

Managing livestock to reduce methane emissions

Across Australia, livestock are the third largest source of greenhouse gas emissions after the energy and transport sectors. In NSW, agriculture contributes about 14 per cent of the state's total greenhouse gas emissions, with livestock methane accounting for over 80 per cent of agricultural emissions. Most of this methane is produced by the digestive processes of ruminant livestock, with about 10 per cent released from manure management. As a greenhouse gas, methane is relatively short-lived, but potent, having a global warming potential around 30 times higher than the more persistent carbon dioxide.

Managing livestock on-farm to reduce methane emissions can contribute significantly to climate mitigation. Methane emissions from livestock also represent lost energy. Some studies have shown as much as 10% of the energy in feed may be lost due to methane emissions. Many practices that reduce livestock methane make good economic sense as they increase the efficiency of animal production.

This factsheet summarises **livestock management strategies** that NSW primary producers can use to reduce methane emissions while also improving productivity and animal health.

Livestock management strategies for emission reductions

Management strategies to reduce methane emissions can either reduce the rate of emissions per animal (and the amount of methane produced), increase the efficiency of production (and reduce the emissions per unit of production) or remove unproductive livestock.

Where livestock are managed to be more productive, farmers may need to decide whether to maintain livestock numbers to gain extra production (which will either increase on-farm emissions or have no reduction in emissions) or reduce livestock numbers to maintain previous production levels with lower on-farm emissions. In some cases, this may free up productive areas of the farm for tree planting or conservation to amplify on-farm emissions reduction through increased carbon sequestration. This will help to offset on-farm emissions and may also provide an additional income stream.

Changes in farm management practices to reduce emissions can be applied in extensive grazing systems and more intensive feedlot and dairy systems. They offer some flexibility for farmers to choose management options which meet their personal preferences or business goals.



Livestock management strategies that can reduce methane emissions include:



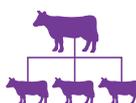
Early breeding

Emissions intensity ↓
Profitability ↑



Retaining high performing animals

Emissions intensity ↓



Enhancing fertility

Emissions ↓



Improving animal health

Emissions ↓
Growth rates ↑
Reproductive performance ↑



Genetic selection

Emissions ↓
Productivity ↑
Yield ↑



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Early breeding

Animals intended for breeding do not contribute economically until they deliver their first offspring. However, in the meantime, they consume feed and generate methane emissions. Reducing the time before first joining can therefore reduce emissions intensity and increase profitability.

However, females must be at a suitable weight before they can breed for the first time. Mating underweight young females can cause lower reproductive performance, which can offset any emissions reductions gained from mating early.



Retaining high performing animals

Culling for age is a standard management practice across most NSW beef and sheep properties. However, the strategy can lead to the loss of high performing animals in the herd or flock.

Retaining high-performing females and reducing the number of non-productive females being reared can help to reduce emissions intensity.



Enhancing fertility

Higher fertility means that fewer breeding animals are needed in the herd to meet production targets, resulting in reduced methane emissions.

Enhanced fertility rates can be achieved by increasing the amount of energy supplied to cows and ewe during the breeding season (nutritional flushing). Culling unproductive reproducing animals and selecting for improved fertility can also help to enhance the fertility of the herd or flock and therefore reduce methane emissions.



Improving animal health

Infected and diseased animals have poor productivity and lower reproduction rates. Maintaining herd health through good husbandry (including disease prevention) and culling for disease will reduce methane emissions and increase growth rates and reproductive performance. Maintaining health is particularly important for dairy cattle and wool sheep, to ensure long productive lifetimes.



Genetic selection

Reduced methane production means faster animal growth. Therefore, genetically selecting for animals that produce less methane creates higher productivity and yield.

While genetic selection is a slow process, and may compromise other economic traits, it is a management strategy that could deliver steady improvements. For example, research shows that methane yield in beef cattle can be reduced by 1.45 per cent annually through genetic selection focused on methane.

Research to identify and apply genetic markers and genomic breeding values for selecting animals with lower methane yields is underway. Such genetic selection is likely to become a more attractive strategy in coming decades.

Conclusion

Methane emissions represent energy lost from livestock production that might otherwise be converted to milk, meat or fibre. Implementing livestock management strategies to reduce methane emissions provides primary producers with opportunities to act on climate change, increase livestock productivity and improve profits.

This summary was taken from the report 'Managing livestock to reduce methane emissions: Assessment of strategies for abatement of enteric methane.' by A.K. Almeida and R.S. Hegarty, 2021.

For more information

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The full report is available at
<https://www.dpi.nsw.gov.au/dpi/climate/Carbon-and-emissions/emissions-reduction-pathways/livestock-industries>

