

Column Name - The Heartland Minute

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“Advanced Reproductive Technologies”

Have you ever wondered how advanced reproductive technologies (ART) like embryo transfer (ET) or in-vitro fertilization (IVF) may fit in to your livestock programs? Those technologies can help beef, dairy, sheep, goat, and swine producers maximize the genetic potential of their operations. In-vitro embryo production has drastically improved its success rate and increased its use in the animal science industry.

To help you understand how embryo transfer and in-vitro fertilization work let's look at the process. With embryo transfer, a female is given a hormone so that she will ovulate more than one egg and then when she is bred, the eggs are fertilized within the animal before the embryos will be collected approximately a week later. This is known as in-vivo (inside a living organism). With in-vitro (outside a living organism) fertilization, oocytes (un-fertilized) are collected and then fertilized in a lab outside of the donor female to grow in to embryos (fertilized egg).

With IVF the oocytes can be collected from the females at a younger age and then those females can be bred to have natural offspring at the same time as the rest of the group. Young females can have progeny on the ground before they have ever had a baby themselves. It is estimated, in a beef herd, that 10-20 offspring can be born a year to a recipient cow instead of just one. With IVF or ET we are taking the genetics from a superior female and matching them with that of a quality male.

In many cases purebred producers will partner with commercial operators to place embryos into recipient (surrogate) animals. The purebred producer will then buy back the offspring at a premium because they have greater genetic value than market price. This is most common in beef operations. Another benefit for commercial producers is the availability of higher-quality genetics to select from for their herds. Dairy producers can use this to shorten the time window it would take to rapidly increase genetic potential in their herds and boost milk production. Embryos can be frozen instead of being used at the time they are made. This opens up the possibilities of storing them for years to use at a later time and shipping them to other parts of the country or even world.

As you consider whether or not to adopt these technologies, it really comes down to cost/benefit decisions. Whether you are talking artificial insemination or these other systems, you have to look at the success rates of each of these methods and then decide what you need to do to maximize those rates for whichever system you choose. Reproductive success does not happen without managing herd health, nutrition, and environment as well. These are all important factors to consider.

Information comes from K-State University Beef Cattle Institute veterinarians, Dr. Brian Lubbers, Dr. Brad White, and Dr. Bob Larson. As well as Dr. Clay Breiner.

For more information regarding Agriculture and Natural Resources, 4-H Youth Development, or K-State Research and Extension call the office at 620-583-7455, email me, Ben Sims, at benjam63@ksu.edu, or stop by the office which is located inside the courthouse. Be sure to follow K-State Research and Extension- Greenwood County on Facebook for the most up-to-date information on Extension education programs and the Greenwood County 4-H program.