



[Homepage](#) > [Science and Research Projects](#) > [Science Search](#) > [Science and Research Projects](#)

## Science and Research Projects

[Return to Science Search homepage](#) [Return to Project List](#)

### Ruminant nutrition regimes to reduce methane and nitrogen emissions - AC0209

#### Description

In the last two decades there has been increasing concern regarding the contribution of livestock production to greenhouse gas and other pollutant emissions, particularly in regards to methane and nitrogen.

Methane is an important greenhouse gas. Methane is produced during anaerobic fermentation in the rumen of cattle, sheep and other ruminants. On a global scale agriculture produces between 21 and 25% of the total anthropogenic emissions of methane, however, in more rural communities, agriculture contributes almost 50% of annual methane emissions with over 90% of this due to rumen fermentation.

Nitrogen in livestock manure and urine is another important cause of pollution. Soluble N compounds are quickly converted in soil to nitrate-N (NO<sub>3</sub><sup>-</sup>) which enters ground and surface waters both following application of manures to land and directly from grazed pastures. Around 29% of leached NO<sub>3</sub><sup>-</sup> is estimated to arise from such livestock manure. In addition nitrous oxide may be emitted from livestock housing, during manure storage, following application of manures to land and from grazed pastures. Like methane, nitrous oxide (N<sub>2</sub>O) makes a major contribution to global warming and it is estimated that livestock manures represent c. 12 % of national emissions of N<sub>2</sub>O .

Thus the aim of this study is to reduce methane emissions and nitrogen excretion from ruminant farm livestock. To do so a collaborative programme of interdisciplinary work involving a number of interlinked objectives is envisaged.

#### Objective

The aim of this study is to reduce methane emissions and nitrogen excretion from ruminant farm livestock in both intensive and extensive systems.

This will be achieved through a collaborative programme of interdisciplinary work and will involve a number of interlinked objectives:

1. Synthesis of existing knowledge of ruminant nutrition and husbandry to identify strategies to decrease methane and nitrogen emissions per animal and per unit output and evaluate the most promising of these within the context of intensive dairy farming.
2. Utilize recent advances in grass and legume breeding and evaluate the use of novel pastures to decrease methane and nitrogen emissions per animal and per unit output in extensive farming systems.
3. To evaluate the use of novel dietary supplements identified in recent screening programs for the ability to decrease methane emissions and nitrogen excretion per animal and per unit output in both intensive and extensive farming systems.
4. To modify and utilize existing farm livestock models and economic benefit and farmer uptake models to expand the

interpretation of the data obtained to a whole systems context and to consider wider husbandry, environmental, and economic impacts of the strategies adopted.

5. To establish an advisory and dissemination committee representing the major stakeholders in both the livestock production and livestock feed supply industries including the major levy boards. This committee will (a) ensure that the project is both informed and driven by the latest industry practice and (b) ensure rapid and effective dissemination and uptake, of the results obtained. Representation on the committee will include expertise in the EU regulatory framework with regard to additives and supplements in animal feeds.

#### Related Documents

- ROAME Document : [Mitigating pollution and greenhouse gas emissions from agriculture to air](#)

#### Time-Scale and Cost

From: 2007

To: 2010

Cost: £746,495

#### Contractor / Funded Organisations

[University Wales, Aberystwyth](#)

#### Keywords

[Environmental Protection](#) [Climate and Weather](#) [Climate Change](#) [Sustainable Production](#)  
[Farming](#) [Horticulture](#) [Fruit](#) [Apples](#) [Nutrition](#)  
[Livestock](#)

#### Fields of Study and Contacts

[Agriculture and Climate Change](#) - [adminteam@defra.gsi.gov.uk](mailto:adminteam@defra.gsi.gov.uk)

Page last modified: 30 October 2007