An accurate assessment of blood progesterone concentrations is critical for optimal reproductive management of broodmares. The goal of this observational study was to compare progesterone concentrations determined by six different endocrine laboratories in a series of identical plasma samples from mares in various stages of reproduction. Blood samples were collected from nine different Quarter Horse mares at various stages of the estrous cycle. Blood was collected into tubes containing EDTA, centrifuged within 10 minutes (1,000 x g for 10 minutes), plasma removed and subdivided into six identical aliquots and frozen at -10°C. Plasma samples were shipped to commercial laboratories on ice using an overnight courier. Four commercial laboratories reported using a radioimmunoassay (RIA) for analysis, while one laboratory used an enzyme immunoassay (EIA) and one laboratory used an enzyme linked fluorescent immunoassay (ELFA). Data are presented as the mean ± SD. Progesterone concentrations for each sample from all six laboratories were within two standard deviations of the mean (i.e. no statistical outliers). However, considerable variation was noted between laboratories for the two samples with the highest P4 concentrations (Sample 1; 8.8±2.8 ng/ml; Sample 3; 6.1±1.9 ng/ml; Figure).

Figure. Progesterone analysis of nine plasma samples by six different endocrine laboratories.

Diagnostically important progesterone values in broodmare management are 1.0 ng/ml, (presence or absence of luteal tissue), and 4.0 ng/ml, (adequacy of luteal function for maintenance of pregnancy). Progesterone values obtained from commercial laboratories are not all identical. There is no uniform standardization between commercial endocrine laboratories.

Keywords: Equine, progesterone, analysis, laboratory