



In this CVERA e-zine, we provide a brief overview of some of the recent work conducted by CVERA staff in collaboration with a wide range of national and international institutions. More in-depth information can be found at <http://www.ucd.ie/cvera/>, noting the role of CVERA to provide high quality independent scientific research and advice to support national evidence-based policy-making in animal health & welfare and public health and related matters.

On-going bTB diagnostic test research

The Single Intradermal Comparative Tuberculin Test (SICTT) is the primary screening test for detection of bTB in infected herds. The interferon-gamma (IFN- γ) assay is also used as an ancillary test, interpreted in parallel with the SICTT in severe bTB breakdowns, to improve the sensitivity of detection of bTB. There are two on-going bTB diagnostic studies that CVERA is currently involved with. In one study, the impact of changing the threshold criteria of the IFN- γ assay is being explored. From 2018, the threshold of the B-A component changed to $B-A > 80$. The aim of this study is to follow individual animals that had initially tested negative to the IFN- γ assay, and to monitor any change in bTB status over time with a focus on those animals that would have been removed under the old criteria ($0 < B-A < 80$). Separately, in a pilot study, an antibody bTB test is being investigated. The objective of this study is to explore the possible added benefit of using the

Enferplex test in bTB herd breakdowns after the removal of cattle that had tested positive to the SICTT and IFN- γ assay. Animals were recruited in newly disclosed bTB herd breakdowns, Enferplex tested and then followed over time for two years. Both studies are near completion and the findings will help inform policy on diagnostic tests in the national programme.

Potential of Whole Genome Sequencing and its use in bTB epidemiology

Work is ongoing to explore the utility of molecular biology and, more specifically, Whole Genome Sequencing (WGS), in applied bTB epidemiological investigations. A descriptive epidemiology study is being carried out to elucidate the key decisions that are needed to establish connectivity between genetically identical, but geographically diverse, bTB isolates from cattle and badgers. The key connectivity decision tree is almost complete. The next stage in the project will

be to apply this 'Connectivity Decision Tree' (CDT) to a number of clusters of Irish bTB outbreaks, which fulfil the criteria above. Following that, it is hoped to use internationally available, open access machine learning tools to assess its use in an Irish context.

A framework for assessing the confidence in freedom from infection in animal disease control programmes

CVERA was a collaborator in a European project, STOC free (Surveillance Tool for Outcome-based Comparison of FREEdom from infection; <https://www.stocfree.eu>), which was recently finalised. The primary aim of the project was the development of methods (specifically, the STOC free model) to allow a standardised and harmonised comparison of the outputs of different control programmes (CPs) for cattle diseases. The STOC free model can be used to evaluate the probability of freedom from infection for herds in CPs and to determine whether these CPs comply with the European Union's pre-defined output-based standards. In the project, bovine viral diarrhoea virus (BVDV) was chosen as the case disease because of the diversity in CPs in the six participating countries. It was concluded that the STOC free model is applicable to diseases that are endemic, given that it needs the presence of some infection to estimate parameters and enable convergence. In countries where infection-free status has been achieved, a scenario tree model could be a better suited tool. This study was led by G. van Schaik from Utrecht University and Royal GD in the Netherlands in collaboration with

colleagues from France, Ireland, Sweden, Germany, and Scotland. The paper is published in the [*OIE Scientific and Technical Review* 42, 210-217](#).

An observational study of ear-tagged calf mortality (1 to 100 days) on Irish dairy farms and associations between biosecurity practices and calf mortality on farms participating in a Johne's disease control program

Calf mortality rates vary between countries and show differences in temporal trends. Most, however, are characterized by high levels of between-farm variability. Explaining this variation can be difficult because herd-level information on management practices relevant to calf health is often not available. The Irish Johne's Control Programme (IJCP) contains a substantial on-farm monitoring program called the Veterinary Risk Assessment and Management Plan (VRAMP). Although this risk assessment is largely focused on factors relevant to the transmission of paratuberculosis, many of its principles are good practice biocontainment policies that are also advocated for the protection of calf health. The objectives of this study were to quantify mortality in, and determine risk factors for, ear-tagged Irish dairy calves between 2016 and 2020 using both survival and risk approaches, to determine whether 100-d cumulative mortality hazard was higher in ear-tagged calves within herds registered in the IJCP versus those that were not registered in the IJCP and whether there were differences between these cohorts over time, and within IJCP herds, to determine whether VRAMP score or changes in VRAMP score were associated with 100-d

cumulative mortality hazard. Excluding perinatal mortality, the overall 100-d cumulative mortality hazard was 4.1%, declining between 2016 and 2020. Cox proportional hazards models showed that cumulative mortality hazard was greater in male calves, increased with increasing herd size, was highest in calves born in herds that contract-reared heifers, and lowest in those born in mixed dairy-beef enterprises. Furthermore, increasing VRAMP scores (indicating higher risk for paratuberculosis transmission) were positively associated with increased calf mortality hazard. The study suggests that implementation of recommended biocontainment practices to control paratuberculosis in IJCP herds was associated with a reduction in calf mortality hazard. This project was led by Conor McAloon from Herd Health and Animal Husbandry in the School of Veterinary Medicine in collaboration with colleagues from UCD CVERA, the School of Veterinary Science and Medicine in the University of Nottingham, Animal Health Ireland, and the Teagasc Animal and Bioscience Research Department. This paper is published in the [*Journal of Dairy Science* \(in press\)](#).

This e-zine, and recent news items, can be found at:

<http://www.ucd.ie/cvera/news/>

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GeoVet 2023

GeoVet 2023, the International Conference of Spatial Epidemiology, Geostatistics and GIS applied to animal health, public health and food safety, will take place in Teramo, Italy from 19-21 September 2023. The conference will bring together researchers, policymakers, industry, and international experts in spatial epidemiology, spatial statistics and Geographic Information Systems as applied to animal health, public health, and food safety. Experts from different disciplines will share their knowledge and perspectives, promoting multi-sectoral approaches to provide tools and methodologies for analysing and visualizing data originating from diverse sources under a One Health approach. In addition to the conference programme, several pre-conference workshops will be held. Dr Annamaria Conte, Head of Statistics and GIS Unit of the National Reference Centre for Epidemiology from IZS-Teramo is Chair of GeoVet 2023. Programme details, workshops and registration can be found at <https://geovet2023.izs.it/>