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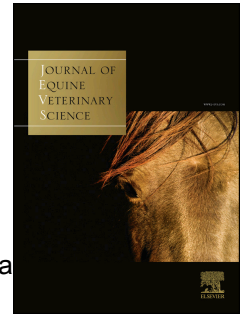
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# Dry matter intake and apparent digestibility of nutrients in the ration of Mangalarga Marchador weanling horses fed sorghum silage versus grass hay

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**Abstract:** In central Brazil, there are two well defined climatic periods, the rain and the dry season, the latter being marked by massive forage shortages in pastures. In this context, forage conservation such as making hay and silage for herbivores is imperative during the dry season. Grass hay is most commonly used for horses but sorghum silage is often used for ruminants. The objective was to compare the nutrient digestibility, fecal production and dry matter intake of sorghum silage (*Sorghum bicolor* L. moench- cv. BRS 655) to that of Vaquero hay (*Cynodon* CV. 90160 CD x CV. Mirage). Twelve Mangalarga Marchador fillies (8 months of age) were divided into two groups: S (sorghum silage, n=6) and F (Vaquero hay, n=6). The ration was formulated to supply 3.0% body weight in dry matter per day, with a forage:concentrate ratio of 50:50 on a dry matter basis. The concentrate used was a corn-based ration formulated to meet or exceed requirements for growth when fed at 1.5% BW dry matter to young horses. The animals were housed in individual stalls (3x3m) for a period of 25 days, with 21 days for adaptation, followed by four days of total collection of feces. During the collection period an external marker of digestibility, Purified and Enriched Lignin - LIPE<sup>®</sup> was added to the concentrate as an external marker to determine the apparent digestibility coefficients of dry matter, crude protein, gross energy, neutral detergent fiber, acid detergent fiber, hemicelluloses, and cellulose. The forage dry matter intake was calculated by subtracting the quantity supplied at each meal minus the amount of forage that was not eaten by the next meal (orts). The measures of digestibility of the sorghum silage were not different (P>0.05) from that of Vaquero hay. However, dry matter intake of the sorghum silage was lower (P<0.05) than the Vaquero hay and may be of concern if fed for prolonged periods of time and not supplemented with carefully balanced concentrates. LIPE<sup>®</sup> can be used as a marker for evaluation of digestibility of nutrients in weanling horses.

Keywords: digestibility, LIPE<sup>®</sup>, sorghum silage, weanling horses

## 1. Introduction

Young horses reach 90% of their final height by twelve months of age [1]. In order to reach their genetic potential, it is necessary that they receive proper nutrition during this critical period of rapid growth. It is important to determine how to provide adequate nutrients to sustain growth even in periods of the year when there is low forage quantity and quality on pastures [2].

In central Brazil, there are two well defined climatic periods, the rainy and the dry season, the latter being marked by massive forage shortages in pastures. In this context, conserved forages such as hay and silage are usually supplemented to herbivores during the dry season. Grass or legume hays are used most often in equine nutrition during the dry period. The use of ensiled forages is well accepted primarily in the feeding of ruminant animals [3].

For adult horses grain silages have already been tested with satisfactory results on the digestibility of nutrients [4, 5, 6]. However, there are few studies of the use of sorghum silage as a sole source of roughage in equine nutrition, especially with respect to young, rapidly growing horses.

To properly evaluate a feed's digestibility, it is necessary to measure the consumption and to calculate apparent digestion coefficients of nutrients by subtracting what is lost in the feces from what was known to be consumed. For this, the best technique is to do total collection of feces over a period of 3 to 5 days, which requires confinement of animals. However, for animals maintained on pasture it is necessary to use indirect methods to estimate digestibility and intakes, such as the use of indigestible external markers. The external indicator Purified Lignin Enriched (LIPE<sup>®</sup>) has been validated as such a marker for various species, such as sheep, rabbits, pigs and birds [7] and, for the equine species, it has been used successfully since 2009 [7, 8, 9, 10, 11, 12, 13].

The objective of the current study was to compare intake and nutrient digestibility of rations in weanling fillies that were fed sorghum silage (*Sorghum bicolor* cv. Moench CV. BRS 655) to that of fillies fed Vaquero hay (*Cynodon* cv. 90160 CD x cv. Mirage) as the only source of roughage in the dry period. The hypothesis was that the sorghum silage would have higher values of digestibility of nutrients when compared with vaquero hay. A second objective was to compare the apparent digestion of nutrients using both LIPE<sup>®</sup> as external indicator of digestibility to total collection of feces, in order to further validate its use in horses.

## 2. Materials and methods

This study was approved by Committee of Ethics and Animal experimentation - CEUA, of the Federal University of Minas Gerais (UFMG) in Belo Horizonte, Minas Gerais, Brazil, registration number 207/2014.

The experiment was performed at Haras Catuni, in Montes Claros, Minas Gerais and lasted 25 days. During the test of digestibility, maximum and minimum temperatures were 31 °c and 17° C and the average relative humidity was 50.7%.

Twelve weanling Mangalarga Marchador fillies (8 months of age) were selected for use in the study. Weanlings were paired based on weight and age and divided into two groups of six animals: S: fed sorghum silage (*Sorghum bicolor* L. moench- cv. BRS

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