



# From mice to livestock: Exploring the potential of the gut-microbiome-brain axis regulation in animal production

Aberystwyth, Wales  
April 24-25



## Background

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Over the past decade, a growing body of literature has demonstrated that the gut-microbiome-brain axis plays a key role in the normal neurodevelopment and behaviour of rodent models and in human subjects. Changes in the microbiota community structure have been associated with negative health outcomes, such as nutrition/metabolic related disorders and immune-mediated diseases. Additionally, the microbiota and its metabolites are likely to be involved in modulating behaviours and brain processes, including stress responsiveness, pain modulation and intake behaviour. This raises the potential of targeting this system in other species, such as in livestock animals, in order to develop novel ways to modulate animal stress-susceptibility and feeding behaviour, and hence improving animal health, welfare and productivity.

## Objectives

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The aim of this two-day symposium is to bring together experts on the fields of human and animal nutrition, microbiology, behaviour and neurobiology to:

- Share state-of-the art research on the gut-microbiome-brain axis.
- Generate dialogue and facilitate greater research collaboration across disciplines, sectors, research institutes and countries.
- Strengthen the scientific rigor of the field of neurocognition of livestock animals, including concepts, frameworks, measures and methods.

## Additional information

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Hosted in Aberystwyth (Main Medrus room, Penglais Campus, this event will have a noon-to-noon format over 2 days in Aberystwyth University, and will include national and international speakers covering state-of-the-art research from different disciplines related to the gut-microbiome-brain axis (see programme below).

A round-table discussion will also be organized the last day with the ultimate goal of developing a common agenda of research priorities and funding bids to understand the opportunities and challenges of manipulating the gut-microbiome-brain axis in livestock animals.

Meals, refreshments and accommodation are included with the [free registration](#), along with a complimentary social dinner on Monday night. Free parking is available at the venue in the University car park. Please visit the website of [Aberystwyth University](#) for more information about your transport options.

## Acknowledgements

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# PROGRAMME

April 24: Neuroscience of behaviour, cognition and mood, chaired by Dr Sebastian McBride

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**12:30 pm – 1:45 pm** Lunch and Registration.

**1:45 pm – 2:00 pm** Welcome message from [Professor Jamie Newbold](#).

**2:00 pm – 2:30 pm** The mechanisms associated to preference and aversion learning, and the effects of stress on food preference. [Professor Dominic Dwyer](#) (Cardiff University).

**2:30 pm – 3:00 pm** Affect and decision-making: a conceptual overview of affect-decision-making links and how they provide a grounding for the development of new measures of animal affect and welfare.

[Professor Michael Mendl](#) (University of Bristol)

**3:00 pm – 3:30 pm** The role of the autonomic nervous system on personality and cognition of free-ranging mammal, and mapping psychological, physiological, and behavioural profiles in goats. [Dr Alan McElligott](#) (Queen Mary University of London).

**3:30 pm – 4:00 pm** Coffee break.

**4:00 pm – 4:30 pm** The neurobiological factors mediating differences in behaviour: the impact of early life events on stress responsiveness in animals. [Professor Cathy Dwyer](#) (Scotland's Rural College).

**4:30 pm – 5:00 pm** Precision farming: measuring and managing the variability in biological resources at the individual animal level, and how natural behaviours of domestic cattle can help. [Professor Mark Rutter](#) (The National Centre for Precision/Harper Adams University).

**7:00 pm** Dinner in Aberystwyth (Belle Vue Royal Hotel).

April 25: Effects of diet and gut microbiome on brain function, chaired by Prof Andy Smith (Bangor University)

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**9:00 am – 9:30 am** The potential role of pro- and prebiotics in future clinical and metaphylactic treatments. [Professor Jamie Newbold](#) (Aberystwyth University).

**9:30 am – 10:00 am** Neurophysiological consequences of highly palatable feeds and how it affects neural mechanism of motivation in domesticated ungulates. [Dr Sebastian McBride](#) (Aberystwyth University).

**10:00 am – 10:30 am** "Gut bacteria and mind control", and the role of the mucosal immune system on lipid metabolism and the maintenance of a healthy gut microbiome. [Professor Simon Carding](#) (Institute of Food Research/University of East Anglia).

**10:30 am – 11:00 am** Coffee break.

**11:00 am – 11:30 am** Gut microbiota regulates stress, anxiety, and cognition: mechanisms and therapeutic potential. [Professor John Cryan](#) (University College Cork).

**11:30 am – 12:00 pm** Microbial Endocrinology, and the relationship between stress and the progress human and animal infectious diseases. [Dr Primrose Freestone](#) (University of Leicester).

**12:00 pm – 1:00 pm** Round table.

**1:00 pm** Lunch.