Florida Beef Enhancement Funding – Nutrition of Beef Females

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Body condition score (BCS) at calving is the most important factor that influences overall pregnancy rate and calving distribution of beef cows. Also, poor nutrition during gestation can alter fetal organ formation and decrease offspring's future performance (fetal-programming). In 2016, our group obtained funds from *The FL Beef Enhancement Board* to evaluate different supplementation strategies for pregnant beef females and its impacts on performance of cows and calves. In this article, we will provide a draft summary of the results currently available for both studies.

STUDY #1 – Does year-round supplementation of cows pay off?

We believed that year-round supplementation of molasses or range cubes would increase cow BCS throughout gestation and at calving. Also, year-round supplementation of molasses and range cubes would improve calf development during pregnancy, and then, calf growth after birth. In June 2017, mature Brangus cows were allocated to bahiagrass pastures. Treatments consisted of control cows supplemented with molasses from calving until end of breeding season (November 2017 to April 2018; **MOL-Fall/Winter**), or cows receiving year-round supplementation of molasses (**MOL-Year-round;** June 2017 to May 2018) or range cubes (**CUB-Year-round**; June 2017 to May 2018). Total annual amount of supplement was similar among all treatments (600 lb/cow; Table 1). Trace mineral/vitamin supplementation is being provided during the entire year in a loose meal form for control cows or mixed into the molasses or range cubes for cows assigned to year-round supplementation.

Table 1. Supplement dry matter intake (lb/day) of cows offered molasses during Fall/Winter only or year-round supplementation of molasses or range cubes.

Treatments	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
	lb of dry matter/cow daily											
Year-round Molasses	0.5	0.5	1.5	1.5	1.5	2.5	3.0	3.0	2.5	2.5	0.5	0.5
Year-round cubes	0.5	0.5	1.5	1.5	1.5	2.5	3.0	3.0	2.5	2.5	0.5	0.5
Fall/Winter Molasses	0	0	0	0	0	4.0	4.0	4.0	4.0	4.0	0	0

Molasses and range cubes supplementation increased cow BCS in October and at calving (November) compared to cows receiving no supplementation (Figure 1). Although cows assigned to year-round supplementation of molasses and range cubes lost more BCS from calving until the start of the breeding season (Table 2), both treatments maintained greater BCS at the start of breeding season compared to control cow (MOL-Fall/Winter cows). However, no differences were detected for pregnancy rates among treatments (Table 2), which was unexpected but can be explained by the fact that the control cows (MOL-Fall/Winter) calved in an acceptable BCS (despite the lack of supplementation before calving) and had

minimal BCS loss after calving. **It is important to highlight that our group has only 1 year of data collection up to this moment. We are repeating this study for a second year to confirm such results.** Despite the greater nutritional status of cows during late gestation (indicated by the greater BCS at calving compared to MOL-Fall/Winter cows), calf body weight at birth and weaning also did not differ among treatments.

Figure 1. Body condition score of cows offered molasses from calving until the end of the breeding season (MOL-Fall/Winter; November 2017 to April 2018) or year-round supplementation of molasses (MOL-Year-round) or range cubes (CUB-Year round). [a-b] Within month, means without a common superscript differ ($P \leq 0.05$).

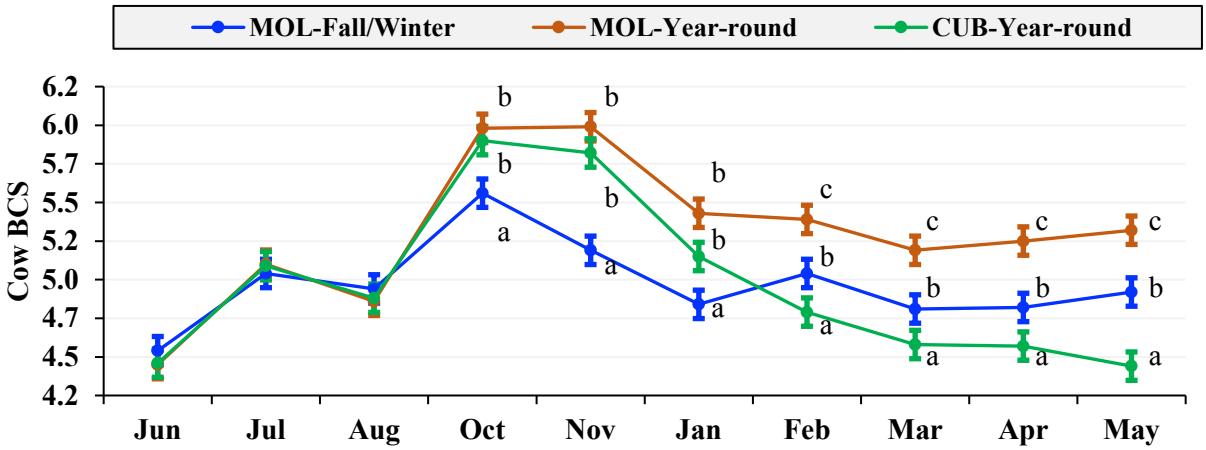

Table 2. Performance of cows and calves during the pre-weaning phase (STUDY 1).

Item	MOL-Fall/Win	MOL-Year-round	CUB-Year-round	SEM	*P*
Pregnant cows (May palpation), %	96.3	88.5	88.9	5.60	0.53
Calf birth weight, lb	79	76	80	3.2	0.64
Calf weaning weight, lb	559	539	566	10.9	0.14
Calf average daily gain, lb/day					
Birth to weaning (August 2018)	1.85	1.74	1.82	0.045	0.18

STUDY 2 – *Evaluating cost-effective supplementation programs for cows during late-gestation*

This study: **(1)** evaluated if dry distillers grains (DDG) supplementation of cows during the entire late-gestation **(2.25 lb/day for 12 weeks = 189 lb per cow; August to November)** would increase cow reproductive success and calf performance after birth, and **(2)** investigated if concentrating cow DDG supplementation during the period of lowest nutrient demand (first 6 weeks after weaning) would be more cost-effective than cows supplemented during the entire late-gestation. First, we believed that cows supplemented before calving, regardless of length of supplementation, would have greater reproductive performance than non-supplemented cows. Second, we believed that supplementing **4.50 lb/day for 6 weeks after weaning** would reduce feed costs, have the greatest impact on cow reproduction success, but not cause fetal-programming effects (due to the shorter supplementation period), whereas the

supplementation of **2.25 lb/day for 12 weeks** would increase feed costs, cause less impact on reproduction, but enhance calf growth after birth.

At the time of calving (November), cows that received supplementation for 6 weeks or 12 weeks had similar BCS (Figure 2). This response indicates that a 6-week period of supplementation was more cost effective than a 12-week supplementation period, because cows supplemented for 6 weeks achieved the same BCS at calving and had half of the feeding labor costs compared to cows supplemented for 12 weeks. Also, cows supplemented for 6 weeks or 12 weeks had greater BCS at the time of calving AND at start of the breeding season compared to control cows that did not receive supplementation before calving. However, no differences were observed for cow reproductive performance during the 2018 breeding season. As observed in STUDY 1, control cows (NoSUP) calved in an acceptable BCS and had minimal BCS loss after calving, which likely benefited their subsequent reproductive performance. This study is being repeated for an additional year to confirm such results.

Contrary to STUDY 1, we observed differences in calf pre-weaning performance in STUDY 2. Calves born from cows that received supplementation for longer periods (SUP 12 weeks) were heavier at weaning compared to remaining treatments. These results (if confirmed after the second year of data collection) indicates that in terms of calf performance, longer periods of supplementation (with smaller amounts of supplement) was required to increase calf weaning weights, and that decreasing the length of cow supplementation period prevented increments on calf weaning weights.

Figure 2. Body condition score of cows that received no supplementation before calving (No SUP), and cows that were supplemented with 4.50 lb/day of dried distillers grains for 6 weeks after weaning (SUP 6 weeks) or with 2.25 lb/day of dried distillers grains for 12 weeks after weaning (SUP 12 weeks). After calving, all cows received 4 lb/day of molasses dry matter until the end of the breeding season. [a-b] Within month, means without a common superscript differ ($P \leq 0.05$).

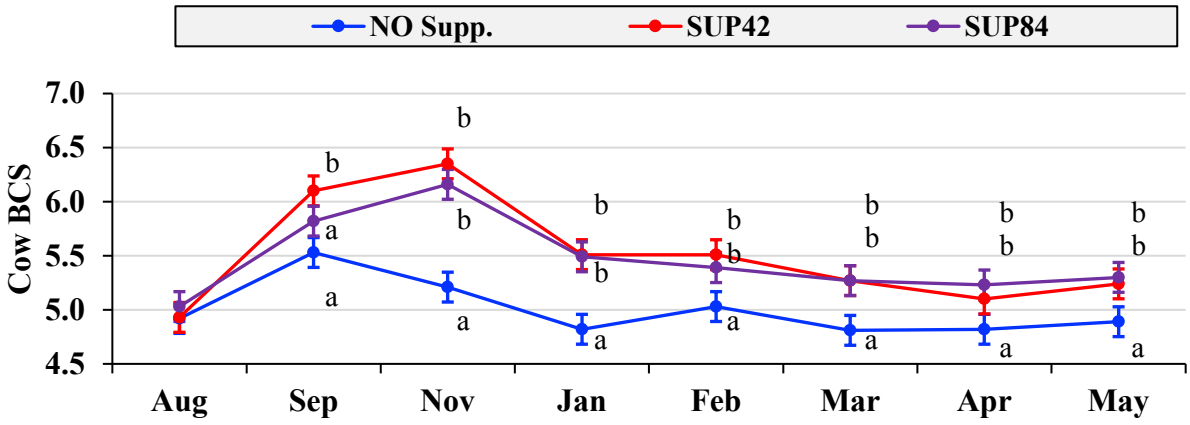

Table 3. Performance of cows and calves during the pre-weaning phase (STUDY 2).

Item	NO Supp.	SUP84	SUP42	SEM	*P*
Pregnant cows (May palpation), %	96.3	96.2	84.6	5.15	0.19
Calf birth weight, lb	76.1	75.7	78.4	2.36	0.60
Calf weaning weight, lb	554[a]	580[b]	561[a]	9.7	0.10

Calf average daily gain, lb/day					
Birth to weaning (August 2018)	1.82	1.97	1.83	0.047	0.12

[a-b] Means without a common superscript differ ($P \leq 0.05$).

Online training - Body Condition Scoring (BCS): Our group, in collaboration with the South Florida Beef and Forage Program, developed an online BCS training tool to educate and improve the accuracy of BCS among stakeholders. It is unique, free and can be taken multiple times!
To access this training, please visit: rcrec-ona.ifas.ufl.edu/animal-science/

If you have any questions please contact me at pmoriel@ufl.edu.