

**Press release**

November 2012

**Scientists use trackers on cows to develop early warning system for illness**

A landmark research project using wireless tracking sensors on a herd of dairy cows to monitor their welfare is about to start in Essex.

The idea, which originates from Dr Jonathan Amory, Principal Lecturer in Animal Behaviour and Welfare at Writtle College, will see small sensors attached to cow collars to record the behaviour of the livestock. Experts from the University of Essex will then use cutting-edge mathematical techniques to analyse the information in order to develop an early warning system for mastitis and lameness, which have been identified by leading scientists as the major factors affecting cow welfare.

The 39-month joint project – which will see Writtle College and the University of Essex also working with experts from University of Exeter and Royal Veterinary College - could have a huge impact on the welfare of the UK's 1.8million dairy cows as well as increasing productivity, with mastitis and lameness costing the industry in this country around £100m-plus. But it could also have a global implication, helping the huge commercial dairy farms in New Zealand, the US and Canada to monitor their stock.

Awarded an £820,000 government grant from the Biotechnology and Biological Sciences Research Council (BBSRC) – which will be used on two post-doctoral students - the project will initially monitor the differences in behaviour of healthy and unhealthy cows before being expanded to whole herds.

Dr Amory said: "A sick cow and a well cow behave differently. A sick cow might lie down in different areas of the house or split itself away from the herd, or use the same areas at different times, or go to eat a bit later. The idea of that is we can quickly identify those cows that are just becoming ill and develop an early warning system.

“Animal scientists working here at Writtle will put the sensors on the cows, collect the data and monitor the health of the cows, as they cannot fill in a questionnaire about how they feel. Dr Edward Codling, a bio-mathematician at University of Essex, will then take all the information, analyse it and create a predictive model for disease detection.

“The system could be applied to all farms, being relatively cheap, particularly the more intensive larger farms where it is harder for farmers to monitor the welfare of the cows themselves.”

The battery-powered sensors, produced by Omnisense in Cambridge-will ‘talk’ to each other every eight seconds over a three-month period using novel network technology that can cope with over 1,000 individuals.

Dr Codling said: “Ideally, we hope the system will highlight any out-of-character behaviour before the symptoms of these diseases start.

“This early warning will be crucial in identifying which cows are unhealthy so they can be treated earlier and suffer less.”

The research is expected to start on 19 November and will initially monitor an Essex dairy herd of 120 cows before moving onto Devon herds. Results are expected next year.

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### ***The research team***

**Dr Jonathan Amory, Writtle College** (main supervisor for proposed PhD study) - Principal Lecturer in Animal Behaviour and Welfare at Writtle College. Dr Amory has led research into animal welfare for the Centre for Equine and Animal Science since 2006. He was the lead applicant this year in a successful bid for £820,000 to BBSRC to fund research in cow welfare based on local positioning sensor technology. He is working with two technology companies in Cambridge - Temperature Concepts and Omnisense - to develop new methods for animal welfare detection and disease monitoring. Previously, Dr Amory was an advisor to DairyCo in the development of their industry standard mobility score for monitoring lameness incidence in dairy herds.

**Dr Edward Codling, University of Essex** - Senior Lecturer in Mathematical Biology in the Department of Mathematical Sciences, linked to the Department of Biological Sciences, at the University of Essex. Dr Codling is an expert in modelling the movement behaviour of animals at both the individual and group level and is a member of the National Centre for Statistical Ecology.

**Dr Zoe Barker, Writtle College** (from Nov 2012) – Postdoctoral Researcher. Following her PhD in the epidemiological study of lameness in UK dairy cattle at the University of Warwick as part of the

£2million EU LAMECOW project, Dr Barker worked on the Healthy Feet programme at University of Bristol and is currently working with BPEX.

**Dr Darren Croft, University of Exeter** - Senior Lecturer in Animal Behaviour in the School of Psychology, where he is the research group leader for the Centre for Research in Animal Behaviour. Dr Croft has played a leading role in developing social network theory to quantify population social structure in animal societies.

**Dr Nick Bell, Royal Veterinary College** - Lecturer in Livestock Extension Services and one of the UK's leading authorities on dairy cattle health and welfare. Dr Bell was the principal investigator on the Marks and Spencer Dairy Herd Health and Welfare Programme and the DairyCo Healthy Feet Programme. Dr Bell sits on the council for the British Cattle Veterinary Association, is an advisor to the RSPCA and DairyCo, and is founder and chair of the UK Cattle Lameness Conference.

### ***Information on Writtle College***

A partner of the University of Essex, Writtle College is a specialist provider of Higher Education and Further Education courses covering Horticulture, Design, Equine & Animal Management, Sport, Agriculture and Conservation. Founded in 1893 the College has trained generations of graduates who have made significant contributions to enhancing the environment and landscape. Today, the College combines its heritage with a cutting edge training approach to prepare its students for the future challenges in the specialist areas in which it operates.

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