

Cow Herd Considerations

Are you making the most of your replacement heifers?

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PHOTO BY SHAUNA ROSE HERMEL

►Greater focus on heifer selection and management can lead to greater cow herd productivity.

Genetics on the male side of the pedigree may account for most of the performance progress in your herd, but selecting the right replacement heifers can also contribute to greater overall performance. Even better, state beef specialists say managing replacement heifers does not have to be rocket science. Even small adjustments in key areas can positively affect your future cow herd's productivity.

Manage milk production

Justin Sexten, University of Illinois (U of I) Extension beef specialist, says the most important factor influencing weaning weight within a herd is milk production. Increasing milk production of first-calf heifers can also improve preweaning production efficiency.

"The data show producers should strive to manage replacement heifers for optimum milk production," he says. "Replacements spend most of the critical mammary development period nutritionally managed by their dam, and that can have long-term consequences."

Sexten notes that analysis shows an inverse relationship between a mother's milk production and a heifer calf's future milk production. "A generation of heavy-milking cows

raises heifers that produce less milk than themselves, yet the heifers retained from the low-production generation produce at levels comparable to the initial generation," he says.

Creep-feeding replacement heifer calves can negatively affect milk production. Sexten says research shows heifer calves creep-fed prior to weaning had lighter calves and less milk during three lactations than the non-creep-fed control calves.

"Angus cows creep-fed as calves produced fewer and lighter calves over a 10-year period, which results in lower lifetime productivity,"

Sexten says. "Research also shows lower milk production and weaning weights from heifers creep-fed as calves. In instances where creep-feeding negatively influences milk production, preweaning average daily gain (ADG) has increased."

Sexten says several management strategies are designed to improve heifer ADG without sacrificing future milk production. "Compensatory growth programs are structured so cattle are energy-restricted by limiting feed intake to 70% that of controls during critical periods of mammary development, and then re-fed at 130% between these periods," he explains. "These feeding programs have improved milk production over the controls by 9%, but they can be difficult to implement."

Sexten cites dairy research indicating that when heifers gain more than 2 pounds (lb.) per day, the dietary protein-to-energy ratio accounts for more than 60% of the variation in milk production. Increasing dietary protein in replacement heifer diets appears to be beneficial in cases where protein is limiting tissue growth. In six experiments at the U of I, Sexten adds, increasing dietary protein levels of developing beef heifers resulted in little milk production benefit.



►Left: Producers can consider using coproducts such as DDGS, CGF and SH in replacement-heifer diets, says Paul Walker, ISU animal science professor.

►Right: Producers who take the time and effort to effectively manage replacement heifers prior to breeding as yearlings will generally be rewarded in the long run, says David Patterson, University of Missouri Extension beef specialist.



In addition, Sexten says current research indicates body condition score (BCS) at breeding is responsible for 44% of variation in milk production.

"These findings, combined with lab research using a hormone from fat known as leptin, suggest keeping heifers leaner during the preweaning period may be key to optimizing future milk production," he explains. "To accomplish this, producers should restrict preweaning ADG to a maximum 2.2 pounds per day and avoid overconditioning heifers during the prepubertal mammary growth phase."

"Strategies to accomplish these goals will vary by operation according to forage availability, dam milk production and steer calf management goals," Sexten says.

Consider feed coproducts

As renewable fuels production continues to rise, producers may be able to capitalize on using the resulting corn and soybean coproducts in replacement heifer diets, including distillers' dried grains with solubles (DDGS), corn gluten feed (CGF) and soyhulls (SH).

"There's no reason why cow-calf producers should not consider using these coproducts in replacement-heifer diets," asserts Paul Walker, Illinois State University (ISU) animal science professor. "But many factors beyond just nutritive value must be considered when determining whether or not to include DDGS, CGF or SH in diets."

Walker says beef producers must also evaluate the rate at which any of these coproducts can and will be included in the diet, what type of storage facility is available, the roughage availability and cost for the given area, the type of corn processing used, the herd's nutrient management plan, and anticipated cattle performance.

"If cows are fed average- to high-quality hay, then I recommend you supplement with soyhulls. But if cows are fed corn silage, then you should supplement with CGF or DDGS," he says. "The supplement chosen should be a function of the heifer's protein and metabolizable energy needs. On corn silage and most low-quality forage diets, soyhulls will not meet replacement heifer crude protein (CP) needs. But, soyhulls are an effective energy replacement for shelled corn with higher-quality grass and/or legume-mixed hay."

A recently completed 84-day feeding trial at ISU found similar ADG for calves fed a shelled-corn, SH-based or DDGS-based supplement at 2% of body weight and *ad libitum* grass hay. The replacement calves fed SH- and shelled-corn-based supplements had higher daily dry-matter intake (DMI) and feed-to-gain (F/G) ratios than the calves fed the DDGS-based supplement. In



► Justin Sexten (right), U of I Extension beef specialist, visits with a cattleman. Sexten says current research indicates BCS at breeding is responsible for 44% of variation in milk production.

addition, Walker observed that none of the heifers fed the SH supplement required treatment for respiratory illness during the first 28 days on feed, and they had higher ADG and F/G ratios during the first 12 days.

"It appears growing calves fed coproduct-based supplements can perform equally as well or better than calves fed shelled-corn-based supplements," he says.

But, the decision to use supplements is not without nutritional concerns. Walker warns that sulfur (S) content is relatively high in CGF and DDGS, compared to other feedstuffs. High sulfate concentrations can lead to low thiamin (B_1) production and may require thiamin supplementation.

"The greater the dry-matter portion of the diet composed of DDGS or CGF, the higher the rate of thiamin supplementation required, especially if the DDGS or CGF approach 40% of the diet's dry matter," he says. "In addition, high relative sodium (Na) concentration means producers may want to limit salt concentration in mineral mixtures by requesting low-salt mineral mixes. DDGS and CGF coproducts can also contain relatively high concentrations of phosphorous (P) and should be monitored."

Place emphasis on prebreeding

Producers who take the time and effort to effectively manage replacement heifers prior to breeding as yearlings will generally be rewarded in the long run. David Patterson, University of Missouri Extension beef specialist, says that's because most of the fertility components that influence calving and reproductive performance of replacement heifers are not highly heritable — they are influenced almost entirely by management.

"Use of various prebreeding management technologies enables producers to improve

breeding performance of heifers during the first breeding season and subsequent calving and rebreeding as 2-year-olds," he says. "Such practices ensure heifers add to the general performance and productivity of the entire herd, immediately and long term."

Prior to the first breeding season, Patterson advises producers choose a sire with a low birth weight (BW) or calving ease maternal (CEM) expected progeny difference (EPD) and to monitor target weights, reproductive tract scores (RTSs, which estimate pubertal status based on uterine and ovarian structure development), pelvic measurements, and estrus synchronization.

Patterson says allowing replacement heifers to reach puberty one to three months before they are bred can increase pregnancy rates. An earlier age at puberty in relation to breeding ensures that a high percentage of heifers are cycling, and the effects of lowered potential fertility at the pubertal estrus are minimized, he explains.

He also encourages producers to set up a management procedure plan and develop points of measurement to gauge success. Reproductive management procedures can include feeding replacement heifers separately; breeding prior to the mature herd; using artificial insemination (AI), condition scoring and pregnancy diagnosis; taking pelvic measurements, prebreeding weights and RTSs; and synchronizing estrus.

"Collectively, these practices help ensure that heifers entering a herd as replacements contribute immediately and add long term to herd performance and productivity," Patterson says. "These procedures provide an objective assessment of the postweaning to prebreeding development phase and are useful in selecting or culling replacements."

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