



## **HUMAN CHORIONIC GONADOTROPIN (hCG)**

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Human chorionic gonadotropin (hCG) is a glycoprotein hormone used primarily to induce ovulation in mares. It is also used diagnostically in a stimulation test to detect the presence or absence of testicular tissue in geldings exhibiting stallion-like behavior. The biological action of this human-origin hormone is due to its inherent luteinizing hormone (LH) type activity. In mares, a surge of natural or endogenous LH from the anterior pituitary during estrus (heat) causes final maturation and ovulation of the dominant follicle. Exogenous hCG essentially mimics the role of endogenous LH.

Induction of ovulation is advantageous if a mare is in a timed breeding, shipped semen, frozen semen or embryo transfer program. In addition, in mares with a history of accumulating fluid in the uterus following mating or insemination, it may be beneficial to induce ovulation and limit the number of times the mare has to be bred.

During a natural estrous cycle, mares are typically in heat for 4 to 7 days. A traditional breeding program may entail mating a mare every other day while she is showing heat. Such a strategy would result in an average of 2 to 3 breedings per cycle. This may not be an issue if the mare is young and reproductively healthy and if the

stallion is located on the same farm and semen is not limited.

Administration of an ovulation-inducing agent such as hCG is common for mares enrolled in a shipped semen program in which the stallion owner is likely to only provide semen once during a given estrous cycle. Use of hCG may also be very beneficial when breeding mares with frozen semen, since a majority of mares will ovulate within a relatively consistent time period. Consequently, a mare can be inseminated with one dose of frozen-thawed semen within a few hours of when she is predicted to ovulate and a second dose after ovulation has been confirmed.

Human chorionic gonadotropin is generally administered when a mare is in estrus, a follicle >35 mm is present and edema is visible in the uterus on ultrasound. Ovulation will usually occur an average of 36 hours after hCG administration. A wide dose range of hCG has been used successfully for induction of ovulation and the drug may be given intravenously or as an intramuscular injection.

The hormone is very effective in inducing ovulation in young mares that have not received the hormone previously and in middle-aged to older mares receiving the hormone for the first time or two within a

single breeding season. However, the efficacy may be somewhat reduced if hCG is given to a mare repeatedly during the same breeding season (i.e. the mare may not ovulate in the predicted time period).

Colts or geldings with an uncertain medical history suspected of being cryptorchid may be administered hCG as part of a diagnostic test to determine if testicular tissue is present. The "hCG stimulation test" is performed by collecting a blood sample immediately prior to administration of hCG and collecting a second blood sample one to two hours later. The samples are then submitted to a diagnostic laboratory for evaluation of testosterone levels. True geldings will have low testosterone levels in both samples. Intact normal stallions will have high levels of testosterone in the first sample and even higher levels in the second sample. Cryptorchid horses usually have moderately low levels in the first sample and increased testosterone levels in the second blood sample. The LH-like activity of hCG causes an increase in testosterone production from Leydig cells of the testes, if they are present.

It should be noted that hCG is a controlled drug in some states. As with any medication, please consult with your equine veterinarian regarding safe and effective use.