

Results of Two Studies Conducted at Michigan State University Measuring the Effects of Weightcarrying on Young Horses

Nielsen, B.D., O'Connor, C.I., Rosenstein, D.S., Schott, H.C. and Clayton, H.M. (2002)

Influence of trotting and supplemental weight on metacarpal bone development

Equine Veterinary Journal, S34, 236-240

The objective was to study the effect of carrying weight on bone development during an exercise program. Seventeen horses were divided into three groups: controls exercised counterclockwise in a free-flow exerciser, the weight group performed the same exercise carrying progressively increasing weight up to 45 kg, and the weight supplement group also received a myo-anabolic supplement. Bone mineral content of the third metacarpus (MCIII) was determined on four occasions: baseline (d -108), pre-conditioning following 108 days stall confinement (d 0), mid-conditioning (d 39) and end-conditioning (d 78). Stall confinement resulted in significant loss of mineral in the lateral and medial cortices of both MCIII. During conditioning, weight-carrying increased mineral deposition in lateral and medial cortices of MCIII of the left (inside) leg compared with controls. In the right leg controls had lower mineral content of the lateral cortex at d 39 than weight-carrying horses but no differences between treatments were recorded at d 78. Markers of bone metabolism did not change from baseline to pre-conditioning, but increased from d 0 to d 39 and 78 for all groups.

O'Connor, C.I., Nielsen, B.D., Schott, H.C. and Clayton, H.M. (2002)

Effects of weight carrying, exercise and a myo-anabolic supplement on growth and muscle

Equine Veterinary Journal, S34, 178-181

This study examined the effect of weight-carrying and nutritional supplementation on muscle development and growth. Seventeen horses were divided into three groups: controls exercised in a free-flow exerciser, a weight group that performed the same exercise carrying progressively increasing weight up to 45 kg, and a weight-supplement that group also received a myo-anabolic supplement. Horses were gentled for 30 days then baseline measurements of weight, body condition score, wither height, hip height, forearm and gaskin circumferences, and cross-sectional area of the longissimus dorsi were taken. Horses were stalled for 108 days then conditioned for 78 days. At the end of conditioning, all measurements were taken again. Supplemented weight-carrying horses increased their lean body tissue, as indicated by greater body weight ($P<0.05$) combined with decreased body condition score ($P<0.01$). Greater increases in wither height ($P=0.09$) and hip height ($P<0.01$) were seen in weight-carrying horses and are likely the result of increased muscle tone. Supplemented weight-carrying horses increased forearm ($P<0.01$) and gaskin circumferences ($P<0.05$). It is believed that weight-carrying, when combined with additional dietary protein, enabled greater muscle anabolism.