

HEALTH & HUSBANDRY

Developing leading ladies

by Brad White, Kansas State University, Beef Cattle Institute



A good BLT sandwich is one of my favorite summer foods. Good tomatoes are a critical part

of the process. A bacon-lettuce sandwich just doesn't have the same appeal.

For the best sandwiches we need good-quality tomatoes, and we want continued production through summer. This means selecting the correct plant variety to thrive in our environment, providing extra care early when plants are vulnerable, and supportive maintenance beyond production of the first fruit. The steps in this process are similar to creating a good program for replacement-heifer development.

Developing for longevity

Reproductive success and optimal performance in cow-calf herds is heavily influenced by management of replacement heifers. Developing replacement heifers is a significant investment. She only generates a return when the heifer is successfully added to the mature herd. Therefore, my goal for a successful replacement-heifer program is creating a heifer that calves at the beginning of the calving season *for her second calf*.

This goal is a significant hurdle. However, achieving it increases ranch income through efficient lifetime productivity. Critical control points can be managed along the way in specific production phases, including birth to prebreeding, prebreeding, breeding, and gestation to calving.

The metric for a successful program is the percent of heifers that have their second calf in the first 21 days of the calving season.

Birth to prebreeding

Knowledge-based management of replacement heifers starts near birth by individually identifying potential replacements. Recording birth dates, or at least birth week, is useful because heifers born early in the calving season are more likely to get bred early in the first breeding season. Individual ID allows performance and pedigree tracking, which influences the heifers to select for the future herd.

Consult with your veterinarian for a specific immunization program for your operation. In general, our goal is building immunity against pregnancy-wasting infectious agents well before breeding. A series of vaccinations at or near weaning can help protect the heifers.

The specific vaccines included should consider herd biosecurity status and previous disease history. Heifers should also be treated with an appropriate anthelmintic because internal parasites can negatively affect weight gains from weaning to breeding.

Our goal is to have most heifers reach puberty before breeding season initiation. Pubertal onset is influenced by weight, age and breed. Age and breed are typically threshold parameters: Once a minimum age for a specific breed is attained, greater age is not valuable. Weight at breeding is often a limiting factor in pubertal onset,

and heifers from most breeds reach puberty at 55%-65% of mature body weight.

The rate of gain necessary to meet breeding target weight



PHOTOS BY SHAINA HERMEL

can be calculated by subtracting weaning weight from target breeding weight and dividing by the number of days between weaning and breeding. For example, assume we wean heifers at 550 pounds (lb.) on Nov. 15, with a planned breeding date of May 15 (180 days) and a target weight at breeding of 812 lb. (65% of a 1,250-lb. cow).

In this scenario target rate of gain is about 1.5 lb. per head per day, which can be very achievable. A few caveats must be considered.

First, be sure the mature cow body weight selected is realistic. If this number is based off cull-cow weights, we are likely underestimating good-fleshed mature cow weights.

Second, decide if you want to target 55% or 65% of mature body weight by breeding. The lower end of the spectrum will work for some heifers and will cost less, but there is less margin for error — either in estimation of cow weight or actual rate of gain. For these reasons I often target 65% of mature body weight.

Third, consider how to manage the heifers through the period. This is far easier with planning starting at weaning. Achieving target

weights prior to the onset of the breeding season is key to achieving the goal of having most heifers conceive early in the season.

Prebreeding

Preparing heifers to breed early in the breeding season is critical. The timing of calving with the first calf influences overall lifetime productivity. Calving early in the calving season increases calf weaning weight due to age and enhances the heifer's chances of rebreeding.

The postpartum interval in heifers is the time required from calving to potential rebreeding. This period ranges from 80 days to 120 days. To meet our goal of having her second calf early in the calving season, our first-calf heifer often needs to be bred to calve prior to the mature cow herd.

A prebreeding examination of heifers provides insight on the pubertal status of the group and identifies problems in individuals that may need to be removed from the replacement pool. This examination is typically done when heifers are yearling age and near enough the breeding season to

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provide an accurate prediction of the breeding status of the heifers. The prebreeding exam may occur anywhere two to six weeks prior to breeding.

Performing the prebreeding soundness exam six weeks prior to breeding allows time for management changes (nutrition or ration changes) to be implemented. However, the greater time from actual breeding date means potentially less-accurate depiction of the reproductive status of the group. Performing the prebreeding soundness exam two weeks prior to breeding provides an accurate depiction of replacement-heifer status, but does not allow time to initiate any management changes.

The prebreeding heifer soundness exam typically consists of several assessments of each heifer combined to make an overall determination of the group and identify individual problem heifers. Collected information typically includes body weight, body condition score (BCS), age, a reproductive tract score (RTS), and a pelvic measurement.

These data can be combined in a variety of manners, and we have found using the Ready, Intermediate, Problem (RIP) categorization system as a useful tool (see Table 1). The RIP categorization allows placing heifers

Table 1: Ready, Intermediate, Problem (RIP) categorization system

	Ready to breed (R)	Intermediate (I)	Problem (P)
% Mature body weight	<60%	50%-60%	<55%
Reproductive tract	Cycling heifer (evidence of corpus luteum or follicle; reasonable tract size)	Noncycling, but relatively close	Problem (freemartin, pregnancy, adhesions, other) or normal (but in this category due to other reason)
Pelvis	Pelvic area >130 cm ² (only evaluated if cycling), normally shaped	Normally shaped	Abnormally shaped or small

into discrete categories based on the combination of measurements assessed at prebreeding. Heifers in the Ready category are deemed as ready to breed immediately, Problems should be culled, and Intermediate may eventually be good breeding stock, but are not currently ready.

In herds close to breeding (within two weeks), the target is to have 85%-90% of heifers in the Ready category. For heifers farther from breeding (six weeks), the target is to have 65% in the Ready category, assuming with a homogenous group the Intermediate heifers will begin cycling by the start of breeding. Problem heifers should be a minimal component of the group and should be culled.

The prebreeding examination is also an appropriate time to booster vaccinations to prevent reproductive losses. Prebreeding examinations should not be

confined to the female component of the herd. Bulls scheduled to be used for natural service should have a breeding soundness examination performed prior to the onset of the breeding season.

Breeding

Sire selection is an important decision affecting dystocia, or calving difficulty, rates and offspring performance. Many breeds offer birth weight and calving ease expected progeny differences (EPDs). Selecting the correct natural service or artificial insemination (AI) sire for your operation is important. Minimizing calving difficulty is important, but avoid single-trait selection, and choose sires with growth and performance traits that match your marketing goals.

The breeding season goal is to front-end load the calving season, or rather, get as many heifers

bred at the onset of breeding as possible. Synchronizing estrus can be beneficial to this process, but these programs are most effective when the heifers are cycling and ready for breeding. While some programs will help heifers reach puberty a little early, the preparation to make sure heifers are cycling occurs well before starting any synchronization program.

Numerous estrous synchronization programs are available. Protocol selection should be based on farm goals and availability of resources — financial, labor and facilities. Prior to instituting an estrous synchronization and/or an AI program, consult with your reproductive provider to find out what fits your operation. I recommend investing in prebreeding reproductive examinations to be sure the

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Heifers are not small cows

Two comments frequently arise when discussing growth programs for heifers between weaning and breeding:

1) The goal is to produce cows that fit our environment and do *not* require much supplementation: *If I feed them prior to breeding, am I selecting for cattle that may not fit my ranch?*

First, I totally agree with the concept. We want to create a herd that fits our environment and available feeding resources as efficiently as possible. A large part of this process is through good genetic selection and picking replacements from cows with a frame size that matches the environment and nutrient availability of your area. We also

want to avoid frame creep, which happens when we save the biggest heifers from the biggest cows. Over time our herd increases in frame size due to high heritability of these traits. However, heifers are not just small cows. They are growing young stock, and they need a different level of supplementation until breeding. Make the best selections to fit your operation, then supplement their growth through this developmental stage to hit your target weights. By starting early, the rate of gain won't be excessive.

2) *Feed supplement can be expensive; how can I be sure the process is efficient?*

Efficiency is important. Consult with a nutritionist or other expert to help find a

ration suitable for your operation. Knowing the target rate of gain is critical in this process. The earlier you start, the lower the daily rate of gain will be to meet your target. Additionally, consider sorting your way to success. Rather, segregate heifers based on weight at weaning into groups that require different rates of gain.

One challenge at weaning is heifers may have a wide spread in weights. Managing as a single group means overfeeding some heifers while underfeeding others. If you have the facilities and labor, consider sorting into groups that have two different target rates of gain to help enhance feeding efficiency.

heifers are ready to respond to the program.

Gestation and calving

Pregnancy diagnosis is the next step and an opportunity to cull animals that did not get bred in the targeted window. After pregnancy diagnosis, the bulk of gestation is low-maintenance for the heifers.

These animals are still growing and should be fed separately from the mature herd if possible. A nutritional plan should be formulated to grow heifers to 85% of mature weight by calving.

Precalving nutritional status plays a critical role in dystocia, calf health and postcalving conception rates. Assigning BCS two to three months prior to calving can provide a valuable checkpoint for the goal of having heifers calve at a BCS 6 (on a scale of 1 to 9).

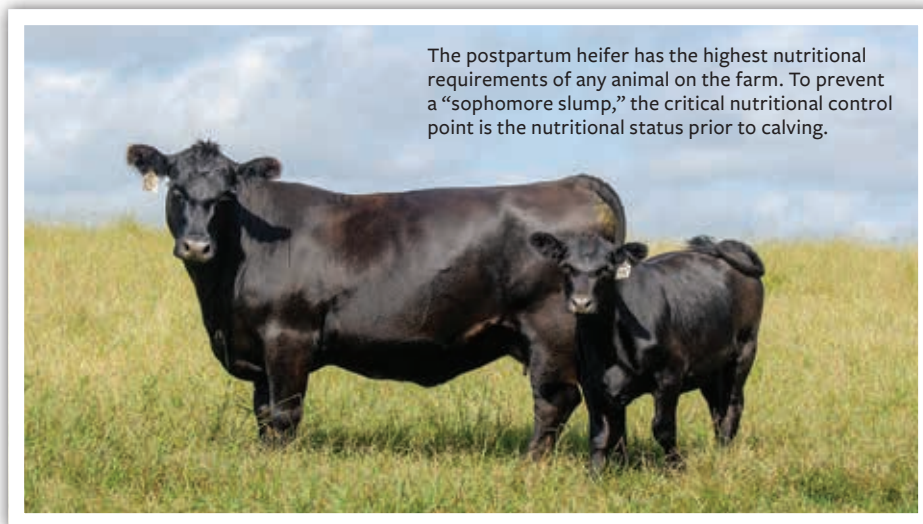
Calving

Calving is the culmination of the replacement-heifer program, but

not the end of the intensive management. Employing the management tools described above (EPD selection, culling criteria) will reduce, but not eliminate, the frequency of calving difficulty. Heifers should be observed frequently, and early intervention is indicated to reduce consequences of dystocia. I prefer to use 30 minutes of nonprogressive labor as a threshold to determine when to intervene when calving heifers.

The postpartum heifer has the highest nutritional requirements of any animal on the farm. The new dam is growing, lactating and preparing to breed back. If nutrients are limited, the first thing to suffer is conception rate.

It is virtually impossible to supplement enough feed to place animals in a positive energy balance during this time. Therefore, to prevent a “sophomore slump,” the



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Conclusions

Replacement-heifer management is key to long-term beef cow-calf reproductive success. The metric for a successful program is the percent of heifers that have their second calf in the first 21 days of the calving season. A successful program is based on both preparing

heifers to be ready for the initial breeding season and using selection tools to identify the subset of heifers with the greatest chance of reproductive success. |

Editor's note: “Health & Husbandry” is a regular *Angus Beef Bulletin* column devoted to the care and well-being of the herd. Author Brad White is on faculty at Kansas State University College of Veterinary medicine and serves as director of the Beef Cattle Institute. To learn more on this and other beef herd health topics, tune in to the weekly Beef Cattle Institute *Cattle Chat* podcast available on iTunes, GooglePlay or directly from KSUBCI.org.