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Enteric methane emissions from heifers fed grass-clover silage or pulp silage made from grass-clover

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Background

Harvest of plant material (here grass-clover) for biorefining.

Screw pressing

The pulp fraction has potential as feed for ruminants.

The green juice can be refined into protein concentrate for monogastrics.

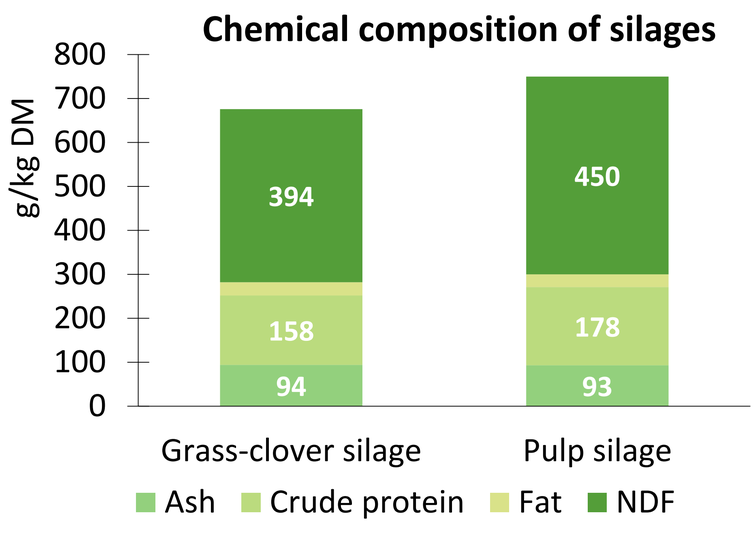
Aim

To compare feed intake, enteric methane emissions and rumen fermentation for heifers fed grass-clover silage (GCS) or pulp silage (PS) as the sole feed.

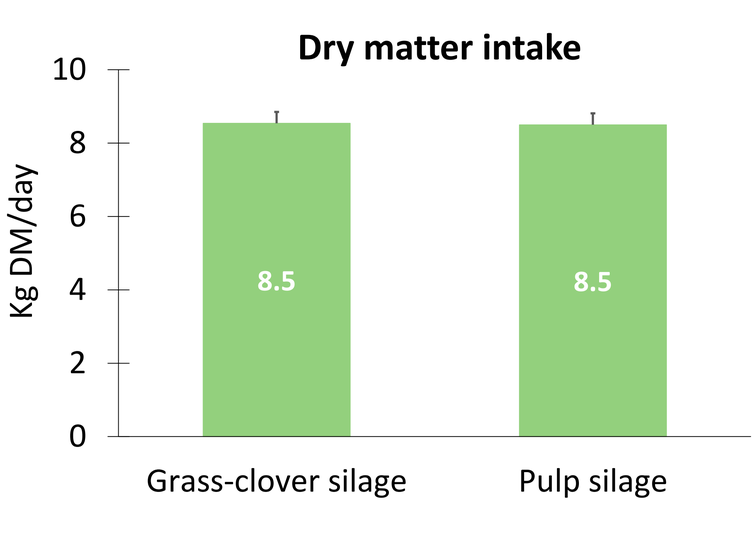
Material and methods

- Eight Holstein heifers with an average age of 17.2 ± 1.1 mo. (mean ± s.d.) were used in a cross-over design.
- Four heifers were randomly allocated to start on GCS and the other four on the PS.
- The grass-clover used for extraction and thereby production of pulp silage and for grass-clover silage was harvested at the same field, grass-clover silage 6 days later than the grass-clover used for the pulp silage.
- The heifers were fed silage as the sole feed ad libitum.
- Each period in the experiment lasted 14 days with the first 11 days for adaptation, and the remaining three days for measuring methane emissions using respiration chambers.
- A stomach tube was used for rumen fluid sampling the last day of each period just before feeding.

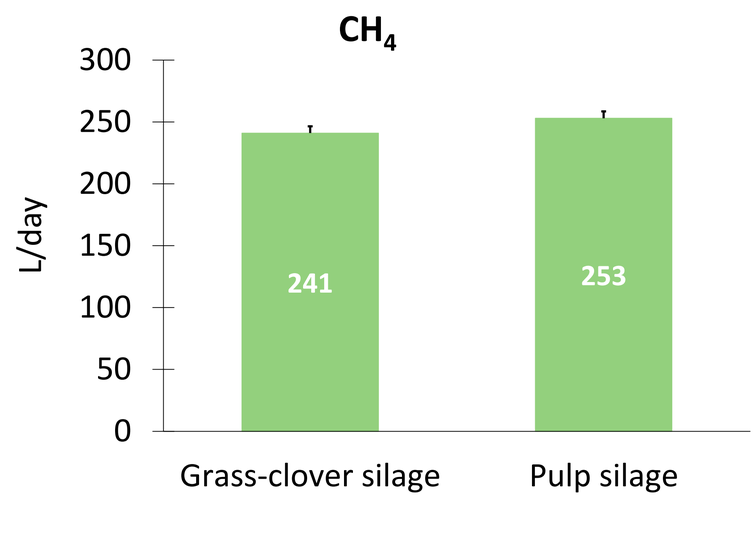
Results



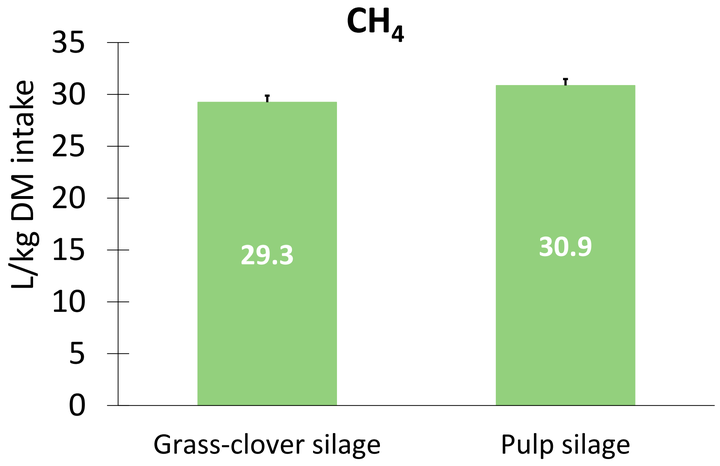
The NDF concentration is higher on PS than GCS.



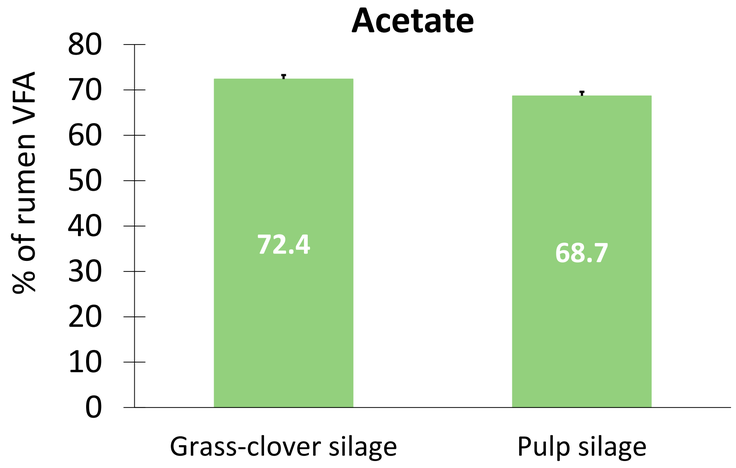
The DM intake was similar (P=0.88) on GCS and PS.



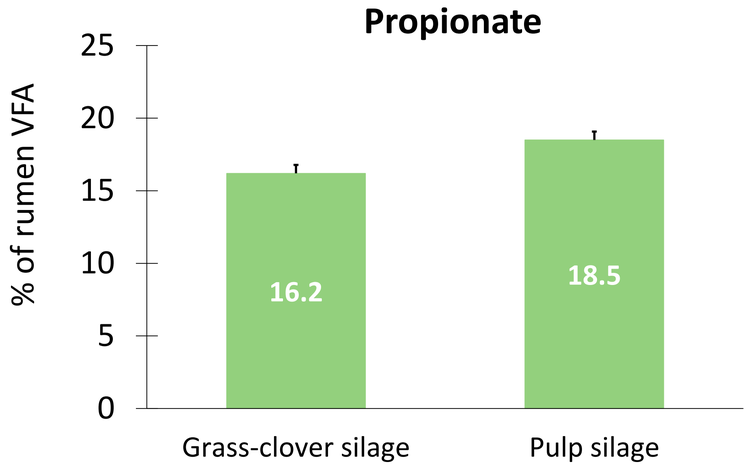
The daily methane emission was higher (P=0.01) on PS than on GCS.



Methane per kg dry matter intake was higher (P=0.01) on PS than on GCS.



The proportion of acetate (P=0.01) was higher on GCS than on PS



The proportion of propionate (P=0.01) was higher on PS than on GCS.

Conclusion

Feeding of pulp silage to heifers as the sole feed resulted in higher enteric methane emissions than clover-grass silage probably due higher intake of NDF.

Funding

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