


In vitro degradability of selected Nigerian forages for their use in ruminant diets



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FEDERAL UNIVERSITY OF AGRICULTURE ABEOKUTA KNOWLEDGE FOR DEVELOPMENT

BACKGROUND OF THE STUDY

Feed occupies about 60-70% of Ruminant Production Cost. However, during the dry season the available feed varies based on regions

Temperate region	Tropical region
Feed Conserved forages, Concentrates Legumes, High quality grasses	**Feed** Legumes, Crop by-products Low quality grasses
Feed nutritive quality Good	**Feed nutritive quality** Not too good
Microbial Community Increased microbial community thus facilitating feed degradability	**Microbial community** Decreased microbial community thus reducing feed degradability
Better Ruminant Production	Poor Ruminant Production

MATERIALS AND METHODS

Figure 1: Illustration of the procedure for the *in vitro* experiment .

Weighing scale

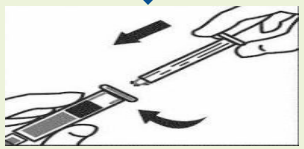
Dried Forage (0.2g)

syringe

Buffered Rumen Fluid (20ml)

beaker

Flush with CO2 gas



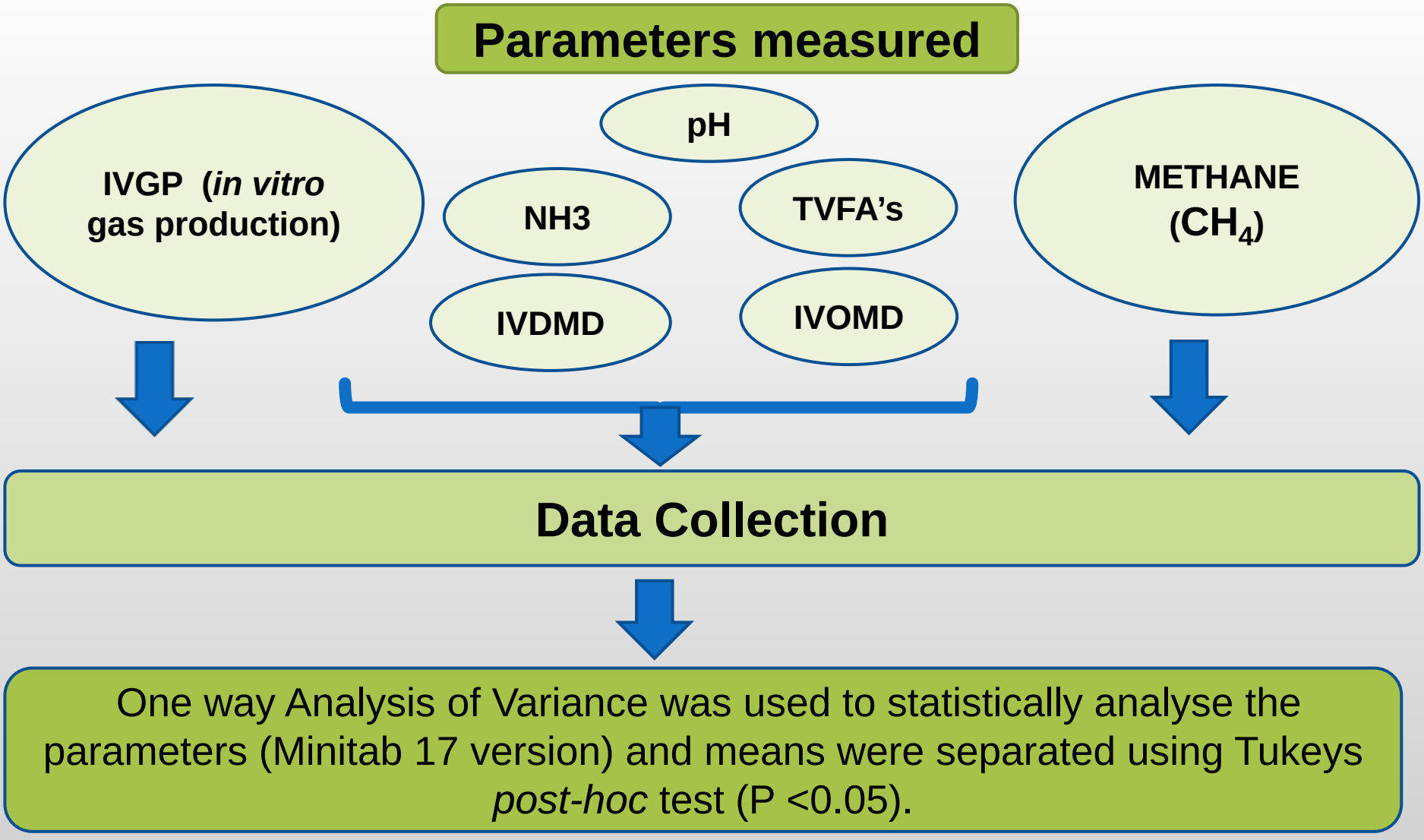
Place plunger into syringe

Set the syringes in the water bath at 39C

Part of the syringes were used for some degradability parameters measurement

Part of the syringes were used for gas measurement and methane analysis

MATERIALS AND METHODS CONTD.



Where IVDMD: *in vitro* dry matter degradability
IVOMD: *in vitro* organic matter degradability
TVFA's: Total volatile fatty acids

RESULTS AND DISCUSSIONS

Table 1: *In vitro* ruminal fermentation parameters of the selected forages

Main effect of grasses	IVDMD (g/Kg DM)	IVOMD (g/kg DM)	Methane (L/Kg OM)
P. purpureum	508.34a	494.21a	38.79
P. maximum	431.96b	472.24ab	28.22
B. decumbens	444.49b	445.05b	22.2
A. gayanus	522.37a	517.29a	45.67
Means	476.79	482.2	33.72
SEM	11.7	9.57	4.68
Main effect of Legumes			
G. sepium	616.03a	611.10a	54.13a
L. leucocephala	504.10b	529.05b	17.56b
Means	560.07	570.07	35.85
SEM	22.89	21.85	8.16

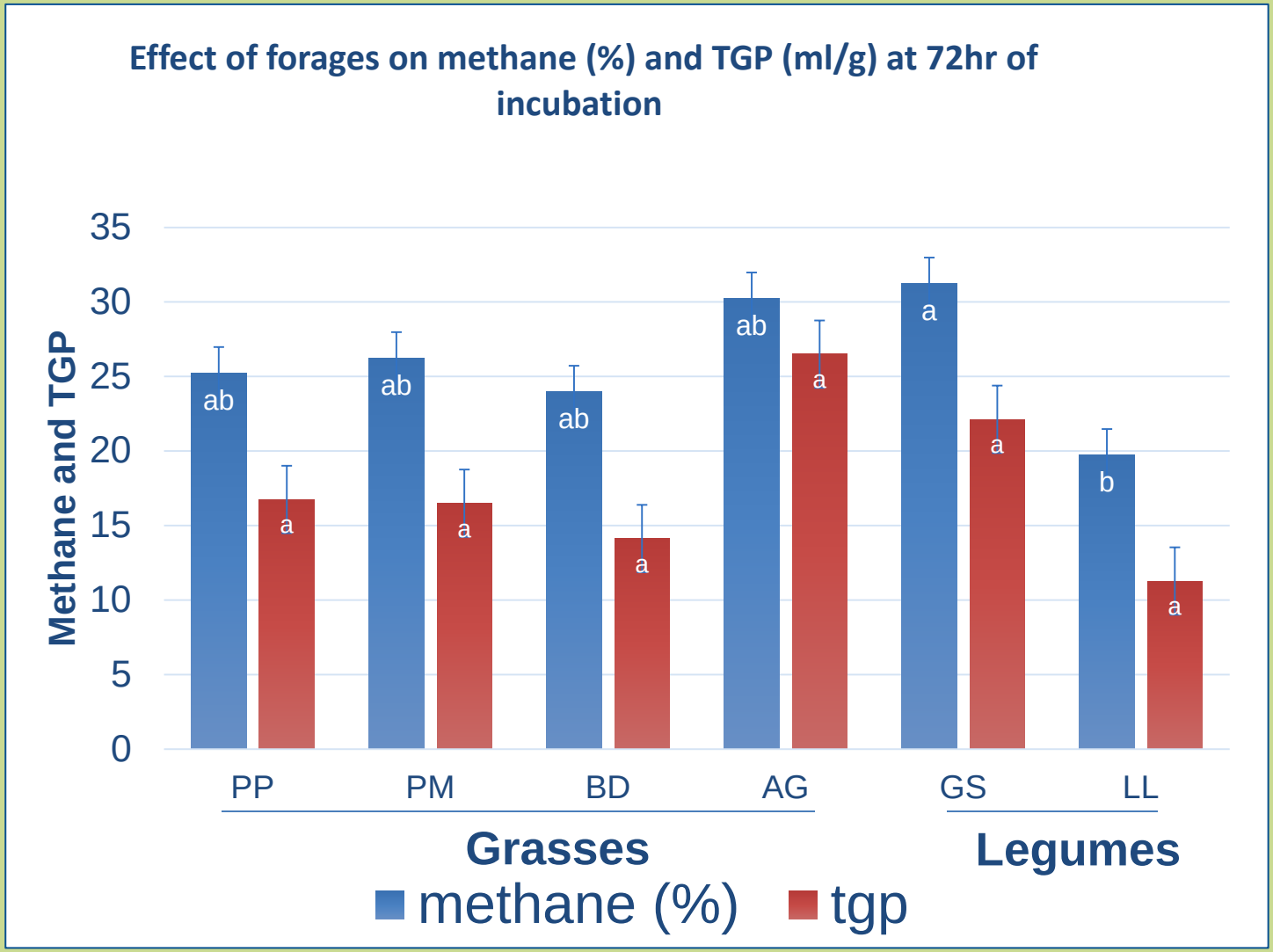
RESULTS AND DISCUSSION CONTD.

Table 2: *In vitro* ruminal fermentation parameters of the selected forages

	NH3	TVFA	Acetate	Propionate	Butyrate	Isovaleric	pH
Main effect of grasses	kg/L			mmol/L			
Control	100.11b	12.67c	10.58b	1.27c	0.41b	0.31a	7.23a
P. purpureum	109.04b	34.40b	20.29a	11.31b	2.46a	0.06c	6.78b
P. maximum	116.08b	31.32b	19.28a	10.77b	0.90ab	0.15b	6.84b
B. decumbens	69.10c	40.68a	22.81a	15.39ab	2.03ab	0.06c	6.77b
A. gayanus	147.06a	41.37a	22.92a	16.54a	1.26ab	0.19b	6.79b
Means	108.28	32.09	19.18	11.06	1.41	0.15	6.88
SEM	6.42	2.46	1.18	1.38	0.29	0.02	0.04
Main effect of legumes							
Control	100.11b	12.67b	10.58b	1.27b	0.41b	0.31a	7.23a
G. sepium	161.38a	39.16a	31.52a	5.23a	1.48a	0.38a	6.86b
L. leucocephala	110.35b	35.10a	29.62a	3.77a	1.08a	0.19b	6.89b
Means	123.94	28.98	23.91	3.42	0.99	0.29	6.99
SEM	8.74	4.24	3.48	0.56	0.16	0.03	0.05

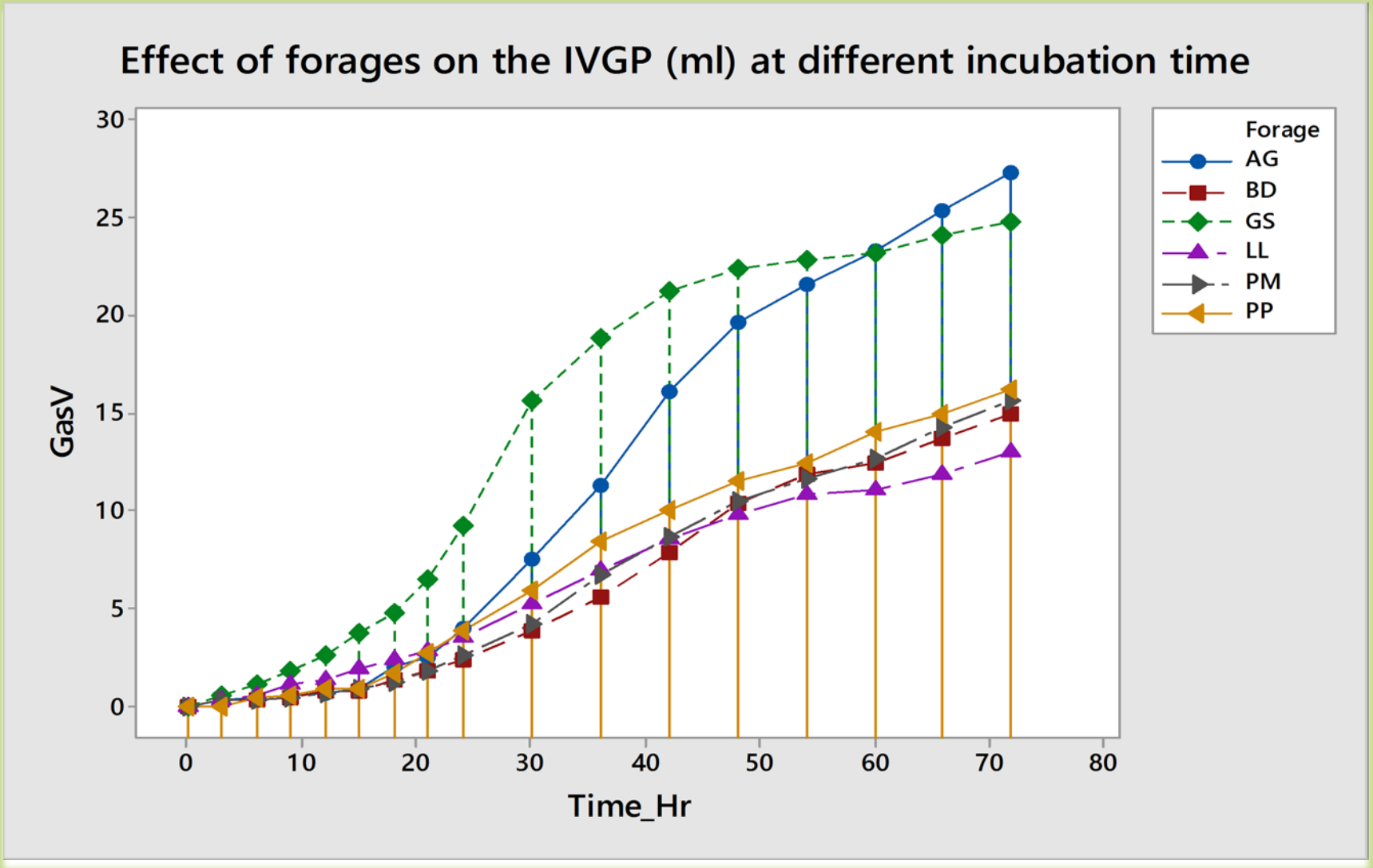
RESULTS AND DISCUSSION CONTD

Figure 2: *In vitro* ruminal fermentation parameters of the selected forages after 72h of incubation



RESULTS AND DISCUSSION CONTD

Figure 3: *In vitro* ruminal fermentation parameters of the selected forages (ml/g)



CONCLUSION

- It appeared that the grasses had low degradability than the legumes.
- This indicates that the grasses cannot supply the rumen microbes with sufficient nutrients needed by them to facilitate degradability.
- This study suggests that if more protein by pass from the rumen is required, *L. leucocephala* will be a better choice than *G. sepium* since its protein is more protected. This modulated the characteristics of the rumen fermentation and reduced the amount of methane produced.
- *A. gayanus* and *B. decumbens* have been identified as the highest and least degradable grasses respectively while *L. leucocephala* has been identified as a possible protein source that encourages higher protein by pass from the rumen.
- Further study therefore intends to investigate these grasses as possible energy sources by biologically improving them with or without *L . leucocephala* supplementation for better ruminant growth.

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Thank you for listening