The Australian Wine Research Institute

Fact Sheet

Using grape marc as a feed additive in livestock industries

Project purpose

- Investigating the practicalities of using grape marc (a winery by-product) as a supplement in livestock feed to reduce methane emissions.
- Testing treatment and storage methods for grape marc to maintain its nutritional and methane-reducing properties while incorporating its use into commercial livestock production.

Background – greenhouse gases and agricultural industries

Greenhouse gases (GHG) are gases which when produced, are retained in the atmosphere and act to trap heat that would otherwise escape, leading to increasing global temperatures. Significant worldwide efforts are underway to reduce GHG emissions, with the goal of keeping the increase in global surface temperature below 2°C. The GHGs with the largest impact are carbon dioxide, methane and nitrous oxide.

The agricultural sector accounts for around 15% of Australia's total GHG emissions. [1] Methane (CH_4) produced by ruminant animals (largely cows and sheep) is responsible for 65% of these agricultural emissions, representing approximately 10% of Australia's total emissions (National Inventory Report, 2013).

Reducing emissions using grape marc

The livestock industry is interested in ways to reduce methane emissions from ruminant animals, while optimising production. Feed materials tannins have been highlighted as

[1] In CO_2 equivalences (CO_2-e). Methane is 21 times more potent than CO_2 over 100 years (i.e. one tonne of CH_4 equals 21 tonnes of CO_2-e).

one way to achieve this. Recent AWRI research has shown excellent potential for grape marc to be used as a source of tannins for this purpose, and initial trials by the Victorian Department of Economic Development, Jobs, Transport and Resources of grape marc supplementation observed up to 20% reductions in methane.

Directing research towards new commercial practices

Handling of grape marc cannot be achieved using the same methods as other common livestock feed components and more research is needed to apply grape marc as a useful feed additive in commercial settings. In particular, processing and storage methods for grape marc need to be optimised to maintain both its methane-reducing and nutritional properties. The AWRI's project *Using grape marc as a feed additive in commercial settings* aims to extend the current research and take supplementation of livestock feed with grape marc from the lab to the feedlot. The project commenced in September 2013 and will run until June 2016. It will be conducted in three major stages.

Project stages

Stage 1 - Identify the best methods to store and treat grape marc to ensure its methane-reducing and nutrition properties are preserved.

Stage 2 - Trial storage methods identified in stage 1 at a research feedlot, to determine the *in vivo* effects of the different methods and identify the best method for applying grape marc in a commercial setting.

Stage 3 – Demonstrate the use of grape marc as an effective feed additive in a commercial feedlot, based on the results from stage 2.

The key areas to be investigated are: inhibiting mould formation during storage and use of grape marc; large scale collection and storage of grape marc leading to a more stable product through different silage techniques; and limiting the degradation of compounds that are active in mitigating methane generation.

Figure 1. Grape marc storage method on trial: ensiling grape marc within a grain bag

Why is the AWRI involved in this research?

The project is designed to assist both the wine industry and the livestock industry. Climate change is a key issue for the Australian grape and wine industry, with many potential impacts in Australian grapegrowing regions. Grape marc is an underused wine industry by-product, the disposal of which currently presents logistical and cost issues but which

has potential to contribute to global efforts to reduce GHG emissions. The AWRI's expertise in tannin chemistry is also an essential component of the research into the methane-reducing properties of grape marc.

Acknowledgements

The AWRI project *Using grape marc as a feed additive in commercial settings* is supported by funding from the Australian Government. The University of New England, Tarac Technologies Ltd and Wanderibby Feedlot are project partners.

Reference

Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education, 2013, *Australian National Greenhouse Accounts, National Inventory Report 2011, Volume 1*. Accessible from: http://www.climatechange.gov.au/publications/greenhouse-acctg/~/media/climate-change/emissions/2012-12/AUS_NIR%202011%20Vol%201.pdf

Contact

For further information, please contact:

Kieran Hirlam

Phone 08 8313 6600 **Fax** 08 8313 6601

Email kieran.hirlam@awri.com.au

Website www.awri.com.au

Address Wine Innovation Central Building, Corner of Hartley Grove & Paratoo Rd, Urrbrae (Adelaide), SA 5064

Australian Government