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In vitro Rumen Fermentation of *Sauropus androgynus* (L.) Merr. Compared to Hays of Different Quality

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Introduction

Katuk leaves (*Sauropus androgynus* (L.) Merr.) have a high crude protein (CP) content. Supplementing Katuk leaves to lignified forages, e.g., crop residues that are low in metabolisable energy (ME) and CP could increase the nutritional value of the feedstuffs.

Objectives

- To evaluate the chemical composition, the estimated metabolisable energy (**ME**) and net energy for lactation (**NEL**) values of Katuk leaves.
- To evaluate the effect of blending Katuk leaves with hay of differing quality on *in vitro* rumen fermentation using an *in vitro* gas production technique, namely the Hohenheim Gas Test (**HGT**).

Materials

Hay Low Quality
Hay Medium Quality
Hay High Quality
+
Katuk Leaves (KL)

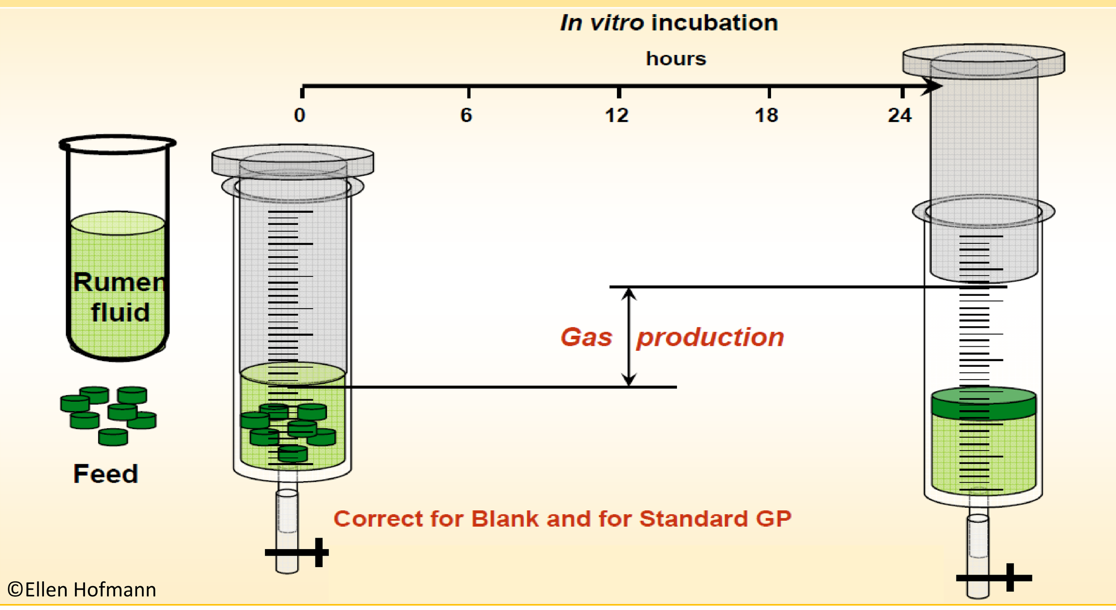
- Hay low + 5% Katuk
- Hay low + 10% Katuk
- Hay low + 20% Katuk
- Hay medium + 5% Katuk
- Hay medium + 10% Katuk
- Hay medium + 20% Katuk
- Hay high + 5% Katuk
- Hay high + 10% Katuk
- Hay high + 20% Katuk

Methods

Chemical Analysis

- Dry matter (DM)
- Crude protein (CP)
- Ash
- Crude fat
- Neutral detergent fiber on an ash free or organic matter basis (aNDFom)
- Ash free acid detergent fiber (ADFom)
- Acid detergent lignin (ADL)

Hohenheim Gas Test (HGT)



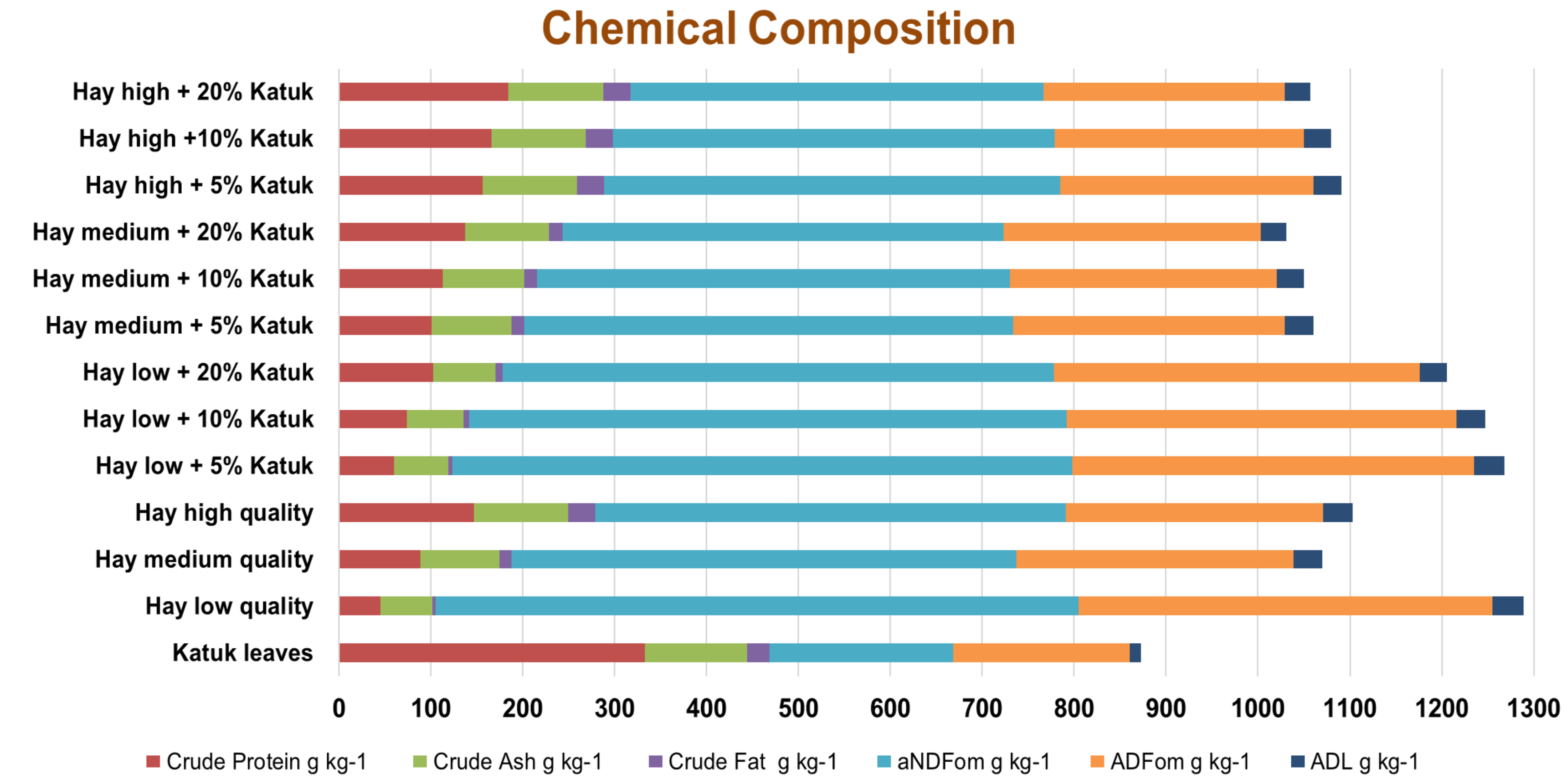
Menke and Steingass (1988):

ME = 2.20 + 0.1357 GP + 0.0057 CP + 0.0002859 CL^2, R^2 = 0.94

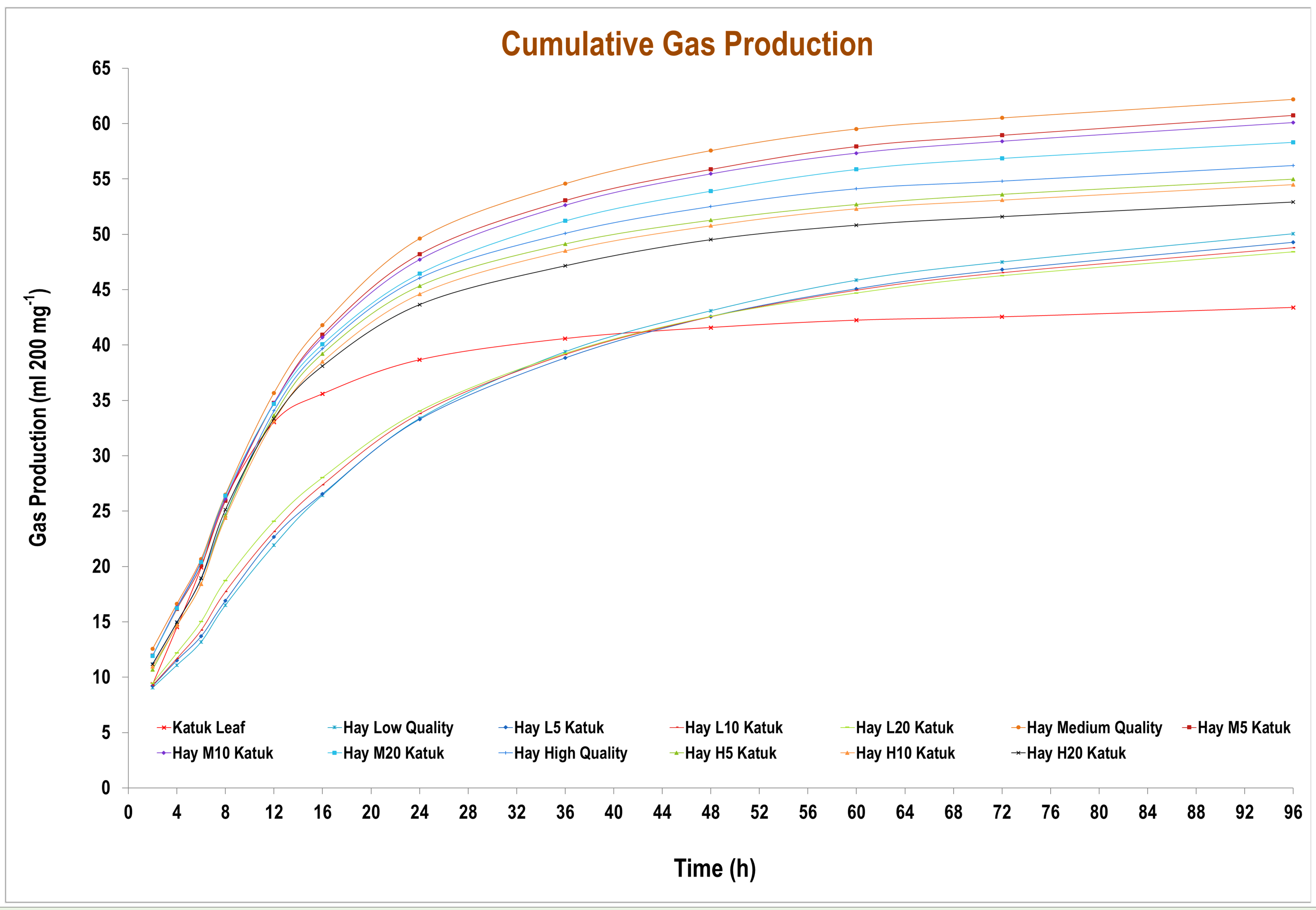
NEL = 0.54 + 0.0959 GP + 0.0038 CP + 0.0001733 CL^2, R^2 = 0.93

Results

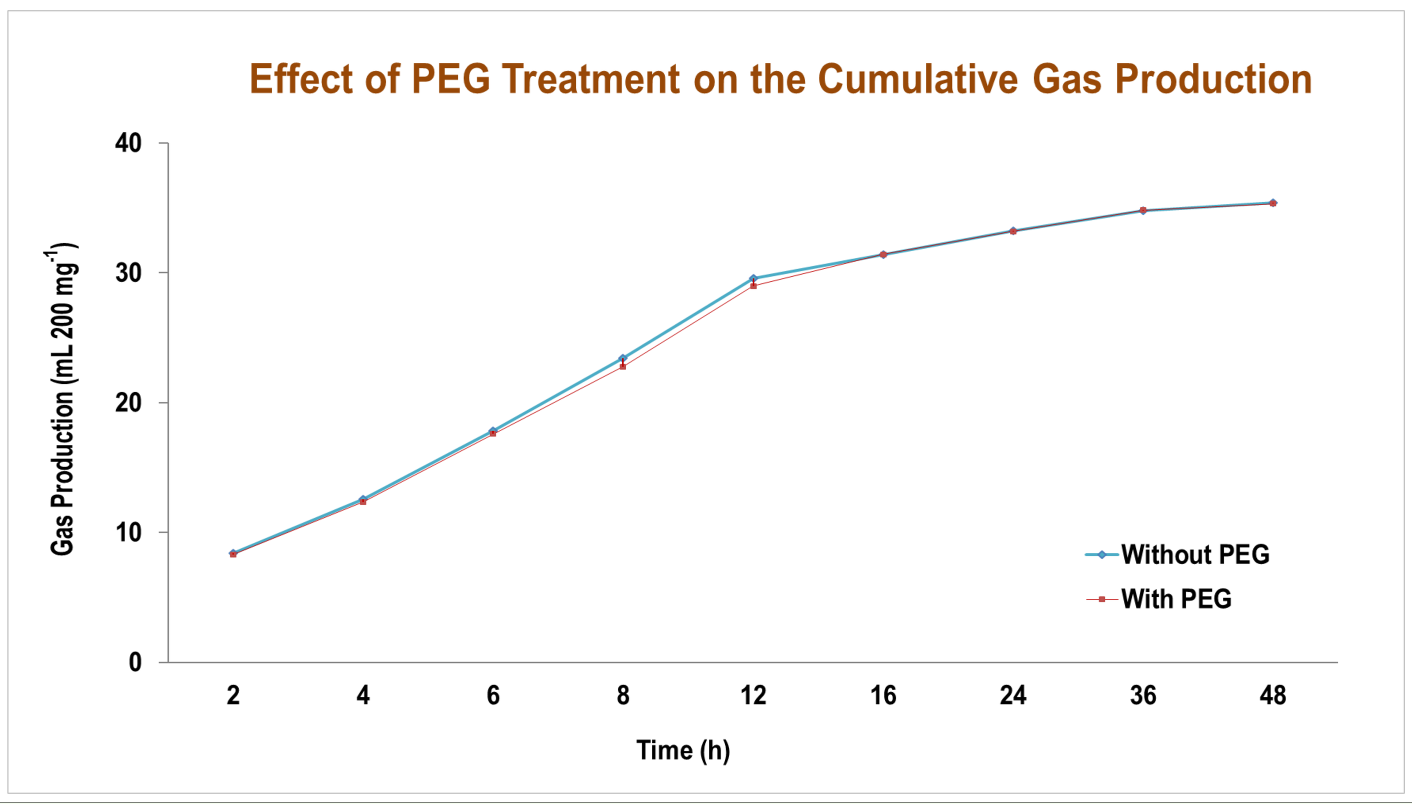
Chemical Composition



- **Crude Protein: 45.3** g kg^{-1} DM (hay low quality) to **333** g kg^{-1} DM (Katuk leaves).
- **Ash: 56.3** g kg^{-1} DM (low quality hay) to **111** g kg^{-1} DM (Katuk leaves).
- **Ether extract: 3.6** g kg^{-1} DM (low quality hay) to **30** g kg^{-1} DM (high quality hay).
- **aNDFom: 200** g kg^{-1} DM (Katuk leaves) to **700** g kg^{-1} DM (low quality hay).
- **ADFom: 192** g kg^{-1} DM (Katuk leaves) to **450** g kg^{-1} DM (low quality hay).
- **ADL: 11.9** g kg^{-1} DM (Katuk leaves) to **33.9** g kg^{-1} DM (low quality hay).

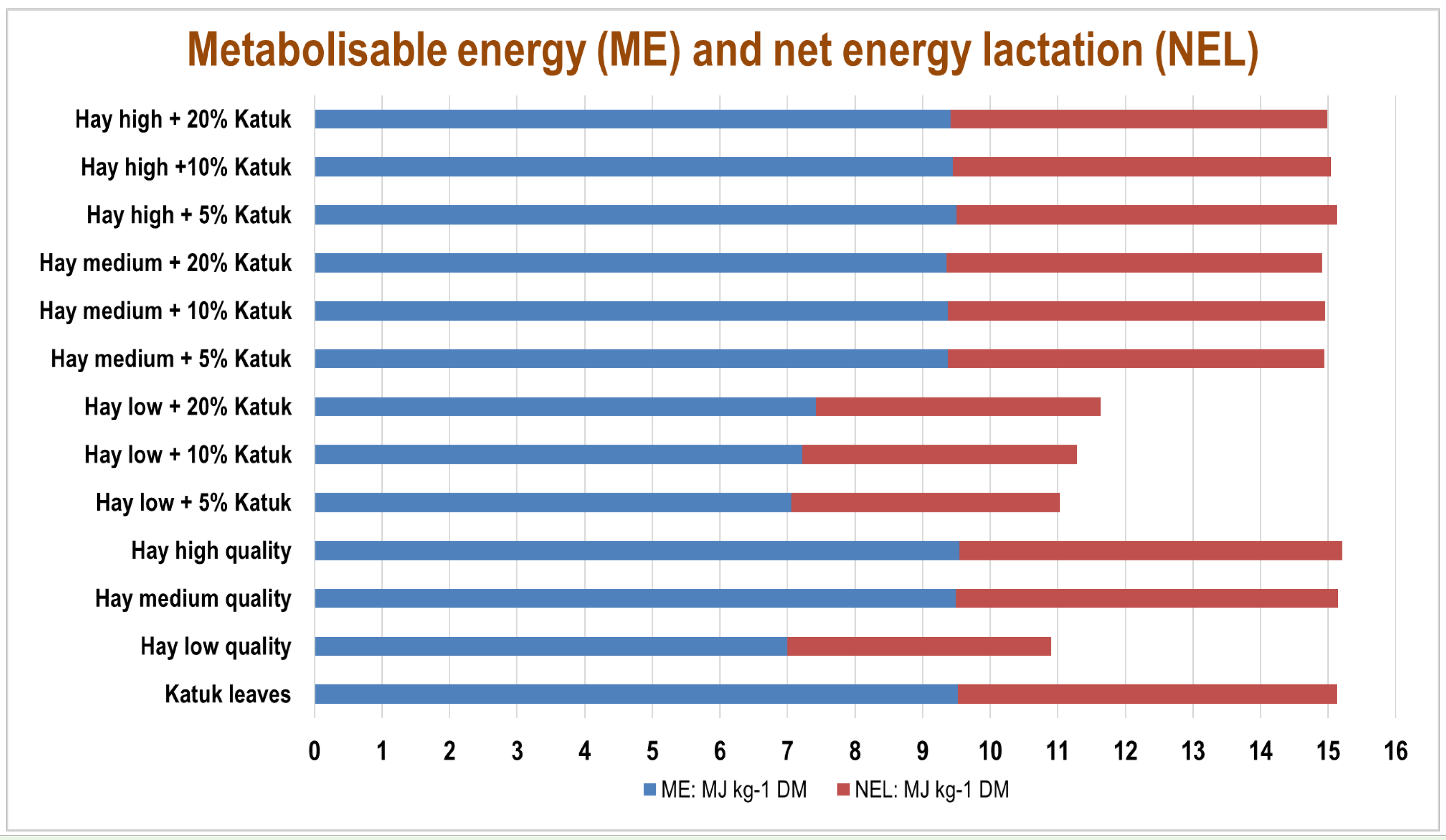


Net gas production value of feedstuffs in 24 h incubation was found between **33.3** (low quality hay + 5% of Katuk leaves) and **49.6** (medium quality hay) ml 200 mg^{-1} dry matter .



Gas produced after 24 h incubation of **Katuk leaves with PEG and without PEG did not differ.**

Metabolisable energy (ME) and net energy lactation (NEL)



The estimated **ME** and **NEL** ranged from **7.57 to 10.34** MJ kg^{-1} DM and from **4.32 to 6.27** MJ kg^{-1} DM.

Conclusion

No effect of PEG addition indicates that Katuk leaves do not contain tannin. Moreover according to chemical composition, *in vitro* gas production and resulting ME and NEL estimation, the mixture of high quality hay with 20% of Katuk leaves was the best blend in terms of nutritive value for ruminants.

Reference:

Menke, K.H., & H. Steingass (1988). Estimation of the energetic feed value obtained from chemical analysis and *in vitro* gas production using rumen fluid. Anim. Res. Dev. 28: 7–55.

Acknowledgment:

This project was funded by **LPDP (Lembaga Pengelola Dana Pendidikan) Scholarship Indonesia** & contribution of this poster is supported by **AGRINATURA**

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agrinatura The European Alliance on Agricultural Knowledge for Development