



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.

### **Nicola Harvey joins CVERA**

We are delighted that Nicola Harvey has joined CVERA in her role as Veterinary Epidemiologist. Nicola completed her B.A. (Zoology) in TCD. Subsequently, she qualified from the University of Glasgow School of Veterinary Medicine and Surgery. In 2016, Nicola joined the Department of Agriculture, Food and the Marine (DAFM) as a Veterinary Inspector and was based in the Regional Veterinary Offices in Kerry and Limerick. Prior to joining DAFM, Nicola working for 16 years in mixed practice in the United Kingdom and in Co. Clare. As part of her MSc in Epidemiology at the London School of Tropical Medicine and Hygiene, Nicola will be researching the potential of Whole Genome Sequencing (WGS) and its use in bTB epidemiology.

### **A computer model for Johne's disease in Ireland**

A computer model for Johne's disease in Ireland has now been developed, providing an *in silico* representation of the behaviour of this disease in Irish dairy herds. Models such as this can be very useful, providing a means to ask 'what if' questions to assist with programme decision-making. This work was funded by Irish Department of Agriculture, Food and the Marine, and will support the Irish Johne's Control Programme, run by Animal Health Ireland. Floor Biemans completed this work in collaboration with colleagues in INRAE in France, Jamie Tratalos and Simon More from CVERA, Lawrence Gavey from Animal Health Ireland and George Ramsbottom from Teagasc. The work is presented in three published papers. The [first paper](#) describes the within-herd model, which captures the compact spring calving pattern that is a feature in many Irish herds. This is then extended in the [second paper](#) to a regional

model, incorporating actual animal movements between Irish dairy farms. In the [third paper](#), Biemans et al. focus on opportunities to control the spread of infection between herds through risk-based trading (based on the Johne's herd indicator as currently used in the programme) and the impact of a range of possible control strategies within infected herds. Risk-based trading effectively reduced the increase in herd prevalence over a 10-year-period in Ireland; however, for risk-based trading to be effective, a high percentage of dairy herds had to participate. The most important within-herd measures were improved herd hygiene and early culling of highly infectious cows. Combining risk-based trading with within-herd measures reduced within-herd prevalence even more effectively.

### **Bovine tuberculosis in youngstock cattle: A narrative review**

Like most infectious diseases, the risk of contracting and spreading bovine tuberculosis varies between ages. The aim of this narrative review was to summarize what is known about the susceptibility, diagnosis, transmission (infectiousness), and epidemiology to *M. bovis* in youngstock (up to 1-year of age). Youngstock are susceptible to *M. bovis* infection when exposed, with the capacity to develop typical bTB lesions. When recorded as positive by ante-mortem test, youngstock appear to have the highest probabilities of any age cohort for confirmation of infection post-mortem. They also appear to have the lowest false negative bTB detection risk. Mathematical models suggest that calves may also experience a lower

force of infection (the rate that susceptible animals become infected). Policies to reduce testing for youngstock could lead to infected calves remaining undetected and increasing onwards transmission. Further studies are required to assess the risk associated with changes to testing policy for youngstock in terms of the impact for within-herd disease control, and how this may affect the transmission and persistence of infection across a network of linked herds. This study was led by Andrew Byrne in the DAFM One-Health and Welfare Scientific Support Unit in collaboration with colleagues from DAFM ERAD, UCD CVERA, Nancy Laboratory for Rabies and Wildlife (LRFSN) in France, and the UCD Tuberculosis Diagnostics and Immunology Research Laboratory. [[Frontiers in Veterinary Science 9, 1000124 \(2022\)](#)]

### **Quantification of local bovine tuberculosis (bTB) transmission in badgers and cattle with and without vaccination of badgers (*Meles meles*) in Ireland**

Badger vaccination is progressively replacing culling as part of the Ireland's national strategy in controlling the spread of bTB. An understanding of the local dynamics of infection is key to ensuring the success of the vaccination programme. A test, vaccinate and removal or release field trial is ongoing to quantify local transmission of *M. bovis* in badgers and to evaluate the effects of local factors on badger vaccination. The field trial, consisting of 8 sweeps, is taking place at various sites throughout Ireland. Seven sweeps are now complete, and the final sweep will commence early

2023. Preliminary observations indicate a wide range of, and interesting trends in, local vaccination coverages, field-test positivity rates, and badger population densities. The influence of these local variations on the transmission of *M. bovis* in the badger-cattle system will be explored. Furthermore, the trial is providing insight into the efficacy of badger vaccination on the dynamics of infection in the multi-host system, both spatially and temporally. The results of this trial will help to inform national policy in relation to the vaccination programme. This work is led by Ann Barber from Wageningen University in The Netherlands & CVERA in association with the Dept. of Agriculture, Food and the Marine and is the subject of her PhD.

### **Schedule 8 prescribing**

In Ireland between 2008 and 2022, intramammary antimicrobial (AM) products could be prescribed by a veterinary practitioner under what was known as Schedule 8 (or remote) prescribing. Under this prescribing route, an annual herd visit was not required when criteria were met as outlined in Animal Remedies Regulation 2007 to 2017 (statutory instruments No. 7786/2007 and 558/2017). This study sought a clearer understanding of the role of milk purchasers in the prescribing and sale of intramammary AM products in Ireland during 2019 and 2020, whilst this Regulation was in force. Significant differences between milk purchasers were observed in the quality of milk, as measured through somatic cell count values, from supplying herds. In the context of intramammary AM prescribing, veterinary

oversight under this Regulation was very limited, with a single Schedule 8 prescriber, on average, prescribing for 549.3 herds. The sale of intramammary AM products through milk purchasers represented 15.2% and 26.9% of national sales in in-lactation and dry cow tubes, respectively. There were also significant associations between EMA classification and route of sale (through milk purchasers or otherwise), both for in-lactation and dry cow tubes, reinforcing the need for Irish veterinary practitioners to move away from EMA category B intramammary AMs. Past experiences with Schedule 8 prescribing (no longer permitted from 28 January 2022) may influence current efforts towards improved intramammary AM stewardship. This study was led by Simon More in collaboration with colleagues from CVERA and the UCD School of Veterinary Medicine. [This paper will be available shortly in the [\*Irish Veterinary Journal\* \(in press\)](#)]

### **Understanding the dog population of the Republic of Ireland: insight from existing data sources?**

Reliable information about national pet dog populations is an important contributor to informed decision-making, both by governments and national dog welfare organisations. In some countries, there is an improved understanding of aspects of the national pet dog population, but as yet limited published information is available in Ireland. This study highlights the challenges faced when using existing national data to gain insights into the dog population of Ireland. The linking of existing national databases (individual dog identification,

dog licencing, dog control statistics) has the potential to improve both the representativeness and accuracy of information about the Irish pet dog population. In the next phases of our work, we focus on the work of dog welfare organisations, given both the increased role played by these organisations and the substantial public funding that has been committed in this sector. This study which is the first in a series of three was led by Simon More in collaboration with colleagues from CVERA, the School of Veterinary Medicine, Animal Health Ireland, and the Department of Agriculture, Food and the Marine. [[Irish Veterinary Journal 75, 16 \(2022\)](#)]

### **High accuracy monitoring of honey bee colony development by image analysis**

Honey bees are key insect pollinators, providing important economic and ecological value for human beings and ecosystems. This has triggered the development of several monitoring methods for assessing the temporal development of colony size, food storage, brood and pathogens. In this study, we present and test a novel accurate and observer-

independent method for honey bee colony assessment, capable of being fully standardized. Honey bee colony size is quantified by assessing the weight of adult bees, while brood and provision are assessed by taking photos and conducting image analysis of the combs with the image analysis software Deepbee®. We conclude that the use of this fully quantitative method offers a more accurate alternative to classic visual colony assessments, with negligible impact on colony development. This study was conducted by Nuno Capela from the Centre for Functional Ecology in Portugal in collaboration with colleagues from the Department of Ecoscience in Denmark, the European Food Safety Authority in Italy, the Evolution, Genome, Behavior and Ecology laboratory in France, eCentro de Investigac in Portugal, the Research Centre in Digitalization and Intelligent Robotics in Portugal, CVERA, and the Department of Agricultural, Forest, and Food Sciences in Italy. [[Journal of Apicultural Research \(in press\)](#)]

This e-zine, and recent news items, can be found at: <http://www.ucd.ie/cvera/news/>

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