*Advanced Course*

# Reducing methane emissions in ruminants through nutrition: measuring, management and accounting options

**Granada (Spain) • 27-29 October 2026**

CIHEAM ZARAGOZA · Re-Livestock · Funded by the European Union · CSIC · Global Research Alliance · Global Methane Hub

## Objectives

As the livestock sector faces intensifying global pressure to decarbonise, enteric methane reduction has transitioned from a research challenge to a regulatory and corporate necessity. The EU-funded Re-Livestock project invites senior policy advisors, public decision-makers, private sector executives, academics and extensionists to Granada, Spain, for the intensive course: "Reducing methane emissions in ruminants through nutrition: measuring, management and accounting options". Taking place from 27–29 October 2026 at the Estación Experimental del Zaidín (CSIC), this programme moves beyond academic theory to provide industry and policy leaders with the technical literacy required for high-stakes environmental governance and corporate strategy.

From science to strategic decision-making, participants will evaluate the scalability of nutritional interventions, from advanced feed additives to grazing management, while exploring the regulatory frameworks and adoption barriers that define the current landscape. Critically, the course provides hands-on exposure to measurement technologies and modelling tools for accounting at the farm, regional, and national levels, illustrated by real cases from different livestock production systems. By bridging the gap between biological pathways and value-chain accounting, this course empowers executives and decision-makers to make informed investment and policy decisions that align livestock productivity with international climate commitments.

At the end of this course, participants will:

- Have a more precise overview of global methane emissions from ruminants and developments for their mitigation.
- Have a clear understanding on the relevance of animal nutrition to reduce enteric emissions, the biological basis of these reductions and the techniques and devices to effectively measure ruminant methane emissions.
- Be able to develop and promote nutritional strategies to reduce methane emissions, focused on specific feedstuffs.
- Understand the importance and functioning of feed additives for abating methane emissions and have a view on the pathways for innovating on these types of feed ingredients.
- Have developed skills for accounting and modelling methane emissions reductions and understanding the trade-offs with other carbon emission sources linked to livestock farming.

## Organisation

The course is jointly organised by the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), through the Mediterranean Agronomic Institute of Zaragoza (CIHEAM Zaragoza), the Horizon Europe Re-Livestock project "Facilitating Innovations for Resilient Livestock Farming Systems" (GA No. 101059609), the Spanish National Research Council (CSIC), the Global Research Alliance (GRA), and the Global Methane Hub (GMH).

The course will be held at the Experimental Station of Zaidín-CSIC (Granada, Spain) over a period of 3 days, from 27 to 29 October 2026, in morning and afternoon sessions, face-to-face and online.

The programme has an applied approach. Lectures are complemented by applied examples, case studies and practical sessions in which participants will be invited to use software to model emissions at farm-national levels.

## Programme

**0. Welcome to participants, message from organisers. Programme explanation (1 h)**

**1. Overview of global methane emissions and developments for mitigation in ruminants. Emission metrics and global warming metrics (1 h)**

**2. Methane production in the rumen – biology and pathways (1.5 h)**
- 2.1. Rumen anatomy and microbial ecology
- 2.2. Rumen fermentation
- 2.3. Methane biochemical pathway

**3. Methane measurement techniques (1.5 h)**
- 3.1. In vitro and in vivo tools
- 3.2. Discussion on different methane measurement techniques
- 3.3. Technical visit: in situ demonstration of methane measurement techniques

**4. Nutritional strategies to reduce enteric methane: Feeds, nutrient composition and feeding strategies (1.5 h)**
- 4.1. General principles on nutritional strategies to reduce methane
- 4.2. Examples in grazing systems
- 4.3. Examples in semiarid systems
- 4.4. Examples in temperate systems

**5. Nutritional strategies to reduce methane: Feed additives (2.5 h)**
- 5.1. Technical development of feed additives
- 5.2. Regulatory frameworks for the authorisation of feed additives
- 5.3. Discussion session: Acceptance and adoption of additives in practice, from farmers to consumers

**6. Modelling and accounting for methane emissions reductions (3.5 h)**
- 6.1. Animal
- 6.2. Farm/Value chain
- 6.3. Regional/National
- 6.4. Practical work: Tools to model emissions reductions at farm-national levels

**7. Trade-off with other emission sources (1 h)**

**8. Summary and final discussion (1 h)**

## Guest lecturers

**Bannink, André** - WUR, Wageningen, the Netherlands
**Ettema, Peter** – GRA, New Zealand
**Newbold, Jamie** - SRUC, Edinburgh, United Kingdom
**Newbold, John** - SRUC, Edinburgh, United Kingdom
**Ramos-Morales, Eva** - CSIC, Granada, Spain
**Rivelli, Ines** - CSIC, Granada, Spain
**Romero-Huelva, Manuel** - CSIC, Granada, Spain
**Yáñez-Ruiz, David** - CSIC, Granada, Spain

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## Admission

The course is designed for senior public decision-makers and policy advisors, private companies, executives, academics and extensionists. Postdocs and PhD students from Mediterranean and European countries, involved in reducing GHG emissions of livestock farming systems to deal with potential climate change impacts may be eligible if places are available. There are 30 places for face-to-face participation and 30 places for attendance online.

English will be the working language of the course.

## Registration

- Candidates may apply online at the following address: https://admission.iamz.ciheam.org/en/
- Applications must include a *curriculum vitae* and a copy of the supporting documents most related to the course subject.
- The deadline for the submission of applications is **15 June 2026**. If free places are available, the deadline may be extended for candidates not applying for a scholarship.
- Applications from candidates requiring authorisation to attend the course may be accepted provisionally.

## Scholarships

Candidates from CIHEAM and GRA member countries as well as from other European countries may apply, during the registration process, for financial support covering totally or partially the cost of travel and accommodation.

Candidates from other countries who require financial support should apply directly to other national or international institutions.

All applications will be subject to a selection process based on the profiles submitted.

## Insurance

It is compulsory for participants attending the course in person to have medical insurance valid for Spain. Proof of insurance cover must be given at the beginning of the course. Participants who do not already have insurance may subscribe to a collective policy taken out by the Organisation upon payment of the stipulated sum. Participants from the EU should bring their European Health Insurance Card.