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Sent:	Friday, November 4, 2016 12:28 PM
To:	Eversole, Dan; Shane Gadberry; jbhall@idaho.edu; gclamb@ufl.edu; jxc16@psu.edu
Subject:	Article to Review
Attachments:	Feed a Cow to Breed.docx

Gentlemen,

Since you are quoted in the attached article, I want to give you an opportunity to review it prior to submission to the editor Monday afternoon. Your quotes were taken from some of your publications. The article will be published in the December issue of Gulf Coast Cattleman.

Thanks for your contributions to the beef cattle industry.

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Feed a Cow to Breed

By Robert Fears

Cattle prices have fallen to a level that producers might need to trim costs and fine-tune management practices in order to keep the ranch profitable. An important goal for cow-calf operators, especially during tough economic times, is to ensure that every cow has a calf every year. Cows that don't meet this goal should be culled, but only after a good herd health plan is utilized and the animals receive proper nutrition. You don't want to risk sacrificing good genetics due to mismanagement of herd health and nutrition. It is wise to draft and implement a herd health plan through consultation with a local large animal veterinarian.

"Body condition scoring (BCS) is a useful management tool for monitoring nutritional status of beef cows," said Dan Eversole, PhD, Virginia Tech. "BCS ranges from 1 to 9, with a score of 1 being extremely thin and 9 being very obese. (See Table 1) Research indicates that there is a strong link between a cow's body condition and her reproductive performance. Percentage of open cows, calving interval, and calf vigor at birth are all closely related to cow body condition at calving and during the breeding season. Ideal live weight varies from cow to cow whereas ideal body condition (BCS 5-6) is the same for all cows."

An advantage of body condition scoring is that it can be measured in the field without gathering or working cattle and should be done every time the herd is observed. "At a minimum, evaluate body conditions of spring calving cattle at midsummer, weaning, in the fall, 60 days before calving, during calving and at the beginning of the breeding season," said Shane Gadberry, University of Arkansas. "Changes in management and the use of supplemental feed may be warranted, even during the summer, to prevent drastic body weight changes. There are few economical ways to increase body condition once winter has arrived."

"For nutritional and most management purposes, the beef cow production cycle is divided into four phases – pre-calving, postpartum (after calving), lactating and breeding, and gestation (period between conception and delivery)," said John Hall, PhD, University of Idaho. "Each one of these phases is physiologically unique and each has its own set of nutritional requirements."

"For a cow to have a calf every year, she must conceive within 83 days after calving," said Cliff Lamb, PhD, University of Florida. "Many beef cattle don't even resume their estrous (heat) cycle within this time period. Several factors contribute to delaying the onset of estrous cycles in postpartum cows; however, nutrition and nursing are the two most critical factors that tend to dictate when cows begin to cycle."

"Postpartum is the 80 to 90 day period that begins at calving," Hall continued. "It is the period of greatest nutrition demand because cows must lactate, repair their reproductive tracts, resume heat cycles, breed and heifers need to continue to grow as well. All these processes put considerable strain on the cow and as a result, her voluntary feed intake is

highest during the postpartum period. If she is not fed to meet her nutritional demands, she will fail or be delayed in rebreeding and will lose weight."

"There are reams of data to show cows in poorer body condition at calving have a longer postpartum interval, lower rebreeding rate, and a shorter life in the herd than cows in adequate condition," said John Comerford, PhD, PennState Emeritus. "First-calf heifers are the usual suspects for poor condition since they are adding growth to the stress of lactation and reproduction. Studies show BCS at calving has very little effect on calf birth weight, so it seems that Nature is pushing nutrient intake to fetal growth at the expense of cow condition.

"There are two ways to determine nutrient requirements of beef cattle," said Hall. "The first and most useful for most producers is to use pre-calculated tables from the Nutrient Requirements of Beef Cows publication updated by the National Research Council in 2000. Except for unusual circumstances, these tables give sufficiently accurate requirements for beef cows, heifers and young calves."

Tables 2 and 3 contain simplified nutritional information for postpartum cows and first-calf heifers. The second method is to use one of the available computer software programs for determining nutritional needs.

To use the tables, select Table 1 if you are determining nutrient requirements for postpartum, mature cows or Table 2 for first-calf heifers. Locate the average body weight of the animal and read across the table. This gives you the animal's daily nutrient needs in pounds per head per day. Then look at the required nutrient density line at the bottom of the table. These figures are the minimum concentration of nutrients needed in the diet.

"Either an animal's daily nutrient needs or diet nutrient density can be used to design diets to meet the nutritional needs of beef cattle," explained Hall. "Because cows are generally allowed to eat all they want, the diet nutrient density requirements in dry matter are most useful. Basically, if a cow eats all she can consume of a diet containing the required percentage of a nutrient, she will consume the needed amount of that nutrient each day.

"Dry matter intake requirements are listed in the second column of Tables 2 and 3. These numbers are a guide to how much 100 percent dry feed an animal could or should eat. They are not the total pounds of feed in its normal or as fed form an animal could eat."

For example, an 1100 pound cow in the postpartum period needs to eat 26.2 pounds (dry matter basis) of feed that is 15.5 percent TDN (total digestive nutrients or energy) and 2.75 percent CP (crude protein) to meet her requirements. Assume you have hay that is 85 percent dry matter (DM), 55 percent TDM and 10 percent CP. The TDN and CP contents of this hay exceed the cow's requirements. If they did not, nutrient deficits should be filled with supplement.

Use the following formula to determine the amount of hay to feed:

lbs. required DM ÷ % DM of feed = lbs of needed feed
26.2 ÷ .85 = 30.8
The cow should be fed 30 to 31 pounds of feed to meet her nutritional needs.

NEm requirements are listed in the fourth column of Tables 2 and 3. Net energy for maintenance (NEm) and gain (NEg) are used to formulate diets for growing and finishing cattle. These energy values are more useful than TDN, because they allow more accurate prediction of the amount of energy used for maintenance and gain purposes. TDN is useful is useful for beef cow rations that are primarily forage. When moderate to high amounts of concentrate are fed, net energy should be used to formulate diets. TDN values tend to under predict concentrate feeding values.

Nutrition in cow-calf operations should be built around available standing forage for an economical feeding program. To ensure nutritional requirements of cattle are met, analyze both standing and harvested forage for nutrient content. These analyzes will determine when and how much supplement should be fed. Above all, feed a cow to breed.

Table 1. Body Condition Scores and Animal Appearance at each Condition Score[1]

BCS[2]	Condition	Appearance
1	Emaciated	Shoulder, ribs and back are visible
2	Very thin	Some muscle, no fat deposits
3	Thin	Some fat deposits, ribs visible
4	Borderline	Fore ribs not noticeable
5	Moderate	12th and 13th ribs not visible
6	Good	Ribs covered, sponginess to tail head
7	Very Good	Abundant fat on tail head
8	Fat	Fat cover thick and spongy
9	Obese	Extremely fat throughout

[1]*Reproduction And Breeding: Influence of Nutrition on Reproduction in the Beef Cow Herd*, G. Cliff Lamb, University of Minnesota Extension

[2]Body Condition Score

Table 2. Daily nutrient Requirements and Diet Nutrient Densities for Mature Postpartum Cows[1]

Body Weight	Dry Matter Intake (lb)	Lb. Per Animal Per Day				
		TDN[2]	NEm[3]	CP[4]	Ca[5]	P[6]
1100	26.2	15.5	15.7	2.75	0.08	0.05
1200	27.6	16.2	16.3	2.82	0.08	0.06
1300	29.1	17.0	17.2	2.91	0.09	0.06
1400	30.4	17.6	17.6	3.01	0.09	0.06
Required Diet		**%TDN**	**NEm**	**%CP**	**%Ca**	**%P**
Nutrient Density		59.2	0.60	10.5	0.30	0.20

[1]John B. Hall, William W. Seay and Scott M. Baker; Virginia Tech

[2]Total Digestible Nutrients, [3]Net Energy, [4]Crude Protein, [5]Calcium, [6]Phosporus

Table 3. Daily Nutrient Requirements and Diet Nutrient Densities for First-Calf Heifers[1]

Body Weight	Dry Matter Intake (lb)	Lb. Per Animal Per Day				
		TDN[2]	NEm[3]	CP[4]	Ca[5]	P[6]
1100	22.4	13.6	13.9	2.35	0.07	0.04
1200	23.7	14.3	14.7	2.44	0.07	0.05
1300	25.0	15.0	15.5	2.53	0.08	0.05
1400	26.2	15.7	16.2	2.62	0.08	0.05
Required Diet		**%TDN**	**NEm**	**%CP**	**%Ca**	**%P**
Nutrient Density		60.6	0.62	10.5	0.31	0.19

[1]John B. Hall, William W. Seay and Scott M. Baker; Virginia Tech

[2]Total Digestible Nutrients, [3]Net Energy, [4]Crude Protein, [5]Calcium, [6]Phosporus