

## **The Roslin Vector-Borne Disease Research Facility: Enabling Whole-System Studies on Tsetse Flies, Ticks, and Cattle Pathogens**

Vector-borne diseases impose a significant global burden on animal health, particularly in tropical regions where livestock infections transmitted by parasitic arthropod vectors result in substantial economic losses and threaten food security. These diseases arise from complex interactions among vectors, pathogens, and hosts, with research often limited by a lack of facilities to support integrated, whole-system studies.

The Roslin Vector-Borne Disease Research Facility (RVRF), located at the Roslin Institute, University of Edinburgh, provides a platform for studying major cattle disease vectors, specifically *Glossina morsitans* (tsetse flies), and the tick species *Rhipicephalus microplus*, *Rhipicephalus appendiculatus*, and *Hyalomma anatolicum excavatum*. The facility combines vector and pathogen containment infrastructure, multidisciplinary expertise, and access to the Large Animal Research and Imaging Facility (LARIF; also, at the Roslin Institute), allowing comprehensive exploration of host and vector biology, pathogen transmission dynamics, and the interactions among hosts, vectors, and pathogens. The RVRF also provides access to murine models, enhancing the ability to investigate disease systems via controlled and scalable methodologies. This flexibility enables the study of livestock diseases such as African Animal Trypanosomosis and tick-borne infections such as *Theileria parva* (the causative agent of East Coast Fever), from multiple biological perspectives.

Ongoing research at the RVRF includes investigations into vector biology and transmission, the development of biologically relevant vector-mediated infection systems in cattle, development of novel tick vaccines, and the creation of novel genetic tools for both *R. microplus* and tsetse flies. The facility's team consists of researchers with expertise in parasitology, immunology, vector biology, and disease ecology, providing tailored support for collaborative projects aimed at advancing the understanding of vector-borne disease systems. Additionally, the facility provides high-quality vectors and associated pathogens for external research collaborations. By studying host, pathogen, and vector in a single integrated environment, the RVRF aims to advance knowledge of vector-borne disease systems and to develop improved disease control strategies to combat them.