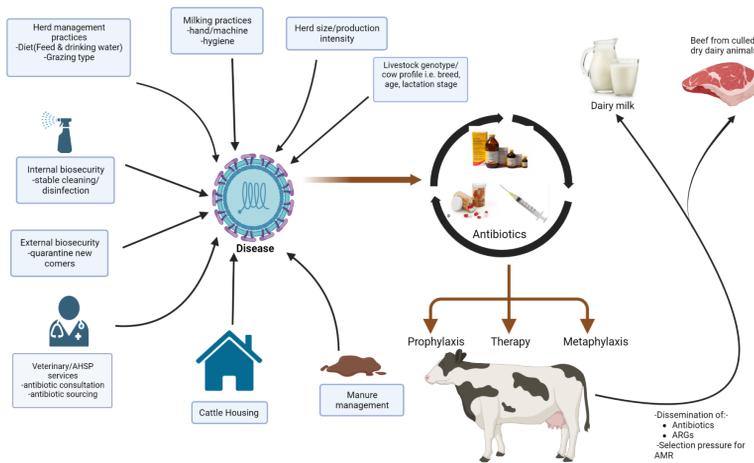# Practices and drivers of antibiotic use in Kenyan small-holder dairy farms

Lydiah Kisoo[1*,2], Dishon M. Muloi[1,2], Walter Oguta[1], Daisy Ronoh[1], Lynn Kirwa[1], James Akoko[1], Eric Fèvre[1,2], Arshnee Moodley[1,3], Lillian Wambua[1,4*]
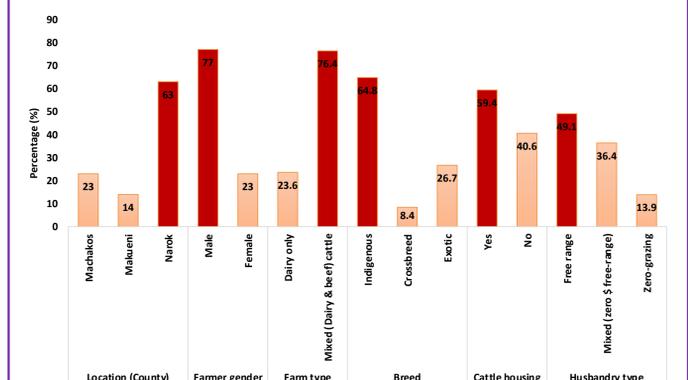
[1]Animal and Human Health Department, International Livestock Research Institute, Nairobi, Kenya
[2]Institute of Infection, Veterinary and Ecological Sciences, University of Liverpool, Neston, United Kingdom
[3]Department of Veterinary and Animal Sciences, University of Copenhagen, Frederiksberg C, Denmark
[4]World Organization for Animal Health, Sub-regional Representation for East Africa, Kenya
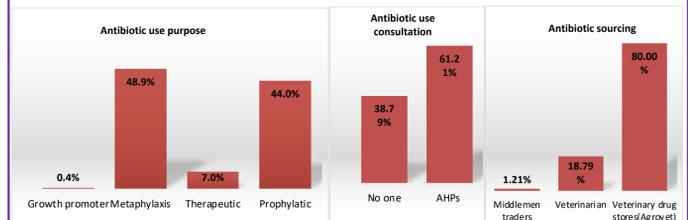*Current address

Drivers of antibiotic use (AMU) in Dairy farms

Figure 1. Factors associated with antibiotic use in dairy production systems

- Antibiotic use is increasing in food-producing animals and is a major driver of antimicrobial resistance.

- About 10% of the milk from small-holder dairy farmers has been reported to contain beta-lactam residue levels that exceed the maximum allowed limits (0.01 to 100 parts per billion (ppb) (Aduda, 2023)

- Here, we **quantified levels** of commonly used antibiotics and **assessed possible drivers** of antibiotic use in Kenyan dairy farms.

Methods

Figure 2. 165 dairy farms in Machakos, Makueni and Narok counties

- 165 farms were surveyed using the AMUSE, version 2 questionnaire (https://hdl.handle.net/10568/107443)
- Metadata: **socio-demographic characteristics, herd management and antibiotic use practices, patterns**
- Modelled the **drivers of antibiotic use.**

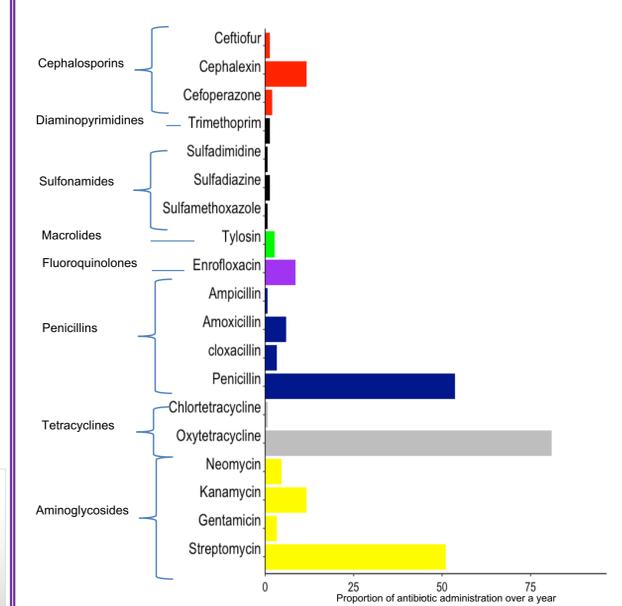### A: Socio-demographic characteristics of sampled dairy farms

Figure 3. Socio-demographic characteristics

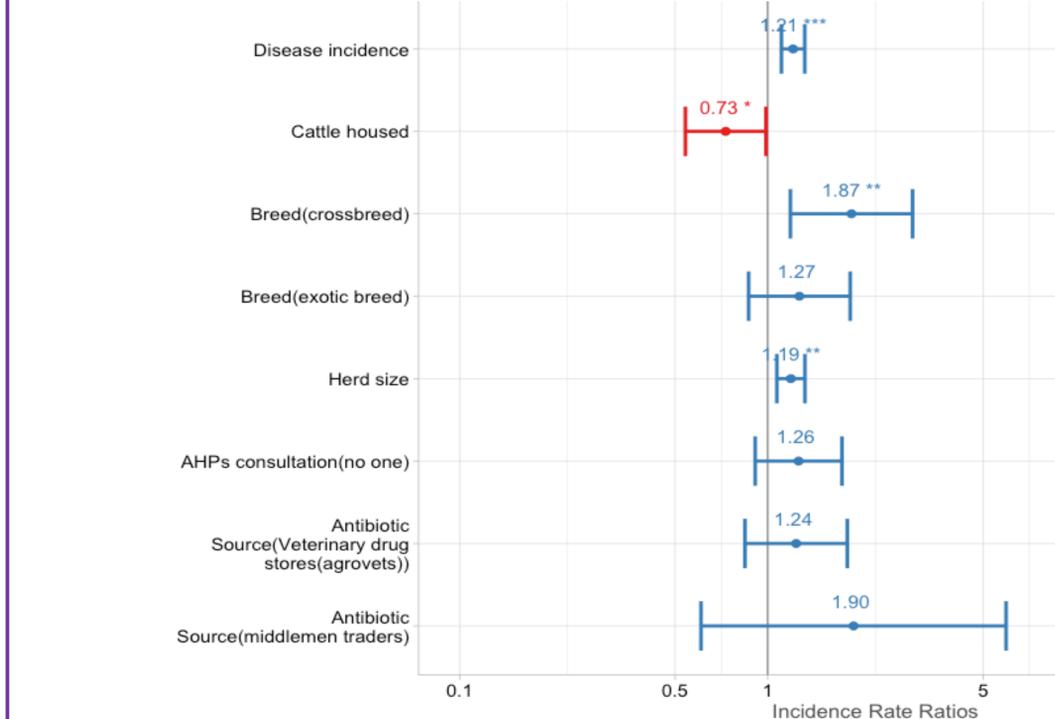### B: Antibiotic use practices

Figure 4. Antibiotic use purpose, consultation and sourcing

C: Antibiotic use patterns

Figure 5. Antibiotic use patterns by single active pharmaceutical ingredients(APIs) and antibiotic classes
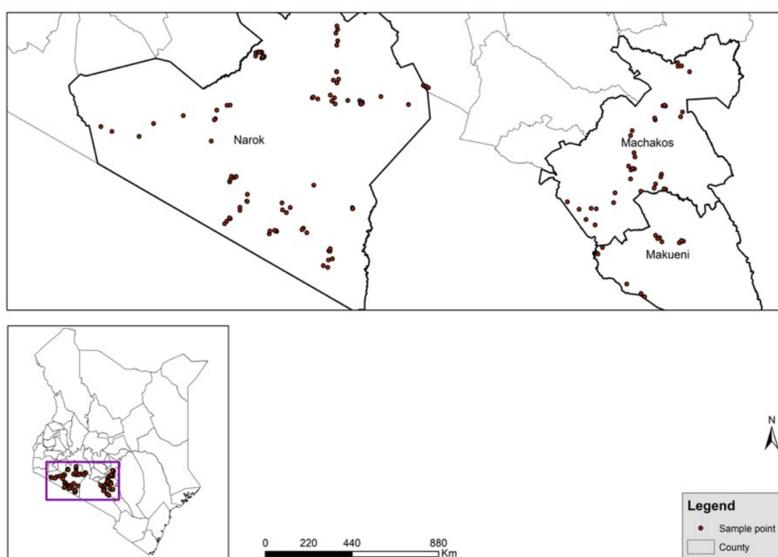
D: Model of antibiotic use drivers

Figure 6. Multivariable zero-inflated negative binomial regression model results showing drivers of antibiotic use.

Conclusion and Next Steps

- Antibiotic usage is associated with disease incidence and inappropriate herd management practices
- There is a need to educate dairy farmers on appropriate antibiotic usage and promote safe herd management practices
- Antimicrobial stewardship efforts should target all stakeholders, including animal health service providers
- Large-scale surveillance is necessary to provide data on veterinary antibiotic usage and inform evidence-based policies for mitigating antibiotic misuse or overuse and spreading antimicrobial resistance.

Correspondance : L.Kisoo@cgiar.org