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Practical Uses for Ultrasound in Managing Beef Cow Reproduction

By John Arthington

UF/IFAS, Range Cattle REC and Okeechobee Extension Office



For questions or comments regarding this publication contact

[Dr. John Arthington](#)

Ultrasound has been utilized as a tool in beef and dairy research systems for many years, and in more recent years has become available to commercial livestock agriculture. In this environment, ultrasound has found itself useful as a tool to predict genetic merit, as associated with carcass quality, in young bulls, and to determine pregnancy, age of fetus, and sex of fetus. This article will focus only on the latter.

Recently, Dr. Cliff Lamb from the University of Minnesota visited the Range Cattle Research and Education Center and used ultrasound to determine the age of fetuses in pregnant Braford cows. This information was then used to back-calculate time of conception \pm 3 days. By simply using calf birth date to back-calculate conception date, the range in error can exceed 14 days. The speed, simplicity and accuracy of the ultrasound was surprising. Clearly, this technology holds much promise as a tool to improve reproductive management systems in Florida cow-calf operations.

Ultrasound can accurately determine the presence of a viable embryo as early as 30 days after mating. The accuracy may approach 100 %, because the user can visually identify the viable embryo by the presence of a beating heart. At 60 to 75 days of age the trained user can even determine fetal sex with over 95 % accuracy. These two features alone provide many options for the use of ultrasound in reproductive management practices.

Most producers are faced with difficult decisions when choosing bulls that address the contributions of both maternal and carcass traits. Not only is there variation in the attributes of multiple breeds, but variation within breed is substantial. By combining ultrasound and AI, a producer can develop a breeding program that optimizes both maternal and carcass traits. Prior to the start of a normal breeding season (or during the

first 21 to 30 days of the breeding season) bulls possessing high maternal traits may be selected and used in an AI system. After this time, natural service bulls, selected for carcass merit, can be used for the remainder of the breeding season. Using ultrasound, the producer may now determine which females are pregnant with AI-sired heifer calves. These females can be managed separately with the knowledge that they are pregnant with replacement heifer calves possessing quality maternal traits. Further, because these heifer calves are conceived early in the breeding season, they will be older and larger and more productive replacements in the upcoming breeding season. Calves from all other females will either be male siblings to the replacement heifers or progeny of the terminal cross (carcass trait) bulls.

Many producers may wish to use a common bull type but manage individual pregnancies depending on sex of calf. An example of this management strategy is found in purebred operations wishing to separate cows giving birth to bull calves from those giving birth to heifers. At approximately 60 days after the end of the breeding season, ultrasound may be used to determine fetus sex. As well, cows that did not conceive will be identified. Producers can now divide the herd and manage each of the births in a manner that best fits their production system for heifer and bull calves.

In a typical commercial cow-calf production environment a controlled breeding season can range from 60 to 120 days. Therefore, on a common weaning day, calves from these cows vary substantially in both age and weight. By using ultrasound, as early as 30 days after the conclusion of the breeding season, producers can divide their herd in to three groups, 1) cows bred early, 2) cows bred late, and 3) open cows. Each of these herds may now be managed to best complement their pregnancy status. For instance, late-bred cows may be maintained on pastures that will optimize calf growth, alleviating differences in calf weaning weight between older siblings. Producers may wish to utilize creep feeding for calves born to cows in the late-bred group, or supplement these cows in a manner that might lessen the following post partum interval. Finally, producers may wish to wean these groups on different dates, optimizing calf uniformity and market price.

There are other potential uses for ultrasound in cow-calf production systems. A limitation in Florida is the availability of trained technicians and the costs associated with its use. As with any emerging technology, this hurdle will be overcome as producers find ways to incorporate ultrasound into reproductive management practices.