

# ***ONA REPORTS***

*published in*

***THE FLORIDA CATTLEMAN AND LIVESTOCK JOURNAL***

**May 2009**

## **Pre-weaning management of Florida beef calves**

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A recent USDA Census of Agriculture reported a total of 160 beef cow/calf ranches in the US with greater than 2,500 cows. Of these 160 ranches, 60% reside in just four states with Florida, Texas, Nebraska and New Mexico possessing 38, 28, 19, and 10, respectively. These results illustrate a significant anomaly when considering the fate of weaned feeder calves from these major calf producing states. Texas, Nebraska, and New Mexico each have a developed feedlot industry as well as being located to neighboring states with significant feedlot resources. Florida, on the other hand, has no commercial feedlot industry. The vast majority of weaned feeder calves are transported out of Florida for further feeding and marketing. The primary receiving state for Florida-born beef calves is Texas, a distance of approximately 1,500 miles. The vast majority of these feeder calves are born and raised on ranches in southern Florida. This isolation in Florida's peninsular region creates a unique experience for both environmental and transportation stress considerations impacting weaned calves.

Three of the most stressful events encountered by a feeder calf are weaning, transportation, and feedlot entry. To further complicate this issue, our normal production management systems often link these three events very close in a calf's lifetime, in many cases calves may experience all 3 within only 1 to 3 days. These events have the potential to create multiple detrimental impacts on the calf, many of which are unavoidable. Some of these include, but are not limited to, 1) dehydration, 2) abrupt change in diet, 3) change in social order, 4) exposure to disease, and 5) major weather changes. The final resulting outcome will always be the overriding balance between the cumulative level of stress imposed and the resistance of the calf. One of the two will ultimately win out. In typical production systems we recognize when the stressor wins out as an incidence of morbidity, but how much production loss do we incur during the balancing act between stress and resistance?

At the Range Cattle REC in Ona, we have completed several years of research evaluating

the influence of weaning management on measures of performance in transport-stressed, Florida calves. In one study, we evaluated the performance of early- versus normal-weaned calves through the receiving, growing, and finishing phases of the feedlot. In that study, we utilized 40 crossbred steers assigned to be; 1) early-weaned; n = 20, and 2) normal-weaned; n = 20. The average age at weaning was 89 and 300 days for early- and normal-weaned steers, respectively. Early-weaned steers were supplemented on pasture at the ranch from the time of early weaning until shipping. Shipping occurred on the day of normal weaning. Calves were transported to Butner, North Carolina, a distance of approximately 750 miles. Calves remained on the livestock trailer for 24-hours before unloading. In this study, early-weaned steers experienced a two-fold improvement in feed conversion compared to normal-weaned steers during the first 28 days in the feedlot. This response was not a result of increased feed intake, as no differences were detected in voluntary feed intake among the weaning treatments. We attribute this response to at least two potential factors. Firstly, the early-weaned calves likely had a more developed rumen, since they had been exposed to concentrate supplement (1% of body weight) for 210 days prior to shipping. This factor may have influenced their greater initial ability to convert feed into body weight gain upon entry into the feedlot. Secondly, and probably more important, the early-weaned calves experienced a greatly reduced inflammatory response following feedlot entry compared to their normal-weaned contemporaries. Again, the calves in this study experienced no instances of morbidity, but the underlying inflammatory reaction, experienced to a greater degree by the normal-weaned calves, very likely drained energy and nutrients away from body weight gain and toward the immune system.

In another study, we examined the effects of four weaning management scenarios on measures of stress and productivity of beef calves following a long-haul simulation. This study was conducted over two consecutive years using Brangus-crossbred calves assigned to one of four weaning management scenarios, involving: 1) early weaning at 80 days of age, 2) creep-feeding for 50 days prior to weaning and transport, 3) pre-weaning on the ranch 45 days prior to transport, and 4) normal-weaning by cow x calf separation on the day of transport. All calves were trucked within the state of Florida for 1,000 miles. Calves remained on the trailer for a full 24 hours before being unloaded into the research feedlot.

In the first week of feedlot receiving, early-weaned calves consumed more grain and less hay compared to normal-weaned calves. Pre-weaned calves consumed more grain, but a similar amount of hay compared to creep-fed calves. This difference diminished by week 2 with no further differences observed over the next 3 weeks. Overall average dry matter intake was greatest for early-weaned compared to normal-weaned calves and also greater for pre-weaned compared to creep-fed calves. Feed efficiency of early-weaned calves was greater than normal-weaned calves, but did not differ among pre-weaned and creep-fed calves.

The results of these studies reveal some new information while strengthening some widely recognized management concepts. First, early calf weaning (70 to 90 days of age) appears to impact the ability for calves to better tolerate the stressors associated with

transport and feed yard entry. This is recognized primarily through the substantial improvement in feed efficiency during the first 30 days after feedlot entry. Although this response is diminished during the subsequent growing and finishing phases, the dramatic advantage during the receiving period may impact overall efficiency of the entire finishing process.

In our study, calves consumed an average of 5.6 lb/d of creep feed. This intake was less than we expected and is a common problem experienced by many producers attempting to creep feed calves prior to weaning. The costs associated with creep feeding are also an important consideration. In our two-year study, creep-feeding cost an average of \$34 dollars per calf annually (average of 49 days of consuming 5.4 lb/day). Compared to control calves, the added gain resulting from creep feeding was only 0.17 lb/d, resulting in a F:G conversion of 32:1 and an average cost of gain of \$4.16/lb. This is a very poor result and could potentially be lessened if the creep-feeding process had been extended beyond 60 days. Although numerically less each year, creep-fed calves had similar ADG and dry matter intake compared to pre-weaned calves.

Although few, if any, value added marketing programs target creep-feeding as a management prerequisite, a period of pre-weaning prior to shipping is a commonly prescribed procedure. A common problem with this management practice is the lack of regularity among performance responses, which is a major consideration when considering whether or not to pre-wean beef calves in Florida, especially south Florida. In addition, the majority of Florida calves are weaned during the months of July, August and September. These months are also some of the most extreme for environmental conditions such as excessive heat, rainfall, insect pressures, and violent storms. The risks associated with pre-weaning during these months must be weighed against any potential advantages for market premiums paid for the practice. In our study, the feed inputs associated with pre-weaning for approximately 48 days prior to shipping were \$56 per calf. The added risk due to death loss and/or injury during this time adds another \$10 to the variable costs of the practice. This total cost of \$66 does not include labor and miscellaneous expenses such as fencing and feeding equipment. Our 600 lb steer calves would need to receive over \$6 per cwt premium just to offset the cost of feed. As a comparison, researchers from Colorado State conducted an analysis of certified health programs using 268,500 calves. A comparison of calves with similar vaccination management revealed an average premium of only \$3.75 per cwt for calves that were pre-weaned for at least 45 days prior to shipping compared to calves shipped at the time of weaning. This large-scale evaluation suggests that buyers are not willing to pay a premium for pre-weaned calves sufficient to offset the costs of feed. More information on the studies reported in this article can be obtained by contacting John Arthington at [jarth@ufl.edu](mailto:jarth@ufl.edu). A full length version of this paper and data contained herein is available in the Proceedings of the 2007 Florida Ruminant Nutrition Symposium.