

Abstract book



JOINT COMBAR WG MEETING
ANTHELMINTIC RESISTANCE IN RUMINANTS: FROM RESEARCH TO RECOMMENDATIONS

9-10 DECEMBER 2020 · ONLINE

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EUROPEAN COOPERATION
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4th Joint COMBAR WG meetings: “Anthelmintic Resistance in Ruminants: from Research to Recommendations”

Local organiser:

Dr. Smaro Sotiraki, HAO Demeter, Greece

With support from:

Dr. Johannes Charlier, Kreavet, Belgium

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4th Joint COMBAR WG meetings: “Anthelmintic Resistance in Ruminants: from Research to Recommendations”

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Initial assessment of the economic burden of major parasitic helminth infections to the ruminant livestock industry in Europe

J. Charlier¹, L. Rinaldi², V. Musella³, H.W. Ploeger⁴, C. Chartier⁵, H. Rose Vineer⁶, B. Hinney⁷, G. von Samson-Himmelstjerna⁸, B. Băcescu⁹, M. Mickiewicz¹⁰, T.L. Mateus^{11,12}, M. Martinez-Valladares¹³, S. Quealy¹⁴, H. Azaizeh¹⁵, B. Sekovska¹⁶, H. Akkari¹⁷, S. Petkevicius¹⁸, L. Hektoen¹⁹, J. Höglund²⁰, E.R. Morgan²¹, D. J. Bartley²², E. Claerebout²³

Corresponding author: icharlier@kreavet.com

We report a European wide assessment of the economic burden of gastrointestinal nematodes, *Fasciola hepatica* (common liver fluke) and *Dictyocaulus viviparus* (bovine lungworm) infections to the ruminant livestock industry. The economic impact of these parasitic helminth infections was estimated by a deterministic spreadsheet model as a function of the proportion of the ruminant population exposed to grazing, the infection frequency and intensity, the effect of the infection on animal productivity and mortality and anthelmintic treatment costs. In addition, we estimated the costs of anthelmintic resistant nematode infections and collected information on public research budgets addressing helminth infections in ruminant livestock. The epidemiologic and economic input data were collected from international databases and via expert opinion of the Working Group members of the European Cooperation in Science and Technology (COST) action COMbatting Anthelmintic Resistance in ruminants (COMBAR). In order to reflect the effects of uncertainty in the input data, low and high cost estimates were obtained by varying uncertain input data arbitrarily in both directions by 20%. The combined annual cost [low estimate-high estimate] of

¹ Kreavet, Belgium

² Department of Veterinary Medicine and Animal Production, CREMOPAR, University of Naples Federico II, Italy

³ Department of Health Sciences, University of Catanzaro "Magna Græcia", Italy

⁴ Department of Infectious Diseases and Immunology, Clinical Infectiology Division, Faculty of Veterinary Medicine, Utrecht University, the Netherlands

⁵ INRAE, Oniris, BIOEPAR, France

⁶ Department of Infection Biology and Microbiomes, Institute of Infection, Veterinary and Ecological Sciences, University of Liverpool, UK

⁷ Institute of Parasitology, Department of Pathobiology, University of Veterinary Medicine Vienna, Austria

⁸ Freie Universität Berlin, Institute for Parasitology and Tropical Veterinary Medicine, Germany;

⁹ Faculty of Veterinary Medicine, Spiru Haret University, Romania;

¹⁰ Division of Veterinary Epidemiology and Economics, Institute of Veterinary Medicine, Warsaw University of Life Sciences, Poland

¹¹ CISAS, Escola Superior Agrária, Instituto Politécnico de Viana do Castelo, Portugal

¹² EpiUnit – Instituto de Saúde Pública da Universidade do Porto, Portugal

¹³ Instituto de Ganadería de Montaña (CSIC-Universidad de León), Spain

¹⁴ VirtualVet, Ireland;

¹⁵ Institute of Applied Research, University of Haifa & Tel Hai College, Department of Environmental Sciences, Israel

¹⁶ Faculty of Veterinary Medicine, University St. Cyril and Methodius, Republic of North Macedonia;

¹⁷ Laboratory of Parasitology, University of Manouba, National School of Veterinary Medicine of Sidi Thabet, Tunisia

¹⁸ Department of Veterinary Pathobiology, Faculty of Veterinary Medicine, Veterinary Academy, Lithuanian University of Health Sciences, Lithuania

¹⁹ Department of Production Animal Clinical Sciences, Faculty of Veterinary Medicine, Norwegian University of Life Sciences, Norway

²⁰ Swedish University of Agricultural Sciences, Department of Biomedical Sciences and Veterinary Public Health, Section for Parasitology, Sweden

²¹ Institute for Global Food Security, Queen's University Belfast, UK

²² Moredun Research Institute, UK;

²³ Ghent University, Faculty of Veterinary Medicine, Laboratory of Parasitology, Belgium

the three helminth infections in 18 participating countries was estimated at € 1.8 billion [€ 1.0 - 2.7 billion]. Eighty-one percent of this cost was due to lost production and 19% was attributed to treatment costs.

The cost of gastrointestinal nematode infections with resistance against macrocyclic lactones was estimated to be € 38 million [€ 11 – 87 million] annually. The annual estimated costs of helminth infections per sector were € 941 million [€ 488 – 1,442 million] in dairy cattle, € 423 million [€ 205 - 663 million] in beef cattle, € 151million [€ 90 - 213 million] in dairy sheep, € 206 million [€ 132 - 248 million] in meat sheep and € 86 million [€ 67 - 107 million] in dairy goats.

Important data gaps were present in all phases of the calculations which lead to large uncertainties around the estimates. Accessibility of more granular animal population datasets at EU level, deeper knowledge of the effects of infection on production, levels of infection and livestock grazing exposure across Europe would make the largest contribution to improved burden assessments. The known current public investment in research on helminth control was 0.15 % of the estimated annual costs for the considered parasitic diseases. Our data suggest that the costs of enzootic helminth infections which usually occur at high prevalence annually in ruminants, are similar or higher than reported costs of epizootic diseases. Our data can support decision making in research and policy to mitigate the negative impacts of helminth infections and anthelmintic resistance in Europe, and provide a baseline against which to measure future changes.

Barriers and incentives for uptake of diagnostics for sustainable worm control by European dairy cattle farmers

Vande Velde F.^{1,2}, Hektoen L.³, Phythian C.J.³, Rinaldi L.⁴, Bosco A.⁴, Hinney B.⁵, Strube C.⁶, May, K.⁷, Knubben-Schweizer, G.⁸, Dourado Martins O.⁹, Mateus T.^{10,11}, Simion V-E.¹¹, Charlier J.¹², Bartley D.¹³, Claerebout E.¹

Corresponding author: fiona.vande.velde@nmbu.no

To mitigate emerging anthelmintic resistance in cattle, sustainable worm control strategies should be adopted, such as the use of diagnostic methods to take informed treatment decisions. To understand the factors affecting European farmers' intention to adopt diagnostic methods and to gauge for differences between European regions, a theoretical framework, based on theories in the field of behavioural psychology and health psychology, was validated through a questionnaire survey, carried out in dairy farms in 6 European countries. Despite insufficient data from 2 countries and several confounders prohibiting statistical comparisons between countries, three models were developed, which allowed to describe general trends and differences between regions. Data from Northern- (Norway) and Central-Europe (Austria and Germany) resulted in two similar models, which differed in 3 questions. Southern Europe's (Italy) data were more difficult to align with the conceptual model and several factors were deleted to fit the model. In all models, subjective norms, affected by a bandwagon bias, had the largest influence on farmers' adoption intention. Perception of anthelmintic resistance had no effect on adoption intention for Northern and Central, but to some extent for Southern Europe. In Northern and Central Europe, attitude towards anthelmintics had a negative effect on adoption intention, while attitude towards diagnostics had a positive effect. Both types of attitudes were affected by the default bias. Finally, by combining self-reported practices for Northern and Central Europe, a larger effect of descriptive norms on farmers' actual adoption of diagnostics was observed, compared to adoption intention and the default bias.

¹ Laboratory for Parasitology, Faculty of Veterinary Medicine, Ghent University, Belgium

² Department of Public Health Science, Faculty of Landscape and Society, Norwegian University of Life Sciences, Norway

³ Institute for Production Animal Clinical Sciences, Faculty of Veterinary Medicine, Norwegian University of Life Sciences, Norway

⁴ Department of Veterinary Medicine and Animal Production, University of Naples Federico II, Crempar, Italy

⁵ Institute of Parasitology, Department of Pathobiology, Vetmeduni Vienna, Austria

⁶ Institute for Parasitology, Centre for Infection Medicine, University of Veterinary Medicine Hannover, Germany

⁷ Institute of Animal Breeding and Genetics, Justus-Liebig-University of Gießen, Germany

⁸ Clinic for Ruminants with Ambulatory and Herd Health Services, Ludwig-Maximilians Universität Munich, Germany

⁹ Instituto Politécnico de Bragança, Portugal

¹⁰ Center for Research and Development in Agrifood Systems and Sustainability, Instituto Politécnico de Viana do Castelo, Portugal

¹¹ EpiUnit – Instituto de Saúde Pública da Universidade do Porto, Portugal

¹² Kreavet, Belgium

¹³ The Moredun Research Institute, United Kingdom