



## **PREGNANCY TESTS**

Patrick M. McCue

DVM, PhD, Diplomate American College of Theriogenologists

Economic pressures of the equine breeding industry result in a demand for accurate early pregnancy diagnosis. Some horse owners presume that a mare that fails to come back into heat within 3 weeks after breeding is pregnant. That is not necessarily true. Up to 10% of bred mares that fail to return to heat are not pregnant. Reasons for a non-pregnant mare not coming back into heat include persistence of the corpus luteum (pseudopregnancy), seasonal effects on ovarian function, and some ovarian disorders. The most reliable test for pregnancy is ultrasonography. Pregnancy tests based on hormone levels in blood or urine are generally used only when palpation and ultrasonography per rectum is not possible.

### Ultrasound Examination

Ultrasound has been used for more than 2 decades for early detection of pregnancy in mares. Pregnancy diagnosis by ultrasound may initially be performed 12 to 18 days after ovulation. Ultrasound examination on or before day 16 is also beneficial for the identification and management of twins, scheduling of rebreeding in open mares, and early detection of problems associated with pregnancy. A follow-up examination with ultrasonography is generally recommended between 25 and 35 days of pregnancy to confirm that the pregnancy is still viable. The actual embryo, with a tiny heart beating

regularly, can be seen within the fluid-filled embryonic vesicle after day 25. Mares determined to be open on the follow-up examination prior to day 35 can usually be rebred that season. Administration of prostaglandins will be required to bring these mares back into heat. Unfortunately, most mares that lose pregnancies after day 35 will not cycle again that season or are very difficult to get in foal.

### Hormonal Tests for Pregnancy

Measurement of progesterone in the blood of mares is of limited value for pregnancy diagnosis since normal diestrous mares, pseudo-pregnant mares and some non-pregnant mares with ovarian abnormalities may all have elevated levels of progesterone. In contrast, a very low progesterone level (less than 1 ng/ml) indicates that the mare is very unlikely to be pregnant. Progesterone measurement is valuable in determining if a pregnant mare is producing sufficient progesterone to maintain her pregnancy. Normal progesterone levels vary with the stage of pregnancy so interpretation of progesterone results and management decisions must be made appropriately.

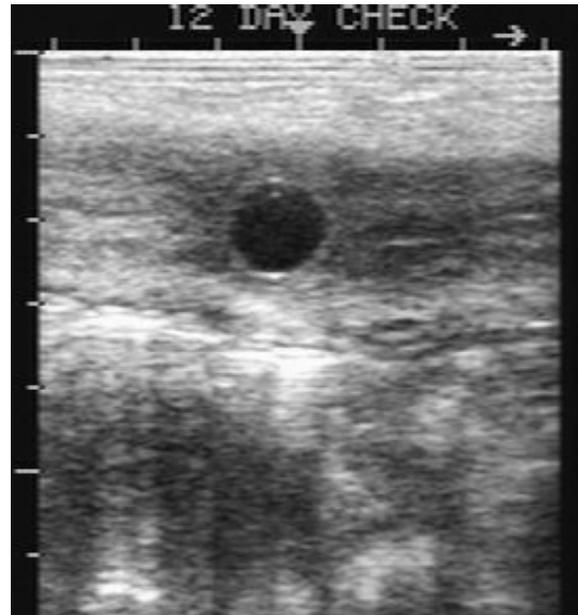
Detection of elevated levels of equine chorionic gonadotropin (eCG) in the blood of mares may be used as a method of pregnancy detection. This hormone is produced from groups of specialized

placental cells called endometrial cups and is only present in pregnant mares from approximately 35 to 120 days of gestation. Two major problems exist with using eCG levels for pregnancy diagnosis. First, a false negative diagnosis (i.e. no eCG detected in a mare that is truly pregnant) can be made if a blood sample is collected prior to day 35 or after day 120 of pregnancy. Second, a false positive pregnancy diagnosis (i.e. elevated eCG detected in a mare that is truly not pregnant) can be made if a blood sample is collected from a mare that lost her pregnancy after endometrial cup formation. Therefore, detection of elevated eCG in the blood of a mare will only confirm that endometrial cups are present and do not indicate true pregnancy status or fetal health.

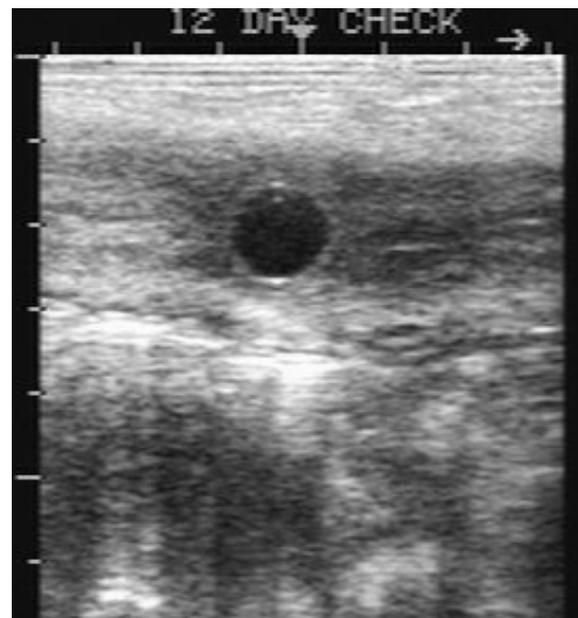
Estrogens have also been used to determine the pregnancy status of mares. The estrogenic hormone estrone sulfate may be used to diagnose pregnancy after approximately 60 days of gestation. Small amounts of estrone sulfate are initially produced by the ovary of the pregnant mare in response to rising levels of eCG. Larger amounts of estrone sulfate are produced by the fetal-placental unit after day 90 of gestation. Measurement of estrone sulfate after the third month of gestation is useful to both diagnose pregnancy and monitor fetal viability as fetal death leads to a rapid decline in estrone sulfate levels.

In summary, ultrasonography is the most useful tool for early pregnancy diagnosis, identification of twins, and detection of uterine or ovarian problems. However, if endocrine tests are required for pregnancy diagnosis, especially if the breeding date is unknown, it is recommended that a combination of progesterone, eCG and estrone sulfate assays be used. Alternative tests for pregnancy diagnosis have come and gone over the years. A word of advice - if a

test seems too good to be true...it probably is.



**Ultrasound image of a 12-day pregnancy**



**Ultrasound image of a 25-day pregnancy**



Ultrasound image of a 50-day pregnancy