Holbrook Landcare Network

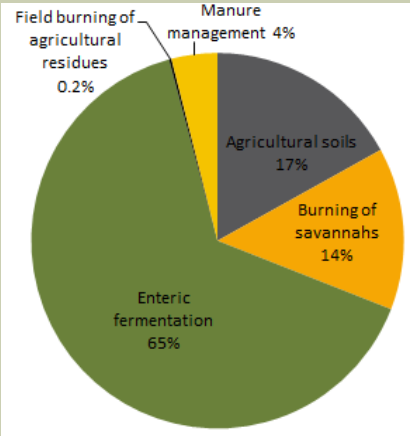
carbon farming and your business

Greenhouse Gas Factsheet Series

Methane (CH_4)

This factsheet has been produced by Holbrook Landcare Network to provide land managers in this region with information about the issues of methane.

Sources of agricultural methane emissions in Australia (Industry & Investment, 2009).



Enteric (gut) methane equals 65% of all agricultural GHG emissions.

Adopting farming practices that lower methane emissions is likely to deliver economic and environmental benefits, with the potential to create offsets under Government initiatives.

WHAT IS METHANE?

Methane (CH_4) in agricultural systems is a natural by-product of ruminant microbial digestion, and the anaerobic decomposition of biological material.

Atmospheric levels of methane have risen from pre-industrial levels of 700 parts per billion (ppb) to 1,753 ppb in 2013. It has a global warming potential 21 times that of carbon dioxide.

Methane is an issue in livestock enterprises as ruminants produce methane as a by-product of fermentative digestion in the rumen and hindgut. This gas, known as enteric (gut) methane, makes up 65% of all agricultural emissions.

WHY DO FARMERS NEED TO BE AWARE?

The majority of agricultural emissions of CH_4 are from livestock. Efforts to lower emissions from animal production systems are considered important for achieving long term domestic emission reduction targets and moderating their impact on climate change. There is also the potential to increase profitability and benefit the environment.

HOW CAN FARMERS REDUCE THEIR CH_4 EMISSIONS?

Methane emissions from the agricultural sector may be reduced through a range of changes to farm and livestock management practices.

Livestock - manage diet to get maximum feed-conversion efficiency and have the animals producing less methane. Herd management practices can reduce the methane produced per unit of product, eg. Selling stock at a younger age and/or genetic selection. In more intensive agriculture enterprises, management of waste and effluent are the most important factors o be considered.

Agricultural soils - manage agricultural soils to reduce the incidence of water logging to reduce both methane and nitrous oxide production. The most important factor is, however, management of fertiliser application (see *Nitrous oxide* factsheet).

FUTURE OPTIONS

Dietary supplements - research is continuing into supplements that may be given to reduce methane emissions (see overleaf).

Animal genetics - breeding animals with better feed-conversion figures.

Plant breeding - breeding plants with a more balanced

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REDUCING METHANE EMISSIONS

Researchers are continuing to look for new options for reducing methane whilst improving productivity. The options listed here can now be implemented on farm and reduce emissions while Improving productivity. Improving FCE (feed conversion efficiency) means animals either eat less for same production (thus producing less methane), or produce more for the same intake (thus producing less methane per unit of product).

Some of the options for reducing methane may never emerge as offset options under Government initiatives.

HERD MANAGEMENT TO PRODUCE LESS METHANE PER UNIT OF PRODUCT

- Cross breeding - through capitalising on hybrid vigour from cross breeding as the first generation animals generally have better feed conversion efficiency.
- Earlier mating means animals spend less time un-productive and may reduce their adult size. On lower quality rangeland this can mean less energy required to maintain the animal and lower intakes producing less methane.
- Earlier finishing means animals being sent to market earlier thus spending less time producing methane.
- Improved fertility and weaning rates can mean less cows or ewes required for the same number of progeny, thus producing less methane from less animals.

IMPROVING FEED CONVERSION EFFICIENCY THROUGH QUALITY OF DIET

- Pasture improvement and management to increase the pasture quality and digestibility, thus producing less methane.
- Adding grain to a forage diet may further improve animal performance and reduce methane emissions.
- Feeding forages that contain natural tannins has been shown to reduce methane, eg. *Lotus* species.
- Dietary supplements:
  - significant research has been conducted on supplementing cows with oils from a range of by-products. Results have found that for every 1% of extra oil added to the diet, methane emissions are reduced by 3.5%.
  - However, ruminants (cattle and sheep) cannot be fed more than 7% oil in their diet.
  - In southern Australia, pastures are often 5-7% total oil already, but oils in the forage are low (1-2%) in summer. This means that this strategy is really most effective during the 90 days of summer, where oil containing supplements may be added.
  - The by-products (eg. Brewers grain, cold-pressed canola meal, whole cotton seed, hominy meal) are recommended over other oil seed products, as the emissions from their production are essentially alr4eady accounted against their primary use (biodiesel, bioethanol).

References

Australian Bureau of Agricultural and Resource Economics. (2011). Options for on-farm mitigation of greenhouse gasses in Australia. *Science and Economic Insights*, 3.

Alford, A.R., Hegarty, R.S., Parnell, P.F., Cacho, O.J., Herd, R.M., & Griffith, G.R. (2006). The impact of breeding to reduce residual feed intake on enteric methane emissions from the Australian beef industry. *Australian Journal of Experimental Agriculture,* 46:813-820.

DAFF (2011). Reducing emissions from livestock fact sheet. Department of Agriculture, Fisheries and Forestry.

Eckard, R.J., Grainger, C. & de Klein, C.A.M. (2010). Options for the abatement of methane and nitrous oxide from ruminate production: A review. *Livestock Science* 130: 47-56.

Industry & Investment. (2009). Reducing methane from ruminants: the next step forward. *NSW Government*. Retrieved from www.dpi.nsw.gov.au/_data/assests/pdf_file/0019/302266/I-and_-NSW-methane.pdf

Jones, F. (2009). Seeking to reduce livestock greenhouse emission. *Department of Agriculture and Food WA,* Factsheet 376.

Jones, F., Phillips, F. & Naylor, T. (2009). Greenhouse emissions from breeding beef cows selected for extremes in low and high net feed efficiency under a pasture grazing system. *Environmental Science and Technology* 46:11770-11778.

This factsheet has been developed by Holbrook Landcare Network as part of the “Carbon Farming and your Business” project. The information contained in this factsheet is based on knowledge and understanding at the time of publication.

This project was supported through funding from the Australian Government.

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