

Vet Call

by Bob L. Larson, DVM, University, of Missouri



Getting replacement heifers ready to work

To evaluate the reproductive soundness of yearling beef heifers, consider target weight, reproductive tract score and pelvic area.

Target weight

Angus heifers should reach puberty at about 60-65% of mature weight. You can determine the target weight for heifers by knowing the average mature weight of the cow herd, or by knowing the frame score and using it to predict mature weight.

Once you determine your heifer target weight and the number of days until the start of the breeding season (or until a mid-development ration change), you can easily calculate the rate of gain your heifers need to reach puberty on time.

$$\text{(Target wt. - present wt.)} \div \text{number of days} = \text{pounds (lb.)/day}$$

Meeting the target weight, but not grossly exceeding it, is important for heifer fertility. Developing heifers on a high plane of nutrition (both energy and protein) from weaning to breeding results in earlier puberty, improved udder development and increased conception rates compared to developing them on a low plane of nutrition.

On the other hand, overfeeding heifers before breeding has detrimental effects on pregnancy rates. Researchers have shown heifers that gained 1-1.5 lb./day had higher pregnancy rates during a 45-day breeding season than did heifers with gains above or below this range. Body condition scores in the same group of 1,863 heifers showed the same tendency. First-service conception rates improved as body condition increased up to a score of 6 (9-point scale) and then declined in very fat heifers.

To be assured target weights and body condition scores are being met, weigh and condition score a sub-group of the heifers at reasonable intervals (such as monthly). If gains are not near target levels, adjust the ration accordingly.

Reproductive tract scores

Productivity for beef herds is increased when a high percentage of heifers conceive early in the first breeding season. In order for heifers to conceive early their first breeding season, they must reach puberty prior to the start of the breeding season.

In addition, because conception rates are higher for heifers bred on their third estrus compared to heifers bred on their puberal estrus, first-service conception rates are improved if heifers reach puberty at least 21 days prior to the start of the breeding season.

The hormone system and the internal organs of the reproductive system mature gradually. The changes taking place in the ovaries and the uterus can be determined by palpation and described in terms of reproductive tract scores (RTS). The system assigns a score to each heifer using a five-point scale.

RTS 1 describes heifers with infantile reproductive tracts that are not near puberty when palpated. These heifers have small, flaccid tracts and small ovaries. Heifers may be categorized as RTS 1 because:

- They are simply too young to fit into the breeding season being planned;
- They are too light to reach their target weights and are not able to express their genetic potential for reaching puberty;
- They were implanted with a growth-promotant near the time of birth.

Heifers assigned RTS 2 have slightly larger uterine diameter, but tone is still lacking and the ovaries have very small follicles.

Heifers described as RTS 3 have some uterine tone and larger uterine diameter than heifers with more immature scores. These heifers are close to cycling and many will begin cycling within 6 weeks. Heifers assigned a score of 4 or 5 are considered to be cycling as indicated by

good uterine tone and size and easily palpable ovarian structures.

Evaluate heifers for reproductive tract score 6-8 weeks prior to the breeding season. If deficiencies are found, management changes instituted this far ahead of the breeding season can increase the number of heifers reaching puberty by the start of the breeding season.

If heifers are evaluated too far ahead of the breeding season (more than 8 weeks), they are likely to be young and to have lower tract scores than what is a true reflection of their potential to reach puberty before the breeding season.

A reasonable goal is to have at least 80% of replacement heifers cycling before the start of the breeding season. If at 6-8 weeks before breeding, at least 60% of the heifers score RTS 4 or 5 and most of the remainder are RTS 3, the group should be ready to breed at the planned time as long as nutrition remains constant.

Melengestrol acetate (MGA®) will induce puberty in some heifers that are near puberty (RTS 3). So, if MGA is used in a synchronization protocol, at least 50% of the heifers should score RTS 4 or 5.

If a low percentage of heifers are cycling at the time of RTS evaluation and many of the heifers score RTS 2, management changes must be instituted immediately. These changes may include:

1. Increasing the plane of nutrition so increased weight gain will allow the heifers to reach their target weights by the start of the breeding season;
2. Increasing the plane of nutrition and delaying the start of the breeding season by several weeks;
3. Holding the heifers over to breed 6 months later to calve in the fall (for spring-calving herds); and
4. Marketing the heifers for feeder cattle and finding another source of replacements.

Pelvic area measurement

Using yearling heifer pelvic measurements as a tool to decrease the incidence of calving difficulty (dystocia) has been described extensively since the early 1980s. Veterinarians have used yearling pelvic area measurements because the major cause of dystocia is a disproportionately large calf compared to the heifer's pelvic area. Pelvic area is moderately to highly heritable (.44-.61), so

after a few years of measuring replacement

heifers and bulls used to produce replacements, producers can increase the average pelvic size of the herd.

Critics of using pelvic area measurements to decrease dystocia point out that pelvic area is also positively correlated to mature cow size and calf birth weight. If producers select for increasingly larger pelvic areas, calf birth weights will also increase and the rate of dystocia is not

likely to decrease. A number of researchers have shown that selection based on pelvic area alone did not significantly reduce the incidence of dystocia in groups of heifers.

Rather than selecting for maximum pelvic size, set a minimum pelvic size as a culling threshold, such as 150 square centimeters (cm²) at a year of age, and don't assign a preference among heifers that exceed the minimum. In addition, include mature weight as a selection criterion, so heifers with a genetic predisposition for small pelvic area are culled without increasing mature size.

Putting it all together

The most effective way to evaluate the reproductive soundness of yearling heifers in a ranch setting is to use yearling weights, RTS and pelvic measurements together to describe maturity and reproductive soundness. These three criteria are closely correlated. Within a set of heifers, one should expect higher tract scores in heifers that have heavier yearling weights, and these heifers should also have greater pelvic areas than lighter-weight heifers.

Because we expect yearling weight, RTS and pelvic area to all be related, take note of heifers or groups of heifers where that relationship is not strong. Heifers that have reached their target weight and have a high RTS but small pelvic areas may have a genetic predisposition for a small pelvis.

Also, heifers that have been implanted with growth promotants soon after their birth may not perform as expected. Many times, these heifers have very adequate yearling weights and pelvic areas, but immature reproductive tracts.

Pelvic area tends to increase more rapidly near the time of puberty than during the prepubertal period. Keep that in mind when examining pelvic area data. A heifer that has an RTS of 5 and is of adequate yearling weight but that has a small pelvis has a high probability of having a small pelvis when she calves as a 2-year-old. Whereas, a heifer with the same pelvic area who has an RTS of 2 and has not reached her target weight may very well have an adequate pelvic size at calving if management changes are made to help her reach puberty and conceive.

ESTABLISHED



The Hembree family has operated Sugar Hill Farms in the river valley of Arkansas since the late 1800s. The farm began as a cotton plantation and is now a fully integrated agricultural enterprise operated by H. Lawson Hembree, IV.

Lawson has an Animal Science degree from the University of Arkansas and placed emphasis on Sugar Hill Farms' livestock operation by replacing its Santa Gertrudis and commercial cow-calf herds with a registered Angus program.

The foundation of the herd was purchased in 1996 when he acquired 160 females from Gulf Pacific Cattle Company in Idaho. Sugar Hill's Angus herd has grown to 250 females through additional acquisitions from Drake Farms, Pollard Angus Ranch, Pheiffer Angus and the use of top AI sires with this group

At the 1998 National Western Stock Show, Sugar Hill Farms joined in partnership with neighboring Belle Point Ranch in purchasing TC Flower 7072 in the National Junior Angus Foundation auction for \$50,000.

Plans are to create a new family for both programs with this daughter of TC Stockman 365, Lawson and David McMahon immediately offered to sell their first embryo flush to benefit NJAA. The contending bidder on the heifer, Leon Heron of KMK Acres, Thompsons Station, Tennessee, gave the nod for five pregnancies to make the heifer reach an pregnancies record price of \$77,500.

This time-honored farming and ranching operation has charted a new direction for its second century. There's a new Angus establishment at Sugar Hill Farms.

H. LAWSON HEMBREE, IV

P.O. Box 10233, Fort Smith, Arkansas 72917 (501) 452-0277, 547 West State Highway 288, Ozark, Arkansas 72949



Bob Larson's E-mail address:
vmlarson@ext.missouri.edu