

EMBRYO FREEZING – STEPPING IT UP ANOTHER NOTCH!

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The day is drawing ever so closer when a person interested in creating their own foal doesn't even need to own a mare or stallion. Embryos can now be made by purchasing semen on demand and leasing breeding cycles from quality mares owned by others. In fact, in the industry today we are starting to see advertisements promoting equine embryos for sale. Has our industry taken it to the next step? The answer is yes. It is now possible to create a genetic cross and then put it into storage until someone is willing to buy it. Once a buyer is found, then the embryo can be transferred into a surrogate or recipient mare for the eventual birth of a foal. A step beyond, one doesn't even have to purchase an already chosen genetic cross. By leasing a mare for a given number of cycles, a person can try to get one or more embryos from any number of stallions. Of course, success is not as simple as that. It is necessary to do homework and really understand the logistical management, expense and success rates when involving oneself with such an endeavor. Effective management and techniques, reproductive soundness of the mare, and semen quality all play a role. Fortunately, within the last few years research has shown us that acceptable pregnancy rates can be achieved with the use of frozen embryos. Lascombes and Pashen (2000) obtained 24 pregnancies from 44 transfers when small, frozen embryos (<200 μ) were used, a 55% success rate. Similarly, work by Maclellan and associates

(2002) yielded a 56% (12/17) pregnancy rate when transferring embryos less than 300 μ in size.

This past fall, ERC underwent a research trial whereby 12 mares were bred with either fresh or cooled semen from stallions of proven fertility. Of the 21 cycles managed, 16 embryos were recovered. Twelve of these embryos were designated to 1 or 2 freezing protocols. The embryos ranged in quality from 1.0 to 2.5. Grade 1.0 embryos showed no morphologic abnormalities while a score of 2.5 indicated some significant abnormalities, but still considered worth continuing with the freezing process. Stage of development varied from loose morula to blastocyst. No embryos were greater than 275 μ in size (range: 150-275 μ).

At ERC, five (5) embryos were frozen in Hams F-10 media using the freezing procedure published by Maclellan et al, 2002. Dulbecco's



In 2004: the mare, "Snowflake," is carrying ERC's first frozen embryo pregnancy!

phosphate buffered saline solution was used as the media for 7 additional embryos that were frozen according to the protocol of Lascombes and Pashen, 2000.

With the anovulatory season fast approaching, time restraints limited our ability to adequately transfer all embryos in storage. Time

did allow for 4 embryos (3 morulas and 1 early blastocyst) to be surgically transferred into 2 recipient mares (2 embryos/mare). Each mare became pregnant with one pregnancy, so 2 of the 4

embryos grew to detected pregnancy (50% success rate). Although the number of embryos transferred at ERC was small, it appears that success rates can be obtained and in higher success than was documented years ago. Published pregnancy rates for frozen embryos are only 10 to 15% lower than that of fresh or cooled embryos. With this recent success, frozen embryos can now be thought of as a wonderful asset to a breeding program.

So how can this new advanced technique be of use to a breeder? A wonderful aspect of this technology is in helping the late-foaling mare. A common problem for many breeders is the fact that once a mare foals, it can take a period of time to get her pregnant again. This may place someone in the situation of having foals born in an undesirable time of the year (late summer/early fall). Horse owners in certain breed registries (i.e. Standardbreds, Quarter Horses) make a point of getting early foals so they are bigger for competition. Well, a possible solution is if a mare isn't pregnant by a certain time, such as July 1st, then embryos can be collected from her and frozen. These frozen embryos can be put into storage until early spring. At that time, they are transferred into recipient mares thus guaranteeing early foals every year. Also, this allows for her breeding season to continue into the fall without having the ramifications of late foals.

Embryo freezing can also be advantageous to those breeders wanting to sell offspring from their valuable mares. Instead of waiting for a single foal to be born before selling, it is feasible to obtain 3, 4 or even 5 embryos from a given mare every year and sell them in the frozen state. With proper international acceptance, this technology would even allow embryos to be bought and sold across country lines. A simple comparison could be made with stallion semen being frozen and sold to interested parties. The major difference with embryos is that you have

already chosen the genetic cross. Although each embryo could have a different sire, buyers typically would not have the choice of selecting the genetic cross beforehand. A possibility of getting around that issue is to find someone willing to lease their high-quality mare for only a few cycles. Leasing mares for breeding purposes has been utilized for decades but now with embryo transfer technology, one could simply lease a

Why Freeze an Embryo?

- **For early foals, breed your mares in the fall and transfer the embryos into recipients in the spring.**
- **Sell equine embryos like selling semen.**
- **Reduce embryo transfer costs (by minimizing recipient herd usage).**
- **Get a foal without owning a mare or stallion (using leased mares).**
- **Potential offspring can be in storage indefinitely.**

certain number of cycles so, if desired, one or more embryos could be collected while giving the lessee a choice of selecting parentage.

The largest cost to operating a full-service embryo transfer program is in maintaining a recipient herd. Several mares are necessary to help assure that at least some recipients are at the same stage of the cycle as the mare donating the embryo. Estrus synchronization however would no longer be necessary if frozen embryos were heavily utilized. Since embryos can be stored indefinitely, one could simply wait until a single recipient is at an appropriate stage of the cycle before thawing and transferring. This would minimize the number of recipients needed and subsequently lower the embryo transfer costs to the owner.

With recent advances, frozen embryo usage is becoming more applicable in the industry. To learn more about embryo freezing costs and services, please contact ERC.