**DIAGNOSIS OF PREGNANCY**

Rectal examination and ultrasonographic examination are the most efficient and cost-effective means of diagnosing pregnancy. However, in some cases that are not amenable to examination per rectum, either due to temperament or size, blood tests can provide a reliable substitute. In late pregnancy, transcutaneous ultrasonographic examination or even foetal electrocardiographic examination provide alternative means of identifying pregnancy and foetal viability.

**Overview of The Endocrinology of Pregnancy**

For the first 14 days of pregnancy, hormone profiles are no different from those of a non-pregnant mare. If maternal recognition of pregnancy occurs, normal prostaglandin production is inhibited and luteal tissue remains resulting in sustained production of progesterone. The corpus luteum is the sole source of progesterone production until day 35.

Maternal endometrial cells (which develop into the endometrial cups) produce equine chorionic gonadotrophin (eCG) from day 35 until around day 120 resulting in luteinisation or ovulation of any mature follicles and therefore a rise in serum progesterone between days 40 and 70. Corpora lutea continue to produce progesterone, maintaining pregnancy whilst the placenta develops. Progesterone concentration peaks at around 100 days and reduces to baseline at around days 180-200 following regression of the luteal tissue. Progesterone remains at very low levels until after days 305-310 when it rises, peaking at around 5 days prior to parturition. Progestins from the foetoplacental unit increase from day 90 to day 180 and then remain at a consistent level before rising dramatically from around day 305 to a peak 5 days prior to parturition. Progesterone levels drop rapidly in the 2 days prior to parturition in association with cortisol production from the maturing foetus.

Oestrogen levels are low until day 35 when they increase beyond levels seen in oestrus before regressing by day 120. The foeto-placental unit produces a number of oestrogenic compounds which first surge at around 60 days and if the pregnancy is healthy continue to increase to around days 210 to 240. Total oestrogen concentrations then decrease up until parturition.

**Measurement of Serum Progesterone**

From days 18-20 progesterone concentration in pregnant mares should remain above 6.3 nmol/L until around day 200 of gestation. However, both false positives and false negatives can occur and measurement of progesterone may therefore be unreliable.

A progesterone concentration of < 6.6 nmol/L for more than 3 or 4 days after 300 days of gestation is likely to indicate imminent abortion or parturition.

**Measurement of Equine Chorionic Gonadotrophin (eCG)**

From days 35-38 until around day 120 detection of eCG indicates probable pregnancy. Concentrations are lower but generally detectable between days 90 and 120. False negative results may occur from samples collected before day 35 and after day 90. Embryonic death does not result in regression of endometrial cups therefore eCG gives no indication of the continued viability and presence of the foetus. False positives may result if embryonic death occurs after day 35 and follow-up measurement of oestrone sulphate after day 100 is recommended if a positive eCG result is obtained. False negatives do occur but are uncommon.

**Measurement of Oestrone Sulphate**

Oestrone sulphate can be detected from day 60 and peaks at around day 150. A concentration of > 6ng/ml after 100 days of gestation is considered positive for pregnancy whilst non-pregnant mares generally have oestrone sulphate concentrations < 3ng/ml. Oestrone sulphate is only produced by a viable foetus and may therefore be used as an indicator of foetal viability as well as being an indicator of pregnancy. Oestrone sulphate is the only endocrine test that gives an indication of whether the foetus is alive. Oestrone sulphate is generally measured in serum. Measurement in urine and faeces has also been reported but is less convenient and may also be less reliable.