

Supplementing Beef Cows

Cow-calf production utilizes grazing forages to provide the majority of the nutrients needed for maintaining the cow, growing the calf, and developing replacements. However, beef cattle need supplements in addition to forages during different phases of production and seasons of the year to support genetically achievable and economically optimum performance

The determination of supplements should be organized into priorities of nutrient supplementation:

1. mineral-vitamins as first priority
2. protein as second priority
3. Energy as third priority.

This sequential approach allows utilization and balancing a forage-based diet and can be closely related to the economic importance of providing limiting nutrients for beef cows.

The next step is to determine the nutrient needs or requirements. The nutrients required by cattle will vary depending:

1. weight,
2. age,
3. growth,
4. gain or loss in body condition,
5. pregnancy status, and
6. milk production.

Other factors that will impact requirements in some situations are breed, activity, and heat or cold stress. For this discussion of supplementing beef cattle on forage-based diets, we will focus our discussion on energy and crude protein (CP) requirements.

Step1 Determine Forage Composition.

Forage is the base for cow-calf nutrition and provides many of the nutrients needed in most situations. However, forage quality and composition varies with :

1. maturity,
2. species,
3. season, environmental conditions,
4. and other factors.

The forage composition is needed to compare to requirements and quantify the adequacy of energy and protein.

Step 2: First Economic Priority - Evaluate Mineral-Vitamin Supplementation.

An effective mineral-vitamin supplementation program is evaluated first because Mineral and vitamin deficiencies can reduce growth, body condition score, and pregnancy rate. When considering cost, mineral-vitamin supplements are usually more cost effective than other supplemental nutrients. An effective mineral-vitamin supplementation can cost between \$ 8 to \$12 per cow per year.

Step 3: Second Economic - Priority Evaluate Protein Supplementation

Protein supplements have been shown to increase forage intake and digestibility when protein is deficient. When protein is deficient, results of several studies indicate that protein supplements increase forage consumption by 15 to 45%. In these situations, supplementing protein is usually more cost effective than purchasing energy supplements.

Non Protein Nitrogen (NPN) vs Natural Protein.

Use natural protein supplements for young, growing cattle fed medium- and low-quality forages. The energy consumed limits the synthesis of digestible intake protein (DIP) into microbial protein but in situations where low quality forages are fed, the microbial protein may not meet the animals' protein requirements for maintenance and growth. This is the situation for growing cattle and young cows, and feeding natural protein that contains protein not degraded in the rumen undigestible intake protein (UIP or bypass protein) improves their performance

Step 4: Last Economic Priority Evaluate Energy Supplementation

The costs of energy supplements can be significant so it is essential to supplement only cows and heifers that will give an economical response. Cows that lost calves or cows in BCS 5 or above and calving late probably will not improve performance and need to be removed from the herd being fed energy supplements. Energy in beef cows is used for maintenance and for gain when body condition score is below 5. Maintenance needs increase during environmental stress both cold and hot.

For more than 60 years energy has been evaluated by total digestible nutrients (TDN) system. The system is good however, the net energy system was developed 40 years ago and can be used more accurately than the TDN system. As an example, cattle utilize feedstuff's different for maintenance energy and energy for growth. Corn is an excellent source of energy and has 89 % TDN. The maintenance energy (NEM) is 0.98 mega calorie of energy per pound and the net energy of gain (NEG) is 0.67 mega calorie of energy per pound of corn. Therefore if corn is used for maintenance then the beef cow receives 0.98 mega calories for utilization which is 33 % more energy when the energy is used for gain. Maintenance needs for beef cows are presented in Table 1.

Table 1

Weight of Cow	Mega-Calorie of energy	Increase Needs Cold wet Weather
1000	7.6	8.3 to 8.9
1050	7.9	8.7 to 9.3
1100	8.1	8.9 to 9.5
1150	8.4	9.2 to 9.8
1200	8.7	9.5 to 10.1

Different breeds of cattle tend to need more or less maintenance energy based on breed type. Research has shown that some Beef breeds need more maintenance energy than others do and some need less than the average. Table 1 represents the average

maintenance needs for most beef breeds. Table 2 represents the increase or decrease in maintenance needs by Beef breeds.

Table 2

Breed	NEM Factor	Expected Birth Weight Lbs	Peak Milk Production Lbs per Day
Angus	1.00	68	17.6
Braford	0.95	79	15.4
Brahman	0.90	68	17.6
Brangus	0.95	73	17.6
Braunvieh	1.20	86	26.5
Charlois	1.00	86	19.8
Chianina	1.00	90	13.2
Devon	1.00	71	17.6
Galloway	1.00	79	17.6
Gelbvieh	1.10	86	25.4
Hereford	1.00	79	15.4
Limousin	1.00	82	19.8
Longhorn	1.00	73	11.0
Maine Anjou	1.00	88	19.8
Nellore	0.90	71	15.4
Piedmontese	1.00	84	15.4
Pinzgauer	1.00	84	24.3
Polled Hereford	1.00	73	15.4
Red Poll	1.00	79	22.0
Sahiwal	0.90	84	17.6
Salers	1.00	77	19.8
Santa Gertudis	0.95	73	17.6
Shorthorn	1.00	82	18.7
Simmental	1.20	86	26.5
South Devon	1.00	73	17.6
Tarentaise	1.00	73	19.8

Most of the Brahman and Brahman influenced cattle have lower maintenance requirements. Increase in maintenance for some breeds is related to size as an example the large frame breeds tend to more energy for maintenance. Dairy breeds both Jersey and Holstein need about 20 % more energy for maintenance needs.

Summary

Reasons for feeding supplements to Beef cows consuming grazing forages include:

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1. supply deficient nutrients
2. conservation of forage
3. improvement of animal performance
4. increasing economic return
5. managing cattle behavior.

The most important reason to feed supplements is to maximize the energy in the forage. The first step is to determine the needs of the beef cow herd. After the needs are determined and forage evaluations are conducted, then the proper supplements can be determined. Supplements can be costly if not meeting the needs of the beef cow. Supplements supply minerals and vitamins, protein and energy. Supplements may be primarily minerals or protein (both natural and containing NPN) or energy or both protein and energy or complete with protein, energy and minerals. Supplements are manufactured in different forms:

1. Loose Minerals
2. Minerals blocks
3. Commodities
 - Whole Cottonseed
 - Corn Gluten Pellets
4. Pressed blocks
5. Chemical blocks and tubs
6. Commercial cubes
7. Liquids

The blocks and tubs are considered convenient supplements in that they have intake limitors to control daily intake. The products can be labor saving as well.

Supplements may be used to correct specific nutrient deficiencies, extend forage, carry feed additives or alter animal behavior. Proper economic supplementation of Beef cows can improve the performance and the economics of Beef production.

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