Assessing Cow Fertility on the Ranch

Manny Encinias, Extension Livestock Specialist

Introduction
The responsibility of the beef female is to conceive early in the breeding season, deliver a healthy calf, and wean a calf to its full genetic potential, making fertility the primary driving factor of profitability on a cow-calf operation. When a cow experiences a decrease in reproductive performance it often results in delayed breeding, lighter weaning weights, and more open (non-pregnant) females. These losses, which are attributed to decreased fertility, cost the U.S. beef industry more than $1 billion dollars annually.

Reproductive traits commonly used to describe fertility, generally have a low heritability. In other words, this means that other factors, like production environment and management of a cowherd, play a larger role than genetic selection. Suggesting cow-calf managers should evaluate a production environment’s limitations and consider management strategies to measure, assess, and cost-effectively improve reproductive efficiency in beef females.

Measures of Cow Fertility
Fertility in beef females is commonly measured by numerous traits with low heritability estimates. The following is a descriptive list of traits associated with cow fertility:

Age at puberty- describes the age of sexual maturity of a replacement heifer. This trait is used to measure heifer fertility and is influenced by breed, body weight, and nutritional status. Heifers that achieve puberty at younger ages typically conceive early in the breeding season consequently calve earlier and have higher pregnancy rates than heifers that achieve puberty at older ages

Age at first calving- is correlated to age at puberty in heifers and subsequent calving intervals. First calf females that calve at 24-26 months of age typically experience greater lifetime production.

Pregnancy rate- is simply the percent of the herd diagnosed pregnant, which measures the success of the breeding season.

Calving date- is defined as the day within the calving season in which a beef female calved. Typically, females that calve earlier in a calving season wean heavier calves and have higher pregnancy rates.
Calving interval- describes the number of days between successive deliveries of a live calf. Ideally this period is 365 days or less and not more than 365 days over multiple years to ensure the production of marketable calf on an annual basis.

Dystocia- is a measure of a birth that requires assistance at delivery. An increased incidence of dystocia prolongs post-calving (post-partum) anestrus, negatively impacts fertility.

Pregnancy Diagnosis Tools
Pregnancy detection is the most cost-effective management tool to measure reproductive success. Recent survey data suggests only 18% of beef cow operations in the U.S. evaluate the cowherd for pregnancy. This is unfortunate, since a large portion of the financial losses attributed to infertility in beef cows is the result of maintaining open cows.

Traditionally, manual rectal palpation has been the standard method to assess pregnancy status on ranches throughout the Southwest. In experienced hands, rectal palpation is a rapid, inexpensive method to diagnosis pregnancy. The primary disadvantage of rectal palpation is accuracy. Even the most proficient technician or veterinarian has difficulty accurately detecting early pregnancies (<45 days) and aging pregnancies with rectal palpation. Accurate diagnosis typically increases as pregnancy progresses beyond 90 days. Misdiagnosis is a costly consequence of using rectal palpation, and typically occurs in the hands of less experienced technicians or veterinarians and as fatigue sets in.

The use of real-time ultrasound has evolved as the most accurate tool to diagnose pregnancy in beef cattle. Ultrasound is less invasive, enables the detection of pregnancy as early as 28 days, permits fetal sexing between 60 and 80 days of pregnancy, and does not require the handling of the uterus (which minimizes the loss of early pregnancies). Because ultrasound provides the opportunity to accurately age pregnancies, unique financial and marketing incentives, as well as management options are presented to producers who utilize this technology to determine pregnancy in the cowherd. Furthermore, ultrasound provides the visual proof of a pregnancy, which is something other methods cannot.

In recent years, commercialized blood tests have offered producers an additional tool to determine pregnancy in beef cattle. Most tests require a minimum of 2 ml (cc) of whole blood (collected from the jugular or tail vein). Samples must then be sent off to an accredited laboratory to determine the circulating concentrations of pregnancy-specific proteins. The test simply determines whether or not these proteins are present in the blood. Thus the test is a simple yes or no determination of pregnancy, and does not define the stage of pregnancy. Most results can be received within 24-48 hours after the samples have been received at the lab.

In most situations, a pregnancy report can be generated to accurately identify 99 to 100% of non-pregnant females and 91-95% of pregnant females. False positives exist in the determination of non-pregnant females, typically by sampling too early, and in the determination of pregnant females, where the placenta continues to produce some of these proteins after embryonic mortality. These tests can typically detect a 30-day pregnancy in heifers and cows. The only additional criterion is that lactating cows must be sampled at least 90 days since calving.
The largest advantage of commercialized pregnancy tests is that this tool provides the opportunity for producer’s to conveniently check for pregnancy without the need to be trained to palpate or ultrasound for pregnancy diagnosis, or schedule the services of a veterinarian or skilled technician. This technology may provide the largest benefit to small producers who often time cannot schedule or justify the cost associated with pregnancy diagnosis. The largest disadvantage of these tests is the turnaround time of results when management or marketing decisions need to be made immediately.

Assessing Fertility in the Cowherd
Since multiple diagnostic tools exist for producers to determine the success of their breeding season, the largest decision is making the decision to begin preg-checking the cowherd. The next decision involves defining realistic expectations ahead of preg-checking and interpreting results. Questions like: Were the cows in good breeding condition? Was enough bull power supplied throughout the breeding season? are real questions to define these expectations. Sometimes asking oneself these types of questions ahead of time reduces the shock of going through the results. In most situations it has been our experience that if producers address bull power (i.e. bull:cow ratios, veneral diseases, fertility, etc.) issues, well-managed, middle-age cows adapted to the arid production environment of the Southwest will be confirmed pregnant at the conclusion of a fixed 120-150 day breeding season. However, producers should expect a percentage of open cows from: high risk age classes (pre-pubertal heifers, 1st and 2nd calf cows, and older cows), non-vaccinated females, and poisonous plant interactions.

For the sake of improving reproductive rates it is important to pin-point the root and cause of open females. Utilizing a categorical matrix and developing a series of questions related to the following topics will aid the process of identifying management shortcomings:

Cow/heifer Body Condition Score and Age
- Calving
- Beginning of Breeding Season (i.e. AI or bull turnout)
- During the Breeding Season

Bull Power
- Bull to Cow Ratio (How many cows did I expect the bull(s) to breed?)
  - Age of Bulls (Were expectations too high for younger bulls?)
  - Terrain
- Fertility (Were all bulls fertility and trichomoniasis tested prior to turnout?)
- Soundness
- Social Dominance Management
**Pre-breeding Vaccination Program**
- Disease coverage (What diseases were cattle vaccinated against?)
- Product Quality (Killed, Chemically-Altered, or Modified Live)
- Label Recommendations
  - Was a booster dose required?
  - Timing of last dose prior to the beginning of the breeding season
- Parasite control

**General Herd History and Bio-Security**
- How were new additions to the herd screened and introduced
- Fenceline contact with neighbor’s cattle
- Wildlife and feral hog interactions

**Conclusion**
The goal of improving fertility in any cowherd is setting females up for success by setting realistic goals and implementing a sensible management plan. Recognize reproductive losses are going to happen, even with the best management guidelines put into practice. The bottomline is that the successful manager will make the right decision(s), whenever it is necessary, to improve reproductive efficiency.

If you should have any additional questions on assessing fertility or utilizing pregnancy diagnosis tools in the beef cowherd please feel free to contact me at mencinia@nmsu.edu or (505) 927-7935.

**Reference Sources**


Southern New Mexico State Fair

October 3rd through October 7th

Come out to the fairgrounds, bring the entire family & enjoy!