



The **Technical Working Group on Agriculture and Greenhouse Gases (T-AGG)** is developing a report to summarize strategies for managing GHG emissions from livestock (cattle and swine) systems and to review options for quantification and accounting for farm-scale implementation of such strategies. The project is starting summer 2011 and will be completed by summer 2012.

The report will

- estimate the GHG mitigation potential of management strategies for livestock in the United States based on a review of scientific literature (building on the CAST report);
- summarize research gaps;
- provide an assessment of options for quantifying GHG impacts of management at project or farm scales (various models and tools);
- review available data and data gaps; and
- highlight critical accounting issues for assessing performance with project-scale implementation (baseline determination, leakage).

#### **Report authors:**

**Dr. Shawn Archibeque** is an assistant professor in the department of animal sciences at Colorado State University. He is a ruminant nutritionist.

**Dr. Kristen Johnson** is a professor and animal scientist at Washington State University who conducts research on ruminant nutrition and beef cattle energetics.

**Dr. Ermias Kebreab** is a professor and Senson Endowed Chair in the department of animal sciences at the University of California-Davis. His research includes whole-system and modeling approaches to quantifying greenhouse gas emissions in agriculture.

**Karen Haugen-Kozyra, MSc, PAg** has been working in the field of carbon quantification and policy development since 1997. Karen has over thirteen years of experience in greenhouse gas measurement and modeling (six years) and climate change and environmental policy (seven years).

**Dr. Lydia Olander** directs the ecosystem services program at the Nicholas Institute for Environmental Policy Solutions at Duke University. She works on climate mitigation and ecosystem services policy design and was trained as a biogeochemist.

**Advisors for the project** include Erin Fitzgerald of the Innovation Center for U.S. Dairy and Ying Wang, their LCA expert; Marty Matlock from the Center for Agricultural and Rural Sustainability at the University of Arkansas, who is a technical lead for The Sustainability Consortium; and Garth Boyd, who is currently with Camco and who previously worked as director of environmental technology for Smithfield Foods and on the animal science faculty at Colorado State University.

## Draft Outline for T-AGG Livestock Report

- 1) **Introduction**
- 2) **Summary of mitigation potential** (cattle, goats, sheep, swine)
  - a. For each management practice we would want to assess
    - i. mitigation potential per yield of product (milk, beef) on average or a range
    - ii. indication of potential for U.S., if possible
    - iii. critical research gaps
    - iv. note potential critical co-benefits or life-cycle concerns
    - v. hierarchy of management activities - from significant mitigation potential activities to those that are less promising or unknown (provides an indication or priorities for program development and research); indicate potential economic viability issues
- 3) **Quantification methods - net GHG impact** of management activities described above
  - a. Direct measurement options
  - b. Modeling - mathematical modeling options currently available in the literature. Starting with the IPCC tier 1, 2, and 3 methodologies and including mechanistic models such as MOLLY (UC Davis), COWPOLL (Netherlands/Canada/USA) – Also CoolFarmTool, manure DNDC, and Integrated Farm System Model (IFSM)
    - i. what models for what management activities, useful at what scales (particularly interested in what is viable for projects, known limitations, ability to know uncertainty inherent in models)
    - ii. additional or different models or approaches
    - iii. critical data gaps that impact quantification
- 4) **Implementation considerations** of mitigation projects for livestock
  - a. What do we know about existing management (additionality and baseline)?
  - b. How simple or difficult is it to verify management changes and how does this link to quantification method used?
  - c. Other?

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For more information see our website: <http://nicholasinstitute.duke.edu/ecosystem/t-agg>

### Reports available on our website:

Assessing Greenhouse Gas Mitigation Opportunities and Implementation Strategies for Agricultural Land Management in the United States (coming later this summer)

Greenhouse Gas Mitigation Potential of Agricultural Land Management in the United States: A Synthesis of the Literature [and the associated reference library]

Using Biogeochemical Process Models to Quantify Greenhouse Gas Mitigation from Agricultural Management Projects

T-AGG Survey of Experts: Scientific Certainty Associated with GHG Mitigation Potential of Agricultural Land Management Practices.

An Output-based Intensity Approach for Crediting Greenhouse Gas Mitigation in Agriculture: Explanation and Policy Implications



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