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Vines of the Sweet Potato (*Ipomea batatas*): A Valuable Feed Supplement for Ruminants in Small Holder Systems

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Abstract

Availability of suitable feed, and in particular sources of protein-rich food, is a major constraint to increasing the productivity of smallholders in sub-Saharan Africa it is difficult to justify diverting land from growing crops for human consumption. The roots of the sweet potato are a high energy cash crop, and the leaves and vines (SPV), usually treated as rubbish, are high in protein and have been identified as a valuable livestock feed. Additionally sweet potato has a prodigious dry matter yield (equivalent to 7.3 and 7.5 t ha⁻¹ for vines and roots respectively) when fertilised and tilled and thus has the potential to make a major contribution to livestock feeding requirements, while providing a high yielding crop for human consumption or sale. Recently, SPV silage (SPVS) has been posited as a way to even out seasonal shortfalls in feed production for smallholders.

For the first time we conducted a feeding trial to assess simultaneous effects of SPVS on intake, live weight gain (LWG), daily methane production (DMP) and methane emissions intensity (MEI). We fed SPVS (DE: 12.8 MJ/kg; CP: 156 g/kg, DM) to growing Dorper wethers (n=20; LW:18 kg SEM:1.3 kg) at 5 inclusion levels (0, 20,40,60,80 % as fed) while they consumed a basal diet of chopped maize stover (DE: 10.7 MJ/kg; CP: 46 g/kg, DM) for 70d.

Sheep consuming SPV silage included at 40 % (20 % DM basis) maintained LW, while those consuming diets at 60 and 80 % inclusion levels had significantly higher voluntary intakes ($p < 0.01$), LW gain ($p < 0.05$) and lower MEI ($p < 0.05$) than those consuming maize stover alone or SPVS at the 20 % inclusion rate.

We conclude that SPVS has the ability to significantly improve productivity and decrease MEI in animals fed low-quality basal diets, and should be offered optimally at 24–32 g kg⁻¹ LW (as fed) to animals receiving only poor quality pasture or stovers.

Keywords: Enteric methane emissions, livestock, supplement, sweet potato