



Stephens Farms Replacement Heifer

Sexed semen is not a bandage for poor reproductive performance. Reduced conception rates are expected when using gender-sorted semen because sperm can be slightly damaged during separation. Herds that normally run 60 to 65 percent conception in virgin heifers should expect a conception rate of 35 to 45 percent with sexed semen. Because the process of gender-sorting semen is not perfect, there are limitations and recommendations for its use. It is recommended that sexed semen be used in virgin heifers only, and these herds must have greater than 60 percent conception rate. Only highly experienced technicians should perform AI with sexed semen.

Lastly, sexed semen is not yet recommended for use in lactating cows or when flushing for embryo transfer because of already reduced conception rates with sexed semen.

Results of the project are shown in Table 1. Although the pregnancy rates for gender-sorted semen are not as high as Stephens would like compared with published results, the project pregnancy rates are typical. Stephens is still grateful for the experience and is quick to point out the success of the estrus synchronization on the conventional AI bred cattle. "This is a tool that a lot of producers can use to their benefit."

**Table 1. Ultrasound Pregnancy Diagnosis at Day 35**

Heifers conventional semen	21/29 bred	72.4%
Heifers sexed semen	9/24 bred	37.5%
Cows conventional semen	20/27 bred	74.1%
Cows sexed semen	12/28 bred	42.9%

## Beef Herd Culling and Replacement

Lew Strickland, Interim Extension Veterinarian

I can still hear my daddy now, "We need to keep that cow for one more lactation because she is one of our best cows, and, hopefully, we will get a heifer from her." It didn't seem to matter that her udder was broken down and her teats protruded out similar to a hat hanger, we were going to keep her. Fortunately, the advent of sorted semen has changed the "I hope we get a heifer" to a more certain gender outcome so that we can select the cows with better genetics in the herd for breeding. What I would like for us to take a look at is which cows to cull and which heifers to select for replacements.

### Proper ID

This can be as simple as a notebook or as high tech as the current electronics allow. Proper identification is the first step to performance of an individual animal and their offspring. Ear tattoos should be included with ear tags in case an ear tag is lost. Tag and tattoo calves to match their dams and their calving dates. Some of the production records recommended are cow and calf ID, sire ID, calf sex, birth date and weight, calving ease score, and weaning date and weight.

### Pregnancy Status

A producer once told me that "an open cow to a producer is like an empty well to a thirsty man." They produce expenses without providing a calf to offset the expenses. Cows that are open at the end of a breeding season should be culled and treated with "trailermycin." In a natural service herd, these cows can serve as a source of venereal diseases. Cows persistently infected with trichomoniasis and campylobacteriosis can carry these diseases from year to year and reduce reproductive performance and economic profitability of a cow-calf operation. Pregnancy exams can be performed as early as 26 days with ultrasound, and routine palpation should be performed 60 to 90 days postbreeding. Working closely with a veterinarian can help to identify infertility and herd health problems.

### Structural Soundness

The productive lifetime of a cow varies, but, as long as the cow is structurally sound, she may be able to continue to contribute to the herd. The following are some parameters to consider when determining soundness:

- Does she still have teeth adequate for grazing?
- Is her udder healthy? Are there obvious signs of mastitis, balloon teats or broken suspension?
- Is there any obvious lameness? Are her limbs still structurally sound?

### Health Concerns

Existing disease may influence the decision to cull. These conditions are a big strike against the animal. Cancer eye is one of the most common and economically significant tumors of cattle. Treatment options are available depending upon severity of the lesion. Enucleation may be necessary if the eye is not salvageable. Vaginal or cervical prolapse usually occur pre- or postcalving. These can be repaired, but prepare for a repeat performance. These commonly reoccur and have a genetic component that can be passed onto offspring. An additional strike is Johne's disease. Johne's is a chronic incurable disease that is contagious, especially to offspring of the infected animal. Serological and or fecal tests can be performed to identify the infected animal.

### Records

Once again, a complete permanent set of records in conjunction with a permanent identification system, is crucial for selecting replacement heifers. These records should provide information on an individual's sire and dam, birth date, birth weight, weaning weight and yearling weight. Permanent records on every producing animal in your herd and on culled

animals that still have offspring producing in the herd will allow producers to identify and select females with a record of above average production. Selection is just a guess without proper records.

### EPDs

The selection process can begin with expected progeny differences (EPDs). These are available on most major breeds of cattle and are good predictors of an animal's genetic potential for production. An estimate of an individual's birth weight, weaning weight, yearling weight, milking ability and, in some cases, carcass quality can be calculated from the EPDs of an animal's sire and dam.

### Sire and Dam Traits

Selection of daughters from bulls with a large scrotal circumference is beneficial as well. Research shows that daughters of bulls with a large scrotal circumference tend to reach puberty at an earlier age than do daughters from bulls with smaller testicles. For a closed herd, all genetic progress is made through bull selection or replacement heifer selection.

Select replacement heifers from those born in the first part of the calving season. These heifers will be older, and they will be larger. These heifers should breed readily because they will be more mature at the beginning of the breeding season. Cows that are more fertile usually calve earlier in the season and tend to pass this fertility level on to their daughters. Coupling this female selection characteristic with selecting bulls with large testicles will improve fertility in females.

### Pelvic Measurement

Pelvic measurements can be used to cull heifers with smaller pelvic measurements, but this does not guarantee that a heifer with a certain pelvic measurement will calve without any problems. Average pelvic measurement figures are about 155 to 160 cm<sup>2</sup> as a minimum for a 12- to 14-month-old heifer. Heifers with a measurement smaller than 160 cm<sup>2</sup> are more likely to experience dystocia than those meeting this minimum standard. An additional tool for selecting heifers is scoring reproductive tracts against a standard. Tracts are evaluated for size, tone and ovarian activity. This examination identifies heifers that have attained puberty and those that haven't.

### Conclusion

Several key factors are crucial for the selection of productive, high-quality females:

- Permanent records are essential.
- EPDs help to predict an animal's genetic potential for production.
- Do not get calves too fat between birth and their initial breeding season. Fat deposition in the pelvic canal leads to dystocia.
- Replacement heifers need to gain 1 to 1.5 pounds per day from weaning time to breeding.

- Structural soundness is a must for longevity.
- Select heifers based on sire and dam traits.
- Replacement heifers should meet the standards of pelvic measurement and tract scoring.

## Understanding Index EPDs

Lisa Kriese-Anderson, Extension Animal Scientist

Most beef producers realize the majority of genetic change in a herd is through sire selection. This is not because his genes are more important, but because he leaves many more progeny than a cow. The breeding season for fall calving cows will soon begin and it is not too early to select bulls.

In recent years, many beef breed associations have introduced index EPDs (e.g., \$W, TI, Terminal Sire Profitability Index). Index EPDs are a combination of traits coupled with an economic weighting of each trait.

Index EPDs are a great tool especially for commercial cattle producers. Index values tend to represent what commercial cattle producers are interested in. For example, \$W in the Angus breed is the expected average difference in future progeny performance for pre-weaning merit between two individuals. \$W includes both revenue and cost adjustments associated with differences in birth weight, weaning direct growth, maternal milk and mature cow size. So, two potential sires could have large weaning weight EPD values, but one might have a large birth weight EPD and the other might be breed average for birth weight. The index value will take into consideration costs associated with large birth weights (e.g., potential calving difficulty, loss of calf or cow). Commercial producers evaluate one EPD instead of four or five.

Economic values can be changed if necessary. In a perfect world, producers would be able to use their own economic weights. That would require meticulous financial detail, and not all producers have the financial detail required to estimate the economic weights. So most breed associations with index EPDs have taken the middle road on economic weights.

Index values are interpreted exactly as are EPD values. In the two scenarios in the table below, Bull A's progeny would be \$30 more profitable than Bull B's in a system where calves are sold at weaning and replacement heifers are retained. In a terminal system where all calves are sold, Bull B's progeny would be \$35 more profitable than Bull A's.

Don't be afraid to use index value EPDs. They have all the same properties as single trait EPD values and can be effective in making genetic changes in your herd.

**Table. Comparison of Index Values for Two Bulls**

	Weaning Index	Terminal Index
<b>Bull A</b>	<b>+ \$40</b>	<b>+ \$20</b>
<b>Bull B</b>	<b>+ \$10</b>	<b>+ \$55</b>
<b>Difference</b>	<b>+ \$30</b>	<b>- \$35</b>

# Genetic Defect Update: Fawn Calf Syndrome Name Change

Lisa Kriese-Anderson, Extension Animal Scientist

Dr. Jon Beaver from the University of Illinois has finally unraveled contractural arachnodactyly (CA), formally known as fawn calf syndrome in Angus cattle. CA is inherited as a simple recessive gene. Calves with CA have a portion of their DNA deleted.

There is some debate in the scientific community whether CA is a lethal defect. According to Beaver, "Many CA-affected calves survive and can reach reproductive age. However, at the population level, CA behaves as a lethal genetic defect and should be classified as such."

CA has been reported in Angus calves in Australia for many years. It has probably been in the U.S. population, but not reported (unintentionally). Most calves are born alive, can walk and suckle. They also grow.

Birth weight of CA calves is also normal; however, the affected calves crouch much like an elk or deer. Their feet will be placed more to the rear than normal. Their hocks will be pulled up and the spine arched. Most times, CA calves will also be flat on their pasterns during the first days of life.

CA calves may look completely normal by 4 to 6 months of age. They are always more slight in bone structure and

muscling. Postweaning, CA calves generally gain slowly and are tall, gangly cattle with poor foot conformation.

To date, 39 Angus sires have been identified as CA carriers. A complete list of can be found at [http://www.angus.org/pub/CA/CA\\_Summary.pdf](http://www.angus.org/pub/CA/CA_Summary.pdf). Below is a list of sires common in many southern pedigrees that are carriers of CA. Remember, a carrier has one copy of the chromosome without the deletion (normal) and one copy of the chromosome with the deletion. If you have a calf out of one of these sires, it has a 50 percent chance of carrying the defective chromosome.

A genetic test, similar to tests available for AM and NH, should be available in September. Remember genetic defects are not a problem until they are in your herd. When purchasing your next herd sire or semen, make sure not to introduce problems into your herd. Genetic defect carriers are clearly marked on registration papers.

## Calendar of Events

<b>October</b>	19–21	Sunbelt Expo, Moultrie, Ga.
<b>November</b>	9 & 16	ABCs of Raising and Marketing Freezer Meat, 6:30–8:30 p.m. Contact your regional Extension agent.
	12	Fall Round-Up Bull and Heifer Sale, Union Town, 11:00 a.m.
	18	Field Day, Blackbelt Research & Extension Center, Marion Junction. Contact Lisa Kriese-Anderson at (334) 844-1561 or Jimmy Holliman at (334) 872-7878

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# Livestock Links

A Statewide Newsletter for Alabamians

Fall 2010

## Use of Gender Sorted Semen

Joshua Elmore, Animal Sciences

Stephens Farm has been producing beef cattle since 1957 and is currently owned and managed by Donny and Pat Stephens. At present, the herd consists of 122 Angus and Sim-Angus cross cows. The 90-day calving season begins in September. Ninety-five replacement heifers are developed yearly, half being retained from the herd with the remainder being purchased at Alabama BCIA sales to maintain quality as the herd continues to grow. Feeder calves are marketed each July in the Alabama Feeder Calf Marketing Association tele-auction sale. Vaccination history, negative status of BVD, management practices and BQA certifications are supplied to potential buyers. Heifers are sold through Alabama BCIA, Sunshine Farms and private treaty. Replacement heifers failing to breed and cull feeder steers are fed out on the farm in the "Stephens Farm Freezer Beef Program" started by Stephens' father in the early 1980s.

Stephens Farm has been using artificial insemination for several years. When the opportunity to work with a gender-sorted semen project in conjunction with Select Sires, (Mississippi State and Auburn universities) arose, Stephens jumped at the chance. "The ability to select the best cows to have heifers and the hands on education of working with experts in the field on this project were just a couple of the reasons I chose to do it.



Donny Stephens

"In our cowherd, our overall goals are to sell a uniform load of feeder steers each year and to keep and sell high quality replacement heifers."

The project also incorporated estrus synchronization to breed the cattle. Research demonstrates estrous synchronization in cows can improve calving distribution and progeny value. Synchronizing estrous is a tool that can be used to concentrate when animals exhibit estrus and potentially concentrate calving distribution. Shortened calving periods result in more efficient use of labor inputs for calving and increased returns on feed inputs. "To maintain uniformity, I have found that a 90-day calving season is our maximum length; however, reducing the calving season to 60 to 70 days is a goal," Stephens says. "Last year, 93 percent of the cows calved in the first 63 days."

Gender-sorted semen has been commercially available since 2005. The semen has to be stained with a fluorescent dye and sent through the flow cytometer at 60 mph, under 40 to 60 psi of pressure. The X-chromosome is 3 to 4 percent larger than the Y-chromosome, so it emits more light. A laser detects the gender of the sperm, and the X and Y chromosomes are separated by assigning either a positive or negative charge to the sperm as they pass through the flow cytometer as single droplets of liquid. The sperm are then split into three different groups: positively charged sperm containing one sex go one way, negatively charged sperm containing the other sex go another way, and anything of undefined sex passes straight through. This procedure is determined to be about 90 percent accurate.

Using sexed semen increases the chances of heifer calves from about 50 to 90 percent. More heifers being born on the farm is a fast way to grow a herd internally. "I want my best cows to have all heifers, allowing me to cull more deeply when needed," Stephens says. "To know you have the ability to keep replacement females from certain cow:bull combinations or make high quality steers from a terminal cross, what a great tool." Additionally, heifer calves are usually easier to deliver than bulls, so calving ease is another benefit.