

Utilizing ensiled culled potatoes and bahiagrass hay as a winter-feeding option for beef cattle

T. Wilson*, FAAAA, M. Hersom, W. Mussoline, C. Prevatt

Introduction: Building on pilot data collected in 2017, a field demonstration was conducted that involved ensiling low-quality bahiagrass hay and spring harvested cull potatoes to develop a feed resource that could potentially be used to meet the nutritional requirements of cattle during the winter months.

Methods: In May 2018, 23,500 lbs. of silage was prepared using a mixture of 70% potato and 30% low quality bahiagrass hay (as fed basis) to determine if a value-added product could be developed. Hay and potato samples were tested independently of each other to determine the nutritional value of each feedstuff used at ensiling.

Results: On DM basis, for bahiagrass hay was 6.5% CP and 49% TDN and cull potatoes was 11.5% CP and 82% TDN prior to ensiling. Silage samples were taken in September 2018 (120-days after ensiling) and tested for nutrient composition and mycotoxins. Some mycotoxins were detected but were well below acceptable thresholds. The finished potato silage feed tested 8.55% CP and 53.75% TDN. Compared to hay alone, the silage resulted in an increase of 2.05% in CP and an 4.75% increase in TDN. In March 2019, 10 feeder steers were weighed (600 lb. avg.) and placed in a dry-lot to be fed a combination of approximately 40 lbs. of potato silage and 5 lbs. of dried distillers grain/hd/day for approximately 24-days. Cattle gained 1.435 lbs./hd/day for the feeding period. An economic analysis was conducted, and it was determined the cost of gain for this feedstuff, using industry standards, was \$1.46/lb. Compared to other feedstuffs, cost of gain would need to be between \$0.50 to \$0.70/lb. to be competitive.

Conclusion: Although this feedstuff does not meet all the nutritional needs for cattle during the winter months and its cost of gain is higher than other by-products, it does provide an improvement compared to bahiagrass hay when fed alone.

Bahiagrass/potato silage has limitations, but it does provide an improvement compared to bahiagrass hay when fed alone.



Table 1. Nutritional composition of Bahiagrass hay and potato*

Item	Bahiagrass	
	Hay	Potato
Dry Matter, %	92.6	15.7
TDN, %	49.0	82.0
Net Energy maintenance, Mcal/lb	0.36	0.90
Net Energy gain, Mcal/lb	0.12	0.60
Crude Protein, %	6.50	11.5
ADF, %	40.8	5.30
NDF, %	72.4	6.6

*Analysis on DM basis

Table 2. Comparison of upcycled Bahiagrass hay and potato ensiled mixture to Bahiagrass hay*

Item	Hay:Potato Mixture	
	Silage	Diff. Silage and Hay
Dry Matter, %	39.7	-52.9
TDN, %	52.8	4.75
Net Energy maintenance, Mcal/lb	0.46	0.10
Net Energy gain, Mcal/lb	0.21	0.09
Crude Protein, %	8.55	2.05
ADF, %	32.3	8.60
NDF, %	50.4	-22.0
Ammonia, %	0.58	0.58
Starch, %	24.0	20.5
VFA Score	4.40	
Lactic Acid, %	1.57	1.57
Total Acid, %	3.11	3.11

*Analysis on DM basis

Table 3. Bahiagrass hay-potato silage cost*

Cost Item	\$/lb.	\$/head/day	\$. 24 days	Cost of Gain (COG)
Silage Bunker	\$0.01	\$0.46	\$11.04	\$0.32
Cull Potatoes	\$0.02	\$0.67	\$15.99	\$0.46
Bahiagrass hay	\$0.04	\$0.42	\$10.08	\$0.29
Dried Distillers Grain (DDG)	\$0.11	\$0.53	\$12.60	\$0.37
Feeding Mach. & Equipment	\$0.00	\$0.02	\$0.53	\$0.02
Total Feeding Costs	\$0.18	\$2.09	\$50.24	\$1.46

*Feeding 600 lb. feeder steers