



KALLION FARMS

Why Use Embryo Transfer Technology?

Utilizing embryo transfer technology provides some great opportunities to today's cattlemen. Not only does embryo transfer help a breeder by increasing the number of offspring a genetically important cow can produce, but it also provides an opportunity to other cattlemen who are wanting to improve their cattle genetics.

One of the largest benefits embryo transfer has is that it often provides access to superior genetics at a much more affordable price. Odds are that a breeder would not be willing to sell one of his top cows, at least not for an affordable price. However, he most likely would be willing to sell embryos out of the female. Also, the breeder may have multiple females that are of superior quality. So a cattleman may be able to purchase embryos out of a variety of donor females, which gives him more genetic variety in his own breeding program. For example, one donor female may cost \$15,000, but the breeder may sell embryos out of her at \$400. So instead, the cattleman can technically buy over 35 embryos out of her or 5 embryos out of 7 different donor females for the same price. Also, by using sexed semen, which is around 90% accurate in determining the outcome of the gender of the calf, the cattleman can purchase sexed female embryos or sexed male embryos if desired.

Transporting livestock can also be costly at times, depending on the distance and what health protocols may be required. However, when it comes to embryo and semen transactions, the transportation costs are often drastically cut. To internationally ship a nitrogen tank may cost around \$3000, but one tank can also store hundreds of embryos, which makes the cost per embryo for transporting very nominal. Another unique benefit to embryo transfer is that it provides an enormous amount of flexibility to the cattleman in regards to time. In theory, embryos can remain frozen for an infinite amount of time. Therefore, the cattleman can decide when to transfer the embryos into his recipient (surrogate) cows when it is most convenient to him.

On the other hand, embryo transfer technology has its drawbacks. A successful embryo transfer program is very cost efficient in producing superior livestock, but an unsuccessful program can be disastrous. Preparing the recipient females to receive an embryo is more labor intensive and costly in comparison to simply using bulls for breeding. If the program sees low pregnancy rates in regards to the conception of embryos, the program overall can be an economic failure. Also, if a cattleman wanted to immediately start producing offspring, then embryo work wouldn't be the best option. From the day the embryo is transferred, the cattleman would have to wait over 2 years until the female or male can become of breeding age.

Overall, embryo transfer technology does have its risks and drawbacks, but a successful program can be an incredibly powerful tool to today's cattleman.



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How it Works

Surprisingly, the management and protocols used in a recipient herd to impregnate with embryos is nearly the same as if a cattleman was going to A.I. (artificially inseminate) the females with semen. Simply, instead of breeding the female with semen after she shows estrus and is ovulating, the cattleman instead waits 7 more days and then a technician transfers the embryo into her. Embryos are about 7 days old when they are frozen. Therefore, by placing a 7 day old embryo into a recipient (surrogate) female that came into heat 7 days before, the technician is hoping to “trick” the female into taking the embryo.

When A.I.'ing cattle, a breeder can watch his cattle and wait until they naturally come into heat (a cow's estrus cycle is 21 days.) In theory, a rancher could transfer embryos into recipient cows using natural heats also. However, since a more skilled technician is needed to transfer embryos compared to A.I.'ing cattle, synchronizing recipients is usually much more efficient.

There are many different protocols to synchronizing female cattle available. They do however all share the same goal, which is to group all of the female cattle into the same part of their 21 day cycle. By using a particular hormone, the breeder is then able to bring the majority of their cattle into heat on a day that best suits him. This way a technician can show up on 1 single day and transfer all of the embryos instead have to be there multiple times over 21 days.

Sample Protocol

- Day 0 - Implant Cider and shot of GnRh
- Day 7 - Remove Cider and shot of Prostaglandin
- Day 8 - Shot of GnRh
- Day 9 - Recipients show heat over 2 days
- Day 17 - Transfer embryos



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How to Begin

If a rancher wanted to start an embryo transfer program, the following steps would need to be taken if they are not already in place.

A. Ensure that a proper cattle identification and data collection program are in place.

Simply by giving each recipient its own ear tag with a unique number is a huge help in managing the herd. Once each cow is given a number, the rancher can then begin to keep track of her calving records, pregnancy status, how successful she is in taking an embryo, and other data that is useful.

B. Cull out lower quality females from the potential recipient herd.

Females that are of lower fertility will certainly need to be culled from the program. If the rancher has no calving records then it may be hard to identify the lower fertility females, but the rancher will definitely need to start taking calving records. Additionally, the temperament of the recipient females is important. If a female has a wild temperament, working them multiple times in a short period of time will most likely not work out well. Also, even though the recipients do not genetically influence the embryo calf, she can influence the calf's temperament environmentally.

C. Begin a calving season management program.

A cattle herd that continuously exposes their females to bulls year round will not work well for an embryo transfer program. If a rancher prefers spring calving then he would need to expose his cattle accordingly. A very efficient scenario is to take a group of cows that are open and then perform one round of embryo transfers. The rancher can then immediately expose the females to bulls following the transfer. This way his calving season is not disrupted.

D. Make sure the cattle's nutrition is adequate to receive embryos.

If a female's body condition is poor, she most likely would not be able to take an embryo. Also, throughout her pregnancy she will need to be able to maintain at least decent body condition. If a female will most likely not be able to be bred by a bull, she will certainly not take an embryo.

E. Identify a professional embryo transfer technician



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The technician transferring the embryos plays a vital role in the pregnancy rate in an embryo transfer program. Therefore, finding the right technician who has plenty of experience and success is essential.

Why Use Consulting

Even though a successful embryo transfer program is a very economical way of raising high caliber calves, an unsuccessful program can be a financial disaster. The following table shows the cost variation between different pregnancy rates

Influence of Pregnancy Rate on Cost per Pregnancy (\$400 an embryo)

| Pregnancy Rate of Emb transfers | Total Cost of all Emb work divided by number of pregnancies |
|---------------------------------|---|
| 30% | \$1,700 per pregnancy |
| 35% | \$1,475 per pregnancy |
| 40% | \$1,300 per pregnancy |
| 50% | \$1,000 per pregnancy |
| 60% | \$850 per pregnancy |

A consultant can make a huge impact on how successful a program is if the rancher is inexperienced with embryo work. Clearly, the overall cost per pregnancy varies drastically depending on the pregnancy rate. Even though the management of the program is not extremely complicated, a consultant can have a huge impact on the success rate if the rancher has little or no experience with embryo work.