Linking It All Together: Cow Condition, Nutrition, and Construction

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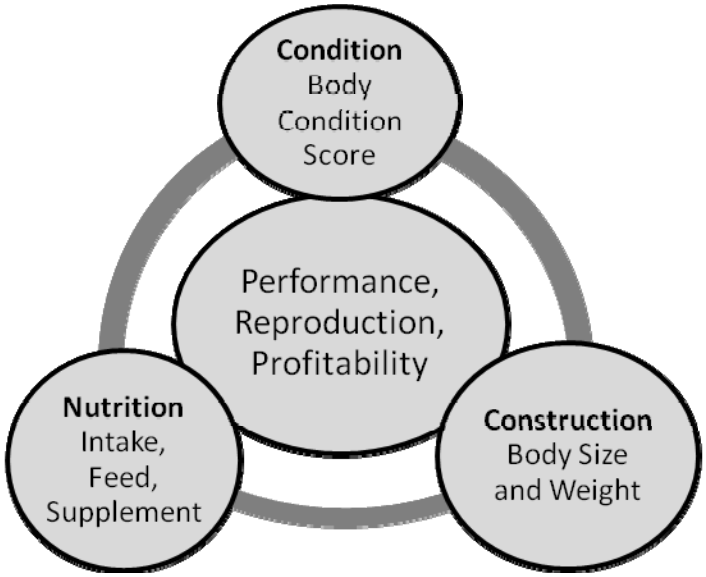
The concepts of cow condition, nutrition, and construction are all inter-related and function to affect the central aspect of a cow individually and on a herd basis. The 3 concepts are linked to each other and to the central aspect of cow performance, reproduction, and profitability (Figure 1). Each of the primary concepts will be addressed individually, but more importantly is that these 3 concepts are always linked to each other; one influencing the others, and always affecting the core mission of the cow herd.

Figure 1. Inter-relationship of Condition, Nutrition, and Construction on cow herd parameters.



BODY CONDITION

Body condition scoring (BCS) is a visual estimation of body fat that a beef animal has. Body condition scores can be utilized in variety of manners, but primarily to gauge the effectiveness of the feeding program that the cow herd has and is experiencing. Body condition score can also be used as a decision making tool to determine the future feeding needs of the cow herd. Body condition score for beef cattle is measured on a 1 (thin) to 9 (fat) scale. Most Florida cows BCS should be in the range from 3 to 7. A medium-frame cow weighs about 1,100 lbs. in a BCS 5, whereas that same cow will weigh approximately 950 lbs. in a BCS 3. A BCS of 5 is the optimum BCS for mature productive cows for Florida cow herds. Body condition or the body fat that it estimates can be utilized as an energy source for the cow, but this is a finite source of energy and ultimately will have to be replaced through additional feed. Body condition score is also a good indicator of future reproductive performance. Body condition scores less than 5 results in:

1) Increased days to return to estrus,
2) Increase services per conception,
3) Increase days to conception,
4) Decreased overall pregnancy rate
5) Decreased calf performance

Table 1 presents a comparison of cow BCS and the resulting economic impact. As a result of fewer cows becoming pregnant, less revenue is derived from the cow herd. Likewise, because of decreased BCS fewer and lighter body weight calves are weaned. Fewer and smaller results in a decrease in the revenues generated from the annual calf crop. Finally, when expressed as dollars generated on a cow basis, revenue is decreased as cow BCS declines.

Table 1. Relationship of cow body condition score, reproductive performance, and economic measure.

	BCS 3	BCS 4	BCS 5
% Pregnant	$41, 913	$44, 907	$47, 907
Weaning %	$16,095	$32,962	$36,884
205-d Weaning Wt	$468.13	$487.73	$491.06
Weaning Wt lb/cow, $/cow	$175	$380	$398

Assumptions: 100 hd herd, all calves marketed, calf weaning weight= 525 lbs, market price of $114.05/cwt.

Body condition score is directly related to nutrition by the underlying nutritional status of the cow and the potential need for supplementation to maintain or regain cow BCS. Ultimately, BCS has a direct effect on cow performance, reproduction, and cow herd profitability.

CONSTRUCTION

Cow body size is a relevant consideration for a number of important production parameters in the beef cow herd. There are direct relationships between cow size/body weight and 1) feed intake potential, 2) cow nutrient requirements, 3) pasture stocking density, 4) cow performance, and 5) productive output. All of the production parameters affect the need for pasture, stored, and supplemental feeds. Ultimately every one of the parameters impacts the beef cow herd enterprise profitability. However, the accuracy of cow size/body weight estimation is a difficult measurement for most beef producers. I've heard several responses to the question of "how big are your cows?" The responses include "I don't know, why does it matter?" It matters because it affects so many other production parameters in the productive cow herd. "My herd runs 1,000 to 1,150 lbs." Really, how do you know, and how is it such a small range. "My cows average about 1,000 lbs." Two things, most cows aren't 1,000 lbs and the spread likely is 800 to 1,200 lbs. "My cull cows averaged 975 lbs, so my herd is a good size." Why were the cows culled, do they represent the whole herd. Figure 2 presents the cow body weight of 3 different Florida cow herds, none have an average cow body weight of 1,000 lbs, and all have a range of over 500 lbs. Likewise, in other Florida research cow body size has important considerations for weaning percent and lbs of calf produced per cow through the first 3 calving cycles (Figure 3).

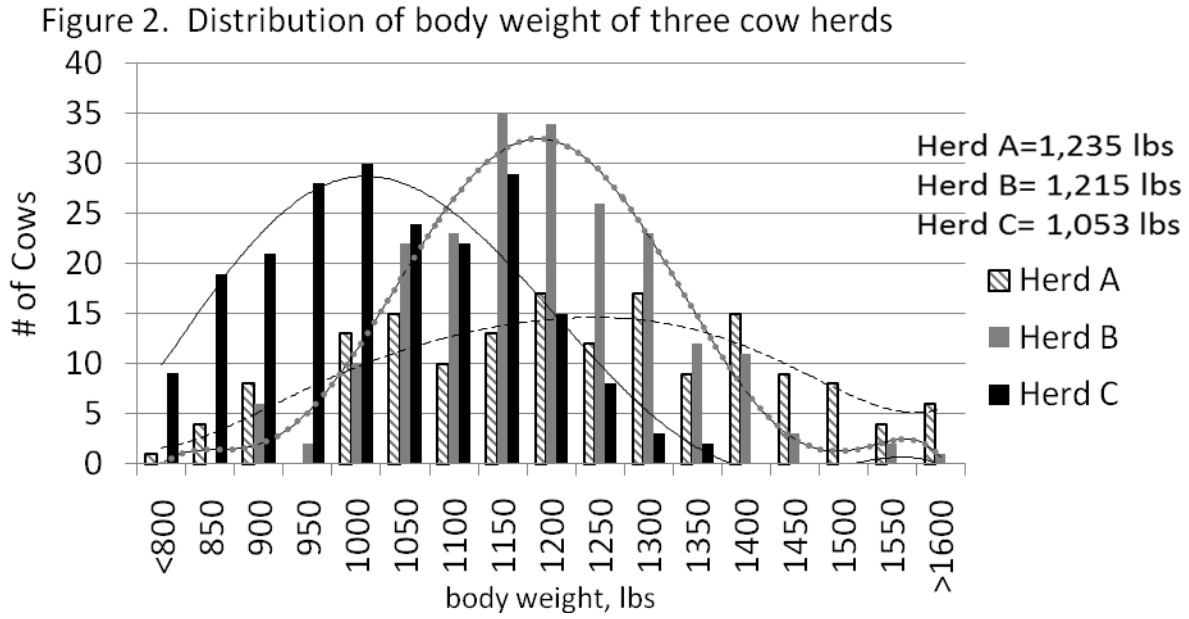
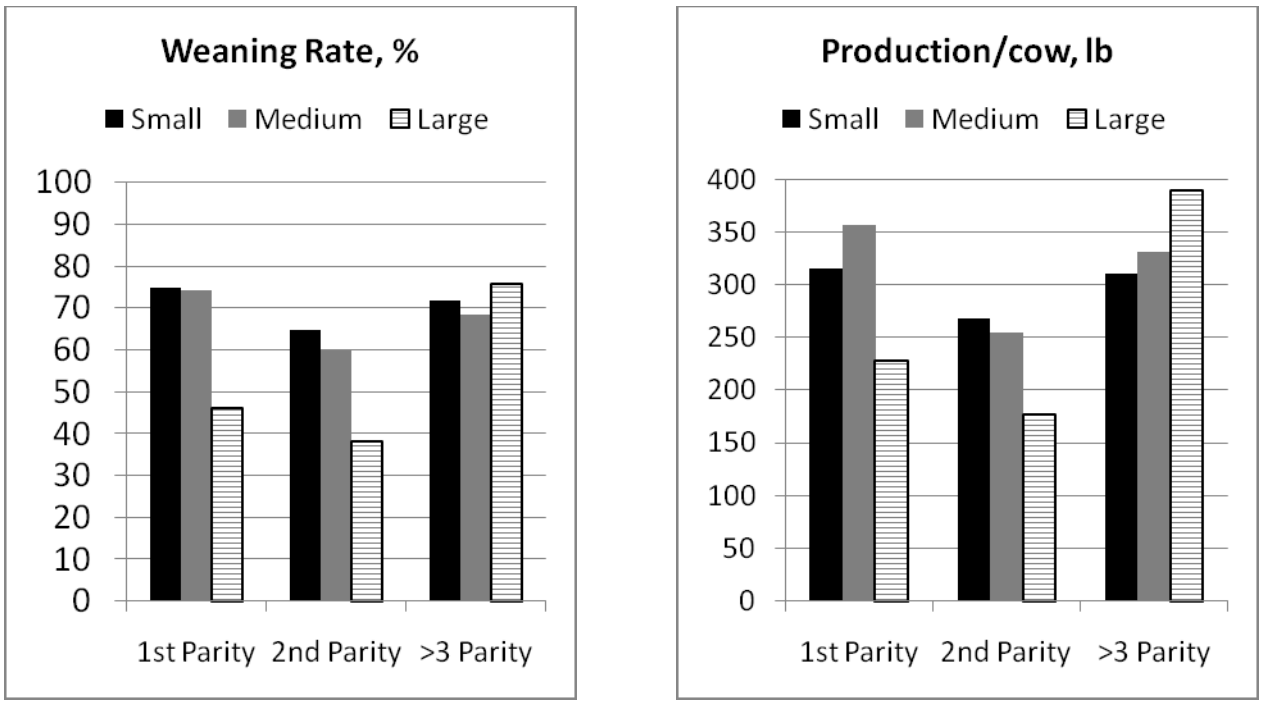


Figure 3. Effect of cow body size on weaning rate and calf production per cow.



NUTRITION

Feeding the cow herd is the largest cost area in beef enterprises and historically approximates 45-50% of the annual maintenance cows. In recent years, the proportion of the annual cost has increased as a result of increases in feed prices. The stored or supplemental feeds that make up a cow herd nutritional program constitute the largest and most variable portion of the annual maintenance cost (Table 1). Therefore, for each cattle producer designing an annual and/or seasonal nutritional-supplementation program correctly is a must. The nutritional program is connected to cow body size through the nutritional requirements mandated by cow body size (Table 2). Likewise, nutrition is connect to cow BCS either by a lack of nutrition leading to a decline in BCS or the need for increased BCS leading to increased nutritional needs.

Table 1. Supplemental feedstuff costs, price/unit of nutrient, and amounts to change body condition score

Feed	$/Ton	% TDN	% CP	$/cwt	$/cwt TDN	$/cwt CP	Lbs to move BCS 3 to 4	Lbs to move BCS 4 to 5
Whole Cottonseed	220	95	23	11.00	11.58	45.83	158	179
Corn	240	88	9	12.00	13.64	133.33	170	193
Dried Distillers Grains	198	88	30	9.90	11.25	33.00	170	193
Citrus Pulp Pellet	188	82	9	9.40	11.46	104.44	183	207
Corn Gluten Feed	196	80	24	9.80	12.25	40.83	188	213
Soybean Hulls	204	80	12	10.20	12.75	85.00	215	243
Cottonseed Meal	325	75	49	16.25	21.67	33.16	200	227
Molasses	200	72	5	10.00	13.89	200.00	208	236
Hay	89	51	8	4.45	8.73	55.63	278	315

Table 2. Relationship of cow intake, energy, and protein requirements and body weight/size.

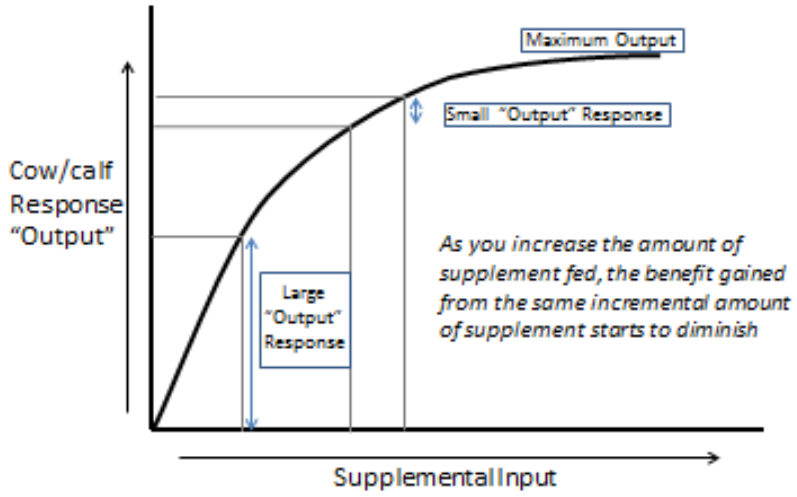
BW, lb	Months After Calving 1	2	3	4	5	6	7	8	9	10	11	12

Dry matter intake, lbs												
1,000	**24.0**	**25.0**	**25.4**	**24.4**	**23.5**	**22.7**	**19.5**	**19.8**	**20.3**	**21.1**	**21**	**21.4**
1,200	**26.8**	**27.8**	**28.4**	**27.4**	**26.5**	**25.7**	**22.4**	**22.8**	**23.3**	**24.3**	**24.1**	**24.6**
1,400	**29.5**	**30.5**	**31.3**	**30.3**	**29.4**	**28.6**	**25.2**	**25.6**	**26.2**	**27.3**	**27.0**	**27.6**
Total Digestible Nutrients, lbs												
1,000	**14.3**	**15.2**	**14.9**	**13.9**	**13.0**	**12.3**	**9.1**	**9.3**	**9.7**	**10.3**	**10.6**	**12.0**
1,200	**15.7**	**16.7**	**16.4**	**15.4**	**14.5**	**13.7**	**10.5**	**10.8**	**11.2**	**11.9**	**12.6**	**13.8**
1,400	**17.1**	**18.0**	**17.8**	**16.8**	**15.9**	**15.2**	**11.8**	**12.1**	**12.6**	**13.4**	**14.2**	**15.6**
Crude Protein, lbs												
1,000	**2.53**	**2.79**	**2.64**	**2.36**	**2.08**	**1.85**	**1.26**	**1.30**	**1.35**	**1.45**	**1.61**	**1.86**
1,200	**2.71**	**2.97**	**2.82**	**2.54**	**2.26**	**2.04**	**1.45**	**1.49**	**1.56**	**1.67**	**1.86**	**2.16**
1,400	**2.88**	**3.14**	**2.99**	**2.70**	**2.44**	**2.21**	**1.63**	**1.67**	**1.75**	**1.89**	**2.11**	**2.45**

Grazing forage alone often does not meet the intake, energy, and/or protein demands of the mature cow herd. The forage-cattle-supplement interaction can be complicated by the characteristics of forage quality, forage availability, cattle nutrient requirements that change during the year (Table 2), and supplement characteristics. Choosing the correct supplement is a decision making process that involves both animal requirement considerations along with economic considerations. There are a number of important considerations regarding choosing supplements.

1. **Start feeding before the grass runs out. The cows have been lacking in intake, energy, and protein long before the grass is exhausted. However, if supplementation has not been initiated prior to a shortage of forage then the beef producer is playing catch-up to the nutritional deficiency of the cow herd. It is always harder to come from behind than it is to maintain a level of performance. This concept also relates to the law of diminishing returns (Figure 4). When a small amount of supplement is fed the response is large, however as supplement amounts increase the response per unit of supplement becomes smaller, to the point of no additional increase in performance as supplement amount increases.**

Figure 4. Law of Diminishing Returns



2. **Supplement only those animals where there is an economic return. The economic return is generally considered a calf. So only cows that will have or currently have a calf should receive supplement. Open cows should be able to maintain themselves on pasture/forage inputs until they are marketed.**
3. **Feed supplement where/how all cattle have access to the supplement. It does no good to put out supplement for 50 cows when only 30 cows can consume the supplement. The cows that are not able to consume supplement when offered are most likely the ones that need it the most. The exception is when self-limited supplements are offered.**
4. **Monitor cow body condition score. Body condition score is the best indicator of the cow nutritional environment, past nutritional experience, and future nutritional needs.**
5. **No one feed alternative is perfect. Supplements differ in nutrients supply, availability, feeding form, and many more issues.**
6. **Compare supplement to determine the optimal supplement to utilize for the cow herd.**
    a. **Determine level of intake: how much supplement needs to be offered or how much will supplement will the cows consume. The need versus want is an important consideration when appropriately supplementing cattle, both from a nutrient supply and economic outlay.**
    b. **Determine concentration of nutrients: the amount of energy, protein, mineral, etc. will aid in dictating the amount of supplement that is needed to meet nutrient deficiencies. Not every feedstuff supplies the same amount of energy, protein, or minerals in a pound of feed. Determining the concentration and amount of nutrient supplied is important to supplement cows appropriately.**
    c. **Determine $/lb of nutrient supplemented: fair comparisons between supplements needs to be made by integrating the amount of nutrient supplied on a cost basis. Raw costs per ton or hundred-weight can be misleading.**
    d. **Factor in all cost/benefits associated with feeding: many issues influence the supplement decisions both positive and negative.**

e. **Suitability – Convenience: some feedstuffs do not always fit into some feeding schemes; likewise some feeds are not easily handled or fed without specialized or expensive equipment and storage facilities.**

Beef cattle enterprise profitability most frequently occurs when expenses and revenues are optimized. The difficulty is that it is always more challenging to optimize a situation than it is to maximize outputs or minimize inputs.