

DEEP CREEK VETERINARY SERVICES

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EQUINE EMBRYO TRANSFER – THE BASICS

You may have heard the words before but were unsure of what it was all about. Here is your chance to learn a little more about it. Embryo transfer (ET) is exciting because it gives us a greater opportunity to breed the best to the best. We have been using frozen semen for a number of years, which allows us access to the best stallions, but ET gives us access to the best mares as well!

ET involves the removal of the embryo from one mare and placing it into the uterus of another mare. Why, you might ask, would anyone want to do this? Some common reasons are:

- Valuable mares may have more than one foal per year
- Young mares can carry embryos from older mares
- Competition mares are able to continue their showing career while other mares carry their foals
- Mares with reduced fertility may be able to donate embryos to reproductively healthy mares

Recent technological advances in ET have greatly improved its success rate making it more available to the average horse owner and breeder.

Embryo Collection and Transfer

The mare whose embryo you want to transfer is called the donor mare and the mare that will actually carry the foal for the entire pregnancy is called the recipient mare. The best embryo donors are mature, reproductively sound mares. Collection and transfer is less successful in older mares, immature mares (<3yrs), barren mares and mares with an inflamed or infected uterus. Pregnancy rates vary from 15% with sub-fertile mares to as high as 75% with reproductively sound mares.

The donor mare is usually bred by artificial insemination (cooled or frozen semen) and she is monitored daily by ultrasound to determine the exact day of ovulation. Knowing when the donor ovulates is important because the embryo needs to be collected 7 or 8 days after ovulation. Recovery of viable embryos before or after this time is unlikely. Those of you familiar with embryo transfer in humans and cows know that fertility drugs to initiate super-ovulation (large numbers of eggs released per estrous cycle) are used. Unfortunately, these drugs do not work in horses and we are limited to only 1 (if lucky, 2) embryos per cycle.

The embryo is flushed out of the mare using a special catheter that is inserted through the mare's cervix into the uterus. Warm fluid (specially formulated to keep embryos happy) is flushed in and out of the uterus. The embryo is caught in a special filter. At this stage in its development the embryo is barely visible to the naked eye and a microscope is required to find and handle it.

Recipient selection is critical. The recipient mares must be reproductively and physically healthy and should be of a quiet disposition. The donor mare and the recipient mare will have their heat cycles synchronized so that they both ovulate at the same time. This is important for survival of the embryo in its new mom. Synchronization of ovulation in horses is challenging and may take a few attempts to get it right. For this reason, it is convenient to have multiple recipient mares per donor mare to ensure that the best possible recipient is made available for the embryo.

How is the embryo transferred? If any of you have watched artificial insemination, it is very similar. The embryo is specially prepared and then placed in a small straw. The straw is then loaded into a long instrument, which is inserted in the cervix, and the embryo is deposited directly into the new uterus. The mare can be pregnancy tested by ultrasound a week later to see if the embryo has survived.

Pregnancy rates are influenced by many factors including the quality of the embryo. Not all embryos are created equal. Some embryos are vigorous and healthy, while others are not. Successful transfer rates of high quality embryos range from 55 – 75% whereas the successful transfer rate of poor quality embryos ranges from 0 – 40%.

Storing and Shipping Embryos

Now this may already seem complicated, but there is yet more to come! Embryos can also be collected, cooled or frozen similar to semen, and then sent virtually anywhere in the world. It won't be long before you will be ordering your designer embryo via the Internet.

If you are interested in embryo transfer or have any questions, please feel free to contact us.

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