World Organisation for Animal Health

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WOAH Collaborative Centre Reports Activities 2024

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CENTRE INFORMATION

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TOR 1 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

Category	Title of activity	Scope
		The CCEAH has continued to champion the

Economics (true)	CCEAH Outcomes	improved use of economics in animal health decision making. It has done this by creating and trialling innovative methods to set robust baselines of animal disease burden. Associated work has included efforts to improve economic data literacy, standardisation of data collection frameworks, and consultation with users of the information provided to assess its value. The information generated provides information for evidence-based investment plans for veterinary services; allow allocation of resources to key social, economic and environmental problems; and support high quality evaluation of existing animal health investments demonstrating the value of veterinary services.
economics (true)	DECIDE H2020	Utrecht University has played a leading role in the DECIDE (H2020) project which plays a leading role in developing methods and tools for the application of economics in animal health. UoL and NVI are also members of the DECIDE consortium supporting the work on disease burden assessments in cattle, chickens, pigs and salmon. For all species steps have been taken to quantify the multidimensional burden of disease in specific production systems and for specific disease and health problems. This has been done through a combination of using primary and secondary data and through data analyses and simulation modelling. For pigs a model is under development to calculate the economic burden of a pig disease, and will be used as a basis for cost effectiveness analyses of mitigation measures. This model is also able to give insights in reduction in disease burden (reduction in spread of the disease), antibiotic use and in some welfare indicators (e.g., cough). This model already provides thus multidimensional output parameters. Also for calves (beef calves) a model (same modelling approach as for pigs) is ready that can calculate the economic burden of disease (BRD), and some other burdens (disease burden, antibiotic use). This model can be used as well to determine the cost effectiveness of several control measures. A start has been made on adapting this model to veal calves. For salmon an existing epidemiological model is currently updated, and a cost-benefit module will be added to determine the costs and benefits of two different interventions for pancreas disease. Also the economic burden of disease can be calculated

		with this model, as well as the welfare burden. For poultry work is ongoing to develop statistical models based on data from Poland, Italy and the Netherlands, led by a PhD student based at Epimundi with support of UoL and UU. These data analysis can provide insights in the economic burden and antibiotic use, and thus also provide multidimensional insights.
Economics (true)	Norwegian Fish Health report	NVI CCEAH members authored an economics chapter in the Norwegian Fish Health report. This report is the most important document in Norway regarding the state of the Norwegian aquaculture industry, and is referred and read by a wide diversity of people (governmental institutions, universities, NGOs, etc.). For the very first time in the report's 20-year lifespan, a chapter on health economics was included in 2024. The chapter included sections on the social consequences of fish health, costs and benefits of various biosecurity measures, an explanation of the "free-rider" problem, approaches for the calculation of animal health economics in aquaculture, a description of the local and global perspective (including explanation of relevance of GBADs work), and finally decision-making. The report is available here: https://www.vetinst.no/rapporter-og-publikasjoner/rapporter/2024/fishhealthreport-2023
		GBADs Phase II was completed, culminating in the production of a Technical Guide. The guide provides a foundation in the process of undertaking a burden assessment, which may be further supported by scientific papers and other peer-reviewed GBADs outputs, and if appropriate through development of collaborations with the GBADs programme. Additionally, for policy makers and those principally interested in GBADs output, the Guide provides insight into how estimates are derived and interpreted, in a form more accessible than academic papers and other GBADs technical outputs. The current document is version 1.0 of the GBADs Technical Guide and as such outlines the current approaches used within the programme. These methodologies, which are in use in country case- studies across the world, will continue to be expanded and refined. New approaches may be added as the programme moves into different

Economics (true)	GBADs technical guide	areas of focus, such as additional species or production systems, and further research questions arise. With these developments in mind, it is important to note that the current guide represents working methods and not a final product. Each chapter of this guide is a working document, outlining the present version of living methods that will change and develop over time, as additional research is conducted, and further case-studies implemented. As a programme, we are keen to engage and work with governments, institutions and individuals who are interested in estimating the burden of animal diseases in their context of interest. We encourage readers of this Technical Guide to engage with the GBADs programme, and welcome feedback from users on the utility of the guide as well as the methods themselves. Each chapter is authored by members of the GBADs consortium leading on the different methodologies. However, all the work in this Guide and its chapters builds on collaborative teamwork from all members of the GBADs consortium, as well as our country-level partners. The GBADs Technical Guide is based on research funded by the Bill & Melinda Gates Foundation and Foreign, Commonwealth and Development Office (FCDO).
Economics (true)	The WOAH Scientific and Technical Review, Vol.43 on 'Global Burden of Animal Diseases'	The edition is a series of research papers from the GBADs consortium and our partners on our methods, their application in case studies and the links to crop and human health. Contents: Estimating livestock biomass across diverse populations and data ecosystems Methods and data needs to estimate the economic market value of livestock at different spatial scales Prevalence data on chicken diseases in low-resource settings A methodological framework for attributing the burden of animal disease to specific causes Loss of production and animal health costs in assessing economic burden of animal disease Ontologies related to livestock for the Global Burden of Animal Diseases programme: a review Linking animal and human health burden: challenges and opportunities Understanding decision-makers and their needs: framing Global Burden of Animal Diseases offerings to enhance relevance and increase impact Global Burden of Animal Diseases informatics strategy, data quality and model interoperability Interpretation and utility of the Animal Health Loss Envelope as part of the Global

		Burden of Animal Diseases analytical process Application of Global Burden of Animal Diseases methods at country level: experiences of the Ethiopia case study Partnerships for policy: initiating a Global Burden of Animal Diseases case study in Indonesia Scoping Study for the Implementation of a Case Study of the "Global Impact of Animal Diseases" Programme in Senegal A Collaborating Centre for animal health economics in the Americas The application of Global Burden of Animal Diseases methodology to aquatic animal production Burden assessment of antimicrobial use and resistance in livestock in data-scarce contexts How the Global Burden of Animal Diseases links to the Global Burden of Crop Loss: a food systems perspective Veterinary Services' use of the Global Burden of Animal Diseases to prioritise interventions, monitor impact and develop critical competencies
Economics (true)	Economic Burden of AMR	Researchers at University of Liverpool and University of Bern (CCEAH Associate member) analysed the burden of AMR in pork production in Denmark. A stakeholder engagement took place in Denmark organised by the Danish Agriculture and Food Council. UoL are also supporting the economic analysis of antimicrobial use reduction interventions in pig production for the H2020 AVANT project led by Professor Luca Guardbassi, University of Copenhagen
Economics (true)	EFSA Burden of Zoonotic Diseases	UU are part of the consortium just initiating this project. Objective 1: estimate production losses of zoonotic diseases (salmonellosis, campylobacteriosis) in animals (poultry) Objective 2: estimate possible (direct or indirect) tangible costs of zoonotic diseases (salmonellosis, campylobacteriosis) in animals (poultry): expenses related to treatment, control, and eradication of the disease Objective 3: estimate intangible costs of zoonotic diseases (salmonellosis, campylobacteriosis): quantify the loss and relevance of consumer confidence
Economics (true)	VIVACE PhD Network	Vaccination of poultry in Europe against avian influenza viruses requires studying the importance, opportunities and challenges associated with its implementation. This is the aim of the VIVACE project, supported by the Marie Sklodowska-Curie doctoral network action of the Horizon Europe

		program and coordinated by the Host-Pathogen Interactions Laboratory (IHAP – INRAE/ENVT) at the INRAE Occitanie-Toulouse centre. UU and UoL are consortium members.
Economics (true)	EU PAH&W	NVI is partner in the EU Partnership in Animal health and welfare (EU PA&W) and contributes on the aquatic part of SOA22_009 Assessing the economic and societal burden of selected priority diseases.
Training, capacity building (true)	Economics training	UoL provided training as part of a Norad funded case study on the burden of diseases in shrimp farming in Java for colleagues at BRIN, Indonesia on economics of animal health and its application to aquatic systems.
Training, capacity building (true)	Audit and guide for AMR risk management	The UoL team have created an audit tool and guide for EBRD AMR risk management in livestock investments that includes antimicrobial stewardship, biosecurity and animal welfare. The tool is designed for use by EBRD staff to evaluate investments, or for self-assessment by current or potential clients. UoL team trained EBRD staff to use the audit. Jonathan Rushton, Ben Huntington, Reg Smith
Training, capacity building (true)	Webinars for Technical Guide Launch	Coordination of launch webinars for GBADs Technical Guide v1.0. Introduction of GBADs approach, successes and learnings of the major case study in Ethiopia, and introduction to the newly published Technical Guide.
Training, capacity building (true)	DECIDE/GBADs webinars	Joint webinars of the DECIDE and GBADs consortia, focusing on the use of economics in animal health. Research methods, experience and ideas transmitted to a broad audience, including many early career researchers. “Monitoring animal diseases and public health: the value of visualisation tools and surveillance data on poultry and swine farms” “Advanced Health Management in Salmon Farming: Data, tools and economic impact” “Data for Policy Making: Insights from GBADs and FVE’s Research and Policy Impact”
Training, capacity building (true)	COST Action consortium and proposal	A Europe-wide consortium was initiated to devise and apply for the COST Action on the Animal Health and Welfare Burden in Europe. If successful, this networking grant would be the major method of funding the future training and capacity building activities of this Collaborating Centre.

TOR 3: 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
GBADs Technical Guide v1.0	The GBADs Technical Guide is designed to provide guidance on implementing and interpreting key GBADs methodologies. It is a working document and will be updated as methods evolve, reflecting the ongoing development and refinement of GBADs analytical approaches. The five chapters of the GBADs Technical Guides cover GBADs methodologies across all four focus areas of the programme. There are two chapters for the first area, Livestock Populations, and one each for the other three areas, as follows: 1. Estimating livestock biomass 2. Estimating the economic value of farmed animals 3. Estimating the Animal Health Loss Envelope (AHLE) 4. Attributing the burden of animal disease to specific causes 5. Assessing the wider economic impact of animal disease burdens Each chapter sets out the background to and overview of the approach, a description of the methods and the data required, and guidance on interpreting the results. Links to other resources, including published papers on the methods described and sample R code, are included where appropriate. Target audience This technical guide is intended to be used by individuals or groups who wish to undertake some or all elements of a burden of animal disease assessment, for terrestrial or aquatic farmed species, using GBADs methodologies. Potential users include national or regional government organisations, private companies such as livestock insurers and finance institutions, livestock production system analysts, and academics. The level of prior knowledge required varies for each chapter, but a basic understanding of topic-specific principles (e.g. economics, disease attribution) is recommended. In addition, the guides will provide insights into how to interpret the information generated by the GBADs methodologies for policy-makers and other stakeholders. How to use this guide Each chapter has stand-alone value, as well as forming part of	Training and Education Health Management Animal Production

	the GBADs analytical framework (Figure 1.1). Users may wish to pursue only one methodology (e.g. calculation of biomass), but we encourage users to consider the wider analytical framework, and how methods presented in the other chapters could be useful in helping to achieve the goals of the animal disease burden assessments they are undertaking. We intend for the GBADs Technical Guide to provide instructions on how to conduct the methodologies currently in use across the GBADs programme and anticipate that the information provided will allow users to adapt these methods to their own data and research questions. To this end, the guides are intentionally written in accessible and non-technical language where possible. However, it is important for users of this Guide to note that the methods described continue to be refined by the GBADs programme and are at different stages of development. For readers who want to explore the methods further, links are provided throughout the text to published academic papers and other resources, which provide additional technical details of the methods outlined.	

3. In exercising your activities, have you identified any regulatory research needs* relevant for WOAH?

Yes

Research need 1

Please type the Research need: Standardisation of biomass estimations

Relevance for WOAH Disease Control, Capacity Building, Other, Standard Setting, Animal Welfare, Facilitation of international collaboration, Environment impacts of animal health ,

Relevance for the Code or Manual Code, Manual,

Field Epidemiology and Surveillance, Diagnostics, Vaccines, Therapeutics, Economics, environment,

Animal Category Terrestrial, Aquatic,

Disease:

Kind of disease (Zoonosis, Transboundary diseases) Zoonosis, Transboundary diseases,

If any, please specify relevance for Codes or Manual, chapter and title

(e.g. Terrestrial Manual Chapter 2.3.5 - Minimum requirements for aseptic production in vaccine manufacture)

Answer:

Notes:

Answer:

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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 WOAH CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
CC for Economics of Animal Health (CCEAH) for the Americas	Americas	América	CCEAH Europe, supported the establishment of the new CCEAH Americas. The Director, at KSU, is a theme lead of the GBADs programme, and the workplan is aligned with that of the European centre.
WOAH Collaborating Centre Network for Veterinary Emergencies	USA	América	Professor Rushton, UoL, has collaborated with The Institute for Infectious Animal Diseases (IIAD) at Texas A&M University in the United States, focused on biological threat reduction. - Economic assessment of point of care tests - Economic assessment of potential ASF outbreaks in the US
Nascent CCEAH Asia Pacific	Indonesia, Australia	Asia y el Pacífico	During 2024 CCEAH Europe, supported the continued scoping of a proposal for a new CCEAH Asia Pacific. The consortium will comprise GBADs partners in the region, notably CSIRO, BRIN (Indonesia) and Murdoch University. The application is an agreed output of the GBADs Indonesian case study.
Nascent CCEAH Africa	Ethiopia, Kenya, Senegal	África	During 2024 CCEAH Europe, supported the scoping of a proposal for a new CCEAH Africa. Informal discussions with ILRI have benefited from

			collaborative work to estimate the burden of animal diseases in Ethiopia and Senegal.
ILRI	Ethiopia, Kenya	África	ILRI continue to play a leading role in the delivery of the GBADs case study in Ethiopia. In addition they are including GBADs approaches into new projects, and supporting user needs assessments through the Livestock Master Plan framework.
OECD	Global	África América Asia y el Pacífico Europa Oriente Medio	OECD economist Michele Ceccini was the main reviewer for a special edition of the WOAH Rev Tech Sci dedicated to GBADs outputs.
CABI	Africa	África	UoL collaborated with CABI to align animal and crop health economics methodologies to determine the burden of diseases of food system hazards.
Stavanger University	Norway	Europa	NVI have partnered with Stavanger University by establishing a 20% position at professor level for support scientific work, research applications and in authoring the health economic chapter for the Norwegian Fish Health Report 2023.

TOR 4 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 WOAH CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose

WOAH Collaborating Centre for Emerging Aquatic Animal Diseases, Cefas, UK	UK, South Africa	Africa	Exploring how the GBADs framework can contribute to the economic hub of a One Food project lead by this centre.
Epidemiology and Risk Assessment of Aquatic Animal Diseases Centre for Aquatic Health Science, Atlantic Veterinary College (AVC), University of Prince Edward Island	Global	Africa Americas Asia and Pacific Europe Middle East	Exploring opportunities to collaborate on burden of disease estimation in aquaculture
WOAH collaborating centre for Epidemiology and Risk Assessment for Aquatic Animal Diseases (NVI, Norway)	Norway	Europe	Collaboration on the economic effects of different intervention (disease spreading) models.

TOR 6: EXPERT CONSULTANTS

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

Yes

Name of expert	Kind of consultancy	Subject
Jonathan Rushton	International consultancy and programme leadership	GBADs co-leadership, member of the NAS One Health panel and ICARS Technical Advisory group. Specific projects: Assessment of the zoonotic disease burdens in the Middle East and North Africa Region for World Bank, Support to the economic assessment of growth promotion antimicrobials in Georgia – funded by ICARS. Support to IIAD, Texas A&M's work on the economic impact of a potential ASF outbreak in the USA and the economic assessment of point of care diagnostic tools for emergency disease response.
Arjan Stegeman	Leadership in veterinary epidemiology	Chair of the scientific committee, IABS and WOAH meeting on vaccination for HPAI
Edgar Brun	Leadership in veterinary epidemiology	Head of section responsible, editor of the Norwegian Fish Health Report.

TOR 7: SCIENTIFIC AND TECHNICAL TRAINING

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

Yes

UK, Norwegian and Dutch governments have benefitted from advice provided by members of the consortium, broadly on the use of economics in animal health and more specifically on the GBADs approach as a way to add value to international aid investments and to support domestic response to increasing cases of Highly Pathogenic Avian Influenza. In Norway, the CCEAH members provided rapid advice to the Ministry of Fisheries on the costs of Pancreas Disease in Salmon.
In March 2024, the Collaborating Centre for Economics in Animal Health (CCEAH), hosted an online meeting of Chief Veterinary Officers, titled: "Future contribution of the Centre to CVO needs". There was a general agreement amongst the participants of the need for improved processes in the use of economics in animal health. Consensus was reached on this Centre's point of difference (compared to European research consortia) would be the provision of advice to CVOs, for example for the translation of research into policy advice, and for rapid response to needs during disease incursions or periods of increased incursion risk. This focus would help the Centre's case for funding from Government sources, which was identified as a priority to maintain such a service. The provision of government funds to the Centre may be facilitated in the future by the inclusion of Centre members with pre-established channels for regular public funding. NVI is already in this situation, receiving some regular funds from the competent authority. The engagement of the Roslin Institute (UK) and Wageningen Economic Research (NL) is proposed in 2025.

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 : 0

b) Seminars : 2

c) Hands-on training courses: 0

d) Internships (>1 month) : 1

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
B	Provided training on methods for economics in animal health	Indonesia	10
B	Training on use of an audit tool to assess AMR, biosecurity and animal welfare risk	Europe	20
D	UoL vet student project on the economics of AMU in South African beef feedlots	Uk	1

TOR 8: SCIENTIFIC MEETINGS

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

Yes

National/International	Title of event	Co-organiser	Date	Location	No. Participants
Internationally	ISVEE, International Symposium on Veterinary Epidemiology and Economics including GBADs special session, a debate on ideal animal health	ISVEE	2024-11-18	Sydney Australia	700
Internationally	World One Health Congress	GlobalOHC	2024-09-14	Cape Town South Africa	700
Internationally	Australasian Agricultural & Resource Economics Society	AARES	2024-02-05	Canberra, Australia	550
Internationally	DECIDE general assembly	DECIDE	2024-06-15	Nantes, France	50
Internationally	GBADs annual meeting	GBADs	2024-11-14	Sydney Australia	50
Internationally	AVANT annual meeting	University of Copenhagen	2024-06-18	Crete	30
Nationally	Global Burden of Animal Diseases (GBADs): Ethiopia case study phase II closing stakeholder workshop	ILRI, GBADs	2024-04-21	Addis Ababa, Ethiopia	30
Nationally	Impact of foodborne zoonoses towards a one health economic analysis	World Bank	2024-03-11	Tunis, Tunisia	30
Nationally	Impact of foodborne zoonoses towards a one health economic analysis	World Bank	2024-03-26	Cairo, Egypt	30

TOR 9: 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:

14

Afonso, J. S., Gilbert, W., Oikonomou, G., & Rushton, J. (2024). Setting the boundaries–an approach to estimate the Loss Gap in dairy cattle. PLOS ONE, 19(6), e0306314. https://doi.org/10.1371/journal.pone.0306314

Amenu, K., Daborn, C., Huntington, B., Knight-Jones, T., Rushton, J., & Grace, D. (2024). Prioritization, resource allocation and utilization of decision support tools in animal health: Results of qualitative interviews with experts. Preventive Veterinary Medicine, 233, 106333. https://doi.org/10.1016/j.prevetmed.2024.106333

Asteraye, G. B., Pinchbeck, G., Knight-Jones, T., Saville, K., Temesgen, W., Hailemariam, A., & Rushton, J. (2024). Population, distribution, biomass, and economic value of Equids in Ethiopia. PLOS ONE, 19(3), e0295388. https://doi.org/10.1371/journal.pone.0295388

Babo Martins, S., Sucena Afonso, J., Fastl, C., Huntington, B., & Rushton, J. (2024a). The burden of antimicrobial resistance in livestock: A framework to estimate its impact within the Global Burden of Animal Diseases programme. One Health, 19, 100917. https://doi.org/10.1016/j.onehlt.2024.100917

Gilbert, W., Marsh, T. L., Chaters, G., Jemberu, W. T., Bruce, M., Steeneveld, W., Afonso, J. S., Huntington, B., & Rushton, J. (2024d). Quantifying cost of disease in livestock: A new metric for the Global Burden of Animal Diseases. The Lancet Planetary Health, 8(5), e309–e317. https://doi.org/10.1016/S2542-5196(24)00047-0

Grace, D., Amenu, K., Daborn, C. J., Knight-Jones, T., Huntington, B., Young, S., Poole, J., & Rushton, J. (2024). Current and potential use of animal disease data by stakeholders in the global south and north. Preventive Veterinary Medicine, 226, 106189. https://doi.org/10.1016/j.prevetmed.2024.106189

Grace, D., Knight-Jones, T. J. D., Melaku, A., Alders, R., & Jemberu, W. T. (2024). The Public Health Importance and Management of Infectious Poultry Diseases in Smallholder Systems in Africa. Foods, 13(3), 411. https://doi.org/10.3390/foods13030411

Li, Y., McIntyre, K. M., Rasmussen, P., Gilbert, W., Chaters, G., Raymond, K., Jemberu, W. T., Larkins, A., Patterson, G. T., Kwok, S., Kappes, A. J., Mayberry, D., Schrobback, P., Acosta, M. H., Stacey, D. A., Huntington, B., Bruce, M., Knight-Jones, T., & Rushton, J. (2024). Rationalising development of classification systems describing livestock production systems for disease burden analysis within the Global Burden of Animal Diseases programme. Research in Veterinary Science, 168, 105102. https://doi.org/10.1016/j.rvsc.2023.105102

Muñoz-Gómez, V. (2024). Global and regional prediction of heterakidosis population prevalence in extensive backyard chickens in low-income and middle-income countries. Veterinary Parasitology, 332, 110329. https://doi.org/10.1016/j.vetpar.2024.110329

Muñoz-Gómez, V., Furrer, R., Yin, J., Shaw, A. P., Rasmussen, P., & Torgerson, P. R. (2024). Prediction of coccidiosis prevalence in extensive backyard chickens in countries and regions of the Horn of Africa. Veterinary Parasitology, 327, 110143. https://doi.org/10.1016/j.vetpar.2024.110143

Peeler E.J., E., Brun, B., Misund, W., Gilbert, B., Huntington, M., Reantaso, C., Walde, A. (2024). The application of Global Burden of Animal Diseases methodology to aquatic animal production. Scientific and Technical Review, 43. https://doi.org/10.20506/rst.43.3528

Railey, A. F., Adamson, D., Simmons, H. L., & Rushton, J. (2024). Economics of reducing response time to foreign-animal disease in the United States with point-of-care diagnostic tests. Preventive Veterinary Medicine, 106284. https://doi.org/10.1016/j.prevetmed.2024.106284

Rasmussen, P., Barkema, H. W., Osei, P. P., Taylor, J., Shaw, A. P., Conrady, B., Chaters, G., Muñoz, V., Hall, D. C., Apenteng, O. O., Rushton, J., & Torgerson, P. R. (2024). Global losses due to dairy cattle diseases: A comorbidity-adjusted economic analysis. Journal of Dairy Science. https://doi.org/10.3168/jds.2023-24626

Smith, D., Ilham, N., Putri, R., Widjaja, E., Nugroho, W. S., Cooper, T. L., Nuradji, H., Dharmayanti, N. L. P. I., & Mayberry, D. (2024b). Calculation of livestock biomass and value by province in Indonesia: Key information to support policymaking. Preventive Veterinary Medicine, 226, 106164. https://doi.org/10.1016/j.prevetmed.2024.106164

Venkateswaran, N., Swetschinski, L. R., Fastl, C., Bari, C. D., Criscuolo, N. G., Mulchandani, R., Zhao, C., Meštrović, T., Ikuta, K. S., Martins, S. B., Coyne, L. A., Afonso, J. S., Huntington, B., Rushton, J., Devleesschauwer, B., Sartorius, B., Van Boeckel, T. P., & Pigott, D. M. (2024). Using priorities between human and livestock bacterial antimicrobial resistance (AMR) to identify data gaps in livestock AMR surveillance. BMC Infectious Diseases, 24(1), 1027. https://doi.org/10.1186/s12879-024-09847-3

b) International conferences:
17
Dustin Pendell Evaluating The Economic Impacts Of African Swine Fever On The U.s. Pork Supply Chain
Anne Meyer Estimating The Disease Burden On Small Ruminant Production In The Mixed Crop-livestock System Of Senegal
Emma-Jane Murray Estimating the Irish cattle herd biomass and associated herd stock value temporal trends
Wudu Temesgen Farm level disease burden in ruminant production systems in Ethiopia
Tom Marsh Are animal health investments optimal? An analysis of the determinants of public investment in agriculture and animal health
Giulia Savioli The burden of disease in Swiss pork production
Emma-Jane Murray Estimating the Irish cattle herd biomass and associated herd stock value temportal trends
Gemma Chaters Use of Cooke's Classical Expert Elicitation to parameterize livestock population models with 'ideal' performance
Nyak Ilham Estimating Livestock Biomass And Economic Value By Province In Indonesia: A Resource To Support Policymaking
Kurtis Sobkowich Antimicrobial Resistance Surveillance And Dashboards/visualizations
Jonathan Rushton Ideal Health State Why Is It Important?
Yin Li Farm-level mortality and risk factors in Ethiopian livestock production systems
Emma-Jane Murray Estimating The Animal Health Losses Of The Irish Cattle Sector Using Routinely Collected Data
Wudu Jemberu Temesgen Mixed Methods For Evaluating Livestock Vaccination Undertaken During Humanitarian Crises In Africa
Ellen Hughes Developing a data dictionary per animal disease burden estimation
Kassy Raymond Streamlining The Discovery And Interoperability Of Livestock Data And Classifications Using Metadata-driven Graph Databases
Ellen Hughes Data Requirements For Estimating The Burden Of Animal Diseases

c) National conferences:
0

d) Other (Provide website address or link to appropriate information):
0

11. What have you done in the past year to advance your area of focus, e.g. updated technology?
The CCEAH has continued to build a trusting and vibrant community of practice leading to multiple awards of research grants and PhD studentships to continue the work to standardise the approach to economics of animal health, and improve its implementation through capacity building.

12. Additional comments regarding your report: