

REPRO TRACKS

by Cliff Lamb, Texas A&M University

Preparing for the Upcoming Breeding Season

What are realistic expectations for pregnancy in my herd when using reproductive technology?

Many of you have initiated your spring calving season and are considering options for your spring breeding season. Be sure to have realistic expectations for pregnancy during the breeding seasons especially when considering an applied reproductive management tool such as artificial insemination (AI), estrous synchronization or embryo transfer (ET).

I often hear of producers who are disappointed with their pregnancy rates after an AI or ET program, which is usually a result of unrealistic expectations. The producer has been oversold on the potential outcome or anticipates greater pregnancy rates than are feasible.

While it is great to aim for pregnancy rates exceeding 65% or 70%, these simply are not realistic for most operations. Unfortunately, there is no “silver bullet” to focus on consistent high pregnancy rates. Obtaining consistently high pregnancy rates is a combination of nutritional management, herd health, climate, cycling status (puberty or anestrus), breed, selection of genetics, age and many more variables. Ensuring all aspects of the operation are efficiently and effectively managed has a significant bearing on the outcome of the reproductive management program.

Effects and outcomes

Pregnancy has a four-times greater economic effect than any other production trait. Therefore focusing on all factors contributing to greater pregnancy rates is key to a successful breeding season. Nonetheless when a producer is disappointed with an outcome, they invariably focus on the AI or ET technician, synchronization protocol, and/or semen.

In most cases these are the most consistent aspects of the reproductive management program. An experienced AI technician usually handles and places

semen or embryos in the correct location; recommended estrous synchronization protocols and products have been tested and are usually consistent if there is a high percentage of cycling females; and if semen is collected by a major semen company under certified semen services certification, the outcomes are usually favorable. With this in mind, when assessing the pregnancy rates of a program, be sure to also consider the many other variables that may have an effect.

Considering what it takes to have a fertilized embryo, embryo

Table 1: Time course of early bovine embryo development

Event	Day	% Pregnant
Estrus	0	
Ovulation and fertilization	1	95-100
First cell division	2	
8-cell stage	3	
Migration recognition of pregnancy	5-6	
Blastocyst	7-8	75-80
Hatching	9-11	
Maternal recognition of pregnancy	15-17	70-80
Attachment to the uterus	19	
Placentation	25	65-75
Definitive attachment of the embryo to the uterus	42	
Birth	285	55-70

Data adapted from Shea, 1981; Flechon and Renard, 1978; Peters, 1996; Telford et al, 1990

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development, fetal development and birth of a live calf, it is amazing we get cattle pregnant at the rates we do.

Beef producers rely on a live calf to wean to generate income. However, we should look at pregnancy differently. Diagnosis for pregnancy does not indicate how many cattle became pregnant but is an indicator of the percentage of females that retained pregnancy until diagnosis.

If every cow or heifer in the herd is cycling and has a chance to express estrus (heat), Table 1 represents the attrition in pregnancy over time. Almost every oocyte (unfertilized egg) from a female that expresses estrus and is exposed to AI or a bull will become fertilized within about 24 hours. From that point there is significant attrition in the survival of the embryo and fetus until birth.

Thus we have almost 100% pregnancy rates on Day One after exposure, and it is our goal to decrease embryo or fetal death until the calf is born. The pregnancy diagnosis reflects the survival of embryos, rather than the percentage of females that became pregnant. Table 1 also demonstrates in a perfect world, we should expect somewhere between 55% and 70% of our females to retain a pregnancy until birth. In most herds, the cyclicity rate ranges from 60% to 90% in heifers and 50% to 80% in cows at the initiation of the breeding season. Therefore, expecting pregnancy rates to exceed 55% often is unrealistic.

Data published by Ky Pohler at Texas A&M University summarized the results of 159 studies (including cycling and noncycling females) on more than 56,000 females and

demonstrates approximately 28% of embryos will not develop past Day Seven of gestation. By the end of the first month of gestation, 48% of cows undergoing AI will not be pregnant.

That means, on average, a pregnancy rate around Day 30 from AI will be around 52%. Females exposed to AI after visual estrous detection had increased pregnancy rate compared to both fixed-timed AI and ET.

Preparing for a successful breeding season to achieve greater pregnancy will mean an increase in the percentage of females that are cycling, plus little room for error in management strategies. You will also need some luck in the weather approaching and shortly after the breeding season. Good luck for the 2021 spring breeding season. **AJ**

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