EMBRYO TRANSFER

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Embryo transfer involves a donor mare, from which the embryo is retrieved, and recipient mares, mares which receive the embryo from the donor.

Donor mares are proven horses which have previously produced foals. Mares with a history of becoming pregnant and then aborting are better candidates for donors than old infertile mares or mares which repeatedly return to estrus (heat) after breeding. The two latter groups of mares are less likely to provide an embryo from the uterus. The donor mare can be bred naturally, with artificial insemination or with fresh cooled semen. Mares which are selected to receive an embryo must pass strict criteria which will be discussed later.

REQUIREMENTS

Donor mares should be proven mares which are cycling normally and are in good physical condition. We recommend that these horses undergo a thorough reproductive examination. The examination includes a rectal palpation, ultrasonographic exam, vaginal exam and a uterine culture/biopsy. If the mare has a clean bill of health, then we can proceed with breeding and collection of the embryo.

The donor mare is maintained at the Centre and evaluated on a daily basis for estrus (heat). She is palpated on a daily basis to monitor the growth of the follicle (egg). The ideal situation is to have the mare go through one estrus cycle prior to breeding. Once she has gone into her second cycle we inseminate (breed) on days 2-3 of estrus and then everyday thereafter. We also palpate the mare on a daily basis to monitor follicular development. If cooled shipped semen is utilized, then we aim to inseminate the mare one day prior to ovulation (release of the egg) and on the day of ovulation. Once the mare has ovulated, we schedule her for embryo collection 6 to 8 days post ovulation.

Recipient mares should be horses that have produced foals or maiden mares. Barren mares, mares which have not produced a foal for one or more years, usually have underlying problems. Recipient mares should be at least 1000 pounds, 3 to 10 years of age, and in good physical condition. Each donor mare requires a minimum of two recipient mares. We recommend that recipient mares also receive a thorough examination. This examination includes: rectal palpation, vaginal exam, ultrasound exam and a uterine culture/biopsy. The findings of this exam should be within normal limits.

The recipient mares are maintained at the Centre and evaluated on a daily basis for estrus (heat). The recipient mares are synchronized with hormones to get their estrus cycle to match that of the donor mare. Once the recipient comes into heat, she is palpated on a daily basis to monitor the growth of the follicle (egg).

EMBRYO COLLECTION

The mare is prepared for embryo collection, her tail is wrapped, tied up and her perianal area cleaned. A special catheter is placed through the cervix and into to uterus. A small inflatable "balloon" in the end of the catheter prevents the catheter from coming out of the uterus. One liter of specially prepared sterile fluid is infused into the uterus by gravity. The fluid is then allowed to drain out of the uterus by gravity through a specialized filter into a collection flask. This procedure is repeated two more times for a total of 3 liters of fluid flushed through the uterus. The solution in the filter is placed into a search dish and examined under a microscope to locate the embryo. Once the embryo is located, it is maintained at room temperature until it is transferred into the donor mare.

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The embryo recovered from the donor mare is then placed into the recipient mare by one of two methods, surgical or nonsurgical. The surgical method requires exposure of the recipient mare's uterus through an incision in her flank. The embryo is placed in a glass pipette resembling a syringe. The uterus is exposed (through the flank incision), a small incision is made in the uterus and the embryo (in the pipette) is flushed into the uterus. The uterus is replaced and the flank incision is sutured closed. The nonsurgical method involves placing a catheter containing the embryo, through the recipient mare's cervix and flushing the embryo into the uterus. The surgical method has the best pregnancy rates, however the nonsurgical method is efficient and inexpensive.

The recipient mares are examined through rectal ultrasonography on days 4 to 5 post transfer, at this point the embryo is 11 to 12 days old. We recommend ultrasound reexamination at days 20, 25, 35, 50 and 60.

Embryo transfer is a feasible and inexpensive option for older mares that conceive but have difficulty carrying a foal to term, or show mares which need to stay in competition. Embryo transfer is also ideal for mares which have foaled late in the year and need to remain open to be rebred early the next year. ❑

(Editor's note: It is wise to check with your mare's breed registry to see if they approve embryo transfers or what restrictions may apply before going ahead with this type of procedure.)