Multiple benefits of feeding willow leaves to ruminants may include reduced greenhouse gas emissions

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Experiments feeding willow leaves to weaned lambs

- Groups of 6 or 8 recently weaned lambs (August)
- Fed over 14-day period, with unfed control group (and high and low fed groups)
- Leaf consumed recorded daily



Mineral supplementation - Cobalt & vitamin B₁₂







Intestinal worm control – *in vitro* & *in vivo* experiments







Elsheikha, H., Helal, M.A., Kendall, N. R. & Stoate, C. In prep.

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Implications for greenhouse gases - willow and protein digestion



- Reduced breakdown of protein in rumen
- Reduced uptake of Nitrogen into blood
- Reduced excretion of Nitrogen in urine
- Lower Nitrogenous gases from urine
- Higher Nitrogen concentration in dung



Nitrous Oxide emissions – monitoring urine patches







Also lower ammonia



Nitrous oxide emissions – Applied known urine volume





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In conclusion





- Feeding willow helps control intestinal worms and enhances Cobalt and vitamin B₁₂
- Appears to reduce Nitrous Oxide emissions, but more robust research is needed
- These benefits are additional to those of shade, shelter, wild bee foraging resources etc

