

Setting Them Up for Success

Enhancing long-term growth and reproduction of heifers.

by Troy Smith, field editor

Just for fun, let's imagine we're taking an opinion poll asking one question. We'd ask producers to share what they enjoy most about being in the cow-calf business.

There's a good chance many, if not most, cow folk would say they find the most pleasure in looking at a new crop of calves. After all, why have a breeding herd unless you enjoy seeing the results of your breeding decisions? That next calf crop keeps a cow-calf operation in business.

But nothing dampens the anticipation of the next calf crop more than a poor pregnancy rate. That's why savvy producers strive to optimize the reproductive performance of their brood cows. For most of them, it starts with managing replacement heifers such that these females are primed for a long and productive stay in the breeding herd.

According to University of Florida animal scientist Philippe Moriel,

optimal heifer management results in replacements reaching puberty by 12 to 13 months of age and becoming pregnant by 15 months of age. Managing the heifer to deliver her first calf in the first 21 days of her first calving season sets her up for success throughout her productive lifetime — calving early in subsequent seasons, weaning heavier (older) calves and remaining longer in the herd.

Nutrition strategies

Toward the goal of optimum reproductive performance, heifer nutrition management practices typically focus on the postweaning period. However, in a November 2020 Applied Reproductive Strategies in Beef Cattle online presentation, Moriel talked about studies of preweaning strategies for promoting early puberty and ultimately enhancing lifetime reproductive performance.

Moriel explained how calf nutrition during the first few months after birth contributes to “metabolic imprinting.” It's similar to fetal programming during gestation in that calf nutrition early in life permanently affects the animal's metabolism and

physiology, including hormonal processes necessary to achieve early puberty.

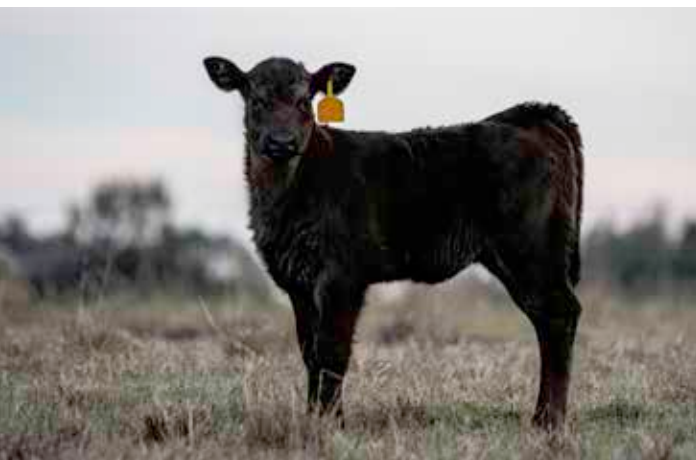
“That period from two to six months of age is a critical window of development,” stated Moriel, who discussed four strategies for enhancing calf nutrition during that time period.

First was early weaning — really early weaning. Heifer calves are weaned at two to three months of age and introduced to a high-concentrate diet. According to Moriel, studies suggest boosting early nutrition in this way can almost double the number of heifers reaching puberty at 12 to 13 months of age — even *Bos indicus*-influenced heifers.

“It's not the early weaning that has the effect, but the application of a high-concentrate diet at the critical window of development,” emphasizes Moriel, noting calves can be returned to pasture and a grazed forage diet after 90 days on the fed ration.

Moriel admits this strategy may not be practical for many commercial operations and may only be economically feasible when early weaning provides a reproductive performance boost to dams, as a result of early weaning, along with enhancement of the long-term reproductive performance of their heifer daughters.

Secondly, Moriel discussed an alternative strategy of giving calves preweaning injections of bovine somatotropine — the same drug



given dairy cows to increase milk production. Research involving administration to beef heifers resulted in increased average daily gain during the critical window of development, without feeding a high-concentrate diet.

“Studies performed were for proof of concept only, because bovine somatotropin is not approved for use in beef systems,” Moriel reported.

Creep-feeding was the third strategy Moriel discussed, explaining how limited research has involved early application. Rather than the traditional method of providing creep feed near the time of weaning, suckling heifer calves were allowed free choice access to creep feed for a period of 50 days, starting when


calves were 68 days of age.

Results included increased rates of gain and levels of insulin-like growth factor 1 (IGF-1) which is associated with fertility growth and development. However, the studies did not show a reproductive performance effect.

Moriel believes the early creep-feeding period was too short and heifer calves did not eat enough feed to produce the permanent effect of metabolic imprinting.

Lastly, Moriel talked about fetal programming and a strategy for influencing an *in utero* heifer calf’s eventual reproductive performance through precalving nutrition of her dam. He cited evidence showing how late-gestation supplementation

with protein, at 125% of maintenance requirement, results in positive effects on heifer calf weaning weight, age at puberty, pregnancy rate and incidence of calving during the first 21 days of the calving season.

“A relatively small investment in supplement can offer dramatic results,” Moriel stated. “Even in situations where cows exhibit adequate body condition score (BCS), protein supplement can have positive effects on daughters’ reproductive performance.” 

Editor’s note: The 2020 ARSBC was a fully online event and featured three sessions: one covering cows and heifers; the second covering bulls; and the third animal health. Links to video presentations delivered during each session can be found at beefrepro.org.