University of Cambridge investigates pain in sheep

Disease can be a major source of pain in animals. Investigating the impacts that diseases such as footrot, mastitis and pregnancy toxaemia may have on the welfare of sheep is the focus for the University of Cambridge AWIN team. They are particularly interested in the relationship that these diseases have with pain.

Pain’s negative consequence on the behaviour and physiology of sheep is being used to identify and assess appropriate indicators of pain in both acute and chronic disease conditions, alongside their clinical assessment. Video footage of both affected and non-affected sheep is being studied for behaviours such as lip licking or lip-curling, ear-movements and abnormal postures. Photographs of affected and non-affected sheep faces are also being used to develop and validate a grimace score for sheep.

Physiologically, cortisol levels in both the wool and faeces are being investigated alongside interleukins and acute-phase proteins. The biomarkers lab at SRUC is helping to develop the analysis of these parameters and so the teams are collaborating on a regular basis. Together this will provide a comprehensive overview of the pain experienced by sheep with these diseases.

The team have recently started to use thermography for their assessment of pain, looking at the limbs of those with footrot and the udders of animals with mastitis. The comparison of thermography with the behavioural responses, including facial expressions, of sheep when diseased is also being investigated. A composite pain score that integrates all of these measures and can be used in practice, will be developed at the end of the project. Through the use of these indicators, better management of pain will be achieved and thus animal welfare will be improved.

UK Sheep Farm survey reveals pregnancy toxaemia incidence by Kenny Rutherford

Surprisingly little is known about the prevalence of various health conditions nationally, but survey data can be important to estimate the true extent of issues such as pregnancy toxaemia on a national scale.

A recent survey of 343 breeding ewe farms has revealed the average ewe incidence of pregnancy toxaemia was 0.38%. At least one case of pregnancy toxaemia was reported on 44.6% of farms, 17.3% of farms reported an incidence of greater than 1%, and the maximum incidence on any individual farm was 5.4%.

Whilst the overall percentage of affected animals is low, given that there were 1.5 million ewes in the UK in 2012, the estimated total number affected by pregnancy toxaemia is around 57,000 ewes.
University of Cambridge and the AWIN team

The Department of Veterinary Medicine at the University of Cambridge houses the Cambridge AWIN team. The department is a centre of excellence for teaching and research offering veterinary science and education at the forefront of its discipline. Its mission is to improve the prevention and treatment of diseases of animals through development and application of best clinical practice.

The research being carried out by the AWIN team does just that; providing up-to-date science on what is the best way to help treat disease and to prevent or limit the associated pain. Advancing the knowledge of the relationship between disease and pain through research will enable the team to improve the welfare of those animals suffering from the disease.

The Cambridge team works within the Centre for Animal Welfare and Anthrozoology. The group consists of veterinarians and welfare and behaviour specialists. Strengths of the team include epidemiology, behaviour, and clinical assessment.

Dr. Fernando Constantino-Casas

Dr. Fernando Constantino-Casas graduated with a Bachelor degree in Veterinary Medicine from the National Autonomous University of Mexico. He was awarded a PhD degree from the University of Cambridge in 1991. Fernando has been a senior lecturer in veterinary pathology, University of Cambridge since 2007 and has published 52 papers. He is involved in a number of different research groups: Veterinary Oncology, Infectious Diseases (Salmonellosis, Toxoplasmosis), Dermatopathology in Domestic Animals, Wild Animal Pathology. He currently supervises 14 undergraduate thesis, 8 Master thesis and 5 PhD thesis. Within the AWIN project, Fernando supervises Dr Krista McLennan, a post-doctoral fellow, and Carlos Rebelo, a research assistant in Cambridge jointly with Dr Murray Corke and Dr Mark Holmes.

Dr. Murray Corke

Dr Murray Corke is a Clinical Teaching Fellow at the University of Cambridge Veterinary School with responsibility for teaching farm animal medicine and communication skills. He has a PhD in sheep welfare and disease. His experience of sheep medicine has been useful in developing and refining the Cambridge AWIN project investigating the behavioural and physiological responses to pain in sheep with footrot, acute mastitis and pregnancy toxaemia. His research interests include fluid therapy in farm animals, colostral transfer of immunity to neonatal calves and lambs, and the impact of disease on the welfare of farm animals. Outside work, his interests include walking, sailing, wildlife and photography.
Dr. Mark Holmes

Dr. Mark Holmes is a senior lecturer in preventive veterinary medicine at the University of Cambridge. His background is in veterinary immunology, microbiology and epidemiology. His research apart from the AWIN project is currently focussed on his group’s recent discovery of a novel form of MRSA in dairy cows and people using next-generation sequencing which is funded by the MRC, the BBSRC and the Wellcome Trust. He has a long standing interest in disease in farm animals and bovine mastitis in particular. He is a co-author of textbooks on veterinary clinical research and evidence-based veterinary medicine.

Prof. Donald Broom

Donald M. Broom has been Professor of Animal Welfare, Cambridge University, Department of Veterinary Medicine 1986-2009, Emeritus 2009. His research has included the development of concepts and methods of scientific assessment of animal welfare and studies of housing, management and transport of cattle, pigs, poultry, fish, companion and zoo animals. In addition, he has worked on cognition in domestic animals, ethics, attitudes to animals and sustainable agriculture systems. He has published over 300 refereed papers and 8 books, and has lectured on animal welfare in 39 countries. In AWIN, Don helps with WP4 and gives advice to those who want it, including regular evaluation of the sheep.

Dr. Krista McLennan

Dr. Krista McLennan is a postdoctoral researcher at the University of Cambridge Veterinary School and she joined the AWIN project in January 2013 bringing her knowledge in behaviour and welfare assessment of farm animals to the group. Krista is primarily responsible for the identification of behavioural and facial expression indicators of pain and the day to day running and coordination of the project.

Carlos Rebelo

Carlos Rebelo is a research assistant at the University of Cambridge and is responsible for the clinical and biological assessment of the animals on the project. Carlos graduated in Veterinary Medicine at the Faculdade de Medicina Veterinária in the Universidade Técnica of Lisboa and then continued his studies focusing on the connection between public/animal health legislation and its implementation in the veterinary field. Carlos gained an MSc in Public and Animal Health.

After working in a feed company (a fully integrated beef operator), Carlos worked for two years in a Small Ruminants Farmers’ Association as a practitioner, where he was also in charge of seven veterinary teams.
Footrot in Sheep

Ovine footrot is often a chronic and infectious disease caused by the bacterium *Dichelobacter nodosus*. It is one of the main causes of lameness and foot lesions in sheep within the UK (Kaler and Green 2009). The disease causes severe lesions and rotting of the flesh within the foot and as a consequence severe lameness, suggesting that it is a very painful condition. This clearly has significant adverse consequences on the welfare of sheep and can bring about a negative public perception of the sheep industry. With a £24 million loss a year due to footrot alone (Nieuwhof & Bishop, 2005), the UK sheep industry is keen to get control and manage this disease effectively to improve the welfare of their animals. Thus, it is imperative that the research being carried out by Cambridge University continues, and links between research and industry stakeholders is maintained.

AWIN represented at the International Conference on Lameness in Ruminants

Four members of the AWIN small ruminants team (Dr. Krista McLennan, Carlos Rebelo, Inês Grenho Gonçalves Ajuda and Carol Thompson) attended the International Conference on Lameness in Ruminants held in Bristol from 12th to 14th August.

The conference was run over 3 days focusing on the best methods in which lameness can be tackled. Lameness is a major health and welfare issue for cattle, sheep and goats alike, and such a conference enables experts from around the world to come together and discuss the importance in tackling this problem head on. Despite significant focus being on cattle, both sheep and goats were well represented and the AWIN team were able to contribute to this area through the presentation of two posters (Lameness on dairy goats: What is the level of pain experienced and how can we evaluate it? Preliminary results by Inês; Clinical efficacy of tulathromycin administration in sheep with footrot - preliminary results by Carlos), and a stand was provided by the organisers for Carol so that she was able to recruit willing volunteers for her survey on sheep lameness.
For more information about the AWIN project, please visit:
www.animal-welfare-indicators.net

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The next edition of the AWIN newsletter will focus on the team at the Institute of Animal Science, Prague. To join the mailing list please email Sarah.Hall@sruc.ac.uk

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