The effects of diet and exercise on the behavior of stabled horses

Davidson, N., Harris, P., Goodwin, D., Cook, S., and Pagan, J.

Although it is widely asserted by horse owners that diet affects the tractability of horses, there have been few controlled studies of this subject. A preliminary trial was conducted to investigate the effects of diet and exercise on the behavior of four stabled horses. The horses were maintained on all combinations of two exercise regimens (light and strenuous) and two diets (forage and mixed forage and grain). Horses were kept on each of the four diet and exercise regimens for a period of four weeks in an order determined by a Latin Square. Observations were made on 3 consecutive days in the second and fourth weeks of each period, during a set handling routine, and on 3 consecutive days in the second week during a four hour period when housed in stalls.

During the handling trials, the horses were observed when being groomed with a rubber curry comb, groomed with a dandy brush, having their hooves picked out, having their faces sponged, having their docks sponged, having fly spray applied, and being fitted with a surcingle-mounted heart monitor. In the second week of each diet/exercise treatment the horses were videotaped while housed in stalls between 12 noon and 4 pm. When in the stalls, five-minute scan sampling of the behaviour of each individual in turn was concentrated on three 30-minutes observation periods constituting the beginning, middle, and end of the four-hour period. Behavior was recorded from videotapes using the Observer 3 and analyzed using multifactor ANOVA in SPSS for Windows.

During the handling trials, the main effect on the behavior of the horses was associated with exercise. Horses which had been only lightly exercised exhibited significantly higher frequencies of a number of uncooperative behavior patterns such as "head evasion" ($F=71.8$ $(1,3)$ $P<0.01$). During the periods of stall housing, diet was found to have a significant effect on a number of behavior patterns. Horses receiving the mixed diet exhibited higher frequencies of "head down" ($F=15.7$ $(1,3)$ $P<0.05$) and "rest leg" ($F=10.8$ $(1,3)$ $P<0.05$) during the third period of scan sampling. Repeated investigation of the floor associated with "head down" and high frequencies of "rest leg" which indicated repeated transfer of weight from one back leg to the other suggest a state of restlessness associated with confinement when maintained on a mixed diet. There was an interaction between diet and exercise for a number of redirected oral behavior patterns such as "lick object" ($F=20.4$ $(1,3)$ $P<0.05$) with highest mean durations being recorded for horses receiving the mixed diet and light exercise. Only one horse exhibited "windsucking" in the trial, and did so only when receiving the mixed diet. Frequency and duration of "windsucking" were highest when receiving a mixed diet and light exercise.

Although this preliminary trial is restricted by a small sample size, it has indicated that both diet and exercise can produce effects on the behavior of the four horses studied. The link between diet and behavior in horses suggested by the trial warrants further investigation.