



Ridin' Herd

► by *Rick Rasby*, University of Nebraska

Heifer development affects future reproductive performance

Heifer-development programs can be a major expense for the cow-calf enterprise. Heifer-development costs will depend on when the potential replacements are weaned and the feeding strategy used to develop them. Because the replacement-heifer enterprise does not generate income, or usually very little income from cull replacements, costs for this enterprise are borne by the cow-calf enterprise.

Profit potential

The more economical the replacement-heifer program, the greater the profit potential of the cow-calf enterprise as long as reproductive performance of the heifers is not compromised. We are learning more about the effect of development strategies on future reproductive performance and stayability in the cow herd. Heifers developed to about 55%-60% of their mature weight perform as well reproductively as those heifers developed to 66% of their mature weight.

Pregnancy rates have been correlated with the percentage of heifers that reach puberty before or during the breeding season. It has been demonstrated that heifers inseminated on their pubertal (first) estrus (heat) have a decreased pregnancy rate compared to heifers inseminated on their third estrus. However, heifers inseminated on pubertal estrus were inseminated at an earlier date than heifers inseminated on the third estrus. How does the number of estrous cycles prior to the beginning of the breeding season, which is a function primarily of the nutrition program, affect reproductive performance during the current and subsequent breeding seasons?

Number of estrous cycles

There are data that illustrate the impact of the number of estrous cycles that a heifer experiences prior to her first breeding season and how that affects reproductive performance during her first breeding season. A data set published in 1987 reported a decrease of 21 percentage units in pregnancy rate for heifers inseminated at their pubertal estrus compared to being inseminated on their third estrus. In this report, on the date of insemination, heifers that were inseminated when they became pubertal were 50 days younger compared to heifers that were inseminated on their third estrus. The number of heifers in this data set was small.

The question is, how many estrous cycles should a heifer experience before her first breeding season to achieve optimal reproductive performance when the age at first insemination is not different. The number of estrous cycles prior to the start of the breeding season will be affected by the nutrition program.

A more recent study, using a large number of heifers in the experiment, suggests there was a tendency for greater reproductive performance [artificial insemination (AI) pregnancy rate] for heifers that had reached puberty — and therefore cycled — prior to the time they were Aled compared to those heifers that were inseminated on their first estrus.

In another data set in which heifers were bred by natural service, overall pregnancy rates were greater in heifers that had reached puberty prior to the start of the breeding season.

The following comments will be in relationship to the impact of the number of estrous cycles prior to the start of the breeding season on reproductive performance. Heifers were categorized as not having exhibited an estrous cycle prior to the start of the breeding season or as having had one, two, three, or more than four estrous cycles prior to the start of the breeding season. Birth date was not different between all heifers regardless of whether they had or had not exhibited an estrous cycle(s) prior to the start of the breeding season.

There was a tendency for heifers to have greater pregnancy rates as the number of estrous cycles prior to the start of the breeding season increased. However, pregnancy rates did not differ between heifers that had one estrous cycle prior to the start of the breeding season compared to heifers that had two or more estrous cycles prior to the start of the breeding season.

An interesting component with this data set was that the researchers followed these heifers through their second pregnancy. Heifers that were pubertal (exhibited an estrous cycle) prior to their first breeding season had about a 17% greater pregnancy rate for their second pregnancy compared to heifers that had not exhibited an estrous cycle prior to the start of their first breeding season.

Target weights

Using the “target” weight concept, let’s say the number of days between weaning and the start of the breeding season for your heifers is 200 days. Feed them for the light end of the group of heifers to be at their target weight in 179 days (assuming a 21-day estrous cycle) to give them the opportunity to have at least one estrous cycle prior to the start of the breeding season. If the light end of the replacement heifers weigh 475 pounds (lb.) and their target weight is that they need to weigh 720 lb. by 179 days postweaning, project the whole replacement heifer group to be fed to gain 1.4 lb. per day $[(720 \text{ lb.} - 475 \text{ lb.}) \div 179 \text{ days}]$.

The heavier end of the replacement heifers would weigh more than the 720-lb. target weight, which would be okay because an average daily gain (ADG) of 1.4 lb. would not grow them at a rate at which they would get fat.

The projected ADG of 1.4 lb. could be accomplished a number of different ways and, depending on the quality of the forage, the ration would likely need very little concentrate to accomplish this ADG. The target weight was based on a 1,200-lb. cow mature weight and the weight for the heifers was calculated to be 60% of mature weight.

Final thoughts

In challenging times, pushing the pencil on management strategies that reduce feed inputs will increase profit potential of the cow-calf enterprise. Develop feeding strategies so heifers exhibit at least one estrous cycle prior to the start of their first breeding season. This not only affects reproductive performance during their first breeding season, but also during the second breeding season. We continue to learn more and more about how management early (even during development in the uterus) in a bovine female’s life affects future reproductive performance. Many of these relationships are a function of quality and timing of nutrition.

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