Tropentag, September 17-19, 2018, Ghent

"Global food security and food safety:
The role of universities"

Screening of Livestock Feed Resources Owning Low Enteric Methane Emissions for Sustainable Food Security in Sub-Sahara Africa

Aberra Melesse[1], Herbert Steingass[2], Markus Rodehutscord[2]

[1] *Hawassa University, Animal and Range Sciences, Ethiopia*
[2] *University of Hohenheim, Inst. of Animal Nutrition, Germany*

Abstract

Livestock sector accounts for 40 % of agricultural domestic product. Food from animal sources contributes 18 % of global calories (kcal) and 25 % of global protein consumptions. However, livestock sector contributes to green house gas (GHG) emissions causing global climate change. The most important GHG emitted from the livestock agriculture is methane (CH_4), which originates from enteric fermentation and manure. Ruminant animals reared in Sub-Sahara Africa are usually fed on tropical forages and produce high enteric CH_4 due to poor digestibility and nutrient content. Thus, searching for alternative livestock feed resources with possible low CH_4 emission while owing better nutrient quality would be justifiable. With this research gap in mind, 48 plant materials (foliages and pods of multipurpose trees, legume and grass forages, leaves of root crops, fruit waste and agro-industrial byproducts) were tested *in vitro* for their potentials to mitigate CH_4 emission. Results indicated that among the investigated multipurpose trees, leaves of *Prosopis juliflora*, *Cajanus cajan*, *Leucaena leucocephala*, *Acacia nilotica* and *Moringa oleifera* as well as pods of *Millitia ferruginea* and *P. juliflora* produced the lowest CH_4. *Panicum colouratum* and *Desmodium intortum* were found to be suitable tropical forages in reducing CH_4. Sweet potato and cassava leaves among root crops as well as Mango seed kernels and *Moringa* seeds from fruit byproducts were identified as potential candidates in mitigating CH_4 emission. In conclusion, leaves of those multipurpose trees and root crops as well as fruit byprodcuts that were identified as potential candidates for reduced CH_4 can be used as protein and energy supplements to poor quality forages and crop residues for practical mitigation of CH_4 emissions from ruminants. Moreover, those forages that showed the lowest CH_4 can be fed alone or in combinations to supplement tropical feed resources. We recommend animal-based experiments to validate the actual feeding values of the identified feed materials and assess their production potential.

Keywords: Forage crops, fruit byproducts, methane emission, multipurpose tree foliage, nutrient compositions, root crop leaves

Contact Address: Aberra Melesse, Hawassa University, Animal and Range Sciences, Hawassa University, 05 Hawassa, Ethiopia, e-mail: a_melesse@uni-hohenheim.de