2012 FEED COMP

A compilation of the latest nutrient values of 300 feeds commonly fed to cattle and sheep.

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Nutrition research spanning more than 100 years has defined the nutrients required by animals. Using this information, diets can be formulated from feeds and ingredients to meet these requirements with the expectation that animals will not only remain healthy, but also will be productive and efficient. The ultimate goal of feed analysis is to predict the productive response of animals when they are fed diets of a given nutrient composition.

Unlike chemicals that are "chemically pure" and thus have a constant composition, feeds vary in their composition for many reasons. What's the value then of showing composition data for feeds? An actual analysis of a feed to be used in a diet is much more accurate than the use of tabulated composition data, and actual analysis should be obtained and used whenever possible. But, it's often difficult to determine actual composition in a timely way; therefore, tabulated data are the best source of information.

In using tabulated values, one can expect organic constituents (e.g., crude protein, ether extract and fiber) to vary as much as ±15%, mineral constituents to vary as much as ±30%, and energy values to vary up to ±10%. Thus, the values shown can only serve as guides. That's why they're called typical values. They're not averages of published information since judgment was used in arriving at some of the values in the hope these values will be realistic for use in formulating cattle and sheep diets.

New crop varieties may result in nutrient composition changes. Genetically modified crops may result in feeds with improved nutrient content and availability, and/or decreased anti-nutrient factors.

Chemical constituents vs. biological attributes

Feeds can be chemically analyzed for many things that may or may not be related to the response of an animal when fed the feed. Thus, in the accompanying table, certain chemical constituents are shown.

The response of cattle and sheep when fed a feed, however, can be termed the biological response to the feed. This is a function of its chemical composition and the ability of the animal to derive useful nutrient value from the feed. The latter relates to the digestibility or availability of a nutrient in the feed for absorption into the body. Its ultimate efficiency of use depends upon the nutrient status of the animal and the productive or physiologi-

cal function being performed by the animal. Thus, ground fence posts and shelled corn may have the same gross energy value but have markedly different useful energy value (TDN or net energy) when consumed by the animal.

Therefore, the biological attributes of a feed have much greater meaning in predicting the productive response of animals but are more difficult to precisely determine because there's an interaction between the feed's chemical composition and the animal's digestive and metabolic capabilities. Biological attributes of feeds are more laborious and costly to determine and are more variable than chemical constituents. They're generally more predictive, however, since they relate to the animal's response to the feed or diet.

Source of table information

Several sources of information were used in arriving at the typical values shown in this table. Where information wasn't available, but a reasonable estimate could be made from similar feeds or stage of maturity, this was done; after all, it's not very helpful to have a table with considerable missing information. Where zeros appear, the amount of that item is so small that it can be considered insignificant in practical diet formulation. Blanks indicate an unknown value.

Using the table information

Feed names: The most obvious or commonly used feed names are used in the table. Feeds designated as "fresh" are feeds that are grazed or fed as fresh-cut materials.

Dry matter: Typical dry matter (DM) values are shown, but the moisture content of feeds can vary greatly. Thus, DM content can be the biggest reason for variation in feed composition on an "as-fed basis." For this reason, chemical constituents and biological attributes of feeds in the table are on a DM basis.

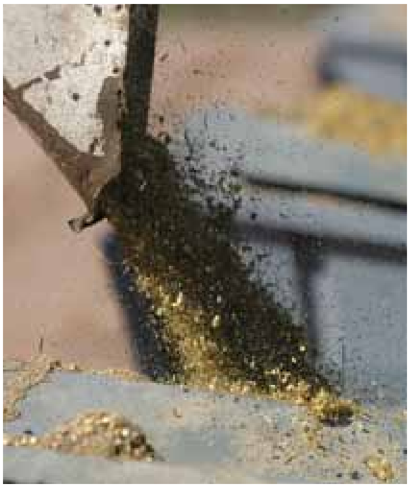
Since DM can vary greatly and one of the factors regulating total feed intake is the DM content of feeds, diet formulation on a DM basis is preferred rather than using "as-fed" values. If one wants to convert a value to an "as-fed basis," multiply the decimal equivalent of the DM content times the compositional value shown in the table.

Energy: The table lists four measures of the energy value of feeds. Total digestible nutrients (TDN) is shown because there are more determined TDN values and it's been the standard system for expressing the energy value of feeds for cattle and sheep.

There are several technical problems with TDN, however. For one, the digestibility of crude fiber (CF) may be higher than for nitrogen-free extract (NFE) in certain feeds due to the partition of lignin in the CF analysis. TDN also overestimates the energy value of roughages compared to concentrates in producing animals. Some argue that since energy isn't measured in pounds or percent, TDN isn't a valid energy measure. This, however, is more a scientific argument than a criticism of TDN's predictive value. ▸▸▸

Digestible energy (DE) values aren't included in the table. There's a fairly constant relationship between TDN and DE in cattle and sheep; DE (Mcal/cwt.) can be calculated by multiplying the %TDN content by 2. The ability of TDN and DE to predict animal performance is therefore the same.

Interest in using net energy (NE) in feed evaluation was renewed with the development of the California Net Energy System. This is due to the improved predictability of the productive response of animals depending on whether feed energy is being used for maintenance (NE_m), growth (NE_g), or lactation (NE_l).



The major problem in using these NE values is predicting feed intake and thus the proportion of feed that will be used for maintenance and production. Some only use NE_g but this suffers the equal, but opposite, criticism mentioned for TDN; NE_g will overestimate the feeding value of concentrates relative to roughages.

The average of the two NE values can be used, but this would be true only for cattle and sheep eating twice their maintenance energy requirement. The most accurate way to use these NE values to formulate diets is to use the NE_m value plus a multiplier times the NE_g value all divided by one plus the multiplier. The multiplier is the level of feed intake relative to maintenance. For example, if 700-lb. cattle are expected to eat 18 lbs. of DM, 8 lbs. of which will be required for maintenance, the diet's NE value would be: **$NE = [NE_m + (10/8)(NE_g)]/[1 + (10/8)]$**.

In deciding the energy system to use, there's no question on NE's theoretical superiority over TDN in predicting animal performance. But this superiority is lost if only NE_g is used to formulate diets. If NE is used, some combination of NE_m and NE_g is more accurate. NE_l values are also shown but few have actually been determined. NE_l values are similar to NE_m values except for very high and low energy feeds.

Protein: Crude protein (CP) values are shown, which are Kjeldahl nitrogen times 100/16 or 6.25, since proteins contain an average of 16% nitrogen. CP doesn't give any information about the actual protein and non-protein nitrogen (NPN) content of a feed.

Digestible protein (DP) isn't included in these tables, as the contribution of microbial and body protein to the protein in feces makes it more misleading than CP. However, one can estimate DP from the CP content of the diet fed to cattle or sheep by the following equation: **%DP = 0.9(%CP) – 3** where %DP and %CP are the diet values on a DM basis.

Undegradable intake protein (UIP, rumen "by-pass" or escape protein) values are shown. This value represents the percent of the CP passing through the rumen without degradation by rumen microorganisms. Degradable intake protein (DIP) is the percent of the CP degraded in the rumen and is equal to 100 minus UIP. Like other biological attributes, these values aren't constant. UIP values on many feeds haven't been determined and reasonable estimates are difficult to make. ▸▸▸

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2012 Feed Composition Tables

All values except dry matter (DM) are shown on a DM basis.

		ENERGY				PROTEIN		FIBER											
FEEDSTUFF	DM %	TDN %	NE_m (Mcal/cwt.)	NE_g	NE_l	CP %	UIP %	CF %	ADF %	NDF %	eNDF %	EE %	ASH %	Ca %	P %	K %	Cl %	S %	Zn ppm
Alfalfa Cubes	91	57	57	25	57	18	30	29	36	46	40	2.0	11	1.30	0.23	1.9	0.37	0.33	20
Alfalfa Dehydrated 17% CP	92	61	62	31	61	19	60	26	34	45	6	3.0	11	1.42	0.25	2.5	0.45	0.28	21
Alfalfa Fresh	24	61	62	31	61	19	18	27	34	46	41	3.0	9	1.35	0.27	2.6	0.40	0.29	18
Alfalfa Hay Early Bloom	90	59	59	28	59	19	20	28	35	45	92	2.5	8	1.41	0.26	2.5	0.38	0.28	22
Alfalfa Hay Midbloom	89	58	58	26	58	17	23	30	36	47	92	2.3	9	1.40	0.24	2.0	0.38	0.27	24
Alfalfa Hay Full Bloom	88	54	54	20	54	16	25	34	40	52	92	2.0	8	1.20	0.23	1.7	0.37	0.25	23
Alfalfa Hay Mature	88	50	50	12	49	13	30	38	45	59	92	1.3	8	1.18	0.19	1.5	0.35	0.21	23
Alfalfa Seed Screenings	91	84	92	61	87	34		13	15			10.7	6	0.30	0.67				
Alfalfa Silage	30	55	55	21	55	18	19	28	37	49	82	3.0	9	1.40	0.29	2.6	0.41	0.29	26
Alfalfa Silage Wilted	39	58	58	26	58	18	22	28	37	49	82	3.0	9	1.40	0.29	2.6	0.41	0.29	26
Alfalfa Leaf Meal	89	60	60	30	60	26	15	16	24	34	35	3.0	10	2.88	0.34	2.2		0.32	39
Alfalfa Stems	89	47	47	7	46	11	44	44	51	68	100	1.3	6	0.90	0.18	2.5			
Almond Hulls	89	56	56	23	56	3	60	16	29	36	100	3.1	7	0.24	0.10	2.0	0.03	0.07	20
Ammonium Chloride	99	0	0	0	0	163	0	0	0	0	0	0.0		0.00	0.00	0.0	66.00	0.00	0
Ammonium Sulfate	99	0	0	0	0	132	0	0	0	0	0	0.0						24.15	
Apples	17	70	73	44	71	3	10	7	9	25	10	2.2	2	0.06	0.60	0.8			
Apple Pomace Wet	20	68	70	41	69	5	10	18	27	36	27	5.2	3	0.13	0.12	0.5		0.04	11
Apple Pomace Dried	89	67	69	40	68	5	15	18	28	38	29	5.2	3	0.13	0.12	0.5		0.04	11
Artichoke Tops (Jerusalem)	27	61	62	31	61	6		18	30	41	40	1.1	10	1.62	0.11	1.4			
Avocado Seed Meal	91	52	52	16	51	20		19	24			1.2	16						
Bahiagrass Hay	90	53	53	18	53	6	37	32	41	72	98	1.8	7	0.47	0.20	1.4		0.21	
Bakery Product Dried	90	90	100	68	94	11	30	3	9	30	0	11.5	4	0.16	0.27	0.4	2.25	0.15	33
Bananas	24	84	92	61	87	4		4	5			0.8	3	0.03	0.11	1.5			8
Barley Hay	90	57	57	25	57	9		28	37	65	98	2.1	8	0.30	0.28	1.6		0.19	25
Barley Silage	35	59	58	26	58	12	22	34	37	58	61	3.0	9	0.46	0.30	2.4		0.22	28
Barley Silage Mature	35	58	58	26	58	12	25	30	34	50	61	3.5	9	0.30	0.20	1.5		0.15	25
Barley Straw	90	44	44	1	43	4	70	42	55	78	100	1.9	7	0.32	0.08	2.2	0.67	0.16	7
Barley Grain	89	84	92	61	87	12	28	5	7	20	34	2.1	3	0.06	0.38	0.6	0.18	0.16	23
Barley Grain, Steam Flaked	85	90	100	70	100	12	39	5	7	20	30	2.1	3	0.06	0.35	0.6	0.18	0.16	23
Barley Grain Steam Rolled	86	84	92	61	87	12	38	5	7	20	27	2.1	3	0.06	0.41	0.6	0.18	0.17	30
Barley Grain 2-row	87	84	92	61	87	12		6	8	24	34	2.3	2	0.05	0.31	0.6	0.18	0.17	
Barley Grain 6-row	87	84	92	61	87	11		6	8	24	34	2.2	3	0.05	0.36	0.6	0.18	0.15	
Barley Grain Lt. Wt. (42-44 lb/bu)	88	78	83	54	80	13	30	9	12	30	34	2.3	4						
Barley Feed Pearl Byproduct	90	74	78	49	76	15	25	12	15			3.9	5	0.05	0.45	0.7		0.06	
Barley bran	91	59	59	28	59	12	28	21	27	36	6	4.3	7						
Barley Grain Screenings	89	71	74	46	73	12		9	11			2.6	4	0.35	0.33	0.9		0.15	
Beans Navy Cull	90	84	92	61	87	24	25	5	8	20	0	1.4	5	0.15	0.60	1.4	0.06	0.26	45
Beet Pulp Wet	17	77	82	53	79	9	35	20	25	45	30	0.7	5	0.65	0.08	0.9	0.40	0.22	21
Beet Pulp Dried	91	76	81	52	78	9	44	21	26	46	33	0.7	5	0.65	0.08	0.9	0.40	0.22	21
Beet Pulp Wet with Molasses	24	77	82	53	79	11	25	16	21	39	33	0.6	6	0.60	0.10	1.8		0.42	11
Beet Pulp Dried with Molasses	92	77	82	53	79	11	34	17	23	40	33	0.6	6	0.60	0.10	1.8		0.42	11
Beet Root (Sugar)	23	80	86	56	83	4		5	7	16		0.4	3						
Beet Tops (Sugar)	19	58	58	26	58	14		11	14	25	41	1.3	24	1.10	0.22	5.2	0.20	0.45	20
Beet Top Silage	25	52	52	16	51	12		12				2.0	32	1.38	0.22	5.7		0.57	20
Bermudagrass Coastal Dehydrated	90	62	63	33	63	16	40	26	29	40	10	3.8	7	0.40	0.25	1.8	0.72	0.23	18
Bermudagrass Coastal Hay	89	56	56	23	56	10	20	30	36	73	98	2.1	6	0.47	0.21	1.5	0.70	0.22	16
Bermudagrass Hay	89	53	53	18	53	10	18	29	37	72	98	1.9	8	0.46	0.20	1.5	0.70	0.25	31
Bermudagrass Silage	26	50	50	12	49	10	15	28	35	71	48	1.9	8	0.46	0.20	1.5	0.72	0.25	31
Birdsfoot Trefoil Fresh	22	66	68	38	67	21	20	21	31	47	41	4.4	9	1.78	0.25	2.6		0.25	31
Birdsfoot Trefoil Hay	89	57	57	25	57	16	22	31	38	50	92	2.2	8	1.73	0.24	1.8		0.25	28
Biuret	99	0	0	0	0	248	0	0	0	0	0	0.0	0	0.00	0.00	0.0	0.00	0.00	0
Blood Meal, Swine/Poultry	91	66	68	38	67	92	82	1	2	10	0	1.4	3	0.32	0.28	0.2	0.30	0.70	22
Bluegrass KY Fresh Early Bloom	36	69	71	43	70	15	20	27	32	60	41	3.9	7	0.37	0.30	1.9	0.42	0.19	25
Bluegrass Straw	93	45	45	3	44	6		40	50	78	90	1.1	6	0.20	0.10				
Bluestem Fresh Mature	61	50	50	12	49	6		34				2.5	5	0.40	0.12	0.8		0.05	28

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		ENERGY				PROTEIN		FIBER											
FEEDSTUFF	DM %	TDN %	NE_m (Mcal/cwt.)	NE_g (Mcal/cwt.)	NE_l (Mcal/cwt.)	CP %	UIP %	CF %	ADF %	NDF %	eNDF %	EE %	ASH %	Ca %	P %	K %	Cl %	S %	Zn ppm
Bone Meal Steamed, Swine/Poultry	95	16	27	0	11	13		1	0	0	0	11.6	77	27.00	12.74	0.2		2.50	290
Bread Byproduct	68	90	100	68	94	14	24	1	2	3	0	3.0	3	0.10	0.18	0.2	0.76	0.15	40
Brewers Grains Wet	23	85	93	62	88	26	52	13	21	45	18	7.5	4	0.30	0.58	0.1	0.15	0.32	78
Brewers Grains Dried	92	84	92	61	87	25	54	14	24	49	18	7.5	4	0.30	0.58	0.1	0.15	0.32	78
Brewers Yeast Dried	94	79	85	55	81	48		3				1.0	7	0.10	1.56	1.8		0.41	41
Bromegrass Fresh Immature	30	64	65	36	65	15	22	28	33	54	40	4.1	10	0.45	0.34	2.3		0.21	20
Bromegrass Hay	89	55	55	21	55	10	33	35	41	66	98	2.3	9	0.40	0.23	1.9	0.40	0.19	19
Bromegrass Haylage	35	57	57	25	57	11	26	36	44	69	61	2.5	8	0.38	0.30	2.0		0.20	19
Buckwheat Grain	88	75	79	50	77	12		13	17			2.8	2	0.11	0.36	0.5	0.05	0.16	10
Buttermilk Dried	92	88	98	65	91	34	0	5	0	0	0	5.0	10	1.44	1.00	0.9		0.09	44
Cactus, prickly pear	23	61	62	31	62	5		16	20	28		2.1	18	4.00	0.10	1.5		0.20	
Calcium Carbonate	99	0	0	0	0	0		0	0	0	0	0.0	99	38.50	0.04	0.1		0.00	0
Canarygrass Hay	91	53	53	18	53	9	26	32	34	67	98	2.7	8	0.38	0.25	2.7		0.14	18
Canola Meal, Solv. Ext.	90	72	75	47	74	41	30	11	19	29	23	2.0	8	0.74	1.14	1.1	0.07	0.78	68
Carrot Pulp	14	62	63	33	63	6		19	23	40	0	7.8	9						
Carrot Root Fresh	12	83	90	60	86	10		9	11	20	0	1.4	10	0.55	0.32	2.5	0.50	0.17	
Carrot Tops	16	73	77	48	75	13		18	23	45	41	3.8	15	1.94	0.19	1.9			
Cattle Manure Dried	92	38	40	0	36	15		35	42	55	0	2.5	14	1.15	1.20	0.6		1.78	240
Cheatgrass Fresh Immature	21	68	70	41	69	16		23				2.7	10	0.60	0.28				
Citrus Pulp Dried	90	78	83	54	80	7	38	13	20	21	33	2.9	7	1.81	0.12	0.8	0.04	0.08	14
Clover Ladino Fresh	19	69	71	43	70	25	20	14	33	35	41	4.8	11	1.27	0.38	2.4		0.20	20
Clover Ladino Hay	90	61	62	31	61	21	25	22	32	36	92	2.0	9	1.35	0.32	2.4	0.30	0.20	17
Clover Red Fresh	24	64	65	36	65	18	21	24	33	44	41	4.0	9	1.70	0.30	2.0	0.60	0.17	23
Clover Red Hay	88	55	55	21	55	15	28	30	39	51	92	2.5	8	1.50	0.25	1.7	0.32	0.17	17
Clover Sweet Hay	91	53	53	18	53	16	30	30	38	50	92	2.4	9	1.27	0.25	1.8	0.37	0.46	
Coconut Meal, Mech. Ext.	92	76	81	52	78	21	56	13	21	56	23	6.8	7	0.40	0.30	1.0	0.33	0.04	
Coffee Grounds	88	20	36	0	16	13		41	68	77	10	15.0	2	0.10	0.08				
Corn Whole Plant Pelleted	91	63	64	34	64	9	45	21	24	40	6	2.4	6	0.50	0.24	0.9		0.14	
Corn Fodder	80	65	66	37	66	9	45	25	29	48	100	2.4	7	0.50	0.25	0.9	0.20	0.14	
Corn Stover Mature (Stalks)	80	54	54	20	54	5	30	35	43	70	100	1.3	7	0.45	0.15	1.2	0.30	0.14	22
Corn Silage Milk Stage	26	65	66	37	66	8	18	26	32	54	60	2.8	6	0.40	0.27	1.6		0.11	20
Corn Silage Mature Well Eared	34	72	75	47	74	8	28	21	27	46	70	3.1	5	0.28	0.23	1.1	0.20	0.13	22
Corn Silage Sweet Corn	24	65	66	37	66	11		20	32	57	60	5.0	5	0.24	0.26	1.2	0.17	0.16	39
Corn Grain Whole	88	88	98	65	91	9	58	2	3	9	60	4.3	2	0.02	0.30	0.4	0.05	0.14	18
Corn Grain Rolled	88	88	98	65	91	9	54	2	3	9	34	4.3	2	0.02	0.30	0.4	0.05	0.14	18
Corn Grain, Steam Flaked	85	93	104	71	97	9	59	2	3	9	40	4.1	2	0.02	0.27	0.4	0.05	0.14	18
Corn Grain High Moisture	74	93	104	71	97	10	42	2	3	9	0	4.0	2	0.02	0.30	0.4	0.06	0.14	20
Corn Grain, High Oil	88	91	102	69	95	8	54	2	3	8	60	6.9	2	0.01	0.30	0.3	0.05	0.13	18
Corn Grain Hi-Lysine	92	87	96	64	90	12	58	4	4	11	60	4.4	2	0.03	0.24	0.4	0.05	0.11	18
Corn and Cob Meal	87	82	89	59	85	9	52	9	11	26	56	3.7	2	0.06	0.27	0.5	0.05	0.13	16
Corn Cobs	90	48	48	9	47	3	70	36	39	88	56	0.6	2	0.12	0.04	0.8		0.27	5
Corn Screenings	86	91	102	69	95	10	52	3	4	9	20	4.3	2	0.04	0.27	0.4	0.05	0.12	16
Corn Bran	91	76	81	52	78	11		10	17	51	0	6.3	3	0.04	0.15	0.1	0.13	0.08	18
Corn Germ, Full-fat	97	135	198	160	198	12	55	6	11	36	20	44.9	2	0.02	0.28	0.1	0.02	0.17	60
Corn Gluten Feed	90	80	86	56	83	22	25	9	12	38	36	3.2	7	0.11	0.84	1.3	0.25	0.47	84
Corn Gluten Meal 41% CP	91	85	93	62	88	46	63	5	9	32	23	3.2	3	0.13	0.55	0.2	0.07	0.62	35
Corn Gluten Meal 60% CP	91	89	99	67	93	67	65	3	6	11	23	2.5	2	0.06	0.54	0.2	0.10	0.90	40
Corn Cannery Waste	29	68	70	41	69	8	15	28	36	59	0	3.0	5	0.10	0.29	1.0		0.13	25
Cottonseed, Whole	91	95	107	73	99	23	38	27	37	47	100	19.4	5	0.16	0.64	1.0	0.06	0.24	34
Cottonseed, Whole, Delinted	90	95	107	73	99	24	39	19	28	40	100	22.9	5	0.12	0.54	1.2		0.24	36
Cottonseed, Whole, Extruded	92	87	98	67	91	26	50	32	44	53	33	9.5	5	0.17	0.68	1.3		0.24	38
Cotton Gin Trash (Burrs)	91	42	43	0	40	9		35	50	70	100	2.0	14	1.40	0.18	1.9		0.14	25
Cottonseed Hulls	90	45	45	3	44	5	45	48	70	87	100	1.8	3	0.15	0.08	1.0	0.02	0.05	10
Cottonseed Meal, Solv. Ext. 41% CP	90	77	82	53	79	47	42	13	18	25	23	1.5	7	0.22	1.23	1.6	0.05	0.44	66
Cottonseed Meal, Mech. Ext. 41% CP	92	79	85	55	81	46	50	13	19	31	23	5.0	7	0.21	1.18	1.6	0.05	0.42	64
Crab Waste Meal	91	29	37	0	30	32	65	11	13			3.0	43	15.00	1.88	0.5	1.63	0.27	107

2012 Feed Composition Tables

		ENERGY				PROTEIN		FIBER											
FEEDSTUFF	DM %	TDN %	NE_m (Mcal/cwt.)	NE_g (Mcal/cwt.)	NE_l (Mcal/cwt.)	CP %	UIP %	CF %	ADF %	NDF %	eNDF %	EE %	ASH %	Ca %	P %	K %	Cl %	S %	Zn ppm
Crambe Meal, Solv. Ext.	91	81	88	58	84	31	45	25	35	47	23	1.4	8	1.27	0.86	1.1	0.70	1.26	44
Crambe Meal, Mech. Ext.	92	88	98	65	91	28	50	24	33	42	25	17.0	7	1.22	0.78	1.0	0.65	1.18	41
Cranberry Pulp Meal	88	49	49	11	48	7		26	47	54	33	15.7	2						
Crawfish Waste Meal	94	25	36	0	29	35	74	12	15				42	13.10	0.85				
Curacao Phosphate	99	0	0	0	0	0		0	0	0	0	0.0	95	34.00	15.00				
Defluorinated Phosphate	99	0	0	0	0	0		0	0	0	0	0.0	95	32.60	18.07	1.0			100
Diammonium Phosphate	98	0	0	0	0	115	0	0	0	0	0	0.0	35	0.52	20.41	0.0		2.16	
Dicalcium Phosphate	96	0	0	0	0	0		0	0	0	0	0.0	94	22.00	18.65	0.1		1.00	70
Distillers Grains, Wet	25	90	100	68	94	28	52	8	18	40	4	9.6	5	0.10	0.70	1.0	0.20	0.60	95
Distillers Grain, Barley	90	75	79	50	77	30	56	16	20	44	4	8.5	4	0.15	0.67	1.0	0.18	0.43	50
Distillers Grain, Corn, Dry	91	99	113	75	105	29	58	8	16	39	4	10.0	5	0.09	0.75	0.9	0.14	0.70	65
Distillers Grain, Corn, Wet	36	101	115	77	108	29	54	8	16	39	4	10.0	5	0.09	0.75	0.9	0.14	0.70	65
Distillers Grain, Corn with Solubles	89	98	111	76	103	29	52	8	16	38	4	11.9	6	0.10	0.84	0.9	0.18	0.80	85
Distillers Dried Solubles	93	87	96	64	90	29	0	4	7	22	4	13.0	8	0.35	1.20	1.8	0.28	1.10	91
Distillers Corn Stillage	7	92	103	70	96	22	55	8	10	21	0	8.1	5	0.14	0.72	0.2		0.60	60
Distillers Grain, Sorghum, Dry	91	84	92	61	87	33	62	13	20	44	4	10.0	4	0.20	0.68	0.3		0.50	50
Distillers Grain, Sorghum, Wet	35	86	95	63	89	33	55	13	19	43	4	10.0	4	0.20	0.68	0.3		0.50	50
Distillers Grain, Sorghum with Solubles	92	85	93	62	88	33	53	12	18	42	4	10.0	4	0.23	0.70	0.5		0.70	55
Elephant (Napier) grass hay, chopped	92	55	55	21	54	9		24	46	63	85	2.0	10	0.35	0.30	1.3		0.10	
Fat, Animal, Poultry, Vegetable	99	195	285	230	285	0		0	0	0	0	99.0	0	0.00	0.00	0.0			
Feather Meal Hydrolyzed	93	67	69	40	68	87	68	1	14	42	23	7.0	3	0.48	0.45	0.1	0.20	1.82	90
Fescue KY 31 Fresh	29	64	65	36	65	15	20	25	32	64	40	5.5	9	0.48	0.37	2.5		0.18	22
Fescue KY 31 Hay Early Bloom	88	65	66	37	66	18	22	25	31	64	98	6.6	8	0.48	0.36	2.6		0.27	24
Fescue KY 31 Hay Mature	88	52	52	16	51	11	30	30	42	73	98	5.0	6	0.45	0.26	1.7		0.14	22
Fescue (Red) Straw	94	43	44	0	41	4		41				1.1	6	0.00	0.06				
Fish Meal	90	74	78	49	76	66	60	1	2	12	10	9.0	20	5.55	3.15	0.7	0.76	0.80	130
Flax Seed Hulls	91	38	40	0	36	9		32	39	50	98	1.5	10						
Garbage Municipal Cooked	23	80	86	56	83	16		9	50	59	30	20.0	10	1.20	0.43	0.6	0.67		
Glycerol (Glycerin)	88	90	100	68	94	0	0	0	0	0	0	0.0	6				4.00		
Grain Screenings	90	65	66	37	66	14		14				5.5	9	0.25	0.34				30
Grain Dust	92	73	77	48	75	10		11				2.2	10	0.30	0.18				42
Grape Pomace Stemless	91	40	42	0	38	12	45	32	46	54	34	7.6	9	0.55	0.07	0.6	0.01		24
Grass Hay	88	58	58	26	58	10	30	33	41	63	98	3.0	6	0.60	0.21	2.0		0.20	28
Grass Silage	30	61	62	31	61	11	24	32	39	60	61	3.4	8	0.70	0.24	2.1		0.22	29
Guar Meal	90	72	75	47	74	39	34	16				3.9	5						
Hominy Feed	90	89	99	67	93	11	48	5	8	21	9	6.5	3	0.04	0.55	0.6	0.06	0.10	32
Hop Leaves	37	49	49	11	48	15		15				3.6	35	2.80	0.64				
Hop Vine Silage	30	53	53	18	53	15		21	24			3.1	20	3.30	0.37	1.8		0.22	44
Hops Spent	89	35	39	0	33	23		26	30			4.6	7	1.60	0.60				
Kelp Dried	91	32	38	0	29	7		7	10			0.5	39	2.72	0.31				
Kenaf Hay	92	48	48	9	47	10		31	44	56	98	2.9	12						
Kochia Fresh	29	55	55	21	55	16		23				1.2	18	1.10	0.30				
Kochia Hay	90	53	53	18	53	14		27				1.7	14	1.00	0.20				
Kudzu Hay	90	54	54	20	54	16		33				2.6	7	3.00	0.23				
Lespedeza Fresh Early Bloom	25	60	60	30	60	16	50	32				2.0	10	1.20	0.24	1.1		0.21	
Lespedeza Hay	92	54	54	20	54	14	60	30				3.0	7	1.10	0.22	1.0		0.19	29
Limestone Ground	98	0	0	0	0	0	0	0	0	0	0	0.0	98	34.00	0.02			0.03	
Limestone Dolomitic Ground	99	0	0	0	0	0	0	0	0	0	0	0.0	98	22.30	0.04	0.4			
Linseed Meal, Solv. Ext.	91	77	82	53	79	38	36	10	18	25	23	1.7	6	0.43	0.91	1.5	0.04	0.47	60
Linseed Meal, Mech. Ext.	91	82	89	59	85	37	40	10	17	24	23	6.0	6	0.42	0.90	1.4	0.04	0.46	59
Meadow Hay	90	50	50	12	49	7	23	33	44	70	98	2.5	9	0.61	0.18	1.6		0.17	24
Meat Meal, Swine/Poultry	93	71	74	46	73	56	64	2	7	48	0	10.5	24	9.00	4.42	0.5	1.27	0.48	190
Meat and Bone Meal, Swine/Poultry	93	72	75	47	74	56	24	1	5	34	0	10.0	29	13.50	6.50				
Milk, Dry, Skim	94	87	96	64	90	36	0	0	0	0	0	0.9	8	1.36	1.09	1.7	0.96	0.34	41

		ENERGY				PROTEIN		FIBER											
FEEDSTUFF	DM %	TDN %	NE_m (Mcal/cwt.)	NE_g (Mcal/cwt.)	NE_l (Mcal/cwt.)	CP %	UIP %	CF %	ADF %	NDF %	eNDF %	EE %	ASH %	Ca %	P %	K %	Cl %	S %	Zn ppm
Mint Slug Silage	27	55	55	21	55	14		24				1.8	16	1.10	0.57				
Molasses Beet	77	75	79	50	77	8	0	0	0	0	0	0.2	12	0.14	0.03	6.0	1.64	0.60	18
Molasses Cane	77	74	78	49	76	6	0	0	0	0	0	0.5	14	0.95	0.09	4.2	2.30	0.68	15
Molasses Cane Dried	94	74	78	49	76	9	0	2	3	7	0	0.3	14	1.10	0.15	3.6	3.00		30
Molasses, Cond. Fermentation Solubles	43	69	71	43	70	16	0	0	0	0	0	1.0	26	2.12	0.14	7.5	2.73	0.93	30
Molasses Citrus	65	75	79	50	77	9	0	0	0	0	0	0.3	8	1.84	0.15	0.2	0.11	0.23	137
Molasses Wood, Hemicellulose	61	70	73	44	71	1	0	1	2	4	0	0.6	7	1.10	0.10	0.1		0.05	
Monoammonium Phosphate	98	0	0	0	0	70	0	0	0	0	0	0.0	24	0.30	24.70	0.0		1.42	81
Mono-Dicalcium Phosphate	97	0	0	0	0	0		0	0	0	0	0.0	94	16.70	21.10	0.1		1.20	70
Oat Hay	90	54	54	20	54	10	25	31	39	63	98	2.3	8	0.40	0.27	1.6	0.42	0.21	28
Oat Silage	35	60	60	30	60	12	21	31	39	59	61	3.2	10	0.34	0.30	2.4	0.50	0.25	27
Oat Straw	91	48	48	9	47	4	40	41	48	73	98	2.3	8	0.24	0.07	2.5	0.78	0.22	6
Oat Grain	89	76	81	52	78	13	18	11	15	28	34	5.0	4	0.05	0.41	0.5	0.11	0.20	40
Oat Grain, Steam Flaked	84	88	98	65	91	13	26	11	15	30	32	4.9	4	0.05	0.37	0.5	0.11	0.20	40
Oat Groats	91	91	102	69	95	18	15	3				6.6	2	0.08	0.47	0.4	0.10	0.20	
Oat Middlings	90	91	102	69	95	16	20	4	6			6.0	3	0.07	0.48	0.5		0.23	
Oat Mill Byproduct	89	33	38	0	30	7		27	37			2.4	6	0.13	0.22	0.6		0.24	
Oat Hulls	93	38	40	0	36	4	25	33	41	75	90	1.6	7	0.16	0.15	0.6	0.08	0.14	31
Orange Pulp Dried	89	79	85	55	81	9		9	16	20	33	1.8	4	0.71	0.11	0.6		0.05	
Orchardgrass Fresh Early Bloom	24	65	66	37	66	14	23	30	32	54	41	4.0	9	0.33	0.39	2.7	0.08	0.20	21
Orchardgrass Hay	88	59	59	28	59	10	27	34	40	67	98	3.3	8	0.32	0.30	2.6	0.41	0.20	26
Pea Vine Hay	89	59	59	28	59	11		32	50	62	92	2.0	7	1.25	0.24	1.3		0.20	20
Pea Vine Silage	25	58	58	26	58	16		29	44	55	61	3.3	8	1.25	0.28	1.6		0.29	32
Pea Vine Straw	89	51	51	14	50	7		41	49	72	98	1.4	7	0.75	0.13	1.1		0.15	
Peas Cull	88	85	93	62	88	23	22	7	9	12	0	1.4	4	0.14	0.46	1.1	0.06	0.26	30
Peanut Hulls	91	22	36	0	18	7		63	65	74	98	1.5	5	0.20	0.07	0.9			
Peanut Meal, Solv. Ext.	91	77	82	53	79	51	27	9	16	27	23	2.5	6	0.26	0.62	1.1	0.03	0.30	38
Peanut Skins	92	0	0	0	0	17		13	20	28	0	22.0	3	0.19	0.20				
Pearl Millet Grain	87	82	89	59	85	13		2	6	18	34	4.5	3	0.03	0.36	0.5			
Pineapple Greenchop	17	47	47	7	46	8		24	35	64	41	2.4	7	0.28	0.08				
Pineapple Bran	89	71	74	46	73	5		20	33	66	20	1.5	3	0.26	0.12				
Pineapple Presscake	21	71	74	46	73	5		24	35	69	20	0.8	3	0.25	0.09				
Potato Vine Silage	15	59	59	28	59	15		26				3.7	19	2.10	0.29	4.0		0.37	
Potatoes Cull	21	80	86	56	83	10	0	2	3	4	0	0.4	5	0.03	0.24	2.2	0.30	0.09	
Potato Waste Wet	14	82	89	59	85	7	0	9	11	18	0	1.5	3	0.16	0.25	1.2	0.36	0.11	12
Potato Waste Dried	89	85	93	62	88	8	0	7	9	15	0	0.5	5	0.16	0.25	1.2	0.39	0.11	12
Potato Waste Wet with Lime	17	80	86	56	83	5	0	10	12	16	0	0.3	9	4.20	0.18				
Potato Waste Filter Cake	14	77	82	53	79	5	0	2				7.7	3	0.10	0.19	0.2			
Poultry Byproduct Meal	93	79	85	55	81	62	49	2				14.5	17	4.00	2.25	0.5	0.58	0.56	129
Poultry Manure Dried	89	38	40	0	36	28	22	13	15	35	0	2.1	33	10.20	2.80	2.3	1.05	0.20	520
Prairie Hay	91	50	50	12	49	7	37	34	47	67	98	2.0	8	0.40	0.15	1.1	0.06	0.06	34
Pumpkins, Cull	11	80	86	56	83	15		14	21	30	0	8.9	9	0.24	0.43	3.3			
Rice Straw	91	40	42	0	38	4		38	47	72	100	1.4	13	0.23	0.08	1.2		0.11	
Rice Straw Ammoniated	87	45	45	3	44	9		39	53	68	100	1.3	12	0.25	0.08	1.1		0.11	
Rice Grain	89	79	85	55	81	8	30	10	12	16	34	1.9	5	0.07	0.32	0.4	0.09	0.05	17
Rice Polishings	90	90	100	68	94	14		4	5			14.0	9	0.05	1.34	1.2	0.12	0.19	28
Rice Bran	91	71	74	46	73	14	30	13	18	24	0	16.0	11	0.07	1.70	1.8	0.09	0.19	40
Rice Hulls	92	13	35	0	8	3	45	44	70	81	90	0.9	20	0.12	0.07	0.5	0.08	0.08	24
Rice Mill Byproduct	91	39	41	0	37	7		32	50	60	0	5.7	19	0.25	0.48	2.2		0.30	31
Rye Grass Hay	90	58	58	26	58	10	30	33	38	65	98	3.3	8	0.45	0.30	2.2		0.18	27
Rye Grass Silage	32	59	59	28	59	14	25	22	37	59	61	3.3	8	0.43	0.38	2.9	0.73	0.23	29
Rye Straw	89	44	44	1	43	4		44	55	71	100	1.5	6	0.24	0.09	1.0	0.24	0.11	
Rye Grain	89	80	86	56	83	14	20	3	9	19	34	2.5	3	0.07	0.55	0.5	0.03	0.17	33
Safflower Meal, Solv. Ext.	91	56	56	23	56	24		33	41	57	36	1.3	6	0.35	0.79	0.9	0.21	0.23	65
Safflower Meal Dehulled, Solv. Ext.	91	75	79	50	77	47		11	20	27	30	0.8	7	0.38	1.50	1.2	0.18	0.22	36
Safflower Hulls	91	14	35	0	34	4		58	73	90	100	3.7	2						
Sagebrush Fresh	50	50	50	12	49	13		25	30	38		9.2	10	1.00	0.25			0.22	

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FEEDSTUFF	DM %	TDN %	NE_m (Mcal/cwt.)	NE_g	NE_l	CP %	UIP %	CF %	ADF %	NDF %	eNDF %	EE %	ASH %	Ca %	P %	K %	Cl %	S %	Zn ppm
Sanfoin Hay	88	61	62	31	62	14	60	24				3.1	9						
Shrimp Waste Meal	90	48	48	9	47	50	60	11				5.5	25	8.50	1.75		1.15		
Sodium Tripolyphosphate	96	0	0	0	0	0		0	0	0	0	0.0	96	0.00	25.98	0.0		0.00	
Sorghum Stover	87	54	54	20	54	5		33	41	65	100	1.8	10	0.50	0.12	1.2			
Sorghum Silage	32	59	59	28	59	9	25	27	38	59	70	2.7	6	0.48	0.21	1.7	0.45	0.11	30
Sorghum Grain (Milo) Ground	89	82	89	59	85	11	55	3	6	15	5	3.1	2	0.04	0.32	0.4	0.10	0.14	18
Sorhum Grain (Milo) Flaked	82	90	100	68	94	11	62	3	6	15	38	3.1	2	0.04	0.28	0.4	0.10	0.14	18
Soybean Hay	89	52	52	16	51	16		33	40	55	92	3.5	8	1.28	0.29	1.0	0.15	0.24	24
Soybean Straw	88	42	43	0	40	5		44	54	70	100	1.4	6	1.59	0.06	0.6		0.26	
Soybeans Whole	88	92	103	70	96	41	28	8	11	15	100	18.8	5	0.27	0.64	1.9	0.03	0.34	56
Soybeans Whole, Extruded	88	93	104	71	97	40	35	9	11	15	100	18.8	5	0.27	0.64	2.0	0.03	0.34	56
Soybeans Whole, Roasted	88	93	104	71	97	40	48	9	11	15	100	18.8	5	0.27	0.64	2.0	0.03	0.34	56
Soybean Hulls	90	77	82	52	79	13	28	39	48	62	28	2.3	5	0.60	0.19	1.3	0.02	0.12	38
Soybean Meal, Solv. Ext. 44% CP	90	84	92	61	87	49	35	7	10	15	23	1.5	7	0.36	0.70	2.2	0.07	0.41	62
Soybean Meal, Solv. Ext. 49% CP	90	87	96	64	90	54	36	4	6	9	23	1.1	6	0.28	0.71	2.2	0.08	0.45	61
Soybean Mill Feed	90	50	50	12	49	15		36	46			1.9	6	0.46	0.19	1.7		0.07	
Spelt Grain	88	75	79	50	77	13	27	10	17	21	34	2.1	4	0.04	0.40	0.4		0.15	47
Sudangrass Fresh Immature	18	70	73	44	71	17		23	29	55	41	3.9	9	0.46	0.36	2.0		0.11	24
Sudangrass Hay	88	57	57	25	57	9	30	36	43	67	98	1.8	10	0.50	0.22	2.2	0.80	0.12	26
Sudangrass Silage	31	58	58	26	58	10	28	30	42	64	61	3.1	10	0.58	0.27	2.4	0.52	0.14	29
Sunflower Meal, Solv. Ext.	92	65	66	37	66	40	27	18	22	36	23	2.8	8	0.44	0.97	1.1	0.15	0.33	55
Sunflower Meal with Hulls	91	57	57	25	57	31	35	27	32	44	37	2.4	7	0.40	1.03	1.0		0.30	85
Sunflower Seed Hulls	90	40	42	0	38	4	65	52	63	73	90	2.2	3	0.00	0.11	0.2		0.19	200
Sugar Cane Bagasse	91	39	41	0	37	1		49	60	86	100	0.6	4	0.90	0.29	0.5		0.10	
Tapioca Meal, Cassava By-product	89	82	89	59	85	1		5	8	34		0.8	3	0.03	0.05				
Timothy Fresh Pre-bloom	26	64	65	36	65	11	20	31	36	59	41	3.8	7	0.40	0.28	1.9	0.57	0.15	28
Timothy Hay Early Bloom	88	59	59	28	59	11	22	32	39	63	98	2.7	6	0.58	0.26	1.9	0.51	0.21	30
Timothy Hay Full Bloom	88	57	57	25	57	8	30	34	40	65	98	2.6	5	0.43	0.20	1.8	0.62	0.13	25
Timothy Silage	34	59	59	28	59	10	25	34	45	70	61	3.4	7	0.50	0.27	1.7		0.15	
Tomatoes	6	69	71	43	70	16		9	11			4.0	6	0.14	0.35	4.2			
Tomato Pomace Dried	92	64	65	36	65	23		26	50	55	34	10.6	6	0.43	0.59	3.6			
Triticale Hay	90	56	56	23	56	10		34	41	69	98			0.30	0.26	2.3			25
Triticale Silage	34	58	58	26	58	14		30	39	56	61	3.6		0.58	0.34	2.7		0.28	36
Triticale Grain	89	85	93	62	88	14	25	4	5	22	34	2.4	2	0.07	0.39	0.5		0.17	37
Turnip Tops (Purple)	18	68	70	41	69	18		10	13			2.6	14	3.10	0.40	3.0	1.80	0.27	
Turnip Roots	9	86	95	63	89	12	0	11	34	44	40	1.6	9	0.65	0.31	3.1	0.65	0.43	40
Urea 46%N	99	0	0	0	0	288	0	0	0	0	0	0.0	0	0.00	0.00	0.0	0.00	0.00	0
Vetch Hay	89	58	58	26	58	18	14	30	33	48	92	1.8	8	1.25	0.34	2.4		0.13	
Wheat Fresh, Pasture	21	71	74	46	73	20	16	18	30	50	41	4.0	13	0.35	0.36	3.1	0.67	0.22	
Wheat Hay	90	57	57	25	57	9	25	29	38	66	98	2.0	8	0.21	0.22	1.4	0.50	0.19	23
Wheat Silage	33	59	59	28	59	12	21	28	37	62	61	3.2	8	0.40	0.28	2.1	0.50	0.21	27
Wheat Straw	91	43	44	0	41	3	60	43	57	81	98	1.8	8	0.17	0.06	1.3	0.32	0.17	6
Wheat Straw Ammoniated	85	50	50	12	49	9	25	40	55	76	98	1.5	9	0.15	0.05	1.3	0.30	0.16	6
Wheat Grain	89	88	98	65	91	14	23	3	4	12	0	2.3	2	0.05	0.43	0.4	0.09	0.15	40
Wheat Grain Hard	89	88	98	65	91	14	28	3	6	14	0	2.0	2	0.05	0.43	0.5		0.16	45
Wheat Grain Soft	89	88	98	65	91	12	23	3	4	12	0	2.0	2	0.06	0.40	0.4		0.15	30
Wheat Grain, Steam Flaked	85	91	102	69	95	14	29	3	4	12	0	2.3	2	0.05	0.39	0.4		0.15	40
Wheat Grain Sprouted	86	88	98	65	91	12	18	3	4	13	0	2.0	2	0.04	0.36	0.4		0.17	45
Wheat Bran	89	70	73	44	71	17	28	11	14	46	4	4.4	7	0.13	1.32	1.4	0.05	0.24	96
Wheat Middlings	89	80	86	56	83	18	22	8	11	36	2	4.7	5	0.14	1.00	1.3	0.05	0.20	98
Wheat Mill Run	90	76	81	52	78	17	28	9	12	37	0	4.5	6	0.11	1.10	1.2	0.07	0.22	90
Wheat Shorts	89	78	83	54	80	19	25	8	10	30	0	5.3	5	0.10	0.93	1.1	0.08	0.20	118
Wheatgrass Crested Fresh Early Bloom	37	60	60	30	60	11	25	26	28	50	41	1.6	7	0.46	0.32	2.4			
Wheatgrass Crested Fresh Full Bloom	50	55	55	21	55	10	33	33	36	65	41	1.6	7	0.39	0.28	2.1			
Wheatgrass Crested Hay	92	54	54	20	54	10	33	33	36	65	98	2.4	7	0.33	0.20	2.0			32
Whey Dried	94	82	89	59	85	14	15	0	0	0	0	0.9	10	0.98	0.88	1.3	1.20	0.92	10
Yeast, Brewer's	92	79	85	55	81	47	30	3	4		0	0.9	7	0.13	1.49	1.8			

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How should these values be used to improve the predictability of animal performance when fed various feeds? Generally, DIP can supply CP up to 7% of the diet. If the required CP in the diet exceeds 7% of the DM, all CP above this amount should be UIP. In other words, if the final diet is to contain 13% CP, 6 of the 13 percentage units, or 46% of the CP, should be UIP.

Once the relationship between UIP and DIP has been better quantified, CP requirements may be lowered, especially at higher CP levels. For diets high in rumen fermentable carbohydrate, DIP requirements may determine the total CP required in the diet.

Crude, acid detergent and neutral detergent fiber: Crude fiber (CF) is declining in use as a measure of poorly digested carbohydrates in feeds. CF's major problem is that variable amounts of lignin, which isn't digestible, are removed in the CF procedure. In the old scheme, the remaining carbohydrates (nitrogen-free extract or NFE) were thought to be more digestible than CF despite many feeds having higher CF digestibility than NFE. One reason CF remained in the analytical scheme was its apparent requirement for the TDN calculation.

Improved analytical procedures for fiber have been developed, namely acid detergent fiber (ADF) and neutral detergent fiber (NDF). ADF is related to feed digestibility and NDF is somewhat related to voluntary intake and the availability of net energy. Both measures relate more directly to predicted animal performance and thus are more valuable than CF. Lignification of NDF alters the availability of the surface area to fiber-digesting rumen microorganisms.

Recently, effective NDF (eNDF) has been used to better describe the dietary fiber function in high-concentrate, feedlot-type diets. While eNDF is defined as the percent of NDF retained on a screen similar in size to particles that will pass from the rumen, this value is further modified based on feed density and degree of hydration. Rumen pH is correlated with dietary eNDF when diets contain less than 26% eNDF. Thus, when formulating high-concentrate diets, including eNDF may help to prevent acidosis in the rumen.

In feedlot diets, the recommended eNDF levels range from 5-20% depending on bunk management, inclusion of ionophores, digestion of NDF and/or microbial protein synthesis in the rumen. Estimated eNDF values are shown for many feeds. These should be decreased depending on degree of feed processing (e.g., chopping, grinding, pelleting, flaking) and hydration (fresh forage, silages, high moisture grains) if these feed forms are not specified in the table.

Ether extract: Ether extract (EE) shows the crude fat content of the feed.

Minerals: Values are shown for only certain minerals. Calcium (Ca) and phosphorus (P) are important minerals to consider in most feeding situations. Potassium (K) is more important as the concentrate level increases and when NPN is substituted for intact protein in the diet.

Sulfur (S) also becomes more important as the NPN level increases in the diet. High dietary S levels compounded by high S levels in drinking water, however, can be detrimental. Zinc (Zn) is shown because it's less variable and is more generally near a deficient level in cattle and sheep diets. Chlorine (Cl) is of increasing interest for its role in dietary acid-base relationships.

The mineral level in the soil on which feeds are grown or other environmental factors preclude showing a single value for many of the trace minerals in feeds. Iodine and selenium are required nutrients deficient in many diets, yet their level in a feed is more related to the conditions under which the feed is grown than a characteristic of the feed itself. Trace mineralized salt and trace mineral premixes are generally used to supplement trace minerals; their use is encouraged where deficiencies exist.

Vitamins: Vitamins are not included in the table. The only vitamin of general practical importance in cattle and sheep feeding is the vitamin A value (vitamin A and carotene) in feeds. This depends largely on maturity and conditions at harvest, and the length and conditions during storage. Thus, it's probably unwise to rely entirely on harvested feeds as a source of vitamin A value.

When roughages are fed that contain good green color or are being fed as immature, fresh forages (e.g., pasture), there will probably be sufficient vitamin A value to meet animal requirements. Other vitamins, if required, should be supplied as supplements.

Future table revisions

A feed composition table is of value only if it's relatively complete, contains feeds commonly fed and the data are constantly updated. I welcome suggestions and compositional data to keep this table useful to the cattle and sheep industry.

When sending compositional data, adequately describe the feed, indicate the DM or moisture content and if the analytical values are on an as-fed or DM basis. If more than one sample was analyzed, the number of samples analyzed should be indicated. Send them to Rodney Preston, 1495 E. Village Lane #B, Bellingham, WA 98226-8017.

Rod Preston

Rodney Preston is an emeritus professor from Texas Tech University, where he was a Horn Distinguished Professor and held the Thornton Endowed Chair. He was a member of the NRC Committee on Animal Nutrition and president of the American Society of Animal Science.