How a small-scale bovine brucellosis surveillance project was started, what we learned and where to go from here; the SHMPA Story

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Introduction / Background

SHMPA, The Shire Highlands Milk Producers Association, is a dairy cooperative based in around Blantyre in the southern region of Malawi, Africa. With over 9000 members, predominantly female farmers, owning either one or two cows each, it is responsible for the bulk of milk production in this region of Malawi, highlighting the important role smallholder farmers play in milk production. In existence for over 30 years, SHMPA has weathered many challenges as it tries to maintain and grow the dairy supply chain while supporting the domestic economies of farming households. Among these challenges are reproduction problems in cows which hinder milk production. While dairy vets the world over are accustomed to tackling fertility issues in dairy herds as an integral part of their work, SHMPA cows and their owners, because they are based in a country where veterinary infrastructure is weak with little or no diagnostic capacity, lack access to appropriate diagnostics and disease reporting systems, and therefore, are not informed regarding possible causes of poor production parameters. Zoonotic pathogens such as *Brucella* spp., endemic in bovine in so many parts of sub-Saharan Africa until now, remained beyond the diagnostic capacity of animal health staff working with these herds, and the zoonotic risk to farmers and their families was, until now, poorly understood.

Here we tell our story about how we started a simple surveillance project with the collaborative efforts of SHMPA, VIVA, an Irish NGO, and the International Livestock Research Institute to try and understand the zoonotic risk to small scale farmers. This project is an example of how getting the wheels in motion can often be the biggest challenge for any project. It is also an example of the never ending learning journey all of us involved are on, and how while we have learned a lot from our work thus far, this is only the first step towards further studies.

Methods / Approach

An animal health assistance was recruited and hired for a 12 months period to carry out the brucellosis surveillance work. A cross-sectional study was designed to interview SHMPA farmers located in different milk bulking groups and to sample lactating cows. The animal health assistant trailed the farmer questionnaire and used each farm visit as a way of gaining insights into husbandry standards on farms as well as trying to build up working relationships with the farmers.

Between April to July 2022, 431 SHMPA farmers were interviewed using a knowledge, attitude and practices questionnaire. The animal health assistant collected qualitative data from farms to help build up a better picture about farming practices. Blood samples were stored on ice until returning to the SHMPA office where they were centrifuged. Serology sampling was then carried out on each sample with both lateral flow and the Rose Bengal test.

Results/Outcomes

• Serology results for the lateral flow kits showed 29% seropositivity.
• The Rose Bengal test showed 24% sero positivity.
• Overall prevalence for *Brucella* spp. was 22%.
• No farmer of the 431 interviewed knew or had heard about brucellosis.
• Other findings show that while farmers still consume raw milk, the majority of farmers claim to boil milk prior to consumption.
• However, our animal health assistant found that “boiled” means only warmed, therefore mitigation of bacterial load in milk is poor.

Conclusions / Significance

Brucellosis is circulating among SHMPA cows, measures to mitigate transmission need to be urgently discussed and implemented.

Farmers do not know about brucellosis in their animals nor are they aware of the potential zoonotic risk.

Using two screening methods for *Brucella* spp. allowed us to evaluate two methods while also giving us an overall prevalence for brucellosis.

The lack of access to veterinary laboratories and sophisticated diagnostic tools does not mean that infectious disease surveillance work cannot be carried out.

Farm visits to sample cows can be a very effective way of building working relationships with farmers while acting a platform for knowledge transfer.

We want to thank the farmers of SHMPA for their willingness to engage with this project.