

Trainability and reactivity of Mustang Horses (*Equus ferus caballus*) fed Forage-Based Total Mixed (TMR) rations with or without added grain

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The relationship between ration and behavior in horses has not been extensively studied, though it is widely thought that the type of feed fed can influence how a horse behaves. For example, rations high in sugar and starch have been documented to increase young horses' reactivity to novel stimuli. Since the temperament of a horse has been linked to the ease with which it can be trained, documenting if a horse's behavior can be altered by its ration would be of interest to the equine industry. We hypothesized that increasing the starch intake of young mustangs by addition of corn or oats to a forage-based total mixed ration (TMR) would alter their reactivity to stimuli and responsiveness to learned commands. To test this hypothesis 8 recently tamed mustangs (4 geldings and 4 fillies, one and two years of age) were used. The mustangs were divided into two groups based on age, sex and temperament. In a series of three experiments they were fed TMR cubes with or without 10% added corn free choice (Exp. 1, Fall 2010), or a basal ration of TMR cubes free choice with morning meals of 1kg TMR cubes versus an equicaloric amount of corn (Exp. 2, Spring, 2011) or oats (Exp. 3, Spring 2011) in a simple crossover design with 2 to 2.5 week adaptation periods for each trial. The horses' trainability and reactivity to stimuli were evaluated before the treatments were initiated and after each adaptation period 60 to 90 minutes after the morning meals were fed. In the tests the horses were asked to perform a standardized series of commands (ie: walk on, turn, stop and stand still, back up), and were then confronted with a novel stimulus, which varied with each trial. A single handler (SLR) led each horse through the tests, which was then repeated on the next day using a student handler instead. Treatments were then switched and the horses were re-tested, so that each horse was tested on each feed type in all 3 experiments. Each horse's performance was scored by 2 judges, who were both professional trainers who had

been assigned 4 horses to train throughout the study. These judges scored the horses' performances as the tests were done. Each test was videotaped for further evaluation by a third judge (D. Ramnath) who was not familiar with the horses and who was blind to the ration being fed. The performances were scored using a numerical scale of 0-5, with 0=total noncompliance and 5=perfect execution of the tasks asked of the horse. There were no differences ($p>0.1$) in responses to commands or reactivity to stimuli between rations in any of the trials or with respect to which trainer had trained the horse. There were, however, differences ($P<0.05$) among horses, handlers and judges with respect to the scores. It appears that addition of a moderate amount of starchy feed to a horse's ration has less influence on the horse's trainability and reactivity than the animal's natural temperament and handler ability.

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