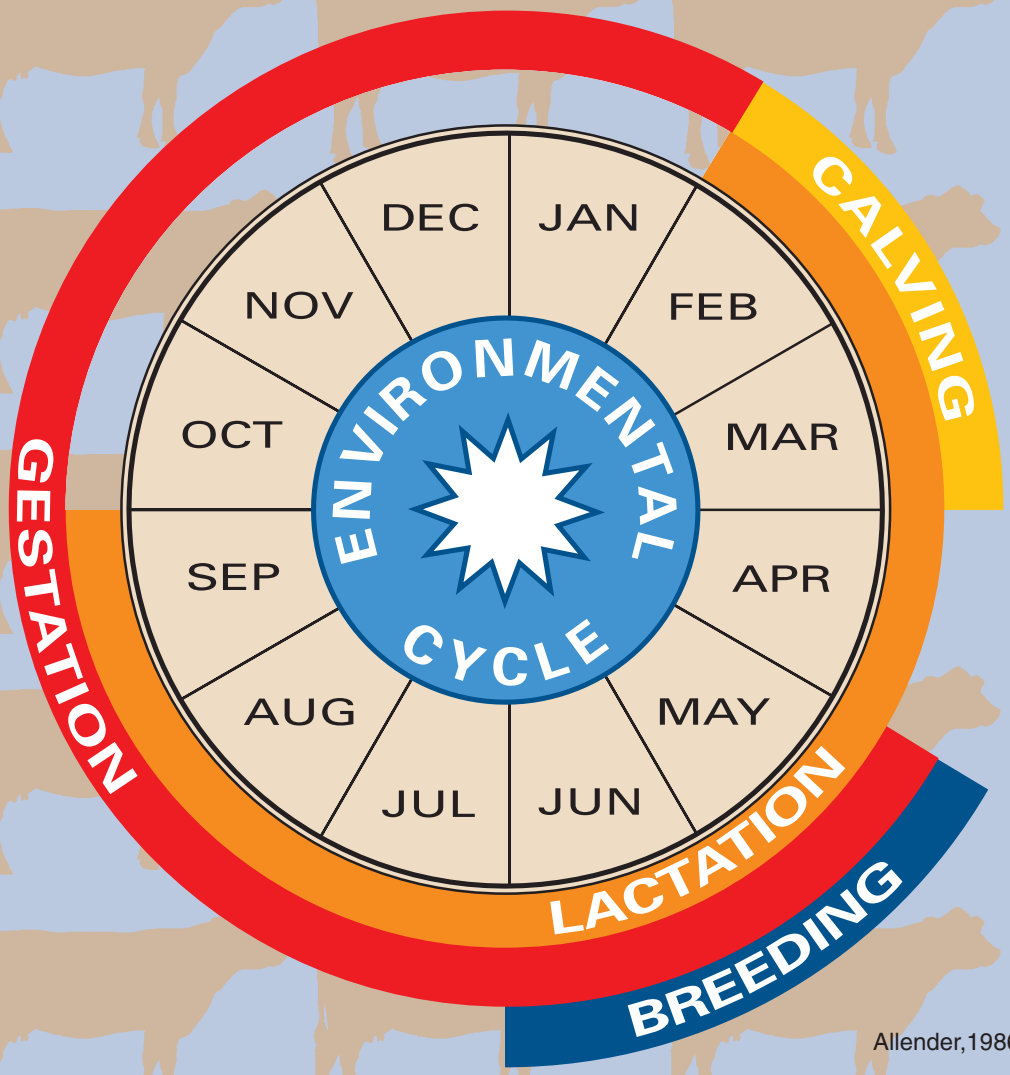
Body Condition

The Beef Cow's Energy Gauge

A Productive Beef Cow Must:

- Deliver a live calf.
- Promptly return to estrus after calving.
- Conceive early in the breeding season.
- Wean an above average calf.
- Nourish a developing fetus.

COWHERD PRODUCTION CYCLE



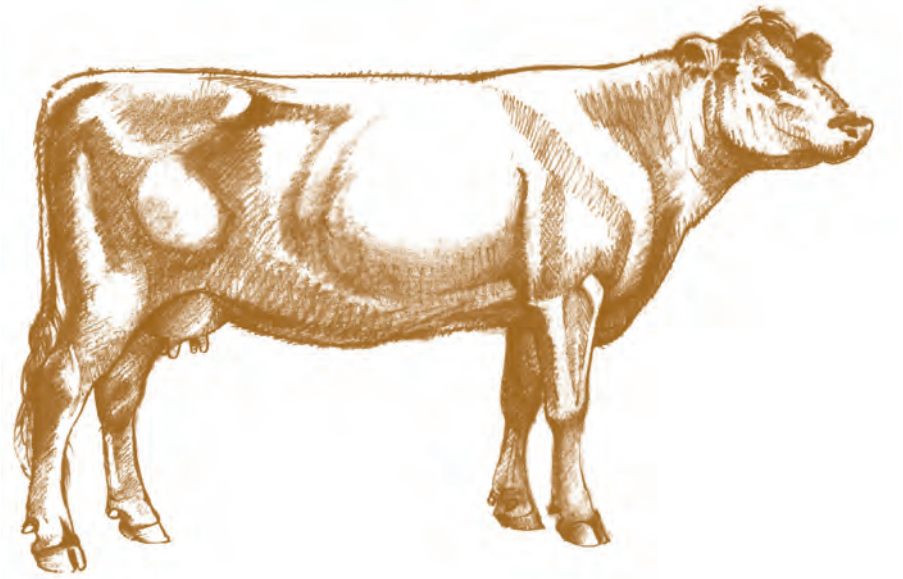
Allender,1986

SLIGHTLY
BELOW
OPTIMAL BODY CONDITION

BODY CONDITION 4

- Foreribs are not noticeable.
- 12th and 13th ribs can be distinguished, particularly in cows with big spring and width between ribs.
- The backbone can be identified but feels rounded rather than sharp.

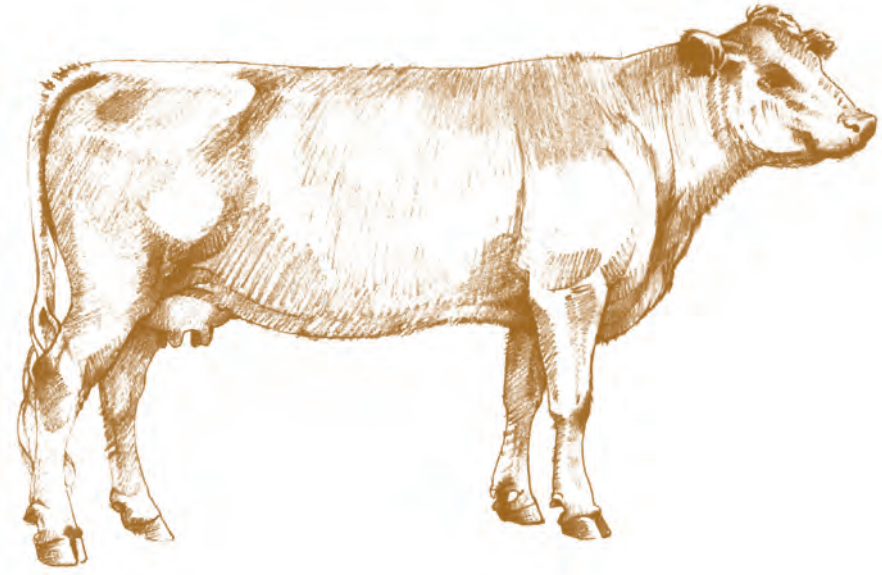
OPTIMAL
BODY CONDITION



BODY CONDITION 5

- 12th and 13th ribs are not visible to the eye (unless animal has been shrunk).
- The backbone can only be felt with firm pressure, but is not noticeable to the eye.
- Areas on each side of the tail head are well filled but not mounded.

SLIGHTLY
ABOVE
OPTIMAL BODY CONDITION



BODY CONDITION 6

- Ribs are fully covered and are not noticeable to the eye.
- Hindquarters are plump and full.
- Noticeable sponginess over the foreribs and on each side of the tail head.

Body Condition Scoring

A Management Tool for Monitoring the Nutritional Status of Beef Cows

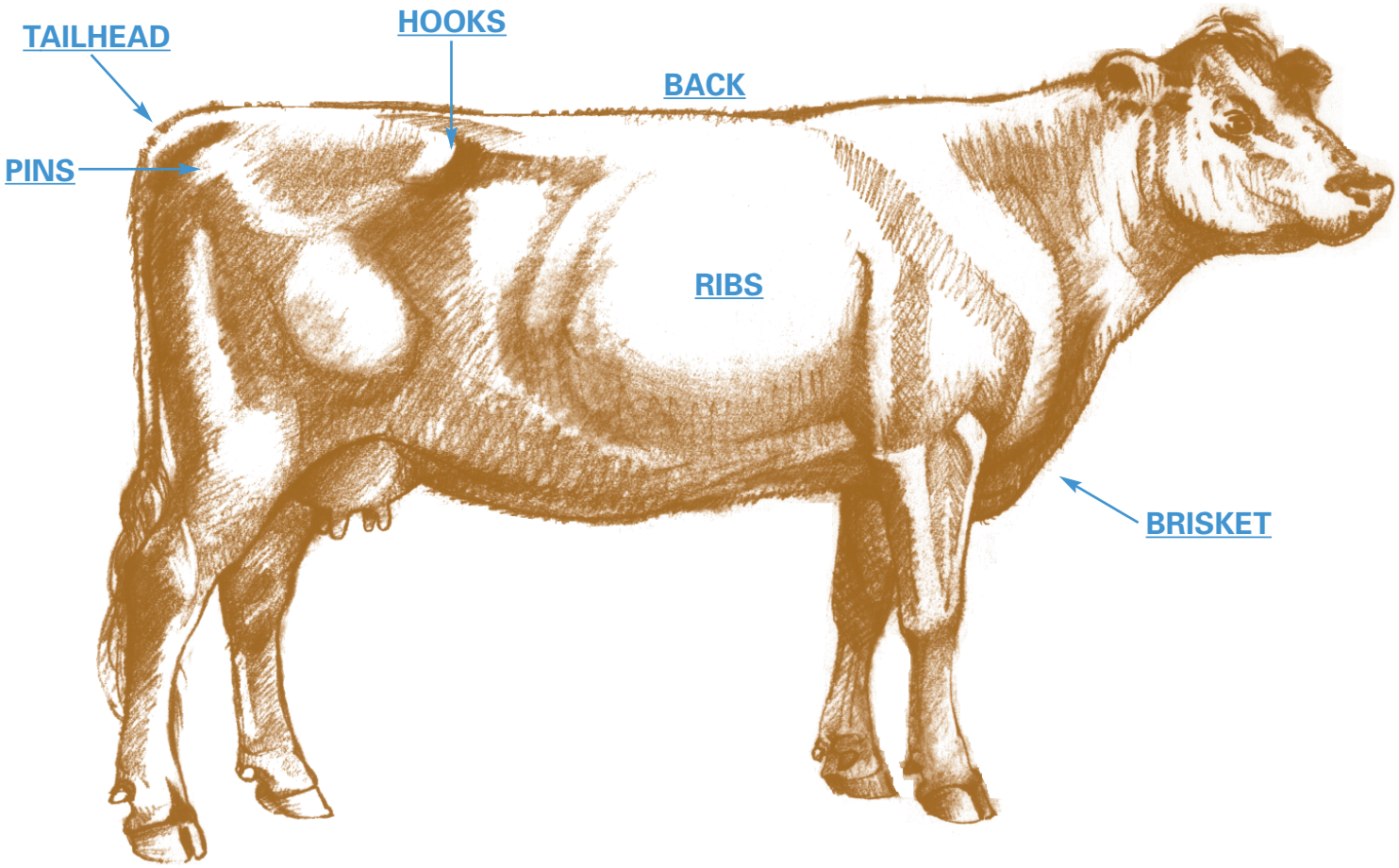
Factors Affecting the Profitability of a Beef Cattle Operation

- Annual cost of maintaining the cow
- Calf weaning weights
- Percent of cows weaning calves
- Price of calves

Research and economic studies show that well-formulated diets and efficient use of forage reduces feed cost. A management tool used by many producers, university personnel, industry representatives and veterinarians to monitor the effectiveness of nutritional programs is body condition scoring (BCS). The concept is not new. BCS simply puts a quantitative score on a procedure many cow/calf producers have followed for years when determining the body fat reserves of their cows. BCS allows the producer to be more exact in the description of their cows and provides a standardized tool for the beef industry to use when monitoring the energy reserves of the beef cowherd.

BCS also allows producers to sort cows according to nutritional needs, thereby improving the efficiency of their nutrition programs. This is possible because of the strong linkage between body condition and weight change. Thus, as BCS decreases or increases, corresponding weight changes will occur.

Dale A. Blasi, Ph.D., Kansas State University
David Dukart, Elanco Animal Health
Connee Quinn, Ph.D., Elanco Animal Health



Description of Body Condition Scoring (BCS)

Body Condition Score

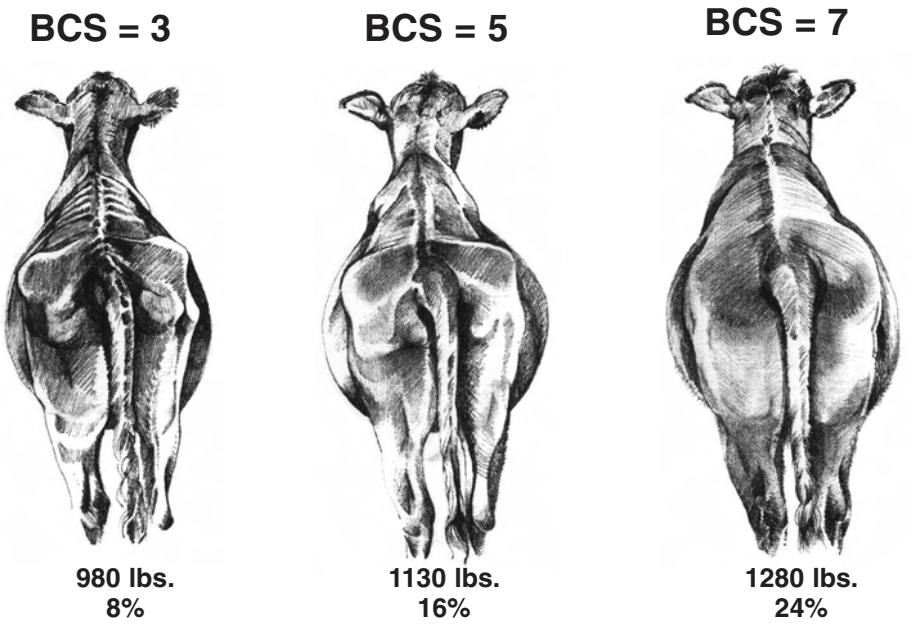
	1	Severely emaciated. Bone structure of shoulder, ribs, back, hooks and pins is sharp to the touch and easily visible. Little evidence of fat deposits or muscling.
	2	Emaciated. Little evidence of fat deposition but some muscling in the hindquarters. The backbone feels sharp to the touch.
CAUTION	3	Very thin, no fat on ribs or brisket, and some muscle still visible. Backbone easily visible.
	4	Thin, with ribs easily visible but shoulders and hindquarters still showing fair muscling. Backbone visible.
	5	Moderate to thin. Last two or three ribs can not be seen unless animal has been shrunk. Little evidence of fat in brisket, over ribs or around tailhead.
	6	Good smooth appearance throughout. Some fat deposits in brisket and over tailhead. Ribs covered and back appears rounded.
CAUTION	7	Very good flesh, brisket full. Fat cover is thick and spongy and patchiness is likely. Ribs very smooth.
	8	Obese, back very square, brisket distended, heavy fat pockets around tailhead. Square appearance.
	9	Rarely observed. Very obese. Animal's mobility may actually be impaired by excessive fat.

Spitzer, 1986

Adequate Nutrition is Required Before Reproduction is Possible

Priorities of Nutrient Allocation:

- Maintenance
- Lactation
- Growth
- Reproduction



Herd & Sprott, 1986

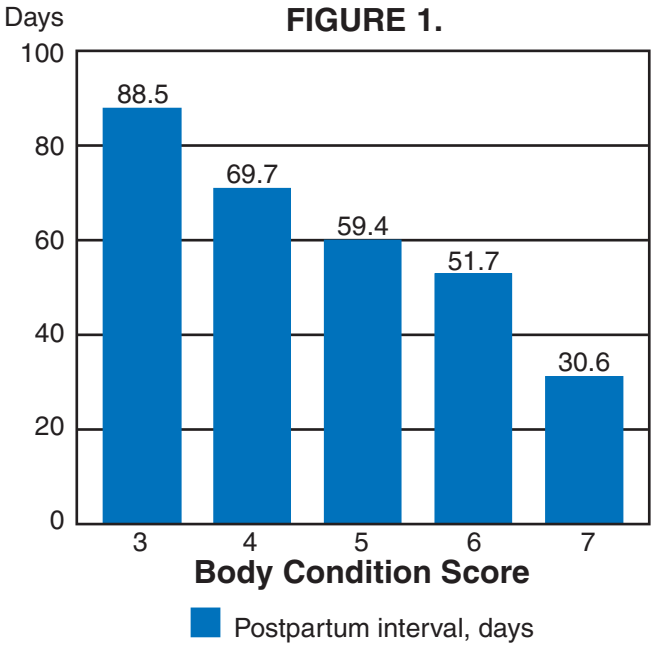
Reproductive Efficiency—Linked to Body Condition Scores

Nature dictates a specific priority for the utilization of nutrients by the beef cow: body maintenance comes first, followed by lactation and growth (in young cows), with reproduction last. In many ways, reproduction is truly a luxury trait that occurs only during periods of nutrient adequacy. During times of nutrient deprivation, which can occur as a consequence of inadequate feeding level and/or harsh environmental conditions, reproductive performance is the first to suffer and the last to recover.

The clearly defined relationship of body condition score on reproductive performance is illustrated in results obtained from Purdue University, Oklahoma State University and the Padlock Ranch. At calving, thinner cows experience a longer period of time from calving to rebreeding (post-partum interval) compared to adequately conditioned or fleshy cows (Figure 1; Houghton et al., 1986). Selk et al. (1986) clearly demonstrated the negative impact of thin body condition at calving on pregnancy rate unless there was sufficient time to recover lost body tissue stores (Figure 2). These data are in agreement with actual ranch records collected at the Padlock Ranch (Table 1).

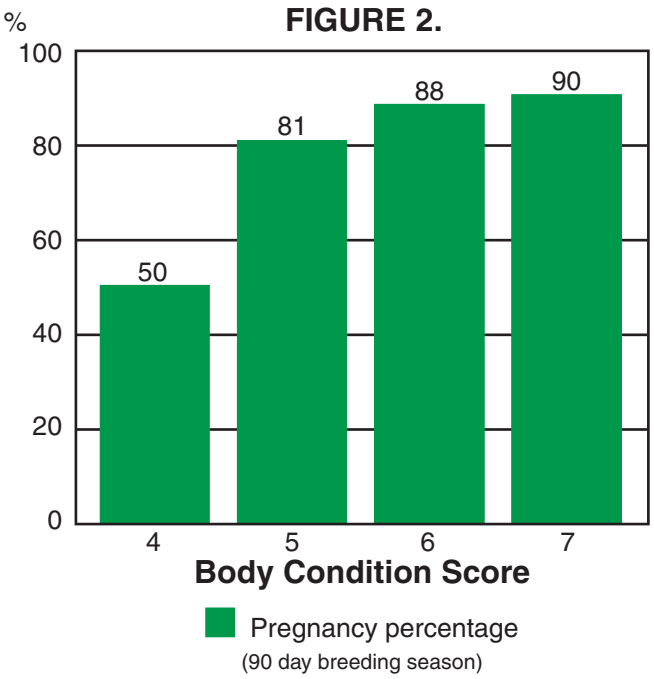
Effect of Body Condition Score at Calving on Postpartum Interval and Pregnancy Percentage

FIGURE 1.



Houghton et al., 1986. Purdue University

FIGURE 2.

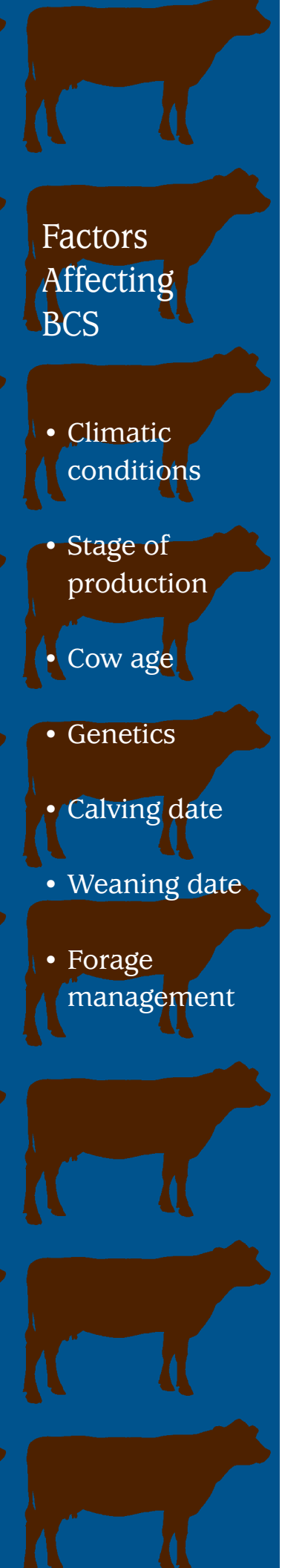


Selk et al., 1986. Oklahoma State University

TABLE 1.
Relationship of Body Condition Score at Weaning and Pregnancy Rate

	Body Condition Score				
	<3	4	5	6	>6
Total Cattle	3,415	23,811	37,970	26,213	9,654
% of Herd	3.4	23.6	37.6	25.9	9.5
% Pregnant	75.7	85.4	93.8	95.6	95.6

Cherni, 1995: Padlock Ranch — Dayton, WY.
9 year summary (1986 - 1994), 101,063 total observations.



Factors Affecting BCS

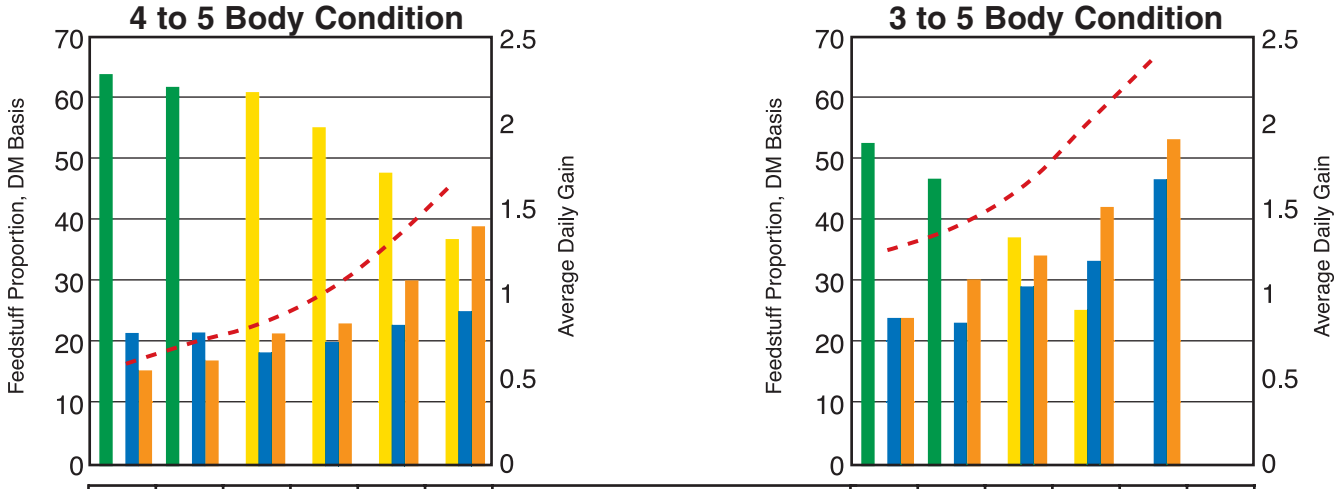
- Climatic conditions
- Stage of production
- Cow age
- Genetics
- Calving date
- Weaning date
- Forage management

How to Utilize Body Condition Scores at Various Stages of Production

PRODUCTION PERIOD	MANAGEMENT
Late lactation (2 months prior to weaning)	Depending upon current forage availability, supplementation and/or a modified weaning strategy may be necessary. Wean thin cows, especially thin, young and older cows.
Weaning	Pay particular attention to young cows weaning their first calf and cows beyond their prime age; they are most likely to be thin at this time.
100 days before calving	Last opportunity to gain body condition. This would be a good time to separate thin cows from cows in good condition and increase feed to thin cows.
Calving	If cows are thin, a change in the feeding program is needed. It is expensive to increase condition on thin cows after calving
Breeding season	If cows are thin at this time, additional supplementation and/or implementation of an early weaning strategy may be necessary.

Failure to monitor body condition prior to key production periods can potentially be disastrous to cowherd productivity. Table 2 illustrates the importance of knowing the condition score of your cows and taking action far enough in advance of calving to best utilize your forage resources. Waiting too long to improve body condition can be cost prohibitive and, in some cases, impossible.

TABLE 2.
Effect of Days to Calving on Proportions of Feedstuffs Necessary to Achieve Desired Daily Gain for an 1100 lb. Pregnant Cow



% of Ration	120	105	90	75	60	45	Days to calving	120	105	90	75	60	45
	64.00	62.00					Low quality forage	52.00	47.00				
			61.00	55.00	48.00	37.00	Medium quality forage			37.00	25.00		Not Possible
	21.00	21.00	18.00	20.00	22.00	25.00	Grain	24.00	23.00	29.00	33.00	47.00	
	15.00	17.00	21.00	25.00	30.00	39.00	Wheat middlings	24.00	30.00	34.00	42.00	53.00	
	0.62	0.71	0.82	0.98	1.23	1.63	Desired daily gain lb/day	1.24	1.40	1.63	1.96	2.44	

Adapted from Buskirk et al., 1992.

As illustrated above, a ration consisting of 48% medium quality forage, 22% grain and 30% wheat middlings would be necessary to produce a daily gain of 1.23 lb/day to improve body condition from a 4 to a 5, sixty days before calving.

Cows in a BCS of 5 or Better at Calving will:

- Better withstand adverse environmental conditions
- Realize higher calf survival rates
- Conceive 90 days or less after calving

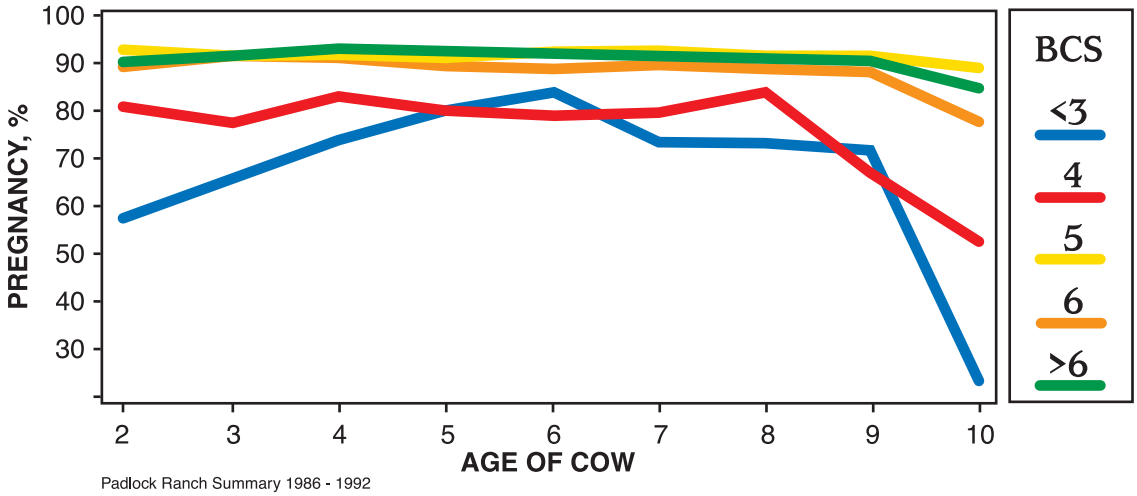
Management Strategies to Alter Body Condition

- Sort cows and heifers by age and nutritional requirements and feed accordingly prior to important productivity periods.
- Develop a calving season which is consistent with forage resources, labor resources and marketing targets.
- Select for production that fits your environment.
- Control parasites and diseases.

FIGURE 3.

A Strong Case for Herd Sorting

The Effects of BCS and Cow Age on Pregnancy Rate



Padlock Ranch Summary 1986 - 1992
Cherni, 1993

Figure 3 illustrates:

- Pregnancy rates of younger and older cows are impacted to a greater extent than prime-aged cows (4 to 8 years of age) at similar body condition scores.
- Regardless of age, cows in a body condition score of 5 or greater at calving have an excellent chance of becoming pregnant.

Feeding Strategies to Alter Body Condition

- Identify forage supply by quantity and quality.
- Submit forages for nutrient analysis determination.
- Save best feed for young or thin older cows.
- Feed lower quality forages to prime age, good condition cows.
- Allow sufficient time for realistic gains to avoid problems.

Economic Benefits of Feeding Beef Cows By Body Condition

The following example (based on industry and research findings) was developed to illustrate the economic advantages of sorting and feeding cattle by body condition score. The following assumptions were made:

1. Cow herd age distribution (per 100 cows) based on North Dakota State University CHAPS records (Helmuth, 1995; 1987-1991).
   A. 63 head or 63% are prime aged cows averaging body condition 5 (Good).
   B. 37 head or 37% (32 young and 5 old cows) averaging body condition 4 (Thin).
2. Dormant native grass, prairie hay, grain and 38% commercial protein supplement are feed sources used.
3. Moderate calving weather.

	Feed as One Group **Feed the entire herd as one group** 100 days prior to calving with the primary goal of targeting the feeding level to maintain BCS 5 despite the fact 37 head are BCS 4.		**Split Feed** **Split the herd based on body condition score and feed differently** 100 days prior to calving. Feed the 63 head of prime-aged females to maintain body condition 5 and feed the remaining 37 head (32 head young and 5 head older cows) to improve one BCS (body condition score 4 to 5).		
	Body Condition		**Body Condition**		
Item	**Thin**	**Good**	**Thin**	**Good**	**Dollars Difference**
Year 1					
100 day pre-calving BCS	4	5	4	5	
Calving body condition	4	5	5	5	
Number cows/age group	37	63	37	63	
Feed Cost (100 days)	**$6,739**		**$7,364**		**($625)**
Additional labor required			**50 hours**		**($400)**[a]
Calf survivability rate, %	92%	97%	97%	97%	
Total weaned calves	**95**		**97**		**$770**[b]
Year 2					
Estimated pregnancy %	80%	95%	95%	95%	
Total Number Pregnant Cows	**90**		**95**		**$1000**[c]
Additional weaning weight			**879 lbs.**		**$483**[d]
Net return per 100 cows					**$1228**
Net return per thin cow					**$33.19**

[a] An additional half hour labor per day @ $8/hour (includes benefits).
[b] 550 lb. calf sold @ $70/cwt.
[c] Market premium for pregnant vs. open cows $200/pregnancy.
[d] 35 calves born 10 days earlier x 2.5 lbs. weight/day of age @ $55/cwt.

In this example, feeding cows in two separate groups nets $1,228 more per 100 cows than group feeding. Because it is impossible to predict future environmental fluctuations, producers should split-feed by body condition to insure cows are body condition 5 by calving.

Estimating Forage Intake

Forage Intake is Affected by:

- Body weight
- Forage quality
- Stage of production
- Supplementation strategy
- Environmental conditions

Before an adequate assessment of the beef cow's supplementary energy and protein requirements can be determined, it is necessary to account for the energy and protein contributions arising from the total amount of forage she can potentially consume on a daily basis.

The amount of forage a beef cow can consume on a daily basis is driven basically by her body weight and the quality of the forage being consumed. Factors which increase forage intake include physiological status (pregnancy and lactation), managerial actions of the producer (supplementation, grinding, pelleting, ammoniation) and environmental conditions. Table 3 lists guidelines for estimating dry matter intake limits of dry, pregnant and lactating beef cows and heifers based on forage quality and supplemental regime used.

TABLE 3.
Forage Intake of Beef Cows as Affected by Stage of Production, Forage Quality and Supplement Type

Stage of production and supplementation strategy	Forage Quality		
	Low	Medium	High
Dry, pregnant cow	Intake expressed on % body weight, dry matter basis		
Unsupplemented	1.5	2.0	2.5
Protein supplementation	1.8	2.2	2.5
Energy supplementation	1.5	2.0	2.5
Lactating cow			
Unsupplemented	2.0	2.3	2.7
Protein supplementation	2.2	2.5	2.7
Energy supplementation	2.0	2.3	2.7

Adapted from Hibberd and Thrift, 1992

It may be necessary to reformulate the ration if the cow cannot, or will not, consume the amount of feed that has been calculated. Some reasons for this occurrence may be due to either nutrient inadequacies (protein and/or energy) of the diet or to heightened nutrient requirements as seen in beef cows during the earlier stages of lactation.

Substitute or Supplement?

Correcting for nutritional deficiencies in the forage and improving body condition are two primary objectives of supplementation. From an efficiency perspective, an ideal supplement should contain feed ingredients which also compliment and improve the utilization of the forage, not restrict its use.

When formulating rations, it is important to understand the potential impact that different feeds have when fed together on ruminal microbial populations and nutrient digestion. This interaction of two or more feeds is often referred to as associative effects and can be positive, negative or with no net effect on forage utilization.

TABLE 4.
Effect of Ear Corn on Performance of Cows Grazing Dormant Native Sandhills Range.

Item	2 lb 32% CP supp. 0 lb ear corn	1 lb 40% CP supp 3 lb ear corn	0 lb supp 3.5 lb ear corn
Supplement CP, lb	.56	.59	.28
Supplement TDN, lb	1.41	3.10	2.77
Initial Weight, lb	1158	1154	1164
Weight change, lb	15[a]	-40[b]	-121[c]

a,b,c means within a row with different superscripts differ (P<.05).

Rush et al., 1987.

TABLE 5.
Effect of Soybean Hull-Soybean Meal Based Supplements on Performance of Pregnant Beef Cows.

Item	Soybean hull based (20% crude protein)	Soybean meal based (40% crude protein)
Feeding rate, lb/day	6.7	3.0
Crude protein, lb/day	1.2	1.2
BCS (90 days pre-calving)	6.1	6.1
BCS (calving)	5.4[a]	5.1[b]
Birth weight, lb	84	83
Weaning weight, lb	461	452

a, b means within a row with different superscripts differ (P<.05).

Marston et al., 1992.

The results from two different research trials depict what can happen to beef cow performance when feeding an appropriate or improper supplementation program. Rush et al., (1987; Table 4) demonstrated a negative associative effect whereby ear corn supplementation substituted for intake of native pasture and meadow hay. This in turn, decreased total daily energy intake causing the largest weight loss observed. Marston et al. (1992; Table 5) illustrated a positive associative response whereby supplementation objectives were met with minimal impact on forage utilization.

Fiber Friendly Feedstuffs

When compared to grains, by-product feedstuffs such as soyhulls, wheat middlings and corn gluten feed contain less starch or energy. However, their fiber composition is highly digestible and so, the energy provided is "fiber friendly" to the forage consumed. Use of these by-products are ideal for improving body condition on a range or pasture setting because total energy intake by the beef cow or heifer can be increased at little or no expense to forage intake.

With poor quality forages (4 to 6% crude protein), producers are encouraged to exercise judicious use of grain or high-grain containing supplements (containing less than 20% crude protein) to meet energy needs so that forage utilization and cowherd performance are not negatively affected. With better quality forages (above 7% crude protein), use of grain or high-grain containing supplements can serve as a good source of supplemental energy as long as daily allotted amounts are restricted to no more than .5% of a cow's body weight (e.g. 1000 pound cow x .5% = 5 pounds of grain containing supplement).

If the result of the analysis lists a TDN value, you can convert this value to NEm and NEg by using the conversion factors listed in Table 6. For example, if your hay is calculated to contain 55% TDN, the NEm and NEg content (Mcal/lb) equals .59 and .27, respectively, as illustrated in the following calculation.

Example calculation:

NEm = (55 x 0.01318) - 0.132 = .59 Mcal/lb.
NEg = (55 x 0.01318) - 0.459 = .27 Mcal/lb.

TABLE 6

Equations for Converting Acid Detergent Fiber (ADF) Content of Forages to % TDN, NEm and NEg (Mcal/lb)

Legumes (Alfalfa), Grasses and Mixed Legume/Grass
% TDN = 88.9 - (.79 x %ADF)
NEm (Mcal/lb) = (%TDN x 0.01318) - 0.132
NEg (Mcal/lb) = (%TDN x 0.01318) - 0.459

Fiber Friendly Feedstuffs are:

- Excellent energy and protein sources
- Less harmful than grain on forage intake and digestability
- Useful supplements when fortified with protein and other nutrients

The Importance of Crude Protein

Protein supplementation offers the most practical and cost-effective means for ensuring maximum utilization of energy from low-quality feedstuffs. A crude protein deficiency can compromise ruminal fiber digestibility and passage rate, which in turn affects overall digestible dry matter intake. Depending on the quality of the grazed forage, current body condition and desired body condition, **beef cows may need to receive approximately 25 to 65% of their NRC crude protein requirement in a supplementary fashion** during late gestation and early lactation. During late pregnancy, beef cows require about 15 to 20% more crude protein than cows in mid-pregnancy. This additional protein is needed to support the increasing protein demands of the mammary gland, fetus and uterus during the last trimester of pregnancy.

Depending on the cow's age, size and level of milk production, the lactating cow may require an additional 3 to 40% more crude protein compared to a 1,150 lb. cow yielding 10 lb. milk/day during the first four months of lactation. This increase in crude protein is needed to meet ruminal ammonia and metabolizable protein needs created by several physiologic demands: maximum lactation, uterine involution, conception and early embryonic development. Most of the increased demand for crude protein during lactation is needed for milk protein synthesis. Thus, daily crude protein needs must be increased by .05 to .08 lb. for each pound of milk produced. The following table lists the daily, total crude protein requirements by cow size and stage of production.

TABLE 7.
Total Daily Crude Protein Needs by Cow Size and Stage of Production

Weight of Cow (lbs.)	Middle 1/3 Pregnancy Mature Cow	Late 1/3 Pregnancy Mature Cow	Lactating 2 yr Old Heifer	Average Milk Mature Cow	Superior Milk Mature Cow
			Pounds of Crude Protein required/day		
800	1.10	1.40	1.90	1.80	2.20
900	1.20	1.50	2.00	1.90	2.40
1000	1.30	1.60	2.10	2.00	2.50
1100	1.40	1.60		2.00	2.60
1200	1.40	1.70		2.10	2.70
1300	1.50	1.80		2.20	2.80
1400	1.60	1.90		2.30	2.90

National Research Council, 1984.

Rumensin

The Feed Additive For Reproducing Beef Cows

Investing in Rumensin Will

- Improve feed efficiency 5 to 10% in cows
- Increase the energy value of your feed
- Save you $6 to $10 per head over a 100 day period.

Rumensin has been widely used in the cattle industry since 1976 as a feed additive to improve feed efficiency. Additional claims for increasing gain in stocker cattle and replacement heifers, as well as controlling coccidiosis in confined and semi-confined cattle, have been added.

Rumensin is approved for improved feed efficiency in mature reproducing beef cows receiving supplemental feed. Rumensin improves feed utilization by altering rumen fermentation patterns, thereby altering the metabolizable energy content of feeds.

TABLE 8.
Summary of Reproductive Safety Data

	Rumensin/ mg/hd/day		
Item	0	50	200
Days on Rumensin at Calving	124	123	125
Days from Calving to Conception	93[a]	87[b]	87[b]
No. Cows Bred	99	93	100
No. Cows Conceived	90	86	97
Percent Conception	90.0	92.5	97.0

a,b Means with different superscripts are significantly different (P<.05)

4-Trial Dose Titration

The following table has been developed to provide some general guidelines for beef cows fed Rumensin under various forage quality scenarios.

TABLE 9.
Rumensin Levels Based on Forage Quality

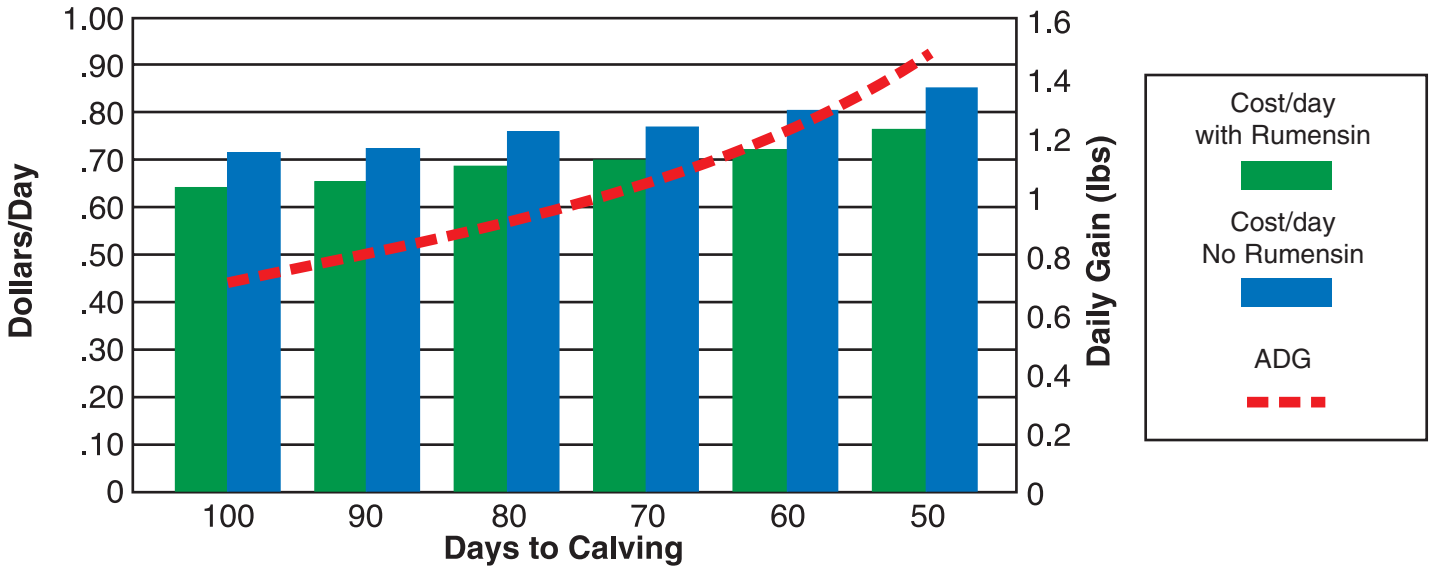
Forage Quality	TDN Value	NEm content (Mcal/lb)	NEg content (Mcal/lb)	Rumensin Mg/Hd/Day
Poor	40-42%	.28-.31	.04-.07	50
Medium	43-48%	.33-.41	.08-.16	100
High	49% or greater	>.41	>.18	150-200

When feeding cows an increased level of nutrition to increase body condition, Rumensin will improve feed efficiency. The result will be lower feed cost when compared to a ration without Rumensin. Figure 4 illustrates this point.

FIGURE 4.

Daily gain necessary to increase one condition score

1100 lb. cow, Body condition score 4 to 5



[1] Based on Prairie hay: % CP = 7, NEm and NEg (Mcal/lb) = .52 and .27, $40/ton, Grain % CP = 8, NEm and NEg (Mcal/lb) = .94 and .64, $80/ton and Protein supplement % CP = 38, NEm and NEg (Mcal/lb) = .85 and .56, $225/ton. Rumensin cost 1.4 cents/day (feeding rate = 200 mg/day).

When Rumensin is added to a cow's diet, more energy is available from a given amount of forage. When the animal's daily forage intake is limited by rumen capacity, the following occurs:

- The amount of forage consumed daily will not be altered by the addition of Rumensin, but rather remains the same as if no Rumensin were present.
- Daily energy available from this given amount of forage is increased when Rumensin is provided.
- The increase in available energy from improved fermentation profiles in the rumen would result in improved feed efficiency.
- Metabolizable and net energy values of feeds are increased when Rumensin is fed at 50-200 mg/hd/day.

Well controlled studies with beef cows show feed efficiency is improved 5-10% when Rumensin is fed at 50-200 mg/hd/day. Fox (1977) and the 1996 Nutrient Requirements of Beef Cattle review data that support the transition of improvement of gain and efficiency values to similar changes in NEg and NEm. The net energy calculations can be adjusted by 5-10% depending on Rumensin level and ration quality. For example, when 200 mg Rumensin is added to the beef cow diet, a multiplier of 1.10 can be applied to the net energy values of the ration ingredients.

Rumensin for Replacement Heifers

Years of experience and independent research have proven the advantages of bringing heifers to breeding weight as soon as possible. The earlier a heifer is bred, the sooner you'll see a return on your investment. Calves born early in the calving season gain more weight and are heavier at weaning. **Research has demonstrated that heifers which breed and calve early will have greater lifetime productivity.**

Increased daily gain from a Rumensin-fortified supplement will bring heifers to breeding weight sooner than when heifers are fed supplement without Rumensin.

TABLE 10.
Rumensin for replacement heifers: Performance and reproductive safety data.

	Control	Rumensin
Average Daily Gain, lbs	1.43	1.57
Age at First Estrus, days	421	408

10 Trial Summary, 590 Heifers, 30 Replicates.
Rumensin Tech. Manual, 1978.

Chart 1
Nutrient Requirements for Beef Cows
Average Weight of Cow

Energy Needed to Maintain BCS

MATURE COWS/YOUNG COWS/HEIFERS

Average Weight of Cow	Pregnant (80 lb Birth Weight)	Pregnant (95-100 lb Birth Weight)	Lactating (Average milk)	Lactating (Superior milk)
950	9.43	9.98	10.68	14.08
1000	9.72	10.27	10.97	14.37
1050	10.00	10.55	11.25	14.65
1100	10.28	10.83	11.53	14.93
1150	10.55	11.10	11.80	15.20
1200	10.83	11.38	12.08	15.48
1250	11.10	11.65	12.35	15.75
1300	11.36	11.91	12.61	16.01
1350	11.63	12.18	12.88	16.28
1400	11.89	12.44	13.14	16.54

Chart 2
Nutrient Requirements for Beef Cows
Days to Calving or Breeding

Energy Needed to Change BCS
MATURE COWS
BCS 3 TO 5

Days to Calving/Breeding	Current BCS	Desired BCS	Daily Gain lbs/day	NE Mcal req./day
120	3	5	1.25	2.46
110	3	5	1.36	2.69
100	3	5	1.50	2.96
90	3	5	1.67	3.28
80	3	5	1.88	3.69
70	3	5	2.14	4.22
60	3	5	2.50	4.93
50	3	5	3.00	5.91
40	3	5	3.75	7.39
30	3	5	5.00	9.85

Energy Needed to Change BCS
HEIFERS/YOUNG COWS
BCS 4 TO 6

Days to Calving/Breeding	Current BCS	Desired BCS	Daily Gain lbs/day	NE Mcal req./day
120	4	6	1.25	2.88
110	4	6	1.36	3.14
100	4	6	1.50	3.45
90	4	6	1.67	3.83
80	4	6	1.88	4.31
70	4	6	2.14	4.93
60	4	6	2.50	5.75
50	4	6	3.00	6.90
40	4	6	3.75	8.63
30	4	6	5.00	11.50

Energy Needed to Change BCS
MATURE COWS
BCS 4 TO 5

Days to Calving/Breeding	Current BCS	Desired BCS	Daily Gain lbs/day	NE Mcal req./day
120	4	5	0.63	1.33
110	4	5	0.68	1.46
100	4	5	0.75	1.60
90	4	5	0.83	1.78
80	4	5	0.94	2.00
70	4	5	1.07	2.29
60	4	5	1.25	2.67
50	4	5	1.50	3.20
40	4	5	1.88	4.00
30	4	5	2.50	5.34

Energy Needed to Change BCS
HEIFERS/YOUNG COWS
BCS 5 TO 6

Days to Calving/Breeding	Current BCS	Desired BCS	Daily Gain lbs/day	NE Mcal req./day
120	5	6	0.63	1.54
110	5	6	0.68	1.68
100	5	6	0.75	1.85
90	5	6	0.83	2.05
80	5	6	0.94	2.31
70	5	6	1.07	2.64
60	5	6	1.25	3.08
50	5	6	1.50	3.70
40	5	6	1.88	4.62
30	5	6	2.50	6.16

AI 8301 (Rev. 6/97)

NOTES:

Sample Problem: A producer has a group of mature cows that are currently body condition score 4. The cows are 100 days from calving and weigh 1117 pounds. Realizing the danger(s) of calving at a body condition score of 4, the producer must feed the cows to reach a body condition score of 5 and weigh 1192 pounds by calving. Assume birth weight will be 95 pounds, and a condition score represents 75 pounds.

COW-CULATOR™ Worksheet

Step 1 Fill in the relevant information provided by producer.

Current weight of cow = 1117 (a)
Desired weight of cow = 1192 (b)
Current body condition score = 4 (c)
Desired body condition score = 5 (d)
Days to calving or breeding = 100 (e)

Step 2 Calculate the average weight of cow.

1117 (a) + 1192 (b) = divided by 2 = 1155 (2) average weight of cow.

Step 3 Refer to page 20, Chart 1. Select the value which corresponds to (2) and the cow's stage of production. Record the appropriate Mcals/day of NEm required/day.

Mcals/day of NEm required/day = 11.10 (3)

Step 4 Refer to page 21, Chart 2. Select the value which corresponds to (c), (d), and (e). Record the appropriate Mcals/day of $NE_{\triangle}$ required/day.

Mcals/day of $NE_{\triangle}$ required/day = 1.60 (4)

Step 5 Calculate NEm and NEg content of ration using the format shown in the table below. To convert % ADF and % TDN to NEm and NEg (Mcal/lb) refer to Page 16, Table 6. Types and proportions of feedstuffs will vary with operation.

Feedstuff	% Feedstuff in Ration, DM	% DM[a] (see pg. 24 & 25)		% Crude Protein[a]	Lb Crude Protein	Feed NEm Mcal/lb[a]	Ration NEm Mcal/lb	Feed NEg Mcal/lb[a]	Ration NEg Mcal/lb
Grass Hay	85	88	x	9 =	.077	0.50 =	.425	0.25 =	.213
Supplement[b]	15	87	x	12 =	.018	0.95 =	.143	0.60 =	.090
Total	100%			Step 5a	.095	Step 5b	.568	Step 5d	.303

a % Dry Matter, % Crude Protein, NEm and NEg (Mcal/lb.) content of feedstuff obtained from NRC feed tables.
b Combination of appropriate energy and protein sources to meet requirements.
c Refer to page 19, with 200 mg/head/day the NE calculations can be adjusted by 10%.

Per lb of Ration:

	NEm Mcal/lb	NEg Mcal/lb
without Rumensin (Step 5b / Step 5d)	0.568	0.303
with Rumensin (Step 5b / Step 5d × Rumensin Multiplier[c] 1.10) × 1.10		
Step 5c / Step 5e	0.625	0.333

Step 6 Determine pounds of ration necessary to maintain cow, fetus and lactation.

Without Rumensin	With Rumensin
Step 3 11.10 ÷ Step 5b .568 = 19.54	Step 3 11.1 ÷ Step 5c .625 = 17.76

Step 7 Determine pounds of ration necessary to achieve desired daily gain.

Step 4 1.60 ÷ Step 5d .303 = 5.28	Step 4 1.6 ÷ Step 5e .333 = 4.80

Step 8 Determine total pounds of ration (DM basis) cow must consume daily to achieve results.

Total pounds of ration:

Step 6 19.54 + Step 7 5.28 = 24.82	Step 6 17.76 + Step 7 4.80 = 22.56

For Prediction of DM Consumption Refer to Page 14, Table 3.

Step 9 Determine pounds of feed in ration (DM Basis)

Step 8 24.82 × % of feed in ration = lbs of feed in ration

Grass/Hay	= 21.10	Grass/Hay	= 19.18
Supplement	= 3.72	Supplement	= 3.38

Chart 1 (page 20)
Nutrient Requirements for Beef Cows
Average Weight of Cow

Energy Needed to Maintain BCS

MATURE COWS/YOUNG COWS/HEIFERS

Average Wt. of Cow	Pregnant (80 lb BW)	Pregnant (95-100 lb BW)	Lactating (Avg. milk)	Lactating (Superior milk)
950	9.43	9.98	10.68	14.08
1000	9.72	10.27	10.97	14.37
1050	10.00	10.55	11.25	14.65
1100	10.28	10.83	11.53	14.93
1150	10.55	11.10	11.80	15.20
1200	10.83	11.38	12.08	15.48
1250	11.10	11.65	12.35	15.75

Chart 2 (page 21)
Nutrient Requirements for Beef Cows
Days to Calving or Breeding

Energy Needed to Change BCS

MATURE COWS

BCS 4 TO 5

Days to Calving/Breeding	Current BCS	Desired BCS	Daily Gain lbs./day	NE Mcal req./day
120	4	5	0.63	1.33
110	4	5	0.68	1.46
100	4	5	0.75	1.60
90	4	5	0.83	1.78
80	4	5	0.94	2.00
70	4	5	1.07	2.29
60	4	5	1.25	2.67
50	4	5	1.50	3.20
40	4	5	1.88	4.00
30	4	5	2.50	5.34

Enter the producer's calculations from Step 9 onto the form below to determine the Rumensin Advantage.

How to Convert Dry Matter (DM) Values[1] to As Fed (AF) Values[2]

	Without Rumensin			With Rumensin		
Feedstuff		**% DM[3]**			**% DM[3]**	
Grass Hay	21.10 ÷	.88 =	24.00	19.18 ÷	.88 =	21.79
Supplement	3.72 ÷	.87 =	4.28	3.38 ÷	.87 =	3.89

Feedstuff	Feed Cost $/lb	w/o Rumensin lb of ration	Cost of Ration (AF)	Feed Cost $/lb	w.Rumensin lb of Ration	Cost of Ration (AF)
Grass Hay	.033[4] x	24.00 =	79.2¢	.033 x	21.79 =	71.9¢
Supplement	.065[5] x	4.28 =	27.8¢	.065 x	3.89 =	25.3¢
				Rumensin		1.4¢[6]
		28.28			25.68	
		COST/HEAD/ DAY	$1.07		COST/HEAD/ DAY	98.6¢

Rumensin Advantage

per head per day = $1.07 - 98.6¢ = **8.4¢/head**

per head per 100 days = **$8.40/100 Days**

1 Transfer from page 22, Step 9.
2 The feedstuffs, prices and pounds fed were arbitrarily chosen in order to illustrate the calculations. You must provide your own figures in order to arrive at a realistic scenario for your operation.
3 To convert DM to AF, divide DM lb. by % DM of the feed.
4 Grass hay = $65.00/Ton.
5 Supplement = $130/Ton.
6 200 mg of Rumensin at $0.00007/mg = $0.014.

How to Determine Crude Protein of the Ration

Step 5a .095 (page 22) × total pounds of ration 28.28 = without Rumensin 2.69

.095 × 25.68 = with Rumensin 2.44

For estimates of protein requirements, refer to page 17, Table 7.

NUTRITIONAL COMPOSITION OF FEEDSTUFFS FOR BEEF CATTLE

FEEDSTUFF	% Dry Matter	% Crude Protein	% TDN	NEm Mcal/lb	NEg Mcal/lb	% Calcium	% Phos.
	100% Dry Matter Basis						
▸CONCENTRATES:							
Bakery byproduct, dry	91	10.0	92	1.04	.72	.22	.30
Barley, 48-50 lb.	88	13.0	84	.94	.64	.05	.38
Barley, 40 lb.	88	13.4	76	.81	.53	.07	.37
Barley screenings	89	13.1	78	.85	.56	.09	.33
Beet molasses, wet	78	8.5	79	.87	.58	.17	.03
Beet pulp, dehydrated	91	9.7	75	.80	.52	.69	.10
Brewers grains	92	26.9	82	.90	.60	.35	.60
Cane molasses, wet	75	5.8	74	.78	.51	1.00	.11
Corn, ear, ground	87	8.9	82	.90	.60	.07	.27
Corn, shelled	86	10.0	90	1.02	.70	.02	.35
Corn, flaked	80	10.0	95	1.08	.76	.02	.35
Corn, ensiled whole	73	10.0	93	1.06	.74	.02	.35
Corn, ground ensiled	73	10.0	91	1.03	.71	.02	.35
Corn gluten meal	90	67.2	89	1.01	.69	.08	.54
Corn gluten feed, 21%	90	24.0	84	.94	.64	.20	1.00
Cottonseed meal, 41%	90	45.6	78	.85	.56	.20	1.20
Distiller's grains, corn	92	23.0	89	.96	.66	.11	.43
Distiller's solubles, corn	92	29.7	88	.99	.68	.35	1.37
Grain dust	89	10.0	82	.90	.60	.35	.25
Grain sorghum, fine grind	87	10.0	84	.94	.64	.04	.34
Grain sorghum, coarse gr.	87	10.0	81	.89	.59	.04	.34
Gr. sorghum, steam flaked	80	10.0	92	1.05	.73	.04	.34
Gr.sorghum, ensiled whole	72	10.0	92	1.05	.73	.04	.34
Gr.sorghum,ground ensiled	72	10.0	87	.98	.67	.04	.34
Hominy feed	90	11.5	94	1.07	.75	.05	.57
Linseed meal, 34%	90	38.3	78	.85	.56	.43	.89
Millet, proso	90	12.9	83	.93	.63	.03	.34
Oats, 38 lb.	89	13.3	78	.85	.56	.10	.36
Oats, 32 lb.	89	13.4	73	.77	.50	.10	.36
Rye	88	13.8	84	.94	.64	.07	.37
Soybean seeds	92	42.8	91	1.03	.71	.27	.65
Soybean meal, 44%	89	49.9	83	.93	.63	.33	.71
Soybean meal, 48%	90	53.9	87	.98	.67	.29	.70
Soy hulls	91	12.1	77	.84	.55	.49	.21
Sunflower seeds, oil-type	91	19.0	88	.99	.68	.20	.60
Sunflower seeds, confect.	91	23.5	73	.77	.50	.10	.60
Sunflower meal, 28%	90	33.0	63	.64	.38	.23	1.03
Sunflower meal, 42%	90	48.8	73	.77	.50	.44	.98
Tallow or vegetable fat	99	0.0	192	2.34	1.80	.00	.00
Triticale	89	15.5	83	.93	.63	.06	.33

FEEDSTUFF	% Dry Matter	% Crude Protein	% TDN	NEm Mcal/lb	NEg Mcal/lb	% Calcium	% Phos.
	100% Dry Matter Basis						
▸CONCENTRATES, continued:							
Urea, feed grade, 45% N	99	287.0	0	.00	.00	.00	.00
Wheat, hard red	88	14.0	88	.99	.68	.05	.43
Wheat, soft red	88	14.0	88	.99	.68	.05	.43
Wheat, soft white	89	11.0	89	1.00	.69	.07	.35
Wheat, red, steam flaked	82	14.0	92	1.05	.73	.05	.43
Wheat middlings	89	18.4	78	.85	.56	.13	.99
Wheat screenings	89	15.8	71	.75	.48	.15	.39
▸ROUGHAGES:							
Alfalfa dehy, 15% protein	92	16.5	59	.59	.33	1.32	.24
Alfalfa dehy, 17% protein	92	18.9	61	.61	.35	1.52	.25
Alfalfa dehy, 20% protein	92	22.4	63	.64	.38	1.93	.30
Alfalfa hay, bud	88	20.0	61	.61	.35	1.70	.28
Alfalfa hay, early bloom	88	18.0	58	.58	.32	1.41	.22
Alfalfa hay, mid-bloom	88	16.0	56	.54	.28	1.31	.21
Alfalfa hay, late bloom	88	14.0	52	.47	.22	1.13	.18
Alfalfa haylage, early bloom	35	19.0	59	.59	.33	1.65	.26
Alfalfa/grass hay, early blm.	89	14.5	57	.56	.30	.85	.26
Alfalfa/grass pasture, veget.	25	18.5	67	.69	.43	1.52	.36
Barley silage, soft dough	35	10.0	69	.72	.45	.34	.28
Barley straw	89	4.3	40	.28	.04	.25	.07
Bluestem pasture, veget.	28	11.0	65	.67	.41	.55	.20
Bluestem pasture, dormant	80	4.0	43	.32	.08	.35	.10
Brome hay, pre-bloom	88	16.0	58	.58	.32	.32	.28
Brome hay, late bloom	89	10.0	54	.51	.25	.30	.26
Brome hay, mature	90	6.0	50	.44	.19	.26	.18
Buffalograss, vegetative	26	13.0	66	.68	.42	.57	.21
Buffalograss, dormant	80	5.5	46	.37	.12	.34	.12
Clover hay, mid-bloom	89	15.0	55	.52	.26	1.23	.22
Corn cobs	90	3.2	50	.44	.19	.12	.04
Corn stalks, early grazing	65	6.5	52	.47	.22	.58	.18
Corn stalks, late grazing	85	3.5	44	.34	.10	.42	.10
Corn stover, baled	87	5.2	49	.42	.17	.50	.13
Corn silage, droughty	30	9.3	64	.66	.40	.34	.19
Corn silage, well-eared	33	8.1	70	.74	.47	.23	.22
Corn screenings	89	10.0	85	.95	.65	.04	.32
Cottonseed hulls	91	4.1	42	.31	.07	.15	.09
Fescue hay, late bloom	88	7.5	53	.48	.23	.30	.26
Fescue, early winter, with N	35	11.0	54	.51	.25	.35	.30
Fescue, winter, no nitrogen	50	6.5	48	.41	.16	.30	.25
Gamma pasture, vegetative	27	11.5	66	.68	.42	.50	.20
Gamma pasture, dormant	80	5.0	46	.37	.12	.34	.12

FEEDSTUFF	% Dry Matter	% Crude Protein	% TDN	NEm Mcal/lb	NEg Mcal/lb	% Calcium	% Phos.
	100% Dry Matter Basis						
▸ROUGHAGES, continued:							
Kochia hay	89	11.0	50	.44	.19	1.50	.25
Oats hay, full bloom	88	10.0	56	.55	.29	.34	.24
Oats silage, soft dough	35	9.6	57	.57	.31	.34	.24
Oats straw	90	4.4	44	.34	.10	.24	.06
Prairie hay, early bloom	90	9.0	55	.52	.26	.47	.19
Prairie hay, late bloom	90	5.8	51	.45	.20	.43	.15
Sorghum silage, head chop	67	11.1	76	.83	.54	.13	.27
Sorgh.silage, grain type	38	9.5	66	.68	.42	.35	.24
Sorgh.silage,forage,high grain	32	7.8	63	.64	.38	.40	.23
Sorgh.silage,forage,med.grain	29	7.2	60	.60	.34	.45	.21
Sorgh.silage,forage,low grain	26	6.2	56	.54	.28	.50	.19
Sorghum, forage (cane) hay	87	7.0	54	.50	.24	.45	.22
Sorghum-sudan pasture	22	14.0	61	.61	.35	.43	.28
Sorghum-sudan hay	87	10.0	56	.53	.27	.46	.21
Sorghum-sudan silage	30	10.0	56	.54	.28	.46	.21
Sorghum stubble, early graze	55	7.5	52	.47	.22	.55	.18
Sorghum stubble, late graze	75	4.0	46	.37	.12	.40	.12
Sorghum stover, baled	86	6.0	49	.42	.17	.45	.14
Soybean hay, mid-bloom	89	16.0	54	.50	.24	1.26	.27
Sweet clover hay, mid-bloom	87	13.0	54	.50	.24	1.27	.25
Triticale silage, soft dough	35	9.5	56	.55	.29	.34	.25
Wheat hay, soft dough	88	8.5	58	.58	.32	.32	.22
Wheat silage, soft dough	35	9.0	62	.63	.37	.33	.25
Wheat straw	90	4.0	41	.29	.05	.18	.05
Wheat straw, ammoniated	90	9.0	50	.43	.18	.18	.05
Wheat pasture	20	28.0	70	.73	.46	.30	.25
Wheat grass, western, hay	88	9.0	54	.51	.25	.30	.20
Wheat grass, crested,hay	88	9.8	54	.50	.24	.33	.21
▸MINERALS:							
Bone meal, steamed	97	8.4	0.0	0.0	0.0	31.5	14.2
Dicalcium phosphate	97	0.0	0.0	0.0	0.0	22.0	19.3
Monocalcium phosphate	97	0.0	0.0	0.0	0.0	16.4	21.6
Ground limestone	100	0.0	0.0	0.0	0.0	34.0	0.0
Monosodium phosphate	97	0.0	0.0	0.0	0.0	0.0	22.5
Rock phosphate, defluorinated	100	0.0	0.0	0.0	0.0	32.0	18.0

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COW-CULATOR™ Worksheet

Step 1 **Fill in the relevant information provided by producer.**

Current weight of cow = _____(a)
Desired weight of cow = _____(b)
Current body condition score = _____(c)
Desired body condition score = _____(d)
Days to calving or breeding = _____(e)

Step 2 **Calculate the average weight of cow.**

_____(a) + _____(b) = divided by 2 = _____(2) average weight of cow.

Step 3 **Refer to page 20, Chart 1. Select the value which corresponds to (2) and the cow's stage of production. Record the appropriate Mcals/day of NEm required/day.**

Mcals/day of NEm required/day = _____(3)

Step 4 **Refer to page 21, Chart 2. Select the value which corresponds to (c), (d), and (e). Record the appropriate Mcals/day of $NE_{\triangle}$ required/day.**

Mcals/day of $NE_{\triangle}$ required/day = _____(4)

Step 5 **Calculate NEm and NEg content of ration using the format shown in the table below. To convert % ADF and % TDN to NEm and NEg (Mcal/lb) refer to Page 16, Table 6. Types and proportions of feedstuffs will vary with operation.**

Feedstuff	% Feedstuff in Ration, DM	% DM[a] (see pg. 24 & 25)	% Crude Protein[a]	Lb Crude Protein	Feed NEm Mcal/lb[a]	Ration NEm Mcal/lb	Feed NEg Mcal/lb[a]	Ration NEg Mcal/lb
		x	=		=		=	
		x	=		=		=	
Total			Step 5a		Step 5b		Step 5d	

a % Dry Matter, % Crude Protein, NEm and NEg (Mcal/lb.) content of feedstuff obtained from NRC feed tables.
b Combination of appropriate energy and protein sources to meet requirements.
c Refer to page 19, with 200 mg/head/day the NE calculations can be adjusted by 10%.

Per lb of Ration:

NEm Mcal/lb without Rumensin (Step 5b) **with Rumensin** (Step 5b × Rumensin Multiplier[c] 1.10) ×_____
Step 5c

NEg Mcal/lb without Rumensin (Step 5d) **with Rumensin** (Step 5d × Rumensin Multiplier[c] 1.10) ×_____
Step 5e

Step 6 **Determine pounds of ration necessary to maintain cow, fetus and lactation.**

Step 7 **Determine pounds of ration necessary to achieve desired daily gain.**

Step 8 **Determine total pounds of ration (DM basis) cow must consume daily to achieve results.**

Total pounds of ration:

For Prediction of DM Consumption Refer to Page 14, Table 3.

Step 9 **Determine pounds of feed in ration (DM Basis)**

Without Rumensin	With Rumensin
Step 3 _____ ÷ Step 5b _____ = _____	Step 3 _____ ÷ Step 5c _____ = _____
Step 4 _____ ÷ Step 5d _____ = _____	Step 4 _____ ÷ Step 5e _____ = _____
Step 6 _____ + Step 7 _____ = _____	Step 6 _____ + Step 7 _____ = _____
Step 8 _____ × % of feed in ration = lbs of feed in ration	
Grass/Hay = _____	Grass/Hay = _____
Supplement = _____	Supplement = _____

COW-CULATOR™

Worksheet

How to Convert Dry Matter (DM) Values[1] to As Fed (AF) Values[2]

	Without Rumensin			With Rumensin		
Feedstuff		% DM[3]			% DM[3]	
	÷	=		÷	=	
	÷	=		÷	=	
Total Ration						
Feedstuff	Feed Cost $/lb	w/o Rumensin lb of ration	Cost of Ration (AF)	Feed Cost $/lb	w.Rumensin lb of Ration	Cost of Ration (AF)
	x	=		x	=	
	x	=		x	=	
				Rumensin		
		COST/HEAD/ DAY			COST/HEAD/ DAY	/

Rumensin Advantage

per head per day =

per head per 100 days =

1 Transfer from page 22, Step 9.
2 The feedstuffs, prices and pounds fed were arbitrarily chosen in order to illustrate the calculations. You must provide your own figures in order to arrive at a realistic scenario for your operation.
3 To convert DM to AF, divide DM lb. by % DM of the feed.
4 Grass hay = $65.00/Ton.
5 Supplement = $130/Ton.
6 200 mg of Rumensin at $0.00007/mg = $0.014.

How to Determine Crude Protein of the Ration

Step 5a _____(page 22) × total pounds of ration _____ = without Rumensin _____

_____ × _____ = with Rumensin _____

For estimates of protein requirements, refer to page 17, Table 7.

COW-CULATOR™ Worksheet

Step 1 **Fill in the relevant information provided by producer.**

Current weight of cow = _____(a)
Desired weight of cow = _____(b)
Current body condition score = _____(c)
Desired body condition score = _____(d)
Days to calving or breeding = _____(e)

Step 2 **Calculate the average weight of cow.**

_____(a) + _____(b) = divided by 2 = _____(2) average weight of cow.

Step 3 **Refer to page 20, Chart 1. Select the value which corresponds to (2) and the cow's stage of production. Record the appropriate Mcals/day of NEm required/day.**

Mcals/day of NEm required/day = _____(3)

Step 4 **Refer to page 21, Chart 2. Select the value which corresponds to (c), (d), and (e). Record the appropriate Mcals/day of $NE_{\triangle}$ required/day.**

Mcals/day of $NE_{\triangle}$ required/day = _____(4)

Step 5 **Calculate NEm and NEg content of ration using the format shown in the table below. To convert % ADF and % TDN to NEm and NEg (Mcal/lb) refer to Page 16, Table 6. Types and proportions of feedstuffs will vary with operation.**

Feedstuff	% Feedstuff in Ration, DM	% DM[a] (see pg. 24 & 25)		% Crude Protein[a]	Lb Crude Protein	Feed NEm Mcal/lb[a]	Ration NEm Mcal/lb	Feed NEg Mcal/lb[a]	Ration NEg Mcal/lb
			X		=		=		=
			X		=		=		=
Total				Step 5a		Step 5b		Step 5d	

a % Dry Matter, % Crude Protein, NEm and NEg (Mcal/lb.) content of feedstuff obtained from NRC feed tables.
b Combination of appropriate energy and protein sources to meet requirements.
c Refer to page 19, with 200 mg/head/day the NE calculations can be adjusted by 10%.

Per lb of Ration:

NEm Mcal/lb without Rumensin (Step 5b) **with Rumensin** (Step 5b × Rumensin Multiplier[c] 1.10) ×_____
Step 5c

NEg Mcal/lb without Rumensin (Step 5d) **with Rumensin** (Step 5d × Rumensin Multiplier[c] 1.10) ×_____
Step 5e

Step 6 **Determine pounds of ration necessary to maintain cow, fetus and lactation.**

Without Rumensin

Step 3 _____ ÷ Step 5b _____ = _____

With Rumensin

Step 3 _____ ÷ Step 5c _____ = _____

Step 7 **Determine pounds of ration necessary to achieve desired daily gain.**

Step 4 _____ ÷ Step 5d _____ = _____

Step 4 _____ ÷ Step 5e _____ = _____

Step 8 **Determine total pounds of ration (DM basis) cow must consume daily to achieve results.**

Total pounds of ration:
Step 6 _____ + Step 7 _____ = _____
For Prediction of DM Consumption Refer to Page 14, Table 3.

Step 6 _____ + Step 7 _____ = _____

Step 9 **Determine pounds of feed in ration (DM Basis)**

Step 8 _____ × % of feed in ration = lbs of feed in ration

Grass/Hay = _____
Supplement = _____

Grass/Hay = _____
Supplement = _____

COW-CULATOR™

Worksheet

How to Convert Dry Matter (DM) Values[1] to As Fed (AF) Values[2]

	Without Rumensin			With Rumensin		
Feedstuff		**% DM[3]**			**% DM[3]**	
	÷	=		÷	=	
	÷	=		÷	=	
Total Ration						
Feedstuff	**Feed Cost $/lb**	**w/o Rumensin lb of ration**	**Cost of Ration (AF)**	**Feed Cost $/lb**	**w.Rumensin lb of Ration**	**Cost of Ration (AF)**
	x	=		x	=	
	x	=		x	=	
				Rumensin		
		COST/HEAD/ DAY			**COST/HEAD/ DAY**	/

Rumensin Advantage

per head per day =

per head per 100 days =

1 Transfer from page 22, Step 9.
2 The feedstuffs, prices and pounds fed were arbitrarily chosen in order to illustrate the calculations. You must provide your own figures in order to arrive at a realistic scenario for your operation.
3 To convert DM to AF, divide DM lb. by % DM of the feed.
4 Grass hay = $65.00/Ton.
5 Supplement = $130/Ton.
6 200 mg of Rumensin at $0.00007/mg = $0.014.

How to Determine Crude Protein of the Ration

Step 5a _____(page 22) × total pounds of ration _____ = without Rumensin _____

_____ × _____ = with Rumensin _____

For estimates of protein requirements, refer to page 17, Table 7.

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Rumensin Use Directions

Type A Medicated Article
Do Not Feed Undiluted

Active Drug Ingredient: Monensin Granulated, USP, 80g monensin activity per pound

GROWING CATTLE ON PASTURE OR IN DRY LOT (stocker and feeder and dairy and beef replacement heifers):

A. For increased rate of weight gain

Feeding directions: Feed at the rate of not less than 50 nor more than 200 mg per head per day in not less than one pound of Type C Medicated Feed; or after the 5th day, feed at the rate of 400 mg per head per day every other day in not less than 2 pounds of Type C Medicated Feed. The monensin concentration in the Type C Medicated Feed must be between 25 and 400 grams per ton. During the first 5 days, cattle should receive no more than 100 mg per day contained in not less than 1 pound of feed. Do not self feed.

B. For the prevention and control of coccidiosis due to *Eimeria bovis* and *Eimeria zuernii*

Feeding directions: Feed at a rate to provide 0.14 to 0.42 mg per pound body weight per day, depending upon severity of challenge, up to a maximum of 200 mg per head per day. The monensin concentration in Type C Medicted Feed must be between 25 and 400 g/ton. During the first 5 days, cattle should receive no more than 100 mg per day contained in not less than 1 pound of feed.

C. Free-choice (self-fed) medicated feeds

All Free-choice medicated feeds must provide not less than 50 nor more than 200 mg monensin per head per day. (1) Free-choice medicated feeds manufactured from a published formula and/or specifications do not require a Medicated Feed Mill License. (2) Other manufacturers Type C free choice feeds with a proprietary formula and/or specifications require an FDA approved Medicated Feed Mill License.

MATURE REPRODUCING BEEF COWS (on pasture or in dry lot):

A. For improved feed efficiency when receiving supplemental feed

Feeding directions: Feed continuously at a rate of 50 to 200 mg per head per day. Blend into a minimum of 1 pound of Type C Medicated Feed and either hand feed or mix into the total ration. Feed (other than the Type C Medicated Feed containing Rumensin®) can be restricted to 95% (of normal requirements) when 50 mg of monensin activity is fed, and to 90% at 200 mg. Cows on pasture or in dry lot must receive a minimum of 1 pound of Type C Medicated Feed per head per day. Additionally, a minimum of 16 pounds (air-dry basis) of roughage such as silage, haylage, ammoniated straw, hay or equivalent feedstuffs should be fed in order to meet NRC recommendations for mature reproducing beef cows to gain 0.25 to 0.75 pounds per head per day. Standing, dried winter range forage may not be of adequate quality to result in improved efficiency when supplemented with Rumensin. During the first 5 days, pastured cattle should receive no more than 100 mg per day contained in not less than 1 pound of feed. Do not self feed.

B. For the prevention and control of coccidiosis due to *Eimeria bovis* and *Eimeria zuernii*

Feeding directions: Feed at a rate of 0.14 to 0.42 mg per pound of body weight per day, depending upon severity of challenge, up to a maximum of 200 mg per head per day. During the first 5 days, pastured cattle should receive no more than 100 mg per day contained in not less than 1 pound of feed.

CAUTION: Do not allow horses or other equines access to feeds containing monensin. Ingestion of monensin by horses has been fatal. Monensin medicated cattle and goat feeds are safe for use in cattle and goats only. Consumption by unapproved species may result in toxic reactions. Feeding undiluted or mixing errors resulting in high concentrations of monensin has been fatal to cattle and could be fatal to goats. Must be thoroughly mixed in feeds before use. Do not exceed the levels of monensin recommended in the feeding directions as reduced average daily gains may result. Do not feed to lactating goats. If feed refusals containing monensin are fed to other groups of cattle, the concentration of monensin in the refusals and amount of refusals fed should be taken into consideration to prevent monensin overdosing. A withdrawal time has not been established for pre-ruminating calves. Do not use in calves to be processed for veal.

WARNING: When mixing and handling **Rumensin 80**, use protective clothing, impervious gloves and a dust mask. Operators should wash thoroughly with soap and water after handling. If accidental eye contact occurs, immediately rinse with water.

The label contains complete use information, including cautions and warnings. Always read, understand and follow label and use directions.

ELANCO

Rumensin®™

Good health is good business.

Elanco Animal Health
A Division of Eli Lilly and Company
2001 West Main Street
Greenfield, Indiana 46140
(800) 428-4441
www.elanco.com

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