



Research

Effect of grazing muzzles on the rate of pelleted feed intake in horses



Erin B. Venable*, Stephanie Bland, Victoria Braner, Natalie Gulson, Michael Halpin

Department of Animal Science, Food and Nutrition, Southern Illinois University, Carbondale, Illinois

ARTICLE INFO

Article history:

Received 26 November 2014

Received in revised form

21 September 2015

Accepted 4 October 2015

Available online 20 October 2015

Keywords:

choke

equine

grazing muzzle

feed intake

ABSTRACT

Esophageal obstruction or “choke” is a relatively common occurrence in equines. It often results from improper mastication, consuming feed too quickly, dehydration, or a decrease in saliva production. Esophageal obstruction is a medical emergency during which a horse cannot dislodge a bolus of feed from the esophagus and must wait for human intervention or for the block to be softened and moved by peristalsis. This condition may result in the formation of ulcers, esophageal rupture, aspiration pneumonia, and possibly death. Grazing muzzles have been shown to slow the rate of forage intake. We hypothesized that grazing muzzles could also be used to decrease the rate of pelleted feed intake and so possibly reduce the risk of equine esophageal obstruction in horses fed large meals of pelleted feed. The objective of this research was to compare the rate of pelleted feed intake for horses wearing grazing muzzles to those wearing no muzzle. Using a crossover design, horses were randomly assigned to 3 groups with each horse receiving each treatment. Treatments were as follows: no muzzle, easy breath grazing muzzle, or tough 1 nylon grazing muzzle. Eight adult stock-type horses aged 5 ± 1 years were offered 2.27 kg of pelleted concentrate to consume in a 10-minute period once daily. The study was comprised of 3 periods (5 days each) with a 2-day resting period between each. Horses were weighed daily and no significant change in bodyweight was observed. Data for daily intake were analyzed using the PROC MIXED procedure of SAS with significance established at $P < 0.05$. Both the easy breath grazing muzzle and the tough 1 nylon grazing muzzle reduced rate of intake ($P < 0.05$) during a 10-minute feeding interval as compared with no muzzle. The findings of this study revealed that grazing muzzles may be a viable option to reduce the rate of intake of pelleted feed, which may benefit horses susceptible to choke as a result of rapid feed ingestion.

© 2016 Elsevier Inc. All rights reserved.

Introduction

Equine esophageal obstruction, or “choke,” is a dangerous condition and the most common source of esophageal complications (Duncanson, 2006). Choke occurs when a bolus of foodstuff becomes lodged in the esophagus and must be removed either through the action of salivary lubrication, which is often inadequate, or human intervention (Hillyer, 1995). Choke is generally a result of improper or inadequate mastication, consuming pelleted feed too quickly (bolting), or insufficient salivary production (Kobluk et al., 1995). Signs of esophageal obstruction include dysphagia, excessive drooling, nasal drainage, coughing, halitosis, spasms of the neck muscles, and repeated swallowing (Hillyer, 1995). In addition, there may also be a visible mass in the throat

area. Esophageal obstruction blocks the esophagus and prevents the passage of feed and liquid and, if present for long periods of time, can cause permanent damage to the esophagus. Damage due to choking includes esophageal ulcers, impaction colic, aspiration pneumonia, and potentially death (Kobluk et al., 1995). Treatment for choke is problematic as it involves insertion of a tube down the afflicted horse's throat and flushing out the bolus. This procedure can cause additional trauma to the esophagus and, in severe cases, surgical removal of the bolus may be necessary (Hillyer, 1995).

Because a majority of choke incidents are caused by rapid intake of feedstuff, decreasing the rate of intake and encouraging proper mastication is critical to prevent choke (Frape, 2008). Many horse owners use grazing muzzles to slow the intake of forages (Glunk et al., 2014a,b; Longland et al., 2011). We hypothesized that grazing muzzles could also be used to decrease the rate of pelleted feed intake and possibly reduce the risk of equine esophageal obstruction. The objective of this research was to compare the rate of pelleted feed intake for horses wearing 2 different types of grazing muzzle with those wearing no muzzle (NM).

* Address for reprint requests and correspondence: Erin B. Venable, Department of Animal Science Food and Nutrition, Southern Illinois University, 1205 Lincoln Drive, Carbondale, IL 62901, Tel: +1 (618) 453-1358; Fax: +1 (618) 453-2090.

E-mail address: evenable@siu.edu (E.B. Venable).

Methods

Institutional Animal Care and Use Committee approval was obtained before the initiation of this study. All researches were conducted at Southern Illinois University Equine Center, Carbondale, Illinois. Eight Southern Illinois University–owned horses, 2 geldings and 6 mares, aged 5 ± 1 years (mean \pm SD), and with a bodyweight of 491 ± 35 kg (mean \pm SD), current with vaccinations and in good dental health were used. The grazing muzzles included the Easy Breathe Grazing Muzzle (EBM; JT International Distributors, Inc., Indianapolis, Indiana) and Tough 1 Nylon Grazing Muzzle (TNGM; JT International Distributors, Inc., Indianapolis, Indiana). The EBM has a single central rectangular opening with an area of 6.35 cm. The TNGM has a single circular opening with an area of 1.99 cm.

Before the start of this study, horses were acclimated to both muzzles for 1 week by wearing them during normal morning feeding. Horses were randomly assigned to treatment groups with data collection occurring during 3 periods (5 days each) with a 2-day resting period. The study was designed such that the third and final period served as the control for all 8 horses. This was done in an effort to prevent negative associative behavior that may arise with daily muzzle use. Authors were concerned that the horses would become “trained” to the muzzles and would delay eating until the muzzles were removed. Prior research has demonstrated that horses are adept at learning and can discriminate between new stimuli with very few reinforcements needed (McCall, 1990). In addition, the horses used for this study had been recently cecally cannulated ($90 \text{ days} \pm 1$) using a 2-stage surgical technique (Beard et al., 2011), and the authors wanted to be certain that all control measurements were collected simultaneously to ensure that the surgical healing process was similar across treatments. The adaptation of this randomized, crossover design was used with a repeated measures component such that each horse would provide data in each period and would receive each treatment (Vonesh and Chinchili, 1997).

At the start of each period, each horse was removed from grass pasture at approximately 1600 hours and placed in separate identical 3×4 meter stalls with *ad libitum* access to water and a salt

block. Each horse was offered 2.27 kg of pelleted grain (Strategy Purina Animal Nutrition LLC, Shoreview, MN) and 2.27 kg of mixed grass hay. At approximately 2200 hours, the hay was removed from the stalls and horses were weighed using a digital livestock scale. Horses were fasted overnight to ensure adequate appetite for the morning meal. At approximately 0600 hours, the horses were offered 2.27 kg of pelleted feed in 68-liter, oval pans (Tuff Stuff Products, Terra Bella, California) for a 10-minute feeding interval. After the completion of the 10-minute feeding interval, feeding pans were removed from the stall. Spillage and orts were measured to calculate total consumption. The horses were then allowed to finish any uneaten portion (as required for Institutional Animal Care and Use Committee compliance) before being turned out to pasture for the day. Air temperature was taken every morning at 0600 hours.

Data were analyzed using SAS version 9.4 (Cary, North Carolina). Each treatment had 8 horses except TNGM, which had 7 horses because of an unrelated health issue in a single horse. Consumption data were analyzed as repeated measures (Littell, et. al., 1998) using the MIXED procedure of SAS with significance established at $P < 0.05$. Spillage data were analyzed using the PROC NPAR1WAY procedure of SAS with the Kolmogorov-Smirnov test to check for significance between treatment groups.

Consumption data are reported as the differences of least square means with fixed effects of horse, time, treatment, and treatment \times time analysis using a Tukey’s post hoc test to test for significance between each group. Spillage data are reported as means per morning feeding event.

Results

Both the EBM and the TNGM grazing muzzles caused a decrease ($P < 0.001$) in rate of pelleted feed intake during the 10-minute feeding interval as compared with the NM treatment (Figure 1). Although there was no effect of day ($P > 0.05$), there was an effect of treatment \times day interaction ($P < 0.05$). The authors have concluded that this interaction effect may be the result of a behavioral artifact associated with the NM group and their reduced intake on day 1. Student observers reported that the

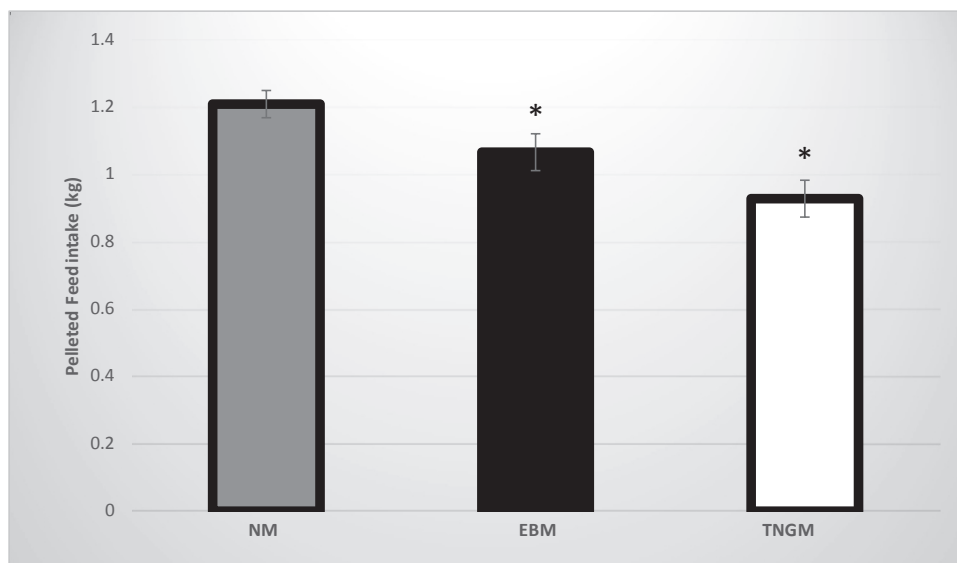


Figure 1. Effects of no muzzle (NM), easy breathe muzzle (EBM), and tough one grazing muzzle (TNGM) on pelleted feed intake (kg) consumed in a 10-minute feeding event. *Means differ among groups ($P < 0.05$).

Download English Version:

<https://daneshyari.com/en/article/8484306>

Download Persian Version:

<https://daneshyari.com/article/8484306>

[Daneshyari.com](https://daneshyari.com)