How much should I feed my cows?

The Answer... in five simple questions.

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Review of a cow/calf enterprise budget generally finds supplementation among the top three expenses. If profitability is a primary goal, then it's imperative that supplementation efforts be effective and cost efficient.

Unlike cattle feeders and dairymen, beef producers seldom know exactly what and how much their cows are eating. So the question often arises - "How much should I feed my cows?"

This question is similar to "How long does it take to get to Amarillo?" Perhaps the most accurate answer to both is "It depends." A response which in turn begs more questions: Where are you departing from? Method of transportation? Route? Number of stops?

The intent herein is to identify five questions (in order of priority) cattlemen should consider as they develop their supplementation program. [Supplementation is often thought of in the context of a winter activity. Yet as the previous three years (2011-2013) have illustrated, supplementation may be warranted anytime nutrient demand exceeds nutrient availability, regardless of the season.]

1. How much do they weigh?

Larger cows can eat more and must do so to satisfy maintenance requirements and production expectations. Body weight is the largest factor affecting the pounds of nutrients required. Table 1 illustrates the effect of body weight on nutrients needed.

Table 1. Protein & Energy Requirements – Mature Cows
Middle 1/3 Gestation *(maintaining weight)*

Weight, lb*	Dry Matter Intake, lb/d	Crude Protein, lb/d	TDN, lb/d	Calcium, grams/d	Phosphorus, grams/d
1000	18.1	1.3	8.8	15	15
1200	20.8	1.4	10.1	18	18
1400	23.3	1.6	11.4	21	21

*in average body condition (BCS=5)
from Nutrient Requirements of Beef Cattle, 6th Ed., 1984

Notice the weights listed in nutrient requirements tables assume cows are in average condition (body condition score = 5). For more information on body condition scoring

beef cows go to http://animalscience.tamu.edu/livestock-species/beef/publications/ and look for *B-1526 Body Condition, Nutrition and Reproduction of Beef Cows.*

Stocking rates and forage demand are expressed in animal units, with an animal unit being the weight/number of a species expected to consume 26 pounds of air dry forage per day. Relative to beef cows, an animal unit is a 1000 pound cow.

Mature weight/size of the US beef cow herd has steadily increased over the past 40 years. *There is no substitute for scales when it comes to assessing cow body weight* – too often 'guesses' are off by 200 pounds or more. Suffice it to observe - there are not many 1000 pound cows left in the country.

2. What stage of production are they in?

In addition to body weight, nutrient demand is influenced by physiological status or stage of production. In order of increasing nutrient demand, the four stages of production are:

mid-gestation --> late gestation --> late lactation --> early lactation

Yet the order in which they occur is:

mid-gestation --> late gestation --> early lactation --> late lactation

and depending on calf age at weaning, late lactation and mid-gestation may overlap.

Like body weight [among some breeds], milk production has increased appreciably in most breeds in the last three decades. Greater milk production is accompanied by increased nutrient demands. In addition, cows with greater milk production potential have increased maintenance requirements, even when not lactating. Nutrients needed to support maintenance and lactation are shown in Table 2.

Table 2. Protein & Energy Requirements – Mature Cows
1st 3-4 months lactation *(predicted gain 0.0 lb/day; superior milking ability)*

Weight, lb*	Dry Matter Intake, lb/d	Crude Protein, lb/d	TDN, lb/d	Calcium, grams/d	Phosphorus, grams/d
1000	20.6	2.5	13.8	36	25
1200	23.8	2.7	15.2	39	28
1400	26.7	2.9	16.5	42	31

*in average body condition (BCS=5)
from Nutrient Requirements of Beef Cattle, 6th Ed., 1984

Compare the requirements between the two production stages (Table 1 vs. Table 2) for a given weight of cow and it illustrates the effect of physiological status. Compare between body weights of cows within either table and one understands the importance of accurately assessing cow body weight.

3. What response do you expect?

Reproductive performance is closely related to nutrition. Research results clearly demonstrate that cows need to be in body condition of five (5) in order to facilitate early lactation and a timely return to estrus (such that the cow will conceive within 90 days after calving and maintain a 365 day (or less) calving interval). Cows in adequate condition *at calving* (condition score 5 or greater) have the 'luxury' of being able to utilize body reserves (primarily fat) and lose weight while sustaining lactation and reproduction.

Maintenance requirements must be met daily; otherwise the cow will lose weight. Weight gain results when nutrient intake exceeds nutrient demand, hence the most efficient conversion of supplement to body weight gain is expected to occur after weaning and prior to late gestation. Improving body condition of a grazing beef cow via supplementation during periods of greatest nutrient demand (late gestation through early lactation) is difficult if not economically and practically unfeasible.

4. What and how much [forage] do they have to eat?

Supplementation and feeding are often used interchangeably, but the two have different intentions.

Supplementation is filling the void between nutrient demand and nutrient(s) supplied by the forage/hay being consumed. (Realize hay is a substitute for standing forage.)

Feeding is providing a balanced diet that meets nutrient demand (i.e. drylot cows).

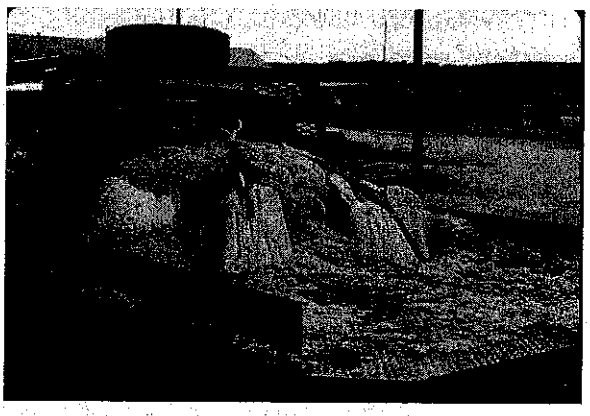
***The success or failure of a supplementation program is dependent upon the quantity and quality of forage being supplemented.**

As forage quality decreases (envision dormant, dry grass mid-winter), nutrient content decreases as does forage intake. If cows had unlimited intake and digestion potential, they could stay fat on wheat straw. Unfortunately, the fiber content of forages limits how quickly digestion occurs, which in turn influences forage intake. In contrast, the higher the quality (picture immature wheat pasture or lush spring grass), the more a cow can and will eat.

Understanding the quantity and quality of the forage being consumed is fundamental to designing a supplementation program for beef cows. If a cow is roaming over several acres of native range consuming some grasses, some forbs and maybe a small amount of browse, estimation of diet quality is difficult. Observing grazing behavior and the consistency of feces are useful indicators of forage availability and quality, respectively. Experienced range cattle nutritionists/cattlemen often use experience and best-guess estimates of diet quality as a starting point for developing supplementation strategies.

5. What supplement(s) are available?

Supplements come in numerous forms – cubes, blocks, tubs, lick tanks, grains, bales, plant co-products, milling co-products, bakery waste, bulk candy, etc. The choice of supplement is often determined by historical use, producer preference, quantity purchased and ease of handling/provision.



Ruminants are amazing animals created with the unique ability to convert a wide variety of feedstuffs, from rice hulls to casein, into high quality animal protein and/or milk. Generally, forages comprise the least expensive portion of a cow's diet, so the challenge becomes how to 'best' supplement the forage to achieve performance goals (weight change, reproduction, lactation). As noted in Tables 1 and 2, protein and energy are the two major nutrients considered for supplementation (mineral requirements and supplementation not to be overlooked).

Identify the first production-limiting nutrient (often protein) and evaluate supplements on a cost per unit of that nutrient basis. Most supplements contain both protein and energy, so it becomes a balancing challenge to determine which supplement best combines the needed nutrients at the best (not necessarily the cheapest) cost?

Supplement delivery also has an influence on decision making. If it is not practical/feasible to see cows every day or two, then self-limiting supplements or those that can effectively be fed infrequently (once per week) might be considered. Purchasing in large quantity (tons) typically results in a lower cost per unit of supplement, but some producers cannot handle (economically or physically) large quantities of supplement. Physical ability also effects supplement choice; whether mobility-challenged or not producers should exercise caution when distributing supplement. The inability to avoid cows competing for supplement can result in serious injury.

For more detail regarding supplementation strategies see *B-6067 Supplementation Strategies for Beef Cattle* at to http://animalscience.tamu.edu/livestock-species/beef/publications/ .

Producer-friendly software is available to aid in answering these questions and development of a sound supplementation program for beef cows. Oklahoma State faculty have developed *Cowculator*, a very useful tool for evaluating supplementation options. The program may be downloaded at no cost.
http://www.extension.org/pages/23788/osu-cowculator-v20-beef-cow-nutrition-evaluation-software#.U8BzWkC9ZmM