In Vitro Digestibility, Digestion Kinetics and Gas Production Potentials of 'Coastal' and 'Tifton 85' Bermudagrass Supplemented with Varying Levels of Dried Distillers' Grains

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Objective

- To evaluate degradation kinetics and products of degradation from 'Coastal' or 'Tifton 85' bermudagrass (*Cynodon dactylon* [L.] Pers.) supplemented with varying levels of dried distillers' grains (DDG).

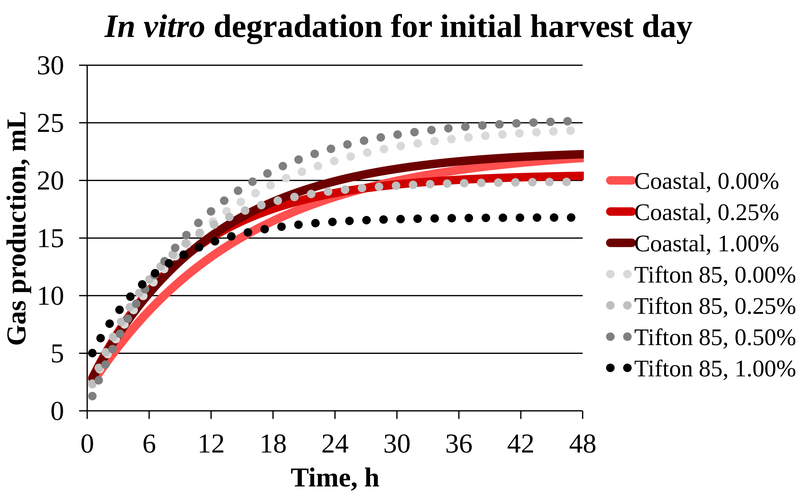
Materials and Methods

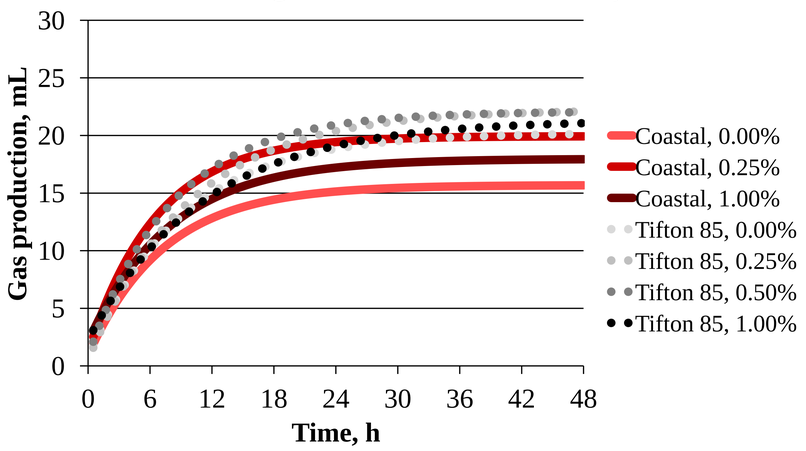
- Samples of Coastal (COS) and Tifton 85 (TIF) bermudagrass were collected from pastures at Texas A&M AgriLife Research and Extension Center, Overton, TX, on 14-d intervals from 10-Jun to 01-Oct, 2014.
- **TIF Experiment:** 16 pastures, 0.6 ± 0.01 ha, steers supplemented (SUP) with DDG at either 0.00, 0.25, 0.50 or 1.00% BW daily for 110 d.
- **COS Experiment:** 9 pastures, 1.3 ± 0.17 ha, steers SUP with DDG at either 0.00, 0.25 or 1.00% BW daily for 96 d.
- Forage samples were created using the SUP proportions and an assumed daily intake of approximately 2% BW as DM.
- Forage samples were incubated in a randomized complete block design (unbalanced incomplete with respect to harvest date) via *in vitro* anaerobic fermentation chamber (Tedeschi et al., 2009).
- Following incubation, headspace was sampled and CH_4 measured using gas chromatography.
- Degradation kinetics were determined using the computer-collected data and fit to single-lag exponential models using Gas Production Fitting System (GasFit; http://nutritionmodels.com/gasfit.html).
- Data analyzed using SAS® PROC MIXED. Fixed effects were Cultivar, Treatment within Cultivar, Day, and the two-way interactions. For missing data, a parsimonious model removing Day and Treatment within Cultivar by Day was used for CH_4 and neutral detergent fiber digestibility (NDFD).

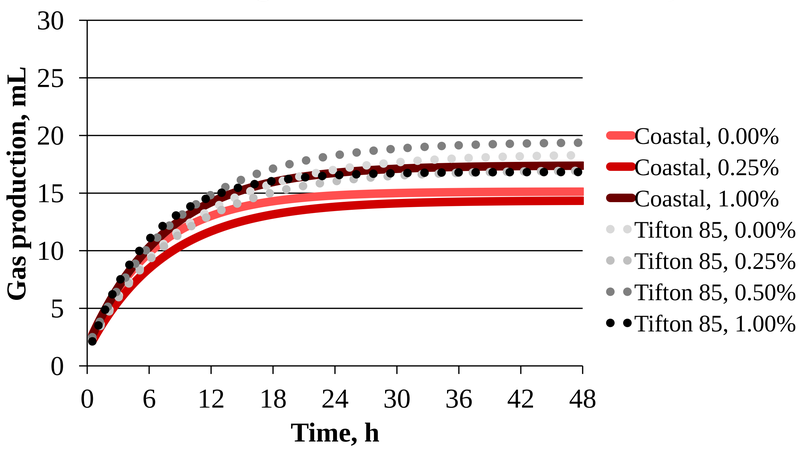
Table 1. Significance measures for fixed effects in the assessment of the effect of bermudagrass cultivar, chronological forage maturity, and supplementation level on *in vitro* degradability and gas production.

Response variable	Cultivar	Treatment (Cultivar)	Day	Cultivar × Day	Treatment (Cultivar × Day)
Asymptote, mL	< 0.01	< 0.01	< 0.01	< 0.01	0.05
Degradation rate, mL h^{-1}	< 0.01	< 0.01	0.02	< 0.01	0.02
Lag time, h	0.02	0.18	0.32	0.65	0.11
CH_4, mM	0.60	0.02	.	0.21	.
NDFD, g 100 g^{-1}	< 0.01	< 0.01	.	< 0.01	.
NDFD rate, g 100 g^{-1} h^{-1}	0.83	0.65	.	0.10	.

Figure 1. Selected plotting of *in vitro* degradation of bermudagrass cultivars as influenced by harvest day and DDG supplementation level.







Conclusions

- Tifton 85 appeared to have a greater extent of degradation than COS. The potential extent of degradation generally decreased with increasing SUP level.
- Rate of degradation was greater from TIF initially, but the difference subsided with increasing chronological maturity (day).
- Methane production was greatest with either 0.50 or 1.00% BW DDG, but appears to minimize with low level of DDG (0.25%).
- Supplementation with DDG may decrease methane production at low levels, but this may be done at the expense of diet digestibility.

Figure 2. Methane concentration as influenced by DDG supplementation level within bermudagrass cultivar.