

Ingredient Analysis Table: 2011 Edition

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THE purpose of the *Feedstuffs* Ingredient Analysis Table is to provide nutritionists with a reasonable estimate of the nutritive values of common feed ingredients. These values are based on current analysis and are reviewed yearly. For each ingredient listed, significant differences in composition can and do exist due to factors such as regional location, manufacturing practices and climatic conditions. In a number of cases, especially with rendered animal proteins, blends of poultry meal, meat and bone meal, fish meal, feather meal, etc., ingredients are prepared to meet a specific objective. Such ingredients will vary in composition over time and market conditions. Thus, the reader is urged to use the values listed in this Table as a guide, and to invest in ingredient analyses as necessary prior to diet formulation. The authors emphasize that in no way should the use of any table of nutrient value replace a well-designed quality control program.

The authors recognize that many values in the Table were determined several decades ago, and may not have been recently verified. This is particularly true of the mineral content of major ingredients. To address this problem, a study was conducted by the authors in which commercial nutritionists from different regions of the U.S. submitted samples of corn and dehulled soybean meal. At our laboratory, the macro- and micro-mineral content of each was determined. Results are included in the current Table. Of particular interest for many will be phosphorus. During the coming year, we hope to conduct a similar study to document the selenium

content of several popular ingredients.

One of the dynamic aspects of animal nutrition is the industry's interest in utilizing new and/or modified feed ingredients as they become available in commercial quantities. The authors are pleased to include new ingredients in the Table once adequate analytical work has been completed. For example, *camelina meal* was first introduced in the Table last year.

During the past several years, there have been marked changes in several ingredients. The tremendous interest in biofuel production has led to an effort to characterize the nutrient profile of a number of novel byproducts in addition to corn dried distillers grains plus solubles. We have and will continue to update the nutrient profile of such ingredients as data are received. The authors recognize that increased interest in the fractionation process in relation to fermentation for ethanol production results in different byproducts that may have similar names with products that were already available. Because there has only been limited analysis of these new, different byproducts, the authors do not feel they can include averages in the Table at this time. However, it is our objective to include these ingredients in future Tables as more analyses are conducted.

The authors very much appreciate correspondence from those wishing to propose changes to either the listing of ingredients or their respective profiles. It is fully recognized that those active in a specific industry will be better attuned than we to such modifications, as we sincerely appreciate their enabling us to improve the Table listings. Unfortunately, some errors are bound to occur in a Table with so many individual values. Any comments or questions can be sent to the authors by mail or email.

1. Mineral analysis table (Prepared by Amy Batal and Nick Dale, University of Georgia, Athens, Ga.)

	Calcium	Total phos.	Ash	Sodium	Potassium	Magnesium	Fluorine	Manganese	Iron	Copper	Zinc	Selenium	
	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	
Bone meal (steamed)	24.0	12.0	71.0	0.46	N/A	0.64	N/A	30.4	840	16.3	424	N/A	
Calcium carbonate	38.0	—	95.8	0.06	0.06	0.50	N/A	279	336	24	N/A	0.07	
Curacao phosphorus	36.0	14.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Diammonium phosphate (N-18%)	0.5	20.0	34.5	0.04	—	0.45	0.2	500	15,000	80	300	N/A	
Defluorinated phosphate	33.0	18.0	99.0	4.5	0.09	—	0.2	220	9,200	22	44	0.60	
Dicalcium phosphpate	22.0	18.5	85.6	0.08	0.07	0.60	0.18	300	10,000	80	220	0.60	
Mono-dicalcium phosphate	16.0	21.0	83.2	0.05	0.06	0.50	0.15	220	7,000	70	210	0.60	
Monammonium phosphate (N-11%)	0.5	24.0	34.5	0.06	—	0.45	0.24	500	12,000	80	300	N/A	
Sodium phosphate (monobasic)	—	21.8	96.7	32.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Sodium tripolyphosphate	—	25.0	96.0	31.0	N/A	N/A	0.02	N/A	42	N/A	N/A	N/A	
Phosphoric acid (75%)	—	23.8	N/A	N/A	N/A	N/A	—	N/A	5	N/A	N/A	N/A	
				Potassium	Magnesium	Iron	Copper	Manganese	Zinc	Cobalt	Sulfur	Selenium	Sodium
				%	%	%	%	%	%	%	%	%	%
Copper chloride, Tri-basic (Cu ₂ (OH) ₂ Cl)	—	—	N/A	N/A	N/A	58	N/A	N/A	—	—	—	—	—
Copper sulfate (CuSO ₄ ·5H ₂ O)	—	—	N/A	N/A	25.0	N/A	N/A	—	—	—	—	—	—
Cupric carbonate (CuCO ₃)	—	—	N/A	N/A	53.0	N/A	N/A	—	—	—	—	—	—
Cupric oxide (CuO)	—	—	N/A	N/A	75.0	N/A	N/A	—	—	—	—	—	—
Cobalt sulfate (CoSO ₄ ·7H ₂ O)	—	—	0.04	0.001	0.001	0.002	—	21.0	—	—	—	—	—
Cobalt carbonate (CoCO ₃)	—	—	N/A	N/A	N/A	N/A	—	45.0	—	—	—	—	—
Cobalt sulfate (CoSO ₄ ·7H ₂ O)	—	—	0.06	0.001	0.003	—	—	33.0	—	—	—	—	—
Ferrous sulfate (FeSO ₄ ·7H ₂ O)	—	—	0.05	21.0	0.01	0.12	0.01	—	11.0	—	—	—	—
Ferrous carbonate (FeCO ₃)	—	—	0.31	43.0	0.3	0.35	N/A	—	0.4	—	—	—	—
Manganese sulfate (MnSO ₄ ·H ₂ O)	—	—	0.03	0.04	—	25.0	—	—	19.0	—	—	—	—
Manganous oxide (MnO)	—	—	2.4	3.4	0.2	60.0	0.42	—	—	—	—	—	—
Magnesium sulfate (MgSO ₄ ·7H ₂ O)	—	—	10.0	N/A	N/A	N/A	N/A	N/A	13.0	—	—	—	—
Magnesium sulfate (MgSO ₄)	—	—	20.0	N/A	N/A	N/A	N/A	N/A	26.6	—	—	—	—
Potassium sulfate (K ₂ SO ₄)	44.8	—	—	—	—	—	—	—	18.3	—	—	—	—
Sodium selenite (Na ₂ SeO ₃)	—	—	—	—	—	—	—	—	—	—	—	45.6	26.6
Sodium selenate (Na ₂ SeO ₄)	—	—	—	—	—	—	—	—	—	—	—	41.8	24.3
Zinc sulfate (ZnSO ₄ ·7H ₂ O)	—	—	N/A	N/A	N/A	N/A	36.0	—	N/A	—	—	—	—
Zinc oxide (ZnO)	—	—	0.5	0.08	0.07	0.01	73.0	—	1.0	—	—	—	—

2. Liquid supplement ingredient table (Prepared by Amy Batal and Nick Dale, University of Georgia, Athens, Ga.)

	Total			Ruminant			Phos-			Potas-			Mang-										
	DM %	CP %	Sugars %	Brix %	pH	TDN %	RDP %	Ash %	Calcium %	phorus %	Nitrogen %	Sodium %	Chlorine %	sium %	Mag- nesium %	Sulfur %	Iron %	anese %	Copper %	Zinc %	Selenium %	Cobalt %	
Molasses, beet	78.5	7.6	48.0	79.5	7.5	61.0	4.2	10.5	0.1	0.02	1.22	1.17	N/A	4.77	0.23	0.47	0.01	—	—	—	—	—	—
Molasses, cane	78.0	6.3	48.0	86.0	5.7	62.0	1.8	16.0	0.82	0.08	0.90	0.09	1.5	3.38	0.35	0.65	0.02	0.0004	0.006	—	—	—	—
Molasses, citrus	67.7	5.7	45.0	71.0	N/A	52.5	2.5	5.4	1.2	0.12	0.91	0.27	N/A	0.09	0.14	—	0.03	0.0003	0.007	0.01	—	—	—
Molasses, starch, corn	73.0	0.05	N/A	N/A	N/A	65.0	—	8.0	0.1	0.6	—	2.5	N/A	0.2	N/A	1.0	N/A	N/A	N/A	N/A	—	—	—
Molasses, wood	66.0	0.7	35.0	65.0	N/A	50.0	0.3	4.0	0.52	0.05	—	N/A	N/A	0.04	0.07	N/A	N/A	N/A	N/A	N/A	—	—	—
Sodium lignin sulfonate	50.0	—	14.0	N/A	6.2	15.0	—	6.0	N/A	—	2.2	N/A	N/A	N/A	N/A	2.5	—	—	—	—	—	—	—
Calcium lignin sulfonate	50.0	0.3	3.5	65.0	5.5	20.0	0.2	6.0	2.5	—	0.05	0.4	—	0.1	0.1	3.3	0.1	0.1	—	—	—	—	—
Ammonium lignin sulfonate	50.0	12.5	11.0	N/A	4.0	26.5	8.0	N/A	—	—	2.0	N/A	—	N/A	N/A	3.0	N/A	N/A	—	—	—	—	—
Grains, brewers grains, wet	23.8	5.5	—	—	—	15.9	4.0	1.1	0.07	0.12	0.88	—	—	—	—	0.02	—	—	—	—	—	—	—
Distiller stillage, wet	6.2	1.9	—	—	—	4.2	1.24	0.3	—	—	0.3	—	—	—	—	—	—	—	—	—	—	—	—
Distillery stillage, strained	3.8	1.1	—	—	—	2.4	0.72	0.3	—	0.05	0.18	—	—	—	—	—	—	—	—	—	—	—	—
Urea, 45% N	0.5	281.0	—	—	—	—	—	197.0	N/A	—	45	—	—	—	—	—	—	—	—	—	—	—	—
Biuret	0.5	218.0	—	—	—	—	—	153.0	N/A	N/A	35	—	—	—	—	—	—	—	—	—	—	—	—
Diammonium phosphate	95.0	112.5	—	—	—	—	78.8	36.0	0.5	20.0	18	0.04	—	—	0.45	—	1.5	0.05	0.008	0.03	—	—	—
Ammonium polyphosphate (9-30-0)	95.0	62.5	—	—	—	—	43.7	34.5	0.5	14.8	10	0.06	—	—	0.45	—	1.2	0.05	0.008	0.03	—	—	—
Ammonium polyphosphate (11-37-0)	95.0	68.8	—	—	—	—	48.1	34.5	0.5	16.1	11	0.06	—	—	0.45	—	1.2	0.05	0.008	0.03	—	—	—
Sodium phosphate, monobasic	N/A	—	—	—	—	—	—	96.7	—	21.8	—	32.3	—	—	—	—	—	—	—	—	—	—	—
Sodium triphosphate	N/A	—	—	—	—	—	—	96.0	—	25.0	—	31	—	—	—	—	—	—	—	—	—	—	—
Phosphoric acid, 75%	N/A	—	—	—	—	—	—	N/A	—	23.8	—	—	—	—	—	—	—	—	—	—	—	—	—
Phosphoric acid, 80%	N/A	—	—	—	—	—	—	N/A	—	25.3	—	—	—	—	—	—	—	—	—	—	—	—	—
Phosphoric acid, 85%	N/A	—	—	—	—	—	—	N/A	—	27.4	—	—	—	—	—	—	—	—	—	—	—	—	—
Calcium chloride dihydrate 77%	78.0	—	—	—	—	—	—	N/A	—	27.8	—	—	49.2	—	0.02	—	—	—	—	—	—	—	—
Salt, plain (NaCl)	99.6	—	—	—	—	—	—	N/A	—	—	—	39.34	60.66	—	—	—	—	—	—	—	—	—	—
Copper sulfate (CuSO ₄ ·5H ₂ O)	99.5	—	—	—	—	—	—	N/A	—	—	—	—	—	—	—	13.8	—	—	25	—	—	—	—
Ferrous sulfate (FeSO ₄ ·7H ₂ O)	99.5	—	—	—	—	—	—	N/A	—	—	—	—	—	—	0.05	11.0	21	0.12	0.01	—	—	—	—
Cobalt sulfate (CoSO ₄ ·7H ₂ O)	99.5	—	—	—	—	—	—	N/A	—	—	—	—	—	—	0.04	11.4	0.001	0.002	0.001	—	—	—	21
Zinc sulfate (ZnSO ₄ ·7H ₂ O)	99.5	—	—	—	—	—	—	N/A	—	—	—	—	—	—	—	18.0	—	—	—	—	—	—	36
Manganese sulfate (MnSO ₄ ·H ₂ O)	99.5	—	—	—	—	—	—	N/A	—	—	—	—	—	—	0.3	19.0	0.04	25	—	—	—	—	—
Magnesium sulfate (MgSO ₄ ·7H ₂ O)	99.5	—	—	—	—	—	—	N/A	—	—	—	—	—	—	10	13.0	—	—	—	—	—	—	—
Potassium sulfate (K ₂ SO ₄)	99.5	—	—	—	—	—	—	N/A	—	—	—	—	—	—	—	44.8	—	—	—	—	—	—	—
Sodium selenite (Na ₂ SeO ₃)	99.5	—	—	—	—	—	—	N/A	—	—	—	26.6	—	—	—	—	—	—	—	—	—	—	45.6
Sodium selenate (Na ₂ SeO ₄)	99.5	—	—	—	—	—	—	N/A	—	—	—	24.3	—	—	—	—	—	—	—	—	—	—	41.8

