

Mitigation of methane emissions from local cattle using cashew nut shell liquid feeding

Production

Implementation

Item: Livestock

GHG emission reduction

Outline

Cashew nut shell liquid (CNSL) feeding can decrease the enteric CH_4 emission from Vietnamese local cattle (Lai Sind, Fig. 1) by 20% by inhibiting the methanogen activity in the rumen.

Background/effect/note

Livestock production, especially ruminant production, is reported to be one of the major sources of greenhouse gas (GHG) emissions in Southeast Asian countries.

Here, we demonstrated that the average enteric methane emission per kg dry matter intake from Vietnamese local cattle (Lai Sind) decreased by 20.2~23.4% with CNSL feeding (Fig. 2). Additionally, CNSL feeding decreased the abundance of methanogens and increased the abundance of propionate-producing bacteria in the rumen, which can improve the production of the cattle (Fig. 3).

This technology can be widely applied for zebu cattle (*Bos indicus*), which are common in the tropical region.



Fig. 1. Vietnamese local cattle (Lai Sind) and methane emission measurement

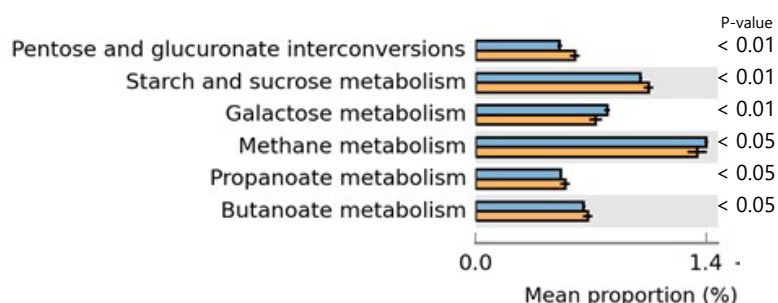


Fig. 3. Effect of cashew nut shell liquid (CNSL) feeding on the function of the rumen microbiome

Orange: CNSL+, Blue: CNSL-

Propanoate metabolism is significantly stimulated due to CNSL feeding.

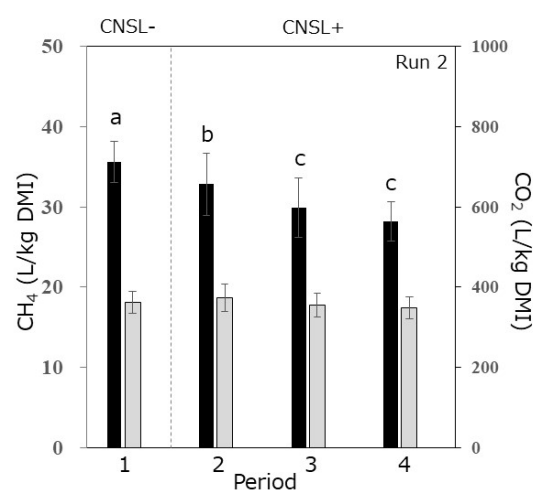


Fig. 2. Enteric methane (CH_4 , black) and carbon dioxide (CO_2 , grey) emissions per kg dry matter intake (DMI) from Lai Sind cattle with continuous CNSL feeding (4 periods of 5 days/period)



Technical details:

https://www.jircas.go.jp/en/publication/research_results/2020_a01

Contact

greenasia-ml@jircas.go.jp

Japan International Research
Center for Agricultural Sciences

