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► Reproductive tract scoring may tell producers if their heifers have reached sexual maturity.

Are your replacement heifers Reproductively Ready?

by **Troy Smith**

You can't tell by looking. You can scrutinize replacement heifers for age, size and weight, and still not know if they are ready to breed. There is a way, however, of reducing the risk of carrying heifers least likely to cycle and conceive during the coming breeding season.

"You cannot look at a heifer, or weigh her, and tell where she is with regard to

reproductive tract development," says David Patterson, University of Missouri professor of animal science. "Prebreeding examinations that include reproductive tract scoring furnish the opportunity to assess reproductive development, but further provide an appraisal of possible aberrant situations that may detract from a heifer's reproductive potential."

Originally developed by researchers at Colorado State University (CSU), the reproductive tract scoring system has been available for several years. Still, Patterson laments, little more than 1% of U.S. cow-calf producers use this method of predicting reproductive efficiency. It is a subjective analysis, so it isn't precise, he admits. But, it is a practice that Patterson recommends.

The exam

Reproductive tract scoring to evaluate sexual maturity is accomplished through rectal palpation of a heifer's reproductive organs. The size and development of the uterus and ovaries offer an indication of a heifer's reproductive readiness.

This is how the scoring system works. Upon examination, each heifer receives a numerical reproductive tract score (RTS), ranging from 1 to 5 (see Table 1). A score of 1 represents an infantile reproductive tract with small, toneless uterine horns and small ovaries without significant follicular development. Heifers with an RTS of 1 are likely to be farthest from puberty at the time of examination.

A score of 2 means the heifer is considered closer to puberty, indicated by larger uterine horns and ovaries. A score of 3 puts the heifer on the verge of estrus — almost ready to cycle — as indicated by increased uterine tone and the presence of palpable ovarian follicles.

Further development of uterine size and tone, coiling of the uterine horns and larger follicles are indicators of an RTS of 4. A heifer exhibiting an easily distinguished corpus luteum (CL) earns a score of 5.

Put scoring to work

Results of CSU research showed that reproductive tract scoring at one month prior to breeding can help identify heifers least likely to respond to estrus synchronization and become pregnant during a short breeding season. A series of studies indicated, generally, a 5% to 22% advantage in pregnancy rate to synchronization for heifers earning scores of 4 and 5 vs. heifers with scores of 3. Pregnancy rates for RTS 1 heifers were 41% to 58% lower than heifers with scores of 4 and 5.

Patterson says reproductive tract scoring can be particularly useful to producers who purchase heifers for which management history may be unknown. For example, a producer may not know if purchased heifers received growth-promoting implants. Studies indicate exposure of heifer calves to implants containing progesterone or estradiol may affect uterine structure and function. Undesirable effects have been

Table 1: Reproductive tract scores

| RTS | Uterine horns | Ovarian diameter | Ovarian length | Ovarian height | Ovarian width | Ovarian structures |
|-----|-------------------|------------------|----------------|----------------|---------------|------------------------------|
| 1 | Immature, no tone | <20 mm | 15 mm | 10 mm | 8 mm | no palpable follicles |
| 2 | No tone | 20-25 mm | 18 mm | 12 mm | 10 mm | 8-mm follicles |
| 3 | Slight tone | 20-25 mm | 22 mm | 15 mm | 10 mm | 8- to 10-mm follicles |
| 4 | Good tone | 30 mm | 30 mm | 16 mm | 12 mm | 10-mm follicles, CL possible |
| 5 | | >30 mm | >32 mm | 20 mm | 15 mm | CL present |

Source: K.J. Anderson et al., 1991, Colorado State University.

observed in heifers up to 15 months after the first implant exposure.

“The changes that occur in uterine morphology as a result of implant administration are in many cases palpable at the time reproductive tract scoring is performed,” he notes.

Reproductive tract scoring is an additional tool Patterson recommends using in conjunction with management of prebreeding weight and pelvic measurement.

Reproductive management

Among individual heifers, puberty occurs at a genetically predetermined size, and only when they reach that target weight can high pregnancy rates be achieved. The widely accepted target weight principle calls for developing heifers to a prebreeding weight representing 65% of projected mature weight. Until a better rule of thumb is established, Patterson says, the target weight principle remains the best method of ensuring that a relatively high percentage of yearling heifers reach puberty by the breeding season.

Pelvic measurements should be used in addition to, not in place of, selection for size, weight and fertility. Patterson warns that selection for increased pelvic area seldom results in larger pelvic size alone, but will result in increased size of the entire skeleton. Pelvic measurements are best used to identify heifers with abnormally small or abnormally shaped pelvises.

Studies suggest that puberty does exert a positive influence on pelvic area in yearling heifers, but differences seen among heifers may no longer exist by the time they calve as 2-year-olds. Therefore, a heifer’s pubertal status at the time measurements are taken should be a consideration when culling on the basis of pelvic measurements.

Timing of reproductive tract scoring varies with producer objectives. As a last-minute culling tool, scoring may be done no more than a month prior to breeding as an indication of a heifer’s ability to conceive early in the breeding season. To place selection pressure on age at puberty, the best time to evaluate heifers is when about half of them are thought to have begun cycling, based on age, weight and observation of estrus. To evaluate the success of a heifer development program, scoring heifers 30-60 days prior to breeding may be most appropriate. This allows time for adjustment of nutrition or the starting date of the breeding season.

When timed appropriately, RTS can serve as an indicator of whether heifers are ready for an estrus synchronization treatment. When choosing a synchronization protocol initiated by the feeding of melengestrol

acetate (MGA), Patterson recommends application of reproductive tract scoring procedures within two weeks prior to introducing MGA. If at least 50% of heifers within a group earn scores of 4 or 5, indicating they have reached puberty and are cycling, he advises proceeding with treatment. An acceptable number of heifers can be expected to exhibit estrus and ovulate after MGA is withdrawn.

“If only 20% or 30% of heifers in the group score 4 or 5, the group probably needs more time, and nutrition probably needs to be addressed,” Patterson explains.

If young heifers are behind in

development, earning scores of 2 or 3, they often will respond to a higher plane of nutrition and catch up. Poor reproductive performance should be anticipated for any heifer with an RTS of 1, and culling of these heifers is advised.

Like many tools for managing reproductive performance, Patterson says, reproductive tract scoring is underutilized. While it will not predict if or when a young heifer will start cycling, it can help identify heifers that are reproductively ready — right now.

