WOAH Collaborative Centre Reports Activities 2022

Activities in 2022

This report has been submitted : 8 mars 2023 16:38

Centre Information

Title of WOAH Collaborating Centre	
Address of WOAH Collaborating Centre	WOAH Collaborating Centre for Risk Analysis and Modelling, The Royal Veterinary College, North Mymms, Hatfield, AL7 9TA, UK
Tel.:	
E-mail address:	RAM.WOAHCollaboratingCentre@apha.gov.uk
Website:	https://www.rvc.ac.uk/research/risk-analysis-and-modelling
Name Director of Institute (Responsible Official):	Professor Stuart Reid
Name (including Title and Position) of Head of the Collaborating Centre (WOAH Contact Point):	Professor Stuart Reid, President & Principal, Royal Veterinary College
Name of the writer:	Professor Stuart Reid

TOR1 AND 2: SERVICES PROVIDED

1. Activities as a centre of research, expertise, standardisation and dissemination of techniques within the remit of the mandate given by WOAH

Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
	A study was conducted to review the epidemiological situation of BSE

Review of BSE epidemiology and impact	cases in Great Britain and its economic impact. This is now published in the Journal Food Control (https://www.sciencedirect.com/science/article/pii/S0956713522006831)
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
QMRA for HEV in pigs	Submitted deliverable report for BIOPIGEE EJP project on QMRA for HEV in pigs. Also presented at ISVEE conference and final EJP meeting in Rome. Model results inform an economic analysis completed by the University of Vienna.
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
Rabies risk assessment	Expanded a quantitative rabies risk assessment model to consider if there has been a recent increase in risk of introduction to the UK from dogs from eastern Europe. Work conducted for Defra after request from UK CVO.
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
EXpert Prioritisation of Emerging Risks and Threats framework (ExPERT)	Developed framework to utilise expert opinion workshops to parameterise a risk prioritisation tool for ranking of introduction of infectious disease to the UK. Case study of impact of current situation in Ukraine, at the request of UK CVO.
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
Output-based surveillance system selection methodology	Deliverable for MATRIX EJP project: Report on output-based surveillance system selection methodology, includes cost-effectiveness of tests for E. multilocularis.
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
Hazard Identification: import of Alpacas to UK from Australia	A hazard identification (ID) was conducted to identify potential pathogens that could enter UK via import of alpacas and llamas from Australia. The work was conducted for Defra and the methodology will act as a template for future hazard IDs.
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
	Coordinating the development of surveillance guidelines for endemic

Surveillance guidelines for FAO	zoonoses in the animal reservoir upon request from FAO (ongoing).
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
Assistance analysing AMR data from a study in Bangladesh	Providing epidemiological analytical support to a MSc student post supported by the FAO AMR Ref Centre and the WOAH Collaborating Centre for Risk Analysis and Modelling.
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
Providing advice for economic modelling of ASF Surveillance in Colombia	Providing advice for development, interpretation and writing of research project on economic modelling of African swine fever in Colombia, led by the Faculty of Veterinary Medicine in Barcelona.
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
Import QMRA for Aujeszky's disease	As part of freedom of disease model, update of import quantitative risk assessment for Aujeszky's disease in live pigs.
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
Outbreak response – avian influenza	2021/22 and 2022/23 outbreaks of avian influenza in the UK. Provision of multiple risk assessments for tracing, feed and licensed movements during the outbreaks. Collation of epidemiological reports for CVO, reports for WOAH.
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
Dose-response model for porcine cysticercosis	Contribution to development of dose-response model for porcine cysticercosis, of relevance for future quantitative microbiological risk assessments.
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
Tool for risk ranking of foodborne pathogens and	Development and publication of approach for risk ranking of foodborne pathogens and food products in scarce-data settings:

food products in scarce-data settings	https://www.sciencedirect.com/science/article/pii/S0956713522003450

Training, capacity building	
Title of activity	Scope
Introduction to Infectious Disease Modelling and its Applications	Two APHA members of staff attended a 2-week training course organised by London School of Hygiene and Tropical Medicine. June 2022.

Training, capacity building	
Title of activity	Scope
Expert Knowledge Elicitation	Two APHA members of staff attended a 2-day training course organised by Sheffield University. September 2022.

Training, capacity building	
Title of activity	Scope
Advanced Course in Epidemiological Analysis	APHA member of staff attended a 2-week training course organised by London School of Hygiene and Tropical Medicine. August 2022.

Training, capacity building	
Title of activity	Scope
Introduction to Statistics	Two APHA members of staff attended a 5-day training course organised by Bristol University. December 2022.

Training, capacity building	
Title of activity	Scope
PhD in Epidemiology	APHA member of staff successfully completed and passed her PhD. The PhD was entitled "Bovine tuberculosis risk characterization and applied epidemiology". Staff from both RVC and APHA provided supervision.

Training, capacity building	
Title of activity	Scope
Scenario Tree Modelling course.	15 APHA staff members completed a 12-hour course organised by AUSVET on the use of scenario tree modelling to demonstrate freedom from disease.

Training, capacity building	
Title of activity	Scope
Ongoing seminar series	RVC staff regularly participate in weekly seminars addressing various technical aspects.

TOR3: HARMONISATION OF STANDARDS

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the main fucus area for which you were designated

Proposal title	Scope/Content	Applicable area
Assessment of the control measures for Category A diseases of the new Animal Health Law.	EFSA Panel on Animal Health and Welfare (2022) Assessment of the control measures of the Category A diseases of the Animal Health Law: prohibitions in restricted zones and risk-mitigating treatments for products of animal origin and other materials. EFSA Journal 20: e7443. doi: 10.2903/j.efsa.2022.7443	health management
Review of BSE policy and regulations in the UK.	Current and historical analysis of the cattle BSE epidemic situation in Great Britain, including a review of the policies implemented, its impact and the possible factors explaining the occurrence of new cases.	health management
Articles published in a peer-reviewed journal	16 papers published in the EFSA journal this year each assessing and providing recommendations for updates to the control measures of 16 category A diseases of the new Animal Health Law (diseases included PPR, FMD, ASF, CBPP and antimicrobial resistance).	health management
Guidelines for surveillance of zoonoses in endemic settings	RVC coordinating the development of guidelines for surveillance of endemic zoonoses in the animal reservoir upon request from FAO	health management
Guidance for evaluating integrated surveillance of antimicrobial use and resistance	RVC researchers contributed to development and publication of guidance for evaluating integrated surveillance of antimicrobial use and resistance: https://www.cabidigitallibrary.org/doi/full/10.1079/cabionehealth.2022.0007	health management

4. Did your Collaborating Centre maintain a network with other WOAH Collaborating Centres (CC), Reference Laboratories (RL), or organisations designated for the same specialty, to coordinate scientific and technical studies?

Yes

Name of OIE CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
University of Melbourne (Australia), New Zealand Government (Department of Primary Industries), Azure Quality Assurance (NZ), Canadian Food Inspection Agency, USDA Animal and Plant Health Inspection Service (USA)	Australia, New Zealand, Canada, USA	Americas Asia and Pasific	Collaboration between APHA and groups in USA, Canada, Australia, New Zealand and UK focussing on application of FMD modelling.
One Health European Joint Programme BIOPIGGEE. German Federal Institute for Risk Assessment (BFR), National Veterinary Institute (SVA), National Veterinary Institute (NVI), Estonian Veterinary and Food Laboratory, Robert Koch Institute, Wageningen Bioveterinary Research (WBVR), ANSES, Austrian Agency for Health and Food Safety (AGES), National Veterinary Research Institute of Poland (PIWET), Veterinary Research Institute (CZ), Bulgarian Food Safety Agency, Istituto Superiore di Sanità, Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise, Istituto Zooprofilattico Sperimentale della Lombardia e Dell'Emilia Romagna, RIVM	Germany, Sweden, Norway, Estonia, Netherlands, Austria. Poland, Bulgaria, Italy	Europe	Final project meeting for the One Health EJP-funded BIOPIGEE project on biosecurity practises for pig farming across Europe.
Wageningen Bioveterinary Research (WBVR), National Veterinary Institute (SVA), University of Copenhagen, Denmark.	Netherlands, Sweden, Denmark	Europe	Data collection and modelling of mammal abundance across Europe.

VEO consortium (20 institutes in the EU). Led by Erasmus Medical Centre, Netherlands.	Various	Europe	EU Horizon 2020 project in which APHA are providing generic risk assessment tools, data analytic approaches to assess disease incursion into Europe. (https://www.veo-europe.eu/)
WOAH Collaborating Centre in Animal Disease Surveillance Systems, Risk Analysis and Epidemiological Modelling Centers for Epidemiology and Animal Health. USDA-APHIS-VSCEAH. United States of America; WOAH Collaborating Centre in Veterinary Epidemiology and Public Health. EpiCentre and mEpiLab Institute of Veterinary and Biomedical Sciences Massey University. New Zealand. China Animal Health and Epidemiology Centre. China (People's Republic of); WOAH Collaborating Centre in Veterinary Services Capacity Building (Americas), University of Minnesota. United States of America; WOAH Collaborating Centre in Economics of Animal Health. University of Liverpool, Utrecht University, Norwegian Veterinary Institute.	USA, China, New Zealand, UK, Netherlands, Norway	Americas Asia and Pasific Europe	Editing a WOAH Sci. Tech. Review on Animal Health Data Management. International scientists invited to collaborate and contribute articles on various aspects of animal health data management, including use for risk analysis and modelling.
Pharmacy Directorate of the Ghanaian Ministry of Health	Ghana	Africa	APHA epidemiologist mentoring a FAO Fleming Fund fellow on surveillance of AMR. Supporting the development of AMR data collection systems, data analysis and the creation of dashboards.
National Veterinary Institute (SVA),			DACRAH. Systematic review of published literature to gather data on factors such as

Wageningen Bioveterinary Research (WBVR), University of Surrey	Sweden, Netherlands, UK	Europe	diagnostic tests and experimental infection for risk assessments on vector borne disease and Animal health law diseases.
Centre for Environment, Fisheries and Aquaculture Science (CEFAS) – WOAH Reference Laboratory, Veterinary Medicines Directorate, Defra, Food Standards Agency, Foods Standards Scotland, Health & Safety Executive, UK Health Security Agency, Public Health Scotland, Business, Energy and Industrial Strategy, Marine Scotland Science	UK	Europe	Regular correspondence via a cross-Government risk assessment group which discusses, and exchanges information on, the current and future practices of risk assessment for the UK Government.
EpiCentre and mEpiLab, WOAH Collaborating Centre for Veterinary Epidemiology and Public Health	New Zealand	Asia and Pasific	Planning of sabbatical of RVC academic, to be hosted by WOAH collaborating centre in veterinary epidemiology and public health during the first quarter of 2023 to discuss and develop collaborative projects on surveillance and risk analysis.

TOR4 AND 5: NETWORKING AND COLLABORATION

5. Did your Collaborating Centre maintain a network with other WOAH Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?

Yes

Name of OIE CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Friedrich Loeffler Institut, Germany; Erasmus Medical Centre, Netherlands; Animal and Plant Health Agency, UK; Linneuniversitetet, Sweden; Istituto Zooprofilattico Sperimentale Delle Venez, Italy; The Royal Veterinary College, UK; Schweizerische Vogelwarte Sempach,	Netherlands, Sweden, Italy, UK	Europe	New partnership for the investigation the ecology and biology of HPAIV H5. This includes new development of novel risk assessment tools and economic modelling of the disease.

Switzerland.			
The Pirbright Institute – TPI (WOAH reference laboratory)	UK	Europe	Collaboration between RVC and TPI researchers as part of research projects on lumpy skin disease, sheep and goat pox and foot and mouth disease and in capacity building and knowledge exchange in Nigeria. TPI have 10 WOAH reference laboratories.
National Academy of Medicine	UK	Europe	Prof. Stuart Reid is a member of the USA National Academy of Medicine
Animal and Plant Health Agency WOAH reference laboratory for Avian Influenza	UK	Europe	As required, provision of ad hoc consultancy and advice in epidemiology, risk assessment and modelling.
Animal and Plant Health Agency WOAH reference laboratory for Bovine Spongiform Encephalopathy (BSE) and Scrapie	UK	Europe	As required, provision of ad hoc consultancy and advice in epidemiology, risk assessment and modelling.
Animal and Plant Health Agency WOAH reference laboratory for brucellosis	UK	Europe	Collaboration on brucellosis surveillance in endemic settings.

TOR6: EXPERT CONSULTANTS

6. Did your Collaborating Centre place expert consultants at the disposal of WOAH?

Yes

NAME OF EXPERT	KIND OF CONSULTANCY	SUBJECT
Rob Dewar, Robin Simons, Tony Pacey (APHA)	Risk assessment expertise	APHA initiated a meeting with Peter Melens and Paolo Tizzani from the WOAH WAHIS team to discuss ways in which the website could better facilitate use by risk assessors, modellers and data analysts, including use of an API. WOAH-WAHIS suggested that there might be an offer to help test out systems in the future. Soon after the meeting it was noted that a suggestion that

		it was made clear that the 'Animal Health Capacity' button was not currently functional was implemented. Additionally, temporary solutions were provided such as access to a temporary SharePoint site.

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

7. Did your Collaborating Centre provide advice/services to requests from Members in your main focus area?

No

8. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by WOAH, to personnel from WOAH Members?

Yes

a) Technical visit :

b) Seminars : 1

c) Hands-on training courses: 6

d) Internships (>1 month) :

TYPE OF TECHNICAL TRAINING PROVIDED (A, B, C OR D)	CONTENT	COUNTRY OF ORIGIN OF THE EXPERT(S) PROVIDED WITH TRAINING	NO. PARTICIPANTS FROM THE CORRESPONDING COUNTRY
c	Introduction to Game Theory and its applications to animal health at SVEPM in Belfast, Ireland	Multiple countries in Europe	30
c	Field Epidemiology Training Program for Veterinarians: delivery of 4 week training course to veterinarians from Jordan veterinary services.	Jordan	18
c	As part of the EFSA EU-FORA fellowship, teaching on quantitative food safety risk assessment. 3 days, Parma	Multiple countries in Europe	18
c	As part of the EFSA EU-FORA fellowship, teaching on animal health risk assessment and modelling. 1/2 day, online	Multiple countries in Europe	15

c	Online course in risk assessment for food safety and animal health (APHA, RVC, ILRI)	Ethiopia, Ghana, Bangladesh and Nigeria	12
b	Workshop on generic risk assessment for animal disease incursion, ICAHS 4, Copenhagen	Multiple countries within Europe	14
c	Contribution to workshop on disease outbreak investigations at SVEPM conference in Belfast, Ireland.	Multiple countries within Europe	30

TOR8: SCIENTIFIC MEETINGS

9. Did your Collaborating Centre organise or participate in the organisation of scientific meetings related to your main focus area on behalf of WOAH?

No

TOR9: DATA AND INFORMATION DISSEMINATION

10. Publication and dissemination of any information within the remit of the mandate given by WOAH that may be useful to Members of WOAH

a) Articles published in peer-reviewed journals:

45

1. Adeyemo, P et al. (2022). Estimating the financial impact of livestock schistosomiasis on traditional subsistence and transhumance farmers keeping cattle, sheep and goats in northern Senegal. Parasites & vectors 15 (1), 1-20

2. Alarcon, P et al. (2022). Classical BSE in Great Britain: Review of its epidemic, risk factors, policy and impact. Food Control, 109490

3. Andrade-Mogrovejo, DA et al. (2022). Development of a dose-response model for porcine cysticercosis. PloS one 17 (3), e0264898

4. Bacigalupo, SA et al. (2022) The importance of fine-scale predictors of wild boar habitat use in an isolated population. Ecology and evolution 12 (6), e9031

5. Bacigalupo, SA et al. (2022). Wild boar visits to commercial pig farms in southwest England: implications for disease transmission. European Journal of Wildlife Research 68 (6), 1-13

6. Banks, CJ et al. (2022). SCoVMod–a spatially explicit mobility and deprivation adjusted model of first wave COVID-19 transmission dynamics. Wellcome Open Research 7 (161), 161

7. Blake, LJ et al. (2022). The UK Antimicrobial Resistance Strategy 2013-18: A Qualitative Study of International and Domestic Policy and Action Related to Livestock and the Food Chain. Frontiers in Sustainable Food Systems 6, 819158

8. Brand, CL et al. (2022). Pandemic Puppies: Demographic Characteristics, Health and Early Life Experiences of Puppies Acquired during the 2020 Phase of the COVID-19 Pandemic in the UK. Animals 12 (5), 629.

9. Burnett, E et al. (2022) How much is that doodle in the window? Exploring motivations and behaviours of UK owners acquiring designer crossbreed dogs (2019-2020). Canine Medicine and Genetics 9 (1), 1-16

10. Compson, P et al. (2022). A systematic review of the methods used to analyse the economic impact of endemic foot-and-mouth disease. Transboundary and Emerging Diseases 69 (5), 2249-2260.

11. Condoleo, R et al. (2022). Microbial risk assessment of Escherichia coli shiga-toxin producers (STEC) in raw sheep's milk cheeses in Italy. Food Control 137, 108951

12. Courcier, EA et al. (2022). The impact of BCG strains and repeat vaccinations on immunodiagnostic tests in Eurasian badgers (Meles meles). Vaccine 40 (34), 4972-4978

13. Craighead, L et al. (2022). Brucellosis in dairy herds: Farm characteristics and practices in relation to likely adoption of three potential private–public partnership (PPP) vaccination control strategies. Transboundary and Emerging Diseases 69 (3), 1479-1505

14. Crotta, M et al. (2022). Microbiological risk ranking of foodborne pathogens and food products in scarce-data settings. Food Control 141, 109152

15. Di Pol et al. (2022). Modelling the temperature suitability for the risk of West Nile Virus establishment in European Culex pipiens populations. Transboundary and Emerging Diseases 69(5):e1787-e179

16. Dixon, MA et al. (2022). Global Force-of-Infection Trends for Human Taenia solium Taeniasis/Cysticercosis. Elife. 11: e76988.

17. Downs et al. (2022). Detection of a local Mycobacterium bovis reservoir using cattle surveillance data. Transboundary and Emerging Diseases, 69, e104-e118. https://doi.org/10.1111/tbed.14272

18. Garza, M et al. (2022). Typology of interventions for antimicrobial use and antimicrobial resistance in aquaculture systems in low-and middle-income countries. International Journal of Antimicrobial Agents 59 (1), 106495

19. Goddard, MR et al. (2022) A restatement of the natural science evidence base regarding the source, spread and control of Campylobacter species causing human disease. Proceedings of the Royal Society B 289 (1977), 20220400

20. Haider, N et al. (2022). Increased outbreaks of monkeypox highlight gaps in actual disease burden in Sub-Saharan Africa and in animal reservoirs. International Journal of Infectious Diseases, 33

21. Hennessey, M et al. (2022). Modelling multi-player strategic decisions in animal healthcare: A scoping review . Preventive Veterinary Medicine 205:105684.

22. Hsing, PY et al. (2022). Large-scale mammal monitoring: The potential of a citizen science camera-trapping project in the United Kingdom. Ecological Solutions and Evidence 3 (4), e12180

23. Huber, N et al. (2022). What is a biosecurity measure? A definition proposal for animal production and linked processing operations. One Health, 100433

24. Jolma, ER et al. (2022). Serologic responses correlate with current but not future bacterial shedding in badgers naturally infected with Mycobacterium bovis. Transboundary and Emerging Diseases 69 (4), 1922-1932

25. Jones et al. (2022). The effectiveness of short-duration in-feed organic acid use in finisher pigs for Salmonella control at slaughter. Preventive Veterinary Medicine 209, 105772

26. Mason, SS et al. (2022). Camera trap distance sampling for terrestrial mammal population monitoring: lessons learnt from a UK case study. Remote Sensing in Ecology and Conservation 8 (5):717–730

27. McCarthy, C et al. (2022). Estimating the likelihood of ESBL-producing E. coli carriage in slaughter-aged pigs following bacterial introduction onto a farm: A multiscale risk assessment. Microbial Risk Analysis 20, 100185

28. Montagnin, C et al. (2022). Efficacy of Five Disinfectant Products Commonly Used in Pig Herds against a Panel of Bacteria Sensitive and Resistant to Selected Antimicrobials, Animals 12 (20), 2780

29. Nunney, E et al. (2022). Effect of tuberculin skin testing on serological results against Mycobacterium avium ssp. paratuberculosis (MAP): Evidence of distinct effects in MAP-infected and noninfected cows. Journal of Dairy Science 105 (10), 8354-8363

30. Olorunleke, SO et al. (2022). Molecular characterization of extended spectrum cephalosporin resistant Escherichia coli isolated from livestock and in-contact humans in Southeast Nigeria. Frontiers in microbiology 13, 937968

31. Paniw, M et al. (2022). Higher temperature extremes exacerbate negative disease effects in a social mammal. Nature Climate Change 12 (3), 284-290

32. Patterson, SJ et al. (2022). Trait-Based Vaccination of Individual Meerkats (Suricata suricatta) against Tuberculosis Provides Evidence to Support Targeted Disease Control. Animals 12 (2), 192

33. Queenan, K et al. (2022). A food systems approach and qualitative system dynamics model to reveal policy issues within the commercial broiler chicken system in South Africa. PloS one 17 (6), e0270756

34. Romero, MP et al. (2022). Machine learning classification methods informing the management of inconclusive reactors at bovine tuberculosis surveillance tests in England. Preventive Veterinary Medicine 199, 105565

35. Roslan, NA et al. (2022). Student Perceptions of the Introduction of Pig Production, Management, and Health Teaching into the Veterinary Curriculum of a Muslim-Majority Country: A Case Study in Jordan. Journal of Veterinary Medical Education, e20220013

36. Rossi, G et al. (2022). Phylodynamic analysis of an emergent Mycobacterium bovis outbreak in an area with no previously known wildlife infections. Journal of Applied Ecology 59 (1), 210-222

37. Rüegg, SR et al. (2022). Guidance for evaluating integrated surveillance of antimicrobial use and resistance. CABI One Health, 0007

38. Smith, GC et al. (2022). Defining and testing a wildlife intervention framework for exotic disease control. Ecological Solutions and Evidence 3 (4), e12192

39. Smith, GC et al. (2022). Simulating partial vaccine protection: BCG in badgers. Preventive Veterinary Medicine 204, 105635.

40. Walker, M et al. (2022). Improving anthelmintic treatment for schistosomiasis and soil-transmitted helminthiases through sharing and reuse of individual participant data. Wellcome Open Research 7.

41. Waller, ELA et al. (2022). Bovine TB infection status in cattle in Great Britain in 2020. Veterinary Record 191 (11), e2513.

42. Whatford L et al. (2022). A systematic literature review on the economic impact of endemic disease in UK sheep and cattle using a One Health conceptualisation. Preventive Veterinary Medicine, 105756

43. Willen, L et al. (2022). Demographic patterns of human antibody levels to Simulium damnosum s.l. saliva in onchocerciasis-endemic areas: An indicator of exposure to vector bites. PLOS Neglected Tropical Diseases 16 (1), e0010108

44. Withenshaw, SM et al. (2022). A systematized review and qualitative synthesis of potential risk factors associated with the occurrence of non-O157 Shiga toxin-producing Escherichia coli (STEC). Comprehensive Reviews in Food Science and Food Safety 21 (3), 2363-2390

45. Withenshaw, SM et al. (2022). Study of Animal Mixing and the Dynamics of Hepatitis E Virus Infection on a Farrow-to-Finish Pig Farm. Animals 12 (3), 272

b) International conferences:
25
1. Presentation at ICAHS4. Nowcasting monthly salmonella cases in cattle. Copenhagen, Denmark, 3rd – 5th May 2022. Matthew Coleman (APHA)

2. Presentation at ICAHS4. Validation of generic risk assessment tools using a case study of African Swine Fever Copenhagen, Denmark, 3rd – 5th May 2022. Rachel Taylor (APHA)

3. Presentation at M. bovis 2022. Using computer simulation models to assess potential impacts of changes to primary bovine tuberculosis surveillance testing of cattle in England. Galway, Ireland, 7-10th June 2022. Colin Birch (APHA).

4. Presentation at World Veterinary Association Congress. The contrasting food borne disease risk of brucellosis across endemic settings. Abu Dhabi. March 2022. Javier Guitian (RVC).

5. Presentation at World Veterinary Association Congress. Epidemiology of MERS-CoV in camels and livestock-owning households in southern Jordan. Abu Dhabi. March 2022. Javier Guitian (RVC).

6. Presentation at ISVEE 2022. An analysis of the impact of badger control on bovine tuberculosis in England. Halifax, Canada, 7-12th August 2022. Colin Birch (APHA).

7. Presentation at ISVEE 2022. GEM Pigs ASF - A Model to Simulate Spread of African Swine Fever in Great Britain. Halifax, Canada, 7-12th August 2022. Matthew Coleman (APHA).

8. Presentation at ISVEE 2022. The Quads Epiteam: report on key outputs and current research activities. Halifax, Canada, 7-12th August 2022. Charlotte Cook (APHA).

9. Presentation at ISVEE 2022. Managing fasciolosis and triclabendazole resistance in hill sheep through a participatory process. Halifax, Canada, 7-12th August 2022. Bryony Jones (APHA).

10. Presentation at ISVEE 2022. A genomic epidemiological investigation of the association between antimicrobial resistance and antimicrobial usage in UK livestock. Halifax, Canada, 7-12th August 2022. Hannah Jones (APHA).

11. Poster at ISVEE 2022. Effective biosecurity measures for the control of Salmonella in European pig farms. Halifax, Canada, 7-12th August 2022. Hannah Jones (APHA).

12. Presentation at ISVEE 2022. Antimicrobial resistance of Escherichia coli isolated from healthy pigs: single vs. pooled samples. Halifax, Canada, 7-12th August 2022. Maria J. Vilar

13. Presentation at ISVEE 2022. A farm-to-consumption quantitative microbiological risk assessment for hepatitis E in pigs, Halifax, Canada, 7-12th August 2022. Neil Wilkins (APHA)

14. Poster at ISVEE 2022. Developing a National Bovine Tuberculosis Epidemiology Team. Halifax, Canada, 7-12th August 2022. Rachelle Avigad (APHA).

15. Guillaume Fournie (RVC) alongside Bryony Jones (APHA), Melissa McLaws (FAO) and Theo Knight-Jones (ILRI) chaired a Special Session on "Modelling Approaches to Support the Progressive Control & Eradication of Transboundary Animal Diseases, with a Focus on PPR & FMD" at ISVEE 2022 in Halifax, Canada, 7-12th August.

16. Presentation at ISVEE 2022. Modelling the heterogeneity of small ruminant populations and the impact on vaccination effectiveness to achieve PPR elimination. Halifax, Canada, 7-12th August 2022. Beth Savagar (RVC)

17. Barbara Haesler (RVC), Polly Compston (RVC), and Klara Saville (Brooke) organised and co-chaired a Special Session on "Systems Approaches to Promote Better Health for Animals, People and Ecosystems" at ISVEE 2022 in Halifax, Canada, 7-12th August.

18. Presentation at ISVEE 2022. A systems approach to understand drivers of AMU and AMR in aquaculture systems in Northern Vietnam. Halifax, Canada, 7-12th August 2022. Maria Garza (RVC).

19. Presentation at ISVEE 2022. Qualitative System Dynamics modelling to study health, nutrition and environmental outcomes of the broiler meat system in South Africa. Halifax, Canada, 7-12th August 2022. Kevin Queenan (RVC).

20. Presentation at ISVEE 2022. Epidemix – an online tool to make modelling more accessible. Halifax, Canada, 7-12th August 2022. Guillaume Fournié (RVC)

21. Presentation at ISVEE 2022. Examining decision making in the vaccine value chain for foot-and-mouth disease in Kenya. Halifax, Canada, 7-12th August 2022. Polly Compston (RVC).

22. Presentation at ISVEE 2022. An economic assessment of the impact of foot-and-mouth disease on smallholder dairy farmers in Nakuru County, Kenya. Halifax, Canada, 7-12th August 2022. Polly Compston (RVC).

23. Presentation at ISVEE 2022. Integrating evidence from epidemiological studies and systematic risk ranking to inform prevention of zoonotic transmission of Brucella abortus. Halifax, Canada, 7-12th August 2022. Hannah Holt (RVC).

24. Facilitator at pre-ISVEE workshop on Evaluating Surveillance Systems for AMR and AMU in a One Health context. Halifax, Canada, 7th August 2022. Barbara Haesler (RVC)

25. Presentation at SVEPM 2022. Antimicrobial usage in farm animal practices in the UK: a mixed methods approach. Belfast, March 2022. Doaa Elkholly (RVC).

c) National conferences:

d) Other (Provide website address or link to appropriate information):
32
EFSA publications

1. EFSA (2022). Assessment of animal diseases caused by bacteria resistant to antimicrobials: kept fish species. EFSA Journal 20 (2), e07076

2. EFSA (2022). Assessment of the control measures of the category A diseases of Animal Health Law: Burkholderia mallei (Glanders). EFSA Journal 20 (1), e07069

3. EFSA (2022). Assessment of the control measures for category A diseases of Animal Health Law: Contagious Bovine Pleuropneumonia. EFSA Journal 20 (1), e07067

4. EFSA (2022). Assessment of the control measures of category A diseases of the Animal Health Law: Infection with rinderpest virus (Rinderpest). EFSA Journal 20 (1), e07071

5. EFSA (2022). Assessment of the control measures for category A diseases of Animal Health Law: Lumpy Skin Disease. EFSA Journal 20 (1), e07121

6. EFSA (2022). Assessment of the control measures of the Category A diseases of the Animal Health Law: prohibitions in restricted zones and risk-mitigating treatments for products of animal. EFSA Journal 20 (8), e07443

7. EFSA (2022). Assessment of the control measures of the category A diseases of Animal Health Law: Rift Valley Fever. EFSA Journal 20 (1), e07070

8. EFSA (2022). Assessment of listing and categorisation of animal diseases within the framework of the Animal Health Law (Regulation (EU) No 2016/429): infection with Equine Herpesvirus-1. EFSA Journal 20 (1), e07036

9. EFSA (2022). Guidance on good practice in conducting scientific assessments in animal health using modelling. EFSA Journal 20 (5), e07346

10. EFSA (2022). Welfare of cattle during transport. EFSA Journal 20 (9), e07442

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Website

32. Further development of a website to publicise the work of the WOAH Collaborating Centre for Risk Analysis & Modelling: https://www.rvc.ac.uk/research/risk-analysis-and-modelling

11. What have you done in the past year to advance your area of focus, e.g. updated technology?
The WOAH Collaborating Centre for Risk Analysis and Modelling is editing a future edition (Thematic vol. 41 (2)) of the WOAH Sci Tech Review. The series of papers focuses on "Animal Health Data Management" and is expected to contain 24 peer-reviewed publications. Pre-prints for some of the papers can be found online at https://www.woah.org/en/what-we-do/publications/scientific-and-technical-review/#ui-id-7

12. Additional comments regarding your report:
Epidemiology has played a key role in the response to the ongoing avian influenza outbreak in Great Britain through the National Emergency Epidemiology Group (NEEG). As well as leading the investigation into source and spread, the Group has co-ordinated expert elicitation exercises and prioritisation of tracing and surveillance activities. Work is ongoing to collate the substantial epidemiology report for the 21/22 outbreak. Other outbreak related epidemiology work includes investigation into methods for cluster identification, dashboard development and dissemination to aid communication of cases identified, supporting national research initiatives such as the FluMAP programme, and contributing to disease control exercises and contingency planning.