Fibrolytic enzymes on *in vitro* gas production and degradability of Tifton hay (*Cynodon spp*).

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INTRODUCTION

Brazil's ruminant production system is dependent on grazing native and cultivated grass pastures. Use of exogenous fibrolytic enzymes has shown promise in increasing forage utilization and also positive impacts on improving nutrient utilization in the rumen.

Therefore, the aim of present study was to examine the dose effect of cellulase treated substrate (CTS), xylanase treated substrate (XTS) and equal mixed enzymes treated substrate (METS) on *in vitro* gas production and degradability of Tifton hay substrate.

MATERIAL AND METHODS

- Six adult Santa Inês sheep served as inoculum donors.
- After 24 hours of incubation: fermentation interrupted and rumen degradability

COMMERICIAL PRODUCT

Cellulase enzyme

Xylanase enzyme

Dose effect (0, 2, 20 and 200 International Units (IU) / 500mg DM substrate)

Figure.1-Semi-automatic *in vitro* gas production technique

- Data subjected to ANOVA using GLM.

RESULTS

- Tifton hays (old vs new) showed no effect (P>0.05) among the treatments.
- TDOM and DNDF was not affected by CTS addition (P>0.10).

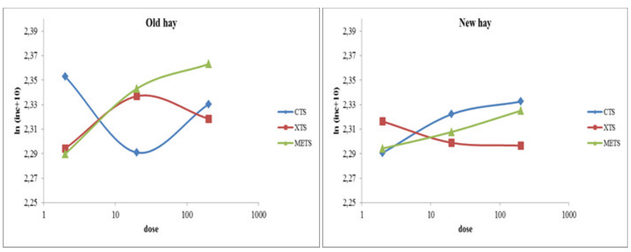

Figure.2-Improvement on DNDF of different hay had showed no significant effect.

Table.1-Effect of enzyme treated substrate on in vitro gas production and nutrient degradability

Particulars	Control	2 IU	20 IU	200 IU	SEM	p-Value
Mixed Enzyme treated substrate (METS)						
TDOM (g/kg)	360.9[a]	348.9[a]	403.7[ab]	439.1[b]	15.79	0.004
DNDF (g/kg)	213.1[a]	198.4[a]	265.8[ab]	309.4[b]	19.44	0.004
GP (mL/g/DM)	93.43[a]	94.07[a]	108.13[ab]	143.05[b]	7.19	<0.01
CH_4 (mL/g/OMD)	1.83[a]	1.88[a]	2.93[b]	5.50[c]	0.40	<0.01
PF	1.70	1.57	1.65	1.32	0.11	0.106
Cellulase treated substrate (CTS)						
TDOM (g/kg)	394.2	400.2	372.4	417.4	12.60	0.131
DNDF (g/kg)	254.3	261.4	227.5	282.8	15.54	0.133
GP (mL/g/DM)	105.3[a]	105.2[a]	105.4[ab]	163.6[b]	4.64	<0.01
CH_4 (mL/g/OMD)	2.48[a]	2.77[a]	2.58[ab]	6.17[b]	0.24	<0.01
PF	1.60[a]	1.63[a]	1.50[ab]	1.08[b]	0.05	<0.01
Xylanase treated substrate (XTS)						
TDOM (g/kg)	349.6	372.4	390.0	373.2	17.39	0.457
DNDF (g/kg)	199.2	227.5	248.9	228.3	21.41	0.459
GP (mL/g/DM)	97.00	100.23	102.90	97.60	5.55	0.872
CH_4 (mL/g/OMD)	2.12	2.40	2.43	2.58	0.28	0.695
PF	1.62	1.57	1.60	1.72	0.11	0.779

- However, In CTS had highly significant effect (P<0.01) on total gas production (mL/g/DM), methane production (mL/g/OMD) and Partition Factor (PF).
- In contrast, XTS addition had no effect (P>0.10) on all the variables evaluated, whereas METS had shown dose effects (P<0.05) for all variables.

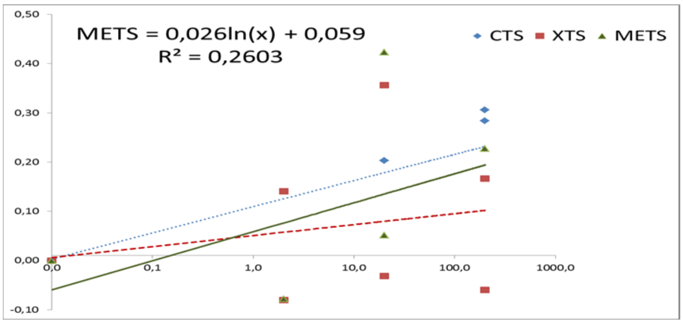

Fig.3 - Improvement on DNDF of METS (DNDFimp = (DNDFwe – DNDFwoe) x DNDFwoe-1) showed significant dose effect (P=0.04).

CONCLUSION

Results suggest that 200 IU per 500 gram of Tifton hay of CTS or METS may improve efficiency of nutrient utilization in rumen.

REFERENCES

– Bueno I.C.S., et al. (2005) Influence of inoculum source in a gas production method. Animal Feed Science and Technology 123, 95–105.

– Dineshkumar, D. et al. 2014. Effect of temperature and pre-incubation time of fibrolytic enzymes on in vitro degradability of Brachiaria (*Brachiaria decumbens*) Animal Production Science 54, 1779–1783.

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