



Zoonoses in Emerging Livestock Systems

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INSIDE THIS ISSUE:

Letter from the CO-PI 1

Introducing ZooLinK students and Staff 2

Student Section 3

Student Section 4

News in Brief 4

ZooLinK Newsletter

The Quarterly Newsletter of the Zoonoses in Livestock in Kenya Programme

LETTER FROM CO-PI



Professor Olivier Hanotte

It gives me great pleasure to write this first newsletter for 2018. A lot has been happening in the project over the last couple of years and we are now on the 8th cycle of the 24 planned sampling cycles. Specifically during the past year, 2017, a few challenges including nurse strikes, affecting our hospital sampling sites, foot and mouth disease outbreaks and the Kenyan general elections slowed down activities a bit but this year has started on a high with all activities going on as scheduled.

During this year, Lian Thomas has joined the team and is the Post-Doc looking at the economics component of the project with Jonathan Rushton as her main PI link on the project. Later this year, we look forward to wel-

come the Diagnostic Post-Doc who will be looking at the diagnostic quality controls and setting up other assays among others. The main PI link to the project for the diagnostic Post-Doc is Phil Toye. Additionally this year, we now have the University of Nairobi Laboratory staff on board. They will be supporting the current lab capacity as more and more samples from the sampling sites come through. Additionally we have a new PhD student joining the project. Ellie Balchin who is funded by the Risk Institute at Liverpool will be looking at financial risk taking and uncertainty in households in western Kenya. Clearly a lot of exciting activities happening during this new year on the project.

So far from the samples collected we have been able to get and share the results to the participants in form of public engagements. Feedback has been shared with medical officers, public health officers, nursing officers, clinical officers and laboratory staff at Bumula sub-county hospital in Busia County (held on 28/02/2018) Mukumu mission hospital in Kakamega county (held on 07/02/2018) and Lukolis health center in Bungoma County (held on 14/12/2017) while public engagement with livestock

traders, butchers, meat inspectors and animal health officers at Myanga slaughterhouse and livestock market in Bungoma County (held on 28/02/2018) and in Shinyalu slaughterhouse and livestock market in Kakamega County (held on 07/02/2018). The objective of the public engagements at the health facilities, livestock markets and slaughterhouses were to share research sampling results so far, to inform the study participants of the work we do, zoonoses covered by the study and offer recommendations on control and prevention of the zoonoses detected. The public engagements were done through talks and issuing of infobooklets highlighting ZooLinK's objectives, study areas, detected zoonoses infostories, including their control & prevention options and the project's next steps.

On the genetics front, our current work is now focussing on DNA extraction from whole blood primarily from cattle and pigs. This is expected to start from May onwards using DNAeasy kits. Afterwards, we will be genotyping the extracted DNA with species specific SNP chips with the objectives to estimate the proportion of exotic versus indigenous breeds in all these samples.

We look forward to share the outcomes of the analyses of the data, in our subsequent newsletters.

Introducing Students and Staff



Dr. Lian Thomas,

ZooLinK Post- Doc (Economics Component)

I am a University of Liverpool post-doctoral research associate, supervised by Prof. Jonathan Rushton and will be working specifically on the economics component of ZooLinK. Originally from the north coast of Cornwall in the UK I studied veterinary medicine at St. Georges University in Grenada, West Indies, undertook research for my MSc in Uganda in conjunction with Makerere University and was based at ILRI from 2010-2012 as a graduate fellow working on my PhD from the University of Edinburgh. I was supervised by Prof. Eric Fèvre and supported by the Biotechnology & Biological Sciences Research Council (BBSRC) and my PhD focused on the epidemiology of *T. solium* cysticercosis in the human and porcine populations of western Kenya.

Since completing my PhD in 2013 I have been based in Zimbabwe and Zambia, working as an independent consultant on projects for the World Health Organisation, Australian Animal Health Laboratories, and ILRI. I am a member of the Global Waters Pathogens Project, Cystinet Europe and the zoonotic disease task force for the Zambia National Public Health Institute. I have a particular interest in the relationship between animal health and economic development,

surveillance and control of zoonotic disease and the use of digital technology in disease surveillance.



Lucy Nyoroka Gitonga

ZooLinK Laboratory Technician in Busia Lab

I am a University of Nairobi staff and very pleased to finally be on the project. I was previously working in the now concluded Urban Zoonosis project and look forward to contribute to ZooLinK project whilst learning new technologies. I hold a Diploma in Biology from Thika Technical Training Institute.



Johnson Nyongesa Masinde

ZooLinK Laboratory Technician in Busia Lab

I am also a University of Nairobi staff member, and like Lucy, was previously working for Urban Zoonosis project and before that I was an animal health technician at the central veterinary Lab in Kabete. I hold a diploma in Biotechnology from the Technical University of Kenya. I also hold a certificate in animal health and production from AHITI.



Ellie Balchin, PhD Student, University of Liverpool

I am a PhD student at the University of Liverpool. For my PhD I will be looking at understanding motivations behind financial risk taking by those who are switching from a subsistence model of agriculture to a more commercially focused, intensified model, in Western Kenya. I will be supervised by Eric Fèvre, Jude Robinson and Rob Christley.

I hold a B.A. in International Development, 2015, from the University of Sussex and an MRes in Quantification and Management of Risk & Uncertainty in Complex Systems & Environments from the Institute of Risk and Uncertainty in Liverpool.

Internship Insight: A day at the ZooLinK project lab in Western Kenya

Article by Project interns from the Animal Health and Industry Training Institute (AHITI): Esther Wairimu, Ruth Mbaya and Charles Okelo

We are very excited to be interning at the ILRI-ZooLinK project based in Western Kenya. This is made possible through a memorandum of understanding between ZooLinK and Animal Health Industry and Training Institute (AHITI) for providing AHITI trainees with hands-on practical experience in field and Laboratory operations. The internship program spans a total of three months, for each intern. The project is now on Cohort 5 with AHITI.

Since joining the ILRI-ZooLinK project in January 2018, we have been able to have hands-on practical experience in three key areas: The field Veterinary experience in both livestock markets and abattoirs, The medical experience with the hospital team and Laboratory experiences with the Lab teams. This report will focus on the Laboratory component of our internship thus far, interesting experience.

A working day in the ZooLinK laboratory entails receiving both human and animal samples, uniquely identifying, culturing, aliquoting (Fig.1),

and stocking samples for further analysis. The immediate step in sample management involves sorting and differentiating the samples to facilitate efficient processing. Sample tracking is achieved through the use unique identifiers (barcodes); the barcode data is scanned and stored into a secure server using handheld devices through a software called Gather. Samples received at the lab



Esther Wairimu, Ruth Njoki, and Charles Okello busy aliquoting serum at the Busia Lab, in Western Kenya

range from; stool, blood, nasal swabs, ear tissues and lymph nodes (from pigs).

Stool samples are received in polypot tubes and specifically used to detect presence of bacteria that cause common stomach infections in humans and animals such as *Escherichia coli*, *Salmonella* and *Campylobacter*

Blood samples are received in 3 types of vacutainer tubes i.e. 1) Red top vacutainer used to extract serum for detecting presence of hemobacteria such as brucellosis; 2) Purple top vacutainer that contains an anticoagulant (EDTA) for identifying extracellular parasites such as Trypanosomes; 3) Green top vacutainer with the anticoagulant heparin for identifying the zoonotic tuberculosis causing bacteria (*Mycobacterium bovis*).

Nasal swabs are used to investigate presence of *Staphylococcus aureus* with further tests to investigate antimicro-

bial resistance.

Tissue samples range from the ear-tissues for investigating the genetic diversity of the herds; liver with hydatid cysts to detect echinococcosis; tongue with cysts to investigate cysticercosis and lymph nodes from pigs for culturing *Salmonella*.

Certain zoonotic pathogen (especially enteric and resident ones) are initially cultured (provided with food to grow). Such cultures include; MacConkey agar for growing and identifying *Escherichia coli*, Mannitol Salt agar for growing and identifying *Staphylococcus aureus* and Blood Free Selective Agar Base for growing and identifying *Campylobacter*. *Escherichia coli* and *Campylobacter* cause stomach upsets in people as well as animals while *Staphylococcus aureus* causes skin infections in people as well as animals.

Our short-term session in the ZooLinK lab has equipped us with laboratory skills in zoonotic diseases diagnostics that is a crucial step in the surveillance pathway.

Partner Logos



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ZELS 2018 Social Science day, grant holders workshop and ZELS-AS meeting in Hanoi Vietnam, 22-27th January 2018;

By: PhD Student Titus Mutwiri

The ZELS Social Science day and ZELS grant holders workshop were sandwiched by two ZELS students meetings.

The ZooLink team was represented by Prof Eric Fèvre, Prof Jonathan Rushton, Dr. Laura Falzon, Dr. Salome Bukachi and Titus Mutwiri

During the Social science day the critical role played by social science

opined on the need to go off jargon when natural scientists and social scientists speak to each other since sticking to their respective languages hinders integration in multi-disciplinary aspects. However there was emphasis on the need to continue advancing own disciplines.

During the proceeds it was demonstrated that social science is not just about human behaviour but also involves beliefs, relationships (between human to human and human to animals), knowledge,

cluding that "everything is everywhere, it's the environment that selects through multiplicity of factors and microbial agents".

During the workshop we understood that Health is not only biological but social. It involves effects of patriarchy, cultural beliefs, what mediates people's ability to act, management of health seeking behaviour, as well as constraints relating to history, environment, and politics. This influences current issues within livestock systems, hence the aspects of Value chain

analysis, Health systems analysis and Ethnography remain key in unravelling the impending issues on zoonotic and livestock systems. The emphasis on this was that Livestock management relies on human decisions but within environment, social and political constraints, systematic and behaviour changes.



2018 ZELS Grant holders meeting, Hanoi

in ZELS projects was discussed at length and consensus reached on need for participation of social scientists in the initial stages of project planning. The meeting opined that bringing people of diverse backgrounds to understand the concept of the research before its initiation was key to helping multidisciplinary research ease and manage future interventions

Among the discussions regarding what went well and what did not with regard to social science, it was viewed that there is need to have more social science leads and more social science questions. The meeting felt that social scientists should participate more in driving research questions. Working with other disciplines & institutions, building trust, looking at research from a systems prism, involvement in community level intervention and policy development is key to success of ZELS. The meeting

power, change & rights and somewhat all these influence livestock systems.

ZooLink Co-PI Salome Bukachi, using the western Kenya scenario expounded on the need to understand human animal interface from a social cultural dimension, the underlying Indigenous knowledge perceptions and how these affect risk outbreaks.

The HAZEL team working on Salmonella and Campylobacter emphasized on the Social science influence on mathematical modelling – identifying points of risk along the value chain as they gave a talk on a probabilistic model for the spread of contamination in beef supply chain for the Moshi municipal district in Tanzania.

Steve Hinchcliffe's presentation on Interdisciplinary entanglements pointed out on "The social, the microbe, and the Biome" by con-

Advantages within multidisciplinary were highlighted as: broader understanding of problems, acquisition of new conceptual and physical tools, and intellectual growth. However within multidisciplinary we should anticipate challenges which include, but are not limited to, leaving the comfort zone, meeting new concepts and languages, mismatching of institutional structures and slow down of one's own discipline. However available tools may help enhance interdisciplinary working and they include: collaborative software, online learning especially through iTunesU and TED talks and coffee meetings and journal clubs for multidisciplinary topics.

During the 2 day ZELS grant holders meeting numerous projects were discussed ranging from works going on in Tanzania, Kenya, Ethiopia, Bangladesh, Pakistan, Togo, Burundi, Cameroon, Niger, Senegal, and Vietnam.