



THE VETERINARY LINK

by **BOB LARSON, DVM, University of Missouri**

Use pelvic measurements appropriately

Using yearling pelvic measurements as a selection tool to decrease the incidence of calving difficulty (dystocia) has been described extensively since the late 1970s.

Many veterinarians have adopted the technique because the major cause of dystocia is a disproportionately large calf compared to the heifer's pelvic area and because pelvic area is moderately to highly heritable (0.44-0.61). After a few years of measuring replacement heifers and bulls used to produce replacements, producers can increase average pelvic size in the herd.

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

A number of researchers have shown that selection based solely on pelvic area did not significantly reduce the incidence of dystocia in groups of heifers and that selecting bulls with low birth weight expected progeny differences (EPDs) was a more powerful tool in decreasing the number and severity of difficult calvings in heifers.

Know your limit

Because of the pros and cons of using heifer pelvic measurements, veterinarians and producers need to discuss whether the procedure will be cost-effective in each particular herd. If a herd is having a high rate of difficult births in the heifer population, a strategy to evaluate bull selection, heifer nutrition and growth, and pelvic area may be in order.

When using pelvic measurements to reduce a herd's dystocia problem, many experts recommend that, rather than applying selection pressure to achieve ever-increasing pelvic areas, they should be used to cull heifers with less than a minimum standard pelvic area. You and your veterinarian should establish this standard after considering the age and history of the herd.

I use a range of 135 to 150 square centimeters (sq. cm) as a minimum pelvic area for 1-year-old heifers that have reached puberty, and I will select a cutoff within that range on a farm-by-farm basis. Heifers not meeting this standard are culled; however, no selection pressure is applied on heifers that

exceed the standard.

In addition, by including mature weight as a selection criterion, heifers with a genetic predisposition for small pelvic area are culled without increasing mature size. Average pelvic-area growth has been calculated at 0.27 sq. cm/day from 1 year to 2 years of age in heifers and continues to grow at a slower rate until the cow reaches maturity. You can use this figure to adjust pelvic areas to a standard date.

Do the math

Pelvic measurements can be obtained with two types of instruments. The Rice pelvimeter has a scissor action that allows the veterinarian to measure, on an external scale, the distance between two calipers placed in the rectum. Other instruments use either a hydraulic or pneumatic cylinder to measure width and height within the pelvic canal. A veterinarian or an experienced producer can obtain these measurements.

It is important to realize that practice and a thorough understanding of the birth canal, pelvic structure and reproductive tract are necessary before accurate measurements can be obtained.

Pelvic area is determined by taking the instrument into the rectum while wearing a protective sleeve and determining the distance between two separate pairs of bony landmarks. The vertical measurement is taken within the pelvic birth canal between the backbone and the floor of the pelvis. An experienced operator can palpate small landmarks to ensure the instrument is placed in the proper location.

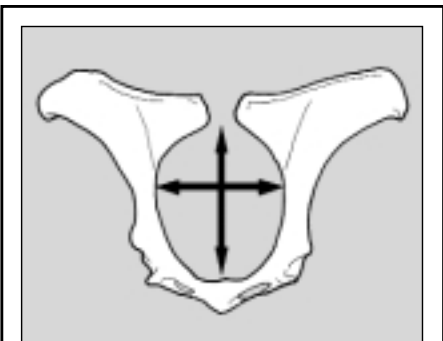
A horizontal measurement is taken at the widest point between the bones of the pelvis, being careful not to slip off the pelvis into the soft tissue before or behind the bony pelvis. The two measurements are multiplied to give the pelvic area.

Generally, most cattle will have a vertical measurement between 12 cm and 15 cm and a horizontal measurement between 10 cm and 12 cm. Although a few heifers fall outside this range, a measurement that is far from what I expect will cause me to measure again to confirm or to correct my original measurement.

What about bulls?

Measuring the pelvic area of bulls used to produce replacement heifers also has been

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Two measurements are multiplied to calculate pelvic area. The vertical measurement is taken within the pelvic birth canal between the backbone and the floor of the pelvis; the horizontal measurement is taken at the widest point between the bones of the pelvis.

described as a tool to indicate their daughters' calving ease. The genetic correlation between pelvic area in heifers and bulls, however, has been estimated in two major studies to be 0.6. This indicates that, although many of the same genes likely control pelvic area, there are important differences in regulation between the sexes.

Pelvic-area measurement can be a valuable tool when evaluating heifers with an unknown history or in a herd where the rate of calving difficulty in the heifers is too high. Pelvic area should be used in conjunction with body weight, reproductive-tract maturity and other factors to determine if a yearling heifer is at high risk for dystocia when she calves about 12 months later.