

Grouping the Commercial Beef Herd for Winter Feeding

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Nutrition-related costs usually account for 60 percent or more of the total annual variable costs of producing a weaned calf. Over 50 percent of the total feed costs are incurred during the winter feeding period. Because of the magnitude of winter feed costs, it is advantageous to develop a feeding and management program that will allow the cow herd to be carried through the winter at least cost. Since cattle in different developmental stages or intended use have different nutrient and management requirements, separation of the herd into groups with similar nutrient and management requirements is desirable.

Distinct management groups of cattle found in most beef herds are: 1) dry, mature pregnant cows, 2) cows nursing calves, 3) weanling replacement heifers, 4) pregnant replacement heifers, 5) growing steers and heifers and 6) herd bulls. Most herds will contain at least three of these groups.

The daily requirements of protein and energy (total digestible nutrients, TDN) and feed quality (expressed as % protein and TDN) for each group are shown in Table 1.

Not only does the quality and quantity of feed needed for each group vary but each group also has unique management requirements that are influenced by age and stage of production. Specific feeding and management of the various production groups follows.

Dry, Mature Pregnant Cows

Nutritional requirements of the dry, mature pregnant cow (7 to 12 months since calving) are only

slightly above maintenance and are lower than at any other period in the annual production cycle.

Because of the low nutrient requirements, the dry, mature pregnant beef cow is able to utilize a lower quality forage than any other class of beef cattle. Feed that is only 6.5% to 8.7% crude protein and 46.8% to 56.0% TDN on a dry matter basis is sufficient for the dry, mature (1,100 lb) pregnant cow. This provides an opportunity for the cow-calf producer to cut winter feed costs by using feeds such as crop residues, mature grasses, low quality hay and other lower quality feeds.

The greatest percentage of the growth and development of the unborn calf occurs during the last third of pregnancy. Therefore, feed quantity and quality must increase to insure proper fetal development and rebreeding performance of the cow.

Cows Nursing Calves

Nutrient requirements, as well as the level of management of the beef cow, increase dramatically following calving (Table 1). Nutrient requirements are positively related to the cow's milk production. If adequate milk production and rebreeding are to be obtained, both feed quality and quantity must be increased.

More frequent observation and management are required during this period of production to detect calving problems, to insure that calves receive colostrum and that the cows rebreed on schedule.

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Table 1. Nutrient Requirements of Beef Cattle^{1,2}

Class	Body Weight (lb)	Months Since Calving	ADG ³ (lb)	Dry Matter Intake (lb)	Percentage of the Ration (dry-matter basis)		Daily Nutrients Per Animal (lb)	
					CP ⁴	TDN	CP	TDN
Mature Cows 10 lb peak milk		2		23.5	8.9	56.3	2.10	13.2
		4		24.1	7.8	53.2	1.89	12.8
		6		23.3	7.0	51.6	1.64	12.0
		7		20.9	6.5	46.8	1.36	9.8
		8		21.2	6.6	47.2	1.40	10.0
		10		22.6	7.0	48.9	1.56	11.1
		12		23.0	8.7	56.0	2.00	12.9
Weanling Heifer	400		1.50	10.7	12.1	64.0	1.30	6.8
	500		1.50	12.6	11.2	64.0	1.41	8.1
Yearling Heifer	600		1.00	16.6	8.0	52.7	1.32	8.8
Pregnant Heifer								
	2 months since conception	700	0.90	18.5	7.2	50.4	1.33	9.3
	6 months since conception	850	1.36	20.8	7.5	52.3	1.57	10.9
9 months since conception	1,000	2.35	22.9	9.8	60.6	2.24	13.9	
Two-Year-Old Lactating Heifer								
	2 months since calving, 20 lb peak milk	900		22.5	10.9	61.7	2.45	13.9
Backgrounding Steers								
1,200 lb @ finishing	500		1.50	12.6	11.2	63.0	1.41	7.9
Mature Herd Sire	2,000		0	37.2	5.6	46.0	2.07	17.1

¹ Adapted from Nutrient Requirements of Beef Cattle, Seventh Revised Edition (1996 NRC). For a more extensive listing of nutrient requirements, refer to MP 391, *Nutrient Requirements of Beef Cattle*.

² Requirements for cows and heifers with mature weights of 1,100 lb.

³ Average daily gain.

⁴ Crude protein.

Weanling Replacement Heifers

Research has shown that for maximum lifetime production, heifers should calve first as two-year-olds. Depending on breed and type differences, heifers should be 14 to 15 months old and weigh 600 to 800 lb at breeding. Adequate nutrition and management are essential if heifers are to reach this weight. A review of the nutrient requirements for the growth and development of weanling heifers (Table 1) reveals that their feed must have greater protein and energy percentages than feed required by the mature cow herd. Replacement heifers wintered with the cow herd are at the lowest levels of the “social order” and are “bossed” by older cows. The result is inadequate feed intake for growth and development. Also, the feed provided the mature cows would probably be of too low quality to produce the needed gain. The newly weaned heifer calf requires frequent observation to detect possible sickness due to the stress of weaning.

Pregnant Replacement Heifers

Although absolute requirements for energy and protein increase for the pregnant heifer, feed intake capacity also increases so that a lower quality feed may be used with the pregnant heifer than with the weanling heifer.

Providing the proper quantity of feed to meet nutrient requirements of the pregnant heifer is especially critical immediately prior to and following calving. Before calving, the heifer has a nutrient demand for her own growth and development of the unborn calf. After calving, the young cow must have adequate feed to produce milk, continue to grow and rebreed properly. During this period, the young female should be fed to gain from 0.5 lb to 1.0 lb per day. This gain will help to insure rebreeding on schedule.

Frequent observation is necessary with the first-calf heifer near calving because she is more likely to have calving difficulties.

Backgrounding Steers and Heifers

Many producers have begun to maintain ownership of calves beyond weaning in an effort to increase sale weights and efficiency of production.

Depending on the management and marketing program, these calves should be fed to gain 0.75 to 2 lb per day. Due to their limited “feed intake ability,” these calves require a higher quality feed than do older, heavier calves and the mature cow herd (Table 1). These calves should be separated from the remainder of the herd and fed a high quality forage. Grain and protein supplement will need to be added to medium or poor quality forage if the calves are to grow at a profitable rate. These calves will perform better if the supplemental protein source is primarily natural (such as soybean or cottonseed meal) rather than NPN (such as urea).

Herd Bulls

Herd bulls compose the smallest group in the commercial cow-calf herd but are just as important as any other group. Depending on condition, a mature bull’s nutrient requirements are for maintenance. The nutrient requirements for maintenance of a mature bull are outlined in Table 1.

Bulls do not require as frequent observation as other groups of cattle in the herd but should be separated to maintain a definite breeding and calving season. Herd bulls should be maintained in a lot that would provide for ample exercise and fed to maintain a thrifty condition. A breeding soundness exam should be given before breeding season starts to eliminate potential problem breeders.

Table 2. Cattle Inventory and Winter Feeding Plan

	A	B			C	D ¹			E ²		
	Number of Head	Est. Feed/Animal/Day			Days in Winter	Est. Feed/Animal/Winter			Total Feed Needs for Winter (AxD)		
		Hay (lb)	Grain (lb)	Protein Sup. (lb)		Hay (Tons)	Grain (lb)	Suppl (lb)	Hay (Tons)	Grain (lb)	Suppl (lb)
<u>Example</u>											
Cows 10 to 12 mo. since calving	30	25	1	---	120	1.5	120		45	3,600	
Cows 10 to 12 mo. since calving		25	1	---							
Mature Cows 1 to 3 mo. since calving		24	3	---							
Weanling Replacement Heifers		9	3.5	1							
Pregnant Replacement Heifers		21	2.5	---							
Two-Year-Old Lactating Heifers		19	5.5	1							
Backgrounding Steers 400-600 lb		10	3.5	1							
Mature Herd Sires		43	---	---							

¹ Calculated by multiplying column B by column C.

² Calculated by multiplying column A by column D.

³ Add estimated storage and feeding losses to total hay needs to determine adjusted total hay needs. (For example, if losses are expected to be 15 percent, multiply total hay needs (tons) x 1.15).

Total Hay Needs (Tons) _____

Adjusted Total Hay Needs (Tons)³ _____

Grain Needs (lb) _____

Supplement Needs (lb) _____

Determining Total Winter Feed Needs

Determining the winter feed needs and inventorying the quality and quantity of feed available are also important parts of group feeding. Obviously the cattle producer can utilize a wide variety of feeds in a winter feeding program due to the different nutrient requirements of the various groups of cattle. In general, the highest quality feed should be fed to cows and first-calf heifers nursing calves, and also to young growing cattle. Lower quality feed should be fed to dry, mature pregnant cows and herd bulls.

Feed quality is best determined by a chemical forage analysis. The local Extension agent should be able to provide sampling assistance for a forage analysis.

Once quality has been determined, Table 2 can be used to estimate total quantity needs. Total winter feed needs are highly dependent on the quality of forage available for the herd. The hay illustrated in Table 2 is assumed to be 9% crude protein and 52% TDN on a dry-matter basis. An example of the feed needs of 30 dry cows is shown in the first row of Table 2. A feeding period of 120 days was used to calculate the feed amounts in column D (column B x 120).

Total feed needs for each group of cattle (column E) are calculated by multiplying column A by column D. Summing column E will give total winter feed needs for the herd. The hay needs should be adjusted upward due to losses which occur during storage and feeding. These losses could easily be 20 to 30 percent or more, unless recommended storage and feeding practices are used to prevent excessive losses.

Summary

Considerable variation exists in the amount of nutrients and quality of winter feed required by the different classes of cattle in a beef herd. A much more efficient and economical job can be done if the cattle are sorted into groups of uniform nutritional and management needs. Failure to do this can result in over and underfeeding of cattle and a wasting of feed dollars.

The original manuscript on "Grouping the Commercial Beef Herd for Winter Feeding" was written by John Thomas Johns, Assistant Extension Professor, University of Kentucky, and James B. Neel, Assistant Professor, Animal Science/Extension - Beef, University of Tennessee. The original manuscript was updated with 1996 NRC nutrient requirement guidelines and adapted for Arkansas producers.