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Feed Ingredient Composition for Beef Cattle

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It is essential to know feedstuff nutrient content in order to properly formulate beef cattle diets. This publication provides estimates of the nutrient composition of feedstuffs that are used commonly in Missouri. Estimates presented in the following table are adapted from *Nutrient Requirements of Beef Cattle*, 7th Revised Edition, (National Research Council, 2000). Readers are reminded that the true nutrient content of feedstuffs varies. Tabular nutrient values such as those depicted in this publication should not be interpreted as guarantees of nutritional value. They are to serve only as guides when comparing the relative value of feedstuffs. They should not be used to replace compositional analysis of feedstuffs or quality control procedures. Readers are directed to pay close attention to the units of measure for individual nutrient analyses. When comparing feedstuffs, make sure that the units of measure are the same. Nutrient analyses in relation to feedstuff cost are not the only means by which to compare the economic value of feedstuffs. Some feedstuffs have intrinsic value as sources of fiber, sources of oil, mixing agents, or flavoring agents that are not reflected by nutrient analyses.

This publication uses abbreviations to refer to specific nutrients or chemical components of feedstuffs. All abbreviations are defined as follows:

DM = Dry matter = the moisture-free portion of a feedstuff

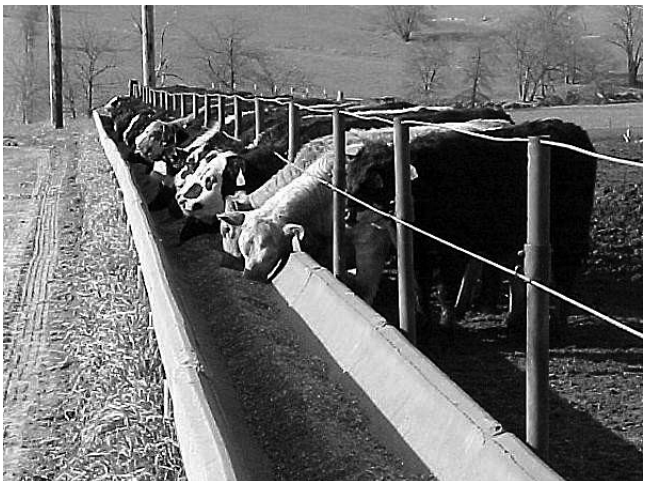
TDN = Total digestible nutrients = the adjusted sum of digestible protein, fat, and nitrogen-free extract contained in a feedstuff

NEm = Net energy for maintenance = a measure of the efficiency with which metabolizable energy is used for maintenance

NEg = Net energy for gain = a measure of the efficiency with which metabolizable energy is used for tissue growth

CP = Crude protein = the percentage of nitrogen in a feedstuff multiplied by 6.25

RDP = Ruminally degradable protein = the proportion of CP that is available for degradation by ruminal microbes



NDF = Neutral detergent fiber = a functional measurement of the cellulose, hemicellulose, and lignin in a feedstuff

eNDF = Effective neutral detergent fiber = the proportion of NDF that provides ruminal health-sustaining plant fiber to the diet

Mcal = Megacalorie = 1000 kilocalories = a unit of measurement of dietary energy

IU = International unit = a pharmaceutical unit of measurement

ppm = Parts per million = a unit of measurement that is equivalent to milligrams per kilogram

Many of the feedstuffs listed in this publication are byproducts of grain or oilseed milling. Nutrient composition of these types of feedstuffs typically varies over time and between dealers. This is particularly true of mineral values. Purchasers of byproduct feedstuffs are encouraged to request guaranteed analyses from feed dealers or to submit a representative sample for compositional analysis to a reputable nutrition laboratory. Nutrition laboratories can be located through the University of Missouri Agricultural Electronic Bulletin Board (http://agebb.missouri.edu/haylst/t_labs.htm).

Common name	DM (%AF)	TDN (%DM)	NEm (Mcal/lb)	NEg (Mcal/lb)	CP (%DM)	RDP (%CP)	NDF (%DM)	eNDF (% NDF)	Fat (%DM)	Calcium (%DM)	Phos-phorus (%DM)	Magne-sium (%DM)	Potas-sium (%DM)	Sulfur (%DM)	Sodium (%DM)	Vitamin A (1000 IU/lb)	Vitamin D (1000 IU/lb)	Vitamin E (IU/lb)	Selenium (ppm)	Zinc (ppm)	Copper (ppm)	Man-ganese (ppm)	Cobalt (ppm)	Iodine (ppm)	Iron (ppm)
Byproducts feeds																									
Apple pomace	22.00	68.90	0.73	0.45	5.40	48.21	41.00	34.00	4.70	0.23	0.11	0.00	0.53	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bakery waste	92.00	89.00	1.00	0.69	9.00	75.60	18.00	0.00	12.70	0.15	0.24	0.18	0.43	0.02	1.12	3.49	0.00	20.36	0.00	19.50	12.10	71.20	1.34	0.00	180.00
Barley malt sprouts	93.00	71.00	0.76	0.48	28.10	64.17	46.00	34.00	1.40	0.19	0.68	0.18	0.27	0.85	0.95	0.00	0.00	1.81	0.45	60.70	6.30	31.70	0.00	0.00	200.00
Beet pulp, dry	91.00	74.00	0.80	0.52	9.80	42.63	44.60	33.00	0.60	0.68	0.10	0.28	0.22	0.22	0.20	0.18	0.27	0.00	0.12	1.00	13.80	37.70	0.08	0.00	293.00
Brewers grain, dry	92.00	66.00	0.68	0.41	29.20	34.12	48.70	18.00	10.80	0.29	0.70	0.27	0.58	0.40	0.15	0.36	0.00	13.15	0.76	82.00	11.30	44.00	0.08	0.07	221.00
Brewers grain, wet	30.00	70.00	0.74	0.47	26.00	40.86	42.00	18.00	6.50	0.29	0.70	0.27	0.58	0.34	0.15	0.36	0.00	13.15	0.00	106.00	11.30	40.90	0.10	0.07	270.00
Corn bran	91.00	76.00	0.81	0.52	11.00	0.00	0.00	4.00	6.30	0.04	0.15	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corn distillers grain + solubles, dry	25.00	88.00	0.99	0.68	29.50	27.19	46.00	4.00	10.30	0.32	0.83	0.33	1.07	0.40	0.24	0.54	0.00	22.40	0.40	67.80	10.56	27.60	0.18	0.09	560.00
Corn distillers grain + solubles, wet	91.00	88.00	0.99	0.68	29.70	45.09	23.00	4.00	9.20	0.32	1.40	0.65	1.83	0.40	0.24	0.54	0.00	22.40	0.40	94.80	83.90	77.60	0.18	0.09	560.00
Corn distillers grain, dry	91.00	88.00	0.99	0.68	30.40	27.97	46.00	4.00	9.80	0.32	1.40	0.65	1.83	0.40	0.24	0.54	0.00	22.40	0.40	94.80	83.90	77.60	0.18	0.09	560.00
Corn distillers grain, wet	25.00	90.00	1.02	0.70	26.00	33.40	40.00	4.00	9.90	0.32	1.40	0.65	1.83	0.40	0.24	0.54	0.00	22.40	0.40	94.80	83.90	77.60	0.18	0.09	560.00
Corn distillers solubles, condensed	30.00	88.00	0.99	0.68	29.70	0.00	23.00	4.00	9.20	0.35	1.47	0.65	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corn gluten feed	90.00	80.00	0.88	0.59	23.80	75.00	36.20	36.00	3.91	0.07	0.95	0.40	1.40	0.47	0.26	0.45	0.00	42.63	0.30	73.30	6.98	22.10	0.01	0.07	226.00
Corn hominy	90.00	91.00	1.03	0.71	11.50	47.49	23.00	0.00	7.30	0.05	0.57	0.26	0.65	0.03	0.09	0.00	0.00	0.00	0.00	0.00	15.10	16.10	0.06	0.00	80.00
Grape pomace	90.00	33.00	0.15	-0.08	0.00	100.00	55.00	33.00	7.90	0.58	0.17	0.10	0.91	0.00	0.09	0.00	0.00	0.00	0.00	24.20	0.00	40.70	0.00	0.00	0.00
Rice bran	90.50	70.00	0.74	0.47	14.40	50.96	33.00	0.00	15.00	0.10	1.73	0.97	1.89	0.20	0.03	0.00	0.00	30.25	0.44	33.00	12.20	396.00	1.53	0.00	229.00
Soybean flour, cake	90.00	80.30	0.89	0.59	27.50	50.00	38.00	0.00	12.00	0.96	0.31	0.05	1.33	0.31	0.59	0.00	0.00	0.00	0.00	9.30	13.23	17.60	0.00	0.00	141.00
Soybean hulls	91.00	80.00	0.88	0.59	12.20	58.00	66.30	2.00	2.10	0.53	0.18	0.22	1.29	0.11	0.03	0.00	0.00	1.68	0.14	48.00	17.80	10.00	0.12	0.00	409.00
Wheat middlings	89.00	83.00	0.92	0.62	18.40	77.15	35.00	2.00	3.20	0.15	1.00	0.38	1.10	0.19	0.01	2.63	0.00	12.20	0.83	109.10	11.00	128.30	0.11	0.12	110.00
Whey, dry	93.00	71.00	0.76	0.48	17.90	100.00	0.00	0.00	1.10	1.60	1.18	0.23	3.16	1.15	1.54	0.00	0.00	0.00	0.06	8.40	7.50	8.60	0.00	10.55	270.00
Whey, wet	7.00	78.00	0.85	0.56	14.20	100.00	0.00	0.00	0.70	0.81	0.71	0.00	2.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.20	0.00	0.00	290.00
Ration conditioners																									
Corn distillers solubles, condensed	30.00	88.00	0.99	0.68	29.70	0.00	23.00	4.00	9.20	0.35	1.47	0.65	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molasses, beet	77.90	75.00	0.81	0.53	8.50	100.00	0.00	0.00	0.00	0.15	0.03	0.29	6.06	0.60	1.48	0.00	0.00	0.00	0.00	18.00	21.60	6.00	0.47	0.00	87.00
Molasses, cane	74.30	72.00	0.77	0.49	5.80	100.00	0.00	0.00	0.00	1.00	0.10	0.42	4.01	0.47	0.22	0.00	0.00	3.17	0.00	21.00	65.70	59.00	1.59	2.10	263.00
Fats and oils																									
Calcium soaps	95.30	163.50	2.28	1.56	0.00	0.00	0.00	0.00	84.50	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrolyzed tallow fatty acids	99.80	176.30	2.45	1.69	0.00	0.00	0.00	0.00	99.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Partially hygrogenated tallow	100.00	96.60	1.35	0.93	0.00	0.00	0.00	0.00	99.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tallow	99.80	147.40	2.05	1.41	0.00	0.00	0.00	0.00	99.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vegetable oil	100.00	184.00	2.56	1.76	0.00	0.00	0.00	0.00	99.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forages																									
Alfalfa hay	91.00	66.00	0.68	0.41	30.00	90.00	33.00	92.00	4.00	1.50	0.33	0.21	2.51	0.54	0.12	36.28	0.00	0.00	0.55	37.40	11.40	47.10	0.29	0.00	240.00
Alfalfa hay	91.00	60.00	0.59	0.33	25.00	88.00	39.30	92.00	2.90	1.41	0.22	0.34	2.51	0.30	0.12	25.40	0.91	11.79	0.55	30.00	12.70	36.00	0.29	0.17	240.00
Alfalfa hay	91.00	55.00	0.52	0.26	17.00	82.00	48.80	92.00	3.40	1.19	0.24	0.27	1.56	0.27	0.07	11.79	0.91	4.99	0.00	26.10	9.90	42.30	0.23	0.13	155.00
Alfalfa hay	91.00	50.00	0.44	0.19	14.00	79.00	58.00	92.00	1.30	1.18	0.21	0.22	2.07	0.25	0.08	8.75	0.45	0.00	0.55	22.10	13.70	38.50	0.41	0.00	170.00
Alfalfa meal, dehydrated	90.00	59.00	0.58	0.32	17.30	54.00	55.40	92.00	2.40	1.38	0.25	0.29	2.46	0.21	0.08	14.97	0.00	41.27	0.31	21.00	10.50	31.00	0.19	0.13	309.00
Bermudagrass hay	91.00	49.00	0.42	0.18	7.80	85.00	76.60	98.00	2.70	0.26	0.18	0.13	1.30	0.21	0.08	61.77	0.00	0.00	0.00	20.00	9.00	0.00	0.12	0.00	290.00
Birdsfoot trefoil hay	91.00	59.00	0.58	0.32	15.90	82.00	47.50	98.00	2.10	1.70	0.23	0.51	1.92	0.25	0.07	34.01	0.68	0.00	0.00	77.00	9.26	29.00	0.11	0.00	227.00
Brome hay	88.00	60.00	0.59	0.33	16.00	79.00	55.00	98.00	2.60	0.32	0.37	0.09	2.32	0.20	0.02	49.16	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brome hay	88.00	56.00	0.53	0.28	14.40	79.00	57.70	98.00	2.20	0.29	0.28	0.10	1.99	0.00	0.01	11.79	0.00	0.00	0.00	30.00	25.00	40.00	0.58	0.00	91.00
Brome hay	91.00	55.00	0.52	0.26	10.00	59.00	68.00	98.00	2.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brome hay	92.00	53.00	0.49	0.23	6.00	48.00	70.50	98.00	2.00	0.26	0.22	0.12	1.85	0.00	0.01	6.80	0.45	0.00	0.00	24.00	10.40	73.00	0.00	0.00	80.00
Caucasian bluestem	88.00	52.00	0.50	0.20	9.60	65.00	76.00	100.00	1.80	0.21	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fescue hay	91.00	61.00	0.61	0.35	15.00	82.00	62.20	98.00	5.50	0.51	0.37	0.27	2.30	0.18	0.00	0.00	0.00	0.00	0.00	22.00	0.00	0.00	0.00	0.00	0.00
Fescue hay	91.00	58.00	0.56	0.31	12.90	77.00	67.00	98.00	5.30	0.43	0.32	0.17	2.30	0.26	0.00	0.00	0.00	0.00	0.00	0.00	28.00	103.00	38.00	0.00	0.00
Fescue hay	91.00	44.00	0.34	0.01	10.80	86.00	70.00	98.00	4.70	0.41	0.30	0.16	1.96	0.00	0.02	0.00	0.00	0.00	0.00	35.00	22.00	97.00	0.00	0.00	132.00
Fescue - legume pasture (spring)	20.00	62.00	0.64	0.35	16.00	75.00	40.00	98.00	4.00	0.78	0.25	0.14	2.32	0.22	0.01	0.00	0.00	0.00	0.00	18.00	7.00	41.00	0.00	0.00	135.00
Fescue - legume pasture (summer)	28.00	43.00	0.33	0.08	8.00	75.00	67.00	98.00	4.00	1.02	0.31	0.33	2.26	0.29	0.01	0.00	0.00	0.00	0.00	33.00	10.00	62.00	0.00	0.00	195.00

Common name	DM (%AF)	TDN (%DM)	NEm (Mcal/lb)	NEg (Mcal/lb)	CP (%DM)	RDP (%CP)	NDF (%DM)	eNDF (% NDF)	Fat (%DM)	Calcium (%DM)	Phos-phorus (%DM)	Magne-sium (%DM)	Potas-sium (%DM)	Sulfur (%DM)	Sodium (%DM)	Vitamin A (1000 IU/lb)	Vitamin D (1000 IU/lb)	Vitamin E (IU/lb)	Selenium (ppm)	Zinc (ppm)	Copper (ppm)	Man-ganese (ppm)	Cobalt (ppm)	Iodine (ppm)	Iron (ppm)
Fescue - legume pasture (fall)	22.00	59.00	0.58	0.28	12.00	75.00	45.00	98.00	4.00	0.60	0.28	0.27	2.58	0.28	0.01	0.00	0.00	0.00	0.00	25.00	8.00	97.00	0.00	0.00	210.00
Fescue - legume pasture (winter)	30.00	43.00	0.33	0.08	6.00	75.00	67.00	98.00	4.00	0.60	0.19	0.19	1.14	0.18	0.01	0.00	0.00	0.00	0.00	23.00	6.00	82.00	0.00	0.00	494.00
Fescue pasture (stockpiled)	25.00	59.00	0.58	0.28	12.00	75.00	50.00	98.00	4.00	0.60	0.21	0.19	1.14	0.18	0.01	0.00	0.00	0.00	0.00	23.00	6.00	80.00	0.00	0.00	494.00
Ladino clover hay	89.00	60.00	0.59	0.33	22.40	86.00	36.00	92.00	2.70	1.45	0.33	0.47	2.44	0.21	0.13	14.97	0.00	0.00	0.00	17.00	9.41	123.00	0.16	0.30	470.00
Oat hay	91.00	53.00	0.49	0.23	9.50	68.00	63.00	98.00	2.40	0.32	0.25	0.29	1.49	0.23	0.18	22.49	0.91	0.00	0.00	45.00	4.80	99.00	0.07	0.00	406.00
Orchardgrass hay	89.00	65.00	0.67	0.40	12.80	77.00	59.60	98.00	2.90	0.27	0.34	0.11	2.91	0.26	0.01	6.80	0.00	0.00	0.00	40.00	19.00	157.00	0.43	0.00	93.00
Orchardgrass hay	90.60	54.00	0.50	0.25	8.40	64.00	65.00	98.00	3.40	0.26	0.30	0.11	2.67	0.00	0.01	3.63	0.00	0.00	0.03	38.00	20.00	167.00	0.30	20.00	84.00
Red clover hay	88.00	55.00	0.52	0.26	15.00	80.00	46.90	92.00	2.80	1.38	0.24	0.38	1.81	0.16	0.18	3.63	0.86	0.00	0.00	17.00	11.00	108.00	0.16	0.25	238.00
Reed canarygrass hay	89.00	55.00	0.52	0.26	10.30	71.00	64.00	92.00	3.10	0.36	0.24	0.22	2.91	0.00	0.02	14.33	0.00	0.00	0.00	0.00	11.90	92.40	0.00	0.00	150.00
Ryegrass hay	88.00	64.00	0.65	0.39	8.60	65.00	41.00	98.00	2.20	0.00	0.00	0.00	0.00	0.00	0.00	90.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sorghum sudan hay	91.00	56.01	0.53	0.28	11.30	69.00	66.00	98.00	1.80	0.51	0.31	0.37	2.08	0.06	0.02	0.00	0.00	0.00	0.00	38.00	31.40	76.30	0.13	0.00	170.00
Sorghum-sudan pasture	18.00	65.00	0.67	0.40	16.80	88.00	55.00	41.00	3.90	0.49	0.44	0.35	2.14	0.11	0.00	138.14	0.00	0.00	0.00	0.00	35.90	81.40	0.13	0.00	210.00
Timothy hay	89.00	59.00	0.58	0.32	10.80	73.00	61.40	98.00	2.80	0.51	0.29	0.13	2.41	0.13	0.01	39.68	0.00	5.90	0.00	62.00	11.00	103.00	0.00	0.00	203.00
Timothy hay	89.00	56.00	0.53	0.28	8.10	62.00	64.20	98.00	2.90	0.43	0.20	0.09	1.99	0.14	0.07	0.00	0.00	0.00	0.00	54.00	29.00	93.00	0.00	0.00	140.00
Grains																									
Barley grain	88.00	84.00	0.94	0.63	13.20	66.93	18.10	34.00	2.20	0.05	0.35	0.12	0.57	0.15	0.01	1.72	0.00	11.88	0.18	13.00	5.30	18.30	0.35	0.05	59.50
Corn grain, whole	88.00	88.00	0.99	0.68	9.80	44.67	10.80	56.00	4.30	0.03	0.31	0.11	0.33	0.14	0.01	0.00	0.00	0.00	0.00	0.00	4.80	6.40	0.43	0.00	30.00
Corn grain, cracked	88.00	88.00	0.99	0.68	9.80	44.67	10.00	56.00	4.30	0.03	0.32	0.12	0.44	0.11	0.01	0.45	0.00	11.34	0.14	24.20	2.51	7.90	0.31	0.03	54.50
Corn grain, ground	88.00	90.00	1.02	0.70	9.80	57.37	9.00	0.00	4.30	0.03	0.31	0.11	0.33	0.14	0.01	0.00	0.00	0.00	0.00	0.00	4.80	6.40	0.43	0.00	30.00
Corn grain, steam flaked	84.00	92.00	1.05	0.74	9.80	43.04	9.00	48.00	4.30	0.03	0.31	0.11	0.33	0.14	0.01	0.00	0.00	0.00	0.00	0.00	4.80	6.40	0.43	0.00	30.00
Corn grain, high moisture	72.00	93.00	1.05	0.74	9.80	67.82	9.00	0.00	4.30	0.03	0.31	0.11	0.33	0.14	0.01	0.00	0.00	0.00	0.00	0.00	4.80	6.40	0.43	0.00	30.00
Corn grain, ground cob + grain	87.00	80.00	0.90	0.60	9.00	45.00	28.00	40.00	0.00	0.07	0.27	0.14	0.53	0.16	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cottonseed, whole black	92.00	95.00	1.08	0.76	23.00	69.56	40.00	100.00	17.50	0.16	0.62	0.35	1.22	0.26	0.03	0.00	0.00	0.00	0.00	37.70	7.90	12.20	0.00	0.00	160.00
Cottonseed, whole high lint	92.00	90.00	1.02	0.70	24.40	69.56	51.60	100.00	17.50	0.17	0.62	0.38	1.24	0.27	0.01	0.00	0.00	0.00	0.00	37.70	7.90	131.00	0.00	0.00	107.00
Oat grain	91.00	73.00	0.78	0.50	13.60	76.55	42.00	34.00	4.90	0.07	0.30	0.16	0.45	0.23	0.06	0.09	0.00	6.80	0.24	39.20	6.70	40.10	0.06	0.13	80.00
Oat grain	89.00	77.00	0.84	0.55	13.60	83.00	29.30	34.00	5.20	0.01	0.41	0.16	0.51	0.21	0.02	0.09	0.00	6.80	0.24	40.80	8.60	40.30	0.06	0.13	94.10
Rice grain, ground	89.00	79.00	0.87	0.58	8.90	69.85	16.00	0.00	1.90	0.07	0.36	0.14	0.53	0.05	0.07	0.00	0.00	7.12	0.00	16.90	3.00	20.20	0.05	0.05	0.00
Rice grain, polished	89.00	89.00	1.00	0.69	8.60	66.30	1.84	0.00	0.80	0.03	0.13	0.10	0.26	0.09	0.02	0.00	0.00	5.31	0.00	15.40	6.10	33.40	0.96	0.00	20.00
Rye grain	88.00	84.00	0.94	0.63	13.80	78.99	19.00	34.00	1.70	0.07	0.36	0.14	0.52	0.17	0.03	0.09	0.00	7.53	0.44	32.20	8.60	82.30	0.00	0.00	80.00
Sorghum grain, whole	89.00	76.00	0.83	0.54	11.60	50.76	13.30	34.00	3.10	0.05	0.34	0.14	0.47	0.12	0.04	0.02	0.00	5.44	0.23	19.10	4.90	17.90	0.53	0.07	60.00
Sorghum grain, rolled	90.00	82.00	0.91	0.61	12.60	43.00	16.10	34.00	3.03	0.04	0.34	0.17	0.44	0.14	0.01	0.02	0.00	5.44	0.46	16.00	4.70	15.40	0.53	0.07	80.80
Sorghum, steam flaked	70.00	88.00	0.99	0.68	12.00	56.40	23.00	34.00	3.10	0.05	0.34	0.14	0.35	0.12	0.04	0.02	0.00	5.44	0.23	19.10	4.90	17.90	0.53	0.07	60.00
Wheat grain, whole hard red spring	88.00	84.00	0.94	0.63	14.20	73.95	11.70	0.00	2.00	0.05	0.42	0.16	0.41	0.17	0.02	0.00	0.00	6.53	0.30	43.30	6.80	42.20	0.14	0.00	70.00
Wheat grain, whole soft white	90.00	85.00	0.95	0.65	11.30	73.95	9.70	0.00	1.90	0.07	0.33	0.11	0.43	0.13	0.02	0.00	0.00	15.51	0.05	30.00	7.80	40.00	0.15	0.00	40.00
Wheat grain, ground	89.00	88.00	0.99	0.68	14.20	77.00	11.80	0.00	2.34	0.05	0.44	0.13	0.40	0.14	0.01	0.00	0.00	7.71	0.05	38.10	6.50	36.60	0.50	0.10	45.10
Mineral supplements																									
Ammonium phosphate, dibasic	97.00	0.00	0.00	0.00	115.90	100.00	0.00	0.00	0.00	0.52	20.60	0.46	0.01	2.16	0.05	0.00	0.00	0.00	0.00	100.00	10.00	400.00	0.00	0.00	12400
Ammonium phosphate, monobasic	97.00	0.00	0.00	0.00	70.90	100.00	0.00	0.00	0.00	0.28	24.74	0.46	0.01	1.46	0.06	0.00	0.00	0.00	0.00	100.00	10.00	400.00	10.00	0.00	17400
Ammonium sulfate	100.00	0.00	0.00	0.00	134.10	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.10	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	10.00
Calcium carbonate	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.39	0.04	0.05	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	300.00	0.00	0.00	300.00
Calcium phosphate, monobasic	97.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.40	21.60	0.61	0.08	1.22	0.06	0.00	0.00	0.00	0.00	90.00	10.00	360.00	10.00	0.00	15800
Calcium sulfate	97.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.28	0.00	0.00	0.00	18.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cobalt carbonate	99.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	460000	0.00	500.00
Copper sulfate	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.84	0.00	0.00	0.00	0.00	0.00	0.00	254500	0.00	0.00	0.00	0.00
Dicalcium phosphate	97.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.00	19.30	0.59	0.07	1.14	0.05	0.00	0.00	0.00	0.00	100.00	10.00	300.00	10.00	0.00	14400
Ethylenediamine dihydroiodine	98.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	803400	0.00
Iron sulfate	98.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	218400
Magnesium carbonate	98.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	30.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	220.00
Magnesium oxide	98.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.07	0.00	56.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Manganese carbonate	97.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	478000	0.00	0.00	0.00
Manganese oxide	99.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	774500	0.00	0.00	0.00
Monocalcium phosphate	97.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.00	18.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Common name	DM (%AF)	TDN (%DM)	NEm (Mcal/lb)	NEg (Mcal/lb)	CP (%DM)	RDP (%CP)	NDF (%DM)	eNDF (% NDF)	Fat (%DM)	Calcium (%DM)	Phos-phorus (%DM)	Magne-sium (%DM)	Potas-sium (%DM)	Sulfur (%DM)	Sodium (%DM)	Vitamin A (1000 IU/lb)	Vitamin D (1000 IU/lb)	Vitamin E (IU/lb)	Selenium (ppm)	Zinc (ppm)	Copper (ppm)	Man-ganese (ppm)	Cobalt (ppm)	Iodine (ppm)	Iron (ppm)
Potassium bicarbonate	99.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium chloride	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.34	50.00	0.45	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	600.00
Potassium iodide	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	681700	0.00
Potassium sulfate	98.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.61	41.84	17.35	0.09	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	710.00
Sodium bicarbonate	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sodium chloride	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sodium selenite	98.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.60	0.00	0.00	0.00	456000	0.00	0.00	0.00	0.00	0.00	0.00
Sodium sulfate	97.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.95	14.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc oxide	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	780000	0.00	0.00	0.00	0.00	0.00
Zinc sulfate	99.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	17.68	0.00	0.00	0.00	0.00	0.00	363600	0.00	10.00	0.00	0.00	10.00
Roughages																									
Alfalfa pellets, 17%	91.00	50.00	0.44	0.19	14.00	79.00	58.00	90.00	1.30	1.18	0.21	0.22	2.07	0.25	0.08	8.75	0.45	0.00	0.55	22.10	13.70	38.50	0.41	0.00	170.00
Barley straw	91.00	40.00	0.27	0.03	4.40	30.00	72.50	100.00	1.90	0.30	0.07	0.23	2.37	0.17	0.14	0.45	0.32	0.00	0.00	7.00	5.40	16.00	0.07	0.00	200.00
Corn cobs, ground	90.00	50.00	0.44	0.19	2.80	22.00	87.00	56.00	0.60	0.12	0.04	0.07	0.89	0.47	0.08	0.54	0.00	0.00	0.08	5.00	7.00	6.00	0.13	0.00	230.00
Corn stalks, post-harvest grazing	50.00	65.85	0.68	0.41	6.50	69.00	65.00	100.00	2.10	0.62	0.09	0.00	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cotton gin trash	90.00	44.00	0.39	0.03	7.40	0.00	80.00	100.00	1.70	0.65	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cottonseed hulls	91.00	45.00	0.35	0.11	4.10	0.00	80.00	100.00	1.70	0.15	0.09	0.14	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oat hulls	92.00	35.00	0.19	0.00	3.90	0.00	80.00	100.00	1.80	0.15	0.15	0.09	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oat straw	92.20	45.00	0.36	0.11	4.40	55.00	74.40	100.00	2.20	0.23	0.06	0.17	2.53	0.22	0.42	2.86	0.45	0.00	0.00	6.00	10.30	31.00	0.00	0.00	164.00
Soybean straw	88.00	44.00	0.44	0.00	5.20	0.00	80.00	100.00	1.40	1.59	0.06	0.92	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wheat straw	89.00	41.00	0.29	0.05	3.50	31.00	78.90	100.00	2.00	0.17	0.05	0.12	1.41	0.19	0.14	0.45	0.03	0.00	0.00	6.00	3.60	41.00	0.05	0.00	157.00
Protein supplements																									
Bloodmeal, porcine	90.00	66.00	0.68	0.41	93.79	25.00	0.92	0.00	1.70	0.40	0.32	0.04	0.31	0.80	0.40	0.00	0.00	0.00	0.80	33.00	13.90	11.70	0.01	0.00	2281.00
Canola meal	92.00	69.00	0.73	0.45	40.90	67.85	27.20	23.00	3.47	0.70	1.20	0.57	1.37	1.17	0.03	0.00	0.00	0.00	0.00	71.50	7.95	55.80	0.00	0.00	211.00
Corn gluten meal, 40% cp	91.00	84.00	0.94	0.63	46.80	38.08	37.00	36.00	2.40	0.16	0.51	0.06	0.03	0.22	0.10	13.51	0.00	14.51	1.11	190.20	30.30	8.50	0.09	0.00	430.00
Corn gluten meal, 60% cp	91.00	89.00	1.00	0.69	66.30	41.00	8.90	36.00	2.56	0.07	0.61	0.15	0.48	0.90	0.06	6.35	0.00	11.79	0.00	61.40	4.76	20.60	0.09	0.00	159.00
Cottonseed meal, 41% mech. Extr.	92.00	75.00	0.81	0.53	46.10	57.00	28.90	36.00	3.15	0.20	1.16	0.65	1.65	0.42	0.07	0.00	0.00	0.00	0.98	74.00	16.50	26.90	0.53	0.00	162.00
Cottonseed meal, 41% solv. Extr.	92.00	78.00	0.85	0.56	44.00	57.00	28.00	36.00	5.00	0.16	0.76	0.35	1.22	0.26	0.03	0.00	0.00	0.00	0.00	0.00	53.90	12.20	0.00	0.00	160.00
Cottonseed meal, 43% mech. Extr.	92.00	75.00	0.81	0.53	48.90	57.00	28.00	36.00	1.70	0.16	0.76	0.35	1.22	0.26	0.03	0.00	0.00	0.00	0.00	0.00	53.90	12.20	0.00	0.00	160.00
Feather meal	90.00	68.00	0.71	0.44	85.80	30.00	39.00	23.00	7.21	1.19	0.68	0.06	0.20	1.85	0.24	0.00	0.00	0.00	0.98	105.00	14.20	12.00	0.13	0.05	702.00
Fish meal	90.00	73.00	0.78	0.50	67.90	40.00	2.00	10.00	10.70	5.46	3.14	0.16	0.77	0.58	0.44	0.00	0.00	5.90	2.34	157.00	11.30	40.00	0.12	1.19	594.00
Linseed meal	90.00	65.40	0.54	0.28	32.60	70.00	36.00	0.00	1.70	0.40	0.83	0.55	1.22	0.37	0.09	0.00	0.00	0.00	1.05	69.00	19.00	39.00	0.00	0.00	369.00
Peanut meal	92.40	77.00	0.84	0.55	52.90	80.00	14.00	0.00	2.30	0.32	0.66	0.17	1.28	0.33	0.03	0.00	0.00	0.00	0.00	36.00	16.00	29.00	0.00	0.07	155.00
Soybean meal, 44% solv. Extr.	89.00	84.00	0.94	0.63	49.90	65.00	14.90	23.00	1.60	0.40	0.71	0.31	2.22	0.46	0.04	0.00	0.00	0.00	0.51	57.00	22.40	35.00	0.12	0.00	185.00
Soybean meal, 48% solv. Extr.	90.00	87.00	0.98	0.67	54.00	65.00	7.79	23.00	1.10	0.29	0.71	0.33	2.36	0.48	0.01	0.00	0.00	0.00	0.22	63.00	22.50	41.00	0.12	0.12	145.00
Soybean, whole roasted	90.00	94.00	1.07	0.75	42.80	38.31	13.40	100.00	18.80	0.27	0.65	0.29	1.80	0.24	0.00	0.73	0.00	16.60	0.12	61.80	19.80	39.60	0.00	0.00	100.00
Soybeans, whole raw	90.00	94.00	1.07	0.75	40.34	75.00	14.90	100.00	18.20	0.27	0.65	0.27	2.01	0.35	0.04	0.73	0.00	16.60	0.12	59.00	14.58	34.50	0.00	0.00	182.00
Sunflower seed meal	90.00	65.00	0.67	0.40	25.90	80.00	40.00	23.00	2.90	0.45	1.02	0.70	1.27	0.33	0.03	0.00	0.00	0.00	2.30	105.00	4.00	20.00	0.00	0.00	33.00
Silages																									
Alfalfa silage	38.00	58.00	0.56	0.31	17.00	91.00	47.00	82.00	3.10	1.74	0.27	0.33	2.35	0.31	0.16	70.29	0.00	0.00	0.00	40.70	11.10	49.70	0.00	0.00	280.00
Barley silage	39.00	60.00	0.59	0.33	11.90	86.00	56.80	65.00	2.92	0.52	0.29	0.19	2.57	0.24	0.12	0.00	0.00	0.00	0.15	24.50	7.70	44.80	0.72	0.00	375.00
Corn silage, 25% grain	29.00	61.00	0.61	0.35	8.30	76.00	55.00	80.00	2.10	0.31	0.27	0.22	1.22	0.12	0.03	26.35	0.00	0.00	0.00	21.20	9.20	41.10	0.01	0.00	180.00
Corn silage, 35% grain	33.00	69.00	0.73	0.45	8.60	77.00	46.00	80.00	2.60	0.31	0.27	0.22	1.22	0.12	0.03	26.35	0.00	0.00	0.00	21.20	9.20	41.10	0.01	0.00	180.00
Corn silage, 40% grain	33.00	66.00	0.68	0.41	9.20	78.00	45.00	80.00	3.10	0.31	0.27	0.22	1.22	0.12	0.03	26.35	0.00	0.00	0.00	21.20	9.20	41.10	0.01	0.00	180.00
Corn silage, 45% grain	34.00	72.00	0.77	0.49	8.65	78.00	43.00	80.00	3.09	0.25	0.22	0.18	1.14	0.12	0.01	8.16	0.05	0.00	0.00	17.70	4.18	23.50	0.01	0.00	131.00
Corn silage, 50% grain	35.00	75.00	0.81	0.53	8.00	75.00	41.00	70.00	3.50	0.31	0.27	0.22	1.22	0.12	0.03	26.35	0.00	0.00	0.00	21.20	9.20	41.10	0.01	0.00	180.00
Corn silage, immature (no ears)	25.00	65.00	0.67	0.40	9.00	78.00	60.00	80.00	3.10	0.52	0.31	0.31	1.64	0.00	0.00	0.00	0.00	0.00	0.00	184.50	0.00	0.00	0.00	0.00	490.00
Oat silage	36.40	59.00	0.58	0.32	12.70	85.00	58.10	98.00	3.12	0.58	0.31	0.21	2.88	0.24	0.09	0.00	0.00	0.00	0.07	29.80	8.00	66.30	0.00	0.00	367.00
Sorghum-sudan silage	28.00	55.00	0.52	0.26	10.80	72.00	68.00	41.00	2.80	0.50	0.21	0.42	2.61	0.06	0.02	79.55	0.00	0.00	0.00	0.00	36.60	98.80	0.27	0.00	120.00
Sorghum silage	30.00	60.00	0.59	0.33	9.39	73.00	60.80	41.00	2.64	0.49	0.22	0.28	1.72	0.12	0.01	0.00	0.00	0.00	0.03	32.00	9.20	68.50	0.30	0.00	383.00
Wheat silage	35.00	57.00	0.55	0.29	12.50	81.00	60.70	61.00	2.50	0.44	0.29	0.17	2.24	0.21	0.04	26.76	0.00	0.00	0.00	28.00	9.00	79.50	0.00	0.00	386.00

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