Comparison of blood progesterone values obtained from an in-house one hour enzyme linked fluorescent immunoassay (ELFA) with radioimmunoassay (RIA)

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Introduction
Determination of blood progesterone concentration is routinely performed during equine reproduction case management. The goal of this study was to compare an ELFA progesterone assay (mini VIDAS®, bioMérieux) with a previously validated progesterone RIA.

Material and methods

Experiment 1: Serum, heparinized plasma, and plasma samples (n=54) were collected from eighteen mares. Experiment 2: A total of 238 blood plasma samples (EDTA) were collected from 119 mares throughout the estrous cycle. All samples were centrifuged and plasma removed and subdivided into aliquots and frozen. Progesterone analysis was performed using the mini VIDAS® system in accordance with manufacturer’s instructions. Briefly, 200 μl of plasma was diluted with 200 μl of serum free buffer; 200 μl of the diluted plasma was deposited into the test cartridge, and the progesterone program was selected. A second aliquot from each plasma sample was analyzed for progesterone by RIA.

Results

Experiment 1: EDTA plasma was determined to be more accurate than serum or heparinized plasma in measurement of progesterone using the mini VIDAS® system (Figure 1). Experiment 2: A high correlation (Pearson Correlation Coefficient of r=0.75) for progesterone concentrations was obtained between the mini VIDAS® system and RIA across a wide spectrum of progesterone levels (Figure 2). The inter- and intra-assay coefficients of variation were 9 % and 4 %, respectively.

Discussion
The mini VIDAS® one hour progesterone assay was able to provide similar results to a validated progesterone RIA for equine EDTA plasma. Clinically, the ELFA assay would provide a rapid accurate assessment of progesterone concentration and allow for an early informed decision for reproductive management.

Keywords: Equine, progesterone, analysis, validation

Figure 1. Blood serum and plasma progesterone values obtained by the mini VIDAS® system as compared to RIA. The gray line represents a theoretical perfect concordance between test results.

Figure 2. Blood EDTA plasma progesterone values obtained by the mini VIDAS® system compared to RIA. The gray line represents a theoretical perfect concordance between test results.