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Original Research

Efficacy of Wearing Grazing Muzzles for 10 Hours per Day on Controlling Bodyweight in Pastured Ponies

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ABSTRACT

Five, nonobese, adult ponies were pastured for 23 hours daily, either grazing freely (freegraze) or fitted with a grazing muzzle (muzzle) for 10 hours, from 8 AM to 6 PM. The trial was a crossover design, with 2, 3 week periods, in the summer of 2014. Ponies were acclimatized to grazing and drinking through their muzzles before the trial. Ponies were weighed on alternate days at 8 AM and 6 PM, and the daily average determined. Average daily changes in bodyweight (as a percentage of bodyweight) for four of the ponies when on treatment freegraze were 0.289 ± 0.109 being significantly greater than the -0.039 ± 0.098 when on treatment muzzle. Daily changes in percentage bodyweight for the fifth pony when undergoing treatment muzzle averaged 0.313 per day. Because of the rapid weight gain observed when this pony was muzzled, it was withdrawn from the trial and did not undergo treatment freegraze. There was an apparent learning phase during the first week of treatment muzzle, as changes in percentage bodyweight at the end of week 1 of this treatment averaged losses of −0.216, versus daily increases in percentage bodyweight of 0.073 and 0.029 for weeks 2 and 3, respectively. Corresponding values for treatment freegraze were 0.265, 0.283, and 0.322 for weeks 1, 2, and 3, suggesting a fairly constant mean daily weight change across the 3-week period. Thus, overall, use of grazing muzzles for 10 hours per day generally reduced the rate of weight gain in most, but not all animals.

1. Introduction

A number of studies in the UK indicate that between 20% and 45% of certain subpopulations of riding horses in the UK are overweight or obese [1,2]. Obesity in equines is associated with a number of health disorders, including metabolic conditions such as insulin resistance [3], laminitis [4], and impaired reproductive efficiency [5]. Furthermore, obesity in other species is associated with increased risk of many conditions including arthritis [6] and compromised cardiovascular health [7].

Many equines in the UK have 24 hours access to grazing, particularly during the late spring, summer, and early autumn months. Such management may be perceived as being ideal, enabling the animal to graze freely, exercise, and engage in social behavior on the one hand and requires relatively little labor input from the owner, on the other. However, for animals in receipt of minimal structured exercise, constant access to pasture can lead to weight gain and obesity. This is particularly true for native or cob-type animals grazing improved pastures that were developed for highly productive livestock. Indeed, at certain times of year, such improved pastures contain herbage with an energy value that is equal to or exceeds that of a high-energy compound feed [8].

To prevent obesity in susceptible animals at pasture, it is important to control herbage intake and grazing muzzles

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may be used for this purpose. These are partial muzzles that allow restricted amounts of herbage to protrude through an aperture(s) in the base of the muzzle, reducing bite size and intake. Grazing muzzles may be preferred by owners over other methods of herbage intake regulation because they allow the animal to graze larger areas and for longer periods when compared to animals that are turned out for very short periods of time or confined to small, bare paddocks. It has been shown that intakes of pasture by ponies, fitted with grazing muzzles for 3-hour periods, are reduced by ca. 80% compared to when they graze the same pasture for 3 hours without muzzles [9,10]. These ponies were stabled for the remaining 21 hours per day when they were offered restricted amounts of hay. Similarly, the efficacy of grazing muzzles on restricting intakes by horses over 6 hours at pasture also showed a 75% to 86% reduction in intake [11]. However, for animals that have constant access to pasture, owners may muzzle their equids for 9 to 12 hours per day in an attempt to restrict their pasture intakes to some degree. However, it is not known if such a strategy is effective in reducing overall daily herbage intakes, or, if indeed the animals compensate by ingesting disproportionately large amounts of pasture when unmuzzled.

The aim of the present study, therefore, was to determine in ponies with 24 hours access to pasture, the efficacy of grazing muzzles to control their bodyweight when fitted for 10 hours per day.

2. Methods and Materials

2.1. Animals

Five, mature, nonobese equines (1 × Welsh Section A, 2 × Welsh Section B, 1 × Welsh Section D cross, and an Arabian aged 12 ± 3.67 years; height range, 109–147 cm; average initial weight 337 ± 106 kg [range 190–447 kg]; and an average initial body condition score [BCS] of 5.2 ± 0.57) were used. The animals are subsequently referred to as ponies as they did not exceed 148 cm in height. Before the start of the trial, ponies were vaccinated against tetanus and equine influenza, dewormed (Moxidectin), received a dental check and treatment as necessary, and had their feet trimmed. Ponies received 30-minute light exercise 3 times per week largely comprising walk (10 minutes) and trot (18–20 minutes ca. 12 km/hour) with an occasional canter (1–2 min ca.16 km/hour) for a total of 30 minutes.

2.2. Pony Measurements

Bodyweight was determined on a calibrated equine weighbridge (Equiscale, Palway Ltd) which has a reported accuracy of 0.1%. The correct functioning of the weighbridge was determined once weekly by sequentially adding 20 × 25 kg standard weights to the weighbridge and recording the weights. Thereafter, 5 × 0.5 kg weights were incrementally added to the weighbridge and then removed, the weights being recorded on each addition/removal of the standard weights. Subsequently, the weighbridge recordings were checked before each weighing session by recording the weights of 4 × 25 kg standard weights. In the event of any discrepancy between the recorded and known standard weights, the weighbridge was reset until the recorded and known weights were equal. Ponies were initially weighed twice on each weighing occasion. If these two weights were not equal (if, e.g., the animal moved excessively), the pony was reweighed until three equal weights were obtained. Ponies were weighed on alternate days at 8 AM and 6 PM, with the average being used as the weight for that day.

2.3. Grazing Muzzles

Shires Equestrian grazing muzzles were used, which featured a nylon face mask with a solid, round rubber base with a 2-cm, circular aperture in the center, through which limited amounts of forage could protrude. Muzzles were secured by means of a nylon head piece and throat latch. For added security, a headcollar was placed over the entire assemblage to prevent ponies dislodging their muzzles, but fitted so as not to interfere with muzzle use. Ponies were gradually acclimatized to grazing when fitted with muzzles during the 2 weeks before the beginning of the trial. During this time, it was also ensured that each animal was confident in drinking from water troughs while muzzled. To prevent chafing, muzzles were padded with fleece sleeves (Nuumed) at points of skin contact, and ponies' heads were checked daily for any signs of rubbing. The aperture in the base of each muzzle was checked daily. Any muzzle that had an aperture that had become modified in size/shape by the foraging activity of the pony was discarded and exchanged for a new, unmodified muzzle.

2.4. Pasture

The pasture (ca. 2.5 ha) was an old, established, level meadow (>25 years old) and contained mixed grass species including *Lolium, Agrostis,* and *Fesctuca* sp. and a small amount of white clover (*Trifolium repens*). The pasture was closed up from grazing on May 17, 2014. The few broad-leaved weeds (mainly *Rumex* sp.) were spot sprayed with "Grazon 90" (Dow Chemicals). The pasture was treated with an application of micronutrients ("Grasstrac," Yara) and a modest amount of fertilizer (N: P: K, 20:10:10–30 kg N/ha) to encourage moderate but not excessive herbage growth. The pasture was harrowed and rolled and bare areas reseeded. The pasture was topped to a height of 8 to 10 cm before initial grazing and divided by means of electric tape, into two paddocks of equal area, which were grazed sequentially in periods 1 and 2. The ungrazed paddock was kept at a height of 8 to 10 cm by regular topping, to maintain vegetative growth equivalence between paddocks. Each paddock led onto hard standing giving access to automatically filling water troughs, and two field shelters (16 × 12′ and 12 × 24′, floored with rubber matting), each of which contained a salt lick, mounted on the wall.

2.5. Timing

The trial ran from July until September 2014.