

The effects of feeding dried browse leaves on rumen ammonia levels, methanogens and protozoa amplification of sheep in the Coastal Savannah of Ghana

Abstract

Tanniferous browse leaves are reported to inhibit methanogens and protozoa activity in the rumen, thus contributing to a reduction of methane emission. This study evaluated the influence of feeding dried browse leaves to sheep on rumen ammonia concentration, the base pair at which protozoa and methanogens were amplified and double stranded DNA concentration (dsDNA) from rumen fluid and faeces. The eight treatments were urea treated rice straw, *Albizzia lebbek* (AL), *Moringa oleifera* (MO), *Millettia thonningii* (MT), AL + MO, AL + MT, AL + MO + MT and MO + MT. After feeding 32 ram lambs for 3 months, one ram lamb on each of the eight experimental diets was randomly selected and slaughtered to obtain rumen fluid. Genomic DNAs were extracted from methanogen and protozoa strains obtained from rumen liquor and from faecal matter of sheep. Rumen ammonia was determined using spectrophotometer. Methanogens and protozoa from rumen fluid and faeces were amplified at 1100 base pair, 200–1100 base pair, 320–1100 base pair and 200–750 base pair respectively. Rumen ammonia concentration, dsDNA from rumen fluid and faeces ranged from 14.51 to 23.01 mg/dl, 65 to 900 µg/ml and 100 to 950 µg/g respectively. The rumen ammonia concentration met the requirements for efficient growth of microbes. The presence of methanogens and protozoa in the rumen fluid and in the faeces indicated that dried browse diets were able to inhibit the growth of both protozoa and methanogens in the rumen by eliminating them, and thus, were excreted in the faeces. Hence, feeding of dried browse leaves can contribute to lower methane emission.