Quantitative Ultrasound: A Non-Invasive Method for Bone Assessment in Thoroughbred Horses

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In this study we investigated and described the methodology and usefulness of speed of sound (SOS) measurements in horses, using the Omnisense (Sunlight Ltd., Israel) multi-site quantitative device. Twenty-five thoroughbred horses aged 2 years (n=19) and 4 to 10 years (n=6) from both sexes (16 stallions, 9 females) were evaluated for SOS values at three different sites of both third metacarpus (McIII). The probe was placed midway between the apex of the sesamoid bone and the proximal extremity of metacarpus II or IV. The probe was then moved according to the position: lateral, dorsal, or medial. For acoustic coupling, 1000 centistokes silicon oil was applied to the measured sites without prior shaving. Three SOS measurements were taken by the same operator at all three sites. The intra-operator coefficient of variation (CV) was less than 3%, the lowest CV being obtained at the lateral site and the highest CV at the medial site. The average 150 SOS measurements (mean±SD) obtained at the lateral site were 4210±54 m/s compared to the medial (3993±63 m/s) and the dorsal site (3834±93 m/s). We conclude that SOS measurement at the McIII of horse with a multi site ultrasound device appears to be a precise and reproducible technique in thoroughbred horses without prior shaving of the sites. The lowest SOS values are measured at the dorsal site. The SOS values at the lateral site are higher or equal compared to the medial site. The lowest CV achieved on the lateral aspect of McIII compared to the highest CV at the medial site can be explained in horses by a difference in accessibility.

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