



# The Veterinary Link

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## Assessing heifer reproductive soundness

Selection and development of replacement heifers should start by selecting heifers born early in the calving season from dams and bulls likely to produce calves that have sound feet and legs, good udders, and appropriate size and milking ability for the available forage.

Approximately six weeks before the start of the breeding season, heifers should undergo a thorough physical examination, including determination of body weight and palpation of the reproductive tract. Confirming that a high percentage of replacement heifers are cycling prior to the start of the breeding season as well as identifying and removing freemartins, very immature heifers, and pregnant heifers will increase the success of an estrous synchronization and AI program and allow more appropriate management of these nonbreeding animals.

### Reproductive tract scores

The reproductive tract scoring (RTS) system was developed to determine if heifers have reached puberty — using

size of the uterus and ovaries estimated by palpation. Several different scoring systems have been described and used — but they all use three or more categories to classify heifers as already cycling, prepubertal, immature or a problem breeder (freemartin, pregnant, etc.).

Heifers should be evaluated for reproductive tract scores about six to eight weeks prior to the breeding season. If deficiencies are found, management changes instituted this far ahead of the breeding season can result in an increased number of heifers reaching puberty by the start of the breeding season. If the heifers are evaluated too far ahead of the breeding season (more than 8 weeks), the heifers are likely to be young and have lower tract scores than the true reflection of their potential to reach puberty before the breeding season.

The scores assigned with an RTS system are able to predict the reproductive performance of yearling heifers, especially for pregnancy percentage following synchronized breeding — in that heifers with more mature reproductive

tracts prior to the breeding season had higher pregnancy percentages to artificial insemination (AI) and calved earlier.

A reasonable goal is to have at least 80% of replacement heifers cycling by the start of the breeding season. A group is considered to be properly developed to reach this goal if at least 60% of the heifers are determined to already be cycling when evaluated six to eight weeks before breeding. Because progesterone or melengestrol acetate (MGA®) will induce puberty in some heifers that are near puberty, a lower percentage (50%) of heifers classified as cycling when evaluated prior to breeding is adequate to meet the 80% goal at breeding if using MGA or CIDR® inserts. In order to reach the goal of at least 80% of heifers in a replacement pool cycling at the start of the breeding season, nutrition must remain adequate for continued growth from the time of RTS evaluation until breeding.

If a low percentage of heifers are cycling at the time of RTS evaluation and many of the heifers are classified as immature, management changes must be instituted immediately. These changes may include: 1) increasing the plane of nutrition so that increased weight gain will allow the heifers to reach target weight 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 six months later to calve in the fall (for spring-calving herds), or 4) marketing the heifers as feeder cattle and finding another source of replacements.

### Pelvic area measurement

The use of pelvic area measurement at one year of age has been described extensively since the late 1970s, but its value to decrease the risk of calving difficulty should not be overestimated. Veterinarians have used pelvic area measurements of yearlings because the major cause of calving difficulty in heifers is a disproportionately large calf compared to the heifer's pelvic area. The correlation between yearling and 2-year-old pelvic areas is high; therefore, measuring pelvic area as a yearling is beneficial for predicting pelvic size at the time of calving. Pelvic area is moderately to highly heritable, so after a few years of measuring replacement heifers and bulls used to produce replacements, producers can increase average pelvic size of the herd.

Critics of using pelvic area measurements to decrease calving difficulty point out that pelvic area is also positively correlated to mature cow size and calf birth weight. If producers select for increasingly larger pelvic area, calf birth

weight will also increase and the risk of calving difficulty is not likely to decrease. A number of researchers have shown that selection based on pelvic area alone did not significantly reduce the likelihood of calving difficulty in groups of heifers.

Rather than using pelvic area measurement to select for maximum pelvic size, this tool should be used to set a minimum pelvic size (such as 130 to 150 cm<sup>2</sup> at a year of age) as a culling criterion without assigning preference for heifers that exceed the minimum. 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.

### Reproductive soundness

An effective way to evaluate the reproductive soundness of yearling heifers in a ranch setting is by using yearling weights, RTS and pelvic area measurements together to describe the maturity and reproductive soundness of the heifer group. These three criteria are closely correlated, in that, within a set of heifers with similar genetic makeup, 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, one should make 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 that have small pelvic areas may have a genetic predisposition for a small pelvis. This genetic input may have come from the male or the female side of the genetic makeup. Another example where heifers do not perform as expected is the case where heifers are implanted with a growth promotant near the time of birth. Many times these heifers have very adequate yearling weights and pelvic areas, but RTS indicate tract immaturity.

Pelvic area tends to increase more rapidly near the time of puberty than during the prepubertal period. This knowledge is useful when examining pelvic area data in that a heifer that is classified as already cycling and is of adequate yearling weight but who has a small pelvis has a high probability of having a small pelvis at the time of calving as a 2-year-old. Whereas, a heifer with the same pelvic area that has not reached puberty and has not reached her target weight may very well have an adequate pelvis at calving if management changes are made so that she reaches puberty and becomes pregnant.