



Supplementing Pasture Grazing to Meet Beef Cow Requirements or Stretch Pasture Forage

Summer pasture grazing will typically meet the energy and protein needs of cow-calf production with limited supplementation assuming there is an adequate supply of forage to satisfy the dry matter intake of cows.

However, at times, grazing animals need supplementation due to low forage availability or poor quality that will not meet nutritional requirements. There are two main goals of supplementing animals on pasture:

1. Improve or maintain animal performance.
2. Prevent over-grazing or pasture damage, and stretch the available pasture forage.

When pasture forage availability or quality is limiting, cow maintenance and performance will likely suffer, and meeting nutritional requirements will take precedence over stretching pasture forage. Determining the additional feed needed to meet most of the cow's energy and protein requirements and the cost of feeds are the primary factors in determining supplementation strategies in that scenario.

Trying to stretch existing forage for grazing by supplementation is more difficult. Supplemental feed intake is variable in how much it offsets grazing intake.

Supplementing at least 1% of body weight in dry matter intake is likely needed to offset grazing forage intake, and the result would likely be in the range of 0.50-0.75 lb. of forage dry matter intake reduced per pound of dry matter supplemented. The amount of forage available and quality of forage from grazing will affect how successful supplementation strategies might be. Cows will tend to graze more of a high-quality forage when available, versus a supplement. Having sufficient forage or fiber in the supplement seems to be important to limit grazing forage intake. This is logical, as gut fill plays a large role in limiting intake for cattle grazing pasture, and fiber (specifically neutral detergent fiber or NDF) will drive gut fill.

There have been several studies and demonstrations on supplementing corn co-products for grazing animals at various levels. Most of these have been with grazing heifers rather than mature cows, and supplementation of pasture has increased gain on the heifers. An Iowa State University demonstration at the McNay Memorial Research and Demonstration Farm showed a corn co-product supplemented at 1% or more of body weight decreased grazing intake up to 26% when compared to no supplementation. University of Nebraska-Lincoln research found that supplementing distillers grains combined with wheat straw can reduce forage intake from grazing when the mix is fed at about 50% of expected dry matter intake (1.25%-1.5% of body weight). The amount of forage dry

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matter intake from grazing decreased from 0.22 lb. up to 1 lb. for each pound of the distillers grains and wheat straw mix fed. As the mix changed from a 45:55 distillers to forage ratio to a 30:70 ratio, grazing forage intake was more likely to be reduced as the percent of forage in the supplement increased.

Feeding other forages like hay or corn silage could be used to supplement grazing cows. Concentrates like distillers grains, corn gluten, or corn grain can be supplemented. This would increase energy and protein intake on poorer quality pasture and improve animal performance. Research results on grazing reduction with a variety of supplements are lacking. Mixing those concentrates with other forage would likely be more successful in reducing forage intake. Corn should be limited to 0.5% of body weight due to higher starch content potential to limit forage digestion.

Measuring a grazing animal's dry matter intake and nutrient intake is difficult, so managing a cow's body condition score is key for effective supplementation. Supplementation may not be needed on a daily basis. However, some studies have shown that forage offset and performance is improved when feed is delivered daily. In addition to monitoring body condition, it is important to monitor feeding behavior and to make sure all animals have access when feed is delivered. In addition, monitoring pasture condition is also important, as weather and grazing pressure impacts may be variable. Iowa State University Extension and Outreach publication [Estimating Available Pasture Forage](https://store.extension.iastate.edu/Product/5316) (FM 1758) (<https://store.extension.iastate.edu/Product/5316>) provides information and aids to help determine how much forage is available.

Tables 1, 2, and 3 show expected intake and the percent of energy and protein requirements met with example supplemental feeds fed at 25%, 50%, or 75% of expected intake, forage from grazing at 100%, 75%, or 25% of expected intake and the combined forage and supplement.

The requirements are for a 1,300-lb. mid-lactation, mature cow. It is assumed that grazing intake is reduced by 25%, 50%, or 75% as supplements are fed at that level, but that is difficult to determine and grazing intake would likely be higher if forage quality is high. The intakes and

Table 1. Estimated dry matter (DMI), energy, and protein intake from example supplemental feeds fed at 25%, 50%, and 75% of expected intake for a 1,300-lb. cow in mid-lactation.

	DMI (lb.)	% of expected DMI	% of body weight DMI	% of requirement met	
				Energy	Protein
Modified distillers and cornstalks mixed supplement 30:70 mix (% DM)	7.9	25	0.61	28	35
	15.8	50	1.21	55	70
	23.5	75	1.81	83	104
20:80 mix (% DM)	7.7	25	0.59	24	26
	15.4	50	1.18	48	52
	22.9	75	1.76	73	78
15:85 mix (% DM)	7.5	25	0.58	23	22
	15.1	50	1.16	46	44
	22.6	75	1.74	68	67
33% corn and 66% cornstalks mixed supplement	7.9	25	.61	28	16
	15.7	50	1.21	55	33
	23.5*	75	1.81	83	47
Corn silage supplement (35% DM)	8.3	25	0.64	33	20
	16.5*	50	1.27	65	40
	24.6**	75	1.89	98	60
Grass-legume hay supplement (16% CP, 63% TDN)	8	25	0.62	30	28
	16	50	1.23	59	56
	23.9	75	1.84	88	84

* Corn intake at 0.6% BW
 ** Corn intake at 0.9% BW

requirements were based on ISU Extension and Outreach BRaNDS (Beef Ration and Nutrition Decisions Software).

As is evident in the table with the assumed intakes and feed qualities, the 100% of intake by grazing or most of the supplementation strategies exceeds the energy and protein requirements of the mature cow. At the lower levels of supplementation (25% of dry matter intake), grazing intake would likely not be reduced as expected. The higher levels of supplementation would be more likely to offset grazing intake.

Providing supplements to meet cow requirements when grazing pastures with low forage availability or quality is relatively easy to do. Stretching pasture forage using

supplementation is more difficult. Some reduction in forage intake may be expected but the amount reduced is variable. Depending on forage available in the pasture, cost of feed supplements, feeding equipment and labor availability, it may make more sense to remove cows from the pasture and feed a total mixed ration (TMR) to meet their full requirements. Doing so will stretch forage supplies and prevent damage to pastures.

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Table 2. Estimated dry matter (DMI), energy, and protein intake from pasture grazing at 25%, 50%, 75%, and 100% of expected intake for a 1,300-lb. cow in mid-lactation.

	DMI (lb.)	% of expected DMI	% of body weight DMI	% of requirement met	
				Energy	Protein
Pasture grazed cool season grass in boot stage (14% CP and 66% TDN)	7.6	25	0.58	28	26
	15.2	50	1.17	57	53
	22.8	75	1.76	86	80
	30.4	100	2.34	114	106

Table 3. Estimated dry matter (DMI), energy, and protein intake from pasture grazing and supplements combined at 100% of expected intake for a 1,300-lb. cow in mid lactation.

	DMI (lb.)	Supp: Pasture Ratio	% of body weight DMI	% of requirement met	
				Energy	Protein
Modified distillers and cornstalks: Pasture					
30:70 mix (% DM)	31.8	25:75	2.45	117	125
	31.6	50:50	2.43	115	134
	31.5	75:25	2.43	113	143
20:80 mix (% DM)	30.9	25:75	2.38	111	111
	31.2	50:50	2.40	108	113
	30.8	75:25	2.37	103	113
15:85 mix (% DM)	30.4	25:75	2.34	108	104
	30.4	50:50	2.34	103	101
	30.4	75:25	2.34	98	98
33% corn and 66% cornstalks mix: Pasture	31.9	25:75	2.45	117	110
	31.7	50:50	2.44	115	106
	31.5*	75:25	2.43	113	88
Corn silage: Pasture	32.2	25:75	2.48	122	114
	32.4*	50:50	2.49	125	116
	32.6**	75:25	2.51	128	98
Grass-legume hay: Pasture	31.3	25:75	2.41	117	110
	32	50:50	2.46	119	114
	32	75:25	2.46	118	112

* Corn intake at 0.6% BW

** Corn intake at 0.9% BW

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