

Beef Cattle Nutrition Series

Part 3: Nutrient Requirement Tables

(2018 Revised)



UofA **DIVISION OF AGRICULTURE**
RESEARCH & EXTENSION
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▼ Introduction and Updates

This report is an update to the initially prepared *Nutrient Requirement Tables* (MP391) publication that was based on *Nutrient Requirements of Beef Cattle, Seventh Revised Edition* (1996). Updates to this report were determined based on the need to correct known issues with previous tables, modify tables to better accommodate animal classes and adjust values according to model changes associated with the *Nutrient Requirements of Beef Cattle, Eighth Revised Edition* (2016, a.k.a. NRC).

Tables 7 through 12 were generated using equations presented in the *Nutrient Requirements of Beef Cattle, Eighth Revised Edition* (2016).

These tables are for educational purposes, and no guarantee is implied to their accuracy.

Individual animal nutrient requirements and responses to nutrient supply are affected by genetic and environmental factors as well as nutrient imbalances. Animal intake can vary significantly from the predicted intake provided in the tables. Therefore, these values can only serve as a starting point. Monitoring feed intake, rate of weight change and body condition change are necessary to make farm specific adjustments.

▼ Table Generation

Tables 7 through 12 were constructed using an R package developed by the author [available through the github repository using the R devtools package and function `install_github("sgadberry/beefnrc")`]. Table generation with the R package will not mimic outputs generated using the Beef Cattle Nutrient Requirements Model 2016 (BCNRM) Excel add-in provided through National Academy Press.

Primary differences include:

- The R package allows recursive table generation when functions are nested within for loops.
- The BCNRM requires manipulating input and tables worksheets, whereas the R package restricts user inputs to table-specific functions.
- The BCNRM solves tables from user TDN input, whereas the R package solves for TDN and thus dry matter intake based on target NEg for growing cattle and target NEm for mature cattle using while loops.
- The R package uses unshrunk weight inputs and prints unshrunk weight summaries.
- The R package attempts to provide table data for first-calf heifers and pregnant, non-lactating beef cows that version 1.0.37.10 and earlier versions of the BCNRM lack.

▼ General Concepts Applied to This Version

- Animal weights in the tables are unshrunk body weights. Weights in the previous version were considered shrunk weights. $\text{Unshrunk weight} \times 0.96 = \text{shrunk weight}$.
- The multiplicative effect for body condition score on NEm was set to 6. At body condition score 5, adjustment for NEm = 1. At condition score 6, NEm is multiplied by 1.05, which increases the base NEm by 5 percent.

- Tabular values expressed as a percentage of intake throughout represent the NRC 1996, 2000 dry matter intake prediction equations.
- Calf birth weights were calculated as 6.6 percent of either dam's mature weight or 85 percent of dam's mature weight for first-calf heifers.
- NRC recommended adjustments to net energy for maintenance and dry matter intake for growth implant = true and ionophore = true were applied to feeder calves and feeder yearlings and adjustments for growth implant = false and ionophore = false were applied to growing replacement heifers, growing bull calves and growing bull yearlings.

▼ Nutrient Requirements and Adjustments Explained

▼ Mineral Requirements

At least 17 minerals are required by beef cattle. Macrominerals required include calcium, magnesium, phosphorus, potassium, sodium,

chlorine and sulfur. The microminerals required are chromium, cobalt, copper, iodine, iron, manganese, molybdenum, nickel, selenium and zinc. Other minerals, including arsenic, boron, lead, silicon and vanadium, have been shown to be essential for one or more animal species, but there is no evidence that these minerals are of practical importance in beef cattle.

Calcium and phosphorus requirements are shown in Tables 4 to 12. Calcium requirements are similar to those in the 1984 NRC report because new information is not sufficient to justify a change. Calcium requirements are adjusted to 50 percent true absorption. Phosphorus requirements for maintenance are lower in the 1996 NRC report, and the phosphorus requirements have been adjusted to 68 percent true absorption.

The requirements and maximum tolerable concentrations for other minerals are shown in Table 1. For certain minerals, requirements are not listed because research data are inadequate to determine requirements.

A number of elements that are not required (or required in minute amounts) can cause toxicity in beef cattle. Maximum tolerable concentrations

Table 1. Mineral and Vitamin Requirements and Maximum Tolerable Concentrations (in Percentage or PPM of Diet Dry Matter)

Items	Unit	Growing and Finishing	Cows		Maximum Tolerable Concentration
			Gestating	Lactating	
Minerals					
Magnesium	%	0.10	0.12	0.20	0.40
Potassium	%	0.60	0.60	0.70	2
Sodium	%	0.07	0.07	0.10	
Sulfur	%	0.15	0.15	0.15	0.40
Cobalt	ppm	0.15	0.15	0.15	25
Copper	ppm	10.00	10.00	10.0	40
Iodine	ppm	0.50	0.50	0.50	50
Iron	ppm	50.00	50.00	50.00	500
Manganese	ppm	20.00	40.00	40.00	1,000
Selenium	ppm	0.10	0.10	0.10	5
Zinc	ppm	30.00	30.00	30.00	500
Vitamins					
A	IU/lb	1,000	1,273	1,773	
D	IU/lb	125	125	125	
E	IU/lb	16	16	16	
E, for stressed feeder calves	IU/d	400-500			

Source: Adapted from Table 5-1 in *Nutrient Requirements of Beef Cattle*, National Research Council, 1996. Washington, D.C.: National Academy of Sciences.

several elements known to be toxic to cattle are given in Table 2. The maximum tolerable concentration for a mineral has been defined as “that dietary level that, when fed for a limited period, will not impair animal performance and should not produce unsafe residues in human food derived from the animal” (1980 NRC: p. 3).

Table 2. Maximum Tolerable Concentrations of Mineral Elements Toxic to Cattle

Element	Concentration (ppm)
Aluminum	1,000
Arsenic	50 (100 for organic forms)
Bromine	200
Cadmium	0.5
Fluorine	40 to 100
Lead	30
Mercury	2
Strontium	2,000

Source: Adapted from Table 1 in National Research Council, 1980. *Mineral Tolerance of Domestic Animals*. Washington, D.C.: National Academy of Sciences.

▼ Vitamin Requirements

The vitamin most likely to be deficient in beef cattle diets is vitamin A. Vitamin A can be stored in the liver to prevent vitamin A deficiency. No more than two to four months of protection from stored vitamin A can be expected.

Beef cattle requirements for vitamin A are 1,000 IU/lb dry feed for beef feedlot cattle; 1,273 IU/lb dry feed for pregnant beef heifers and cows; and 1,773 IU/lb dry feed for lactating cows and breeding bulls.

Vitamin D is synthesized by beef cattle exposed to sunlight or fed sun-cured forages. Therefore, animals rarely require vitamin D supplementation. The vitamin D requirement of beef cattle is 125 IU/lb dry diet.

Determining vitamin E requirements of ruminants is difficult because of its interrelationships with other dietary components. Vitamin E requirements depend on concentrations of antioxidants, sulfur-containing amino acids and selenium in the diet. Vitamin E is not stored in the body in large concentrations. The vitamin E requirement for beef cattle is not well established but is estimated to be 16 IU/lb feed dry matter except for stressed feeder calves; whereby, 400-500 IU/d vitamin E is recommended.

▼ Energy and Protein Requirements

In most beef production situations, cattle are fed to appetite with either high forage (stocker, back-grounding, cow-calf) or high-grain diets (growing and finishing cattle) and are supplemented to support the desired level of production, based on group averages. The requirement tables were designed with that in mind. Tables 4 to 12 show energy, protein, calcium and phosphorus requirements as 1) daily nutrient requirements per animal in pounds or Mcal for energy and 2) nutrient density of the diet on a dry-matter basis. The following additional adjustments were applied to maintenance energy for table development.

- Ionophore's increased NEm of the diet using a 1.023 multiplier for feeder calves.
- First-calf heifers had a 1.25 NEm multiplier during lactation.
- Bulls had a 1.15 NEm multiplier.
- No adjustments were made for breed (multiplier = 1).
- Lactation factor multiplier was set to 1.2 during lactation and 1 during gestation.
- No adjustments were made for environmental conditions.
- Fixed body condition score set to 6, increasing base NEm by 5 percent.

▼ Dry Matter Intake

Dry matter intake estimates published in Tables 4 through 12 were based on previously developed equations (NRC 1996, 2000) and differed for calves, yearlings and cows less than or equal to 93 or more than 93 days pregnant. Dry matter intake was predicted from shrunk body weight and dietary NEm value with adjustments.

- For growing and yearling feeders, dry matter intake was adjusted by 0.97 for ionophore plus implant responses.
- For bulls and all females, a dry matter intake multiplier of 0.94 was applied to account for implant=false.

- For bulls and all females, a dry matter intake multiplier of 1 was applied to account for ionophore=false.
- Additional factors that were excluded from dry matter intake adjustment include available forage, body fatness, weather and mud.

Dry matter intake alternative equations were presented in the 2016 NRC.

For mature beef cows, an alternative estimate of dry matter intake includes:

- Non-lactating cows
 - 1.8% shrunk body weight for low TDN (< 52%) diets.
 - 2.2% shrunk body weight for moderate TDN diets (52-59%).
 - 2.5% shrunk body weight for high TDN diets (> 59%).
- Lactating cows
 - 2.2% shrunk body weight for low TDN (< 52%) diets.
 - 2.5% shrunk body weight for moderate TDN diets (52-59%).
 - 2.7% shrunk body weight for high TDN diets (> 59%).

For growing cattle, an alternative estimate of dry matter intake includes:

- $DMI = SBW \times (0.01245 + 0.019218 \times NEm_a - 0.007259 \times NEm_a^2) \times \text{Adjustments}$
 - SBW is shrunk body weight (kg)
 - $SBW, \text{ lbs} \div 2.2 = SWB, \text{ kg}$
 - NEm_a is the net energy maintenance content of the diet (Mcal/kg)
 - $NEm_a, \text{ Mcal/lb} \times 2.2 = NEm_a, \text{ Mcal/kg}$

▼ Mature Cows

Table 4 for mature cows includes the nutrient requirements of cows for months 1 to 12 since calving. Requirements are shown for mature cow weights 1,100, 1,200, 1,300 and 1,400 pounds and three levels of peak milk production (average peak milk = 18 and relative milk yield adjustments of 3 and 7 equal to 11 and 25 pounds). Lactation was set for 7 months with peak milk occurring at week 8.5 following calving. Table 3 provides information for predicting peak milk production of beef cows. Calf birth weight was assumed $0.066 \times$ mature shrunk body weight.

Table 3. Predicted Peak Milk Based on Male Calf Shrunk Weaning Weight at 7 Months

Mature Dam Shrunk Weight (lbs)	Peak milk (lb/d)				
	10	15	20	25	30
1,000	460	485	515	545	570
1,100	480	510	540	565	590
1,200	500	530	560	585	615
1,300	520	550	580	605	635
1,400	540	570	600	625	655

Source: Adapted from Appendix Table 12 in National Research Council, 1996. *Nutrient Requirements of Beef Cattle*.

Table 6 includes the nutrient requirements to increase the body condition score (BCS) of beef cows from a BCS 4 to a BCS 6 during the last 90 days of pregnancy. An additional level of protein is suggested, labeled CP_{adj}. CP_{adj} is based on a diet composition TDN:CP ratio of 6:1.

▼ Immature Females

Two-Year-Old Heifers or First-Calf Cows Calving at 24 Months of Age. Table 5 shows the requirements for two-year-old heifers with a peak milk production of 74 percent of peak milk (18 pounds) at maturity. Requirements are based on 85 percent of mature body weight at first calving and 90 percent of mature body weight by second calving with mature weights of 1,100 to 1,400 pounds. The table was generated for heifers with 20 pounds of peak milk production. Calf birth weight was assumed $0.066 \times$ dam's weight at calving.

Table 6 includes the nutrient requirements to increase the body condition score (BCS) of second-calf females from a BCS 4 to a BCS 6 during the last 90 days of pregnancy. An additional level of protein is suggested, labeled CP_{adj}. CP_{adj} is based on a diet composition TDN:CP ratio of 6:1.

Bred Replacement Heifers. Table 7, revised for bred heifers, includes the requirements for animals with mature weights of 1,100 to 1,400 pounds. Nutrient requirements are shown for 9 months. Month 1 is the first month of pregnancy. Target weight at breeding was 60 percent, and target weight at calving was 85 percent of mature body weight. Calf birth weight was set at 6.6 percent heifer's calving weight.

Growing Replacement Heifers. Table 8, summarizes the nutrient requirements of growing replacement heifers within estimated mature weight classes of 1,100 to 1,400 pounds. Growing weight classes range from 400 to 800 pounds and average daily gains from 0.5 to 2 pounds per day.

▼ Feeder and Finishing Cattle

Growing Feeder Calves Less Than 12 Months of Age. Table 9 summarizes the nutrient requirements for this class. Weigh class options at finishing were set at 1,200 and 1,400 pounds. Average daily gain was set for 1 to 3 /d in increments of 0.5 lb/d and weight classes during the growing period range from 400 to 800 pounds.

Yearling Feeder Cattle. Table 10 summarizes the nutrient requirements for this class. Weigh class options at finishing were set at 1,200 and 1,400 pounds. Average daily gain was set for 1 to 3 lb/d in increments of 0.5 lb/d plus an average daily gain of 3.3. Weight classes ranged from 600 to 1,100 pounds.

▼ Bulls

Growing Bull Calves Less Than 12 Months of Age. Table 11 summarizes the nutrient requirements for this class for mature weights of 1,800 and 2,200 pounds. Average daily gain was set for 1 to 3 lb/d in increments of 0.5, and weight ranges spanned from 500 to 900 pounds in 100-pound increments.

Yearling and Breeding Bulls. Table 12 contains the nutrient requirements of growing yearling and maintenance of mature bulls. Mature weight classes were set to 1,800 and 2,200 pounds. Average dialy gain ranged from 1 to 3.5 in 0.5-pound increments. Weight range was from 900 to 1,400 pounds and 1,800 pounds for mature weights of 1,800 and 2,200 pounds, respectively.

Table Abbreviations

Ca	Calcium
CP	Crude protein
CPadj	Crude protein adjusted to a 6:1 TDN:CP ratio
DM	Dry matter
NE_g	Net energy for gain
NE_m	Net energy for maintenance
P	Phosphorus
TDN	Total digestible nutrients

Table 4. Mature Cow Requirements at Mature Unshrunk Weight

Mature Weight: Peak Milk Period	Month Since Calving	Daily Nutrients Required					Daily Nutrients as Percentage of Intake					
		TDN (lbs)	NEm (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	CP %DM	Ca %DM	P %DM
1,100 lbs												
11 lb Peak												
Early Lactation	1	13.46	13.1	2.26	0.06	0.04	23.2	58	0.56	9.7	0.26	0.17
	2	14.13	13.9	2.46	0.066	0.044	23.9	59.1	0.58	10.3	0.28	0.18
	3	13.79	13.5	2.35	0.063	0.042	23.5	58.6	0.57	10	0.27	0.18
Mid Lactation	4	13.12	12.7	2.14	0.057	0.039	22.8	57.4	0.56	9.4	0.25	0.17
	5	12.52	12	1.94	0.051	0.035	22.2	56.4	0.54	8.7	0.23	0.16
	6	11.94	11.3	1.77	0.046	0.032	21.6	55.3	0.52	8.2	0.21	0.15
Mid Gestation	7	11.59	10.9	1.64	0.042	0.03	21.2	54.7	0.51	7.8	0.2	0.14
	8	9.64	8.3	1.34	0.033	0.025	19.8	48.7	0.42	6.8	0.16	0.13
	9	9.91	8.7	1.39	0.033	0.025	19.9	49.9	0.44	7	0.16	0.13
Late Gestation	10	10.32	9.3	1.47	0.054	0.034	20	51.6	0.46	7.4	0.27	0.17
	11	11.03	10.3	1.61	0.054	0.034	20.3	54.2	0.51	7.9	0.26	0.16
	12	12.06	11.7	1.83	0.054	0.034	20.9	57.6	0.56	8.8	0.26	0.16
18 lb Peak												
Early Lactation	1	14.47	14.3	2.58	0.069	0.046	24.3	59.6	0.59	10.6	0.28	0.19
	2	15.38	15.4	2.85	0.077	0.05	25.2	61	0.61	11.3	0.3	0.2
	3	14.88	14.8	2.7	0.073	0.048	24.7	60.3	0.6	10.9	0.29	0.19
Mid Lactation	4	14.04	13.8	2.43	0.065	0.043	23.8	59	0.58	10.2	0.27	0.18
	5	13.19	12.8	2.15	0.057	0.039	22.9	57.6	0.56	9.4	0.25	0.17
	6	12.44	11.9	1.92	0.05	0.035	22.1	56.3	0.54	8.7	0.23	0.16
Mid Gestation	7	11.93	11.3	1.75	0.045	0.032	21.5	55.4	0.52	8.1	0.21	0.15
	8	9.64	8.3	1.34	0.033	0.025	19.8	48.7	0.42	6.8	0.16	0.13
	9	9.91	8.7	1.39	0.033	0.025	19.9	49.9	0.44	7	0.16	0.13
Late Gestation	10	10.32	9.3	1.47	0.054	0.034	20	51.6	0.46	7.4	0.27	0.17
	11	11.03	10.3	1.61	0.054	0.034	20.3	54.2	0.51	7.9	0.26	0.16
	12	12.06	11.7	1.83	0.054	0.034	20.9	57.6	0.56	8.8	0.26	0.16
25 lb Peak												
Early Lactation	1	15.55	15.6	2.91	0.078	0.051	25.4	61.3	0.61	11.5	0.31	0.2
	2	16.58	16.8	3.24	0.088	0.056	26.5	62.7	0.64	12.3	0.33	0.21
	3	15.98	16.1	3.06	0.083	0.053	25.8	61.8	0.62	11.8	0.32	0.21
Mid Lactation	4	14.96	14.9	2.72	0.073	0.048	24.8	60.4	0.6	11	0.29	0.19
	5	13.86	13.6	2.37	0.063	0.042	23.6	58.7	0.58	10	0.27	0.18
	6	12.94	12.5	2.08	0.055	0.037	22.6	57.2	0.55	9.2	0.24	0.17
Mid Gestation	7	12.34	11.8	1.86	0.048	0.034	21.9	56.3	0.54	8.5	0.22	0.15
	8	9.64	8.3	1.34	0.033	0.025	19.8	48.7	0.42	6.8	0.16	0.13
	9	9.91	8.7	1.39	0.033	0.025	19.9	49.9	0.44	7	0.16	0.13
Late Gestation	10	10.32	9.3	1.47	0.054	0.034	20	51.6	0.46	7.4	0.27	0.17
	11	11.03	10.3	1.61	0.054	0.034	20.3	54.2	0.51	7.9	0.26	0.16
	12	12.06	11.7	1.83	0.054	0.034	20.9	57.6	0.56	8.8	0.26	0.16
1,200 lbs												
11 lb Peak												
Early Lactation	1	14.2	13.8	2.34	0.063	0.043	24.6	57.8	0.56	9.5	0.26	0.17
	2	14.8	14.5	2.55	0.069	0.046	25.2	58.6	0.57	10.1	0.27	0.18
	3	14.46	14.1	2.43	0.066	0.044	24.9	58.1	0.57	9.8	0.26	0.18
Mid Lactation	4	13.86	13.4	2.23	0.06	0.041	24.2	57.2	0.55	9.2	0.25	0.17
	5	13.2	12.6	2.02	0.054	0.037	23.5	56.1	0.54	8.6	0.23	0.16
	6	12.69	12	1.85	0.049	0.035	23	55.3	0.52	8.1	0.21	0.15
Mid Gestation	7	12.34	11.6	1.73	0.045	0.032	22.6	54.7	0.51	7.7	0.2	0.14
	8	10.32	8.9	1.43	0.035	0.027	21.1	48.8	0.42	6.8	0.17	0.13
	9	10.59	9.3	1.48	0.035	0.027	21.2	49.9	0.44	7	0.17	0.13
Late Gestation	10	11.06	10	1.58	0.059	0.037	21.4	51.8	0.47	7.4	0.27	0.17
	11	11.85	11.1	1.73	0.059	0.037	21.7	54.5	0.51	8	0.27	0.17
	12	12.95	12.6	1.97	0.059	0.037	22.4	57.9	0.56	8.8	0.26	0.16

Table 4. Mature Cow Requirements at Mature Unshrunk Weight continued

Mature Weight: Peak Milk Period	Month Since Calving	Daily Nutrients Required					Daily Nutrients as Percentage of Intake					
		TDN (lbs)	NEm (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	CP %DM	Ca %DM	P %DM
1,200 lbs												
18 lb Peak												
Early Lactation	1	15.21	15	2.67	0.072	0.048	25.7	59.3	0.58	10.4	0.28	0.19
	2	16.06	16	2.94	0.08	0.052	26.5	60.5	0.6	11.1	0.3	0.2
	3	15.56	15.4	2.79	0.076	0.05	26	59.8	0.59	10.7	0.29	0.19
Mid Lactation	4	14.71	14.4	2.52	0.068	0.045	25.1	58.5	0.57	10	0.27	0.18
	5	13.87	13.4	2.24	0.06	0.041	24.2	57.2	0.55	9.2	0.25	0.17
	6	13.19	12.6	2.01	0.053	0.037	23.5	56.2	0.54	8.6	0.23	0.16
Mid Gestation	7	12.68	12	1.84	0.048	0.034	22.9	55.3	0.52	8	0.21	0.15
	8	10.32	8.9	1.43	0.035	0.027	21.1	48.8	0.42	6.8	0.17	0.13
	9	10.59	9.3	1.48	0.035	0.027	21.2	49.9	0.44	7	0.17	0.13
Late Gestation	10	11.06	10	1.58	0.059	0.037	21.4	51.8	0.47	7.4	0.27	0.17
	11	11.85	11.1	1.73	0.059	0.037	21.7	54.5	0.51	8	0.27	0.17
	12	12.95	12.6	1.97	0.059	0.037	22.4	57.9	0.56	8.8	0.26	0.16
25 lb Peak												
Early Lactation	1	16.23	16.2	2.99	0.081	0.053	26.7	60.7	0.61	11.2	0.3	0.2
	2	17.32	17.5	3.33	0.091	0.059	27.8	62.2	0.63	12	0.33	0.21
	3	16.73	16.8	3.15	0.086	0.056	27.2	61.4	0.62	11.6	0.31	0.2
Mid Lactation	4	15.64	15.5	2.8	0.076	0.05	26.1	59.9	0.59	10.7	0.29	0.19
	5	14.54	14.2	2.46	0.066	0.044	24.9	58.3	0.57	9.8	0.26	0.18
	6	13.69	13.2	2.17	0.058	0.04	24	57	0.55	9	0.24	0.17
Mid Gestation	7	13.01	12.4	1.95	0.051	0.036	23.3	55.9	0.53	8.4	0.22	0.15
	8	10.32	8.9	1.43	0.035	0.027	21.1	48.8	0.42	6.8	0.17	0.13
	9	10.59	9.3	1.48	0.035	0.027	21.2	49.9	0.44	7	0.17	0.13
Late Gestation	10	11.06	10	1.58	0.059	0.037	21.4	51.8	0.47	7.4	0.27	0.17
	11	11.85	11.1	1.73	0.059	0.037	21.7	54.5	0.51	8	0.27	0.17
	12	12.95	12.6	1.97	0.059	0.037	22.4	57.9	0.56	8.8	0.26	0.16
1,300 lbs												
11 lb Peak												
Early Lactation	1	14.87	14.4	2.43	0.066	0.045	25.9	57.4	0.56	9.4	0.25	0.17
	2	15.54	15.2	2.63	0.072	0.048	26.6	58.5	0.57	9.9	0.27	0.18
	3	15.13	14.7	2.52	0.069	0.046	26.2	57.8	0.56	9.6	0.26	0.18
Mid Lactation	4	14.53	14	2.31	0.063	0.043	25.5	56.9	0.55	9.1	0.25	0.17
	5	13.86	13.2	2.11	0.057	0.04	24.8	55.8	0.53	8.5	0.23	0.16
	6	13.36	12.6	1.94	0.052	0.037	24.3	55	0.52	8	0.21	0.15
Mid Gestation	7	13.01	12.2	1.82	0.048	0.035	23.9	54.5	0.51	7.6	0.2	0.15
	8	10.99	9.5	1.52	0.038	0.029	22.4	49	0.42	6.8	0.17	0.13
	9	11.26	9.9	1.58	0.038	0.029	22.5	50	0.44	7	0.17	0.13
Late Gestation	10	11.8	10.7	1.68	0.064	0.04	22.7	52	0.47	7.4	0.28	0.17
	11	12.59	11.8	1.84	0.064	0.04	23.1	54.5	0.51	8	0.27	0.17
	12	13.84	13.5	2.11	0.064	0.04	23.8	58.1	0.57	8.8	0.27	0.17
18 lb Peak												
Early Lactation	1	15.88	15.6	2.75	0.075	0.05	27	58.9	0.58	10.2	0.28	0.19
	2	16.72	16.6	3.02	0.083	0.055	27.8	60.1	0.6	10.9	0.3	0.2
	3	16.3	16.1	2.88	0.079	0.052	27.4	59.5	0.59	10.5	0.29	0.19
Mid Lactation	4	15.38	15	2.6	0.071	0.048	26.4	58.2	0.57	9.8	0.27	0.18
	5	14.54	14	2.32	0.063	0.043	25.5	56.9	0.55	9.1	0.25	0.17
	6	13.86	13.2	2.1	0.056	0.039	24.8	55.9	0.53	8.5	0.23	0.16
Mid Gestation	7	13.42	12.7	1.93	0.051	0.036	24.3	55.3	0.52	8	0.21	0.15
	8	10.99	9.5	1.52	0.038	0.029	22.4	49	0.42	6.8	0.17	0.13
	9	11.26	9.9	1.58	0.038	0.029	22.5	50	0.44	7	0.17	0.13
Late Gestation	10	11.8	10.7	1.68	0.064	0.04	22.7	52	0.47	7.4	0.28	0.17
	11	12.59	11.8	1.84	0.064	0.04	23.1	54.5	0.51	8	0.27	0.17
	12	13.84	13.5	2.11	0.064	0.04	23.8	58.1	0.57	8.8	0.27	0.17

Table 4. Mature Cow Requirements at Mature Unshrunk Weight continued

Mature Weight: Peak Milk Period	Month Since Calving	Daily Nutrients Required					Daily Nutrients as Percentage of Intake					
		TDN (lbs)	NEm (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	CP %DM	Ca %DM	P %DM
1,300 lbs												
25 lb Peak												
Early Lactation	1	16.89	16.8	3.08	0.084	0.055	28	60.3	0.6	11	0.3	0.2
	2	17.99	18.1	3.42	0.094	0.061	29.1	61.7	0.62	11.7	0.32	0.21
	3	17.4	17.4	3.23	0.089	0.058	28.5	61	0.61	11.3	0.31	0.2
Mid Lactation	4	16.3	16.1	2.89	0.079	0.052	27.4	59.5	0.59	10.5	0.29	0.19
	5	15.21	14.8	2.54	0.069	0.047	26.2	57.9	0.56	9.7	0.26	0.18
	6	14.36	13.8	2.25	0.061	0.042	25.3	56.7	0.55	8.9	0.24	0.17
Mid Gestation	7	13.76	13.1	2.04	0.054	0.038	24.6	55.9	0.53	8.3	0.22	0.16
	8	10.99	9.5	1.52	0.038	0.029	22.4	49	0.42	6.8	0.17	0.13
	9	11.26	9.9	1.58	0.038	0.029	22.5	50	0.44	7	0.17	0.13
Late Gestation	10	11.8	10.7	1.68	0.064	0.04	22.7	52	0.47	7.4	0.28	0.17
	11	12.59	11.8	1.84	0.064	0.04	23.1	54.5	0.51	8	0.27	0.17
	12	13.84	13.5	2.11	0.064	0.04	23.8	58.1	0.57	8.8	0.27	0.17
1,400 lbs												
11 lb Peak												
Early Lactation	1	15.54	15	2.51	0.069	0.047	27.2	57.1	0.55	9.2	0.25	0.17
	2	16.21	15.8	2.71	0.075	0.05	27.9	58.1	0.57	9.7	0.27	0.18
	3	15.87	15.4	2.6	0.071	0.049	27.5	57.7	0.56	9.5	0.26	0.18
Mid Lactation	4	15.2	14.6	2.4	0.066	0.045	26.8	56.7	0.54	8.9	0.24	0.17
	5	14.53	13.8	2.19	0.06	0.042	26.1	55.6	0.53	8.4	0.23	0.16
	6	14.02	13.2	2.02	0.055	0.039	25.6	54.9	0.52	7.9	0.21	0.15
Mid Gestation	7	13.75	12.9	1.9	0.051	0.037	25.2	54.6	0.51	7.6	0.2	0.15
	8	11.59	10	1.61	0.041	0.032	23.7	48.9	0.42	6.8	0.17	0.13
	9	11.92	10.5	1.67	0.041	0.032	23.8	50.1	0.44	7	0.17	0.13
Late Gestation	10	12.47	11.3	1.78	0.068	0.043	24	51.9	0.47	7.4	0.28	0.18
	11	13.4	12.6	1.96	0.068	0.043	24.5	54.8	0.52	8	0.28	0.17
	12	14.73	14.4	2.24	0.068	0.043	25.2	58.4	0.57	8.9	0.27	0.17
18 lb Peak												
Early Lactation	1	16.54	16.2	2.84	0.078	0.052	28.3	58.6	0.57	10	0.28	0.19
	2	17.39	17.2	3.11	0.086	0.057	29.1	59.7	0.59	10.7	0.29	0.19
	3	16.96	16.7	2.96	0.082	0.054	28.7	59.2	0.58	10.3	0.28	0.19
Mid Lactation	4	16.12	15.7	2.68	0.074	0.05	27.8	58	0.57	9.7	0.27	0.18
	5	15.28	14.7	2.41	0.066	0.045	26.9	56.8	0.55	9	0.24	0.17
	6	14.52	13.8	2.18	0.059	0.042	26.1	55.7	0.53	8.4	0.23	0.16
Mid Gestation	7	14.09	13.3	2.01	0.054	0.039	25.5	55.1	0.52	7.9	0.21	0.15
	8	11.59	10	1.61	0.041	0.032	23.7	48.9	0.42	6.8	0.17	0.13
	9	11.92	10.5	1.67	0.041	0.032	23.8	50.1	0.44	7	0.17	0.13
Late Gestation	10	12.47	11.3	1.78	0.068	0.043	24	51.9	0.47	7.4	0.28	0.18
	11	13.4	12.6	1.96	0.068	0.043	24.5	54.8	0.52	8	0.28	0.17
	12	14.73	14.4	2.24	0.068	0.043	25.2	58.4	0.57	8.9	0.27	0.17
25 lb Peak												
Early Lactation	1	17.56	17.4	3.16	0.087	0.058	29.3	59.9	59.9	10.8	0.3	0.2
	2	18.65	18.7	3.5	0.097	0.063	30.4	61.3	61.3	11.5	0.32	0.21
	3	18.06	18	3.31	0.092	0.06	29.8	60.5	60.5	11.1	0.31	0.2
Mid Lactation	4	16.96	16.7	2.97	0.082	0.055	28.7	59.1	59.1	10.4	0.29	0.19
	5	15.95	15.5	2.62	0.072	0.049	27.6	57.8	57.8	9.5	0.26	0.18
	6	15.02	14.4	2.34	0.063	0.044	26.6	56.5	56.5	8.8	0.24	0.17
Mid Gestation	7	14.42	13.7	2.12	0.057	0.04	25.9	55.7	55.7	8.2	0.22	0.16
	8	11.59	10	1.61	0.041	0.032	23.7	48.9	48.9	6.8	0.17	0.13
	9	11.92	10.5	1.67	0.041	0.032	23.8	50.1	50.1	7	0.17	0.13
Late Gestation	10	12.47	11.3	1.78	0.068	0.043	24	51.9	51.9	7.4	0.28	0.18
	11	13.4	12.6	1.96	0.068	0.043	24.5	54.8	54.8	8	0.28	0.17
	12	14.73	14.4	2.24	0.068	0.043	25.2	58.4	58.4	8.9	0.27	0.17

Table 5. First Calf Heifers, Peak Milk:13 lbs (74% of Mature Production), NEm × 1.25 During Lactation

85% Mature Weight: and Period	Month Since Calving	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg Mcal/lb	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
935 lb														
Early Lactation	1	14.19	14.1	0.3	2.17	0.058	0.038	22.1	64.3	0.66	0.39	9.8	0.26	0.17
	2	14.87	14.9	0.3	2.38	0.064	0.041	22.8	65.3	0.67	0.39	10.4	0.28	0.18
	3	14.55	14.5	0.3	2.27	0.061	0.039	22.5	64.7	0.67	0.39	10.1	0.27	0.18
Mid Lactation	4	13.96	13.8	0.3	2.07	0.055	0.036	21.9	63.8	0.65	0.39	9.5	0.25	0.17
	5	13.37	13.1	0.3	1.87	0.049	0.033	21.3	62.8	0.64	0.39	8.8	0.23	0.15
	6	12.87	12.5	0.3	1.71	0.044	0.03	20.8	61.9	0.62	0.39	8.2	0.21	0.14
Mid Gestation	7	12.61	12.2	0.3	1.59	0.04	0.028	20.5	61.6	0.62	0.39	7.8	0.2	0.14
	8	9.22	7.6	0.3	1.29	0.031	0.023	18.2	50.8	0.45	0.39	7.1	0.17	0.12
	9	9.48	8	0.3	1.34	0.031	0.023	18.3	51.8	0.47	0.39	7.3	0.17	0.12
Late Gestation	10	9.9	8.6	0.3	1.42	0.05	0.03	18.5	53.4	0.49	0.39	7.7	0.27	0.16
	11	10.51	9.5	0.3	1.55	0.05	0.03	18.9	55.6	0.53	0.39	8.2	0.27	0.16
	12	11.44	10.8	0.3	1.75	0.05	0.03	19.5	58.6	0.57	0.39	9	0.26	0.16
1,020 lbs														
Early Lactation	1	14.94	14.8	0.3	2.25	0.061	0.04	23.3	64	0.66	0.39	9.7	0.26	0.17
	2	15.62	15.6	0.3	2.46	0.067	0.043	24.1	64.9	0.67	0.39	10.2	0.28	0.18
	3	15.39	15.3	0.3	2.35	0.064	0.041	23.8	64.6	0.66	0.39	9.9	0.27	0.17
Mid Lactation	4	14.72	14.5	0.3	2.16	0.058	0.038	23.2	63.5	0.65	0.39	9.3	0.25	0.16
	5	14.14	13.8	0.3	1.96	0.052	0.035	22.6	62.6	0.63	0.39	8.7	0.23	0.15
	6	13.71	13.3	0.3	1.79	0.047	0.032	22.1	62	0.63	0.39	8.1	0.21	0.14
Mid Gestation	7	13.38	12.9	0.3	1.67	0.043	0.03	21.8	61.4	0.62	0.39	7.7	0.2	0.14
	8	9.85	8.1	0.3	1.38	0.034	0.025	19.4	50.8	0.45	0.39	7.1	0.17	0.13
	9	10.11	8.5	0.3	1.43	0.034	0.025	19.5	51.7	0.47	0.39	7.3	0.17	0.13
Late Gestation	10	10.58	9.2	0.3	1.52	0.055	0.033	19.8	53.4	0.49	0.39	7.7	0.28	0.17
	11	11.28	10.2	0.3	1.66	0.055	0.033	20.2	55.8	0.53	0.39	8.2	0.27	0.16
	12	12.27	11.6	0.3	1.88	0.055	0.033	20.9	58.8	0.58	0.39	9	0.26	0.16
1,105 lbs														
Early Lactation	1	15.7	15.5	0.3	2.34	0.064	0.042	24.6	63.8	0.65	0.39	9.5	0.26	0.17
	2	16.38	16.3	0.3	2.54	0.069	0.045	25.3	64.7	0.67	0.39	10	0.27	0.18
	3	16.13	16	0.3	2.44	0.066	0.044	25.1	64.3	0.66	0.39	9.7	0.26	0.17
Mid Lactation	4	15.55	15.3	0.3	2.24	0.061	0.04	24.5	63.5	0.65	0.39	9.1	0.25	0.16
	5	14.88	14.5	0.3	2.04	0.055	0.037	23.8	62.4	0.63	0.39	8.6	0.23	0.15
	6	14.46	14	0.3	1.88	0.05	0.034	23.4	61.8	0.62	0.39	8	0.21	0.15
Mid Gestation	7	14.12	13.6	0.3	1.76	0.046	0.032	23	61.3	0.62	0.39	7.6	0.2	0.14
	8	10.46	8.6	0.3	1.47	0.037	0.027	20.6	50.8	0.45	0.39	7.1	0.18	0.13
	9	10.8	9.1	0.3	1.52	0.037	0.027	20.8	52	0.47	0.39	7.3	0.18	0.13
Late Gestation	10	11.27	9.8	0.3	1.62	0.059	0.036	21.1	53.5	0.5	0.39	7.7	0.28	0.17
	11	11.96	10.8	0.3	1.77	0.059	0.036	21.5	55.7	0.53	0.39	8.3	0.28	0.17
	12	13.1	12.4	0.3	2.01	0.059	0.036	22.2	59	0.58	0.39	9.1	0.27	0.16
1,190 lbs														
Early Lactation	1	16.45	16.2	0.4	2.42	0.067	0.044	25.8	63.7	0.65	0.38	9.4	0.26	0.17
	2	17.14	17	0.4	2.62	0.072	0.047	26.6	64.5	0.66	0.38	9.9	0.27	0.18
	3	16.81	16.6	0.4	2.52	0.069	0.046	26.3	64	0.65	0.38	9.6	0.26	0.17
Mid Lactation	4	16.22	15.9	0.4	2.32	0.063	0.042	25.7	63.1	0.64	0.38	9	0.25	0.16
	5	15.64	15.2	0.4	2.12	0.058	0.039	25.1	62.3	0.63	0.38	8.4	0.23	0.16
	6	15.22	14.7	0.4	1.96	0.053	0.036	24.6	61.7	0.62	0.38	7.9	0.21	0.15
Mid Gestation	7	14.96	14.4	0.4	1.84	0.049	0.034	24.3	61.4	0.62	0.38	7.6	0.2	0.14
	8	11.08	9.1	0.4	1.55	0.04	0.029	21.8	50.9	0.45	0.38	7.1	0.18	0.13
	9	11.42	9.6	0.4	1.62	0.04	0.029	22	52	0.47	0.38	7.4	0.18	0.13
Late Gestation	10	11.89	10.3	0.4	1.72	0.064	0.039	22.2	53.5	0.49	0.38	7.7	0.29	0.17
	11	12.72	11.5	0.4	1.88	0.064	0.039	22.7	55.9	0.53	0.38	8.3	0.28	0.17
	12	13.93	13.2	0.4	2.14	0.064	0.039	23.5	59.3	0.58	0.38	9.1	0.27	0.16

Table 6. Target Body Condition Gain From 4 to 6 During 3rd Trimester, Mature Cows and 2-Year-Old Females (non-lactating)

Mature Weight and Age		Daily Nutrients Required					Daily Nutrients as Percentage of Intake									
	Month Since Calving	TDN (lbs)	NEm (Mcal)	NEg (Mcal)	CP (lbs)	CPAdj (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal	CP %DM	CPAdj %DM	Ca %DM	P %DM
1,100 lb Mature Weight, Mature Cow																
	7	12.36	12.1	NA	1.47	2.1	0.054	0.034	21.1	58.6	0.57	NA	7	9.8	0.25	0.16
	8	13.26	13.3	NA	1.61	2.2	0.054	0.034	21.6	61.3	0.61	NA	7.5	10.2	0.25	0.15
	9	14.57	15	NA	1.83	2.4	0.054	0.034	22.5	64.9	0.67	NA	8.2	10.8	0.24	0.15
1,200 lb Mature Weight, Mature Cow																
	7	13.25	13	NA	1.58	2.2	0.059	0.037	22.6	58.8	0.58	NA	7	9.8	0.26	0.16
	8	14.32	14.4	NA	1.73	2.4	0.059	0.037	23.2	61.7	0.62	NA	7.5	10.3	0.25	0.16
	9	15.7	16.2	NA	1.97	2.6	0.059	0.037	24.1	65.2	0.67	NA	8.2	10.9	0.24	0.15
1,300 lb Mature Weight, Mature Cow																
	7	14.14	13.9	NA	1.68	2.4	0.064	0.04	24	58.9	0.58	NA	7	9.8	0.26	0.17
	8	15.28	15.4	NA	1.84	2.5	0.064	0.04	24.7	61.9	0.62	NA	7.5	10.3	0.26	0.16
	9	16.75	17.3	NA	2.11	2.8	0.064	0.04	25.6	65.4	0.68	NA	8.2	10.9	0.25	0.15
1,400 lb Mature Weight, Mature Cow																
	7	15.03	14.8	NA	1.78	2.5	0.068	0.043	25.4	59.2	0.58	NA	7	9.9	0.27	0.17
	8	16.25	16.4	NA	1.96	2.7	0.068	0.043	26.2	62.1	0.63	NA	7.5	10.4	0.26	0.16
	9	17.87	18.5	NA	2.24	3	0.068	0.043	27.2	65.8	0.68	NA	8.2	11	0.25	0.16
1,100 lb Mature Weight, Pregnant 2 year old																
	7	11.19	10.6	0.2	1.38	1.9	0.05	0.03	18.8	59.4	0.59	0.33	7.3	9.9	0.27	0.16
	8	11.98	11.7	0.2	1.5	2	0.05	0.03	19.3	62	0.63	0.33	7.8	10.3	0.26	0.16
	9	13.1	13.2	0.2	1.7	2.2	0.05	0.03	20	65.5	0.68	0.33	8.5	10.9	0.25	0.15
1,200 lb Mature Weight, Pregnant 2 year old																
	7	12.01	11.4	0.3	1.48	2	0.055	0.033	20.1	59.6	0.59	0.33	7.3	9.9	0.27	0.16
	8	12.89	12.6	0.3	1.61	2.1	0.055	0.033	20.7	62.3	0.63	0.33	7.8	10.4	0.26	0.16
	9	14.15	14.3	0.3	1.83	2.4	0.055	0.033	21.5	65.9	0.68	0.33	8.5	11	0.25	0.15
1,300 lb Mature Weight, Pregnant 2 year old																
	7	12.84	12.2	0.3	1.57	2.1	0.059	0.036	21.4	59.9	0.59	0.33	7.3	10	0.28	0.17
	8	13.79	13.5	0.3	1.72	2.3	0.059	0.036	22	62.6	0.63	0.33	7.8	10.4	0.27	0.16
	9	15.13	15.3	0.3	1.96	2.5	0.059	0.036	22.9	66.2	0.69	0.33	8.6	11	0.26	0.16
1,400 lb Mature Weight, Pregnant 2 year old																
	7	13.65	13	0.3	1.67	2.3	0.064	0.038	22.7	60.1	0.6	0.34	7.3	10	0.28	0.17
	8	14.68	14.4	0.3	1.83	2.4	0.064	0.038	23.3	62.9	0.64	0.34	7.8	10.5	0.27	0.16
	9	16.09	16.3	0.3	2.08	2.7	0.064	0.038	24.2	66.4	0.69	0.34	8.6	11.1	0.26	0.16

Table 7. Bred Heifer 60% Mature Weight at Breeding and 85% Mature Weight at Calving as 2 Year Old

Mature Weight and Range*	Month Since Conception	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg (Mcal/lb)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
1,100 lbs														
690 lbs	1	8.83	5.9	1.5	1.35	0.041	0.024	14.9	59.1	0.58	0.32	9	0.28	0.16
	2	9.12	6.1	1.6	1.37	0.042	0.025	15.4	59.2	0.58	0.32	8.9	0.27	0.16
	3	9.39	6.3	1.6	1.39	0.042	0.025	15.9	59.2	0.58	0.32	8.8	0.27	0.16
	4	9.73	6.6	1.7	1.43	0.043	0.026	16.4	59.4	0.59	0.33	8.7	0.26	0.16
	5	10.06	6.9	1.7	1.47	0.043	0.026	16.9	59.7	0.59	0.33	8.7	0.26	0.15
	6	10.51	7.4	1.7	1.54	0.044	0.027	17.4	60.3	0.6	0.34	8.8	0.25	0.15
	7	11.06	8.1	1.7	1.64	0.063	0.035	18	61.3	0.61	0.35	9.1	0.35	0.19
	8	11.85	9.2	1.7	1.8	0.064	0.036	18.8	63	0.64	0.38	9.5	0.34	0.19
1,020 lbs	9	12.69	10.5	1.5	2.04	0.067	0.037	19.6	64.7	0.67	0.4	10.4	0.34	0.19
1,200 lbs														
753 lbs	1	9.49	6.3	1.7	1.44	0.045	0.026	16	59.4	0.59	0.33	9	0.28	0.16
	2	9.78	6.5	1.8	1.47	0.046	0.027	16.5	59.4	0.59	0.33	8.9	0.28	0.16
	3	10.08	6.7	1.8	1.5	0.046	0.027	17	59.4	0.59	0.33	8.8	0.27	0.16
	4	10.42	7	1.8	1.53	0.047	0.028	17.5	59.6	0.59	0.33	8.8	0.27	0.16
	5	10.83	7.4	1.9	1.58	0.047	0.028	18	60	0.59	0.33	8.8	0.26	0.16
	6	11.28	7.9	1.9	1.65	0.048	0.029	18.6	60.5	0.6	0.34	8.9	0.26	0.16
	7	11.91	8.7	1.9	1.76	0.069	0.038	19.3	61.6	0.62	0.36	9.1	0.36	0.2
	8	12.69	9.8	1.8	1.93	0.07	0.039	20.1	63.1	0.64	0.38	9.6	0.35	0.19
1,113 lbs	9	13.67	11.3	1.7	2.19	0.072	0.04	21	65	0.67	0.4	10.4	0.34	0.19
1,300 lbs														
816 lbs	1	10.07	6.6	1.9	1.54	0.049	0.028	17	59.4	0.59	0.33	9.1	0.29	0.17
	2	10.45	6.9	1.9	1.57	0.049	0.029	17.5	59.6	0.59	0.33	8.9	0.28	0.16
	3	10.75	7.1	2	1.6	0.05	0.029	18	59.6	0.59	0.33	8.8	0.28	0.16
	4	11.18	7.5	2	1.63	0.05	0.03	18.6	60	0.59	0.33	8.8	0.27	0.16
	5	11.6	7.9	2.1	1.69	0.051	0.031	19.2	60.3	0.6	0.34	8.8	0.26	0.16
	6	12.13	8.5	2.1	1.76	0.052	0.031	19.9	61	0.61	0.35	8.9	0.26	0.16
	7	12.76	9.3	2.1	1.88	0.074	0.041	20.6	62	0.63	0.36	9.1	0.36	0.2
	8	13.61	10.5	2	2.06	0.076	0.042	21.4	63.5	0.65	0.38	9.6	0.35	0.2
1,205 lbs	9	14.66	12.1	1.8	2.35	0.078	0.043	22.4	65.4	0.68	0.41	10.5	0.35	0.19
1,400 lbs														
878 lbs	1	10.72	7	2	1.64	0.052	0.03	18	59.6	0.59	0.33	9.1	0.29	0.17
	2	11.11	7.3	2.1	1.66	0.053	0.031	18.6	59.8	0.59	0.33	9	0.28	0.17
	3	11.43	7.5	2.1	1.69	0.053	0.032	19.1	59.8	0.59	0.33	8.9	0.28	0.17
	4	11.86	7.9	2.2	1.73	0.054	0.032	19.7	60.1	0.6	0.34	8.8	0.27	0.16
	5	12.29	8.3	2.2	1.79	0.055	0.033	20.3	60.4	0.6	0.34	8.8	0.27	0.16
	6	12.89	9	2.2	1.87	0.056	0.034	21.1	61.2	0.61	0.35	8.9	0.26	0.16
	7	13.6	9.9	2.2	2	0.08	0.044	21.8	62.3	0.63	0.37	9.1	0.37	0.2
	8	14.46	11.1	2.2	2.19	0.081	0.045	22.7	63.7	0.65	0.38	9.7	0.36	0.2
1,298 lbs	9	15.63	12.9	2	2.5	0.084	0.047	23.8	65.7	0.68	0.41	10.5	0.35	0.2

*Weight Range includes weight of conceptus.

Table 8. Growing Replacement Heifers (No Implant or Ionophore Adjustment)

Mature Weight and Range	Daily BW Gain (lbs)	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
1,100 lbs	0.5													
400 lbs		5.12	3.9	0.5	0.82	0.025	0.015	9.2	55.8	0.53	0.28	9	0.28	0.16
500 lbs		6.05	4.6	0.6	0.92	0.028	0.016	10.8	55.7	0.53	0.27	8.5	0.25	0.15
600 lbs		6.95	5.3	0.7	1.01	0.03	0.018	12.5	55.8	0.53	0.28	8.1	0.24	0.15
700 lbs		7.77	5.9	0.8	1.1	0.032	0.02	14	55.7	0.53	0.27	7.9	0.23	0.15
800 lbs		8.57	6.5	0.8	1.18	0.034	0.022	15.4	55.6	0.53	0.27	7.7	0.22	0.14
	1													
400 lbs		5.81	3.9	1.1	1.04	0.039	0.02	9.6	60.6	0.6	0.34	10.8	0.4	0.21
500 lbs		6.86	4.6	1.2	1.12	0.04	0.021	11.3	60.5	0.6	0.34	9.9	0.35	0.19
600 lbs		7.89	5.3	1.4	1.2	0.041	0.023	13	60.6	0.6	0.34	9.2	0.31	0.18
700 lbs		8.82	5.9	1.6	1.27	0.042	0.025	14.6	60.4	0.6	0.34	8.7	0.29	0.17
800 lbs		9.74	6.5	1.8	1.34	0.044	0.026	16.1	60.4	0.6	0.34	8.3	0.27	0.16
	1.5													
400 lbs		6.43	3.9	1.7	1.25	0.051	0.025	9.8	65.8	0.68	0.41	12.8	0.52	0.26
500 lbs		7.59	4.6	2	1.31	0.051	0.026	11.6	65.7	0.68	0.41	11.4	0.44	0.23
600 lbs		8.72	5.3	2.2	1.37	0.052	0.027	13.2	65.9	0.68	0.41	10.4	0.39	0.21
700 lbs		9.77	5.9	2.6	1.43	0.052	0.028	14.9	65.7	0.68	0.41	9.6	0.35	0.19
800 lbs		10.79	6.5	2.8	1.49	0.053	0.03	16.4	65.6	0.68	0.41	9	0.32	0.18
	2													
400 lbs		7	3.9	2.3	1.46	0.064	0.03	9.7	72	0.77	0.49	15	0.66	0.31
500 lbs		8.27	4.6	2.7	1.5	0.063	0.031	11.5	71.9	0.77	0.49	13.1	0.55	0.27
600 lbs		9.5	5.3	3.1	1.55	0.062	0.032	13.2	72.1	0.77	0.49	11.7	0.47	0.24
700 lbs		10.64	5.9	3.5	1.59	0.062	0.032	14.8	71.9	0.77	0.49	10.7	0.42	0.22
800 lbs		11.75	6.5	3.9	1.63	0.061	0.033	16.4	71.8	0.77	0.49	10	0.37	0.2
1,200 lbs	0.5													
400 lbs		5.08	3.9	0.5	0.82	0.026	0.015	9.2	55.5	0.53	0.27	9	0.28	0.16
500 lbs		5.99	4.6	0.6	0.92	0.028	0.017	10.8	55.4	0.53	0.27	8.5	0.26	0.15
600 lbs		6.88	5.3	0.6	1.01	0.03	0.019	12.4	55.5	0.53	0.27	8.2	0.24	0.15
700 lbs		7.7	5.9	0.7	1.1	0.032	0.021	13.9	55.4	0.52	0.27	7.9	0.23	0.15
800 lbs		8.5	6.5	0.8	1.19	0.035	0.023	15.4	55.3	0.52	0.27	7.7	0.23	0.15
	1													
400 lbs		5.74	3.9	1	1.04	0.039	0.02	9.6	60	0.59	0.33	10.9	0.41	0.21
500 lbs		6.77	4.6	1.2	1.12	0.04	0.022	11.3	59.9	0.59	0.33	9.9	0.36	0.19
600 lbs		7.79	5.3	1.4	1.2	0.042	0.023	13	60	0.6	0.34	9.2	0.32	0.18
700 lbs		8.71	5.9	1.5	1.27	0.043	0.025	14.5	59.9	0.59	0.33	8.8	0.3	0.17
800 lbs		9.62	6.5	1.7	1.35	0.045	0.027	16.1	59.8	0.59	0.33	8.4	0.28	0.17
	1.5													
400 lbs		6.33	3.9	1.6	1.25	0.052	0.025	9.8	64.8	0.67	0.4	12.8	0.54	0.26
500 lbs		7.48	4.6	1.9	1.32	0.053	0.027	11.5	64.8	0.67	0.4	11.4	0.46	0.23
600 lbs		8.59	5.3	2.1	1.38	0.053	0.028	13.2	64.9	0.67	0.4	10.4	0.4	0.21
700 lbs		9.61	5.9	2.4	1.44	0.054	0.029	14.8	64.7	0.67	0.4	9.7	0.36	0.2
800 lbs		10.61	6.5	2.6	1.5	0.054	0.03	16.4	64.7	0.66	0.4	9.1	0.33	0.19
	2													
400 lbs		6.88	3.9	2.2	1.46	0.065	0.031	9.8	70.5	0.75	0.47	14.9	0.67	0.31
500 lbs		8.12	4.6	2.5	1.51	0.064	0.031	11.5	70.4	0.75	0.47	13.1	0.56	0.27
600 lbs		9.33	5.3	2.9	1.56	0.064	0.032	13.2	70.5	0.75	0.47	11.8	0.48	0.24
700 lbs		10.44	5.9	3.3	1.6	0.064	0.033	14.8	70.3	0.75	0.47	10.8	0.43	0.22
800 lbs		11.53	6.5	3.6	1.65	0.063	0.034	16.4	70.2	0.75	0.47	10	0.39	0.21

Table 8. Growing Replacement Heifers (No Implant or Ionophore Adjustment) continued

Mature Weight and Range	Daily BW Gain (lbs)	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
1,300 lbs	0.5													
400 lbs		5.04	3.9	0.4	0.82	0.026	0.015	9.1	55.3	0.52	0.27	9	0.29	0.16
500 lbs		5.95	4.6	0.5	0.92	0.028	0.017	10.8	55.2	0.52	0.27	8.5	0.26	0.16
600 lbs		6.85	5.3	0.6	1.01	0.03	0.019	12.4	55.3	0.52	0.27	8.2	0.25	0.15
700 lbs		7.64	5.9	0.7	1.1	0.033	0.021	13.9	55.2	0.52	0.27	8	0.24	0.15
800 lbs		8.43	6.5	0.8	1.19	0.035	0.023	15.3	55.1	0.52	0.27	7.8	0.23	0.15
	1													
400 lbs		5.67	3.9	1	1.04	0.04	0.02	9.5	59.5	0.59	0.33	10.9	0.42	0.21
500 lbs		6.69	4.6	1.2	1.12	0.041	0.022	11.3	59.4	0.59	0.33	10	0.36	0.19
600 lbs		7.7	5.3	1.3	1.2	0.042	0.024	12.9	59.5	0.59	0.33	9.3	0.33	0.18
700 lbs		8.61	5.9	1.5	1.28	0.044	0.025	14.5	59.4	0.59	0.33	8.8	0.3	0.17
800 lbs		9.5	6.5	1.6	1.35	0.046	0.027	16	59.3	0.59	0.33	8.4	0.28	0.17
	1.5													
400 lbs		6.24	3.9	1.5	1.25	0.053	0.026	9.7	64	0.66	0.39	12.8	0.54	0.26
500 lbs		7.37	4.6	1.8	1.32	0.054	0.027	11.5	64	0.66	0.39	11.5	0.47	0.23
600 lbs		8.47	5.3	2	1.39	0.054	0.028	13.2	64.1	0.66	0.39	10.5	0.41	0.21
700 lbs		9.47	5.9	2.2	1.45	0.055	0.03	14.8	63.9	0.65	0.39	9.8	0.37	0.2
800 lbs		10.46	6.5	2.5	1.51	0.056	0.031	16.4	63.9	0.65	0.39	9.2	0.34	0.19
	2													
400 lbs		6.76	3.9	2.1	1.46	0.066	0.031	9.8	69.2	0.73	0.46	14.9	0.68	0.32
500 lbs		7.99	4.6	2.4	1.51	0.066	0.032	11.6	69.1	0.73	0.46	13.1	0.57	0.28
600 lbs		9.17	5.3	2.7	1.57	0.066	0.033	13.2	69.2	0.73	0.46	11.8	0.5	0.25
700 lbs		10.27	5.9	3.1	1.62	0.065	0.034	14.9	69.1	0.73	0.46	10.9	0.44	0.23
800 lbs		11.34	6.5	3.4	1.67	0.065	0.035	16.4	69	0.73	0.45	10.1	0.4	0.21
1,400 lbs	0.5													
400 lbs		5	3.9	0.4	0.82	0.026	0.015	9.1	55	0.52	0.26	9.1	0.29	0.16
500 lbs		5.91	4.6	0.5	0.92	0.029	0.017	10.7	55	0.52	0.26	8.6	0.27	0.16
600 lbs		6.79	5.3	0.6	1.01	0.031	0.019	12.3	55.1	0.52	0.27	8.2	0.25	0.15
700 lbs		7.59	5.9	0.6	1.1	0.033	0.021	13.8	54.9	0.52	0.26	8	0.24	0.15
800 lbs		8.37	6.5	0.7	1.19	0.035	0.023	15.3	54.9	0.52	0.26	7.8	0.23	0.15
	1													
400 lbs		5.61	3.9	0.9	1.04	0.04	0.02	9.5	59	0.58	0.32	10.9	0.42	0.22
500 lbs		6.62	4.6	1	1.12	0.042	0.022	11.2	59	0.58	0.32	10	0.37	0.2
600 lbs		7.61	5.3	1.2	1.21	0.043	0.024	12.9	59.1	0.58	0.32	9.4	0.33	0.18
700 lbs		8.52	5.9	1.4	1.28	0.045	0.026	14.4	59	0.58	0.32	8.9	0.31	0.18
800 lbs		9.4	6.5	1.5	1.36	0.046	0.027	16	58.9	0.58	0.32	8.5	0.29	0.17
	1.5													
400 lbs		6.16	3.9	1.4	1.25	0.054	0.026	9.7	63.3	0.65	0.38	12.9	0.55	0.27
500 lbs		7.28	4.6	1.7	1.32	0.054	0.027	11.5	63.3	0.65	0.38	11.5	0.47	0.24
600 lbs		8.36	5.3	1.9	1.39	0.055	0.029	13.2	63.4	0.65	0.38	10.6	0.42	0.22
700 lbs		9.35	5.9	2.1	1.46	0.056	0.03	14.8	63.2	0.64	0.38	9.9	0.38	0.2
800 lbs		10.33	6.5	2.3	1.52	0.057	0.031	16.3	63.2	0.64	0.38	9.3	0.35	0.19
	2													
400 lbs		6.66	3.9	1.9	1.46	0.067	0.031	9.8	68.1	0.72	0.44	14.9	0.69	0.32
500 lbs		7.87	4.6	2.3	1.52	0.067	0.032	11.6	68.1	0.71	0.44	13.1	0.58	0.28
600 lbs		9.04	5.3	2.6	1.57	0.067	0.033	13.3	68.2	0.72	0.44	11.9	0.51	0.25
700 lbs		10.12	5.9	2.9	1.63	0.067	0.035	14.9	68	0.71	0.44	10.9	0.45	0.23
800 lbs		11.17	6.5	3.2	1.68	0.067	0.036	16.4	67.9	0.71	0.44	10.2	0.41	0.22

Table 9. Feeder Calves (< 12 months of age) With Adjustments for Implant and Ionophore

Mature Weight and Range	Daily BW Gain (lbs)	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
1,200 lbs	1													
400 lbs		5.67	3.9	1	1.04	0.039	0.02	9.8	57.8	0.58	0.32	10.6	0.4	0.2
500 lbs		6.7	4.6	1.2	1.12	0.04	0.022	11.6	57.8	0.58	0.32	9.7	0.35	0.19
600 lbs		7.7	5.3	1.4	1.2	0.042	0.023	13.3	57.9	0.58	0.32	9	0.31	0.17
700 lbs		8.62	5.9	1.5	1.27	0.043	0.025	14.9	57.7	0.58	0.32	8.5	0.29	0.17
800 lbs		9.51	6.5	1.7	1.35	0.045	0.027	16.5	57.7	0.58	0.32	8.2	0.27	0.16
	1.5													
400 lbs		6.26	3.9	1.6	1.25	0.052	0.025	10	62.3	0.65	0.39	12.4	0.52	0.25
500 lbs		7.4	4.6	1.9	1.32	0.053	0.027	11.9	62.3	0.65	0.39	11.1	0.44	0.22
600 lbs		8.5	5.3	2.1	1.38	0.053	0.028	13.6	62.4	0.65	0.39	10.1	0.39	0.2
700 lbs		9.51	5.9	2.4	1.44	0.054	0.029	15.3	62.2	0.65	0.38	9.4	0.35	0.19
800 lbs		10.5	6.5	2.6	1.5	0.054	0.03	16.9	62.2	0.65	0.38	8.9	0.32	0.18
	2													
400 lbs		6.81	3.9	2.2	1.46	0.065	0.031	10.1	67.5	0.73	0.45	14.5	0.65	0.3
500 lbs		8.04	4.6	2.5	1.51	0.064	0.031	11.9	67.4	0.73	0.45	12.7	0.54	0.26
600 lbs		9.23	5.3	2.9	1.56	0.064	0.032	13.7	67.5	0.73	0.46	11.4	0.47	0.24
700 lbs		10.34	5.9	3.3	1.6	0.064	0.033	15.3	67.4	0.73	0.45	10.5	0.42	0.22
800 lbs		11.41	6.5	3.6	1.65	0.063	0.034	17	67.3	0.73	0.45	9.7	0.37	0.2
	2.5													
400 lbs		7.31	3.9	2.7	1.66	0.078	0.036	9.9	73.5	0.82	0.53	16.7	0.78	0.36
500 lbs		8.63	4.6	3.2	1.7	0.076	0.036	11.8	73.5	0.82	0.53	14.5	0.65	0.31
600 lbs		9.92	5.3	3.7	1.73	0.075	0.037	13.5	73.6	0.82	0.53	12.9	0.56	0.27
700 lbs		11.11	5.9	4.2	1.76	0.074	0.037	15.1	73.4	0.81	0.53	11.7	0.49	0.25
800 lbs		12.27	6.5	4.6	1.8	0.073	0.038	16.7	73.3	0.81	0.53	10.7	0.43	0.23
	3													
400 lbs		7.77	3.9	3.4	1.87	0.091	0.041	9.5	81.5	0.93	0.63	19.6	0.95	0.43
500 lbs		9.18	4.6	4	1.89	0.088	0.041	11.3	81.4	0.93	0.63	16.7	0.78	0.36
600 lbs		10.54	5.3	4.5	1.9	0.086	0.041	12.9	81.6	0.93	0.63	14.7	0.66	0.32
700 lbs		11.81	5.9	5.1	1.92	0.083	0.041	14.5	81.2	0.93	0.63	13.2	0.57	0.28
800 lbs		13.04	6.5	5.6	1.94	0.081	0.041	16.1	81.1	0.92	0.62	12.1	0.51	0.26
1,400 lbs	1													
400 lbs		5.55	3.9	0.9	1.04	0.04	0.02	9.7	56.9	0.57	0.31	10.7	0.41	0.21
500 lbs		6.55	4.6	1.1	1.12	0.042	0.022	11.5	56.9	0.57	0.31	9.8	0.36	0.19
600 lbs		7.53	5.3	1.2	1.21	0.043	0.024	13.2	57	0.57	0.31	9.1	0.33	0.18
700 lbs		8.42	5.9	1.4	1.28	0.045	0.026	14.8	56.9	0.57	0.31	8.7	0.3	0.17
800 lbs		9.29	6.5	1.5	1.36	0.046	0.027	16.4	56.8	0.57	0.31	8.3	0.28	0.17
	1.5													
400 lbs		6.09	3.9	1.4	1.25	0.054	0.026	10	60.9	0.63	0.37	12.5	0.54	0.26
500 lbs		7.2	4.6	1.7	1.32	0.054	0.027	11.8	60.9	0.63	0.37	11.2	0.46	0.23
600 lbs		8.27	5.3	1.9	1.39	0.055	0.029	13.6	61	0.63	0.37	10.3	0.41	0.21
700 lbs		9.25	5.9	2.1	1.46	0.056	0.03	15.2	60.8	0.63	0.37	9.6	0.37	0.2
800 lbs		10.22	6.5	2.4	1.52	0.057	0.031	16.8	60.8	0.63	0.36	9.1	0.34	0.19

Table 9. Feeder Calves (< 12 months of age) With Adjustments for Implant and Ionophore continued

Mature Weight and Range	Daily BW Gain (lbs)	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
1,400 lbs	2													
400 lbs		6.59	3.9	1.9	1.46	0.067	0.031	10.1	65.3	0.7	0.43	14.5	0.67	0.31
500 lbs		7.79	4.6	2.3	1.52	0.067	0.032	11.9	65.3	0.7	0.43	12.7	0.56	0.27
600 lbs		8.94	5.3	2.6	1.57	0.067	0.033	13.7	65.4	0.7	0.43	11.5	0.49	0.24
700 lbs		10.01	5.9	2.9	1.63	0.067	0.035	15.4	65.2	0.7	0.42	10.6	0.44	0.22
800 lbs		11.06	6.5	3.2	1.68	0.067	0.036	17	65.2	0.69	0.42	9.9	0.4	0.21
	2.5													
400 lbs		7.06	3.9	2.4	1.67	0.081	0.037	10	70.3	0.77	0.49	16.6	0.8	0.37
500 lbs		8.34	4.6	2.9	1.71	0.08	0.037	11.9	70.3	0.77	0.49	14.4	0.67	0.32
600 lbs		9.58	5.3	3.3	1.76	0.079	0.038	13.6	70.4	0.77	0.49	12.9	0.58	0.28
700 lbs		10.73	5.9	3.7	1.8	0.078	0.039	15.3	70.2	0.77	0.49	11.8	0.51	0.25
800 lbs		11.84	6.5	4.1	1.84	0.077	0.04	16.9	70.1	0.77	0.49	10.9	0.46	0.23
	3													
400 lbs		7.5	3.9	3	1.87	0.094	0.042	9.8	76.4	0.86	0.57	19.1	0.96	0.43
500 lbs		8.86	4.6	3.5	1.9	0.092	0.042	11.6	76.3	0.86	0.57	16.4	0.79	0.37
600 lbs		10.18	5.3	4.1	1.93	0.09	0.043	13.3	76.5	0.86	0.57	14.5	0.68	0.32
700 lbs		11.39	5.9	4.5	1.96	0.089	0.043	15	76.2	0.85	0.56	13.1	0.59	0.29
800 lbs		12.58	6.5	5	1.99	0.087	0.044	16.5	76.1	0.85	0.56	12	0.53	0.26

Table 10. Feeder Yearlings (> 11 months of age) With Adjustments for Implant and Ionophore

Mature Weight and Range	Daily BW gain (lbs)	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
1,200 lbs	1													
600 lbs		8.39	5.3	1.4	1.26	0.042	0.023	15.8	53.1	0.51	0.25	8	0.26	0.15
700 lbs		9.39	5.9	1.5	1.33	0.043	0.025	17.7	53	0.51	0.25	7.5	0.24	0.14
800 lbs		10.36	6.5	1.7	1.4	0.045	0.027	19.6	53	0.51	0.25	7.2	0.23	0.14
900 lbs		11.31	7.1	1.8	1.47	0.046	0.028	21.4	52.9	0.51	0.25	6.9	0.22	0.13
1,000 lbs		12.25	7.7	2	1.53	0.048	0.03	23.1	52.9	0.51	0.25	6.6	0.21	0.13
1,100 lbs		13.18	8.3	2.1	1.59	0.049	0.032	24.9	53	0.51	0.25	6.4	0.2	0.13
	1.5													
600 lbs		9.18	5.3	2.1	1.47	0.053	0.028	16.1	57.1	0.57	0.31	9.2	0.33	0.17
700 lbs		10.28	5.9	2.4	1.53	0.054	0.029	18	57	0.57	0.31	8.5	0.3	0.16
800 lbs		11.35	6.5	2.6	1.58	0.054	0.03	19.9	56.9	0.57	0.31	7.9	0.27	0.15
900 lbs		12.4	7.1	2.9	1.63	0.055	0.032	21.8	56.9	0.57	0.31	7.5	0.25	0.15
1,000 lbs		13.43	7.7	3.1	1.68	0.056	0.033	23.6	56.9	0.57	0.31	7.1	0.24	0.14
1,100 lbs		14.45	8.3	3.4	1.73	0.057	0.035	25.3	57	0.57	0.31	6.8	0.22	0.14
	2													
600 lbs		9.91	5.3	2.9	1.68	0.064	0.032	16.1	61.4	0.64	0.37	10.4	0.4	0.2
700 lbs		11.1	5.9	3.3	1.72	0.064	0.033	18.1	61.3	0.64	0.37	9.5	0.35	0.18
800 lbs		12.25	6.5	3.6	1.75	0.063	0.034	20	61.2	0.63	0.37	8.8	0.32	0.17
900 lbs		13.39	7.1	4	1.79	0.063	0.035	21.9	61.2	0.63	0.37	8.2	0.29	0.16
1,000 lbs		14.5	7.7	4.3	1.82	0.063	0.036	23.7	61.2	0.63	0.37	7.7	0.27	0.15
1,100 lbs		15.59	8.3	4.6	1.86	0.063	0.037	25.4	61.3	0.64	0.37	7.3	0.25	0.15

Table 10. Feeder Yearlings (> 11 months of age) With Adjustments for Implant and Ionophore continued

Mature Weight and Range	Daily BW gain (lbs)	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
1,200 lbs	2.5													
600 lbs		10.58	5.3	3.7	1.88	0.075	0.037	16	66.2	0.71	0.44	11.8	0.47	0.23
700 lbs		11.86	5.9	4.2	1.9	0.074	0.037	18	66	0.71	0.44	10.6	0.41	0.21
800 lbs		13.09	6.5	4.6	1.92	0.073	0.038	19.8	66	0.71	0.43	9.7	0.37	0.19
900 lbs		14.3	7.1	5	1.94	0.072	0.038	21.7	65.9	0.71	0.43	9	0.33	0.18
1,000 lbs		15.49	7.7	5.5	1.96	0.071	0.039	23.5	66	0.71	0.43	8.4	0.3	0.17
1,100 lbs		16.64	8.3	5.9	1.98	0.07	0.04	25.2	66	0.71	0.44	7.9	0.28	0.16
	3													
600 lbs		11.21	5.3	4.5	2.08	0.086	0.041	15.6	71.8	0.79	0.51	13.3	0.55	0.26
700 lbs		12.56	5.9	5.1	2.09	0.083	0.041	17.6	71.6	0.79	0.51	11.9	0.48	0.23
800 lbs		13.88	6.5	5.6	2.09	0.081	0.041	19.4	71.5	0.79	0.51	10.8	0.42	0.21
900 lbs		15.16	7.1	6.2	2.09	0.08	0.042	21.2	71.5	0.79	0.51	9.9	0.38	0.2
1,000 lbs		16.41	7.7	6.7	2.1	0.078	0.042	22.9	71.6	0.79	0.51	9.1	0.34	0.18
1,100 lbs		17.64	8.3	7.2	2.1	0.076	0.043	24.6	71.6	0.79	0.51	8.5	0.31	0.17
	3.3													
600 lbs		11.58	5.3	5.1	2.2	0.092	0.044	15.3	75.8	0.85	0.56	14.4	0.6	0.28
700 lbs		12.96	5.9	5.7	2.19	0.089	0.043	17.2	75.5	0.84	0.56	12.8	0.52	0.25
800 lbs		14.32	6.5	6.3	2.19	0.087	0.044	19	75.4	0.84	0.56	11.5	0.46	0.23
900 lbs		15.65	7.1	6.8	2.18	0.084	0.044	20.7	75.4	0.84	0.56	10.5	0.41	0.21
1,000 lbs		16.94	7.7	7.4	2.17	0.082	0.044	22.4	75.5	0.84	0.56	9.7	0.37	0.2
1,100 lbs		18.21	8.3	8	2.17	0.08	0.044	24.1	75.6	0.85	0.56	9	0.33	0.18
1,400 lbs	1													
600 lbs		8.21	5.3	1.2	1.26	0.043	0.024	15.7	52.3	0.5	0.24	8	0.27	0.15
700 lbs		9.19	5.9	1.4	1.33	0.045	0.026	17.6	52.2	0.49	0.24	7.6	0.25	0.14
800 lbs		10.14	6.5	1.5	1.41	0.046	0.027	19.4	52.1	0.49	0.24	7.2	0.24	0.14
900 lbs		11.08	7.1	1.6	1.48	0.048	0.029	21.2	52.2	0.49	0.24	6.9	0.23	0.14
1,000 lbs		12	7.7	1.8	1.54	0.05	0.031	23	52.2	0.49	0.24	6.7	0.22	0.13
1,100 lbs		12.91	8.3	1.9	1.61	0.051	0.033	24.7	52.2	0.49	0.24	6.5	0.21	0.13
1,200 lbs		13.81	8.9	2	1.68	0.053	0.034	26.4	52.3	0.5	0.24	6.4	0.2	0.13
1,300 lbs		14.62	9.4	2.2	1.74	0.055	0.036	28	52.2	0.49	0.24	6.2	0.2	0.13
	1.5													
600 lbs		8.95	5.3	1.9	1.47	0.055	0.029	16	55.9	0.55	0.3	9.2	0.34	0.18
700 lbs		10.02	5.9	2.1	1.53	0.056	0.03	18	55.7	0.55	0.29	8.5	0.31	0.17
800 lbs		11.07	6.5	2.4	1.59	0.057	0.031	19.9	55.7	0.55	0.29	8	0.29	0.16
900 lbs		12.09	7.1	2.6	1.65	0.058	0.033	21.7	55.7	0.55	0.29	7.6	0.27	0.15
1,000 lbs		13.09	7.7	2.8	1.7	0.059	0.034	23.5	55.7	0.55	0.29	7.3	0.25	0.15
1,100 lbs		14.08	8.3	3	1.76	0.06	0.036	25.2	55.8	0.55	0.29	7	0.24	0.14
1,200 lbs		15.05	8.9	3.2	1.81	0.061	0.037	26.9	55.8	0.55	0.29	6.7	0.23	0.14
1,300 lbs		15.95	9.4	3.4	1.87	0.062	0.039	28.6	55.8	0.55	0.29	6.5	0.22	0.14

Table 10. Feeder Yearlings (> 11 months of age) With Adjustments for Implant and Ionophore continued

Mature Weight and Range	Daily BW gain (lbs)	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
1,400 lbs	2													
600 lbs		9.62	5.3	2.6	1.67	0.067	0.033	16.1	59.6	0.61	0.35	10.4	0.41	0.21
700 lbs		10.78	5.9	2.9	1.72	0.067	0.035	18.1	59.5	0.61	0.35	9.5	0.37	0.19
800 lbs		11.91	6.5	3.2	1.77	0.067	0.036	20	59.4	0.61	0.35	8.8	0.34	0.18
900 lbs		13.01	7.1	3.5	1.81	0.067	0.037	21.9	59.5	0.61	0.35	8.3	0.31	0.17
1,000 lbs		14.08	7.7	3.8	1.86	0.068	0.038	23.7	59.5	0.61	0.35	7.8	0.29	0.16
1,100 lbs		15.14	8.3	4.1	1.9	0.068	0.039	25.4	59.5	0.61	0.35	7.5	0.27	0.15
1,200 lbs		16.18	8.9	4.4	1.94	0.068	0.04	27.1	59.6	0.61	0.35	7.2	0.25	0.15
1,300 lbs		17.15	9.4	4.6	1.98	0.069	0.042	28.8	59.5	0.61	0.35	6.9	0.24	0.14
	2.5													
600 lbs		10.25	5.3	3.3	1.88	0.079	0.038	16.1	63.7	0.67	0.4	11.7	0.49	0.24
700 lbs		11.48	5.9	3.7	1.91	0.078	0.039	18.1	63.6	0.67	0.4	10.6	0.43	0.22
800 lbs		12.68	6.5	4.1	1.94	0.077	0.04	20	63.5	0.67	0.4	9.7	0.39	0.2
900 lbs		13.85	7.1	4.5	1.98	0.077	0.041	21.8	63.5	0.67	0.4	9.1	0.35	0.19
1,000 lbs		15	7.7	4.9	2.01	0.076	0.041	23.6	63.5	0.67	0.4	8.5	0.32	0.18
1,100 lbs		16.12	8.3	5.2	2.04	0.076	0.042	25.4	63.6	0.67	0.4	8	0.3	0.17
1,200 lbs		17.23	8.9	5.6	2.07	0.076	0.043	27.1	63.7	0.67	0.4	7.6	0.28	0.16
1,300 lbs		18.27	9.4	5.9	2.1	0.075	0.044	28.7	63.6	0.67	0.4	7.3	0.26	0.15
	3													
600 lbs		10.84	5.3	4.1	2.08	0.09	0.043	15.9	68.3	0.74	0.47	13.1	0.57	0.27
700 lbs		12.14	5.9	4.5	2.1	0.089	0.043	17.8	68.1	0.74	0.46	11.8	0.5	0.24
800 lbs		13.41	6.5	5	2.12	0.087	0.044	19.7	68	0.74	0.46	10.7	0.44	0.22
900 lbs		14.65	7.1	5.5	2.14	0.086	0.044	21.5	68.1	0.74	0.46	9.9	0.4	0.21
1,000 lbs		15.86	7.7	5.9	2.15	0.085	0.045	23.3	68.1	0.74	0.46	9.2	0.36	0.19
1,100 lbs		17.05	8.3	6.4	2.17	0.083	0.045	25	68.2	0.74	0.46	8.7	0.33	0.18
1,200 lbs		18.22	8.9	6.8	2.19	0.082	0.046	26.7	68.3	0.74	0.46	8.2	0.31	0.17
1,300 lbs		19.32	9.4	7.2	2.21	0.082	0.047	28.4	68.1	0.74	0.46	7.8	0.29	0.17
	3.3													
600 lbs		11.17	5.3	4.5	2.2	0.097	0.046	15.7	71.4	0.79	0.5	14.1	0.62	0.29
700 lbs		12.53	5.9	5.1	2.21	0.095	0.046	17.6	71.2	0.78	0.5	12.6	0.54	0.26
800 lbs		13.83	6.5	5.6	2.22	0.093	0.046	19.4	71.1	0.78	0.5	11.4	0.48	0.24
900 lbs		15.11	7.1	6.1	2.23	0.091	0.046	21.2	71.1	0.78	0.5	10.5	0.43	0.22
1,000 lbs		16.35	7.7	6.6	2.24	0.09	0.047	23	71.2	0.78	0.5	9.7	0.39	0.2
1,100 lbs		17.58	8.3	7.1	2.25	0.088	0.047	24.7	71.2	0.78	0.5	9.1	0.36	0.19
1,200 lbs		18.79	8.9	7.6	2.26	0.087	0.048	26.3	71.4	0.79	0.5	8.6	0.33	0.18
1,300 lbs		19.93	9.4	8	2.27	0.085	0.048	28	71.2	0.78	0.5	8.1	0.3	0.17

Table 11. Growing Bull Calves (< 12 months of age)

Mature Weight and Range	Daily BW Gain (lbs)	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
1,800 lbs	1													
500 lbs		6.87	5.3	0.8	1.15	0.043	0.023	11.3	60.5	0.6	0.34	10.1	0.38	0.2
600 lbs		7.89	6.1	1	1.23	0.045	0.025	13	60.6	0.6	0.34	9.5	0.35	0.19
700 lbs		8.82	6.8	1.1	1.31	0.047	0.026	14.6	60.4	0.6	0.34	9	0.32	0.18
800 lbs		9.75	7.5	1.2	1.39	0.049	0.028	16.1	60.4	0.6	0.34	8.6	0.3	0.17
900 lbs		10.66	8.2	1.3	1.47	0.051	0.03	17.6	60.4	0.6	0.34	8.3	0.29	0.17
	1.5													
500 lbs		7.4	5.3	1.4	1.36	0.057	0.028	11.5	64.3	0.66	0.39	11.8	0.49	0.25
600 lbs		8.5	6.1	1.5	1.43	0.058	0.03	13.2	64.4	0.66	0.39	10.9	0.44	0.23
700 lbs		9.53	6.8	1.8	1.51	0.059	0.031	14.8	64.2	0.66	0.39	10.2	0.4	0.21
800 lbs		10.51	7.5	2	1.58	0.061	0.033	16.4	64.2	0.66	0.39	9.6	0.37	0.2
900 lbs		11.49	8.2	2.1	1.64	0.062	0.035	17.9	64.2	0.66	0.39	9.2	0.35	0.19
	2													
500 lbs		7.91	5.3	1.9	1.57	0.071	0.034	11.6	68.4	0.72	0.45	13.6	0.61	0.29
600 lbs		9.09	6.1	2.2	1.63	0.071	0.035	13.3	68.6	0.72	0.45	12.3	0.54	0.26
700 lbs		10.17	6.8	2.5	1.7	0.072	0.036	14.9	68.3	0.72	0.45	11.4	0.48	0.24
800 lbs		11.23	7.5	2.6	1.76	0.072	0.038	16.4	68.3	0.72	0.44	10.7	0.44	0.23
900 lbs		12.27	8.2	3	1.81	0.073	0.039	18	68.3	0.72	0.45	10.1	0.41	0.22
	2.5													
500 lbs		8.38	5.3	2.4	1.78	0.084	0.039	11.5	73.1	0.79	0.51	15.5	0.73	0.34
600 lbs		9.63	6.1	2.7	1.83	0.084	0.04	13.1	73.3	0.79	0.51	13.9	0.64	0.31
700 lbs		10.78	6.8	3.2	1.88	0.084	0.041	14.8	73.1	0.79	0.51	12.7	0.57	0.28
800 lbs		11.9	7.5	3.3	1.93	0.084	0.042	16.3	72.9	0.78	0.5	11.8	0.51	0.26
900 lbs		13.01	8.2	3.7	1.98	0.084	0.043	17.8	73	0.79	0.5	11.1	0.47	0.24
	3													
500 lbs		8.49	5.3	2.5	1.99	0.101	0.046	11.4	74.3	0.8	0.52	17.4	0.89	0.4
600 lbs		9.75	6.1	2.9	2.04	0.101	0.047	13.1	74.5	0.81	0.52	15.6	0.77	0.36
700 lbs		10.92	6.8	3.2	2.09	0.101	0.048	14.7	74.3	0.8	0.52	14.2	0.68	0.33
800 lbs		12.06	7.5	3.6	2.14	0.1	0.049	16.3	74.2	0.8	0.52	13.2	0.62	0.3
900 lbs		13.18	8.2	3.9	2.19	0.1	0.05	17.8	74.2	0.8	0.52	12.3	0.56	0.28
2,200 lbs	1													
500 lbs		6.73	5.3	0.8	1.15	0.044	0.023	11.3	59.6	0.59	0.33	10.2	0.39	0.21
600 lbs		7.73	6.1	0.8	1.24	0.046	0.025	12.9	59.7	0.59	0.33	9.5	0.36	0.19
700 lbs		8.65	6.8	1	1.32	0.048	0.027	14.5	59.6	0.59	0.33	9.1	0.33	0.19
800 lbs		9.55	7.5	1.1	1.4	0.05	0.029	16	59.5	0.59	0.33	8.7	0.31	0.18
900 lbs		10.43	8.2	1.2	1.48	0.052	0.031	17.5	59.5	0.59	0.33	8.5	0.3	0.18
	1.5													
500 lbs		7.2	5.3	1.2	1.36	0.059	0.029	11.5	62.8	0.64	0.37	11.9	0.51	0.25
600 lbs		8.27	6.1	1.4	1.44	0.06	0.031	13.2	62.9	0.64	0.37	10.9	0.46	0.23
700 lbs		9.26	6.8	1.5	1.52	0.062	0.032	14.8	62.7	0.64	0.37	10.3	0.42	0.22
800 lbs		10.23	7.5	1.7	1.59	0.063	0.034	16.3	62.7	0.64	0.37	9.8	0.39	0.21
900 lbs		11.17	8.2	1.8	1.66	0.065	0.036	17.8	62.7	0.64	0.37	9.3	0.36	0.2

Table 11. Growing Bull Calves (< 12 months of age) continued

Mature Weight and Range	Daily BW Gain (lbs)	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
2,200 lbs	2													
500 lbs		7.66	5.3	1.6	1.57	0.073	0.035	11.6	66.3	0.69	0.42	13.6	0.63	0.3
600 lbs		8.8	6.1	1.9	1.64	0.074	0.036	13.3	66.4	0.69	0.42	12.4	0.56	0.27
700 lbs		9.84	6.8	2.1	1.71	0.075	0.038	14.9	66.2	0.69	0.42	11.5	0.5	0.25
800 lbs		10.87	7.5	2.3	1.78	0.076	0.039	16.4	66.1	0.69	0.42	10.8	0.46	0.24
900 lbs		11.88	8.2	2.6	1.84	0.077	0.041	18	66.1	0.69	0.42	10.3	0.43	0.23
	2.5													
500 lbs		8.09	5.3	2	1.78	0.087	0.041	11.5	70.1	0.74	0.47	15.4	0.76	0.35
600 lbs		9.29	6.1	2.4	1.84	0.087	0.042	13.2	70.2	0.75	0.47	13.9	0.66	0.31
700 lbs		10.4	6.8	2.7	1.9	0.088	0.043	14.9	70	0.74	0.47	12.8	0.59	0.29
800 lbs		11.48	7.5	2.9	1.96	0.088	0.044	16.4	69.9	0.74	0.47	11.9	0.54	0.27
900 lbs		12.55	8.2	3.2	2.02	0.089	0.045	17.9	69.9	0.74	0.47	11.2	0.49	0.25
	3													
500 lbs		8.49	5.3	2.5	1.99	0.101	0.046	11.4	74.3	0.8	0.52	17.4	0.89	0.4
600 lbs		9.75	6.1	2.9	2.04	0.101	0.047	13.1	74.5	0.81	0.52	15.6	0.77	0.36
700 lbs		10.92	6.8	3.2	2.09	0.101	0.048	14.7	74.3	0.8	0.52	14.2	0.68	0.33
800 lbs		12.06	7.5	3.6	2.14	0.1	0.049	16.3	74.2	0.8	0.52	13.2	0.62	0.3
900 lbs		13.18	8.2	3.9	2.19	0.1	0.05	17.8	74.2	0.8	0.52	12.3	0.56	0.28

Table 12. Growing Bull Yearlings (> 11 months of age)

Mature Weight and Range	Daily BW Gain (lbs)	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
1,800 lbs	1													
900 lbs		11.5	8.2	1.4	1.55	0.051	0.03	20.9	55.2	0.52	0.27	7.4	0.24	0.14
1,000 lbs		12.46	8.9	1.5	1.62	0.053	0.032	22.6	55.2	0.52	0.27	7.2	0.23	0.14
1,100 lbs		13.35	9.5	1.6	1.69	0.055	0.034	24.2	55.1	0.52	0.27	7	0.22	0.14
1,200 lbs		14.29	10.2	1.7	1.76	0.056	0.036	25.9	55.2	0.52	0.27	6.8	0.22	0.14
1,300 lbs		15.15	10.8	1.8	1.83	0.058	0.037	27.5	55.1	0.52	0.27	6.6	0.21	0.14
1,400 lbs		16	11.4	1.9	1.89	0.06	0.039	29	55.1	0.52	0.27	6.5	0.21	0.14
	1.5													
900 lbs		12.35	8.2	2.1	1.76	0.062	0.035	21.1	58.5	0.57	0.31	8.3	0.29	0.16
1,000 lbs		13.39	8.9	2.3	1.82	0.063	0.036	22.9	58.5	0.57	0.31	8	0.28	0.16
1,100 lbs		14.34	9.5	2.5	1.88	0.065	0.038	24.6	58.4	0.57	0.31	7.7	0.26	0.15
1,200 lbs		15.34	10.2	2.6	1.94	0.066	0.039	26.2	58.5	0.57	0.31	7.4	0.25	0.15
1,300 lbs		16.28	10.8	2.7	1.99	0.068	0.041	27.8	58.5	0.57	0.31	7.2	0.24	0.15
1,400 lbs		17.2	11.4	2.9	2.05	0.069	0.043	29.4	58.4	0.57	0.31	7	0.23	0.15

Table 12. Growing Bull Yearlings (> 11 months of age) continued

Mature Weight and Range	Daily BW Gain (lbs)	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
1,800 lbs	2													
900 lbs		13.14	8.2	2.9	1.97	0.073	0.039	21.2	61.9	0.62	0.36	9.3	0.34	0.18
1,000 lbs		14.23	8.9	3.2	2.02	0.074	0.04	22.9	62	0.63	0.36	8.8	0.32	0.18
1,100 lbs		15.25	9.5	3.3	2.06	0.074	0.042	24.6	61.9	0.62	0.36	8.4	0.3	0.17
1,200 lbs		16.31	10.2	3.6	2.11	0.075	0.043	26.3	62	0.63	0.36	8	0.29	0.16
1,300 lbs		17.31	10.8	3.8	2.16	0.076	0.045	27.9	61.9	0.62	0.36	7.7	0.27	0.16
1,400 lbs		18.29	11.4	4	2.2	0.077	0.046	29.5	61.9	0.62	0.36	7.5	0.26	0.16
	2.5													
900 lbs		13.87	8.2	3.7	2.17	0.084	0.043	21.1	65.7	0.68	0.41	10.3	0.4	0.21
1,000 lbs		15.03	8.9	4	2.21	0.084	0.045	22.8	65.8	0.68	0.41	9.7	0.37	0.19
1,100 lbs		16.1	9.5	4.3	2.24	0.084	0.046	24.5	65.6	0.68	0.41	9.1	0.34	0.19
1,200 lbs		17.23	10.2	4.6	2.28	0.084	0.047	26.2	65.8	0.68	0.41	8.7	0.32	0.18
1,300 lbs		18.27	10.8	4.9	2.32	0.085	0.048	27.8	65.7	0.68	0.41	8.3	0.3	0.17
1,400 lbs		19.31	11.4	5.2	2.35	0.085	0.049	29.4	65.7	0.68	0.41	8	0.29	0.17
	3													
900 lbs		14.56	8.2	4.6	2.37	0.094	0.048	20.8	69.9	0.74	0.47	11.4	0.45	0.23
1,000 lbs		15.78	8.9	4.9	2.4	0.094	0.049	22.5	70	0.74	0.47	10.6	0.42	0.22
1,100 lbs		16.91	9.5	5.2	2.42	0.094	0.05	24.2	69.8	0.74	0.46	10	0.39	0.2
1,200 lbs		18.09	10.2	5.7	2.45	0.093	0.05	25.9	70	0.74	0.47	9.5	0.36	0.2
1,300 lbs		19.19	10.8	6.1	2.47	0.093	0.051	27.5	69.9	0.74	0.47	9	0.34	0.19
1,400 lbs		20.28	11.4	6.3	2.5	0.093	0.052	29	69.8	0.74	0.46	8.6	0.32	0.18
	3.5													
900 lbs		15.23	8.2	5.4	2.57	0.105	0.052	20.4	74.7	0.81	0.53	12.6	0.52	0.26
1,000 lbs		16.49	8.9	5.9	2.58	0.104	0.053	22.1	74.8	0.81	0.53	11.7	0.47	0.24
1,100 lbs		17.69	9.5	6.2	2.6	0.103	0.053	23.7	74.6	0.81	0.52	11	0.43	0.22
1,200 lbs		18.91	10.2	6.7	2.61	0.102	0.054	25.3	74.8	0.81	0.53	10.3	0.4	0.21
1,300 lbs		20.06	10.8	7.2	2.62	0.101	0.055	26.9	74.7	0.81	0.53	9.8	0.38	0.2
1,400 lbs		21.2	11.4	7.4	2.64	0.1	0.055	28.4	74.7	0.81	0.52	9.3	0.35	0.2
2,200 lbs	1													
900 lbs		11.27	8.2	1.2	1.54	0.052	0.031	20.7	54.3	0.51	0.25	7.4	0.25	0.15
1,000 lbs		12.21	8.9	1.3	1.62	0.054	0.033	22.5	54.4	0.51	0.26	7.2	0.24	0.15
1,100 lbs		13.08	9.5	1.4	1.69	0.057	0.035	24.1	54.3	0.51	0.25	7	0.23	0.14
1,200 lbs		14	10.2	1.5	1.76	0.059	0.036	25.7	54.4	0.51	0.26	6.9	0.23	0.14
1,300 lbs		14.85	10.8	1.5	1.83	0.061	0.038	27.3	54.3	0.51	0.25	6.7	0.22	0.14
1,400 lbs		15.68	11.4	1.6	1.9	0.063	0.04	28.9	54.3	0.51	0.25	6.6	0.22	0.14
1,500 lbs		16.51	12	1.7	1.97	0.065	0.042	30.4	54.3	0.51	0.25	6.5	0.21	0.14
1,600 lbs		17.33	12.6	1.8	2.04	0.067	0.044	31.9	54.3	0.51	0.25	6.4	0.21	0.14
1,700 lbs		18.15	13.2	1.9	2.1	0.069	0.046	33.4	54.3	0.51	0.25	6.3	0.21	0.14
1,800 lbs		18.96	13.8	2	2.17	0.072	0.048	34.9	54.3	0.51	0.25	6.2	0.21	0.14

Table 12. Growing Bull Yearlings (> 11 months of age) continued

Mature Weight and Range	Daily BW Gain (lbs)	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
2,200 lbs	1.5													
900 lbs		12.03	8.2	1.8	1.75	0.065	0.036	21	57.2	0.55	0.3	8.3	0.31	0.17
1,000 lbs		13.03	8.9	2	1.82	0.066	0.037	22.8	57.2	0.55	0.3	8	0.29	0.16
1,100 lbs		13.97	9.5	2.1	1.89	0.068	0.039	24.5	57.1	0.55	0.29	7.7	0.28	0.16
1,200 lbs		14.94	10.2	2.3	1.95	0.069	0.041	26.1	57.2	0.55	0.3	7.5	0.27	0.16
1,300 lbs		15.86	10.8	2.4	2.01	0.071	0.043	27.7	57.2	0.55	0.3	7.3	0.26	0.15
1,400 lbs		16.74	11.4	2.5	2.07	0.073	0.044	29.3	57.1	0.55	0.29	7.1	0.25	0.15
1,500 lbs		17.64	12	2.6	2.13	0.075	0.046	30.9	57.1	0.55	0.29	6.9	0.24	0.15
1,600 lbs		18.51	12.6	2.8	2.19	0.076	0.048	32.4	57.1	0.55	0.29	6.8	0.24	0.15
1,700 lbs		19.38	13.2	2.9	2.25	0.078	0.05	33.9	57.1	0.55	0.29	6.6	0.23	0.15
1,800 lbs		20.24	13.8	3.1	2.31	0.08	0.051	35.4	57.2	0.55	0.3	6.5	0.23	0.15
	2													
900 lbs		12.74	8.2	2.6	1.96	0.077	0.041	21.2	60.1	0.6	0.34	9.3	0.36	0.19
1,000 lbs		13.8	8.9	2.7	2.02	0.078	0.042	22.9	60.2	0.6	0.34	8.8	0.34	0.18
1,100 lbs		14.79	9.5	3	2.08	0.079	0.044	24.6	60.1	0.6	0.34	8.4	0.32	0.18
1,200 lbs		15.82	10.2	3.2	2.13	0.08	0.045	26.3	60.2	0.6	0.34	8.1	0.3	0.17
1,300 lbs		16.79	10.8	3.4	2.19	0.081	0.047	27.9	60.1	0.6	0.34	7.8	0.29	0.17
1,400 lbs		17.74	11.4	3.6	2.24	0.082	0.048	29.5	60.1	0.6	0.34	7.6	0.28	0.16
1,500 lbs		18.67	12	3.8	2.29	0.084	0.05	31.1	60.1	0.6	0.34	7.4	0.27	0.16
1,600 lbs		19.6	12.6	3.9	2.34	0.085	0.051	32.6	60.1	0.6	0.34	7.2	0.26	0.16
1,700 lbs		20.52	13.2	4.1	2.39	0.086	0.053	34.1	60.1	0.6	0.34	7	0.25	0.16
1,800 lbs		21.43	13.8	4.3	2.44	0.088	0.055	35.6	60.1	0.6	0.34	6.9	0.25	0.15
	2.5													
900 lbs		13.41	8.2	3.2	2.17	0.089	0.045	21.2	63.3	0.64	0.38	10.2	0.42	0.21
1,000 lbs		14.52	8.9	3.5	2.21	0.089	0.047	22.9	63.3	0.65	0.38	9.7	0.39	0.2
1,100 lbs		15.56	9.5	3.7	2.26	0.09	0.048	24.6	63.2	0.64	0.38	9.2	0.36	0.19
1,200 lbs		16.65	10.2	4	2.31	0.09	0.049	26.3	63.3	0.65	0.38	8.8	0.34	0.19
1,300 lbs		17.66	10.8	4.2	2.35	0.091	0.051	27.9	63.3	0.64	0.38	8.4	0.33	0.18
1,400 lbs		18.66	11.4	4.4	2.4	0.092	0.052	29.5	63.2	0.64	0.38	8.1	0.31	0.18
1,500 lbs		19.64	12	4.7	2.44	0.093	0.053	31.1	63.2	0.64	0.38	7.9	0.3	0.17
1,600 lbs		20.63	12.6	4.9	2.49	0.093	0.055	32.6	63.2	0.64	0.38	7.6	0.29	0.17
1,700 lbs		21.59	13.2	5.1	2.53	0.094	0.056	34.1	63.2	0.64	0.38	7.4	0.28	0.16
1,800 lbs		22.55	13.8	5.3	2.57	0.095	0.058	35.6	63.3	0.64	0.38	7.2	0.27	0.16
	3													
900 lbs		14.04	8.2	3.9	2.37	0.1	0.05	21.1	66.6	0.69	0.42	11.2	0.48	0.24
1,000 lbs		15.2	8.9	4.2	2.41	0.1	0.051	22.8	66.7	0.69	0.42	10.6	0.44	0.22
1,100 lbs		16.29	9.5	4.5	2.45	0.1	0.052	24.5	66.5	0.69	0.42	10	0.41	0.21
1,200 lbs		17.43	10.2	4.8	2.48	0.1	0.053	26.1	66.7	0.69	0.42	9.5	0.38	0.2
1,300 lbs		18.49	10.8	5.1	2.52	0.101	0.055	27.7	66.6	0.69	0.42	9.1	0.36	0.2
1,400 lbs		19.54	11.4	5.4	2.56	0.101	0.056	29.3	66.6	0.69	0.42	8.7	0.34	0.19
1,500 lbs		20.58	12	5.7	2.59	0.101	0.057	30.9	66.6	0.69	0.42	8.4	0.33	0.18
1,600 lbs		21.59	12.6	5.9	2.63	0.102	0.058	32.4	66.6	0.69	0.42	8.1	0.31	0.18
1,700 lbs		22.61	13.2	6.2	2.66	0.102	0.059	33.9	66.6	0.69	0.42	7.8	0.3	0.17
1,800 lbs		23.61	13.8	6.5	2.7	0.102	0.061	35.4	66.7	0.69	0.42	7.6	0.29	0.17

Table 12. Growing Bull Yearlings (> 11 months of age) continued

Mature Weight and Range	Daily BW Gain (lbs)	Daily Nutrients Required						Daily Nutrients as Percentage of Intake						
		TDN (lbs)	NEm (Mcal)	NEg (Mcal)	CP (lbs)	Ca (lbs)	P (lbs)	Intake lbs DM/d	TDN %DM	NEm Mcal/lb	NEg Mcal/lb	CP %DM	Ca %DM	P %DM
2,200 lbs	3.5													
900 lbs		14.64	8.2	4.6	2.57	0.112	0.055	20.8	70.4	0.75	0.47	12.3	0.54	0.26
1,000 lbs		15.85	8.9	5	2.6	0.111	0.056	22.5	70.4	0.75	0.47	11.5	0.49	0.25
1,100 lbs		17	9.5	5.4	2.63	0.111	0.057	24.2	70.3	0.75	0.47	10.9	0.46	0.23
1,200 lbs		18.18	10.2	5.7	2.66	0.111	0.057	25.8	70.4	0.75	0.47	10.3	0.43	0.22
1,300 lbs		19.28	10.8	6.1	2.69	0.11	0.058	27.4	70.3	0.75	0.47	9.8	0.4	0.21
1,400 lbs		20.37	11.4	6.5	2.71	0.11	0.059	29	70.3	0.75	0.47	9.4	0.38	0.2
1,500 lbs		21.45	12	6.8	2.74	0.11	0.06	30.5	70.3	0.75	0.47	9	0.36	0.2
1,600 lbs		22.52	12.6	7.1	2.77	0.11	0.061	32	70.3	0.75	0.47	8.6	0.34	0.19
1,700 lbs		23.57	13.2	7.5	2.79	0.11	0.062	33.5	70.3	0.75	0.47	8.3	0.33	0.19
1,800 lbs		24.62	13.8	7.8	2.82	0.11	0.063	35	70.4	0.75	0.47	8.1	0.31	0.18
Mature Maintenance														
1,800 lbs		16	13.8		1.86	0.053	0.041	32.7	48.9	0.42	0.18	5.7	0.16	0.12
2,200 lbs		18.6	16		2.16	0.065	0.05	38	48.9	0.42	0.18	5.7	0.17	0.13

▼ Beef Cattle Nutrition Series Publications

This publication is one component of a series.

Part 1. Nutrient Basics (FSA3078)

Part 2. Establishing Nutritional Requirements (FSA3079)

Part 3. Nutrient Requirement Tables (MP391)

Part 4. Formulating Rations (FSA3080)

Some of the information in this publication was taken from *Nutrient Requirements of Beef Cattle, Eighth Edition* (2016 NRC). Tabular values were compiled from the Beef Cattle Nutrient Requirements Model 2016 Version 1.0.37.9 or software provided with the 1996 NRC publication.

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