

Bart van den Borne

Interpretive Summary

A mediation analysis to quantify the interrelationships between lameness, milking frequency, and milk production in farms with automatic milking systems

While the milking frequency of dairy cows is fixed in conventional milking systems, lameness might result in a reduced milking frequency in herds with an automatic milking system. This in turn, might explain part of the milk yield losses. Using a mediation analysis, this study provided effect estimates of these interrelationships, allowing a future recalculation of the economic losses due to lameness in herds with an automatic milking system.

Mattias Delpont

Interpretive Summary

Determinants of biosecurity compliance in French duck farms: the role of farmers' knowledge, attitude and personality traits

Results from this study confirm that distinct patterns of biosecurity compliance are observed on farms. They also demonstrate that human-related variables, including psychological characteristics such as farmers' knowledge, attitude, and personality traits, play an important role in explaining these patterns. Technical training of farmers may not be sufficient to cause behavioural change. Communication and training should also be tailored to farmer's experience and personality.

Charlotte Doidge

Interpretive Summary

A factorial survey approach to investigate vets decision making when prescribing antimicrobials to sheep and beef farmers

This was the first time a factorial survey was implemented to investigate how vets are making decisions on when to prescribe antimicrobials to sheep and beef farmers. The factors identified as important in the decision to prescribe can be targeted for intervention studies and antimicrobial stewardship programmes with the aim to reduce antimicrobial prescriptions by vets. As a result, antimicrobial usage on sheep and beef farms could be reduced.

Violetta Egberts

Interpretive Summary

Effects of air pollution and temperature on cattle mortality in the Netherlands

Climate is changing and extreme temperatures may occur more often. Air quality may also be an important factor for animal health. We investigated the effect of temperature and air pollution on mortality of calves in different age-classes and lactating cattle. The results of our study indicate that farmers need to take cold and heat mitigating actions depending on the age-class of the cattle to prevent excess mortality. The effect of air pollution on cattle mortality was less clear and needs further investigation.

Maya Gussman

Interpretive Summary

Modelling mastitis transmission and intervention strategies for clinical and subclinical mastitis

We modelled transmission of mastitis pathogens in a dairy herd and evaluated interventions for both clinical and subclinical mastitis. Intervention strategies were focussed on treatment with antibiotics and reactive culling and were compared with respect to costs and efficacy. Our results showed that cow- and herd-specific interventions can be highly cost-effective, but at the cost of an increased use of antibiotics or increased culling rate.

Kristel van den Heuvel

Interpretive Summary

Monitoring udder health using routinely collected census data: evaluating the effects of changing antimicrobial policy

The Dutch cattle health surveillance system (CHSS) closely monitors the effects on udder health of the Dutch antimicrobial usage (AMU) policy for all dairy herds. The CHSS showed that a decrease in AMU did not have a major effect on udder health. Our findings give confidence that introducing restrictions on AMU may increase prudent use of antimicrobials in the livestock industry without jeopardizing animal health and welfare.

Geralda Hop

Interpretive Summary

Dynamics of *Mycoplasma bovis* in Dutch dairy herds with a clinical outbreak

Twenty Dutch dairy farms with acute clinical *M. bovis* outbreaks (arthritis/mastitis) in dairy cows also tested positive in calves and young stock groups. Most *M. bovis*-positive tested cattle do not show clinical symptoms and, therefore, form a potential source of infection to their herd-mates. Over a three-month study period, none of the twenty outbreak farms were free of *M. bovis*, even though few clinical cases were observed at that time.

Emily Hudson

Interpretive Summary

Roaming dogs and spatial kernels: modelling rabies spread in a heterogeneous population

Domestic dogs display complex roaming behaviours, which need to be captured to realistically model the spread of direct-contact infectious diseases such as rabies. We used GPS units to collect behavioural data and characterise roaming patterns of domestic dogs, then developed contact distance kernels. Outputs from this model incorporating heterogeneous contacts clearly display how roaming patterns influence disease spread in domestic dogs.

Amy Jackson

Interpretive Summary

Year-round housed dairy cows: what do the public really think, and does it matter?

The findings of this study present opportunities to change how the dairy sector communicates, and rethink how some practices are implemented in order to improve public acceptance. Indeed, using these findings to shape modern dairy systems that better fit UK citizens' expectations, while fully meeting the health and welfare needs of the animal and the economic imperatives of the farmer, have the potential to provide benefits to all.

Bryony Anne Jones

Interpretive Summary

Exploring local knowledge of sheep and goat disease in the pastoralist Afar Region of Ethiopia: implications for peste des petits ruminants disease surveillance

This study demonstrates the use of mixed methods to improve the understanding of small ruminant disease in a marginalised pastoralist area, to support more appropriate and effective disease surveillance and control strategies. The findings have been used in the design of a training course for Ethiopian veterinarians on peste des petits ruminants (PPR) surveillance in lowland areas of Ethiopia, in support of national PPR eradication activities.

Jean-Joseph Minviel

Interpretive Summary

Business models of French veterinary structures in rural areas and regulation of veterinary drug delivery

The present study assesses the potential impact on veterinary offices of a decoupling of prescribing from drug delivery by veterinarians. Results indicate that, from an economic perspective, a decoupling would likely make veterinarians lose half of their income and move away from the farm animal sector. These results emphasize the need to provide incentives to veterinarians to maintain animal health services in rural areas.

Amelie Mugnier

Interpretive Summary

A breed-specific approach using birth weight as a risk factor for neonatal mortality in canines

From the analysis of data from 6771 puppies (27 breeds, 75 breeding kennels), low birth weight was identified as a risk factor for neonatal mortality. Using receiver operating characteristic (ROC) curves, breed-specific critical thresholds were successfully determined for 14 breeds (sensitivity $\geq 75\%$; specificity: 45 - 78%), providing alert criteria for puppies requiring specific nursing.

Annette Nigsch

Interpretive Summary

Who infects whom: reconstruction of transmission trees in an endemic phase of *Mycobacterium avium* subsp. *paratuberculosis* (MAP) infection in dairy herds by use of sequence data

The epidemiology of paratuberculosis is still poorly understood, leading to limited success of control programmes. Linking genomic data with production and animal contact data opens the way to assess the role of individual animals in the dynamics of infection and to investigate strain-specific differences in spreading patterns.

Ana Rute da Silva Oliveira

Interpretive Summary

Applying a risk assessment framework for emerging vector-borne livestock diseases to pathogens with complex transmission dynamics: the risk of introduction of Japanese encephalitis virus to the United States

The results of this study provide a better understanding of the elements contributing to the risk of introduction of Japanese encephalitis virus (JEV) in the United States, pointing to targeted prevention and control strategies. By using a framework for assessing risk, we were able to integrate complex information, thus validating the methodology for application to other vector-borne diseases and countries.

Lauren Perrin

Interpretive Summary

How can good biosecurity reduce the incidence of bovine tuberculosis?

Systematic literature review shows that robust evidence is sparse and inconsistent for the effectiveness of biosecurity to reduce bovine tuberculosis (TB) on cattle farms. Analysis of on-farm investigations of TB incidents in England suggested a lack of effective biosecurity to reduce transmission between cattle and badgers in at least 43% of incidents. There is scope for biosecurity improvements to reduce TB transmission in British cattle.

Sébastien Picault

Interpretive Summary

Combining early hyperthermia detection with metaphylaxis for reducing antibiotic usage in newly received beef bulls at fattening operations: a simulation-based approach

The control of Bovine Respiratory Diseases during fattening operations is challenged by the balance between disease duration and antibiotic usage. Using Artificial Intelligence methods, we highlighted which hyperthermia durations should be used to trigger individual treatment for such a multi-pathogen system. Realistic durations were assessed, as regards the detection of clinical signs or bolus usage. Metaphylaxis appeared less effective.

Imogen Schofield

Interpretive Summary

Application of spatial modelling to explore environmental exposures for lymphoma in dogs under UK veterinary care

This study describes the novel use of routinely collected primary-care veterinary data to explore environmental exposures in UK companion animals. With increasing interest in the role of environmental exposure upon cancer incidence and parallels between animal and human neoplasia, comparative models could be mutually beneficial. This study found a heterogeneous lymphoma distribution in UK dogs and univariable association with pesticide exposure.

Jana Schultz

Interpretive Summary

Simulating control measures to reduce the spread of livestock-associated Methicillin-resistant *Staphylococcus aureus* (LA-MRSA) among Danish pig herds

Even though there is a national action plan to control Methicillin-resistant *Staphylococcus aureus* (LA-MRSA) in the Danish pig population, a rapid increase in pig herds testing positive for LA-MRSA has been observed. An existing simulation model of LA-MRSA spread among Danish pig holdings was enhanced by four control measures and their combinations. We aimed to study their potential to reduce LA-MRSA spread, retrospectively. The results could be used to adapt the national action plan.

Kajetan Stanski

Interpretive Summary

Data-driven modelling for improving herd-level bovine tuberculosis breakdown predictions in GB cattle

A data-driven model was used to predict herd-level bovine tuberculosis (bTB) breakdowns based on results of bTB diagnostic tests and data related to bTB infection risk, such as holding location and contact tracing. Our model provides higher sensitivity and specificity of breakdown predictions compared to the current diagnostic test, which can help issue better-informed animal movement restrictions and mitigate disease spread.

Lena-Mari Tamminen

Interpretive Summary

Transmission and persistence of VTEC 0157:H7 on cattle farms

The increasing number of human cases of a highly virulent type of VTEC 0157:H7 in Sweden is the result of domestic transmission originating in regional clusters of infected cattle farms. To control this bacteria, a comprehensive picture of infection dynamics, routes of transmission between farms and risk factors for persistence is urgently needed. In this study, we present an approach combining multiple epidemiological tools to provide this.

Weber, Maarten

Interpretive Summary

How can we evaluate the efficacy of paratuberculosis control programmes?

Evaluation of control programmes for paratuberculosis is challenging, because of lack of nonparticipating representative control herds. Furthermore, a trend in the apparent prevalence is a poor indicator of programme efficacy, because culling of test-positives may reduce the sensitivity of tests. Our study demonstrated that the age-at-onset of test-positivity as well as the probability of a positive result at the first test of an individual are useful parameters for evaluation of the efficacy of a control programme.