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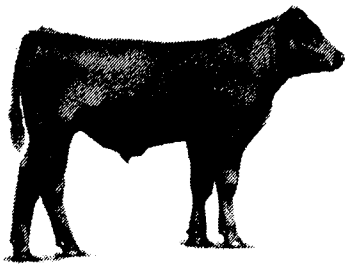

Beef Cattle Management Update

BALANCING GRAZING AND HARVESTED FORAGE IN BEEF COW/CALF HERDS

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INTRODUCTION

Profit in beef cow/calf herds depends on correct management decisions. Four factors determine the bottom line in cow/calf herds:

- Percentage of calf crop weaned or marketed
- Weight of calves at weaning or sale
- Price received for calves
- Cost of production

When considering adoption of a management practice, the goal of producers should be to improve the profitability and efficiency of the entire farming or ranching enterprise, rather than to increase animal production. In some cases, increasing animal performance is the proper choice, in others, cutting costs, while maintaining performance would be appropriate. Proper forage management is a key to profitability for cowherds in Minnesota.

IMPORTANCE OF PROPER NUTRITION

Reproductive rate is the most important animal performance factor in determining profitability. Proper nutrition is critical to reproductive success. This does not necessarily mean supplying a lot of expensive feed, many herds in the state achieve remarkable levels of reproductive efficiency without ever seeing a bite of grain or silage. Timing of feed supplementation can be more important than how much feed is supplied. Feed should be offered in order to meet the needs of breeding females at the most critical times. At other times feed costs can be conserved through use of low cost feedstuffs. In addition to minimizing cost, a nutrition program for the breeding herd should have these goals: to make use of available feed and grazing resources, to have cows in the proper condition at calving time, to have cows in positive energy balance as soon as possible after calving, and to develop heifers to the proper

weight before breeding. To best describe cow nutrient requirements, divide the beef cow year, based on production and nutrient needs. Following is a description of the cow year, with the day of calving as the first of the year:

Period (days)	Description	Nutrient needs
Period 1 = day 1-80	Post-calving	High
Period 2 = day 81-205	Pg and lactating	Moderate to high
Period 3 = day 206-315	Mid-gestation	Low
Period 4 = day 316-365	Pre-calving	Moderate

Table 1 describes the nutrient requirements of the cow during each of the four periods. Periods 1 and 4, from 50 days prior to calving to 80 days post-calving, are the most critical. Too little energy during Period 4 (50 days prior to calving) will reduce the percentage of cows cycling by the start of the breeding season. Cows will cycle and become pregnant eventually even if pre-calving energy levels are low, however, calves will be born late and an annual calving cycle will not be maintained, since cows must become pregnant within 80 days of calving in order to have an annual calving cycle.

Insufficient energy during period 1 will result in cows that cycle but fail to become pregnant when serviced. This is especially critical in cows that are in moderate or thin condition when they calve. Cows that have higher levels of body fat reserves at calving will rebreed well even if post-calving nutrition is less than ideal.

Proper development of replacement heifers is critical as well. Heifers should be weighed at weaning, and again at yearling and their diets adjusted so that they attain 65 to 70% of their mature weight by the start of the breeding season and 85% of mature weight at first calving (Table 2). Table 3 describes a study in which Angus heifers were fed to weigh either 600 or 700 lb at breeding. In this study, investing $22 more in feed during the first winter paid substantial dividends in subsequent productivity. In this example, both hay and grain were used to produce the added weight gain. In Minnesota, high quality forage can be produced and adequate weight gain obtained without grain feeding.

Failure to meet nutrient requirements of the cow will result in cows that are not cycling soon enough to maintain an annual calving pattern, or are cycling but fail to become pregnant when bred. Failure to meet the needs of replacement heifers can cause similar problems and can also result in heifers that are too small at calving time, which will lead to calving difficulty, poor calves, and rebreeding problems.

BALANCING FEED COST WITH REPRODUCTIVE PERFORMANCE

Achieving reproductive success does not necessarily mean supplying a lot of expensive supplemental feed to beef cows. It is possible to meet nutrient needs of the cowherd while maintaining a low cost of production. Timing of feed supplementation can be more important than how much feed is supplied. Feed should be offered in order to meet the needs of breeding females at the most critical times, periods 1 and 4 above. At other times feed costs can be conserved through use of low cost feedstuffs.

A summary of high vs low cost producers in the Nebraska Integrated Resource Management (IRM) program offers insight as to the importance of lowering costs, especially feed costs (Table 4). Low cost producers required $88.74 less per calf weaned, yet weaned heavier calves than high cost producers. This resulted in a $.20 reduction in cost per pound of calf produced.

Low cost producers had $44.92 less feed cost per cow than high cost producers, more than half of the total difference in cost of production between the two groups. Of this, $41.40, or 92%, was in the cost of harvested feedstuffs. As stated before, a dry cow in mid-gestation can be fed low cost feedstuffs and maintained quite cheaply, while still meeting her nutrient requirements, which are low during that period.

One of the keys to minimizing harvested feed cost is maximum use of crop residues. Producers in most areas of Minnesota have access to corn stalk residue or straw from small grains. Crop residues, especially corn stalks can be grazed at minimal cost. Producers who do not have stalk residue should consider leasing it from neighbors. If hay is priced at $40 to 80/T, a fair price for leased stalks would be $9 to 16/cow/month. Stalks can also be harvested as stacks or large, round bales, making further use of haying equipment. Harvested stalks are worth $18 to 37/T of DM. Corn stalks are listed at 55% TDN (NRC, 1984), however, whole or partial ears and small piles of grain may be present in the field, resulting in substantially greater energy content, at least for the first few weeks of grazing.

Straw from small grains, can be ammoniated to produce a relatively cheap feed that is equal in feeding value to medium quality hay. If cows are in adequate condition, feedstuffs such as corn stalks or ammoniated straw should be considered during late fall and early winter, thin cows may require higher quality feed.

Because of lower maintenance requirements, weight gain may be easier to put on in mid-gestation than in late gestation. As a rule of thumb, if weight gain is desired in mid-gestation, increasing quantities of good quality forage may be adequate. On the other hand, if weight gain in late gestation is desired, grain silage will probably be required.

Properly managing body fat and protein reserves is an important task for producers. Cow/calf producers should become familiar with the nine point condition scoring system that has been developed. Assessing condition scores twice annually will allow cattle to be sorted into groups that need to gain, lose or maintain weight. Table 5 describes the mobilizable energy reserves of cows, based on their condition score.

When considering any purchased feedstuffs, cost per pound of energy (TDN) should be evaluated in order to make purchase decisions. Be aware that many by-product feeds have extremely low DM content, some are so low that even if they are free, the transportation cost may be too high for them to be the proper choice. Tables 6 and 7 offer examples of pricing feedstuffs.

A further means to reduce feed cost/cow is to feed Rumensin, an ionophore which was recently approved for use in breeding females. Rumensin alters the microbial population of

the rumen to allow more efficient use of feed. Use of Rumensin can reduce cow costs and can increase growth in replacement heifers, which will cause them to cycle earlier. Some guidelines:

Suggested feeding level: 200 mg/head/day or
400 mg/head/every other day

Heifers will gain 0.2 lb/day faster and cycle 13-14 days earlier.
Cost, including carrier = $22.50 for 200 days.

Cows will reduce intake of medium or higher quality forage by 6-10%.

Do not use with poor quality forage.

Rumensin should only be used with medium or high quality forage since use may limit intake of poor quality severely enough that nutrient needs of the cow cannot be met.

This paper deals primarily with energy as a nutrient. Producers should be careful to consider all nutrients when formulating diets. Since the protein requirement of a cow in mid-gestation is quite low, most maintenance diets require little protein supplementation. All protein sources should be evaluated on a cost/lb of protein basis
when purchase decisions are made. Proper vitamin and mineral nutrition of the cow herd are critical to success.

EXTENDING THE GRAZING SEASON

A typical grazing season in northern Minnesota should last from May 2 until October 10 (142 days or 4.73 months), but many producers have shorter seasons. Producers who are not grazing for that length of time can reduce supplemental feed cost by extending the grazing season. In a herd of approximately 65 cows, beginning the grazing season earlier, or extending into the fall, saves one ton of hay per day of additional grazing.

Proper forage species selection and optimal use of fertilizer can be used to extend grazing seasons. June application of 100 lb of nitrogen to continuously grazed Kentucky bluegrass pastures increased carrying capacity by 59% (4.3 vs 2.7 AUM/acre). Application of an additional 100 lb of nitrogen in August resulted in a further 40% increase (6.0 vs 4.3). Whether native pastures are fertilized or not, legumes provide a mid-season complement. Legumes production peaks in July and August, but legumes have only 70-90 day grazing duration (June 5 through August 31 for alfalfa, June 20 through August 31 for birdsfoot trefoil). Native pasture (Kentucky bluegrass) can then be grazed through the fall. If birdsfoot trefoil, which is non-bloating, but difficult to establish and should not be grazed until late June, is the legume of choice, June nitrogen application to native pasture is essential.

A common improved pasture system involves introduction of only one species of grass, such as reed canarygrass. While simple to plan and manage, single species pasture systems probably will not extend the grazing season, compared to native pasture. Fertilization of reed canarygrass will reduce acreage required. The following system is designed to provide

carrying capacity for a 50 cow herd, including calves, bulls and replacement heifers.

Reed canarygrass

graze 128 days (May 25-Sept 30): 276 AUM needed

N fertilization	AUM/acre	Acres required
0	2.9	95
April 100 lb	4.9	56
April 100 lb, June 100 lb average management	6.4	43
April 100 lb, June 100 lb ideal management	8.6	32

Separate pastures containing orchardgrass or tall fescue can be used for maximum fall grazing and provide a good complement for legume or legume grass pastures. The high production obtained from fertilized orchardgrass pastures can reduce acreage required. Following are two examples of pasture systems that provide good season-long grazing for 50 cow herds.

System 1. Kentucky bluegrass/birdsfoot trefoil

		Acres
Kentucky bluegrass		
June: 100 lb N	2.0 AUM/acre	96
graze 25 d (May 20-June 16)	50 AUM needed	
graze 58 d (Aug 28-Oct 1)	143 AUM needed	
Birdsfoot trefoil		
	4.3 AUM/acre	35
graze 71 d (June 17-Aug 27)	151 AUM needed	
Total: 131 days (May 20-Oct 1)		131

System 2. Orchardgrass/alfalfa-grass

Orchardgrass		
April: 100 lb N	7.3 AUM/acre	19
June: 100 lb N		
graze 10 d (May 20-June 1)	20 AUM needed	
cut for hay (June 20-25)	33 extra AUM	
graze 48 d (Sept 1-Oct 18)	118 AUM needed	
Alfalfa-grass	4.5 AUM/acre	42
graze 90 d (June 2-Aug 31)	190 AUM needed	
Total: 148 days (May 20-Oct 18)		61

In this system, cutting fully headed orchardgrass for hay prevents later reproductive performance from the grass. Thus, late fall growth is all vegetative and nutrient quality is excellent.

SUMMARY

Reducing feed cost, while still meeting the nutrient needs of the cowherd, is a key to improving profit in beef cow/calf herds. Reducing the cost of harvested feedstuffs should be a goal of all producers. Extending the grazing season, making use of crop residues, building body energy reserves during periods of reduced maintenance requirements, developing replacement heifers to the proper weight and purchasing least cost feedstuffs when necessary will improve profit.

Table 1. NRC NUTRIENT REQUIREMENTS FOR 1100 LB COW (15 lb of milk production)

	Period			
	1	2	3	4
TDN, lb/d	13.3	11.5	9.5	11.2
Protein, lb/d	2.3	1.9	1.4	1.6
Calcium, g/d	33	27	17	25
Phosphorus, g/d	24	22	17	20
Vitamin A, 1000 IU/d	9	36	25	27

NRC, 1984.

Table 2. RECOMMENDED WEIGHT OF REPLACEMENT HEIFERS AT BREEDING AND FIRST CALVING, BY EXPECTED MATURE WEIGHT

Expected mature weight	Weight at breeding	Weight at first calving
900	585	765
1000	650	850
1100	715	935
1200	780	1020
1300	845	1105
1400	910	1190

Table 3. HEIFER WEIGHT AT BREEDING AND PRODUCTIVITY

Item	Weight at breeding, lb 600	700	Difference
First winter feed cost, $	100	122	+$22
Pregnant as yearlings, %	58	79	+21%
Calving in 60 days, %	63	87	+24%
Calf wean. wt, lb	360	388	+28 lb
Lb weaned/hfr exposed	206	304	+98 lb
Pregnant as wet 2's, %	72	92	+20%

Hay price = $50/t, corn = $2.55/bu.

Table 4. HIGH vs LOW COST PRODUCERS, NEBRASKA

Item	Low cost producers	High Cost producers
Feed costs, $/calf weaned		
Alfalfa hay	25.75	51.58
Other hay	33.07	31.69
Silage	1.86	18.81
Total harvested	60.68	102.08
Other	92.76	96.28
Total	153.44	198.36
Total costs, $/calf weaned		
Total feed costs	153.44	198.36
Other operating	77.77	105.42
Ownership costs	135.35	151.52
Total	366.56	455.30
Summary		
Cost/calf weaned, $	366.56	455.30
Average weaning wt, lb	500	489.5
Cost, $/lb weaned	0.73	0.93

IRM cooperating herds 1990, average of 1987, 1988 data.

Table 5. WEIGHT, MOBILIZABLE FAT AND PROTEIN AND ENERGY RESERVES OF BEEF COWS, BASED ON CONDITION SCORE

CS	Description	Wt, kg	Mobil fat, kg	Mobil pro, kg	Reserve energy, Mcal
1	Emaciated	382.0	0.0	0.0	0.0
2	Poor	416.0	12.8	4.2	142.2
3	Thin	451.9	30.2	9.2	331.0
4	Borderline	491.1	53.1	15.0	576.1
5	Moderate	533.2	82.5	21.8	887.4
6	Hi moderate	556.7	108.2	22.7	1136.7
7	Good	579.6	136.0	23.7	1404.8
8	Fat	603.1	166.0	24.6	1694.4
9	Extremely fat	626.5	198.2	25.6	2004.8

Adapted from Fox et al. (1988).
Example is a frame score 5 cow, mature weight, 533.2 kg at CS 5.

Table 6. PRICING FEEDSTUFFS BASED ON ENERGY (TDN) CONTENT

Feedstuff	Price, $/T	DM, %	Cost/T of DM	TDN, % in DM	Cost/T of TDN
Corn grain	70	85	82.35	91	90.50
Corn grain	90	85	105.88	91	116.35
Corn grain	110	85	129.41	91	142.21
Corn silage	18	32	56.25	70	80.36
Corn silage	24	32	75.00	70	107.14
Oats	120	88	136.36	75	181.82
Barley	85	88	96.59	83	116.37
Wheat	110	88	125.00	90	138.89
Corn screenings	80	85	94.12	80	117.65
Corn screenings	60	85	70.59	80	88.24
Grain dust	65	88	73.86	80	92.33
Alfalfa hay	80	88	90.91	58	156.74
Alfalfa hay	100	88	113.64	58	195.92
Grass hay	30	88	34.09	45	75.76
Grass hay	40	88	45.45	54	84.18
Wheat straw	50	88	56.82	43	132.14
Potato waste	16	20	80.00	78	102.56

Table 7. COST OF ENERGY (TDN) IN HAY AND CORN

Price	TDN cost, cents/lb	Energy-equivalent value of other feedstuff
Legume-grass hay, $/T	Hay	Corn, $/bu
20	2.1	0.91
40	4.1	1.78
60	6.2	2.69
80	8.3	3.57
100	10.3	4.46
120	12.4	5.37
Whole corn, $/bu	Corn	Hay, $/T
1.50	3.5	33.52
2.00	4.6	44.53
2.50	5.8	6.14
3.00	6.9	66.79
3.50	8.1	78.41
4.00	9.2	89.06

Assumptions: hay = 88% DM, 55% TDN in DM; corn = 85% DM, 91% TDN in DM.