Comparison of Different Management Techniques on Hay Wastage in Horses Fed Coastal Bermudagrass Square Baled Hay

Matthew L. McMillan
Marcy M. Beverly
Stanley F. Kelley
Kyle R. Stutts
Lesley R. McMillan
Sam Houston State University, Huntsville TX 77341

ABSTRACT

Twelve two-year old Quarter Horses in training were used to determine the amount of Coastal bermudagrass hay (*Cynodon dactylon* L.) (Coastal) wastage and incidence of colic when hay was fed in a commercial type feeder versus on the ground. A 2 x 2 Latin Square Design was used as the experimental design. Horses were housed in 3.048m x 4.267m box stalls and offered Coastal at 1.75% their body weight. In treatment 1, horses were offered Coastal on the ground for 14 continuous days. In treatment 2, horses were offered Coastal hay in a common commercial feeder for 14 continuous days. Collection of waste was conducted twice daily one hour prior to next feeding. Waste included any hay on stall floor, or any that may have fallen behind feeder or immediately in front of stall. Once waste was collected all remains were dried, weighed, and recorded. Signs of colic were observed before and after every feeding. No differences were seen in dry matter intake between treatment groups. Wastage (DM) was lower (P<0.001) when Coastal was fed in a commercial feeder versus when fed on the ground. No signs of colic were observed throughout the trial.

KEY WORDS: Coastal bermudagrass, horse, waste

INTRODUCTION

The price of hay in the United States has increased in recent years due to increased fuel costs and lack of supply due to drought. To compound the problem, feeding and storage practices of hay have also contributed to large annual economic losses (Gibbs, 2007). The combination of these variables has made horse ownership become increasingly more expensive. Square baled hay is generally used when horses are fed in a stall setting (Parker, 2003). Some producers prefer to feed their horses on the ground while others prefer to feed in a feeder. Opinions vary on each practice. Some believe that feeding hay on the ground is a more natural way to feed, is safer, and helps reduce ingestion of foreign materials. However, others believe that by feeding hay in a feeder, chance of colic and waste of hay may be reduced (NRC, 2007). Therefore, a better understanding of wastage and consumption of Coastal being fed to horses in a stall setting is needed to help producers make smart decisions in the current economy. The

study had two objectives. 1: To determine the amount of Coastal wastage when horses were fed hay in a commercial feeder versus on the ground in a stall setting and 2: To determine the amount of colic that occurred when horses were fed Coastal in a commercial feeder versus on the ground in a stall setting.

MATERIALS AND METHODS

Twelve two-year old Quarter Horses in training were used to determine hay waste when fed Coastal on the ground or in hay feeders while being housed in 3.048m x 4.267m stalls. A 2 x 2 Latin Square design was used as the experimental design. On day 0 horses were dewormed with a common commercial anthelmentic, placed in stalls, and offered Coastal hay at 1.75% of their body weight on the ground inside the stall area. Horses were fed for 7 days before collection began to allow for any adjustment necessary to the Coastal. Horses were fed at approximately 7:00 am and 4:30 pm daily. On day 7, horses were weighed. Horses then received Coastal hay at 1.75% of their body weight on the ground for 14 continuous days. On day 15, horses were fed Coastal in the feeder for another 14 continuous days. Waste collection occurred daily one hour prior to next feeding. Signs of colic were observed before and after each feeding. The Coastal waste consisted of any hay that was on the stall ground. The process of collection consisted of hand picking through the stall to collect the Coastal waste. To insure the hay outside of the stall was included, the aisle way was swept twice daily. The Coastal waste from the front of the stalls was included and added to the total waste of that stall. The Coastal waste from each stall was collected, dried, and weighed. The same collection processed was used in both treatments; however in treatment two, all of the Coastal that remained in the feeder was considered to be edible and therefore was not considered waste. Horses were exercised daily. Stalls were cleaned of urine and fecal material daily. Clean, fresh water was provided free choice. Upon placing hay in stalls, each flake of hay was sampled for dry matter analysis and nutrient composition (Table 1). After trial was completed, statistical analysis was performed to determine differences amongst treatments

Table 1. Nutrient Analysis of Coastal Bermudagrass Hay[a]

Item	Value
DM, %	90.25
ADF[b],%	31.93
CP[c], %	11.12
TDN[d], %	53.86
Ca, %	0.28
P, %	0.18

[a]All values except DM, % are expressed on a DM basis
[b]ADF = acid detergent fiber
[c]CP = crude protein
[d]TDN = total digestible nutrients

RESULTS

Hay waste on a DM basis was lower (P<0.001) when hay was fed in a feeder versus when fed on the ground (Table 2). The mean percent waste for Coastal when fed on the ground, was 19.55% whereas, when fed in a feeder only 6.08% was wasted. No differences were found in dry matter intake (DMI) between treatment groups. No signs of colic were observed throughout the study.

Table 2. Dry Matter Intake and Waste of Coastal Bermudagrass Hay when Fed on the Ground Versus in Feeder

Item	TRT 1[a]	TRT 2[b]	P Value
DMI, kg	2.3	2.31	0.967
Mean Waste, kg	0.561[c]	0.149[d]	<0.001
Waste, %	19.55[c]	6.08[d]	<0.001

[a] Hay fed on ground
[b] Hay fed in feeder

DISCUSSION

In this study it was found that feeding Coastal on the ground in a stall setting resulted in a higher waste than when compared to being fed in a feeder. This appeared to be true primarily because commercial feeders helped to reduce waste caused by urine and fecal contamination, trampling, and hay used for bedding. Similar results were found by Lawrence and Coleman (Lawrence and Coleman, 2000). No differences were found in DMI and no signs of colic were observed throughout the study. However, when hay was fed on the ground more (P<0.001) waste occurred when compared to feeding hay in a feeder. Due to this large significant difference, economic loss would be much greater when hay is being fed on the ground. Table 3 demonstrates the dollar loss value associated with the different feed management practices. If considering the typical mature horse weighing 1,000 pounds and consuming approximately 6.8 kg of hay per day while also assuming that a typical Coastal square bale would weigh approximately sixty pounds; that horse would consume approximately 100 bales per year. If an average bale costs $8.00 the consumer would lose approximately $107.76 a year if they chose to feed hay on the ground versus in a feeder. This number rapidly increases with the addition of more horses. Further, the moderate size horse farm owning or training ten horses could potentially lose over $1,000 per year, where the larger horse farm could lose over $5,000 per year if hay was fed on the ground. Results from this study conclude that feeding Coastal in a feeder reduces waste as well as economic loss.

Table 3: Difference In Waste Over Time Between Feeding on Ground Versus in Feeder

Item	19.55% Loss	6.08 % Loss	$ Difference
1 bale at $8.00	$1.56	$0.49	$1.08
10 bales at $8.00	$15.64	$4.86	$10.78
50 bales at $8.00	$78.20	$24.32	$53.88
100 bales at $8.00[a]	$156.40	$48.64	$107.76
500 bales at $8.00[b]	$782.00	$243.20	$538.80
1000 bales at $8.00[c]	$1,564.00	$486.40	$1,077.60
2000 bales at $8.00[d]	$3,128.00	$972.80	$2,155.20
5000 bales at $8.00[e]	$7,820.00	$2,432.00	$5,388.00

[a]Average consumption of 1 horse over 1 year
[b]Average consumption of 5 horses over 1 year
[c]Average consumption of 10 horses over 1 year
[d]Average consumption of 20 horses over 1 year
[e]Average consumption of 50 horses over 1 year

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