosis caused by *Taenia solium* larvae is an important zoonotic disease in many developing countries. It poses a serious public health risk and leads to economic losses to pig production industry. This study was carried out from September 2013 to January 2014 to determine the prevalence and risk factors associated with porcine cysticercosis in Nyasa District. A cross-sectional survey was conducted involving 698 pigs which were tongue-examined, 330 pigs were screened by Ag-ELISA test and 22 pig carcasses were screened by meat inspection. A questionnaire survey was also used to collect information on pig management and other potential factors that could explain the prevalence of porcine cysticercosis in the area. Forty four pigs were found positive by tongue examination (6.3%, 95% C.I. 4.5 - 8.1%), while 110 tested positive for Ag-ELISA (33.3%, 95% C.I. 28.22 - 38.38%) and pork inspection detected four infected pigs (18.2%, 95% C.I. 2.08 - 34.32%). The most important risk factor for porcine cysticercosis transmission in Nyasa District was free range of pigs (OR = 7.739, 95% C.I. = 3.201 - 18.707). The present findings indicate that porcine cysticercosis is endemic in Nyasa District and that free-range of pig keeping contribute significantly to porcine cysticercosis transmission in the area. Therefore, mandatory pig confinement, in conjunction with improved use of latrine/toilets should be considered in planning porcine cysticercosis control in Nyasa District.

Key words: *Taenia solium*, Prevalence, Risk factors, pig management, Nyasa, Tanzania

REDUCTION OF SEROLOGICAL MARKER OF ACTIVE INFECTION TO HEPATITIS E VIRUS ON A SWINE FARM, GHANA

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ABSTRACT

This cross-sectional study reports anti-hepatitis E virus (anti-HEV) seroprevalence among 207 participants comprising 110 swine-handlers, 50 swine-farm owners, 39 swine-processors and 8 participants with unknown swine-contact history, on a group-owned swine-farm in Accra. High anti-HEV immunoglobulin M (IgM), serological marker of active infection, 38.1% was reported on same swine-farm previous two years. Participants gave demographic data with additional data on hygiene/behavioral practices collected from 50 swine-farm owners using structured questionnaire. Bio-specimen was collected and serological tests using enzyme-linked immunosorbent assay (ELISA) techniques conducted on blood-serum. Serum and stool samples were processed and analyzed for HEV ribonucleic acid (RNA). Statistical Package for Social Sciences (SPSS) version-16.0 software was used for data analysis. Overall, anti-HEV IgG serological marker of previous infection among 207 participants was 2.4%. Seroprevalence of 5.0% anti-HEV IgM was found in 180 participants comprising 3 (6%) swine-farm owners (n=50), 3 (3.6%) swine-handlers (n=83), 3 (7.6%) swine-processors (n=39) and none in the 8 participants. No HEV RNA was found but one swine-farm owner had both IgG and IgM anti-HEV. Associated risk factors for anti-HEV IgM were, age (P = 0.011, odds ratio (OR) 1.055 95% confidence interval (CI) 1.01-1.10), eating "under-cooked pork" (P= 0.007, OR 45, 95% CI 2.72-730.), not "washing hands with soap before eating" (P = 0.045, OR 23, 95% CI 1.02-516.93). Study suggests a reduction in anti-HEV IgM, the serological marker for active infection compared to previous report of 38.1%. Health education should focus on improvements in personal hygiene. Future studies should involve larger sample-sizes.

Key words: epidemiology, Ghana, hepatitis E virus, risk factors, serological marker.



TABLET BASED SURVEYS AS A TOOL TO COLLECT DATA ON LIVESTOCK: EVIDENCE FROM TANZANIA

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ABSTRACT

Decision-makers require timely and accurate data to effectively formulate, implement and monitor policies or investments. However, data are often unavailable or, when available, they are either of poor quality or outdated to be effectively used in the policy-making process. This has increased the appeal of collecting data with tablet assisted personal interview (TAPI) methods, which significantly improves data timeliness and quality. During July-August 2015, the Tanzania Ministry of Livestock and Fisheries Development (MLFD), with the technical assistance of the Global Strategy to Improve and Agricultural Statistics (GSARS), carried out a baseline survey on the delivery of animal health services in Tanzania using TAPI software called Survey Solutions (SuSo®), with the ultimate objective to design effective institutional reforms in the livestock sector. It was the first time the MLFD implemented a survey using TAPI and was followed closely by the National Bureau of Statistics and the Ministry of Agriculture who are considering wider application. This paper reports on the application of TAPI methods by MLFD, including the background of the study, details of survey implementation and field monitoring using TAPI, overview of costs, and challenges encountered in the field and the measures taken to mitigate them. Final conclusion and lessons learned are also provided. TAPI methods seem particularly appropriate in the policy-making process, when timely information is needed, and particularly when data are needed on the animal disease situation at local, district or national level. Indeed, outbreaks of animal diseases can easily turn into epidemics that, in case of zoonoses, also affect human beings. The expected benefits of using TAPI in terms of timeliness and data quality were realized as very little data cleaning was required and preliminary results were disseminated within a month and a half of the completion of data collection.

Key words: data collection tools, TAPI, MLFD, timely and good quality data



FINNISH PERSPECTIVES ON GLOBAL BIOTHREAT PREPAREDNESS: INTERAGENCY COLLABORATION AND ONE HEALTH

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ABSTRACT

The Centre for Biothreat Preparedness (BUOS) was established in Helsinki in 2005. The Centre combines Finnish scientific and laboratory know-how on biological defence, as well as on biothreat assessment and preparedness. The main task of the Centre is to endorse provision against biological threats, and capabilities to evaluate biological threats. Furthermore, the Centre is a collaborative link between Finnish authorities and experts in preparedness against intentionally caused biological threats. BUOS is a collaborative Centre of excellence between the National Institute for Health and Welfare (THL) and the Finnish Defence forces (FDF), under the Ministries of Social Affairs and Health (STM) and Defence (DEFMIN), respectively. However, despite efficient integration of two operational BUOS Units, financial control is conducted within each administrative branch (THL and FDF). The Centre works in close contact with the Department of Infectious Diseases of THL and with the Centre for Military Medicine (SOTLK) of the Finnish Defence Forces Logistics Command. In addition to the FDF and THL, the Board of Directors of BUOS has one member each from STM, as well as from DEFMIN. Furthermore, the Centre collaborates with the police, Finnish Food Safety Authority EVIRA and the Ministry for Foreign Affairs (MFA). Scientific work at BUOS is carried out with domestic and international partners from the health security sectors and academic communities, as well as from industry. Biological safety laboratory facilities, up to level 3 are available at THL for handling of biological agents. A Deployable Laboratory and other diagnostic capabilities have been established to be used for international tasks, as well as for national duties. In addition to rapid field detection, this laboratory may be used for collection of forensic evidence related to possible cases of alleged use of biological agents. BUOS was in charge of establishing the biosafety and microbial identification requirements of the laboratory. BUOS experts participate in the bi-annual Meetings of States Parties to the Biological Weapons Convention (BWC), and prepare the Finnish Confidence Building Measures (CBM) report of the Convention. In addition to chairing the Steering Committee in 2015, as a national commitment under the Global Health Security Agenda (GHS), Finland has committed to a collaborative project on building local capacity for infectious disease monitoring, and training of local experts in biothreat management in Tanzania. The project is funded by MFA. Main partners in the project are SOTLK together with BUOS, and the Tanzania Veterinary Laboratory Agency. The achieved expertise and capabilities in rapid field diagnosis support and strengthen capacities for the Tanzanian health and other sectors dealing with biothreat reduction in concordance with the One Health strategy. Tanzania joined GHS in September 2015, and has volunteered for an external GHS country assessment.

Key words: Biothreat Preparedness, Biosafety and Biosecurity, Infectious Diseases, national and international collaborations, One Health



ENHANCING DELIVERY OF DIAGNOSTIC AND ADVISORY SERVICES TO RURAL-BASED LIVESTOCK KEEPERS: APPLICATION OF e-BASED SUAVetDiag® SYSTEM

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ABSTRACT

Tanzania has the largest cattle population in Africa after Ethiopia. It is mainly an agricultural country, and the livestock extension service delivery system is mandated to communicate information to livestock keepers. Public extension programmes are often underfunded and delivery of animal health delivery services including diagnosis is not well organised and inadequate, particularly in rural areas where the majority of livestock keepers are based. One of the challenges facing effective delivery of extension and diagnostic services livestock agriculture is limited use of e-services to address development challenges of rural-based population. Information and Communication Technology (ICT), and in particular mobile technologies has potential to play a role of 'game changer' in provision of extension and animal health services in Tanzania. Since mobile telephony enjoys unique advantage of being able to reach the farmers, however remote they are located, it affords extension officers and other private service providers an opportunity to reach and inform farmers on issues affecting them. An e-based diagnostic system (e-SUAVetDiag®) was designed, developed and tested in Kilosa district to address challenge of inability or delayed diagnosis of sick domestic animals through use of public (SUA Animal hospital) and Private (Makanyaga Vet Clinic) veterinary facilities located in Morogoro municipality. This system has proved to be effective in timely delivery of diagnostic and advisory services by submitting specimens using public transport and receiving prompt diagnosis and treatment advice on sick animals within 12 hours using automated SMS service. We share our experience on how the system works and its potential in transforming diagnostic and advisory services to livestock keepers in the country.

Key words: Diagnostic and extension services, e-based system, e-SUAVetDiag®, Kilosa

EVALUATING FACTORS INFLUENCING PREGNANCY RATES IN MPWAPWA BREED RECIPIENT COWS AFTER TRANSFER OF FROZEN-THAWED EMBRYOS

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ABSTRACT

Modern animal reproductive bio-technologies such as embryo transfer (ET) in cattle hold great potential in amplifying reproductive rates of desired female lines and the delivery of superior genetic resources when compared to the use of natural service. The objective of this study was to assess pregnancy rates achievable on-station among Mpwapwa cattle recipients following non-surgical transfer of frozen-thawed Bonsmara breed embryos. A total of 30 potential recipient cows of Mpwapwa breed with a functional corpus luteum (CL) were each injected intramuscularly with 500µg of PGF2α-analog, PG (estroPLAN®) to induce oestrus. Thereafter, to the responding animals, a total of 19 frozen-thawed Bonsmara breed embryos were transferred, one embryo per recipient. Of the treated potential recipients, 28 (93%) exhibited behavioural oestrus on average of 5.1±1.0 (range 3-6) days post PG injection. At 3½ months post-transfer, six recipients (32%) remained pregnant and at term five normal calves (2 females and 3 males) were born. The post-transfer pregnancy rates in Mpwapwa breed recipients were highest when transfer was performed to cows in parity one (66.7%), on Day 6.5 post induced-oestrus (100%) and on the right uterine horn (83%). The average post-transfer gestation period for the calves born (n=5) was 271.2±6.7 days and an average birth weight of 30.2±5.5 kg. A concerted effort and more resources are needed in support of national capacity building in animal bio-technology such as Artificial Insemination (AI) and ET for improved productivity in the food-animal sub-sector.

Key words: embro transfer, pregnancy rates, Mpwapwa cattle, Bonsmara embryos



PRODUCTIVE AND REPRODUCTIVE PERFORMANCE OF HOLSTEIN FRIESIAN DAIRY COWS AT KITULO LIVESTOCK MULTIPLICATION UNIT, TANZANIA

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ABSTRACT

Retrospective data were collected to assess the reproductive and productive performance of Holstein Friesian dairy cows reared at Kitulo Livestock Multiplication Unit, Tanzania. Records of 314 cows within consecutive five productive periods (2009 - 2014) were analyzed. The overall mean age at first calving (AFC), calving interval (CI), days open (DO), number of serve per conception (NSPC), lactation length (LL) and total lactation milk yield (TLMY) were 1151.72±9.63 days, 404.57±1.54 days, 121.82±1.24 days, 1.83±0.24, 306.54±5.53 days and 5,042.12±23.73 kg, respectively. CI differed significantly ($P < 0.05$) with number of parturitions as it decreased as parity level increased but did not affect the TLMY. Number of service per conception positively correlated with DO and CI but negatively correlated with parity. Total lactation milk yield was significantly ($P < 0.05$) influenced by parity and lactation length, but TLMY had no significant ($P > 0.05$) effect on the average number of service per conception. From results of this study, it is concluded that the productive performance levels of Holstein Friesian at Kitulo LMU were not very different from those reported elsewhere in the tropics. However, reproductive performance was sub-optimal needs improvement for better performance of the herd.

Key words: reproductive and productive performance, Holstein Friesian dairy cows, Kitulo, Tanzania.



POPULATION GENETIC VARIATION OF THEILERIA PARVA ISOLATES IN CATTLE AND BUFFALOES: IS IT A THREAT TO THE CURRENT CONTROL METHODS OF EAST COAST FEVER?

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ABSTRACT

Population genetic study of Theileria parva was conducted on 103 cattle and 30 buffalo isolates from Kibaha, Lushoto, Njombe and some selected National parks of Tanzania using three micro- and 11 mini-satellite makers selected from all 4 chromosomes of the parasite genome. The samples used were categorized in five populations which were Kibaha, Lushoto, Njombe, Buffalo, Cattle which graze close to buffalo and Muguga populations. The diversity of across populations was determined by the mean number of alleles, mean number of private allele and expected heterozygosity. The mean number of alleles unique to the population ranged from 3.37 (Buffalo) to 0.24 (Muguga). For other populations, the mean number of alleles was 0.18, 0.71, 1.63 and 0.63 for cattle close to buffalo, Kibaha, Lushoto and Njombe populations, respectively. The mean number of different alleles ranged from 6.97 (Buffalo) to 0.07 (Muguga). Mean number of effective alleles ranged from 4.49 (Buffalo) to 0.29 (Muguga). The highest mean expected heterozygosity was 0.64 (Buffalo) and the lowest was 0.07 (Muguga) and for other populations were 0.29, 0.45, 0.60 and 0.50 for cattle close to buffalo, Kibaha, Lushoto and Njombe, respectively. The population which was close to Buffalo in mean number of different alleles, effective alleles, private alleles and expected heterozygosity was Lushoto and the values were 6.71, 4.17, 1.63 and 0.59 respectively. The study revealed more diversity in buffalo isolates and recommend further studies to establish if there is sharing of parasites between cattle and buffaloes which may affect the effectiveness of the control methods currently in use.

Key words: Buffalo, cattle, diversity, population genetic, Tanzania, Theileria parva



MOLECULAR CHARACTERISATION OF RECENTLY ISOLATED FOOT-AND-MOUTH DISEASE VIRUSES IN TANZANIA

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ABSTRACT

Phylogenetic techniques are used to visualize genetic relationships, including their interpretation in terms of epidemiological clustering and/or geographical/ecological source. Foot and Mouth Disease (FMD) is endemic in Tanzania and serotypes SAT1, SAT2, A and O have been identified since 1954. The main objective was to assess the topotypic distribution of FMDV strains in endemic settings of Tanzania. A total number of 356 FMDV isolates were obtained from outbreaks in various parts of Tanzania between 2008 and 2013. The single-plex real-time RT-PCR (qRT-PCR) with appropriate primers was used for FMDV pan-type detection and serotype specific diagnosis. One-Step, serotype specific RT-PCR was carried out using VP1 primers followed by sequencing of post PCR products. Phylogenetic analysis was by assembling of sequences using SeqMan II (DNASTar Lasergene 8.0). Midpoint-rooted neighbour-joining (NJ) trees were constructed using the Kimura 2-parameter (MEGA 5.0). Findings indicated that 53% of samples (n = 176) were positive for FMDV genome by qRT-PCR with Ct values ranging from 14 to 32. VP1 sequences from 52 samples representing the four serotypes were compared with previously obtained sequences from the Great Lakes countries. The VP1 sequence data revealed that serotype A topotypes clustered into the Africa G1 topotype, those of serotype O into the East Africa 2 (EA-2) topotype, those of SAT1 into the NWZ topotype and the SAT2 isolates into I topotype. In this study, no single topotype was found to be peculiar to Tanzania. The findings of this study suggest that FMDV strains currently circulating in Tanzania probably do not differ genetically from the pre-2009 previously studies. The study further contributes the epidemiological knowledge on where exactly the Foot-and-Mouth Disease topotypes are found. It has been revealed that the genetic features of these strains could be influenced by geographical, epidemiological, ecological and animal movement patterns shared with neighbouring countries.

Key words: Serotypes, phylogeography, phylogeny, VP1 sequence, topotypes/genotypes, Tanzania.



EPIDEMIOLOGICAL STUDY OF BOVINE BRUCELLOSIS IN SMALLHOLDER DAIRY CATTLE IN LUSHOTO AND RUNGWE DISTRICTS, TANZANIA

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ABSTRACT

A cross-sectional study was undertaken between November 2014 and March 2015 in Lushoto and Rungwe districts of Mbeya and Tanga regions, respectively to estimate the seroprevalence of bovine Brucella spp infection in smallholder dairy cattle and to assess risk factors that could be associated with the seroprevalence. Blood samples from 400 animals aged 6 months and above from Lushoto (172) and Rungwe (228) were tested for Brucella abortus antibodies using Rose Bengal Plate test (RBPT), lateral flow Assay (LFA) and Competitive-enzyme-linked immunosorbent assay (cELISA). Information regarding risk factors associated with brucellosis seropositivity, smallholder farmers' knowledge, attitudes and practices (KAPs) were collected using structured questionnaires administered to 400 smallholder households. Univariate and stepwise logistic regression were used to study the association between possible risk factors and Brucella seropositivity. All animals tested negative for Brucella antibodies by RBPT and LFA tests, while the overall animal seroprevalence was 5.3% based on cELISA results. Rungwe had a significantly higher seroprevalence (8.3%) than Lushoto (1.2%) (p=0.001). Seroprevalence was insignificantly higher in females than males in both districts. Furthermore, risk of seropositivity was independent of breeding method, history of abortion herd size, vaccination and number of services before last conception. Handling of aborted materials without the use of protective wear (OR=7.85, 95% CI: 1.02-60.5, p=0.04) was a significant risk practice that was associated with Brucella seropositivity. Results revealed poor knowledge and awareness of brucellosis among farmers and their practices are potential risk factors of disease transmission. Bovine brucellosis is prevalent in the study areas; this calls for public health awareness programmes, and implementation of control measures in the smallholder production systems within and outside the study area.

Key words: Brucellosis, Seroprevalence, Smallholder dairy farmers



VIBRIO CHOLERAE IN VEGETABLES AND FISH RAISED IN WASTEWATER IRRIGATED FIELDS AND STABILIZATION PONDS DURING A NON-CHOLERA OUTBREAK PERIOD IN MOROGORO, TANZANIA

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ABSTRACT

Cholera, one of the world's deadliest infectious diseases, remains rampant, persistent and frequent in Tanzania and thus thwarts existing control measures. The current study was undertaken to evaluate the occurrence of toxigenic *Vibrio cholerae* in low quality water, fish and vegetables during a non-outbreak period in Morogoro, Tanzania. From October 2014 to February 2015, 60 wastewater samples, 60 fish samples from sewage stabilization ponds and 60 wastewater irrigated vegetable samples were collected. Samples were cultured and identified for *V. cholerae* using conventional bacteriological methods. Isolates were confirmed by detection of the outer membrane protein (OmpW) using Polymerase Chain Reaction (PCR). The isolates were further tested for antibiotic susceptibility and the detection of virulence genes including, cholera enterotoxin gene (ctx), the toxin co-regulated pilus gene (tcpA) and the haemolysin gene (hlyA). The prevalence of *V. cholerae* in wastewater, vegetables and fish was 36.7%, 21.7% and 23.3% respectively. Two isolates from fish gills were *V. cholerae*O1 and tested positive for ctx and tcpA. One of these contained in addition the hlyA gene while five isolates from fish intestines tested positive for tcpA. All *V. cholerae* isolates were multidrug resistant and displayed resistance to ampicillin, amoxicillin and some to tetracycline. It is concluded that pathogenic, toxigenic and drug resistant *V. cholerae* species are present and persist in aquatic environments and can be isolated even during non-cholera outbreak periods. This is of serious public health importance and a great challenge to cholera control programmes.

Key words: Cholera - low quality water – fish- vegetables- antibiotic susceptibility



FIELD EFFICACY TRIALS OF ECF VACCINE – MUGUGA COCKTAIL LILONGWE 01 BATCH

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ABSTRACT

East Coast fever (ECF) in cattle is the most fatal tick-borne disease in Tanzania and other parts of Eastern and Central African region. The vaccine to control the disease was formerly produced at the International Livestock Research Institute (ILRI) in Nairobi, Kenya until recent when the production was transferred to the Centre for Ticks and Tickborne Diseases in Lilongwe, Malawi. Following change of vaccine production site it is required by Tanzania Food and Drug Authority (TFDA) to be re-registered. This study was conducted to determine the field efficacy of ECF vaccine manufactured at CTTBD in Tanzania. A total of 470 calves below nine months of age of both sexes were vaccinated. Before immunization blood was taken from 80 calves in Chunya and 110 in Monduli districts on random basis. The seroconversion was assessed 35 days post immunization in 169 calves from Chunya and 190 calves from Monduli. All samples were tested using Indirect Enzyme Linked-Immuno Sorbent Assay (ELISA). Results showed that natural exposure had produced immunity in 29 out of 80 (36.1%) calves in Chunya district and 24 out of 110 (21.1%) in Monduli district. The post vaccination seroconversion was 127 out of 169 (75.2%) in Chunya and 121 out of 190 (63.7%) in Monduli. This trial has demonstrated that ECF immunization is likely to double or treble the chance of survival in a susceptible population in case of ECF outbreak. It can therefore be concluded that ECF vaccine from CTTBD is likely to improve the survival rate of cattle in the targeted areas.

Key words: ECF, vaccine, seroconversion, ELISA, Chunya and Monduli districts, Tanzania.



AN INTEGRATED SYSTEM MODEL FOR ENHANCING EXTENSION SERVICES, ACCESSING AND SHARING OF INFORMATION AMONG LIVESTOCK STAKEHOLDERS

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ABSTRACT

Information and communication Technologies (ICTs) are known to bring economic and social development by reaching to, even those who do not have first-hand access to them. In the livestock sector, extension officers play the role of conveying knowledge and scientific findings to livestock keepers. However, this is not effective because the number of farmers per extension officer is practically too high. Essentially, the number of extension officers is inadequate to meet the need and in turn, it deteriorates extension services. As a result of poor access to timely and relevant livestock information, most of the livestock keepers remain uninformed the situation which is affecting their productivity. Therefore, there is a need of improving information flow, sharing, and access to livestock stakeholders. Fortunately, ICTs promise to bridge this gap. We present how ICTs can be used as a tool for bridging the gap between livestock keepers and information that they need. A special focus is put on web and mobile technology, which is the fast growing area of ICT. As a response we have developed a web and mobile application information flow model that replaces the traditional information flow model. The developed Livestock Information Management System (LIMS) model offers improved online extension services, access and sharing of information among livestock stakeholders. Moreover, it has a recordkeeping functionality capable of assisting farmers in keeping their records, which are crucial during delivering of online extension services, researching and for self-evaluation. The developed system model was tested by livestock stakeholders including livestock keepers, researchers and extension officers. Validation results show that the model has capacity to meet users' requirements.

Key words: Information, mobile phone, Livestock stakeholders, online extension services.



THE IMPACT OF GOOD ANIMAL HEALTH SERVICE DELIVERY IN LIVESTOCK PRODUCTION AND IMPROVED LIVELIHOOD OF THE RURAL POOR

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Abstract

Livestock contributes 40% of the global value of agricultural output and supports the livelihoods and food security of almost a billion people in developing countries. The world demand for animal protein in the form of meat, milk and eggs is expected to double by 2050 as a result of global population growth, urbanisation and increasing income. Livestock is expected to play a critical role in rural poverty alleviation in view of the position it occupies in the livelihood of the resource poor. In spite of laudable efforts in the fields of genetics and intensification to increase productivity, veterinary service delivery, especially in rural areas remains a sector in need of concerted efforts if livestock is to live up to the expected increase in protein intake arising from improved living standards in developing and middle income countries. With support from the United Kingdom Department for International Development (DFID) and the Bill and Melinda Gates Foundation (BMGF) GALVmed is working with other development agencies, in collaboration with public private partners, to bring together critical intellectual resources around the world to identify, develop and translate innovations in animal health into commercially sustainable solutions and making these accessible and affordable to livestock producers in developing countries. Veterinarians and para veterinarians are critical links in these endeavours. GALVmed is catalysing processes and facilitating activities that promote the adoption of animal health solutions including vaccination against preventable diseases, therapeutics and diagnostics for improved livestock production. By promoting linkage between veterinarians and paravets, GALVmed is contributing to the efforts to stimulate concerted stakeholders engagement to promote access to animal health services. In this way GALVmed is contributing to global efforts to save livestock and improve the livelihood of resource poor livestock producers in developing countries.

Key words: Livestock contribution, livelihood, food security, animal health, GALVmed



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Conference on Modernization of the Livestock
Sector Through Improved Animal Health

This image shows a single page of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no text or other markings on the paper.

Conference on Modernization of the Livestock
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[illegible]



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This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. In the bottom right corner, there is a faint, light gray watermark of a classical building facade, featuring columns and a pediment. The overall appearance is that of a clean, unused piece of stationery or a notebook page.

Conference on Modernization of the Livestock Sector Through Improved Animal Health

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. In the bottom-left corner, there is a large, faint, light-grey watermark logo. The logo appears to be a stylized letter 'A' or a similar geometric shape, possibly representing a brand or institution. The rest of the page is blank except for the lines.



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