

Composition of Some Livestock Feeds

Shane Gadberry, Ph.D.
Assistant Professor -
Livestock Nutrition

Since feed is the major cost of producing livestock, most successful producers strive to meet the nutrient needs of their animals at an optimum level of performance and the lowest cost. Overfeeding or underfeeding leads to inefficient production and reduced profit potential, so making the most efficient use of feeds is of prime importance in securing profits.

Rations must be properly balanced so that feeds are used most efficiently and animals remain healthy. Ration balancing is an important management tool the producer can use to maximize profits.

To begin ration balancing, a list of available feeds and their cost or value should be compiled. Next, information on their composition should be obtained.

Feeds can be divided into two basic groups – forages and concentrates. Forages include pastures, hays, silages, haylages, crop residues and other high fiber feeds. Concentrates include energy feeds (corn, milo, wheat, etc.), protein feeds (cottonseed meal, soybean meal, etc.) and commercial formulations of energy and protein feeds. Since most commercial companies guarantee the quality of their feed products, testing is usually not necessary.

“Book values” (as shown in this publication) can be used for nutrient content of grains and protein sources such as cottonseed meal and soybean meal unless there is a reason to suspect the feedstuff is not normal. Book values can also be used for byproduct feeds. However, nutrient composition of byproduct feeds can be

highly variable, and a nutrient analysis is recommended when using these feedstuffs.

Importance of Forage Testing

Estimating the nutrient content of forages by visual evaluation or from book values will lead to errors in feeding. Nutrient values cannot be accurately estimated, and “book values” are not accurate. The nutrient content of plants varies from field to field, from farm to farm and from year to year, as a result of differences in plant species and varieties, soil fertility, climatic factors (rain, wind, sunlight, temperature, etc.), stage of forage maturity and harvesting and storage methods. Therefore, the only way to know the quality of forage is to have it analyzed.

Feed Composition Table

Feed composition tables usually provide reliable information on composition of concentrates, and they can provide some useful information on composition of forages when laboratory analyses are not available.

The nutrient composition of the feeds in the following table was compiled from (1) information contained in *Nutrient Requirements of Beef Cattle*, seventh revised edition, issued in 1996, under the direction of the Subcommittee on Beef Cattle Nutrition, Board of Agriculture of the National Research Council and (2) a University of Arkansas Division of Agriculture, Cooperative Extension Service forage and poultry litter database, which is denoted in the table as “AR” for Arkansas Average composition values.

*Arkansas Is
Our Campus*

Visit our web site at:
<http://www.uaex.edu>

	DM %	Protein		Fiber				Energy					Fat %	Minerals					
		CP %	RDP % CP	CF %	NDF %	eNDF % NDF	ADF %	TDN %	DE Mcal/lb	ME Mcal/lb	NE _L Mcal/lb	NE _m Mcal/lb		NE _g Mcal/lb	Ca %	P %	Mg %	K %	S %
Whole/Processed Grains																			
Barley Grain, Heavy	88	13.2	67	3	18	34	6	84	1.68	1.38	0.88	0.94	0.64	2.2	0.05	0.35	0.12	0.57	0.15
Corn, Dry Ear 56 lb/bu	87	9.0	46	10	28	56	10	82	1.64	1.35	0.86	0.91	0.61	3.7	0.07	0.27	0.14	0.53	0.16
Corn, Dry Grain 56 lb/bu	88	9.8	45	3	9	60	3	88	1.76	1.45	0.93	0.99	0.68	4.3	0.03	0.31	0.11	0.33	0.14
Corn Grain, Cracked	88	9.8	45	3	11	60	3	90	1.80	1.48	0.95	1.02	0.70	4.1	0.03	0.32	0.12	0.44	0.11
Corn Grain, Flaked	86	9.8	43	3	9	48	3	93	1.86	1.53	0.98	1.06	0.74	4.3	0.03	0.31	0.11	0.33	0.14
Corn, Ground Grain 56 lb/bu	88	9.8	57	3	9	0	3	88	1.76	1.45	0.93	0.99	0.68	4.3	0.03	0.31	0.11	0.33	0.14
Corn, High Moisture Ear 56 lb/bu	72	9.0	62	3	28	56	3	85	1.70	1.40	0.89	0.95	0.65	3.7	0.07	0.27	0.14	0.53	0.16
Corn, High Moisture Grain 56 lb/bu	72	9.8	68	3	9	0	3	93	1.86	1.53	0.98	1.06	0.74	4.3	0.03	0.31	0.11	0.33	0.14
Cottonseed, High Lint	92	24.4	70	26	52	100	42	90	1.80	1.48	0.95	1.02	0.70	17.5	0.17	0.62	0.38	1.24	0.27
Oats 38 lb/bu	89	13.6	83	12	29	34	14	77	1.54	1.27	0.80	0.84	0.55	5.2	0.009	0.41	0.16	0.51	0.21
Rice Grain, Ground	89	8.9	70	10	16	0	18	79	1.58	1.30	0.83	0.87	0.58	1.9	0.07	0.36	0.14	0.53	0.05
Rice Grain, Polished	89	8.6	66	4	2	0	5	89	1.78	1.46	0.94	1.00	0.69	0.8	0.03	0.13	0.1	0.26	0.09
Rye Grain	88	13.8	79	3	19	34		84	1.68	1.38	0.88	0.94	0.64	1.7	0.07	0.36	0.14	0.52	0.17
Sorghum, Dry Grain	89	11.6	51	3	13	34	6	76	1.52	1.25	0.79	0.83	0.54	3.1	0.05	0.34	0.14	0.47	0.12
Sorghum, Rolled Grain	90	12.6	43	3	16	34	6	82	1.64	1.35	0.86	0.91	0.61	3.0	0.04	0.34	0.17	0.44	0.14
Sorghum, Steam Flaked	70	12.0	56	3	23	34	6	88	1.76	1.45	0.93	0.99	0.68	3.1	0.05	0.34	0.14	0.35	0.12
Soybean, Whole	90	40.3	75	10	15	100	11	94	1.88	1.54	0.99	1.07	0.75	18.2	0.27	0.65	0.27	2.01	0.35
Wheat Grain, Hard Red Spring	88	14.2	74	3	12	0	6	84	1.68	1.38	0.88	0.94	0.64	2.0	0.05	0.42	0.16	0.41	0.17
Wheat Grain, Soft White	90	11.3	74	3	10	0	4	85	1.70	1.40	0.89	0.95	0.65	1.9	0.07	0.33	0.11	0.43	0.13
Wheat Ground	89	14.2	77	4	12	0	4	88	1.76	1.45	0.93	0.99	0.68	2.3	0.05	0.44	0.13	0.4	0.14
Protein Feeds																			
Cottonseed Meal - Sol-41% CP	92	46.1	57	13	29	36	18	75	1.50	1.23	0.78	0.81	0.53	3.2	0.2	1.16	0.65	1.65	0.42
Canola Meal	92	40.9	68	12	27	23	22	69	1.38	1.13	0.71	0.73	0.45	3.5	0.7	1.2	0.57	1.37	1.17
Corn Gluten Meal	91	46.8	38	5	37	36	9	84	1.68	1.38	0.88	0.94	0.64	2.4	0.16	0.51	0.06	0.03	0.22
Corn Gluten Meal 60% CP	91	66.3	41	2	9	36	5	89	1.78	1.46	0.94	1.00	0.69	2.6	0.07	0.61	0.15	0.48	0.90
Peanut Meal	92	52.9	80	8	14	36	13	77	1.54	1.27	0.80	0.84	0.55	2.3	0.32	0.66	0.17	1.28	0.33
Soybean Meal - 44	89	49.9	65	7	15	23	10	84	1.68	1.38	0.88	0.94	0.64	1.6	0.4	0.71	0.31	2.22	0.46
Soybean Meal - 49	90	54.0	65	4	8	23	6	87	1.74	1.43	0.91	0.98	0.67	1.1	0.29	0.71	0.33	2.36	0.48

	DM %	Protein		Fiber				Energy					Fat %	Minerals					
		CP %	RDP % CP	CF %	NDF %	eNDF % NDF	ADF %	TDN %	DE Mcal/lb	ME Mcal/lb	NE _L Mcal/lb	NE _m Mcal/lb		NE _g Mcal/lb	Ca %	P %	Mg %	K %	S %
Protein Feeds																			
Urea	99	291.0	100	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.0	0	0	0	0	0
Bloodmeal	90	93.8	25	1	1	0	2	66	1.32	1.08	0.68	0.68	0.42	1.7	0.4	0.32	0.04	0.31	0.8
Feather Meal	90	85.8	30	1	39	23	18	68	1.36	1.12	0.70	0.71	0.44	7.2	1.19	0.68	0.06	0.2	1.85
Fishmeal	90	67.9	40	1	2	10	3	73	1.46	1.20	0.76	0.79	0.50	10.7	5.46	3.14	0.16	0.77	0.58
Meat Meal	95	58.2	45	2	28	0	6	71	1.42	1.17	0.74	0.76	0.48	11.0	9.13	4.34	0.27	0.49	0.51
Byproduct Feeds																			
Bakery Waste	92	9.0	76	2	18	0	6	89	1.78	1.46	0.94	1.00	0.69	12.7	0.15	0.24	0.18	0.43	0.02
Barley Malt Sprouts with Hulls	93	28.1	64	11	46	34	20	71	1.42	1.17	0.74	0.76	0.48	1.4	0.19	0.68	0.18	0.27	0.85
Beet Pulp, Dehydrated	91	9.8	43	18	45	33	26	74	1.48	1.22	0.77	0.80	0.52	0.6	0.68	0.1	0.28	0.22	0.22
Brewers Grain, 21% Dry Matter	21	26.0	41	15	42	18	24	70	1.40	1.15	0.72	0.74	0.47	6.5	0.29	0.7	0.27	0.58	0.34
Brewers Grain, Dehydrated	92	29.2	34	15	49	18	24	66	1.32	1.08	0.68	0.68	0.42	10.8	0.29	0.7	0.27	0.58	0.40
Citrus Pulp, Dehydrated	91	6.7	42	14	23	33	20	82	1.64	1.35	0.86	0.91	0.61	3.7	1.88	0.13	0.17	0.77	0.08
Corn Gluten Feed	90	23.8	75	8	36	36	11	80	1.60	1.31	0.84	0.88	0.59	3.9	0.07	0.95	0.4	1.4	0.47
Corn Hominy	90	11.5	47	4	23	9	6	91	1.82	1.50	0.96	1.03	0.71	7.3	0.05	0.57	0.26	0.65	0.03
Cottonseed Hulls	90	4.2	50	48	88	100	65	42	0.84	0.69	0.41	0.31	0.07	1.7	0.15	0.09	0.14	0.88	0.11
Distillers Gr. + Solubles	25	29.5	27	7	46	4	17	88	1.76	1.45	0.93	0.99	0.68	10.3	0.32	0.83	0.33	1.07	0.40
Distillers Gr., Wet	25	26.0	33	7	40	4	17	90	1.80	1.48	0.95	1.02	0.70	9.9	0.32	1.4	0.65	1.83	0.40
Peanut Hulls	92	6.6	70	63	74		65	20	0.40	0.33	0.17	-0.09	-0.32	2.0	0.26	0.07	0.17	0.95	0.10
Peanut Skins	92	17.0		13	28		20	66	1.32	1.08	0.68	0.68	0.42	22.	0.19	0.2			
Poultry Litter, Broiler (AR)	79	23.0		16	41		28	50	1.00	0.82	0.50	0.44	0.19	2.5	2.9	1.64	0.64	2.68	0.48
Rice Bran	91	14.4	51	7	27	0	16	70	1.40	1.15	0.72	0.74	0.47	15.	0.1	1.73	0.97	1.89	0.20
Rice Bran - Defatted	88	16.3	50	9	29	0	18	56	1.12	0.92	0.57	0.53	0.28	3.2	0.11	1.95	0.96	1.82	0.22
Rice Mill Feed	91	6.8	50	32	60	0	50	42	0.84	0.69	0.41	0.31	0.07	6.4	0.08	0.6	0.54	2.2	
Rice Mill Feed - Defatted	90	7.7	50	30	63	0	53	35	0.70	0.58	0.34	0.19	-0.05	1.2	0.08	0.63	0.57	0.79	
Soybean Hulls	91	12.2	58	35	66	2	44	80	1.60	1.31	0.84	0.88	0.59	2.1	0.53	0.18	0.22	1.29	0.11
Sunflower Seed Meal	90	25.9	80	24	40	23	29	65	1.30	1.07	0.67	0.67	0.40	2.9	0.45	1.02	0.7	1.27	0.33
Wheat Bran	89	17.4	80	11	43	0	14	70	1.40	1.15	0.72	0.74	0.47	4.3	0.14	1.27	0.63	1.37	0.18
Wheat Middlings	89	18.4	77	9	35	2	13	83	1.66	1.36	0.87	0.92	0.62	3.2	0.15	1	0.38	1.1	0.19

	DM %	Protein		Fiber				Energy					Fat %	Minerals					
		CP %	RDP % CP	CF %	NDF %	eNDF % NDF	ADF %	TDN %	DE Mcal/lb	ME Mcal/lb	NE _L Mcal/lb	NE _m Mcal/lb		NE _g Mcal/lb	Ca %	P %	Mg %	K %	S %
Molasses/Fats and Oils/Other																			
Distillers Cond. Solubles	31	20.3	79	2	1	0	2	103	2.06	1.69	1.19	1.29	0.93	18.5	0.07	1.57	0.66	2.26	1.13
Corn Steep Liquor	41	35.9	80	1	2.3	0	0.6	83	1.67	1.36	0.88	0.93	0.63	3	0.07	2.8	1.2	3.7	1.57
Tallow	99	0.0	100	0	0	0	0	177	3.54	2.91	1.92	2.16	1.59	99.2	0.57	0.06	0.06	0.32	0
Whey Acid	7	14.2	100	0	0	0	0	78	1.56	1.28	0.81	0.86	0.57	0.7	0.81	0.71	0	2.75	0
Whey Delact.	93	17.9	100	0	0	0	0	71	1.42	1.17	0.74	0.76	0.48	1.1	1.6	1.18	0.23	3.16	1.15
Milk	12	25.8	99	0	0	0	0	130	2.60	2.14	1.39	1.53	1.11	28.5	0.92	0.67	0.08	1.16	
Molasses Beet	78	8.5	100	0	0	0	0	75	1.50	1.23	0.78	0.81	0.53	0.0	0.15	0.03	0.29	6.06	0.60
Molasses Cane	74	5.8	100	0	0	0	0	72	1.44	1.18	0.75	0.77	0.49	0.0	1	0.1	0.42	4.01	0.47

List of Abbreviations Used

DM	dry matter	ADF	acid detergent fiber	NE _g	net energy for gain
CP	crude protein	TDN	total digestible nutrients	Ca	calcium
RDP	rumen degradable protein	DE	digestible energy	P	phosphorus
CF	crude fiber	ME	metabolizable energy	Mg	magnesium
NDF	neutral detergent fiber	NE _L	net energy for lactation	K	potassium
eNDF	effective NDF	NE _m	net energy for maintenance	S	sulfur

Acknowledgment is given to Dr. George Davis, former Extension livestock specialist, who was the original author of this publication.

Printed by University of Arkansas Cooperative Extension Service Printing Services.

DR. SHANE GADBERRY is assistant professor - livestock nutrition, University of Arkansas Division of Agriculture, Little Rock.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director, Cooperative Extension Service, University of Arkansas. The Arkansas Cooperative Extension Service offers its programs to all eligible persons regardless of race, color, national origin, religion, gender, age, disability, marital or veteran status, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer.