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Improving the Productivity of Beef Heifers in Florida[1]

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The management of commercial beef heifers in Florida has been a recognized challenge since producers first began implementing improved agricultural practices. Replacement heifers represent our investment in the continued improved quality of the cowherd. In all herds that are making progress toward genetic improvement, the heifers represent the animals with the highest potential value. "Potential" is the key word here, and achieving this potential takes considerable time and money. Most Florida producers appreciate the maternal characteristics of Brahman-influenced cows. Brahman breeding often makes up 1/4 to 1/2 of the genetic makeup in commercial Florida cowherds. Although Brahman-influenced cows have exceptional longevity, they mature slowly, often not achieving full maturity until 4 years of age. During this development period, these females require special attention. Many management schemes have been developed to address the special needs of developing heifers.

Replacement Heifers – Purchase or Raise My Own?

This is a very important question to answer for your operation, especially if you are a medium to small producer. The costs associated with raising a replacement heifer are great. To complicate the issue, we all realize that selecting bulls that have the potential for producing quality replacement heifers, as well as calves with good carcass traits is difficult. Many producers have addressed this issue by making a habit of always purchasing their replacement females. In doing so, producers are able to select from a wide variety of females with the goal of finding the right breeding at the right price. Under this management system, these producers are able to make bull-buying decisions based only on carcass quality (terminal cross). Even though the average price per heifer replacement may increase, the improved value of the calf crop may offset this difference.

When selecting replacement females, big is not always better. Mature cows consume approximately 2.0% of their body weight every day, no matter what their size. Therefore, we could expect a 900-lb cow to consume about 1 ton less dry matter annually compared to a cow weighing 1200 lb. This increase in feed intake is a major cost to any production system. The added cost must be offset by an increase in calf weaning weight. Select replacement heifers that are in the upper average for weaning weight, but not the largest in the group. An excellent way to best understand this concept is by dividing a calf's

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weaning weight by the weight of its pregnant dam at weaning. This ratio tells us what proportion of the cow's actual body weight is being marketed each year. Although our largest cows are consuming the most feed, they seldom fall out on top in this evaluation.

Maintain Weaned Heifers on a High Plane of Nutrition

Brahman-influenced heifers achieve puberty more slowly than heifers of British breeding. Nevertheless, Brahman-influenced heifers can still successfully breed as yearlings when maintained on a high plane of nutrition after weaning. A common target weight for the start of the breeding season is 60 to 65% of the projected mature cow weight. For example, if your mature cowherd averages 1000 lb, then you should target a heifer weight of about 650 lb by the start of the breeding season. Typically, we can expect heifers to be ready for their first breeding at about 13 to 15 months of age. In a typical Florida system, heifers born during October – December of one year can be exposed to bulls in December and January of the following year. The key to achieving acceptable conception rates is targeting optimal heifer weight at the start of the breeding season.

Separate Heifers and Young Cows from Mature Cows

This is an important concept. Heifers and young cows require increased management beyond that of the mature cowherd. Supplementing heifers and young cows the same as the mature cowherd will result in poor reproductive performance from the young, still-growing females. On the other hand, supplementing the entire cowherd to address the needs of young females will be expensive and wasteful since the mature cows will be provided nutrition beyond their requirement. Consider keeping heifers separate from the mature cows until they have weaned their second calf. This provides the opportunity to address the special nutritional needs of heifers, separate from the mature cowherd, during the first and second lactation.

Target Your Highest Quality Forages for Heifer Grazing

Consider the range in quality of your pasture forages and allow your heifers and young cows access to the highest quality forage available. These females can best utilize this forage to maximize production. If you have improved forages available, consider using these exclusively for heifer and young cow grazing. Also, there are often opportunities to provide limited grazing on hay pastures. Heifers and young cows should be used for these situations as well.

Early Weaning

The added nutrition required to support lactation is great, especially for young females. Recent results from our research have shown that early-weaned, first-calf heifers require approximately 50% less TDN to achieve and maintain an optimal body condition than lactating heifers of the same age. These data alone suggest that early weaning may be a practical and profitable management consideration for Florida cow/calf operations. The use of early weaning will allow young females to regain their lost body condition, and do so with less forage and supplemental feed. These females will also have a shorter post-partum interval. That is they will become pregnant earlier in the breeding season and therefore produce calves that will be older and heavier at next year's weaning.

Producers may choose to market early-weaned calves immediately after weaning rather than accepting the management of these young animals. The mild winters associated with Florida offer a unique opportunity to manage early-weaned calves on a forage-based grazing system using ryegrass, a highly nutritious, winter annual forage. Fall-born early weaned calves can be maintained on winter annuals and then marketed in late April or early May when calf prices are typically their highest of the year.

Supplementing the Lactating First-Calf Heifer – an Example

The lactating, first-calf heifer is one of the most troublesome animals in the herd. Not only does she

have a nutritional requirement for maintenance and lactation, but she is also still growing. This continued growth requires added nutritional inputs. Additionally, she is often in peak lactation during the winter months when our bahiagrass quantity and quality may be limiting.

This heifer will require 12.0 lb of TDN and 2.0 lb of protein (CP) / day. Her dry matter intake will be somewhat less than a mature cow, as a smaller overall volume and the slower passage rate of the poor quality bahiagrass restrict her. We can assume about 16 lb of dry matter intake / day.

Therefore, her estimated nutrient intake from medium-quality bahiagrass would be:

(16 lb bahiagrass) * (45% TDN) =7.2 lb TDN / day

(16 lb bahiagrass) * (5.0% CP) =0.8 lb CP / day

She is lacking 4.8 lb TDN / day (12.0 lb required – 7.2 lb from bahiagrass) and 1.2 lb of CP / day (2.0 lb requirement – 0.8 lb from bahiagrass).

We are assuming that the cow in this example calved in good body condition. If she was in poor body condition at the time of calving, we have almost no hope to provide enough nutrition to get her rebred.

In this situation, we need to supplement a substantial amount of both energy and protein. Additionally, we will want to choose a supplement that provides natural protein. Growing animals respond favorably to natural protein supplementation versus non-protein nitrogen like urea. Let's begin by examining our commercial supplement choices by how much of each supplement we would have to offer to achieve our performance goal.

Calculation:(Required amount of supplemental TDN, lb) ÷ (% TDN in purchased supplement) = Amount of supplement to be fed daily.

In this example, our choices are limited to 16% CP range cubes and bagged or bulk dry feed. The amount of supplemental energy required exceeds the voluntary intake expected with all other free-choice products.

Next, let's determine which of these three supplements will meet the CP requirement. Remember, we need to feed at least 1.2 lb of supplemental CP / d. Let's look at the level of CP achieved when we feed the level required to provide 4.8 lb of TDN.

Range Cube, 16 % CP7.4 lb / d=1.2 lb CP / d

Dry Feed, 12 % CP, bag6.4 lb / d=0.8 lb CP / d

Dry Feed, 12 % CP, bulk6.4 lb / d=0.8 lb CP / d

Only the 16% CP range cube meets our TDN and CP requirement at 7.4 lb / d intake level. If we could raise the CP level in the dry feeds to 16%, say with urea, it probably would be the more economical choice. But the dry feed would have to be fed in a trough, whereas the range cubes could be fed on the ground.

It is possible in situations like this to decrease voluntary forage intake when feeding high levels of supplement. In this case, for example, the 11 lb of range cubes / day will most likely depress the heifer's ability to voluntarily consume 16 lb of dry matter in bahiagrass. Although these examples and calculations are important tools, supplementing grazing cattle is as much of an art as a science. Nothing can take the place of careful observation of cow body condition.

Table 1. Calculating the cost of nutrients within several common commercial supplements available in Florida.[1]

Product	Unit measure	TDN, %[2]	Amount required daily to deliver 4.8 lb of TDN, lb	$/lb TDN	$/d of feeding
Molasses block	250 lb block	60	8.0	0.26	1.24
Molasses block	50 lb block	60	8.0	0.29	1.39
Molasses tub	225 lb tub	60	8.0	0.48	2.30
Range cube 16% CP	50 lb bag	65	7.4	0.15	0.74
Range cube 30% CP	50 lb bag	65	7.4	0.20	0.96
Dry feed	50 lb bag	75	6.4	0.16	0.77
Dry feed	Bulk	75	6.4	0.12	0.58
Liquid feed 16% CP	Bulk	57	8.4	0.15	0.74
Liquid feed 32% CP	Bulk	57	8.4	0.16	0.77

[1] Actual costs were obtained in May 2001 at a Hardee County, Florida feed store.

[2] TDN values are estimated. Actual values for the supplement of interest should be obtained to calculate the actual unit of energy.