Comparison of a Two-Step Insulin-Response Test to a Conventional Insulin-Sensitivity Testing on Insulin-Resistant Horses and Normal Horses

Francois R. Bertin, DVM*; and Janice E. Sojka-Kritchevsky, VMD, MS, Diplomate ACVIM (LAIM)

1. Introduction
Insulin resistance (IR) is important to the equine practitioner because of its association with laminitis and other adverse outcomes. Described methods to assess insulin sensitivity are either not validated in the horse or difficult for practitioners to perform. An insulin-response test has been reported as a safe method to diagnose IR, but clinicians may be reluctant to perform this test because of the time needed to do it. The objective of the study was to compare a two-step insulin-response test to a standard, complete insulin-response test.

2. Materials and Methods
A complete insulin-response test was performed on 12 horses; six were diagnosed as insulin-sensitive and six as insulin-resistant. A two-step insulin-response test consisting of an intravenous injection of 0.1 IU/kg regular insulin and blood glucose determination at 0 and 30 minutes after injection was performed on the same horses. A handheld glucometer was used for glucose determinations.

The times to reach a 50% reduction of glucose baseline (B50) were compared between the two tests and between insulin-resistant horses and normal horses.

3. Results
All the horses tolerated both tests well. The time to reach B50 was not significantly different between the two tests. All insulin-sensitive horses reached B50 before 30 minutes, and all insulin-resistant horses reached B50 after 30 minutes. With a cutoff time of 30 minutes, the two-step test had the same accuracy, sensitivity, and specificity as the complete test. It was concluded that a two-step insulin-response test provided a safe, rapid, and low-cost method to diagnose IR in horses.