Ruminants in the tropics are slow growing, resulting from low quality feed. The use of indigenous multipurpose plants is a good strategy for an improved livestock performance. Chemical composition and Coefficient of preference of green, yellow and brown leaves of *Persea americana* (PA)by West African Dwarf Sheep were determined. *In vitro* gas production (IVGP) of green, yellow and brown leaves of PA were carried out over a period of 24 hr incubation. Metabolizable energy (ME), organic matter digestibility (OMD) and short chain fatty acids (SCFA) were predicted. 10 M NaOH was introduced into the inoculums after 24 hrs from which methane (CH4) production was measured. Results indicated that chemical composition ranged significantly (p<0.05) among the different forms of PA leaves. Dry matter ranged between 88.75 and 91.24% in green and brown leaf respectively, same trend was observed for Neutral detergent fibre, it ranged from 59.48 to 60.01% in green and brown leaf respectively, while the crude protein ranged between 23.59 and 25.85% in brown and green leaf respectively.

The CoP ranged between 1.58 in yellow leaf and 2.01 in green leaf. The IVGP, ME, OMD, SCFA and methane production were not significant (p>0.05). Same trend was observed for all the in vitro parameters with the green leaf recording the highest value, while the lowest values were ontained in the yellow leaf. They ranged between 6.25 and 8.50 ml/200mg DM; 3.73 and 3.96 MJ/Kg DM; 38.66 and 41.67 %; 0.18 and 0.22 µmol; 2 and 4 ml/200mg DM in yellow and green leaf respectively.

The result of this study showed that all forms of *Persea americana* leaf have potential as prospective forage for ruminant production in the tropics