Appendix Table 1. Composition of feeds consumed by runinants.

Name	Stage of maturity, etc.	DM	Composition, DM basis													
			CP	CF	ADF	NDF	TDN	DE	ME	NEm	NEg	NEℓ	Ca	Mg	P	K
			%					Mcal/kg					%			
Roughages (<20% CP and generally >18% CF)																
Pasture-Range-Grasses																
Alkali Scaton (*Sporobolus airoides*)	mid bloom		8	30			57	2.51					0.38		0.15	
Bahia grass (*Paspalum notatum*)	fresh		8	32			52	2.29	1.87	1.11	0.36	1.15	0.45	0.25	0.19	1.45
Bermudagrass (*Cynodon dactylon*)	ear. veg.	32	10	30			57	2.51								
Bluegrass, Canada (*Poa compressa*)	ear. veg.	26	17	26			70	3.08	2.67	1.54	0.97	1.59				
Bluegrass, Kentucky (*P. pratensis*)	ear. veg.	30	17	25			72	3.17	2.76	1.60	1.03	1.64	0.56		0.47	2.27
	ear. bloom	36	15	28	32	65	69	3.04	2.62	1.52	0.95	1.57	0.46	0.11	0.39	2.01
Bluegrass, Sandberg (*P. secunda*)	ear. bloom		11	33			58	2.56					0.45		0.30	
Bluestem (*Andropogon* spp)	ear. veg.	27	13	25			68	3.00					0.63		0.20	1.72
	mature	56	6	34			50	2.20					0.40	0.06	0.12	0.51
Bluestem, Little (*A. scoparius*)	fresh	58	6	33		80	50	2.20					0.32		0.07	
Brome, Cheatgrass (*Bromus tectorum*)	ear. veg.	22	16	23			67	2.95					0.64		0.28	
	full bloom		10	32			58	2.56					0.41		0.25	
	mature	55	5	35			50	2.20					0.38		0.27	
Brome, Ripgut (*B. rigidus*)	fresh		9	27			62	2.73					0.48		0.39	2.92
Brome, Smooth (*B. inermis*)	ear. veg.	29	23	25	27	48	68	3.00	2.58	1.49	0.92	1.54	0.55	0.32	0.45	3.16
	mature	56	9	33	41	60	53	2.33					0.59	0.18		
Buffalograss (*Buchloe dactyloides*)	fresh	46	10	27	36	74	56	2.47					0.57	0.14	0.21	0.71
Buffelgrass (*Cenchrus ciliaris*)	fresh	32	6	34			40	1.76	1.44	0.81			0.06		0.22	
Canarygrass, Reed (*Phalaris arundinacea*)	fresh	23	19	22	28	46	65	2.86					0.36		0.33	3.64
Cordgrass, Marshhay (*Spartina patens*)	ear. veg.		11	32			57	2.51								
	mature		5	33			50	2.20					0.37		0.09	
Cordgrass, Prairie (*S. pectinata*)	mature		7	36									0.25		0.11	
Dropseed, Sand (*Sporobolus cryptandrus*)	ear. bloom	36	12	32			58	2.56					0.45	0.24	0.14	1.53
Fescue, Alta (*Festuca arundinacea*)	ear. veg.	25	20	22	32	48	70									
	ear. bloom	21	14	21	38	58										
Fescue, Foxtail (*F. megalura*)	ear. veg.		16	24												
	full bloom		8	33									0.48		0.36	2.22
Fescue, Idaho (*F. idahoensis*)	fresh		6	38			51	2.24					0.29		0.30	1.09
Fescue, Meadow (*F. elatior*)	ear. veg.	25	18	24			71	3.12					0.38		0.09	
Fescue, Sixweeks (*F. octoflora*)	ear. veg.		20	24			68	3.00					0.76		0.48	
Foxtail, Meadow (*Alopecurus pratensis*)	ear. veg.	26	17	22			73	3.22					0.45	0.21	0.37	2.35
Galleta (*Hilaria jamesii*)	stem cured	86	5	33			51	1.83	1.50				0.57		0.46	
Grama, Black (*Bouteloua eriopoda*)	ear. veg.	50	12	30			57	2.51					0.70	0.08	0.07	0.48
	ear. bloom		9	31									0.32	0.05	0.12	0.55
Grama, Blue (*B. gracilis*)	ear. veg.	48	12	29	33		56	2.47					0.42		0.16	
	dough stage	65	6	29	41		43	1.90					0.46	0.08	0.14	0.61
Guineagrass (*Panicum maximum*)	late veg.	24	9	33	45	69	58	2.56					0.22		0.12	
													0.51	0.29	0.24	2.10

Appendix Table 1. Continued.

Name	Stage of maturity, etc.	DM	CP	CF	ADF	NDF	TDN	DE	ME	NEm	NEg	NEℓ	Ca	Mg	P	K
		%						Mcal/kg					%			
Lovegrass (*Eragostic* spp.)	ear. veg.	43	13	31												
Millet, Foxtail (*Setaria italica*)	full bloom	45	9	33									0.47		0.24	
Mixed grasses (English data)	fresh	29	10	32			63	2.77					0.33		0.18	
	late bloom	26	9	31			64	2.82					0.32		0.19	1.94
	very leafy	18	22	20			70	3.08	2.58							
	leafy	19	17	24			69	3.04	2.56							
	ear. flower	21	14	26			68	3.00	2.51							
	flower	23	10	27			64	2.82	2.36							
	mature	25	8	30			62	2.73	2.29							
Napiergrass (*Pennisetum purpureum*)	late veg.	20	9	33	45	70	55	2.42								
Needle and Thread (*Stipa comata*)	late bloom	23	8	39	47	75	53	2.33					0.60	0.26	0.41	1.31
Oatgrass, Tall (*Arrhenatherum elatius*)	stem cured	92	4		43	83	48	2.12	1.81				0.35	0.26	0.30	1.31
Oats (*Avena sativa*)	ear. veg.	22	20	19			77	3.40					1.08		0.06	
Orchardgrass (*Dactylis glomerata*)	ear. bloom		12	31												
	ear. veg.	16	16	25			70	3.08								
Prairie Grasses, Midwest USA	ear. veg.	22	18	24	29	50	68	3.00								
Redtop (*Agrostis alba*)	ear. bloom	24	13	32	37	54	64	2.82					0.60	0.27	0.58	3.58
Rhodesgrass (*Chloris gayana*)	stem cured	90	5	33									0.45	0.31	0.39	3.38
Rye (*Secale cerale*)	full bloom	26	8	25									0.46		0.10	
Ryegrass, Italian (*Lolium multiflorum*)	fresh	26	8	37			62	2.73	2.31	1.33	0.73	1.40	0.62	0.25	0.37	2.35
	ear. veg.	16	28				58	2.56					0.51	0.21	0.39	2.29
Ryegrass, Perennial (*L. perenne*)	ear. veg.	24	24	19			69	3.04	2.62	1.52	0.95	1.57				
Saltgrass (*Distichlis* spp.)	ear. bloom	35	6	30			66	2.90	2.49	1.44	0.86	1.50	0.62		0.34	1.56
Squirreltail (*Sitanion* spp.)	fresh	27	11	25			57	2.51	2.10	1.25	0.58	1.30				
Sudangrass (*Sorghum vulgare sudanense*)	fresh	74	6	30			68	3.00	2.58							
	stem cured	50	3				53	2.35					0.55	0.19	0.27	1.91
Switchgrass (*Panicum virgatum*)	ear. veg.	18	17	23	29	55	50	2.20	1.70				0.22	0.30	0.08	0.24
Threeawn, Red (*Aristida longiseta*)	mid bloom	23	9	36			70	3.08	2.67	1.54	0.97	1.59	0.37		0.06	
Timothy (*Phleum pratense*)	fresh	55	6	35		75	63	2.27	2.36	1.37	0.77	1.42	0.50	0.35	0.41	2.14
Tobosa (*Hilaria mutica*)	fresh		8	36		74	55	2.42					0.43	0.35	0.41	2.14
Vine Mesquite (*Panicum obtusum*)	late veg.	28	10	31	37	64	55	2.42					0.29		0.10	
Wheat (*Triticum aestivum*)	ear. veg.	40	12	31		70	64	2.82	2.40				0.76		0.13	
Wheatgrass, Bluebunch (*Agropyron spicatum*)	ear. veg.		13	30			54	2.41					0.28	0.15	0.28	2.40
Wheatgrass, Crested (*A. desertorum*)	ear. veg.	22	29	17	30	52	73	3.22	2.80	1.67	1.06	1.67	0.47	0.09	0.14	0.54
	fresh		14		35								0.56	0.26	0.25	2.48
	ear. veg.	28	22										0.42	0.21	0.40	3.50
	ear. bloom	37	11	26			75	3.30	2.68						0.28	
	mature	60	6	39			60	2.65	2.22				0.46	0.28	0.34	
Wheatgrass, Slender (*A. trachycaulum*)	postripe	80	3	40			54	2.38					0.46		0.24	
	fresh	35	8	32			49	2.16					0.27		0.15	
							56	2.47					0.27		0.07	
													0.47	0.36	0.14	

Appendix Table 1. Continued.

Name	Stage of maturity, etc.	DM	Composition, DM basis													
			CP	CF	ADF	NDF	TDN	DE	ME	NEm	NEg	NEℓ	Ca	Mg	P	K
			%					Mcal/kg					%			
Wild Rye, Canada (*Elymus canadensis*)	fresh		8	31			56	2.47								
Wild Rye, Fuzzyspike (*E. caput-medusae*)	ear. bloom		6	31			54	2.38								
Pasture-Range Legumes																
Acacia Pods (*Acacia* spp.)		91	11	22			60	2.69	2.24							
Acacia Twigs		88	11	36			37	1.63								
Alfalfa (*Medicago sativa*)	late veg.	20	20	23	29	38	63	2.77	2.36	1.36	0.76	1.42	2.19	0.27	0.33	2.14
	mid bloom	25	17	30	35	46	58	2.56	2.13	1.24	0.59	1.30	2.01	0.26	0.28	2.06
	full bloom	27	15	34			54	2.38	1.95	1.15	0.44	1.20				
Alfalfa-Brome (Smooth)	ear. bloom	21	20	25			62	2.73	2.31	1.33	0.73	1.40	1.52	0.35	0.37	3.87
Alfileria, Redstem (*Erodium cicutarium*)	ear. veg.		26	12									2.70		0.58	3.95
Burclover, Toothed (*Medicago hispida*)	fresh	27	23													
Clover, Alsike (*Trifolium hybridum*)	ear. veg.	19	24	17			65	2.86	2.44	1.41	0.82	1.47	1.19	0.34	0.42	2.31
	mid bloom	24	16	27			63	2.77	2.36				1.27	0.30	0.25	2.59
Clover, Crimson (*T. incarnatum*)		18	17	28			63	2.77	2.36	1.36	0.76	1.42	1.38	0.29	0.29	3.10
Clover, Hop (*T. agarium*)	fresh	25	17	20			72	3.17	2.76				1.09	0.19	0.33	1.94
Clover, Ladino (*T. repens*)	ear. veg.	21	25	14			70	3.08	2.67	1.54	0.97	1.59	1.50		0.40	
Clover, Red (*T. pratense*)	ear. bloom	20	21	19	33	44	68	2.99	2.58	1.49	0.92	1.54	2.26	0.51	0.38	2.49
	full bloom	26	15	26			64	2.82	2.40	1.39	0.80	1.45	1.01	0.51	0.27	1.96
Clover, Sweet (*Melilotus officinalis*)	fresh	23	19	30			64	2.82	2.40				1.32	0.33	0.27	1.65
Clover, White (*T. repens*)	fresh	18	28	16			73	3.22	2.80	1.67	1.06	1.67	1.40	0.45	0.51	2.14
Lespedeza, Korean (*Lespedeza stipulacea*)	late veg.	32	16	32			59	2.60	2.18				1.12		0.28	1.28
Mesquite, Common (*Prosopis chilensis*)	fresh	35	21	27			69	3.04					1.94	0.23	0.19	1.41
Mesquite, Seeds		89	10	23			65	2.86					0.11		0.18	
Trefoil, Birdsfoot (*Lotus corniculatus*)	fresh	22	25	18			75	3.30					1.98	0.28	0.23	2.07
	full bloom		20	22			68	3.00								
Vetch (*Vicia* spp.)	fresh	22	21	28			59	2.60								
Miscellaneous Pasture-Range Forage																
Bitterbrush, Antelope (*Purshia tridentata*)	fresh	33	12	21												
Chamise (*Adenostroma fasiculatum*)	ear. veg.		7	21			48	2.12								
Kudzu (*Pueraria* spp.)	fresh	28	18	30			65	2.86					3.14		0.23	
Oak, Live, leaves (*Quercus virginiana*)	fresh	50	10		45									0.11		
Prickly Pear Cactus (*Opuntia* spp.)	fresh	20	5	13	23	30	59	2.51					9.16	1.65	0.12	1.21
Rabbitbrush, Small (*Chrysothamnus stenophyllus*)	stem cured	85	6				44	1.94					1.86		0.08	
Rape (*Brassica* spp.)	ear. veg.	18	16	13			70	3.08	2.67				1.33	0.07	0.39	2.98
Russian Thistle (*Salsola kali*)	stem cured	88	11		44	64	50	2.20	1.78				3.31		0.12	
Sage, Black (*Salvia mellifera*)	stem cured	65	9				50	2.20	1.05				0.81		0.17	
Sagebrush, Bud (*Artemisia spinescens*)	ear. veg.	23	17				51	2.24	2.01				0.97		0.33	
	late veg.	32	17	23			52	2.29					0.60	0.49	0.42	
Sagebrush, Fringed (*A. frigida*)	mid bloom	43	9	33			50	2.20								
	mature	60	7	32	35	46	50	2.20								

Name	Stage of maturity, etc.	DM	Composition, DM basis													
			CP	CF	ADF	NDF	TDN	DE	ME	NEm	NEg	NEℓ	Ca	Mg	P	K
			%					Mcal/kg					%			
Saltbrush, Fourwing (*Atriplex canescens*)	fresh	41	19	14			50	2.20					1.19	0.58	0.15	0.81
Saltbush, Nuttall (*A. nuttalli*)	stem cured	55	7				36	1.58					2.21		0.12	
Saltbush, Schadscale (*A. confertifolia*)	stem cured	80	8				31	1.36					2.23		0.08	
Sedge (*Carex* spp.)	ear. veg.		17	26			68	3.00								
Sorrell, Sheep (*Rumex acetosella*)	fresh			10	33		57	2.51								
Turnip Tops (*Brassica rapa rapa*)	fresh	18	16	10			69	3.04	2.62	1.52	0.95	1.57	3.04	0.80	0.44	3.00
Willow Browse (*Salix* spp.)	fresh	41	10	27			55	2.42								
Winterfat, Common (*Eurotia lanata*)	stem cured	80	11		44	72	35	1.66	1.31				1.98		0.12	
Legume Hays																
Alfalfa (*Medicago sativa*)	sc, ear. veg.	89	23	21	28	38	68	3.00	2.58	1.49	0.92	1.54	1.61	0.20	0.37	2.84
	sc, late veg.	90	20	27	34	44	62	2.73	2.31	1.33	0.73	1.40	1.45	0.25	0.30	2.75
	sc, ear. bloom	90	17	31	38	48	58	2.56	2.13	1.24	0.59	1.30	1.40	0.30	0.23	2.08
	sc, mid bloom	89	16	33	40	50	56	2.47	2.04	1.19	0.51	1.25	1.35	0.29	0.22	1.89
	sc, full bloom	88	15	35	42	56	54	2.38	1.95	1.15	0.44	1.20	1.28	0.31	0.20	1.80
	sc, mature	91	14	37	44	59	52	2.29	1.87	1.11	0.36	1.15	1.20	0.30	0.19	1.40
Alfalfa Stems	sc	89	11	44	51	68	47	2.07	1.74	1.12	0.36	1.16	0.90		0.18	2.5
Alfalfa Hay, Pelleted	sc	92	17	29	34	45	58	2.40	2.06	1.27	0.60	1.31	1.61		0.22	
Alfalfa Meal, Dehy.	late veg.	92	19	26	35	45	60	2.65	2.32	1.30	0.71	1.37	1.52	0.32	0.25	2.60
Alfalfa-Smooth Brome	sc, ear. veg.	93	27	30			64	2.82	2.39							
	sc, full bloom	92	14	34			56	2.47	2.04	1.19	0.51	1.25	1.14	0.78	0.26	1.40
Alfalfa-Grass	sc	92	16	34	39		55	2.42	2.00	1.17	0.48	1.23	1.65	0.34	0.23	2.60
Alfalfa-Orchardgrass	sc, cut 1	92	14	30			58	2.56	2.13	1.24	0.59	1.30	1.42	0.32	0.20	1.49
Alfalfa-Timothy	sc	90	14	35			54	2.38	1.95				1.20	0.18	0.21	2.16
Clover, Alsike (*Trifolium hybridum*)	sc	88	15	29			60	2.65	2.22	1.29	0.66	1.35	1.31	0.32	0.25	2.54
Clover, Crimson (*T. incarnatum*)	sc	87	17	32			58	2.56	2.13				1.42	0.27	0.18	1.54
Clover, Ladino (*T. repens*)	sc, late veg.	88	24	21			66	2.90	2.48							
	sc, ear. bloom	89	20	23	32	36	61	2.69	2.27	1.31	0.69		1.70		0.32	2.4
Clover, Red (*T. pratense*)	sc	87	15	32	41	56	55	2.42	2.00				1.28	0.33	0.29	2.36
Lespedeza, Korean (*Lespedeza stipulacea*)	sc, ear. bloom	90	16	28			55	2.42	2.00				1.23	0.26	0.25	1.00
	sc, mid bloom	90	14	30			50	2.20	1.78				1.19	0.27	0.26	1.05
Lespedeza, Sericea (*L. cuneata*)	sc, late veg.	90	19	22			45	1.98	1.56				1.54		0.26	0.69
Lupine, composite sample	sc	90	16	25	31		63	2.77	2.36	1.43	0.73	1.43	1.05		0.20	
Peavine (*Lathyrus* spp.)	sc	91	13	34	49	59	56	2.47	2.04				1.20		0.21	1.80
Trefoil, Birdsfoot (*Lotus corniculatus*)	sc	91	16	30	36	47	61	2.68	2.27				1.75	0.51	0.22	1.80
Vetch (*Vica* spp.)	sc	88	19	31	43	58	62	2.73	2.31				1.18	0.27	0.34	2.12
Grass Hays																
Barley Hay (*Hordeum vulgare*)	sc	87	9	26			57	2.51	2.09	1.23	0.55	1.27	0.21	0.19	0.30	1.49
Bermudagrass, Coastal (*Cynodon dactylon*)	sc, late veg.	91	9	30	35	76	54	2.38	1.95	1.14	0.44	1.20				
	sc	91	6	34	40	80	48	2.11	1.68	1.03	0.19	1.05	0.46	0.17	0.18	1.57
	dehy. pel.	90	16	26	24	40	62	2.73	2.31	1.33	0.73	1.40	0.34		0.25	1.80

Appendix Table 1. Continued.

Name	Stage of maturity, etc.	DM	Composition, DM basis													
			CP	CF	ADF	NDF	TDN	DE	ME	NEm	NEg	NEℓ	Ca	Mg	P	K
			%					Mcal/kg					%			
Bluegrass, Canada (*Poa compressa*)	sc, ear. veg.	89	17	26	29		71	3.12	2.71	1.57	1.00	1.62	0.30	0.33	0.29	1.59
	sc	89	12	29			65	2.86	2.44				0.30	0.33	0.29	1.59
Bluegrass, Kent. (*Poa pratensis*)	sc	89	10	30			61	2.69	2.27	1.31	0.69	1.37	0.45	0.21	0.30	1.87
Brome (*Bromus* spp.)	sc, late veg.	88	10	33	40	68	62	2.73	2.31	1.33	0.73	1.40	0.30	0.09	0.35	2.32
	sc, late bloom	90	7	40	44	72	54	2.38	1.95	1.15	0.44	1.20	0.30	0.08	0.23	2.30
Grass Hay (unidentified)	sc, ear. veg.	89	16	24			60	2.65					0.46	0.11	0.13	0.82
	sc, full bloom	89	10	32			55	2.42					0.57	0.18	0.24	1.34
	sc, mature	91	4	34			50	2.20								
	sc, postripe	90	4	37			47	2.07								
	weathered	90	4	38			46	2.03					0.37		0.10	
Meadow Hay, Intermountain	sc	90	9	32			58	2.56					0.61	0.17	0.18	1.58
Millet, Foxtail (*Setaria italica*)	sc	87	10	29			60	2.65	2.22				0.33	0.23	0.18	1.94
Oat Hay (*Avena sativa*)	sc	88	9	31	36	66	61	2.69	2.27				0.26	0.75	0.24	1.23
Orchardgrass (*Dactylis glomerata*)	sc, ear. bloom	87	11	34	40	70	59	2.60	2.18	1.27	0.62	1.32	0.30		0.28	2.80
	sc, late bloom	88	8	37			50	2.20	1.78	1.07	0.28	1.10				
Prairie Hay, Midwest USA	sc, mid bloom	92	7	35			50	2.20	1.78				0.40		0.13	1.10
Ryegrass, Italian (*Lolium multiflorum*)	sc, ear. veg.	89	15	20			68	2.99	2.58							
	sc, full bloom	88	7	31	45	57	55	2.42	2.00							
Ryegrass, Perennial (*L. perenne*)	sc, late veg.	90	12	20	30	41	68	2.99	2.58							
	sc, mid bloom	88	7	30			56	2.46	2.01				0.65		0.37	1.92
Redtop (*Agrostis alba*)	sc, mid bloom	90	12	25			60	2.65	2.22							
Sorghum, Johnsongrass (*Sorghum halepense*)	sc	90	10	33			56	2.46	2.01				0.71	0.35	0.31	1.35
Sudangrass (*S. vulgare sudanense*)	sc	89	9	36	43	68	57	2.51	2.09				0.50	0.37	0.30	2.10
Timothy (*Phleum pratense*)	sc, ear. bloom	88	12	33	43	68	59	2.60	2.18				0.50	0.14	0.25	0.90
	sc, full bloom	88	8	34	45	70	55	2.42	2.01				0.38	0.17	0.18	1.63
Wheat (*Triticum* spp.)	sc	87	9	28	41	68	58	2.56	2.13	1.24	0.59	1.30	0.14	0.12	0.18	1.00
Wheatgrass, Crested (*Agropyron desertorus*)	sc	92	11	33	36		54	2.38	1.95				0.30		0.15	2.00
Wheatgrass, Intermediate (*A. intermedium*)	sc	90	9	34	40		58	2.56	2.13				0.37	0.06	0.19	1.65
Wheatgrass, Slender (*A. trachycaulum*)	sc	91	8	37			50	2.20	1.78				0.35	0.24	0.25	2.68
Straws																
Barley (*Hordeum vulgare*)		90	4	42	57	82	39	1.72	1.24	0.73	0.0	0.83	0.24	0.19	0.09	2.28
Bean (*Phaseolus* spp.)		90	7	44	56		51	2.24	1.82	1.08	0.26	1.12	1.85	0.13	0.14	1.14
Flax, Common (*Linum usitatissimum*)		91	5	52			40	1.80					0.55	0.31	0.06	1.74
Grass		89	5	41			44	1.94	1.51							
Oats (*Avena sativa*)		90	4	40	46	70	45	1.98		0.90	0.06		0.27	0.18	0.10	2.23
Pea (*Pisum* spp.)		89	9	40			46	2.03		0.99	0.10					
Rice (*Oryza sativa*)		91	4	35	44		41	1.84		0.77	0.04		0.21	0.11	0.08	1.32
Rice, Ammoniated		88	9	39	53	68	45	1.98					0.30		0.10	1.00
Rye (*Secale cereale*)		90	3	43	55	71	40	1.80					0.24	0.08	0.09	0.97
Ryegrass (*Lolium* spp.)		89	4	40			43	1.89								

Appendix Table 1. Continued.

Name	Stage of maturity, etc.	DM	Composition, DM basis													
			CP	CF	ADF	NDF	TDN	DE	ME	NEm	NEg	NEℓ	Ca	Mg	P	K
		%	%	%	%	%	%	Mcal/kg	Mcal/kg	Mcal/kg	Mcal/kg	Mcal/kg	%	%	%	%
Soybean (*Glycine max*)		88	5	42	54	70	40	1.80					1.59	0.92	0.06	0.56
Wheat		89	4	42	56	85	39	1.72	1.24	0.73	0.0	0.83	0.18	0.12	0.05	1.42
Silages, Corn and Sorghum																
Corn (*Zea mays*), well-eared		35	8	24	28	50	70	3.08	2.67	1.54	0.97	1.59	0.27	0.28	0.20	1.05
Corn, not well-eared		35	8	32			65	2.86	2.44	1.41	0.82	1.47	0.34			
Corn stover silage		27	7	32	40	68	58	2.55	2.13	1.24	0.59	1.30	0.38	0.31	0.22	1.65
Corn (sweet) Cannery Residue		30	8	27	36	59	70	3.08	2.67	1.54	0.97	1.59	0.30	0.24	0.90	1.15
Sorghum		30	8	26	28	39	57	2.51	2.09	1.22	0.56	1.27	0.33	0.30	0.20	1.54
Sorghum head silage	postripe	69	10	10			80	3.52	3.11				0.13	0.17	0.25	0.56
Legume, Grass, Miscellaneous Silages																
Alfalfa	late veg.	20	21	31	50		63	2.78	2.36	1.36	0.76	1.42				
	ear. bloom	28	18	33			60	2.65	2.22	1.28	0.66	1.35	1.49	0.30	0.27	2.08
	mid bloom	31	17	33			58	2.56	2.13	1.23	0.59	1.30	1.28	0.35	0.20	2.00
Alfalfa, wilted		30	19	30	35	46	56	2.46					1.50	0.28		2.40
Alfalfa + formic acid		26	19	30												
Alfalfa + molasses		30	19	26			61	2.69					1.64	0.34	0.30	2.60
Barley		32	10	34			50	2.20					0.34	0.13	0.28	2.10
Beet crowns (sugar) w tops		21	13	16			54	2.38		1.15	0.44	1.21	2.32	1.07	0.20	5.80
Beet pulp		11	13	32	40		75	3.30		1.76	1.15	1.72				
Beet (sugar) tailings		19	10	24	30		50	2.20								
Citrus pulp		20	7	16	20		83	3.65		1.96	1.30	1.92	2.04	0.16	0.15	0.62
Clover, Ladino		25	23	21			69	3.04								
Clover, Red + molasses	cut 2		15	33			65	2.86	2.24							
Clover, Red, wilted	mid bloom	31	13	33			57	2.51								
Grass	ear. veg.	28	13	34	38	66	60	2.65								
Grass-legume		29	11	32			56	2.47					0.85	0.32	0.27	1.80
Grass-legume + molasses		28	12	32			58	2.56					1.07	0.32	0.34	1.90
Mint residue (*Mentha* spp.)		28	16	37			54	2.38					1.10		0.57	
Oat forage		30	10	31			56	2.47					0.34	0.30	0.24	2.65
Orange pulp		11	9	18	22		65	2.86								
Pearl millet		30	7	32			59	2.60								
Peavine		24	13	30	49	59	56	2.47					1.31	0.39	0.24	1.40
Potato tubers		25	8	4	5		79	3.48					0.04		0.23	2.13
Soybean forage		27	17	29	36		54	2.38					1.36	0.38	0.47	0.93
Sudangrass		23	11	34	42	65	55	2.42					0.50	0.42	0.21	2.60
Sugarcane		22	5	34			61	2.69					0.35	0.22	0.18	
Sunflower forage	ear. bloom	21	10	33			53	2.33								
Tomato pomace		30	19	45	56		64	2.82					0.50		0.47	
Wheat	ear. veg.	26	12	27			62	2.73					0.27	0.62	0.27	1.39

Appendix Table 1. Continued.

Name	Stage of maturity, etc.	DM	Composition, DM basis													
			CP	CF	ADF	NDF	TDN	DE	ME	NEm	NEg	NEℓ	Ca	Mg	P	K
			%					Mcal/kg					%			
Miscellaneous Field Crop Roughages and Milling By-product Roughages																
Corn cobs		90	3	35	39	88	47	2.07	1.64	1.01	0.15	1.03	0.12	0.07	0.04	0.84
Corn plant, whole	pelleted	91	9	21			63	2.77					1.96		0.14	
Corn stover		87	6	35	40	70	59	2.60	2.18	1.26	0.62	1.32	0.60		0.09	0.92
Cotton bolls		92	11	32			42	1.87					0.90	0.28	0.12	2.73
Cotton gin trash		90	7	34	51		44	1.94					0.92		0.20	
Cottonseed hulls		90	4	50	71	88	44	1.94		0.95	0.02		0.16	0.14	0.10	0.84
Flax hulls		91	8	32	39		38	1.68								
Hegari fodder		90	7	20	25		61	2.69					0.30		0.18	
Hegari stover		90	6	31	39		48	2.12					0.37		0.09	
Millet hulls		88	4	52	65		14	0.62								
Oat hulls		93	4	32	44	78	37	1.63					0.15	0.09	0.15	0.62
Oat mill by-product		92	6	29	37		33	1.45					0.16	0.87	0.24	0.60
Oat mill feed		93	3	35	44		34	1.49					0.11		0.05	
Oats, sprouted 5 d		13	18	20	25		70	3.08								
Palm nut meal		90	19	27	34		84	3.70								
Peanut pods		92	8	65	68	74	22	0.79					0.26	0.17	0.07	0.95
Rice by-product (bran & hulls)		91	7	33	53		33	1.45					0.08		0.59	
Rice hulls		92	3	43	70	80	12	0.65					0.10	0.83	0.08	0.57
Seaweed, Blade Kelp		87	10	10			40	1.76					1.50	0.71	0.27	4.40
Safflower hulls		91	4	58	73		13	0.57								
Sorghum stover		90	5	33	41		48	2.12					0.40		0.11	1.20
✓Soybean hulls	✓	92	12	36	45		64	2.82					0.59		0.17	1.03
Soybean mill run		88	14	41	51		44	1.94					0.42		0.21	
Sugarcane bagasse		55	2	49	59	86	39	1.72					0.35	0.10	0.27	0.50
Sugarcane strippings		45	4	45	56		44	1.94					0.35		0.27	
Sunflower seeds		94	18	31	39		83	3.65					0.18		0.56	0.71
Miscellaneous Foodcrop Roughages																
Almond hulls & shells		91	3	22	41		48	2.12					0.22		0.11	
Bean pods, lima		28	7	39	48		56	2.47								
Beans, green		89	17	25	32		63	2.77								
Carrot pulp		14	6	19	23		63	2.77								
Carrot tops		16	13	18	23		74	3.26					1.94		0.19	1.88
Coffee hulls		90	17	36	45		51	2.24								
Corn cannery waste		23	9	22	29		70	3.08					3.40		0.63	
Grape pomace, dried		91	13	33	54		30	1.33					0.51	0.10	0.40	1.20
Grape pomace, wo stems, dried		91	14	33	42		62	2.73								
Olives, cull		42	5	27	34		89	3.92					0.01		0.10	
Olive pulp with pits, dried		92	6	40	50		40	1.76								
Onions		91	13	23	28		58	2.56					1.80	0.16	0.21	1.76

Appendix Table 1. Continued.

Name	DM	Composition, DM basis													
		CP	CF	ADF	NDF	TDN	DE	ME	NEm	NEg	NEℓ	Ca	Mg	P	K
		%				Mcal/kg						%			
Onion waste, dried	89	10	22	28		61	2.69					1.47		0.23	
Pea pods, dried	88	11	36	45		67	2.95					2.38		0.12	
Pear pulp, dried	92	6	24	30		71	3.12					0.28		0.08	
Pineapple greenchop	18	8	23	35	64	56	2.47					0.28		0.08	
Pineapple juice presscake	21	5	20	36	69	71	3.12					0.28		0.08	
Pineapple stumpmeal	46	3	22	30		64	2.82								
Pineapple tops	16	10	23	29		43	1.90								
Prune mix	82	6	20	25		55	2.42								
Energy Feeds															
Cereal Grains and By-products w <20% CP															
Barley grain															
Barley grain, Pac. Coast	89	14	6	7	19	83	3.65	3.24	1.96	1.31	1.91	0.05	0.15	0.37	0.45
Barley grain, hull-less	89	11	7	9	21	82	3.61	3.19	1.93	1.29	1.89	0.05	0.14	0.36	0.60
Barley grain, pearled	92	18	3			84	3.70					0.04		0.50	
Barley flour by-product	89	10	<1									0.03	0.07	0.26	0.27
Barley groats	89	16	10			81	3.56	3.00				0.08	0.13	0.40	0.60
Barley grain screenings	90	14	2			89	3.92					0.07	0.20	0.51	0.47
Barley malt, dehy.	89	13	9			80	3.52					0.46	0.14	0.32	1.38
Barley middlings	93	14	4			83	3.65					0.17		0.46	
Corn grain, cracked	89	16	10	13		68	3.00								
Corn grain, Opaque 2	89	10	3	3	10	89	3.92	3.51	2.16	1.48	2.05	0.03	0.13	0.31	0.35
Corn grain, flaked	89	12	4			89	3.92	3.51	2.16	1.48	2.05				
Corn grain, ground	89	10				90	3.96	3.56	2.20	1.50	2.09				
Corn grain, high moisture	89	10	2	3	9	89	3.92	3.51	2.16	1.48	2.05				
Corn and cob meal	78	10	3	5		93	4.10	3.69	2.24	1.53	2.12	0.14	0.30	0.34	0.14
Corn ears w husks, gr.	87	9	9	10	28	84	3.70	3.21	1.98	1.32	1.95	0.07	0.14	0.27	0.53
Corn bran	88	8	11			76	3.34	2.94	1.76	1.15		0.07	0.16	0.29	0.80
Corn grits (hominy)	89	9	11		51	76	3.34	2.94	1.76	1.15		0.04	0.29	0.22	0.72
Corn hominy feed	92	11	8			82	3.61					0.03		0.18	
Grain screenings	90	12	6	13	50	94	4.15	3.74	2.32	1.59	2.22	0.18	0.57	0.69	0.03
Oats grain	90	13	14			65	2.86	2.44	1.43	0.81	1.48	0.37	0.14	0.39	0.34
Oats grain, Pac. Coast	90	13	12	17	31	75	3.30	2.89	1.69	1.11	1.72	0.09	0.16	0.38	0.43
Oat groats	91	10	12			77	3.40	2.98	1.76	1.16	1.76	0.11	0.19	0.34	0.42
Oat middlings	91	18	3			93	4.10	3.69	2.24	1.53	2.12	0.08	0.13	0.48	0.39
Oat shorts	91	16	4	5		95	4.20	3.78	2.38	1.54	2.20	0.08	0.16	0.49	0.55
Rice grain, gr.	91	14	15	19		60	2.65	2.22	1.30	0.66	1.35				
Rice bran, solv. extd.	89	8	10			71	3.12					0.70	0.14	0.36	0.36
Rice bran, 13% fat	90	16	13	20	30	62	2.73	2.31	1.39	0.75	1.41	0.07	1.04	1.62	1.91
Rice groats (Brown rice)	91	14	12	16		76	3.34	2.94	1.78	1.21	1.74	0.07	1.04	1.62	1.91
Rice groats, polished	88	9	1			88	3.88	3.47	2.16	1.42	2.03	0.04	0.07	0.25	0.21
	89	8	<1			88	3.88	3.47	2.16	1.42	2.03	0.03	0.02	0.13	0.12

Appendix Table 1. Continued.

Name	Composition, DM basis														
	DM	CP	CF	ADF	NDF	TDN	DE	ME	NEm	NEg	NEℓ	Ca	Mg	P	K
				%					Mcal/kg					%	
Rice middlings	88	16	10	12		67	2.95								
Rice polishings	90	14	3	4		91	4.00	3.60	2.18	1.43	2.12	0.05	0.87	1.48	1.27
Rye grain	88	14	3			80	3.52	3.10	1.86	1.24	1.84	0.07	0.14	0.36	0.52
Rye bran	91	17	8	10		61	2.69	2.27	1.38	0.71	1.37				
Rye middlings	90	18	6	7		80	3.52	3.10	1.87	1.26	1.83	0.07		0.70	0.70
Rye millrun	90	18	5	6		75	3.30	2.89	1.69	1.11	1.72	0.08	0.26	0.71	0.92
Sorghum grain, feterita	89	11	2	3		84	3.70	3.21	1.98	1.32	1.95				
Sorghum grain, milo	89	11	3	6	20	86	3.78	3.39	2.07	1.36	1.98	0.04	0.18	0.32	0.38
Sorghum grain, 6-9% CP	88	8	2			81	3.56	3.16	1.89	1.26	1.86	0.04	0.19	0.33	0.38
Sorghum grain, 9-12% CP	88	12	2	9	18	80	3.52	3.10	1.86	1.24	1.84	0.03	0.19	0.33	0.38
Sorghum grain, 12-15% CP	88	13	2			79	3.48	3.07	1.82	1.21	1.81	0.03	0.19	0.33	0.38
Sorghum grain heads	90	10	9			81	3.56					0.13	0.17	0.25	0.56
Triticale	90	16	4			86	3.78	3.39	2.07	1.36	1.98	0.1		0.34	0.4
Wheat, Durum	89	14	3			88	3.88	3.47	2.15	1.42	2.03	0.06	0.18	0.41	0.58
Wheat, hard red winter	89	14	3	6		89	3.92	3.51	2.16	1.48	2.05	0.05	0.12	0.45	0.48
Wheat, soft white winter	89	11	3	4	14	89	3.92	3.51	2.16	1.48	2.05	0.06	0.11	0.41	0.46
Wheat bran	89	18	11	14	47	70	3.08	2.67	1.53	0.96	1.59	0.12	0.58	1.32	1.39
Wheat flour by-product	88	18	3			82	3.61	3.19	1.93	1.29	1.89	0.50	0.21	0.57	0.59
Wheat grain screenings	89	16	8			77	3.40	2.98	1.76	1.17	1.76	0.17	0.18	0.40	0.58
Wheat middlings	90	18	7	9		83	3.65	3.24	1.96	1.31	1.91	0.16	0.41	1.01	1.08
Wheat mill run	90	17	9	11		79	3.48	3.07	1.82	1.21	1.81	0.11	0.52	1.13	1.33
Wheat shorts	89	18	7	9		83	3.65	3.24	1.96	1.31	1.91	0.11	0.27	0.91	1.04
Miscellaneous Foodcrops or Residues															
Apple pomace, dried	89	5	20	45		69	3.04	2.62	1.52	0.95	1.57	0.13	0.07	0.12	0.49
Apples	17	3	7	9		70	3.08	2.67	1.54	0.97	1.59	0.06	0.29	0.06	0.78
Artichoke, aerial part	27	5	18	23		60	2.65					1.62		0.11	1.36
Artichoke tubers	20	10	4	5		77	3.40							0.29	2.00
Bakery waste, dried	92	11	1			93	4.10	3.69	2.24	1.53	2.12	0.16	0.18	0.25	0.39
Bananas	24	5	2	3		84	3.70					0.03		0.11	
Banana skins, dried	88	8	9	11		59	2.60								
Beans, Carob	81	6	7	9		79	3.48								
Beans, Locust	91	7	10	12		74	3.26								
Bean pods with seeds, Carob	88	6	10	12		79	3.48								
Bean pods with seeds, Velvet	89	19	14	18		59	2.60					0.27	0.24	0.42	1.35
Bean pods, Broad, dried	92	17	18	22		63	2.77								
Beets, mangel, fresh	14	11	7	9		79	3.48					0.22	0.19	0.22	1.98
Beets, sugar, fresh	20	7	6			84	3.70					0.24	0.18	0.24	1.52
Beets, red	13	13	6	8		77	3.40					0.13		0.26	
Beet pulp (sugar), wet	10	9	20	34	59	76	3.34	2.93	1.73	1.14	1.74	0.90	0.14	0.10	0.20
Beet pulp (sugar) w molasses, dehy.	92	10	17	26	47	78	3.44	3.02	1.79	1.19	1.79	0.61	0.14	0.11	1.78

Name	DM	Composition, DM basis													
		CP	CF	ADF	NDF	TDN	DE	ME	NEm	NEg	NEℓ	Ca	Mg	P	K
		%					Mcal/kg					%			
Bread, dried	91	13	1	1		89	3.92	3.51	2.18	1.43	2.18	0.09		0.16	0.16
Buckwheat grain	88	12	13	17		71	3.12	2.71	1.63	1.17	1.61	0.11	0.12	0.37	0.51
Cabbage leaves	15	14	18			67	2.95					0.63		0.21	
Cantalope	10	20	21	26		66	2.90								
Carrots	13	10	9	11		82	3.61					0.37	0.17	0.32	2.50
Cassava meal, dried	90	3	5	6		79	3.48					0.15		0.10	0.26
Celery	6	15	10	13		62	2.73					0.66		0.47	5.78
Citrus pulp, dried	18	7	13	22	23	82	3.65					1.84	0.17	0.12	0.79
Coconut meats, dried	96	7	4	5		109	4.80					0.03		0.20	0.61
Kale, thousand-headed	15	18	10	12		72	3.17								
Lettuce	5	22	11	14		51	2.24					0.86		0.46	4.52
Melons	4	11	23	29		71	3.12								
Orange pulp, dried	88	8	10	16		78	3.43					0.71		0.11	
Orange pulp, ammoniated	89	16	14	17		73	3.22					0.71		0.11	
Parsnips	14	12	7	9		89	3.92								
Pineapple bran (pulp)	87	5	18	28		70	3.08		1.59	0.97		0.24		0.12	
Pineapple presscake	21	5	20	36	69	71	3.12					0.28		0.08	
Potatoes, cull	21	10	2			80	3.52	3.10	1.86	1.24	1.84	0.03	0.14	0.23	2.22
Potato waste, dehy.	89	8	7			85	3.74					0.16		0.67	0.25
Potato waste, fresh	14	7	9			82	3.61					0.16		0.67	1.33
Potato waste filter cake	14	8	2			77	3.40					0.1		0.19	0.2
Prunes, with pits	82	5	13	16		81	3.56					0.13		0.11	
Pumpkins	9	16	14	18		85	3.74					0.24		0.43	3.32
Rutabagas	11	10	11	14		85	3.74					0.49	0.18	0.29	1.84
Sweet potatoes	31	5	6	8		80	3.52					0.09	0.16	0.13	1.19
Tomatoes	6	16	9	11		69	3.04					0.16		0.49	4.21
Turnip roots	9	12	11	34	44	86	3.78					0.64	0.22	0.21	2.79
Fats and Oils															
Animal fat, feed grade	99					174	7.65	6.30	4.53	2.59	5.25				
Vegetable oil, preruminants	99					195	8.60								
Other Liquid Feed or dehy. liquids (<20% CP, DM basis)															
Beet molasses	77	8	0	0	0	78	3.43	3.02	1.79	1.19	1.79	0.17	0.29	0.03	6.07
Citrus molasses	65	11	0	0	0	78	3.43	3.02	1.79	1.19	1.79	1.72	0.21	0.13	0.14
Hemicellulose extract	65	1				76	3.34					1.03		0.09	
Lignin sulfonate, calcium	53	1				40	1.76					3.7			
Molasses dist. sol., cond.	50	13				70	3.08								
Propylene glycol	100		0	0	0	158	6.95	5.70							
Soybean solubles, cond.	60	13													
Starch molasses	75	1	0	0	0	89	3.92					2.0	0.6	0.8	4.3
Sugarcane molasses	74	4	0	0	0	74	3.26	2.85	1.66	1.08	1.69	1.3		0.25	0.03
												1.00	0.43	0.11	4.00

Appendix Table 1. Continued.

Name	DM	CP	CF	ADF	NDF	TDN	DE	ME	NEm	NEg	NEℓ	Ca	Mg	P	K
	Composition, DM basis														
	%						Mcal/kg					%			
Sugarcane molasses, dehy.	94	10	0	0	0	73	3.22					1.20	0.43	0.15	4.00
Whey, condensed	42	14	0	0	0	82	3.61	3.19	1.93	1.29	1.89	0.95	0.14	0.80	0.92
Whey, dehy.	90	14	0	0	0	82	3.61	3.19	1.93	1.29	1.89	0.95	0.14	0.80	0.92
Whey, fresh	7	14	0	0	0	82	3.61	3.19	1.93	1.29	1.89	0.95	0.14	0.80	0.92
Whey, low lactose, cond.	55	16	0	0	0							0.95		1.44	
Whey product, dried	93	17	0	0	0	78	3.43					1.67		1.11	
Protein Supplements w >20% CP															
Oilseed Meals															
Babassu meal, solv-extd	93	21	19	24		66	2.90					0.13	0.97	0.71	
Coconut solv-extd	91	23	16	24		74	3.26	2.85	1.66	1.08	1.69	0.18	0.39	0.66	1.32
Cottonseed, screw press, 41% CP	93	45	13	21	29	77	3.40	2.98	1.76	1.16	1.76	0.17	0.61	1.28	1.49
Cottonseed, solvent extd, 41% CP	91	46	13	22	30	75	3.30	2.89	1.69	1.11	1.72	0.17	0.60	1.31	1.20
Cottonseed, low gossypol. solv-extd	93	45	14			74	3.26								
Cottonseed, prepress-solv-extd, 50% CP	92	54	9			75	3.30	2.89	1.69	1.11	1.72	0.17	0.61	1.31	1.53
Crambe, solv-extd	92	34	25			70	3.08					1.2		1.30	
Hempseed	93	34	25	31		47	2.07								
Linseed, mech-extd	91	39	10	17	25	81	3.56	3.15	1.90	1.27	1.86	0.43	0.64	0.93	1.36
Linseed, solv-extd	91	39	10	17	25	76	3.34	2.93	1.73	1.14	1.74	0.43	0.66	0.91	1.52
Mustard	93	34	12			73	3.22								
Peanut, solv-extd	92	54	11		14	77	3.39	2.98	1.76	1.16	1.76	0.22	0.04	0.71	1.29
Rape, solv-extd	90	44	13	16		69	3.04	2.62	1.51	0.94	1.57	0.67		1.04	1.4
Safflower, solv-extd	92	24	34	43		55	2.42	2.00	1.17	0.48	1.23	0.37	0.37	0.80	0.79
Safflower, wo hulls, solv-extd	90	47	17	21		76	3.34	2.93	1.73	1.14	1.74	0.44	1.33	1.41	1.33
Sesame, mech-extd	92	48	6	7		79	3.48	3.07	1.82	1.21	1.81	2.16	0.86	1.44	1.35
Soybean, solv-extd, 44% CP	89	50	6	10	14	81	3.56	3.15	1.89	1.26	1.86	0.36	0.30	0.75	2.20
Soybean, solv-extd, 46% CP	89	52	5			81	3.56	3.15	1.89	1.26	1.86	0.36	0.30	0.75	2.20
Soybean, wo hulls, solv-extd, 48% CP	89	54	3	6	10	81	3.56	3.15	1.89	1.26	1.86	0.36	0.30	0.75	2.20
Soybean protein conc. >70% CP	92	92				76	3.34					0.12	0.02	0.74	0.19
Sunflower, mech-extd	93	44	13	33	40	70	3.08	2.67	1.54	0.97	1.59	0.46	0.79	1.12	1.16
Sunflower, solv-extd	93	50	12		40	65	2.86	2.44	1.41	0.83	1.47	0.40	0.81	1.10	1.07
Other Plant Protein Sources															
Alfalfa leaves	89	25	15	24	34	72	3.17	2.76	1.61	1.03	1.64	2.48	0.45	0.27	2.30
Alfalfa seed screenings	90	34	12	15		87	3.83					0.17		0.55	
Barley brewers grains, dehy.	91	22	20			67	2.95					0.21		0.50	
Barley distillers grains, dehy.	92	30	11	14		69	3.04					0.20		0.45	
Barley malt sprouts, dehy.	92	28	16	20		68	3.00					0.26	0.20	0.84	0.23
Beans, Blackeye	92	23	3	4		74	3.26								
Beans, Butter	86	21	6	7		73	3.22								
Beans, Lima	90	23	5	6		83	3.65					0.09		0.42	1.80
Beans, Navy	90	25	5	6		83	3.65					0.17		0.58	1.38

Appendix Table 1. Continued.

Name	DM	Composition, DM basis													
		CP	CF	ADF	NDF	TDN	DE	ME	NEm	NEg	NEℓ	Ca	Mg	P	K
		%					Mcal/kg					%			
Beans, Pinto	90	25	5	6		83	3.65					0.16		0.39	
Buckwheat middlings	89	33	8	10		84	3.70							1.15	
Carraway seeds	86	25	16	20		89	3.92								
Chickpeas (Grabanzo)	89	22	8	10		89	3.92					0.17		0.37	0.89
Clover seed screenings	90	32	14			78	3.43					0.46		0.74	
Corn distillers grains, dehy	92	29	14	16	41	84	3.70	3.29	1.99	1.33	1.94	0.12	0.07	0.40	0.84
Corn distillers grains, w sol, dehy	92	30	10	18	44	88	3.88	3.47	2.16	1.42	2.03	0.16	0.07	0.79	0.50
Corn distillers solubles, dehy	93	29	4			88	3.88	3.47	2.16	1.42	2.03	0.38	0.69	1.47	1.87
Corn germ meal	91	22	12			77	3.40					0.04		0.55	0.22
Corn gluten feed	90	26	8	10	41	80	3.52	3.11	1.86	1.24	1.84	0.33	0.32	0.86	0.67
Corn gluten meal	91	45	5	9	37	84	3.70	3.29	1.99	1.33	1.94	0.16	0.06	0.51	0.02
Cottonseed, whole, delinted	93	25	20	29	39	97	4.28	3.87	2.40	1.65	2.23	0.16	0.35	0.76	1.22
Fenugreek seed	91	29	10	13		72	3.17								
Flax seed, whole	94	26	7	8		115	5.06					0.23		0.55	0.84
Flax seed screenings, mech-extd	91	22	13			58	2.56					0.45	0.43	0.58	0.84
Grass, early veg., dehy	88	26	15			74	3.26								
Hempseed	91	20	16	21		90	3.96								
Hops, spent, dehy	93	25	24	30		34	1.50								
Lentil seeds	89	28	4	5		75	3.30					0.09		0.42	
Peas, Canada, field	89	28	9	12		71	3.12								
Peas, cull, dried	90	26	6	9		83	3.65	3.24	1.96	1.31	1.91	0.18	0.10	0.42	1.14
Pea meal, dried	90	20	26	33		84	3.70								
Potato distillers residue, dehy	93	24	22			62	2.73								
Rye distillers dried grains	92	22	13	18		59	2.60					0.16	0.18	0.52	0.08
Rye distillers dried grains w sol.	91	30	9	11		62	2.73								
Rye distillers dried solubles	93	37	4	5		70	3.08					0.37		1.26	
Safflower seeds	92	20	31	40		89	3.92					0.26	0.36	0.67	0.79
Sesame seeds	92	24	11	14		104	4.58					1.02		0.76	
Sorghum distillers grains, dehy	94	33	13	16		82	3.61					0.15	0.19	0.63	0.38
Sorghum distillers grains w sol, dehy	95	35	11	13		84	3.70					0.18		0.97	
Sorghum distillers sol, dehy	93	28	4	5		85	3.74					0.73		1.48	
Sorghum gluten, wet milled, dehy	91	50	11			85	3.74								
Sorghum gluten feed	91	29	8	10		76	3.34					0.10	0.49	0.66	1.61
Soybean seeds, gr	92	42	6	10		92	4.05					0.27	0.29	0.65	1.80
Vetch seed	91	33	6	8		68	3.00								
Walnut meats	91	46	4	5		94	4.14								
Wheat germ meal	90	28	4	5		94	4.14					0.07	0.27	1.06	1.09
Animal and Fish By-Products															
Crab meal, dehy	92	32	12			29	1.28					15.72	1.02	1.71	0.49
Feather meal, hydrolyzed	94	85	2	6	20	82	3.61					0.28	0.22	0.71	0.31

Appendix Table 1. Continued.

Name	DM	Composition, DM basis												
		CP	CF	ADF	NDF	TDN	DE	ME	NEm	NEg	NEℓ	Ca	Mg	P	K
	%	%	%	%	%	%	Mcal/kg	Mcal/kg	Mcal/kg	Mcal/kg	Mcal/kg	%	%	%	%
Fish meal, Herring, mech-extd	92	78	1			83	3.65					2.39	0.16	1.82	1.18
Fish solubles, cond.	50	62	1			84	3.70					0.37	0.06	1.17	3.22
Hair meal, hydrolyzed	92	90		18		80	3.52								
Meat meal	94	55	3			71	3.12					9.44	0.29	4.74	0.61
Meat and bone meal	93	54	3			68	3.00					11.06	1.09	5.48	1.43
Poultry cage layer manure, dehy	91	28	13	15	35	58	2.56					9.31	0.64	2.52	2.25
Poultry litter, dried	86	27	18			66	2.90					2.87	0.46	1.75	1.68
Milk and Milk By-Products															
Buttermilk, dried feed grade	93	34				86	3.78	3.39	2.07	1.36	1.98	1.07	0.10	0.73	1.35
Milk, colostrum	25	46				130	5.72	5.16	3.61	2.01					
Milk, skim	10	36				93	4.10	3.69	2.36	1.52	2.16	1.41	0.12	1.17	1.90
Milk, skim, dehy	94	36				86	3.78	3.39	2.07	1.36	1.98	1.25	0.11	1.03	1.62
Milk, whole	12	26				130	5.72	5.16	3.61	2.01		0.89	0.08	0.72	1.16
Milk, whole, dehy	94	27				130	5.72	5.16	3.61	2.01		0.89	0.08	0.72	1.16
Single Cell Protein Sources															
Pulpmill SCP, dried w fat	94	50	14	44		84	3.70							0.70	
Yeast, active, dehy	90	16	4									0.16		0.98	
Yeast, Brewers, dehy	93	48	3	4		78	3.43					0.13	0.27	1.49	1.79
Yeast, Grain distillers, dehy	93	51													
Yeast, irradiated, dehy	93	51	7			76	3.34					0.83		1.51	2.28
Yeast, molasses distillers, dehy	93	25	6			57	2.51								
Yeast, torula, dehy	93	52				80	3.52					0.61	0.14	1.81	
Non-Protein-Nitrogen Sources															
Ammoniated lignin sulfonate	53	20				50	2.20								
Ammoniated condensed whey	64	69				78	3.43					0.28		0.69	1.88
Ammonium sulfate	99	131													
Biuret	98	230													
Dehy-100 (alfalfa-urea)	94	106	18												
Diammonium phosphate	99	112										0.51	0.46	20.25	
Monoammonium phosphate	98	70										0.42	0.46	25.26	
Grain-urea, extruded (Starea)	93	25													
Urea, 45% N	99	282													

Appendix Table 1A. TDN and DE values of selected feeds for horses.*

Name	DM, %	DM basis CP, %	TDN, %	DE, Mcal/kg
Roughage				
Alfalfa hay, ear. bloom	90	17	55	2.42
Alfalfa hay, mid bloom	89	16	52	2.29
Alfalfa hay, full bloom	89	15	49	2.16
Bahiagrass, grazed	30	8	48	2.11
Bahiagrass hay, sc	91	6	43	1.89
Barley hay, sc	89	8	44	1.94
Barley straw	90	4	37	1.63
Bermudagrass, grazed	39	9	50	2.20
Bermudagrass hay, sc	91	7	45	1.98
Bluegrass, Kentucky				
grazed, early	31	17	56	2.46
grazed, posthead	35	12	50	2.20
hay, sc	90	11	50	2.20
Bromegrass, grazed	32	18	68	3.00
Bromegrass hay, late bloom	90	7	54	2.38
Canarygrass, Reed				
grazed	27	12	54	2.38
hay, sc	91	12	49	2.16
Clover, Alsike, hay sc	89	15	48	2.11
Clover, Crimson, hay sc	89	18	49	2.16
Clover, Ladino, hay, sc	90	21	51	2.24
Clover, Red				
grazed, ear. bloom	20	21	57	2.51
grazed, late bloom	26	14	55	2.42
hay, sc	89	15	49	2.16
Corn cobs, gr.	90	3	31	1.36
Cottonseed hulls	91	4	33	1.45
Fescue, Meadow				
grazed	27	11	52	2.29
hay, sc	88	10	46	2.02
Lespedeza, grazed	31	15	50	2.20
Lespedeza, hay, sc	91	14	47	2.07
Oat hay, sc	90	9	47	2.07
Oat straw	92	4	40	1.76
Orchardgrass				
grazed	19	18	55	2.42
hay, sc	89	10	47	2.07
Pangolagrass				
grazed	19	12	51	2.24
hay, sc	88	10	45	1.98
Prairiegrass hay, sc	90	7	46	2.02
Soybean hay, sc	89	16	48	2.11
Soybean hulls	92	12	60	2.64
Timothy				
grazed, mid bloom	30	10	49	2.16
hay, sc, prehead	89	11	50	2.20
hay, sc, head	88	9	45	1.98
Trefoil, Birdsfoot, hay, sc	91	16	50	2.20
Wheat hay, sc	89	9	43	1.89
Wheat straw	89	4	34	1.50
Energy Feeds				
Barley grain	89	14	82	3.61
Barley grain, Pac. Coast	90	11	79	3.48
Beet pulp, dried	91	8	65	2.86
Citrus pulp, dried	90	7	68	2.99
Corn ears, gr.	87	9	74	3.26
Corn grain	88	11	88	3.87
Molasses, beet	78	9	72	3.17
Molasses, cane	75	4	74	3.26
Molasses, cane, dehy.	94	9	72	3.17
Oats grain	89	14	76	3.34
Oats grain, Pac. Coast	91	10	77	3.40
Rye grain	88	14	80	3.52
Sorghum grain	90	13	80	3.52
Wheat bran	89	17	67	2.95
Wheat grain				
hard red winter	89	14	87	3.83
soft red winter	89	13	87	3.83
soft white winter	89	11	87	3.83
Protein Sources				
Brewers grains, dried	92	27	68	3.00
Brewers yeast, dehy.	93	48	75	3.30
Corn distillers grains, dried	92	30	70	3.08
Linseed oil meal, solv-extd	91	39	69	3.04
Milk, cattle, skim, dehy.	94	36	92	4.05
Soybean meal, solv-extd	90	51	82	3.60
Soybean seeds	91	43	92	4.05
Sunflower meal, solv-extd	92	50	71	3.12

* From NRC. Most data on energy values have been extrapolated from data on cattle and sheep. Refer to Appendix Table 1 for information on fiber and mineral content.

Appendix Table 2. Composition of feedstuffs commonly fed to poultry and swine. Data from NRC publications.

Feed class and ingredient name	Int'l. feed number	Composition, as fed					As fed basis				
		Dry matter	Crude protein	Crude fiber	Ca	P	Poultry ME, Kcal/kg	Swine			
								Digest. protein, %	DE	ME	TDN, %
		%							Kcal/kg		
Roughage											
Alfalfa, dehy. mn 15% CP	1-00-022	93.1	15.2	26.4	1.23	0.22	1587	7.0	1436	1331	32
Alfalfa, dehy, mn 17% CP	1-00-023	93.0	17.9	24.3	1.33	0.24	1653	8.3	1435	1322	32
Alfalfa, dehy, mn 20% CP	1-00-024	93.1	20.6	20.2	1.52	0.27	1720	12.6	2217	2029	50
Alfalfa, dehy, mn 22% CP	1-00-851	92.9	22.5	18.5	1.48	0.28	1764	13.7	2253	2052	51
Alfalfa hay, s-c, gnd	1-00-111	92.2	16.7	25.8	---	---	----	7.7	1382	1276	31
Alfalfa leaf meal	1-00-246	88.8	21.3	14.6	2.11	0.26	1580	13.0	2192	2000	50
Pasture grass, closely grazed		20.0	5.2	3.4	---	---	----	3.5	517	----	12
Energy Sources (< 20% CP)											
Animal fat	4-00-409	99.5	---	---	---	---	7090	---	8130	7900	199
Barley grain	4-00-530	89.0	11.6	5.0	0.08	0.42	2646	8.2	3080	2876	70
Buckwheat grain	4-00-994	88.0	11.1	9.0	0.11	0.33	2712	8.0	3026	2829	69
Corn germ meal	5-02-898	93.0	18.0	12.0	0.10	0.40	1700	---	----	----	--
Corn grain	4-02-935	86.0	8.8	2.0	0.03	0.27	3417	7.0	3488	3275	79
Corn hominy feed	4-02-887	90.6	10.7	5.0	0.05	0.53	2866	8.5	3595	3365	82
Millet grain	4-03-098	90.0	12.0	8.0	0.05	0.28	----	8.8	2897	2703	66
Molasses, beet	4-00-668	77.0	6.7	---	0.16	0.03	1962	---	----	----	--
Molasses, cane	4-04-696	75.0	3.2	---	0.89	0.08	1962	---	2464	2343	56
Oats, grain	4-03-309	89.0	11.8	11.0	0.10	0.35	2535	9.9	2860	2668	65
Oats, groats	4-03-331	91.0	16.7	3.0	0.07	0.43	3549	14.0	3250	2999	74
Potatoes, cooked	4-03-784	22.5	2.2	0.7	0.01	0.05	----	1.6	863	811	20
Potato meal	4-07-850	90.3	5.9	1.4	0.07	0.20	3527	5.0	3345	3168	76
Rice bran	4-03-928	91.0	13.5	11.0	0.06	1.82	1630	10.2	3256	3028	74
Rice grain w hulls, grnd	4-03-938	89.0	7.3	9.0	0.04	0.26	2668	5.5	2511	2367	57
Rye grain	4-04-047	89.0	11.9	2.0	0.06	0.34	2888	9.6	3300	3079	75
Sorghum grain, milo	4-04-444	89.0	11.0	2.0	0.04	0.29	3250	7.8	3453	3229	78
Wheat bran	4-05-190	89.0	16.0	10.0	0.14	1.17	1146	12.2	2512	2321	57
Wheat grain	4-05-211	89.0	12.7	3.0	0.05	0.36	3071	11.7	3520	3277	80
Wheat middlings	4-05-203	89.0	18.0	2.0	0.08	0.52	2756	16.0	3212	2952	73
Wheat mill run	4-05-206	90.0	15.3	8.0	0.09	1.02	1764	12.2	3168	2934	72
Wheat shorts	4-05-201	90.0	18.4	5.0	0.11	0.76	2646	15.4	3168	2912	72
Whey, dried	4-01-182	94.0	13.8	---	0.87	0.79	1852	12.6	3432	3191	78

Appendix Table 2. Continued.

Feed class and ingredient name	Int'l. feed number	Composition, as fed					As fed basis				
		Dry matter	Crude protein	Crude fiber	Ca	P	Poultry ME,	Swine			
								Digest. protein,	DE	ME	TDN,
		%					Kcal/kg	%	Kcal/kg		%
Plant Protein Sources (> 20% CP)											
Barley malt sprouts	5-00-545	93.0	26.2	14.0	0.22	0.73	1411	20.7	1558	1406	35
Brewers dried grains	5-02-141	92.0	25.9	15.0	0.27	0.50	2513	20.4	1892	1708	43
Coconut meal, solv. extd	5-01-573	92.0	21.3	15.0	0.17	0.61	1540	15.5	3123	2852	71
Corn distillers grains w solubles, dehy.	5-02-843	92.0	27.4	9.0	0.09	0.37	2425	---	----	----	--
Corn dist. sol., dehy	5-02-844	92.0	26.9	4.0	0.35	1.37	2932	16.1	3300	2976	75
Corn gluten meal	5-02-900	91.0	42.9	4.0	0.16	0.40	3307	---	----	----	--
Cottonseed meal, pre-press solv. extd.	5-07-874	92.5	50.0	8.5	0.16	1.01	2150	45.0	3018	2569	68
Pea seed, grnd	5-03-598	91.0	22.5	9.0	0.17	0.50	2601	19.3	3531	3213	80
Peanut meal, solv. extd.	5-04-650	92.0	47.4	13.0	0.20	0.65	2205	44.5	3408	2920	77
Rapeseed meal, solv. extd.	5-03-871	90.3	39.4	13.8	0.40	0.90	----	32.3	2747	2396	62
Soybean meal, solv. extd.	5-04-604	89.0	45.8	6.0	0.32	0.67	2249	41.7	3300	2825	75
Soybean meal, dehulled, solv. extd.	5-04-612	89.8	50.9	2.8	0.26	0.62	2425	46.3	3405	2881	77
Sunflower meal, solv. extd.	5-04-739	93.0	46.8	11.0	0.40	1.00	1760	42.1	3034	2604	69
Wheat germ meal	5-05-218	90.0	26.2	3.0	0.07	1.04	3086	23.6	3770	3397	86
Yeast, Brewers dried	7-05-527	93.0	44.6	3.0	0.13	1.43	2425	39.2	3076	2654	70
Animal and Fish Protein Sources											
Blood meal	5-00-380	91.0	79.9	1.0	0.28	0.22	2844	62.3	2684	2101	61
Blood flour	5-00-381	91.0	82.2	1.0	0.45	0.37	----	64.1	2608	2029	59
Buttermilk, dried	5-01-160	93.0	32.0	---	1.34	0.94	2756	29.8	3388	3015	77
Casein, dried	5-01-162	90.0	81.8	---	0.61	0.99	4120	76.0	3532	2740	80
Fish meal, anchovy	5-02-985	93.0	66.0	1.0	4.50	2.85	2900	60.7	2994	2446	68
Fish meal, herring	5-02-000	92.0	70.6	1.0	2.94	2.20	2976	66.3	3650	2938	83
Fish meal, menhaden	5-02-009	92.0	61.3	1.0	5.49	2.81	2866	56.4	3123	2580	71
Fish solubles, dried	5-01-971	92.0	62.8	1.0	---	---	2866	60.3	3408	2801	77
Liver meal	5-00-389	92.6	66.5	1.3	0.50	1.25	----	64.4	3920	3195	89
Meat meal	5-00-385	93.5	53.4	2.4	7.94	4.03	1984	47.5	3010	2543	68
Meat meal tankage	5-00-386	92.0	59.8	2.0	5.94	3.17	2646	37.1	2475	2052	56
Meat and bone meal	5-00-388	94.0	50.6	2.2	10.57	5.07	1984	45.0	2859	2434	65
Milk, dried skim	5-01-175	94.0	33.5	---	1.26	1.03	2513	32.8	3784	3360	86

Appendix Table 3. Amino acid composition of selected feedstuffs.

	Crude protein	Amino acids, as fed basis												
		Arginine	Cystine	Glycine	Histidine	Isoleucine	Leucine	Lysine	Methionine	Phenylalanine	Threonine	Tryptophan	Tyrosine	Valine
	%													
Forage - Roughage														
Alfalfa, dehy, 15% CP	15.2	0.60	0.17	0.70	0.30	0.68	1.10	0.60	0.20	0.80	0.60	0.40	0.40	0.70
Alfalfa, dehy, 20% CP	20.6	0.90	---	1.00	0.40	0.80	1.50	0.90	0.30	1.10	0.90	0.50	0.70	1.19
Alfalfa leaf meal, s-c	21.3	0.90	0.34	0.90	0.33	0.90	1.25	0.95	0.30	0.80	0.70	0.25	0.60	0.90
Grass, dehy	14.8	0.99	0.19	0.72	0.46	1.38	1.98	1.06	0.31	1.30	0.89	0.31	0.46	1.57
Energy Feeds														
Barley grain	11.6	0.53	0.18	0.36	0.27	0.53	0.80	0.53	0.18	0.62	0.36	0.18	0.36	0.62
Corn hominy feed	10.7	0.50	0.18	0.50	0.20	0.40	0.80	0.40	0.18	0.30	0.40	0.10	0.50	0.50
Corn germ meal	18.0	1.20	0.32	---	---	---	1.70	0.90	0.35	0.80	0.90	0.30	1.50	1.30
Corn grain	8.8	0.50	0.09	0.43	0.20	0.40	1.10	0.20	0.17	0.50	0.40	0.10	---	0.40
Millet grain	12.0	0.35	0.08	---	0.23	1.23	0.49	0.25	0.30	0.59	0.44	0.17	---	0.62
Oats grain	11.8	0.71	0.18	---	0.18	0.53	0.89	0.36	0.18	0.62	0.36	0.18	0.53	0.62
Potato meal	8.2	0.43	---	---	0.11	0.48	0.30	0.47	0.07	0.29	0.21	0.15	---	0.39
Rice grain w hulls	7.3	0.53	0.10	0.80	0.09	0.27	0.53	0.27	0.17	0.27	0.18	0.10	0.60	0.51
Rye grain	11.9	0.53	0.18	---	0.27	0.53	0.71	0.45	0.18	0.62	0.36	0.09	0.27	0.62
Sorghum grain, milo	11.0	0.36	0.18	0.40	0.27	0.53	1.42	0.27	0.09	0.45	0.27	0.09	0.36	0.53
Wheat grain	12.7	0.71	0.18	0.89	0.27	0.53	0.89	0.45	0.18	0.62	0.36	0.18	0.45	0.53
Wheat shorts	18.4	0.95	0.20	0.40	0.32	0.70	1.20	0.70	0.18	0.70	0.50	0.20	0.40	0.77
Whey, dried	13.8	0.40	0.30	0.30	0.20	0.90	1.40	1.10	0.20	0.40	0.80	0.20	0.30	0.70
Plant Protein Sources														
Brewers dried grains	25.9	1.30	---	---	0.50	1.50	2.30	0.90	0.40	1.30	0.90	0.40	1.20	1.60
Corn dist. solv., dehy	26.9	1.00	0.60	1.10	0.70	1.50	2.10	0.90	0.60	1.50	1.00	0.20	0.70	1.50
Corn gluten meal	42.9	1.40	0.60	1.50	1.00	2.30	7.60	0.80	1.00	2.90	1.40	0.20	1.00	2.20
Cottonseed meal, solv.	50.0	4.75	1.00	2.35	1.25	1.85	2.80	2.10	0.80	2.75	1.70	0.70	0.80	2.05
Peanut meal, solv.	47.4	4.69	---	---	1.00	2.00	3.10	1.30	0.60	2.30	1.40	0.50	---	2.20
Rapeseed meal, solv.	39.4	2.16	---	1.88	1.05	1.43	2.63	2.09	0.76	1.49	1.65	0.48	0.83	1.90
Soybean meal, solv.	45.8	3.20	0.67	2.10	1.10	2.50	3.40	2.90	0.60	2.20	1.70	0.60	1.40	2.40
Sunflower meal, solv.	46.8	3.50	0.70	2.70	1.10	2.10	2.60	1.70	1.50	2.20	1.50	0.50	---	2.30
Yeast, Brewers dried	44.6	2.20	0.50	1.70	1.10	2.10	3.20	3.00	0.70	1.80	2.10	0.50	1.50	2.30
Animal and Fish Protein Sources														
Blood meal	79.9	3.50	1.40	3.40	4.20	1.00	10.30	6.90	0.90	6.10	3.70	1.10	1.80	6.50
Buttermilk, dried	32.0	1.10	0.40	0.60	0.90	2.70	3.40	2.40	0.70	1.50	1.60	0.50	1.00	2.80
Casein, dried	81.8	3.40	0.30	1.50	2.50	5.70	8.60	7.00	2.70	4.60	3.80	1.00	4.70	6.80
Fish meal, anchovy	66.0	4.46	1.00	5.10	1.84	3.40	7.01	5.40	2.19	2.48	3.04	0.80	1.77	3.54
Fish meal, herring	70.6	4.00	1.60	5.00	1.30	3.20	5.10	7.30	2.00	2.60	2.60	0.90	2.10	3.20
Fish meal, menhaden	61.3	4.00	0.94	4.40	1.60	4.10	5.00	5.30	1.80	2.70	2.90	0.60	1.60	3.60
Liver meal	66.5	4.10	0.90	5.60	1.50	3.40	5.40	4.80	1.30	2.90	2.60	0.60	1.70	4.20
Meat meal	53.4	3.70	0.60	2.20	1.10	1.90	3.50	3.80	0.80	1.90	1.80	0.30	0.90	2.60
Meat and bone meal	50.6	4.00	0.60	6.60	0.90	1.70	3.10	3.50	0.70	1.80	1.80	0.20	0.80	2.40
Meat meal tankage	59.8	3.60	---	---	1.90	1.90	5.10	4.00	0.80	2.70	2.40	0.70	---	4.20
Milk, dried skim	33.5	1.20	0.50	0.20	0.90	2.30	3.30	2.80	0.80	1.50	1.40	0.40	1.30	2.20

Appendix Table 4. Vitamin content of selected feedstuffs, fresh basis.

	Carotene	Vitamin E	Choline	Niacin	Pantothenic acid	Riboflavin	Thiamin	Vitamin B_6	Vitamin B_{12}
	ppm								
Plant sources									
Alfalfa, dehy., 15% CP	102	98	1550	42	21	11	3.0	6.5	--
Alfalfa leaf meal, s-c	62	--	1600	55	33	15	--	11	--
Barley grain	--	11	1030	57	6.5	2.0	5.1	2.9	--
Brewers dried grains	--	--	1587	43	8.6	1.5	0.7	0.7	--
Corn dist. sol., dehy.	1	55	4818	115	21	17	6.8	10	--
Corn grain	4	22	537	23	5	1.1	4.0	7.2	--
Cottonseed meal, solv., 41% CP	--	15	2860	40	14	5.0	6.5	6.4	--
Oats grain	--	36	1073	16	13	1.6	6.2	1.2	--
Peanut meal, solv.	--	3	2000	170	53	11	7.3	10	--
Rice grain w hulls	--	14	800	30	3.3	1.1	2.8	--	--
Rye grain	--	15	---	1.2	6.9	1.6	3.9	--	--
Sorghum grain, milo	--	12	678	43	11	1.2	3.9	4.1	--
Soybean meal, solv., 45% CP	--	3	2743	27	14	3.3	6.6	8.0	--
Wheat grain	--	34	830	57	12	1.2	4.9	--	--
Wheat middlings	--	58	1100	53	14	1.5	19	11	--
Yeast, brewers dried	--	--	3885	447	110	35	92	43	--
Animal sources									
Buttermilk, dried	--	6	1808	9	30	31	3.5	2.4	0.02
Fish meal, herring	--	27	4004	89	11	9.0	--	3.7	219
Fish meal, menhaden	--	9	3080	56	9	4.8	0.7	--	0.1
Meat meal	--	1	1955	57	4.8	5.3	0.2	3.0	51
Meat and bone meal	--	1	2189	48	3.7	4.4	1.1	2.5	45
Liver meal	--	--	---	204	45	46	0.2	--	501
Milk, cow's, dried skim	--	9	1426	11	34	20	3.5	3.9	42
Whey, dried	--	--	20	11	48	30	3.7	2.5	0.03