

# MULES ARE PHYSICALLY MOTIVATED TO REACH FOOD, WHILE HORSES ARE NOT

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Aiming to better identify environmental characteristics that should improve animal welfare conditions, Dawkins (2006, 2008) has proposed that we should take a deeper look at what animals want. Thus, preference tests have been applied to identify preferred conditions of the animals. Complementing this idea, Duncan (2006) suggested that it is important to evaluate not only what animals prefer, but also the importance of the resources for the animals. Thus, many studies have applied motivation tests to determine how willing are the animals to reach specific resources. In such tests, animals usually need to spend physical effort, such as by pushing a weighed door, to access the resources. Considering horses, studies evaluating the motivation to reach resources are scarce, and basically, as far as we know, there is no study evaluating the motivation of mules. Taking into account that food is usually considered as one of the most inelastic resources that the animals should be more motivated to reach, here we tested the physical motivation of horses and mules to reach concentrated food. To evaluate this, we varied the weight of a portress that gave access to commercial ration during three consecutive days and registered the frequency of motivation behaviors of each individual (n = 8 horses and 8 mules) at the portress. In a first level, we did not add any extra weight on the portress (control condition); in a second level, we added a weight of 200% of the portress weight; and in a third level, we blocked the opening of the portress, preventing the passage of the animals, to measure the maximum effort that they would apply to reach the concentrated food. In each day of test, the sequence of animals being tested was randomized and there was always one individual (never tested) with the concentrated food to better stimulate the tested animals to reach food, as they are very social and hierarchical animals, which are used to feed together. In each day of test, we observed the animals until they overpassed the portress or up to 30 min. The frequency of the following behaviors indicative of effort were registered each 30 s: push the portress with neck, push the portress with snout and beat the portress with a member. We also registered the frequencies of ears movement, ears back and ears forward behaviors as such movements and positions of the ears are some of the most important body expressions of these animals that could be associated with their internal state during the effort test. Considering mules, they expressed significantly more pushes on the portress with neck and positioned ears forward more frequently when the portress was blocked than in control condition (Friedman test,  $P < 0.05$ ). Moreover, the frequency of ears back behavior was higher when the portress was blocked compared to the other two effort levels (Friedman test,  $P < 0.05$ ); and ears movements were more frequent when the portress was blocked than when it had 200% more of its weight

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(Friedman test,  $P < 0.05$ ), but not when compared with the control condition (Friedman test,  $P > 0.05$ ). Surprisingly, horses did not express any significant difference of behavioral frequencies among the three levels of effort. We conclude that mules are physically motivated to access concentrated food, while horses are not. More frequency in ears movements of mules when the portress was closed than when it was added with 200% of its weight, but not when compared to the control condition may indicate that this behavior should be influenced by external factors, such as noise. However, as mules also expressed significant behavioral differences in positions of their ears (forward and back) consistent with the results observed of physical effort spent, this may indicate differences of the internal state of such animals when spending more physical effort to access food.

**Keywords:** equidae, effort tests, motivational response, commercial ration.

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