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App. A Characteristics of Raw Materials
Table A.1

		% N	C:N ratio	Moisture	Bulk density
	Type of	(dry	(weight	content %	(pounds
Material	value	weight)	to weight)	(wet weight)	per cubic yard)
Crop residues and fruit/vegetable-processing wastes					
Apple filter cake	Typical	1.2	13	60	1,197
Apple pomace	Typical	1.1	48	88	1,559
Apple-processing sludge	Typical	2.8	7	59	1,411
Cocoa shells	Typical	2.3	22	8	798
Coffee grounds	Typical	-	20	-	-
Corn cobs	Range	0.4-0.8	56-123	9-18	-
	Average	0.6	98	15	557
Corn stalks	Typical	0.6-0.8	60-73 a	12	32
Cottonseed meal	Typical	7.7	7	-	-
Cranberry filter cake	Typical	2.8	31	50	1,021
(with rice hulls)	Typical	1.2	42	71	1,298
Cranberry plant (stems, leaves)	Typical	0.9	61	61	-
Cull potatoes	Typical	-	18	78	1,540
Fruit wastes	Range	0.9-2.6	20-49	62-88	-
	Average	1.4	40	80	-
Olive husks	Typical	1.2-1.5	30-35	8-10	-
Potato-processing sludge	Typical	-	28	75	1,570
Potato tops	Typical	1.5	25	-	-
Rice hulls	Range	0-0.4	113-1120	7-12	185-219
	Average	0.3	121	14	202
Soybean meal	Typical	7.2-7.6	4-6	-	-

Tomato-processing waste	Typical	4.5	11 a	62	-
Vegetable produce	Typical	2.7	19	87	1,585
Vegetable wastes	Typical	2.5-4	11-13	-	-
Blood wastes (slaughterhouse waste and dried blood)	Typical	13-14	3-3.5	10-78	-
Crab and lobster wastes	Range	4.6-8.2	4.0-5.4	35-61	-
	Average	6.1	4.9	47	240
Fish-breading crumbs	Typical	2.0	28	10	-
Fish-processing sludge	Typical	6.8	5.2	94	-
Fish wastes (gurry, racks, and so on)	Range	6.5-14.2	2.6-5.0	50-81	-
	Average	10.6	3.6	76	-
Mixed slaughterhouse waste	Typical	7-10	2-4	-	-
Mussel wastes	Typical	3.6	2.2	63	-
Poultry carcasses	Typical	2.4 b	5	65	-
Paunch manure	Typical	1.8	20-30	80-85	1,460
Shrimp wastes	Typical	9.5	3.4	78	-
Broiler litter	Range	1.6-3.9	12-15 a	22-46	756-1,026
	Average	2.7	14 a	37	864
Cattle	Range	1.5-4.2	11-30	67-87	1,323-1,674
	Average	2.4	19	81	1,458
Dairy tie stall	Typical	2.7	18	79	-
Dairy free stall	Typical	3.7	13	83	-
Horse-general	Range	1.4-2.3	22-50	59-79	1,215-1,620
	Average	1.6	30	72	1,379
Horse-race track	Range	0.8-1.7	29-56	52-67	-
	Average	1.2	41	63	-
Laying hens	Range	4-10	3-10	62-75	1,377-1,620
	Average	8.0	6	69	1,479
Sheep	Range	1.3-3.9	13-20	60-75	-
	Average	2.7	16	69	-

Swine	Range	1.9-4.3	9-19	65-91	-
	Average	3.1	14	80	-
Turkey litter	Average	2.6	16 a	26	783
Garbage (food waste)	Typical	1.9-2.9	14-16	69	-
Night soil	Typical	5.5-6.5	6-10	-	-
Paper from domestic refuse	Typical	0.2-0.25	127-178	18-20	-
Pharmaceutical wastes	Typical	2.6	19	-	-
Refuse (mixed food, paper, and so on)	Typical	0.6-1.3	34-80	-	-
Sewage sludge	Range	2-6.9	5-16	72-84	1,075- 1,750
Activated sludge	Typical	5.6	6	-	-
Digested sludge	Typical	1.9	16	-	-
Corn silage	Typical	1.2-1.4	38-43 a	65-68	-
Hay-general	Range	0.7-3.6	15-32	8-10	-
	Average	2.10	-	-	-
Hay-legume	Range	1.8-3.6	15-19	-	-
	Average	2.5	16	-	-
Hay-non-legume	Range	0.7-2.5	-	-	-
	Average	1.3	32	-	-
Straw-general	Range	0.3-1.1	48-150	4-27	58-378
	Average	0.7	80	12	227
Straw-oat	Range	0.6-1.1	48-98	-	-
	Average	0.9	60	-	-
Straw-wheat	Range	0.3-0.5	100-150	-	-
	Average	0.4	127	-	-

Bark-hardwoods	Range	0.10-0.41	116-436	-	-
	Average	0.241	223	-	-
Bark-softwoods	Range	0.04-0.39	131-1,285	-	-
	Average	0.14	496	-	-
Corrugated cardboard	Typical	0.10	563	8	259
Lumbermill waste	Typical	0.13	170	-	-
Newsprint	Typical	0.06-0.14	398-852	3-8	195-242
Paper fiber sludge	Typical	-	250	66	1140
Paper mill sludge	Typical	0.56	54	81	-
Paper pulp	Typical	0.59	90	82	1403
Sawdust	Range	0.06-0.8	200-750	19-65	350-450
	Average	0.24	442	39	410
Telephone books	Typical	0.7	772	6	250
Wood chips	Typical	-	-	-	445-620
Wood-hardwoods	Range	0.06-0.11	451-819	-	-
(chips, shavings, and so on)	Average	0.09	560	-	-
Wood-softwoods	Range	0.04-0.23	212-1,313	-	-
(chips, shavings, and so on)	Average	0.09	641	-	-
Grass clippings	Range	2.0-6.0	9-25	-	-
	Average	3.4	17	82	-
Loose	Typical	-	-	-	300-400
Compacted	Typical	-	-	-	500-800
Leaves	Range	0.5-1.3	40-80	-	-
	Average	0.9	54	38	-
Loose and dry	Typical	-	-	-	100-300
Compacted and moist	Typical	-	-	-	400-500
Seaweed	Range	1.2-3.0	5-27	-	-
	Average	1.9	17	53	-
Shrub trimmings	Typical	1.0	53	15	429
Tree trimmings	Typical	3.1	16	70	1,296
Water hyacinth-fresh	Typical	-	20-30	93	405

Note: Data was compiled from many references listed in the suggested readings section of this handbook (pages 179-180). Where several values are available, the range and average of the values found in the literature are listed. These should not be considered as the true ranges or averages, just representative values.

a Estimated from ash or volatile solids data.

b Mostly organic nitrogen.

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For specific comments related to this page, please contact the [Cornell Waste Management Institute](#) (format and style), or [Tom Richard](#) (technical content).

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