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Valorisation of *Posidonia oceanica* banquettes as a feed ingredient for cattle: an in vitro evaluation of rumen degradability, gas production and methane emission

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The accumulation of *Posidonia oceanica* banquettes on Mediterranean coasts represents an environmental and management issue, highlighting the need for sustainable valorisation strategies. This study evaluated the potential use of *Posidonia oceanica* banquettes as a feed ingredient for cattle through in vitro assays to assess rumen degradability, gas production and methane emission. Four complete low-fermentability diets commonly used for dry cows (LOW) were formulated by progressively replacing straw with *Posidonia oceanica* at 0, 33, 66 and 99% substitution (LOW0, LOW33, LOW66 and LOW99), corresponding to inclusion levels of 0, 10.8, 21.6 and 32.4% on a dry matter basis. Substrates were chemically characterised and incubated in vitro using ruminal fluid from cannulated cows under anaerobic conditions for 24 and 96 h. Measurements included final pH, in vitro organic matter (OM) and neutral detergent fibre (NDF) degradability, total gas production, methane and carbon dioxide production, and fermentation kinetics. Data were analysed using PROC GLM of SAS. After 24 h, final pH was stable across treatments (6.53–6.58). In vitro OM degradability showed minor variation (70.1–71.4%), whereas NDF degradability decreased from LOW0 to LOW99 (38.9 vs. 24.6%). Notably, methane production decreased linearly with increasing *Posidonia oceanica* inclusion, from 9.73 mg/g OM in LOW0 to 8.27 mg/g OM in LOW99. After 96 h, OM degradability declined from 80.8% in LOW0 to 71.1% in LOW99, together with reduced NDF degradability and potential gas production (247 vs. 203 mL/g OM). Overall, *Posidonia oceanica* inclusion reduced methane production and decreased fibre and organic matter degradability, potentially limiting its use in dry cow diets. In addition, the high mineral and salt content of *Posidonia oceanica* should be carefully considered when evaluating its practical dietary inclusion. Despite these constraints, mitigation of methane highlights its potential use to reduce enteric methane emissions.

Inclusion of sainfoin in intensive beef cattle diets: implications for growth performance and nitrogen use efficiency

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The use of locally grown forage legumes can enhance feed self-sufficiency reducing reliance on imported protein sources. Sainfoin (*Onobrychis viciifolia*; SF) can be incorporated into diets of intensively fed cattle either as forage or as an ingredient in concentrate formulations. Forty Montbéliarde young bulls (117 d of age; 188 kg body weight (BW)) were fed ad libitum for 28 weeks with four diets combining two forages (SF hay or barley straw) and two isoenergetic concentrates: a commercial concentrate (C) or a concentrate including 15% SF pellets (CSF). The resulting diets were C+straw, CSF+straw, C+SFhay, and CSF+SFhay. Daily individual BW and concentrate intake were recorded using automated scales and feeders, while forage intake was estimated using an internal marker. Nitrogen (N) balance was assessed at the individual level during two sampling periods using an external marker to estimate faecal output. Also, samples were obtained to analyse ammonia in the ruminal liquid and plasma metabolites (urea and total protein). At the end of the growing phase (week 15), bulls fed C+straw were heavier than those fed C+SFhay, with intermediate values for the remaining diets. By the end of finishing (week 28), bulls fed C+straw remained the heaviest, whereas CSF+straw bulls were the lightest. During the growing period, average daily gain declined with increasing sainfoin inclusion, but concentrate conversion was improved in bulls fed C+SFhay compared with CSF bulls regardless the forage. During finishing, bulls fed CSF+straw showed the poorest feed conversion. During the growing period, CSF+SFhay and CSF+straw reduced urinary N excretion and had lower retained N relative to N intake, indicating improved N use efficiency, especially when related to the different growth of these treatments. Regarding ammonia and urea in plasma, both groups fed CSF had lower values at the growing and finishing periods. Although some sainfoin-based diets resulted in slightly lower growth performance, these effects may be compensated by the adoption of locally based, more circular feeding strategies.