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

John Goopy1, Jesse Gakige1, Daniel Korir1, Marko Kvacic1, Klaus Butterbach-Bahl2,1

1International Livestock Research Institute (ILRI), Kenya
2Karlsruhe Institute of Technology, Institute for Meteorology and Climate Research, Atmospheric Environmental Research, Germany

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

Contact Address: John Goopy, International Livestock Research Institute (ILRI), Nairobi, Kenya, e-mail: j.goopy@cgiar.org