



DECIDE

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Newsletter #3

Welcome to the third issue of the bi-annual newsletter of the DECIDE project. The newsletter serves as a resource to share recent updates and developments of the DECIDE project, exciting results, milestones and insights into the work within the consortium. DECIDE is a five-year Horizon 2020 project, developing data-driven decision support tools for endemic contagious diseases in pigs, poultry, calves and salmon.

Foreword.

We are now in the fourth year of the DECIDE project that will finish in June 2026. Many of the data-based decision support tools are evaluated with their potential users (e.g. farmers, veterinarians). Descriptions of all tools can be found on our website. As an illustration, this newsletter features Abattoir Inspect, the tool created by the pig group.

The DECIDE work is presented at several conferences and in an increasing number of scientific publications. At the end of 2024 we also had the first PhD student that successfully finished and defended a thesis. Baptiste Sorin modelled spread of bovine respiratory diseases (BRD) in beef calves, possible control options and their effect on calf health and antimicrobial use. His work was an important pillar for the cattle group of DECIDE (see the 1st Newsletter). We are sorry to see him leave the project and we wish him very well in his future career. Finally, I would like to draw your attention to our other means to share our knowledge and experiences. On EU-FarmBook we published our first practice abstracts and on March 25, 2025 we will organise an animal health cluster event with about seven EU projects in Berlin. The aims of the event are to share challenges and best practices on 1) Data access and re-use for animal disease surveillance tools and 2) Data-driven tools and stakeholder behaviour.

When you want to know more, please have a look at the website (www.decideproject.eu) where you can find information about the project and the tools we develop. Feel free to contact me with questions or suggestions for the project.



- Project coordinator Prof. Dr. Gerdien van Schaik



Abattoir Inspect - Visualising Meat Inspection Results for a Healthier Future

Analysing livestock condemnation (also known as “meat inspection”) data from abattoirs is crucial for improving herd health and welfare and ensuring food safety by identifying emerging health threats and refining on-farm management practices. This data-driven approach also aids in early detection of zoonotic diseases, safeguarding public health and reducing economic losses through targeted interventions.

Scotland’s highly specialised pig sector, with 98% of breeding sows concentrated in just 150 holdings and most pigs processed at a single facility, sets the stage for transformative improvements. Abattoir Inspect capitalises on this unique setup to provide targeted, actionable insights that can drive efficiency and elevate industry standards.

Developed by the DECIDE partner SRUC, Abattoir Inspect is a new web application to facilitate the visualisation and analysis of meat inspection data. This platform provides

a comprehensive suite of tools for in-depth visualisation, benchmarking, and analytics of condemnations at slaughter such as whole carcass and partial condemnations. Users can rank the most common condemnations in a selected time-range, and in selected farms, against the whole industry. The app’s dynamic time-series analysis with interactive temporal trend visualisations allows users to easily identify cyclical patterns and long-term shifts in condemnation data. The platform’s intelligent alert system employs a triple-algorithm (Holtwinters, CUSUM, EWMA) approach

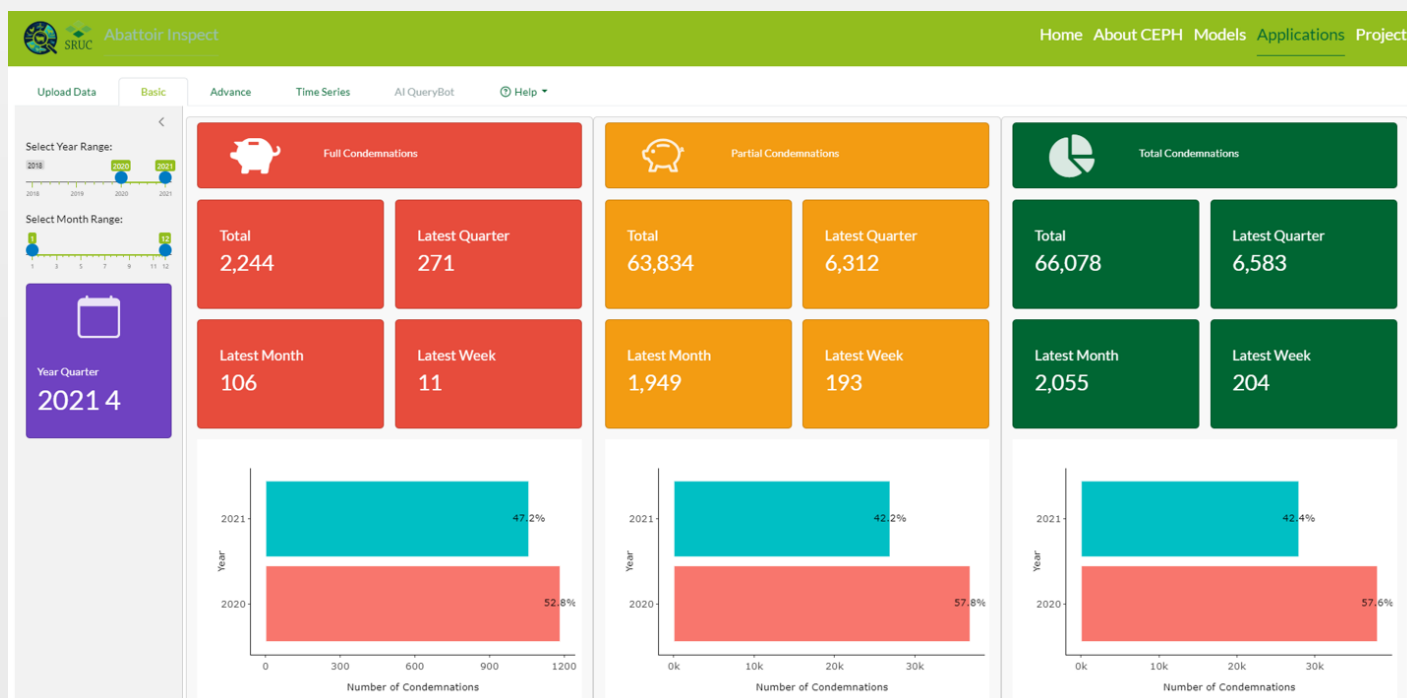


Figure 1 presents key statistics on condemnations for 2020-2021 using the mock dataset. The dashboard is strategically divided into three sections, offering a clear breakdown of the total figures as well as the statistics for the last quarter, month, and week for full, partial, and total condemnations. Each section features bar plots illustrating the annual condemnation counts across all three categories, providing a comprehensive and easily digestible view of the data.

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to detect anomalies in real-time, empowering swift and effective responses.

But that’s not all! Abattoir Inspect offers sophisticated statistical capabilities, including automatic selection of parameters to adapt the statistical analysis to each dataset and provide the most accurate and informative results, adapted to each user’s data and needs. The platform allows for adjustable time-series analysis of the data (represented weekly, monthly, quarterly, or yearly) and provides comprehensive statistical outputs. The application also offers downloadable reports.

The next steps are to test the usability of the app in collaboration with other countries (Animal Health Ireland and Royal GD – The Netherlands), and to evaluate it with Scottish stakeholders. We will refine the app based on the feedback gathered and produce all the tool documentation required to ease tool adaption and reuse for other species and countries.

Join a thriving community of industry representatives, farmers, veterinarians, and national authorities harnessing the power of [Abattoir Inspect](#).



Figure 2 presents a benchmarking analysis of selected farms, illustrating their performance across the top five conditions. This figure provides a comparative view, highlighting how each farm measures up in relation to these key conditions, enabling quick identification of performance trends and areas for improvement.

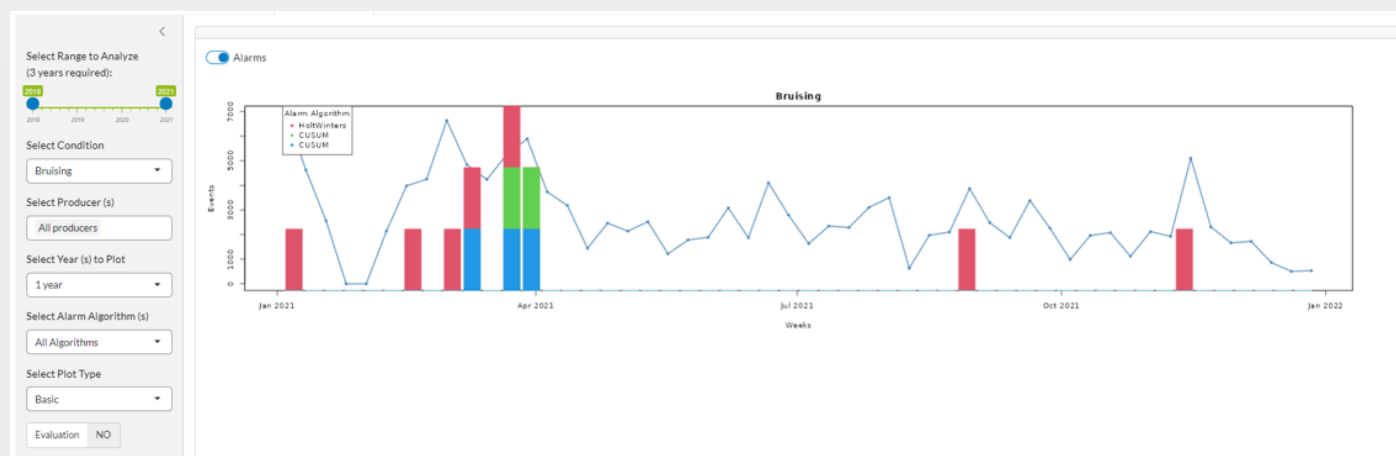


Figure 3 illustrates the time series for the bruising condition, utilising a basic plot format. This figure incorporates alarms generated through the Holt-Winters method and two CUSUM algorithms, effectively highlighting trends and anomalies over time for enhanced analysis.



Recent Publications.

Monitoring monthly mortality of maricultured Atlantic salmon (*Salmo salar* L.) in Scotland II. A hierarchical dynamic linear model

Frontiers in Marine Science, 2024

The sustainability of the salmon farming industry is being challenged by increased mortality rates. Scotland's open-source salmon production data provides the possibility of developing an industry-wide mortality monitoring model, valuable for identifying and addressing unexpected increases in mortality without needing data sharing agreements across different companies. This study aimed to utilize these data to develop a hierarchical dynamic linear model (DLM) for monitoring monthly mortality of maricultured Atlantic salmon in Scotland. We evaluated whether considering the hierarchical structure present in the data (country, region, and site) would improve mortality predictions when compared to the production cycle level DLMs developed in a previous study. Our findings demonstrated that the hierarchical DLM outperformed the production cycle level DLMs, confirming the value of this more complex modelling approach. Nevertheless, the hierarchical model, like the production cycle level DLMs,

Carolina Merca, Annette Simone Boerlage, Anders Ringgaard Kristensen and Dan Børge Jensen



exhibited some uncertainty in the mortality predictions. When mortality is higher than expected, site level warnings are generated, which can encourage producers and inspectors to further investigate the cause. Between 2015 and 2020, approximately 25% of the production cycles and 50% of the sites encountered at least one warning, with most warnings happening in the summer and autumn months. Additionally, the hierarchical model enabled monitoring mortality at multiple levels. This information is useful for various stakeholders as part of a monitoring system, offering insights into mortality trends at national, regional, and sites levels that may benefit from strategic resource management. Recommendations for model improvements include utilizing shorter data aggregation periods, such as weekly, which are not currently available as open-source data.

How do pig veterinarians view technology-assisted data utilisation for pig health and welfare management? A qualitative study in Spain, the Netherlands, and Ireland

Porcine Health Management, 2024

Application of data-driven strategies may support veterinarians' decision-making, benefitting pig disease prevention and control. However, little is known about veterinarians' need for data utilisation to support their decision-making process. The current study used qualitative methods, specifically focus group discussions, to explore veterinarians' views on data utilisation and their need for data tools in relation to pig health and welfare management in Spain, the Netherlands, and Ireland.

Xiao Zhou, Beatriz Garcia-Morante, Alison Burrell, Carla Correia-Gomes, Lucia Dieste-Pérez, Karlijn Eenink, Joaquim Segalés, Marina Sibila, Michael Siegrist, Tijs Tobias, Carles Vilalta & Angela Bearth



It is concluded that the management of pig health and welfare may benefit from data utilisation if the quality of data can be assured, the data tools can meet veterinarians' needs for decision-making, and the collaboration of sharing data and using data between farmers, veterinarians, and other professional parties can be enhanced. Nevertheless, several notable technical and institutional barriers still exist, which need to be overcome.

Broiler flocks in production systems with slower-growing breeds and reduced stocking density receive fewer antibiotic treatments and have lower mortality

Poultry Science, 2024

In the Netherlands, the number of broiler production systems with higher welfare standards, using slower-growing broilers and decreased stocking densities, has increased over the last decade. This study aimed to investigate the effect of this change on antibiotic treatments, mortality, and footpad lesions. Data from national monitoring databases from 2013 to 2021 were used, resulting in 113,380 included flocks from 917 farms. Flocks were divided into conventional (CONV), medium-growing (MED), and slow-growing (SLOW), based on breed and slaughter age (median age: CONV 42 d; MED 50 d; SLOW 56 d). Generalized mixed-effect models were created to compare antibiotic treatments in and after the first week, total on-farm mortality, and footpad lesion scores between these 3 production systems. Year, quarter, flock size, thinning, number of houses, and regional density of poultry farms were included as fixed effects. Random effects were farm and veterinary practice in all models, with an additional random

Yara Slegers, Miel Hostens, Mieke Matthijs, Arjan Stegeman, Sjaak de Wit



slaughterhouse effect to describe footpad lesions. Probability of treatment in the first week of age in CONV flocks overall years (7.2%, 95% CI [5.9, 8.7]) was higher than in MED (2.0%, 95% CI [1.6, 2.5]) and SLOW flocks (1.3%, 95% CI [1.0, 1.7]). Treatment probability after the first week was similarly higher in CONV flocks (14.7%, 95% CI [12.1, 17.6]) than in MED (3.2%, 95% CI [2.5, 4.0]) and SLOW flocks (2.2%, 95% CI [1.7, 2.9]). CONV flocks had a higher mean mortality (3.2%, 95% CI [3.0, 3.4]) than MED (2.0%, 95% CI [1.9, 2.1]) and SLOW flocks (1.9%, 95% CI [1.8, 2.0]). Regarding footpad lesions, CONV flocks had the highest mean scores (range 0–200) over all years, whereas SLOW flocks had the lowest scores (CONV: 46.1, 95% CI [42.1, 50.6]; MED: 21.3, 95% CI [18.9, 24.0]; SLOW: 13.2, 95% CI [11.5, 15.1]). This analysis of data from flocks over a 9-yr period indicates that switching from conventional to alternative production systems with higher welfare standards could positively affect broiler health and antibiotic use.

Harnessing uncertainty: A deep mechanistic approach for cautious diagnostic and forecast of Bovine Respiratory Disease

Preventive Veterinary Medicine, 2024

Bovine Respiratory Disease (BRD) is a prevalent infectious disease of respiratory tract in cattle, presenting challenges in accurate diagnosis and forecasting due to the complex interactions of multiple risk factors. Common methods, including mathematical epidemiological models and data-driven approaches such as machine learning models, face limitations such as difficult parameter estimation or the need for data across all potential outcomes, which is challenging given the scarcity and noise in observing BRD processes. In response to these challenges, we introduce a novel approach known as the Bayesian Deep Mechanistic method. This method couples a data-driven model with a mathematical epidemiological model while accounting for uncertainties within the processes. By utilising 265 lung ultrasound videos as sensor data from 163 animals across 9 farms in France, we trained a Bayesian deep learning model to predict the infection status (infected or non-infected) of an entire batch of 12 animals, also providing associated confidence levels. These predictions, coupled with their

Théophile Ghislain Loïc Eyango Tabi, Maud Rouault, Victoria Potdevin, Xavier L'hostis, Sébastien Assié, Sébastien Picault, Nicolas Parisey



confidence levels, were used to filter out highly uncertain diagnoses and diffuse uncertainties into the parameterisation of a mathematical epidemiological model to forecast the progression of infected animals. Our findings highlight that considering the confidence levels (or uncertainties) of predictions enhances both the diagnosis and forecasting of BRD. Uncertainty-aware diagnosis reduced errors to 32 %, outperforming traditional automatic diagnosis. Forecast relying on veterinarian diagnoses, considered the most confident, had a 23 % error, whilst forecast taking into account diagnosis uncertainties had a close 27.2 % error. Building upon uncertainty-awareness, our future research could explore integrating multiple types of sensor data, such as video surveillance, audio recordings, and environmental parameters, to provide a comprehensive evaluation of animal health, employing multi-modal methods for processing this diverse data.

Data recording and use of data tools for pig health management: perspectives of stakeholders in pig farming

Frontiers in Veterinary Science, 2025

Xiao Zhou, Andrea Knörr, Beatriz Garcia Morante, Carla Correia-Gomes, Lucia Dieste Pérez, Joaquim Segalés, Marina Sibila, Carles Vilalta, Alison Burrell, Tijs Tobias, Michael Siegrist, Angela Bearth

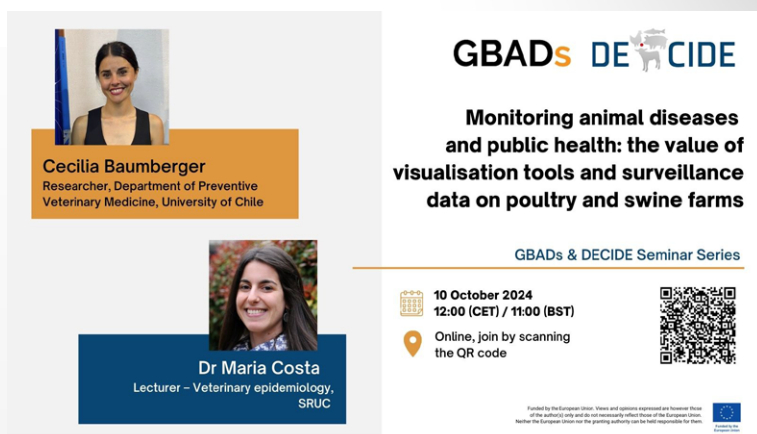


Introduction: Data-driven strategies might combat the spreading of infectious pig disease and improve the early detection of potential pig health problems. The current study aimed to explore individual views on data recording and use of data tools for pig health management by recruiting stakeholders (N = 202) in Spain, Ireland, and the Netherlands. **Methods:** Questionnaire focused on current on-farm challenges, current status of data recording on farms, and evaluation of the two mock data tools. Particularly, “benchmarking tool” was designed to visualize individual farm’s pig mortality, targeting the management of infectious respiratory and gastrointestinal diseases; and “early-warning tool” was designed to generate an alarm through monitoring coughs in pigs, targeting the management of infectious respiratory diseases. **Results:** Results showed that respiratory and gastrointestinal diseases and aggressive behaviors were the most frequently mentioned health challenge and welfare challenge, respectively. Most of the data was more frequently recorded electronically than on paper. In general, the “benchmarking tool” was perceived as useful for the management of infectious respiratory and gastrointestinal diseases, and the “early-warning tool” was evaluated as useful for the management of infectious respiratory diseases. Several barriers to the perceived usefulness of these two

tools were identified, such as the lack of contextual information, inconvenience of data input, limited internet access, reliance on one’s own experience and observation, technical hurdles, and mistrust of information output. The perceived usefulness of both tools was higher among highly educated participants, and those who reported being integrators and positive toward technology for disease control. Female participants and those who came from integrated farms evaluated the “early-warning tool” as more useful compared to their counterparts. The perceived usefulness of the “early- warning tool” was negatively affected by age and work experience, but positively affected by extensiveness of data recording, positive attitude toward technology, and the current use of technology. **Discussion:** In summary, participants showed optimistic views on the use of data tools to support their decision-making and management of infectious pig respiratory and gastrointestinal diseases. It is noteworthy that data tools should not only convey the value of data for informed decision-making but also consider stakeholders’ preconditions and needs for data tools.

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News and Updates.



GBADs DECIDE

Monitoring animal diseases and public health: the value of visualisation tools and surveillance data on poultry and swine farms

GBADs & DECIDE Seminar Series

10 October 2024
12:00 (CET) / 11:00 (BST)

Online, join by scanning the QR code

Cecilia Baumberger
Researcher, Department of Preventive Veterinary Medicine, University of Chile

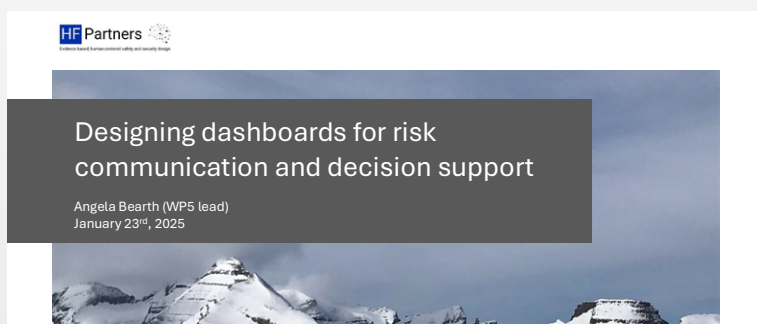
Dr Maria Costa
Lecturer – Veterinary epidemiology, SRUC

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GBADs & DECIDE Webinar #6

DECIDE and GBADs continue hosting joint seminar series. The latest edition titled “Monitoring animal diseases and public health: the value of visualisation tools and surveillance data on poultry and swine farms” hosted by Cecilia Baumberger (University of Buenos Aires) and Maria Costa (SRUC) is available to watch online:

Watch



HF Partners
Horizon-funded partners working together

Designing dashboards for risk communication and decision support

Angela Bearth (WP5 lead)
January 23rd, 2025

Workshop on Data Tool Design

On 23 January 2025, Angela Bearth (HF Partners) organised a half-day online workshop on the psychological and design aspects of tool development. The workshop targeted DECIDE tool developers and combined theoretical aspects of tool design with practical exercises.



DECIDE
practice abstracts
on EU-FarmBook

EU-FarmBook

DECIDE Practice Abstracts on EU-FarmBook

The first set of DECIDE practice abstracts is now available on EU-FarmBook - a Horizon-funded project that serves as a one-stop platform offering practical knowledge and solutions from EU-funded R&I projects, EIP-AGRI operational groups under the CAP, and other research initiatives.

More news

DECIDE

Consortium Updates: New Looks and New Moves.



New Consortium Member: HF Partners

DECIDE welcomed HF Partners, a Swiss research institution and consultancy helping organisations address security and safety risks. Their mission is to improve decision-making and risk communication. Dr Angela Bearth represents HF Partners in DECIDE, leading Work Package 5, which explores decision-makers' behavioural patterns in animal disease management and their responses to data-driven tools.

Baptiste Sorin Successfully Defends PhD Thesis

On 10 December 2024, Baptiste Sorin, PhD Candidate at INRAE, became the first PhD student to complete a thesis within DECIDE, successfully defending his work "Stochastic Modeling of Bovine Respiratory Disease: Using Mathematical Models to Rank Interventions and Control Strategies." His work was a key contribution to the cattle group, and while we are sorry to see him go, we sincerely thank him for his efforts and wish him great success in his future career.



Ausvet Europe Rebrands as EpiMundi

DECIDE partner Ausvet Europe has rebranded as EpiMundi, introducing a new name, logo, and website. While the look has changed, the company remains the same - an independent, private epidemiology research and consulting company based in Lyon, France. In the DECIDE project, EpiMundi continues to co-lead WP1 and contribute to WP2, WP3, and WP5.

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DECIDE at ISVEE 17, Sydney.

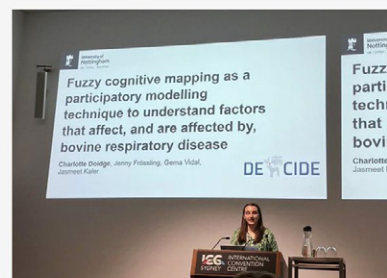
From 11 to 15 November 2024, DECIDE partners participated in the ISVEE 17 conference in Sydney, Australia, contributing eight oral presentations and four poster presentations.

The conference of the International Society for Veterinary Epidemiology and Economics (ISVEE) is an international platform for sharing research and ideas, such as those related to preventive veterinary medicine. The DECIDE project was well represented with several presentations on the design of tools to improve animal health and welfare. Britt Bang Jensen presented work on the salmon tools, Yara Slegers on the poultry tools, Maria Costa on a pig dashboard, and Carolina Merca on the cattle BRD tool. In addition, research done in WP1, WP2, WP3, and WP5 was presented by Camille Delavenne, Carolina

Merca, Gerdien van Schaik, and Charlotte Doidge, respectively. Discussions during the sessions in which the work was presented, as well as throughout the conference, indicated that many researchers struggle with similar issues, such as difficulties in re-using data for animal health and incorporating users' needs into decision support tools. We returned with new ideas to address these challenges and hopefully also provided the ISVEE audience with some solutions used in the DECIDE project.



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What Our Partners Say: Personal Takeaways from ISVEE 17



"My trip to Sydney started with the GBADs meeting in which I was tasked to summarize the first day. I learned that data for determining the burden of diseases is sparse and hard to access. However, solutions were proposed and applied that could very much support the work done in WP4 of the DECIDE project. The interaction with the excellent group of researchers in the GBADs project was useful and motivating."

Gerdien van Schaik, Universiteit Utrecht

"For me, this conference was a great opportunity to share the work we have been doing within DECIDE and to learn about our peers' work regarding veterinary epidemiology, especially in disease modelling and surveillance. The discussions were engaging, and it was great to connect with researchers from around the world. I left Australia feeling inspired and excited about the possibilities ahead!"

Carolina Merca, University of Copenhagen

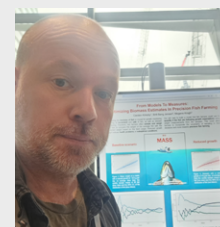


"The EpiMundi team couldn't have been prouder to present the work we have been doing within DECIDE on data integration than at the ISVEE conference. The audience's warm welcome to our presentation and the multiple follow-up discussions surprised us and confirmed our strong commitment to improving data practices. The conference was also a great opportunity to connect with colleagues worldwide and share the latest developments in veterinary epidemiology in the incredible city of Sydney."

Camille Delavenne and Angus Cameron, EpiMundi

"I think this conference was a great opportunity to highlight current research, get to expand the research network, and discuss ideas with old and new colleagues."

Carsten Thure Kirkeby, University of Copenhagen



"After my presentation, I spoke with someone who was particularly interested in our work. He pointed me in the direction of some very relevant literature, which I suspect to further improve the paper we intend to write about our work."

Dan Børge Jensen, University of Copenhagen

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Upcoming Presentations and Events.

Interested in our research?

The DECIDE consortium partners will be presenting their latest findings at several key European and international scientific conferences, as well as at the DECIDE cluster event. We would be delighted to meet you and discuss the future of data-driven decision support tools.

● **DECIDE Animal Health Surveillance Cluster Event | Berlin, Germany**

25 March 2025 | Berlin, Germany

DECIDE is organising a cluster event to engage with the scientific community from EU-funded projects on animal health and welfare. Through presentations, interactive activities, and discussions, the event will focus on two key topics: data access and re-use and stakeholder needs. Participation is by invitation, please contact us if you are interested.

● **Data Availability, Requirements and Limitations in Global Animal Health Research and Decision-making** webinar, GBADs & DECIDE Seminar Series

5 February 2025 | online, register [here](#)

● **The Society for Veterinary Epidemiology and Preventive Medicine (ESPHM)**

26 - 28 March 2025 | Berlin, Germany

● **European Symposium of Porcine Health Management (ESPHM) 2025**

21 - 23 May 2025 | Bern, Switzerland

● **International Society for Economics and Social Sciences of Animal Health (ISESSAH) Conference**

14 - 16 October 2025 | Utrecht, the Netherlands

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