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A Contribution to the Study of Southern Feeding Stuffs

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A CONTRIBUTION TO THE STUDY OF SOUTHERN FEEDING STUFFS.

Bulletins of this Station will be sent, upon application, free of charge, to any Farmer in the State.

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SOME TENNESSEE FEEDING STUFFS.

J. B. McBryde.

There has been of late, especially on the continent of Europe, considerable complaint in regard to the quality of American cottonseed meal and cottonseed cake. The following extract from an article by Dr. Gebeck, of the Bonn Station,[1] may be taken as a sample:

After giving the process of manufacture, he says: "The remaining cake is ground, in America, between large stones, in Germany in steam mills or oil cake breakers. However, the meal produced in this way is not fit for immediate use as a cattle food, for it contains varying quantities of wood splinters, particles of iron, hulls, cords, and cotton fibers. The presence of these impurities is partly due to the imperfect work by the hulling machines and partly to carelessness in handling the seed at the mills. A part of the hulls may be intentionally added as an adulterant. These impurities are in part removed from the meal both in America and Germany, the work being more thoroughly done in the latter country. In America the cleaned press residues, ready for use, are packed in new cotton bags and exported to other countries under the name 'American cottonseed meal, or cake.' They, however, still show admixtures of cotton fibers and other impurities, such as particles of iron, and complaints of the American product are often heard. The better qualities imported contain an average of 2-3 per cent. of cotton fibers, other grades 9-10, and some as high as 20 per cent. On the other hand, in the large German mills, the process of removing these impurities has reached the highest degree of technical perfection. The particles of iron are all removed by magnets, and the cotton fibers, with other impurities, are perfectly removed by machines especially made for this purpose."

"The so-called 'German cottonseed meal,' as finally brought on the market, meets with a greater demand each year, whereas the use of the American product decreases steadily."

[1] Landw. Vers. Stat. XLII, (1893), 279.

"The cost of refining the cottonseed meal is richly repaid by the higher content of protein and fat obtained in the cleaned meal."

Because of this and similar adverse criticisms of our domestic cottonseed meals, this station was led to undertake an examination of the products of our Tennessee oil mills, and, as being in the same line of work, we decided also to examine such samples of the products of our grain mills as we were able to obtain..

Through the kindness of Capt. Jos. W. Allison and other gentlemen connected with the cottonseed oil business of Memphis, we obtained a number of samples of cottonseed products necessary for our work. The cottonseed oil men of Memphis have given us their most hearty support in sending samples and information. On the other hand we found it almost impossible to obtain such samples as were needed from the grain mills. To thirty letters, containing requests for samples and information, sent out to dealers and manufacturers in the smaller towns throughout the State, we received two replies, one from the Ajax Milling Co., of Gallatin, the other from the Lenoir City Milling Co., of Lenoir City, Tenn. The other samples obtained were either selected by ourselves or by agents of our own choosing. Whether the failure of those parties to whom we wrote to send us samples was prompted by a fear to submit their goods to inspection, or whether it was simply from a lack of interest, we are unable to say; but as we offered to pay not only all costs of packing and shipping, but to pay for the sample itself, it looks as though they did not care to have their goods examined.

We regret that it was impossible for us, with the time and money at our disposal, to obtain a more complete and representative line of samples, but we publish the results of the examination of such as we have, hoping they may prove of service towards establishing standards by which to judge of Tennessee feeding stuffs.

The following explanation of the technical terms, used in reporting result of analyses of feeding stuffs, is taken from Tennessee Experiment Station Bulletin 3, Vol. VI:

"*Moisture at 100 C.* is that driven off at the boiling point of water. This is effected by subjecting the portion of the material taken for this purpose to a heat of 100 C., or 212 Fahrenheit, for several hours, until the weight of the material remains constant. What remains is the *dry matter* of the analysis. The amount

varies with the kind of food. This water is of no economic value.

"*Crude Protein* includes all the groups of nitrogenous matters found in the material. Albuminoids contain nitrogen, carbon, oxygen, hydrogen and sulphur, the proportion of nitrogen varying between 15 and 17 per cent., and it is assumed that the average is 16 per cent. When making a proximate chemical analysis of a food-stuff the nitrogen determined as such is multiplied by 6.25, (100 divided by 16=6.25), to express the total quantity of albuminoids, usually stated as *Crude Protein*. Protein is the nitrogenous part of the food. Muscle (lean meat), hair, horn and all the nitrogenous parts of the body are produced or renewed by the albuminoids; they also aid in the production of fat.

"*Crude fat* is dissolved out of the dry matter of the stuff by extracting with ether; the ether is evaporated off and the residue dried at 100 C., and weighed. This fat when extracted from grain is nearly pure fat; from green or coarse dry fodder, a varying proportion of wax or gum and green coloring matter is associated with the fat. *Fat* produces animal heat, or is stored up in the body. For the reason that a pound of fat produces when burned about two and a half times as much heat as one pound of starch or cellulose, the fat is assumed to have a nutritive value two and a half times as much as an equal weight of the other carbo-hydrates.

"*Nitrogen-free Extract Matter* contains the carbo-hydrates, which are various combinations of carbon, hydrogen and oxygen, such as sugar, starch, etc., and are heat and force producers in the animal body. By vital action the carbo-hydrates are oxidized, heat resulting, and warmth and energy developed, as in burning. Besides serving this purpose, the carbo-hydrates are converted into fats and stored up in the fatty tissues of such animals as do not expend them in the performance of work, in giving milk, or in rapid growth.

"*Crude Fiber*, or cellulose, is the woody-tissue residue after all soluble matter has been removed by ether and by successive boilings of the finely pulverized substance with dilute acid and dilute alkalis. This *crude fiber* was once thought to be of no nutritive value—indigestible; but careful and repeated experiments have proven that crude fiber has a feeding value, especially for ruminants, nearly as much as the average of the non-nitrogenous extract matters. In some instances, however, much the larger part of the 'fiber' is indigestible, as, for instance, the bran of corn meal.

"*Crude Ash* is the residue after burning. The combustible part disappears, leaving the mineral ingredients. This ash contains certain constituents, among which are phosphoric acid and potash, which are needful to the animal body, and are also of manurial value."

The analytical methods followed were practically those recommended by the Association of Official Agricultural Chemists.

COTTONSEED PRODUCTS.

Cottonseed meal (decorticated):—Dr. Gebeck, in the article already referred to, writes as follows of cottenseed meal:

"The press residues of hulled American seed, when of a good quality, are of a vivid yellow color; a brown color indicates that such seed were either over-heated or too old, or perhaps became heated in some damp store house. All cakes and meal in good condition have an agreeable smell, neither damp nor sour, and a sweet oily taste like that of a nut. A rancid smell indicates that the cake or meal is too old."

"Cottonseed meal and cake manufactured in America and exported to Germany for immediate use demand especial attention. It is often found that the American products are spoiled during transportation on the ship. They are rancid and contain unhealthy germs, a natural consequence of putrefaction. The meal is more easily affected than the cake. That decomposition has set in is shown by a decided smell of sulphuric acid (SO_3) when water is added to the meal or cake."

He further says: "Intentional adulteration of cottonseed meal or cake has been seldom observed, we may almost say never; it would be easily detected and proven on account of the characteristic yellow color of cottonseed meal. Futhermore, a chemical analysis would at once show if the meal had been adulterated, a like high percentage of protein and fat in the meal being shown only by peanut meal or cake, and the higher price of the latter prevents its use as an adulterant."

For our work on Tennessee cottonseed meal, we have examined sixteen samples from the various mills of the State, as follows:

I. Manufactured by the Chattanooga Oil Mills, Chattanooga, Tenn. Sold by Brandau & McDaniel, Knoxville, Tenn., for $18 per ton. May 10, 1895.

II. Manufactured by Chattanooga Oil Mills, Chattanooga, Tenn. Sold by H. T. Hackney & Co., Knoxville, Tenn., for $1 per 100 lbs. May 18, 1895.

III. Manufactured by Nashville Oil Works, Nashville, Tenn, Sold by R. A, Coleman & Co., Nashville, Tenn., at $17 per ton f. o. b. at mill, June 23, 1896. Sample received May, 23, 1895.

IV. Manufactured by Hanauer Cottonseed Oil Works, Memphis, Tenn. Sample received May 31, 1895, from Jos. W. Allison, Memphis, Tenn. $15.00 per ton.

V. Manufactured by DeSoto Oil Works, Memphis, Tenn. Sample from Jos. W. Allison, Memphis, Tenn. Received May 31, 1895. $15 per ton.

VI. "Mixed Meal." This sample contains an unusual amount of hulls, probably mixed in purposely. Manufactured by Crescent Oil Works, Memphis. Tenn. Sample from Jos. W. Allison, Memphis, Tenn. Received May 31, 1895. $13.50 per ton.

VII. Mauufactured by Valley Oil Works, Memphis, Tenn. Sample from Jos. W. Allison, Memphis, Tenn. Received May 31, 1895. $15 per ton.

VIII. Manufactured by Gayoso Oil Works, Memphis, Tenn. Sample from Jos. W. Allison. Received May 31, 1895. $15 per ton.

IX. Manufactured by Southern Oil Works, Memphis, Tenn. Sample from Jos. W. Allison, Memphis, Tenn. Received May 31, 1895. $15 per ton.

X. Manufactured by Crescent Oil Works, Memphis, Tenn. Sample from Jos. W. Allison. Received May 31, 1895. $15 per ton.

XI. May meal, manufactured by Hanauer Mill, Tennessee Cotton Oil Co., Memphis, Tenn, Sample from Jos. W. Allison, Memphis. Received June 3, 1895. $15 per ton.

XII. February meal. From same source as No. XI.

XIII. April meal. From same source as No. XI.

XIV. January meal. From same source as No. XI.

XV. Prime cottonseed meal. Manufactured by Hanauer Mill, Tennessee Cotton Oil Co., Memphis, Tenn. Sample sent by Tennessee Cotton Oil Co., Memphis, Tenn. Received January 31, 1896. No price given.

XVI. Sample bought on Knoxville market for use on college farm, March 28, 1895. Particulars not stated. Analyst, C. A. Mooers.

These samples were examined mechanically; that is, they were first passed through a sieve having circular openings two millimetres in diameter, and next through one having one millimetre openings. The portions failing to pass through were

weighed and the percentage of each calculated. A magnet was used to find metallic particles, and a strong hand magnifying glass to look for other foreign matter. The results of this work are recorded in table I. None of the samples examined by us were found to be spoiled.

TABLE NO. I.

COTTON SEED MEAL.

	Above 2 mm. diam.	From 2 to 1 mm. diam.	Less than 1 mm. diam.	REMARKS.
I.	10	25	65	Color very dark, much coarse matter consisting of lint and hulls, with some wood splinters.
II.	10	23	67	Same as for No. I.
III.	5	15	80	Color good, coarse matter consists of lint and hulls with some few wood splinters.
IV.	3	12	85	Color fairly good; coarse matter consists of lint and hulls with a few wood splinters and a few grains of wheat.
V.	1	15	84	Color fairly good; coarse matter consists of lint and hulls with a very few wood splinters.
VI.	7	20	73	Color very dark; much coarse matter consisting principally of hulls, with some lint and wood splinters. Meal badly ground.
VII.	1	14	85	Color fairly good; coarse matter consists of lint and hulls, with a few grains of wheat. No wood splinters.
VIII.	10	20	70	Color dark; much coarse matter, consisting of hulls and lint, with some wood splinters and straw. Some metallic particles.
IX.	0	15	85	Color dark; coarse matter consists mostly of hulls, some lint and a few wood splinters.
X.	3	12	85	Color dark; coarse matter consists mostly of hulls with some lint, a few wood splinters and wheat grains. Meal badly ground.
XI.	2	10	88	Color fairly good; coarse matter consists of hulls and lint with some few wood splinters.
XII.	3	15	82	Same as for No. XI.
XIII.	3	10	87	Color fairly good; coarse matter consists of hulls and lint with some wood splinters and wheat grains.
XIV.	5	15	80	Same as for No. XIII.
XV.	2	15	83	Color very good; coarse matter consists of hulls and lint, almost no wood splinters.
Average . .	20		80	

It will be noticed that many of the meals shown in this table carry quite a large amount of coarse matter, too much, in fact. By coarse matter we mean that part of the meal failing to pass through a sieve having circular openings one millimetre[1] in

[1] 1 millimetre equal to 1-25 of an inch, nearly.

diameter. Although we have no data with which to compare the figures shown in Table I., we feel safe in saying that a cottonseed meal should not carry more than 15 per cent. coarse matter, and that this coarse matter should consist only of coarse ground pieces of kernels, together with some coarse pieces of hulls. A little lint is always present in the meal from upland or short staple cottonseed, but it should form but a small part of the meal. The greater part of the lint is found in sifting with the coarse matter, and a fair idea of the amount of lint in the meal may be obtained by simply sifting a small portion. Dr. Gebeck says that the better grades of meal should contain only from 2 to 3 per cent. of lint; they should certainly carry less than 5 per cent. lint.

We think that in judging the value of a cottonseed meal, its mechanical condition and purity must be considered. A chemical analysis is not entirely sufficient. A limit should be fixed for the amount of coarse matter and lint carried by a meal. The character and amounts of the different impurities should also be considered and regulated. Of course a large number of samples must be examined, and practical feeding tests must be made before a standard for judging meals as to their mechanical condition and purity can be safely fixed. But if all the experiment stations using cottonseed meal in feeding tests will make such examinations, it will not take long to obtain all the data necessary for fixing such a standard.

We shall endeavor to extend the work begun in this bulletin and make a thorough study of the cottonseed meals produced by our Tennessee mills.

We give in the following table (II) chemical analyses of the same samples of meal described in Table I. The average composition of the sixteen Tennessee meals is compared with (A) the average of forty-four analyses of cottonseed meal, Table XIX; (B) the average composition of thirty-five analyses, as shown in the tables of Jenkins and Winton, Ex. Sta. Bull. 11, U. S. Dept. Agr., 1892; and (C) the average composition of four hundred and ten analyses compiled by ourselves from all available sources.

Table II.

COTTON SEED MEAL.

	FRESH OR DRY-AIR MATERIAL.						WATER-FREE SUBSTANCE.				
	Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash
I.	7 91	42.22	10.52	27.46	4.81	7.08	45 85	11.42	29 82	5.22	7.69
II.	6.38	41.10	11.00	28.43	6.75	6 34	43.90	11.75	30.37	7.21	6.77
III.	5 64	42 47	11.79	27.63	5.87	6.60	45.01	12.49	29.28	6.22	7.00
IV.	6.31	42.44	11.03	27.22	5.70	7.30	45.29	11.78	29.05	6.08	7.80
V.	6.10	41 38	12 44	27.37	5.75	6.96	44 07	13.25	29.15	6.12	7.41
VI.	8.19	30.38	7.47	35.25	12.85	5.86	33.08	8.14	38.40	14.00	6.38
VII.	6.72	42.25	11.17	27.13	5.70	7 03	45.29	11.98	29.08	6.11	7.54
VIII.	6.12	40.38	13.64	27.03	5.83	7.00	43.01	14 53	28.79	6.21	7.46
IX.	6.10	43.35	10.92	26.61	5.71	7.31	46.17	11.63	28.34	6.08	7.78
X.	9.13	40.72	8.97	27.75	6.33	7.10	44.81	9.87	30 54	6.97	7.81
XI.	6.28	42.66	10.54	27.75	5.38	7.39	45.52	11.25	29.61	5 74	7.88
XII.	6.44	42.63	11.06	27 26	5.61	7.00	45 56	11.82	29.14	6.00	7.48
XIII.	6.56	41 66	12 02	26.77	5.71	7.28	44 59	12.86	28.65	6.11	7.79
XIV.	6.63	43 03	11.31	26.61	5.39	7.03	46 09	12.11	28.50	5.77	7.53
XV.	4.37	44.94	12.50	26.57	4.33	7.29	47.00	13.07	27.78	4.53	7.62
XVI.	6.66	41.31	11.65	27.06	7.18	6.14	44.26	12.48	29.00	7 68	6.58
Maximum . . .	9.13	44.94	13.64	35.25	12.85	7.39	47.00	14.53	38.40	14.00	7.88
Minimum . . .	4.37	30 38	7.47	26.57	4.33	5 86	33.08	8.14	27.78	4.53	6.38
Average	6.60	41.43	11.12	27.75	6.18	6.92	44.34	11.90	29.72	6.63	7.41
Average A . . .	7.40	42 57	10.92	26.34	6.16	6.61	45.97	11.79	28 44	6.66	7.14
Average B . . .	8.17	42.31	13.08	23.65	5.62	7.17	46.10	14.20	25.80	6.10	7.80
Average C . . .	8.52	43.26	13.45	22.31	5.44	7.02	47.29	14.70	24.39	5.95	7 67

The average composition of the sixteen Tennessee meals falls considerably below the general average (C) in both protein and fat. It is not surprising that the amount of fat should be less, for improved machinery now removes the oil more completely, but there is apparently no reason for the lower percentage of protein, except that the samples of meal were inferior. The maximum per cent. of protein in the Tennessee meals, 47 per cent., falls nearly three-tenths of one per cent. below the general average (C), 47.29 per cent. The figures given in Table I show that most of these meals carry a high percentage of coarse matter, such as hulls and lint, and this may account for their poor showing in Table II.

In the averages B and C there are included analyses showing a lower percentage of protein than shown by analysis VI, Table II, 33.08 per cent.; so it is perfectly fair to include this analysis. Even without it the results are almost the same.

COTTONSEED MEAL UNDECORTICATED.

In Table III we show two analyses of cottonseed meal undecorticated, and the average of the two as compared with (A) the average of six analyses of undecorticated cottonseed meal and (B) the average of forty-seven analyses of undecorticated cottonseed cake, both averages being obtained from all available analyses as compiled by ourselves.

I. Sample of meal bought on the Knoxville market for use on the experiment farm. Analyzed by C. A. Mooers.

II. Manufactured by Consumers' Cotton Oil Co., Little Rock, Ark. Sample from Tennessee Cotton Oil Co., Memphis, Tenn. Received April 6, 1896.

TABLE III.

COTTONSEED MEAL—UNDECORTICATED.

	FRESH OR AIR-DRY MATERIAL						WATER-FREE SUBSTANCE				
	Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash
I.	7.71	37.19	7 45	29.73	11.47	6.45	40.30	8.07	32.21	12.43	6.99
II.	6.35	28.60	7.02	34.64	17.57	5.82	30.54	7.49	37.00	18.76	6 21
Average	7.03	32.90	7.23	32 19	14.52	6.13	35.42	7 78	34.60	15.60	6.60
Average A	11.64	24.08	5.91	31.43	20.68	6 26	27.25	6.69	35 57	23.41	7.08
Average B	11.86	24 25	5 82	30.74	20 95	6.38	27.51	6.61	34.87	23.77	7.24

Two analyses are hardly sufficient for fixing an average for undecorticated meal, so we pass over this table without comment.

COTTONSEED CAKE (decorticated).—In Table IV will be found eight analyses of cottonseed cake from the following sources:

I. Manufactured by Planters' Oil Mill, Greenwood, Miss. Sample from Jos. W. Allison, Memphis, Tenn. Received June 3, 1895.

II. Manufactured by Refuge Oil Works, Vicksburg, Miss. Sample from Jos. W. Allison, Memphis, Tenn. Received June 3, 1895.

III. "Box Cake." Manufactured by DeSoto Oil Co., Memphis, Tenn. Sample from Jos. W. Allison, Memphis, Tenn. Received June 3, 1895.

IV. "Plate Cake." Manufactured by DeSoto Oil Co., Memphis, Tenn. Sample from Jos. W. Allison, Memphis, Tenn. Received June 3, 1895.

V. Manufactured by New Braunfels Oil Co., New Braunfels, Texas. Sample from Jos. W. Allison, Memphis, Tenn., Received June 3, 1895.

VI. Manufactured by Valley Oil Co., Memphis, Tenn. Sample from Jos. W. Allison, Memphis, Tenn. Received June 3, 1895.

VII. Manufactured by Dyersburg Oil Co., Dyersburg, Tenn. Sample from Jos. W. Allison, Memphis, Tenn. Received June 3, 1895.

VIII. Manufactured by Southern Oil Co., Memphis, Tenn. Sample from Jos. W. Allison, Memphis, Tenn. Received June 3, 1895.

The average of these eight analyses is compared with the average (A) of four hundred and twenty-nine analyses compiled from various sources by ourselves. Most of the analyses in this compilation are from the tables of Dietrich and König.

TABLE IV.

COTTONSEED CAKE.

	FRESH OR AIR-DRY MATERIAL.						WATER-FREE SUBSTANCE.				
	Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash
I.	6.10	38.44	20.93	23.43	4.61	6.49	40.94	22.29	24.95	4.91	6.91
II.	6.15	43.69	12.19	25.81	4 82	7.34	46.54	12.98	27.50	5.16	7.82
III.	6.51	43.41	10 34	27.30	5.10	7.34	46.44	11.06	29.20	5.45	7.85
IV.	6.07	38.10	15.34	27.18	6.63	6.68	40.56	16.33	28.94	7.06	7.11
V.	6.22	52.85	9.19	22.92	3.23	5.59	56.36	9.80	24.44	3.44	5.96
VI.	6.28	46.66	8.29	26.91	4.65	7.21	49.79	8.85	28.71	4.96	7.69
VII.	4.99	46.97	13.14	23.82	4.08	7.00	49.44	13.83	25 08	4.29	7.36
VIII.	6.42	52.79	6.76	23 38	5.12	5.53	56.41	7.23	24 98	5.47	5.91
Maximum	6.51	52.85	20.93	27.30	6.63	7.34	56.41	22.29	29.20	7.06	7.85
Minimum	4.99	38.10	6 76	22.92	3.23	5.53	40.56	7.23	24.44	3.44	5.91
Average	6.09	45 36	12.02	25.10	4.78	6.65	48.31	12.80	26.72	5.09	7.08
Average A	8.62	44.09	14.23	20.85	5.16	7.05	48.24	15.57	22.83	5.65	7.71

The two averages shown in this table agree remarkably well, except in the amount of fat. The lower percentage of fat is accounted for by better work by the mills.

COTTONSEED HULLS.—In the next table (V) we show seven analyses of cottonseed hulls and their average as compared with (A) the average of twenty-four analyses (see Table XIX); (B) the average of four analyses, Jenkins and Winton's tables, Ex. Station Bull. 11, U. S. Dept. Agr., 1892; and (C) the average of twenty-two analyses compiled by ourselves from various sources. The samples used in this table are from the following sources:

I. Sample of Memphis goods bought in Knoxville market for use on the experiment farm March 20, 1895. C. A. Mooers, analyst.

II. Manufactured by Chattanooga Cottonseed Oil Mills, Chattanooga, Tenn. Sold by Brandau & McDaniel, Knoxville, Tenn. Thirty cents per 100 lbs. May 10, 1895.

III. Manufactured by Chattanooga Cottonseed Oil Mills, Chattanooga, Tenn. Sold by H. T. Hackney & Co., Knoxville, Tenn. $8 per ton. May 10, 1895.

IV. Manufactured by Southern Cotton Oil Co., Memphis, Tenn. Sample from Southern Cotton Oil Co., Memphis, Tenn. $3 per ton loose, $4 per ton baled. Received January 17, 1896.

V. Manufactured by Crescent Cotton Oil Co., Memphis, Tenn. Sample from Crescent Cotton Oil Co., Memphis, Tenn. $2.50 per ton in car load lots, $3 per ton retail, $1.50 per ton extra for baling. Received January 16, 1896.

VI. Manufactured by Valley Oil Mills, Memphis, Tenn. Sample from Valley Oil Mills, Memphis, Tenn. $3 per ton loose, $4 per ton baled. Received January 16, 1896.

VII. "Cottonseed Hull cleaned." Sample manufactured and sent in by Hanauer Mill, Tennessee Cotton Oil Co., Memphis, Tenn. Received January 31, 1896.

TABLE V.

COTTONSEED HULLS.

	FRESH OR AIR-DRY MATERIAL.						WATER-FREE SUBSTANCE.				
	Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash
I.	7.97	3.81	1.28	40 51	41.36	5.07	4.14	1.39	44.03	44 94	5.50
II.	9 41	3.85	1.43	44.84	37 61	2.86	4.25	1.58	49.49	41.52	3.16
III.	8 99	4 38	2 64	45.12	36.02	2.85	4.81	2.90	49.58	39.58	3.13
IV.	8.28	3.88	2 38	45.72	37 29	2.45	4.23	2 59	49.85	40.66	2.67
V.	7.71	4 78	2.60	45.40	37.07	2 44	5.18	2 82	49.19	40.17	2.64
VI.	7 84	3.94	1.88	44 99	38.98	2.37	4.28	2.04	48.82	42.29	2.57
VII.	6.00	9.44	2.32	42.15	37.68	2.41	10.04	2.47	44.84	40.09	2.56
All Averages. Maximum . .	9.41	9 44	2.64	45 72	41.36	5.07	10.04	2.90	49.85	44.94	5.50
All Averages. Minimum . .	6 00	3 81	1.28	40.51	36.02	2.37	4 14	1.39	44.03	39.58	2.56
All Averages. Average . . .	8.03	4.87	2 07	44.11	38 00	2.92	5 28	2.25	47.97	41.32	3.18
Average A	10.53	4 36	2.22	36.88	43.28	2.73	4 86	2.49	41.19	48.41	3 05
Average B	10.41	4.04	2.02	36 52	44 42	2.59	4.50	2.20	40.90	49 50	2.90
Average C	11.36	4.18	2 22	34.19	45.32	2.73	4.72	2.50	38 57	51.13	3 08

Cottonseed hulls are too well known to need any description by us, and this table is self-explanatory.

COTTONSEED HULL BRAN.—We give next a table (VI) showing five analyses of cottonseed hull bran, and the average of these analyses as compared with the average (A) of eight analyses of this article compiled from all available sources by ourselves. This product consists usually of ground cottonseed hulls with part of the lint removed by grinding and sifting. Sometimes a little meal is added and again immature, old, or decayed seed are ground up with the hulls. All the samples in Table VI excepting No. II were merely ground up cottonseed hulls, less part of the lint, carrying the same impurities found in the hulls and meal, namely, wood splinters, pieces of cord, straw, and wheat screenings. The degree of fineness in grinding varied considerably; however, most of the samples were ground quite fine. The samples were from the following mills:

I. Manufactured and sold by Johnson & Co., Memphis, Tenn. Sample sent by Jos. W. Allison, Memphis, Tenn. $10 per ton. Received May 31, 1895.

II. Manufactured by, and sample from Crescent Cotton Oil Co., Memphis, Tenn. $7 per ton in 100 lb. bags. Received January 15, 1896.

III. Manufactured by Tennessee Fiber Co., Memphis, Tenn. Sample from Southern Cotton Oil Co., Memphis, Tenn. $8 per ton. Received January 17, 1896.

IV. Manufactured by, and sample from Crescent Cotton Oil Co., Memphis, Tenn. Received January 25, 1896: $8 per ton in car load lots. $10 per ton in less quantities. Prices given June 23, 1896.

V. Manufactured by Tennessee Fiber Co., Memphis, Tenn. Sample from Tennessee Cotton Oil Co., Memphis, Tenn. Received January 31, 1896.

TABLE VI.

COTTONSEED HULL BRAN.

	FRESH OR AIR-DRY MATERIAL.						WATER-FREE SUBSTANCE.				
	Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash
I.	8.60	3.29	1.49	50.00	34.17	2.45	3 60	1.63	54.70	37 39	2.68
II.	6.83	18.64	9.63	31.61	26.91	6.38	20.00	10 34	33.93	28 88	6.85
III.	7.34	3.31	1.11	50.24	35.60	2 40	3.57	1.19	54 22	38.43	2.59
IV.	7.88	4.16	2.20	47.11	35.65	3.00	4.52	2.39	51 14	38.69	3.26
V.	8.03	3.94	1 83	51.88	32 05	2.27	4.28	2 00	56.40	34.85	2.47
Maximum	8.60	4.16	2.20	51 88	35.65	3 00	4.52	2.39	56.40	38.69	3.26
Minimum	6.83	3.29	1.11	47.11	32 05	2.27	3.57	1.19	51.14	34.85	2.47
Average excluding No. II.	7.96	3.67	1.66	50.06	34.12	2.53	3.99	1.80	54.12	37.34	2.75
Average A	11 66	12.01	3.06	39.22	30 99	3 06	13.60	3.46	44.40	35 08	3.46

This being a comparatively new product has as yet received but little attention from scientific workers. We have been unable to find any record of feeding tests or digestive experiments with it, hence we are unable to speak with any degree of certainty of its feeding value. In chemical composition, however, all our samples, with the exception of No. II, show similarity to cottonseed hulls. No. II evidently contains either meal or ground cottonseed, and although it is sold under this name, it is, strictly speaking, not a hull bran.

The difference between the average composition of the four samples shown in Table VI and average (A) is very considerable, and leads us to believe that there are included in average (A) samples of cottonseed hull bran, to which cottonseed meal has been added. Feeding tests and digestive experiments will be necessary to determine its actual value.

COTTONSEED FEED STUFF.—The following is an analysis of "Cottonseed feed stuff," from a sample of goods manufactured by the Tennessee Fiber Co., of Memphis, Tenn., sent us by the Tennessee Cotton Oil Co. We wrote the Tennessee Fiber Co., some two or three months ago requesting sample and information concerning process of manufacture, but so far have heard nothing from them.

TABLE VII.

COTTONSEED FEED STUFF.

	Air Dry	Chemical Dry
Moisture	6.21	
Crude Protein	22.65	24.15
Crude Fat	5 97	6.37
Nitrogen-free Extract	41.09	43.80
Crude Fiber	19.65	20.96
Crude Ash	4 43	4 72
	100.00	100.00

This article appears to be cottonseed hull bran mixed with cottonseed meal. (See analysis No. II, Table VI, cottonseed hull bran and meal.) It has the appearance of a very inferior

decorticated meal and carries a large percentage of hull and lint with the usual impurities found in the meal and hulls.

Unfortunately we have no record of any feeding tests of this substance, so cannot speak of its actual value with any degree of certainty.

OTHER BY-PRODUCTS.

PEANUT CAKE.—This product, while of great economic importance on the continent of Europe, is almost unknown as a cattle food in this country, cottonseed meal, which is more cheaply produced, taking its place.

We give two analyses of the products and their average as compared with the average (A) of 2,785 analyses taken from the tables of Dietrich and Konig.

I. Peanut cake, white. Manufactured by Tennessee Cotton Oil Co., Memphis, Tenn. Sample sent by Jos. W. Allison, Memphis, Tenn. Received June 3, 1895.

II. Peanut cake, red. Manufactured by Tennessee Cotton Oil Co., Memphis, Tenn. Sample sent by Jos. W. Allison, Memphis, Tenn. Received June 3, 1895.

TABLE VIII.

PEANUT CAKE.

	FRESH OR AIR-DRY MATERIAL.						WATER-FREE SUBSTANCE.				
	Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash
I.	6 30	41.75	10.15	34.57	3.58	3.65	44.56	10.83	36.89	3 82	3.90
II.	6.25	52.31	9 50	24.64	3.43	3.86	55.81	10.13	26 29	3.66	4.11
Average	6.28	47 03	9.83	29.61	3.50	3 75	50 19	10.48	31.59	3.74	4.00
Average A	10.74	46 85	7.89	24.34	5.29	4.89	52.49	8.84	27.26	5.93	5 48

This product is a little higher in protein and lower in fat than cottonseed meal, but otherwise they are quite similar in chemical composition. Judging by its chemical composition, it should make a valuable food stuff, and as a matter of fact, is very extensively used in Germany.

WHEAT BRAN.—We present in the next table analyses of fourteen samples of wheat bran from the following mills:

I. Manufactured by Knoxville City Mills, J. Allen Smith & Co., Knoxville, Tenn. Sold as an "extra" sample from a lot bought for use on experiment farm. Analyzed by C. A. Mooers, March 20, 1895.

II. Manufactured by Knoxville City Mills, Knoxville, Tenn. Sold by Brandau & McDaniel. 95 cents per 100 lbs. Sample taken May 10, 1895.

III. Manufactured and sold by Knoxville City Mills, Knoxville, Tenn. 95 cents per 100 lbs. Sample taken May 15, 1895.

IV. Manufactured and sold by Scott Bros., Knoxville, Tenn. $18 per ton. Sample taken May 16, 1895.

V. Manufactured and sold by J. M. Stone & Co., Nashville, Tenn. Sample by H. I. Anderson, Jr., Nashville, Tenn. $11.40 per ton, June 21, 1896. Received May 23, 1895.

VI. Manufactured and sold by Liberty Mills Co.. Nashville, Tenn. Sample by H. I. Anderson, Jr., Nashville, Tenn. In 100 lb. sacks, $10.70 per ton net, June 23, 1896. Received May 23, 1895.

VII. Manufactured and sold by Model Mill Co., Nashville, Tenn. Sample by H. I. Anderson, Jr., Nashville, Tenn. In 175 lb. sacks, $10.50 per ton f. o. b., June 22, 1896. Sample received May 23, 1895.

VIII. Manufactured and sold by W. R. Cornelius & Co., Nashville, Tenn. Sample by H. I. Anderson. Jr. Received May 23, 1895.

IX. Purchased by S. J. Camp from Moore & Jones, of Memphis, Tenn. Sample sent in by Jos. W. Allison, of Memphis, Tenn. $16 per ton. Received May 31, 1895.

X. "Extra" Bran. Manufactured and sold by Knoxville City Mills, Knoxville, Tenn. 95 cents per 100 lbs. Received June 7, 1895.

XI. Manufactured by Twin City Mills, Bristol, Tenn. Sold by Armitage & Dobson, Greeneville, Tenn. Sample from

J. A. Trim, Greeneville, Tenn. $1.00 per 100 lbs. Received June 27, 1895.

XII. Manufactured by Twin City Mills, Bristol, Tenn. Sold by Doughty Bros., Greeneville, Tenn. Sample from J. A. Trim, Greeneville, Tenn. $1.20 per 100 lbs. Received June 27, 1895.

XIII. Manufactured by, and sample from Ajax Milling Co., Gallatin, Tenn. Received January 20, 1896.

XIV. Manufactured by, and sample from Lenoir City Milling Co., Lenoir City, Tenn. 75 cents per 100 lbs. Received January 24, 1896.

Average (A) is the average of twenty-five analyses as shown in Table IX. Average (B), is the average of eighty-seven analyses from the tables of Jenkins and Winton, Experiment Station Bulletin 11, U. S. Dept. Agr., 1892.

TABLE IX.

WHEAT BRAN.

	FRESH OR AIR-DRY MATERIAL.						WATER-FREE SUBSTANCE.				
	Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash
I.	8.76	16.44	4.07	57.53	7 67	5 53	18.02	4.46	63 05	8.41	6.06
II.	9 47	15.69	4.66	57.96	7.35	4.87	17.33	5.15	64.02	8.12	5.38
III.	8.59	16.38	4 27	57.32	7.84	5.60	17 92	4.67	62 71	8.58	6 12
IV.	7.65	16.35	4 95	59 50	6 36	5.19	17.70	5.36	64.44	6.88	5.62
V.	9.31	16.13	4.85	56 68	7.41	5.62	17.78	5 35	62.50	8.17	6.20
VI.	8.54	16.38	4.14	57.68	7.68	5.58	17.91	4.53	63.06	8 40	6.10
VII.	8.11	16.88	4.80	57.28	7.30	5.63	18.38	5 22	62 33	7.94	6.13
VIII.	7.61	15.25	4.90	58.71	7.77	5.76	16.51	5.30	63.54	8.42	6.23
IX.	8.67	17.28	4 31	58.58	6.66	4.50	18.92	4 72	64.14	7 29	4.93
X.	7.75	15.28	3.95	57.39	8.79	6.84	16.46	4.28	62.22	9.53	7 41
XI.	9.75	15.97	4.46	58 66	6 45	4.71	17.69	4.94	65.00	7.15	5.22
XII.	9.55	16.50	4.19	58.15	6.80	4.81	18 24	4.63	64.29	7 52	5.32
XIII.	6.43	15.10	4.53	64.44	5.21	4.29	16.14	4 84	68.86	5.57	4 59
XIV.	5.71	18.47	3.93	60.44	6.55	4 90	19.58	4.17	64.10	6.95	5.20
Maximum	9.75	18.47	4.95	64.44	8.79	6.84	19 58	5 36	68.86	9.53	7.41
Minimum	5.71	15.10	3 93	56 68	5.21	4.29	16.14	4 17	62.22	5.57	4 59
Average	8.28	16 29	4.43	58.60	7.13	5.27	17.76	4.83	63 88	7.78	5.75
Average A	9 90	15.32	4.05	57.43	8.03	5.27	17.00	4 50	63.74	8.93	5.83
Average B	11.91	15 42	4.03	53 87	8.99	5.78	17.40	4.50	61.30	10.20	6.60

The figures in the table go to show, 1st, that in Tennessee brans are fully up to and even a little above the general average for this country; 2nd, that the average of wheat brans from different sections of this country are practically identical in chemical composition.

None of the samples of bran examined by us were found to be adulterated.

WHEAT MIDDLINGS—In Table X are shown two analyses of wheat middlings and their averages.

I. Bought on Knoxville market for use of experiment farm February 28, 1893.

II. Manufactured by Knoxville City Mills, Knoxville, Tenn. Sold by Knoxville Feed Supply Co., Knoxville, Tenn. $15.50 per ton. Received April 22, 1896.

(A) is the average of thirty-two analyses, taken from the tables of Jenkins and Winton, Ex. Sta. Bull. 11, U. S. Dept. Agr., 1892.

Table X.

WHEAT MIDDLINGS.

	FRESH OR AIR-DRY MATERIAL.						WATER-FREE SUBSTANCE.				
	Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash
I.	6.98	14.35	5.90	63.32	5.45	4.00	15.43	6.34	68.07	5.86	4.30
II.	8.90	19.13	4.59	57.70	5.41	4 27	21.00	5.04	63.33	5.94	4.69
Average	7.94	16.74	5.25	60.51	5.43	4.13	18 21	5.69	65 70	5 90	4.50
Average A	12 10	15.62	3.97	60.42	4.60	3.29	17.80	4.50	68.70	5.20	3.80

The number of analyses reported by us in this table are hardly sufficient for forming a correct average for Tennessee wheat middlings, but their average approximates very closely average "A."

WHEAT SHORTS.—In Table XI we give three analyses of wheat shorts:

I. Manufactured and sold by the Knoxville City Mills, Knoxville, Tenn, $1.50 per 100 lbs. Sample taken May 15, 1895.

II. Manufactured and sold by Scott Bros., Knoxville, Tenn. $1.00 per 100 lbs. Sample by May 16, 1895.

III. Purchased by S. J. Camp from Moore & Jones, of Memphis, Tenn. Sample sent by Jos. W. Allison, of Memphis, Tenn. $18 per ton. Received May 31, 1895.

(A) is the average of twelve analyses, taken from Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892.

TABLE XI.

WHEAT SHORTS.

	FRESH OR AIR-DRY MATERIAL.						WATER-FREE SUBSTANCE.				
	Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash
I.	8.73	17.84	4.90	57.33	6.30	4.90	19.55	5.37	62.81	6.90	5.37
II.	9.68	15.82	4.85	62.61	3.65	3.39	17 52	5.37	69 32	4 04	3.75
III.	10.21	17.25	3.06	65.54	2.07	1.87	19.21	3.40	73 01	2.30	2.08
Average	9.54	16.97	4.27	61.83	4.01	3.38	18.76	4 71	68.38	4.41	3.74
Average A	11.81	14.92	4.51	56.72	7.40	4 64	16.80	5.10	64 50	8 40	5.20

Here again the number of analyses is too small to give a trustworthy average for Tennessee. However, the samples examined were all above the average (A) and were clean and in good condition.

PREPARED OAT FEED.—This is a by-product from the manufacture of oatmeal, and is not a product of a Tennessee mill, but is sold to some extent by dealers in stock feed in the State.

Manufactured by Muscatine Oatmeal Co., Muscatine, Iowa. Sold by Knoxville Feed Supply Co,, Knoxville, Tenn. $15 per ton. Received April 22, 1896.

TABLE XII.

PREPARED OAT FEED.

	Air-Dry	Dry
Moisture	6.29	
Crude Protein	9.88	10.54
Crude Fat	3.96	4.23
Nitrogen-free Extract	54.23	57.87
Crude Fiber	19 95	21.29
Crude Ash	5 69	6.07
	100 00	100.00

MILL PRODUCTS.

CORN MEAL, UNBOLTED.—Table XIII shows eight analyses of unbolted corn meal, from our Tennessee mills, as follows:

I. Manufactured by some country mill in Knox county, name of mill unknown. Sold by Brandau & McDaniel, Knoxville, Tenn. $1.25 per 100 lbs. Sample taken May 10, 1895.

II. Manufactured by Knoxville City Mills, Knoxville, Tenn. Sold by H. T. Hackney & Co., Knoxville, Tenn, $1.15 per 100 lbs. Sample taken May 10, 1895.

III. Manufactured and sold by Knoxville City Mills, Knoxville, Tenn. $1.25 per 100 lbs. Sample taken May 15, 1895.

IV. Manufactured and sold by Scott Bros., Knoxville, Tenn. $1.15 per 100 lbs. Sample taken May 16, 1896.

V. Manufactured by Limestone Mills, Limestone, Tenn. Sold by Hall & Kyle, Greeneville, Tenn. Sample from J. A. Trim, Greeneville, Tenn. 75 cents per bushel. Received June 27, 1895.

VI. Manufactured by Sweetwater Mills, Sweetwater, Tenn. Sold by R. J. Snapp, Greeneville, Tenn. Sample from J. A. Trim, Greeneville, Tenn. 75 cents per bushel. Received June 27, 1895.

VIII. Sample manufactured and sent by Lenoir City Milling Co., Lenoir City, Tenn. 75 cents per bushel. Received January 24, 1896.

(A) is the average of thirteen analyses from Table XIX. (B) is the average of seventy-seven analyses from the tables of Jenkins and Winton, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892.

TABLE XIII.

CORN MEAL, UNBOLTED.

	FRESH OR AIR-DRY MATERIAL.						WATER-FREE SUBSTANCE.				
	Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash
I.	9.66	8.47	4.44	74.35	1.77	1.31	9.35	4 90	82.35	1.95	1.45
II.	10.56	8.71	4 67	72.89	1.78	1.39	9 74	5.22	81.49	1.99	1.56
III.	11.46	8 85	4.42	72 43	1.58	1.26	10.00	5.00	81.81	1.77	1.42
VI.	9.63	8.63	4.59	74.07	1.66	1.42	9.55	5.08	81.96	1.84	1.57
V.	10 07	9.19	4.43	73.47	1.60	1.24	10.22	4.93	81.70	1.78	1.37
VI.	11.36	9.16	3.57	73 18	1.50	1.23	10 33	4 03	82.56	1.69	1.39
VII.	10.52	9 16	4.40	73.13	1.56	1.23	10.25	4.92	81.72	1 74	1.37
VIII.	5.74	8.72	3.95	79.60	0.86	1.13	9 25	4.19	84.45	0 91	1 20
Maximum	11.46	9.19	4.67	79.60	1.78	1.42	10.33	5 22	84.45	1.99	1.57
Minimum	5.74	8.47	3.57	72.43	0.86	1.13	9.25	4.03	81.49	0 91	1.20
Average	9.88	8 86	4.31	74.14	1.54	1.27	9.84	4.78	82.26	1.70	1.42
Average A	11.46	8.59	3.97	73 01	1.64	1.33	9.71	4.46	82 47	1.85	1.51
Average B	14.98	9.17	3.77	68.76	1.90	1.42	10.80	4.40	81.00	2.20	1.60

These results show that in crude protein both the Tennessee meals and the Southern meals as shown in Table XIII, fall about one per cent. below the general average for the United States. In other constituents the three averages agree quite well. There was nothing in the different samples of meal examined by us to show why they should run low in protein. The meals were all comparatively free from adulteration.

FEED MEAL (corn grain and cob ground together).—We show in Table XIV one analysis of feed meal.

I. Manufactured and sold by J. M. Stone & Co., Nashville, Tenn. Sample by H. I. Anderson, Jr., Nashville, Tenn. $9.90 per ton, f. o. b-, June 21, 1896.

(A) average of six analyses of feed meal. See Table XIX.

(B) average of six analyses of feed meal. Jenkins and Winton's tables, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892.

TABLE XIV.

FEED MEAL.

	FRESH OR AIR-DRY MATERIAL.						WATER-FREE SUBSTANCE.				
	Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash
I	9.04	9.19	6.50	64.77	8 36	2.14	10.10	7.15	71.22	9.18	2.35
Average A	15.57	7.23	3.82	63.78	7.74	1 86	8.52	4.49	75.63	9.18	2.18
Average B	15 08	8.45	3 53	64 86	6.62	1.46	10.00	4 10	76.40	7.80	1.70

One analysis is, of course, insufficient for drawing any definite conclusions.

CORN CHOP.—We present next an analysis of corn chop.

I. Purchased by S. J. Camp from Moore & Jones, Memphis, Tenn. Sample sent in by Jos. W. Allison, Memphis, Tenn. $23 per ton. Received May 31, 1895.

(A) is average of three analyses of corn chop, from Table XIX.

(B) average of twelve analyses of corn chop from the table of Jenkins and Winton, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892.

TABLE XV.

CORN CHOP.

	FRESH OR AIR-DRY MATERIAL.						WATER-FREE SUBSTANCE.				
	Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash
I	9.19	10.54	4.51	72.26	2.02	1.48	11.61	4.97	79.57	2.22	1.63
Average A	11.39	10.39	6.46	64.46	5.08	2.22	11.68	7.19	72.79	5.85	2.49
Average B	11.05	9.75	8.28	64.60	3.84	2.48	11.10	9.30	72.60	4.30	2.80

MIXED FEED.—In the following table, XVI, we show the results of analyses of thirteen samples of mixed feed, as follows:

I. Bran, shorts, corn meal, and a few oat grains. Manufactured by Pink Maples, Sevierville, Tenn. Sold by Brandau & McDaniel, Knoxville, Tenn. $1.00 per 100 lbs. Sample taken May 10, 1895.

II. Bran and shorts, manufactured by Knoxville City Mills, Knoxville, Tenn Sold by H. T. Hackney & Co., Knoxville, Tenn. 95 cents per 100 lbs. Sample taken May 10, 1895.

III. Bran, shorts, and corn meal. Manufactured and sold by Scott Bros., Knoxville, Tenn. $20 per ton. Sample taken May 15, 1895.

IV. "Pratt's Food for Stock and Poultry." A mixture of wheat bran, corn meal, fenugreek, and horse powders. From A. G. Settle, sole agent, Nashville, Tenn. Sample by H. I. Anderson, Jr., Nashville, Tenn. 6 cents per lb, or at the rate of $120 per ton. Received May 23, 1895.

V. "Settle's Dairy Food for Cows," consists of a mixture of wheat bran, feed meal, cottonseed meal, oat and wheat screenings, and probably cattle powders. Prepared and sold by A. G. Settle, Nashville, Tenn. Sample from H. I. Anderson, Jr., Nashville, Tenn. Received May 23, 1895.

VI. "Dairy Feed." Wheat bran, feed meal, cottonseed meal, oat and wheat screenings, with possibly some cattle powders. Manufactured and sold by W. R. Cornelius & Co., Nashville, Tenn. Sample by H. I. Anderson, Jr., Nashville, Tenn. Received May 23, 1895.

VII. "Stock Feed." Principally wheat bran, with some cottonseed meal and corn meal. Manufactured and sold by McKay, Reese & Co., Nashville, Tenn. Sample from H. I. Anderson, Jr., Nashville, Tenn. $17 per ton June 22, 1896. Received May 23, 1895.

VIII. "Jones's Cow Feed." "Thirty per cent. bran, twenty per cent. cottonseed meal, fifteen per cent. ground cottonseed hulls, seventeen per cent. ground corn, fifteen per cent. shipstuff, two per cent. salt, one per cent. horse powders." Purchased by S. J. Camp from Moore & Jones, Memphis, Tenn. Sample sent in by Jos. W. Allison, Memphis, Tenn. $20 per ton. Received May 31, 1895.

IX. "Chop." "Mixed corn meal and bran." Some oat and wheat screenings were found in the sample. Manufactured and sent by Lenoir City Milling Co., Lenoir City, Tenn. 75 cents per 100 lbs. Received January 24, 1896.

X. "Mixed Feed." Principally wheat bran, with some corn meal and wheat screenings added. Prepared and sold by Knoxville Feed Supply Co., Knoxville, Tenn. $14 per ton. Received April 22, 1896.

XI. "Chop." Principally wheat bran, with some corn bran and oat and wheat screenings. Manufactured and sold by Limestone Mills, Limestone, Tenn. Sold by James Mahoney & Co., Greeneville, Tenn. Sample from J. A. Trim, Greeneville, Tenn. $1 per 100 lbs. Received June 27, 1895.

XII. "Chop." Principally wheat bran, with some oat and wheat screenings added. Manufactured by W. A. Maloney, Telford, Tenn. Sold by Ed. J. Brumley & Co., Greeneville, Tenn. $1.20 per 100 lbs. Received June 27, 1895.

XIII. "Chop." Principally wheat bran and wheat screenings, mixed with some corn bran and oat screenings. Manufactured by Sweetwater Mills, Sweetwater, Tenn. Sold by R. J. Snapp, Greeneville, Tenn. Sample by J. A. Trim, Greeneville, Tenn. $1 per 100 lbs. Received June 27, 1895.

TABLE XVI.

MIXED FEED.

	FRESH OR AIR-DRY MATERIAL.						WATER-FREE SUBSTANCE.				
	Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash
I	11.09	15 90	3.79	60.99	4.29	3.94	17.88	4.26	68.60	4.83	4.43
II	8.91	15.90	4.82	58.18	7.48	4 71	17.46	5.29	63.87	8.21	5.17
III	9.37	13.07	4.28	65.51	4.17	3.60	14.43	4.72	72.28	4.60	3.97
IV	10.15	16.00	7 40	54.86	5.21	6.38	17.81	8.23	61.06	5 80	7.10
V	7.15	18.19	5.75	55.28	6 42	7.21	19.59	6.19	59.54	6.91	7.77
VI	7.07	20.63	7.55	52.48	5.93	6.34	22.20	8.12	56.48	6.38	6.82
VII	7.83	17.81	6.17	55.21	7.11	5.87	19.32	6.69	59.90	7.72	6.37
VIII	7.91	18.25	4 95	49.56	13.38	5.95	19.82	5.37	53.82	14.53	6.46
IX	7.26	13.91	4.08	68.00	3.77	2.98	15.00	4.40	73.32	4.07	3.21
X	9.59	14.47	4.18	64.65	4.08	3.03	16.01	4.62	71.51	4.51	3.35
XI	9.60	16.19	4 55	56.44	7.92	5.30	17.92	5.03	62.43	8.76	5.86
XII	8.73	16.44	3.95	58.93	6.95	5.00	18.02	4.33	64.55	7.62	5.48
XIII	7.93	15.69	4.57	58.99	7 03	5.79	17.04	4.96	64.07	7.64	6.29

We wish to call special attention to analysis No. IV, sold as "Pratt's feed for stock and poultry." This feed consists principally of wheat bran, with which corn meal has been mixed. To these is added "Fenugreek" which Webster defines as: "A plant (*Trigonella Fœnum Græcum*) cultiyated for its strong smelling seeds, and only used for giving false importance to horse medicine and damaged hay. J. Smith (Pop. Names of Plants, 1881)." The fenugreek is probably itself mixed in horse powders of some sort. Except that it carries a little more crude fat, this mixture is, judging from chemical analysis, no better than ordinary wheat bran, yet it sells for six cents per pound or, at that rate, $120 per ton. This mixture is worth probably as much as good wheat bran, and anyone may make for himself as good a mixture for say $16 per ton.

We may sum up the results of our work on Tennessee cattle foods as follows:

1st. The cottonseed meals (decorticated) examined by us were below the average in quality. The average of their chemical analyses fell considerably below the general average for cottonseed meals, and their mechanical condition was not good.

2nd. The cottonseed meal (undecorticated) was better than the average in chemical composition.

3rd. The cottonseed cakes were fully up to the average.

4th. The cottonseed hulls were better than the average in chemical composition.

5th. In cottonseed hull bran, the average composition falls below the average (A) Table VI, but the number of analyses so far reported is too small to form a very accurate average.

6th. Cottonseed feed stuff. We have on hand no analyses with which to compare this product.

7th. Peanut cake is a little below the average in protein and fiber and above the average in fat.

8th. In chemical composition the wheat brans examined by us were fully up to the average of American brans.

9th. The average of the two analyses of wheat middlings was better than the American average.

10th. In average composition the three analyses of wheat shorts show up better than the average of American analyses.

11th. We have no analyses with which to compare "Prepared oat feed."

12th. Corn meal, unbolted, falls below the American average in protein, otherwise the agreement between the two averages is very close.

13th. Feed meal in chemical composition shows up better than either average (A) or (B) Table XIV.

14th. The one analysis of corn chop shows up fully equal to the average.

15th. In chemical composition the mixed feeds examined show up well.

We find no evidence of intentional adulteration in any of the foods so far examined, and taken as a whole the Tennessee feeding stuffs so far examined by us have made a good showing.

We give next a table showing a number of hitherto unpublished analyses of various cattle foods which have been made from time to time at this station, giving in each case the name of the analyst and the date of analysis.

TABLE XVII.

MISCELLANEOUS ANALYSES.

	Fresh or Air-Dry Material.						Water-free Substance.					REFERENCES.
	Water	Protein	Fat	Nitrogen-free Extract	Fiber	Ash	Protein	Fat	Nitrogen-free Extract	Fiber	Ash	
SILAGE.												
Corn (maize):												
Grains of corn still soft	73.11	1.78	1.56	15.73	6.48	1.34	6.62	5.81	58.49	24.11	4.97	Analyzed by J. B. McBryde, Nov 1893
Grains corn still soft	76.38	1.84	0.98	11.64	6.93	2.23	7 78	4.15	49.30	29.32	9.45	. . . do . . . . . Dec. 1892
No description	74.17	2.15	1.93	13.75	6.28	1.72	8.36	7.47	53.20	24.32	6.65	Analyzed by C. A. Mooers, April, 1895
Average	**74.56**	**1.29**	**1.49**	**13.71**	**6.56**	**1.76**	**7.79**	**5.81**	**53.66**	**25.92**	**7.20**	
Average of 45 analyses for corn silage Table XIX	**70.15**	**2.37**	**1.46**	**14.68**	**9.16**	**2.18**	**8.08**	**4.83**	**49.35**	**30.46**	**7.28**	
Average 77 American analyses corn silage, Ex. Sta. Bul. 11, U. S. Dept. Agr., April, 1892	**79.10**	**1.67**	**.709**	**11.07**	**5.99**	**1.38**	**8.00**	**3.80**	**53.00**	**28.60**	**6.60**	
HAY AND OTHER DRIED COARSE FODDERS:												
HAY OF GRASSES.												
Hungarian grass (*Setaria Germanica, Scribn*), Experimental plots, College farm:												
No description	8.27	8.93	3.51	48.08	24.26	6.95	9.73	3.83	52.42	26.44	7.58	Analyzed by W. E. Stone, April, 1889
Do	9.71	9.12	3.64	48.83	23.56	5.14	10.10	4.03	54.07	26.11	5.69	. . . do . . . . .
Do	7.10	8.14	3.06	49.45	26.66	5.59	8.76	3.29	53.23	28.70	6.02	. . . do . . . . . May, 1889
Do	7.73	9.88	3.23	50.04	23.79	5.33	10.71	3.50	54.24	25.78	5.77	. . . do . . . . .
Do	7.91	9.43	3.23	48.01	24.94	6.48	10.24	3.51	52.14	27.08	7.03	. . . do . . . . . April, 1889
Do	10.01	10.00	3.60	48.35	21.65	6.39	11.12	4.00	53.72	24.06	7.10	. . . do . . . . .
Do	7.63	10.13	2.78	47.39	25.94	6.13	10.97	3.01	51.30	28.08	6.64	. . . do . . . . .
Do	8.78	9.00	3.03	46.98	26.20	6.01	9.86	3.32	51.51	28.72	6.59	. . . do . . . . . May, 1889
Do	8.73	10 06	3.14	46.29	25.51	6.27	11.02	3.44	50.72	27.95	6.87	. . . do . . . . .
All analyses { Maximum	10.01	10.13	3.64	50.04	26.66	6.95	11.12	4.03	54.24	28.72	7.58	
All analyses { Minimum	7.10	8.14	2 78	46.29	21.65	5.14	8.76	3.01	50.72	24.06	5.69	
All analyses { Average	**8.43**	**9.41**	**3.24**	**48.16**	**24.73**	**6.03**	**10 28**	**3 55**	**52.60**	**26.99**	**6 58**	

MISCELLANEOUS ANALYSES—Continued.

	Fresh or Air-Dry Material.						Water-free Substance.					REFERENCES.
	Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash	
HAY AND OTHER DRIED COARSE FODDERS—CONTINUED:												
HAY OF GRASSES—continued.												
Average of 15 analyses Hungarian grass, Table XIX	8.42	8.83	2.88	47.13	25.83	6.91	9.65	3.15	51.47	28.18	7.55	
Average of 12 American analyses Hungarian grass, Ex. Sta. Bul. 11, U. S Dept. Agr., 1892	7.66	7.46	2.12	49.05	27.72	5.99	8.10	2.30	53.10	30.00	6.50	
Samples from College farm:												
Herd's grass (*Agrostis vulgaris*)												
Cut June 3, heads just showing	9.57	11.00	6.38	45.89	22.68	4.48	12.16	7.05	50 75	25.09	4.95	Analyzed by C. C. Moore, 1891
Bermuda grass (*Cynodon Dactylon*)												
Cut July 9, no description	11.10	7.12	2.54	44.49	28.26	6.49	8.01	2.85	50.05	31.79	7.30	do
Wild rye (*Elymus Canadensis*)												
Cut July 9, no description	10.82	3.94	0.86	48.23	32.68	3.47	4.42	0.96	54.09	36.64	3.89	do
Elymus Striatus, cut July 9												
No description	12.21	11.62	0.38	39.24	27.51	9.04	13.24	0.43	44.70	31 33	10.30	do
English rye grass (*Lolium perenne*)												
Cut July 1, no description	11.15	12.06	7.11	39.15	23.61	6.92	13.58	8.00	44.06	26.57	7.79	do
Muhlenbergia Mexicana												
Not yet in bloom	10.65	8.00	2.32	42.38	29.61	7.04	8.96	2.59	47.44	33.14	7.87	do
Panicum clandestinum												
Cut July 9	10.90	10.50	1.33	43.43	28.30	5.54	11 79	1.49	48.74	31.76	6.22	do
Switch grass (*Panicum virgatum*)												
Cut June 16,	10.83	6.81	1.92	45.11	30.26	5.07	7.64	2.15	50.59	33.93	5.69	Analyzed by C. A. Moores, Aug. 1895
English blue grass (*Poa compressa*)												
Cut July 1, 1891, no description	6.27	11.65	3.32	44.27	21.98	12.51	12.43	3.54	47.24	23.45	13.34	Analyzed by C. C. Moore, 1891
Cut June 15, 1895, no description	9.37	7.81	2.96	50.00	24.00	5.86	8.62	3.27	55.17	26.47	6.47	Analyzed by C. A. Moores, Aug., 1895
Gama grass (*Tripsacum dactyloides*)												
Leaves only, cut July 1, 1891	9.47	12.75	5.26	37.81	25.21	9.50	14.09	5.81	41.76	27.85	10.49	Analyzed by C. C. Moore, 1891
Wild Millet, fox-tail (*Setaria viridis*)												
Cut July 1, no description	8.51	12.12	4.92	41.70	24.35	8.40	13.25	5.38	45.58	26.61	9.18	do

HAY OF LEGUMES.												
Clover rowen, used in feeding experiments	7.63	12.86	2.19	38.56	32.17	6.59	13.94	2.37	41.74	34.82	7.13	Analyzed by L. P. Brown, no date
Serradella (*Ornithopus sativus*) Cut July 1; no description	11.74	15.97	2.95	42.01	17.61	9.72	18.09	3.34	47.61	19.95	11.01	Analyzed by C. C. Moore, 1891
HAY OF OTHER FORAGE PLANTS.												
Heron's Bill (*Erodium cicutarium*) In flower and fruit June 8, 1891	12.94	11.87	5.21	40.53	20.34	9.11	13.63	5.99	46.55	23 37	10.46	Analyzed by C. C. Moore, 1891
Corn Husks: No description	6.23	3.73	0.90	56.62	29.61	2.91	3.98	0.93	60.38	31.58	3.13	Analyzed by C. A. Mooers, April, 1895
GRAIN AND OTHER SEED:												
Cow-peas grown on College farm, 1895.												
White, brown eye	10.85	25.43	1.93	55.11	3.24	3.44	28.53	2.16	61.82	3.63	3.86	Analyzed by C. A. Mooers, 1895
Clay	10.62	25.00	1.59	55.55	3.82	3.42	27.97	1.78	62.15	4.27	3.83	do
White, crowder	11.82	24.25	1.88	55.23	3.46	3.36	27.50	2.13	62.64	3.92	3.81	do
Lady	11 40	26.06	1.79	54.66	2.68	3.41	29.42	2.02	61.69	3 02	3.85	do
Unknown	10.51	26.39	1.52	53.61	4.18	3.79	29.49	1.70	59.90	4.67	4.24	do
Red ripper	10.18	25.98	1.71	54.85	3.70	3.58	28.92	1.90	61.07	4.12	3.99	do
Wonderful	10.20	25.88	1.59	54.55	4.13	3 65	28.82	1.77	60.75	4.60	4.06	do
Whip-poor-will	11.36	24.05	1.47	55.60	4.12	3.40	27.13	1.66	62.72	4.65	3.84	do
Black	10.22	24.44	2.01	56.06	3.79	3.48	27.22	2.24	62.44	4.22	3.88	do
Maximum	11.82	26.39	2.01	56.06	4.18	3.79	29.49	2.24	62.72	4.67	4.24	
Minimum	10.18	24.05	1.47	53.61	2.68	3.36	27.13	1.66	59.90	3 24	3.81	
Average	**10.80**	**25.28**	**1.72**	**55.02**	**3.68**	**3.50**	**28.33**	**1.93**	**61.69**	**4.12**	**3.93**	
Average of 19 analyses of cow-peas Table XIX	**12 17**	**24.23**	**1.48**	**54.39**	**4.38**	**3.35**	**27.57**	**1.69**	**61.93**	**4.99**	**3.82**	
Average 5 American analyses cow-peas, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892.	**14.81**	**20.75**	**1.44**	**55.72**	**4.06**	**3.22**	**24.30**	**1.70**	**65 50**	**4.70**	**3.80**	
MILL PRODUCTS:												
Corn (maize) meal, as prepared for fermentation in a whiskey distillery:												
White corn	13.28	9.44	4.50	70.55	0 99	1.24	10.88	5.19	81 36	1.14	1.43	Analyzed by W. E. Stone, April, 1889
Yellow corn	11.49	8.81	4.50	72.62	0.76	1.82	9.93	5.07	82.10	0.86	2.04	do

SOUTHERN FEEDING STUFFS.

It has been repeatedly stated and is somewhat generally believed that many cattle foods,—forage plants, green and dry, grains, etc.,—grown in the South, are superior in chemical composition to similar products grown farther North in a colder climate. We quote the following from an article by Prof. S. W. Tracy, of the Mississippi Station, published in the Experiment Station Record, Vol. VI, page 91–103:

"A comparison of the Northern and Southern grown hays shows very clearly the larger proportions of protein and fats (ether extract) contained in many of the latter, and their consequent superiority for feeding purposes. It is a well-known fact that as hay plants become older, the proportion of crude fiber is increased at the expense of the more valuable protein and carbohydrates. As a rule, the Northern meadows are mowed but once during a season, while those of the South are usually mowed two or three times, so that the season of growth for each crop of the Southern hay is really shorter than for those of the North, a condition which renders superior the quality of the former."

The author then gives tables showing the superiority of the average chemical composition of Southern grown leguminous and other plants, over the average composition of similar plants grown in the North. But we think this hardly a fair comparison, as the Southern analyses were all "from samples taken on the grounds of the Mississippi Station," and represent but one locality, while the averages given for the North are taken from the tables of Jenkins and Winton, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892, and represent all analyses made, up to that time, in the United States, and while it is true that they are almost all analyses of Northern grown products, they represent a very large area and widely different climatic conditions. In order to compare accurately the relative values of two crops of the same forage plant, one crop grown in the North and the other in the South, it is necessary that the two crops should be grown under similar conditions and should be cut at the same stage of growth.

The Texas Station instituted some interesting experiments to show the "Influence of Climate on Composition of Corn." Bul. 15, May, 1891. Analyses of samples of the same variety of corn grown in different States but under similar conditions are shown

in this bulletin, and the author sums up the report as follows: "The experiment simply indicates, without proving, the Southern grown corns to be richer in albuminoids and fats, with a corresponding diminishing in the less important ingredients." Dr. C. D. Woods in report of the Storrs Station, 1893, p. 140–155, gives a compilation of New England feeding stuffs and compares the averages obtained with averages of similar substances shown in the tables of Jenkins and Winton.

Having occasion to make for our own use a compilation of analyses of some Southern feeding stuffs, it occurred to us that it would be interesting to tabulate all available analyses of Southern feeding stuffs and, when possible, compare the individual averages of the various products with the American average shown, for similar products, in the Tables of Jenkins and Winton, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892. This we have done, but the results, owing to a lack of reliable information, are exceedingly unsatisfactory. For many products the number of analyses reported is so small, and the time of cutting and the conditions of growth vary so widely, that no comparison is possible. However, these figures undoubtedly show, where the number of analyses is sufficiently large to form a fair average, and the condition of growth and time of cutting are somewhat similar, that there is but little difference in chemical composition between Northern and Southern grown crops of the same plant. Of course, when a plant is indigenous to one section of the country, it may not reach maturity in the other, and consequently a considerable difference in chemical composition may result. But we believe that a larger number of analyses, from which fair averages may be obtained, will show a striking similarity between so-called Northern and Southern grown crops.

Before considering Table XIX we wish to call attention to some points generally overlooked or neglected in publishing analyses of feeding stuffs.

In making this compilation of analyses we have taken only complete analyses. All analyses from which the percentage of any constituent was omitted, and those whose sums differ from 100 by more than one half of one per cent., have been rejected. When the sum of the constituents of an analysis differed from 100, by one half of one per cent. or less, the error has been corrected in the nitrogen-free extract and the analysis inserted in the table.

On these grounds we have been forced to leave out probably

three hundred analyses. Most of these were omitted because the amount of water was not given. It is, we think, very unfortunate that so many analyses should be published without their percentage of moisture, for unless it is definitely stated, which is rarely done, whether the original sample was a hay or green fodder, one is at a loss how to classify them and assume a percentage of water. Such analyses, therefore, are practically worthless.

It is surprising to note the great number of analyses in which the sum of the constituents fails to add 100. In a bulletin of one station we find reported seventy-five (75) analyses. Of these forty-eight (48) or just sixty-four per cent. were inaccurately added. Such carelessness is inexcusable.

It seems to us high time that our Stations should adopt some rational method of reporting analyses of feeding stuffs. At present they are dished up in every conceivable shape and form, apparently just as it suited the fancy of the writer. Some stations have, in one bulletin, feeding stuff analyses reported in two or even three different methods of grouping the constituents. If an analysis is worth reporting at all, it is certainly advisable to put it in attractive shape, for at best the number of persons reading such matter is small, and the more unattractive the reading matter the smaller the number of readers. We have adopted in this bulletin the German method of arranging results. By this arrangement the constituents commonly supposed to be the most valuable are grouped together and are the first to be seen in glancing at the table.

We wish to call attention to the practice indulged in by some of our Station writers of publishing analyses copied from publications other than their own, without giving any reference to the original publication. In preparing our compilation of analyses, Table XIX, we were several times compelled to write different stations to learn if analyses published in their bulletins were their own work or copied from other sources. This practice is not only misleading to the reading public, but is a form of plagiarism pure and simple. We hold that all quotations should always be accompanied by full references.

Another point: It is always advisable, and often necessary in order to render intelligible the statement set forth, that the botanical name should be given for substances, analyses of which are reported, and it is also necessary that a complete description of the sample be given. These points are too often neglected, analyses being often reported as, for example "clover hay," "bull

grass," "corn fodder," "ensilage," "oats," etc. These are actual examples. The reader is left to his imagination to supply the necessary particulars for the samples, not a word of description accompanying the analysis. We experienced much trouble in classifying analyses reported in this way, and in some cases were compelled to omit the analysis altogether, being unable to decide just what it was intended to represent.

We may summarize by giving the following points, which it will be well for all writers to observe in reportlng analyses or in describing feeding stuffs:

1st. Always give the botanical name of the product reported.

2nd. Give full description of the samples. If a forage plant, give stage of growth, condition of crop, etc.; if a manufactured product, state where and by whom manufactured, cost price, etc.

3rd. Give date of receipt of sample. If from a growing crop, give date of harvest, and, if possible, the meteorological conditions for at least a week preceding date of harvest.

4th, Tell, if possible, whether the crop was grown on fertilized or unfertilized land. If fertilized, give the amount and kind of fertilizer used.

5th. Always report the analysis in full.

In Table XIX there will be found 924 analyses of feeding stuffs, compiled from bulletins and reports of the various Southern Stations named. Wherever possible, the averages of different products are compared with averages of similar products taken from the tables of Jenkins and Winton, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892. In Table XX a number of these analyses are grouped together for the sake of comparison.

In the following table, XVIII, are the names of the various stations and the number and date of the last publication examined for this work.

Table XVIII.

STATIONS.	Report for the year	Bulletin Number
Alabama	. . .	69
Arkansas	1895	39
Florida	. . .	35
Georgia	. . .	28
Kentucky	1894	62
Louisiana	. . .	41
Mississippi	1895	36
North Carolina	1893	119
South Carolina	1895	22
Tennessee	. . .	No. 2, Vol. IX.
Texas	. . .	37
Virginia	. . .	62
West Virginia	. . .	39

It is almost impossible to make a table the size of XIX and have it as first published entirely free from errors and omissions, and as we desire to revise this work from time to time, we beg that those finding errors and omissions will be kind enough to report the same to us, so we may make the necessary corrections.

We have been greatly aided in our work by the compilation of Jenkins and Winton, and wish to make an acknowledgment for the same.

A COMPILATION OF ANALYSES

OF

SOUTHERN FEEDING STUFFS

BY

J. BOLTON MCBRYDE,

TENNESSEE EXPERIMENT STATION.

1896.

TABLE XIX.

ANALYSES OF SOUTHERN FEEDING STUFFS.

"SYMBOLS USED IN THE FOLLOWING TABLES.—The significance of the letters which appear in the following table is as follows:
"*a* Albuminoid nitrogen was determined; *b* nitrogen, phosphoric acid, and potash were determined; *c* the ash ingredients were determined; *d* starch was determined; *e* sugar was determined; *h* yield of fresh substance per acre is given in *loc. cit.*; *i* yield of dry substance per acre is given in *loc cit.*; *j* yield of food ingredients per acre is given in *loc. cit.*; *k* water content is assumed"

		Fresh or Air-Dry Material.						Water-free Substance.					REFERENCES.	
		Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash		
	GREEN FODDER.													
	CEREAL GRASSES.													
1	Corn (maize) fodder; unclassified:													
1	Whole corn cut for ensilage	74.54	1.96	0.55	15.65	5.57	1 73	7.69	2.16	61.48	21.86	6.81	S. C. Ex. Sta. 7th An. Rept. 1894, p. 11.	1
2	Sweet corn, cut before grains had hardened	77.22	2.16	0.85	13.52	4.69	1.56	9 50	3.75	59.32	20 60	6.83	Texas Ex. Sta. Bull. 13, 1890	2
3	Yellow corn, cut before grains had hardened	79.89	1.76	0.50	11.28	5.53	1.04	8.75	2.49	56.07	27.50	5.19	do	3
4	Mosby corn, cut before grains had hardened	67.54	2.03	1.07	19.89	7.48	1.99	6.25	3 31	61.27	23.05	6.12	do	4
5	Ensilage Corn, no description	73.89	2.11	0.52	16.95	5.38	1.15	8.09	1 99	64.92	20.61	4.39	N. C. Ex. Sta. Bul. 90b. 1893	5
	All analyses (5) Maximum	79.89	2.16	1.07	19.89	7.48	1 99	9.50	3.75	64.92	27.50	6.83		
	All analyses (5) Minimum	67.54	1.76	0.50	11.28	4.69	1.04	6 25	1.99	56.07	20.60	4.39		
	All analyses (5) Average	**74 62**	**2.00**	**0.70**	**15.46**	**5 73**	**1.49**	**8.06**	**2.74**	**60.61**	**22 72**	**5.87**		
	Average of 126 American analyses of corn (maize) fodder, all varieties, from Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**79.33**	**1.82**	**0 54**	**12 17**	**4.98**	**1 16**	**8 80**	**2 60**	**58 90**	**24.10**	**5 60**		
6	Corn stalks, no description	67.65	1.56	0.62	16.83	11.61	1.73	4.81	1.91	52.06	35.88	5.34	N. C. Ex. Sta. Bul. 90b. 1893	6
	Sorghum (*Sorghum vulgare*):													
7	Orange sorghum	76.27	1.00	0.42	15.62	6.08	0 61	4.21	1.75	65 84	25.63	2 57	S.C.Ex.Sta.5An.Rept.1892, p. 17	7
8	Orange sorghum (not fertilized)	78 68	2 06	0.54	11.47	5.70	1.55	9.68	2.54	53 77	26.75	7.26	do	8
9	Rural branching sorghum	69.74	1.38	0.42	18.55	9.02	0.89	4.57	1.40	61.29	29.81	2.93	do	9
10	Millo maize	69.61	1.34	0.46	19 67	8.01	0.91	4.41	1.52	64.69	26.37	3.01	do	10
11	Kaffir corn	65.82	1.91	0.52	19.55	10.71	1.09	5.60	2.69	57.19	31.32	3.20	do	11
12	Jerusalem corn	90.24	2.10	0.74	28.43	12.06	1.43	5.39	1.86	58.92	30.34	3.59	do	12

Wambowse corn, cut July 26	75.43	1.06	1.15	12.54	8.00	1.82	4.31	4.68	51.04	32.56	7.41	Texas Ex. Sta. Bul. 13, 1890
Improved orange, cut July 26	72.07	0.93	2.44	14.86	8.16	1.54	3.33	8.73	53.21	29.22	5.51	do
Improved orange, cut Aug. 5	79.72	1.18	1.62	11.40	4.89	1.19	5.81	7.99	56.23	24.11	5.86	do
White African, cut July 26	72.07	1.31	1.40	15.38	7.90	1.94	4.69	5.01	55.07	28.28	6.95	do
White African, cut Aug. 5	70.79	1.37	2.33	17.47	6.32	1.72	4.69	7.97	59.81	21.65	5.88	do
Dutch Hybrid, cut July 26	72.31	1.41	1.31	15.41	8.04	1.52	5.09	4.73	55.70	29.03	5.45	do
Dutch Hybrid, cut Aug. 5	70.70	1.56	2.64	15.73	7.76	1.61	5.32	9.00	53.71	26.48	5.49	do
Early Tennessee, cut July 26	73.90	0.87	0.62	15.36	7.52	1.73	3.33	2.37	58.87	28.81	6.62	do
Early Tennessee, cut Aug. 6	70.65	2.18	1.44	16.06	7.73	1.94	7.42	4.90	54.74	26.33	6.61	do
Planters Favorite, cut July 26	73.95	1.12	0.53	14.87	7.62	1.91	4.29	2.03	57.10	29.25	7.33	do
Planters Favorite, cut Aug. 5	70.50	1.93	2.95	16.55	6.63	1.44	6.55	10.00	56.11	22.47	4.88	do
Price's New Hybrid, cut July 26	72.52	0.93	0.58	15.89	8.41	1.67	3.48	2.11	57.84	30.60	6.07	do
Price's New Hybrid, cut Aug. 6	72.77	1.62	1.94	15.12	6.84	1.71	5.94	7.12	55.55	25.11	6.28	do
Swain's Early Golden, cut July 26	68.90	1.87	1.12	20.92	5.03	2.16	6.01	3.60	67.28	16.17	6.94	do
Swain's Early Golden, cut Aug. 5	74.56	1.50	2.65	13.48	6.41	1.40	5.89	10.41	53.01	25.19	5.50	do
Whiting's Early, cut July 26	64.11	1.87	2.00	18.81	10.96	2.25	5.21	5.57	52.41	30.54	6.27	do
Whiting's Early, cut Aug. 6	66.96	1.93	2.35	18.25	8.52	1.99	5.84	7.11	55.24	25.79	6.02	do
Kansas Orange, cut July 26	77.65	1.18	1.19	11.22	7.44	1.32	5.28	5.32	50.21	33.29	5.90	do
Link's Hybrid, cut July 26	74.36	1.50	1.08	12.82	8.26	1.98	5.85	4.21	50.01	32.21	7.72	do
Link's Hybrid, cut Aug. 5	72.12	1.87	2.10	14.23	7.59	2.09	6.71	7.53	51.08	27.22	7.46	do
Red Liberian, cut July 26	75.05	1.31	1.80	12.55	7.80	1.49	5.25	7.21	50.35	31.22	5.97	do
Red Liberian, cut Aug. 5	74.12	1.62	2.07	14.51	6.22	1.46	6.25	7.99	56.09	24.03	5.64	do
Falgar's Early, cut July 26	74.24	1.18	1.68	12.67	8.57	1.66	4.58	6.52	49.20	33.26	6.44	do
Falgar's Early, cut Aug. 6	70.50	1.41	3.13	16.23	7.14	1.59	4.78	10.63	55.01	24.20	5.38	do
New Sugar Cane, cut Aug. 1	72.52	1.25	1.76	15.23	7.65	1.59	4.54	6.40	55.44	27.83	5.79	do
Honduras, cut Aug. 5	70.94	1.31	2.58	16.59	7.10	1.48	4.50	8.87	57.11	24.43	5.09	do
Orange Cane, cut Aug. 5	74.34	1.50	1.95	13.73	7.09	1.39	5.84	7.59	53.54	27.62	5.41	do
Orange Cane, cut Aug. 7	70.19	1.56	1.91	17.69	7.01	1.64	5.23	6.40	59.36	23.51	5.50	do
Sorghum No. 15, cut July 26	61.04	1.81	1.05	19.76	13.74	2.60	4.67	2.69	50.74	35.26	6.67	do
Sorghum No. 58, cut July 26	58.85	1.56	1.29	24.71	10.72	2.87	3.79	3.13	60.06	26.05	6.97	do
Sorghum No. 42, cut July 26	59.99	2.37	1.14	19.43	14.23	2.84	5.92	2.85	48.56	35.57	7.10	do
Sorghum No. 42, cut Aug. 9	57.50	2.50	1.56	21.69	14.24	2.51	5.88	3.67	51.04	33.51	5.90	do
Sorghum No. 43, cut Aug. 1	47.43	3.12	2.42	27.10	16.84	3.09	5.93	4.60	51.55	32.04	5.88	do
Sorghum No. 43, cut Aug. 9	56.01	1.81	1.62	23.27	15.01	2.28	4.11	3.69	52.97	34.12	5.11	do
Sorghum No. 27, cut Aug. 1	50.99	2.56	2.28	25.36	15.98	2.83	5.22	4.65	51.76	32.60	5.77	do
Sorghum No. 38, cut Aug. 9	55.45	3.75	2.13	20.18	15.49	3.00	8.41	4.78	45.30	34.78	6.73	do
Sorghum Saccaratum, cut Aug. 1	73.71	1.31	1.90	15.32	6.19	1.57	4.98	7.21	58.30	23.54	5.97	do
Sorghum Saccaratum, cut Aug. 5	75.12	1.56	1.16	13.68	6.68	1.80	6.27	4.66	54.99	26.85	7.23	do
Yellow Durra, grains soft	78.15	0.85	0.87	11.74	6.29	2.10	3.91	3.99	53.68	28.80	9.62	do
All analyses (45) Maximum	79.72	3.75	3.13	27.10	16.84	3.09	9.68	10.63	67.28	35.57	9.62	
All analyses (45) Minimum	47.43	0.85	0.42	11.22	4.89	0.61	3.33	1.40	45.30	16.17	2.57	
All analyses (45) Average	**69.39**	**1.63**	**1.58**	**16.80**	**8.79**	**1.81**	**5.30**	**5.33**	**55.14**	**28.30**	**5.93**	
Average of 11 American analyses of Sorghum, whole plant, from Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892.	**79.40**	**1.34**	**0.48**	**11.56**	**6.13**	**1.09**	**6.50**	**2.30**	**56.20**	**29.70**	**5.30**	

ANALYSES OF SOUTHERN FEEDING STUFFS.—Continued.

		Fresh or Air-Dry Material.					Water-Free Substance.				REFERENCES.	
		Water	Protein	Fat	Nitrogen-free Extract	Fiber	Ash	Protein	Fat	Nitrogen-free Extract	Fiber	Ash	
	GREEN FODDER—Continued.												
	CEREAL GRASSES—continued.												
	Rye, fodder, (*Secale cereale*):												
52	Sown in September used for soiling in winter, *a*	71.52	4.61	1.26	14.25	7.08	1.28	16.17	4.41	50.03	24.87	4.52	Ala. Ex. Sta. Bul. 5, 1889	52
53	No description	80.26	4.38	0.89	8.79	3.48	2.20	22.17	4.50	44.51	17.67	11.15	S. C. Ex. Sta. 7An Rept.'94 p11	53
54	do	82.25	3.52	0.62	7.26	4.38	1.97	19.85	3.51	40.86	24.66	11.12	. . . do	54
55	do	79.53	2.35	0.56	9.91	5.72	1.93	11.49	2.75	48.39	27.93	9.44	. . . do	55
	Average	78.39	3.71	0.83	10.05	5.17	1.85	17.42	3.79	45.95	23.78	9.06		
	Average of 7 American analyses of Rye fodder, from Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	76.57	2.69	0.59	8.85	11.59	1.80	11.13	2.50	29.20	49.59	7.70		
	Oat fodder:													
56	No description	80.54	4.10	0.85	8.13	3.93	2.45	21.08	4.35	41.68	20.20	12.69	S.C.Ex.Sta.7 An.Rept.1894,p.11	56
	Barley fodder:													
57	No description	85.13	4.22	0.52	5.30	2.68	2.15	28.39	3.48	35.63	18.04	14.46	. . . do	57
	GRASSES.													
	Rescue grass (*Bromus unioloides*):													
58	Cut April 2; 6 to 8 inches high, *a*	75.84	4.94	1.69	9.07	5.83	2.63	20.45	7.01	37.50	24.14	10.90	Texas Ex. Sta. Bul. 20, 1892	58
59	Cut April 9; in flower, *a*	85.35	3.16	1.01	5.44	3.58	1.46	21.59	6.90	37.09	24.44	9.98	. . . do	59
60	Cut April 14; heading, *a*	71.07	3.85	1.01	11.81	9.79	2.47	13.31	3.52	40.80	33.83	8.54	. . . do	60
61	Cut April 21; dough state, *a*	71.64	3.94	1.31	11.38	9.15	2.58	13.93	4.62	40.12	32.25	9.08	. . . do	61
62	Cut April 29; mature, *a*	66.79	3.86	1.29	17.62	7.94	2.50	11.62	3.89	53.05	23.90	7.54	. . . do	62
	Bermuda grass (*Cynodon dactylon*):													
63	Cut June 16; in bloom, *a*	71.70	2.15	0.95	17.32	5.88	2.00	7.61	3.36	61.17	20.79	7.07	S C.Ex.Sta. 1 An.Rept '88, p.123	63
	Orchard grass (*Dactylis glomerata*):													
64	Cut June 3; in full bloom	71.91	2.49	0.64	14.43	8.41	2.12	8.86	2.27	51.38	29.94	7.55	Ky.ExSta 1AnRept1889-90, p.15	64
	Crow-foot grass (*Eleusine Indica*):													
65	Cut June 16; in bloom, *c*	77.32	1.77	0.40	11.47	7.06	1.98	7.81	1.74	50.61	31.09	8.75	SC.Ex.Sta.2An.Rept.1889, p.146	65

	Teosinte (*Euchlena luxurians*):												
66	No description	81.17	1.83	0.25	11.30	4.62	0.83	9.71	1.34	60.04	24.52	4.39	S.C.Ex.Sta.5An.Rept.1892,p.17
67	Cut Aug. 1	80.23	1.06	0.52	10.34	5.76	2.09	5.37	2.63	52.29	20.12	10.59	Texas Ex. Sta. Bul. 13, 1890
68	Cut Aug 10	83.45	0.82	0.48	8.11	5.28	1.86	4.93	2.93	49.00	31.92	11.22	. . . do
69	Cut Aug. 20	81.38	1.10	0.40	8.84	6.22	2.06	5.93	2.16	47.42	33.41	11.08	. . . do
70	Cut Aug. 30	80.60	1.21	0.44	9.32	6.38	2.05	6.25	2.25	48.01	32.91	10.58	. . . do
71	Cut Sept. 10	78.79	1.51	0.36	9.71	7.08	2.55	7.12	1.68	45.78	33.40	12.02	. . . do
72	Cut Sept. 20	83.06	1.15	0.28	7.51	6.00	2.00	6.81	1.63	44.35	35.44	11.77	. . . do
73	Cut Sept. 30	78.65	1.10	0.26	11.10	6.86	2.03	5.18	1.20	52.00	32.11	9.51	. . . do
74	Cut Oct. 10	76.89	1.24	0.58	10.89	8.53	1.87	5.37	2.51	47.13	36.92	8.07	. . . do
75	Cut Oct. 20	73.52	1.37	0.84	12.70	9.61	1.96	5.18	3.17	47.96	36.28	7.41	. . . do
	All analyses (10) — Maximum	83.45	1.83	0.84	12.70	9.61	2.55	9.71	3.17	60.04	36.92	12.02	
	All analyses (10) — Minimum	73.52	0.82	0.25	7.51	4.62	0.83	4.93	1.20	44.35	24.52	4.39	
	All analyses (10) — Average	79.77	1.24	0.44	9.99	6.63	1.93	6.19	2.15	49.40	32.69	9.66	
	Crab grass (*Panicum sanguinale*):												
76	No description	75.99	2.91	0.69	10.66	7.49	2.26	12.12	2.88	44.36	31.21	9.43	N. C. Ex. Sta. Rept. 1882, p. 131
	Texas Millet (*Panicum Texanum*):												
77	Cut June 19, before blooming, *a*	83.82	2.48	0.60	7.60	3.10	2.40	15.31	3.72	46.97	19.16	14.84	S.C.Ex.Sta 1 An.Rept.1888,p130
78	Cut July 2; in full bloom, *a*	81.61	1.35	0.47	10.93	3.88	1.76	7.36	2.58	59.46	21.12	9.48	. . . do
	Pearl Millet (*Pennisetum typhoideum*):												
79	No description	68.62	1.79	0.39	16.59	11.46	1.15	5.69	1.24	52.86	36.54	3.67	S.C.Ex.Sta. 5 An.Rept.1892,p.17
	Texas Blue Grass (*Poa arachnifera*):												
80	Cut April 19; in bloom, *a c*	72.56	3.07	1.00	13.78	7.67	1.92	11.19	3.64	50.22	27.96	6.99	S C.Ex.Sta 2An.Rept.1889,p.146
	English Blue Grass (*Poa compressa*):												
81	Cut May 12; 8 inches high	76.57	3.63	1.29	10.94	4.88	2.69	15.50	5.50	46.71	20.81	11.48	KyExSta.1AnRept.1889-90,p.15
82	CutJune3;coming in flower¾ ft. high	74.36	2.50	0.77	12.78	7.36	2.23	9.76	3.02	49.82	28.72	8.68	. . . do
83	Cut June 13; seed in milky stage, ¾ ft. high	69.62	2.55	0.72	16.04	8.78	2.29	8.39	2.37	52.79	28.89	7.56	. . . do
	Kentucky Blue Grass (*Poa pratensis*):												
	300 lbs. sulphate of ammonia per acre												
84	Cut May 13, when headed out	73.89	4.62	1.05	12.63	5.96	1.85	17.70	4.03	48.37	22.83	7.07	KyExSta 1An.Rept.1889-90,p.14
85	Cut May 27, done flowering; 2 ft. high	70.09	3.68	1.21	15.51	7.48	2.03	12.32	4.04	51.83	25.01	6.80	. . . do
86	(No fertilizer); cut May 27; done flowering	66.05	3.12	1.04	18.85	8.65	2.29	9.18	3.06	55.51	25.49	6.76	. . . do
	300 lbs. sulphate of ammonia,												
87	Cut June 9; seed nearly ripe	63.25	3.60	1.16	20.60	9.25	2.14	9.80	3.16	56.05	25.16	5.83	. . . do
88	(No fertilizer); cut June 9; seed nearly ripe	54.58	4.10	1.33	25.82	11.41	2.76	9.02	2.92	56.85	25.13	6.08	. . . do
	All analyses (5) — Maximum	73.89	4.62	1.33	25.82	11.41	2.76	17.70	4.04	56.85	25.49	7.07	
	All analyses (5) — Minimum	54.58	3.12	1.04	12.63	5.96	1.85	9.02	2.92	48.37	22.83	5.83	
	All analyses (5) — Average	65 58	3 82	1.16	18 68	8 55	2.21	11 61	3 44	53 72	24.72	6.51	
	Average of 18 American analyses of Kentucky Blue Grass, from Ex. Sta. Bull 11, U. S. Dept. Agr., 1892	65 07	4.12	1.30	17.59	9 14	2.78	11 80	3 70	50 30	26 20	8 00	

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash		
	GREEN FODDER—CONTINUED:													
	GRASSES—continued:													
	Timothy (*Phleum pratense*):													
89	Cut June 3; just headed out	79.41	2.12	0.48	10.31	6.28	1.40	10.33	2.32	50.07	30.49	6.79	KyExSta.1AnRept 1889-90,p.16	89
90	Cut June 13; in full bloom	69.33	2.70	0.66	15.43	9.54	2.34	8.80	2.16	50.30	31.12	7.62	. . . do	90
	Sugar Cane (*Saccarum officinarum*):													
91	Seed cane planted Feb. 22:													
92	Removed from soil June 2	83.38	0.31	0.36	10.23	4.99	0.73	1.87	2.17	61.54	30.03	4.39	La. Ex. Sta. Bul. 14, 1892	91
	do July 14	83.86	0.51	0.41	9.79	4.95	0.48	3.15	2.46	60.71	30.67	3.01	. . . do	92
	Young cane, stems and leaves:													
93	Planted Feb. 22, cut June 2	83.15	1.55	0.71	7.29	4.78	2.52	9.25	4.21	43.14	28.41	14.99	. . . do	93
94	do cut July 14	81.84	1.03	0.72	9.19	5.65	1.57	5.68	3.95	50.60	31.11	8.66	. . . do	94
	Mature cane, planted Feb. 22, cut													
95	Sept. 25: Tops and leaves	72.18	1.03	0.64	14.50	9.63	2.02	3.33	2.30	52.93	34.43	7.01	. . . do	95
96	do	68.86	1.79	0.78	13.79	11.49	3.29	5.07	2.52	44.96	36.89	10.56	. . . do	96
97	Stalks	74.00	0.62	0.57	14.88	8.61	1.32	2.38	2.18	57.28	33.08	5.08	. . . do	97
	Roots of young cane:													
98	Planted Feb. 22, cut June 2	62.60	1.92	0.99	14.28	11.62	8.59	5.13	2.65	38.18	31.07	22.97	. . . do	98
99	do cut July 14	77.57	0.70	0.73	11.33	6.54	3.13	3.12	3.28	50.51	29.16	13.93	. . . do	99
	Johnson Grass (*Sorghum halapense*):													
100	Cut June 2; in full bloom, *a*	80.15	2.45	0.58	11.10	4.45	1.27	12.33	2.98	55.91	22.40	6.38	S C.Ex Sta.1An Rept.1888,p.130	100
101	Cut April 2; 6 in high, *a*	81.06	2.92	1.06	8.75	4.08	2.13	15.42	5.59	46.20	21.55	11.24	Texas Ex. Sta. Bul. 20, 1892	101
102	Cut April 10; 8-10 in. high, *a*	77.44	4.41	1.94	9.37	4.22	2.62	19.54	8.60	41.50	18.74	11.62	. . . do	102
103	Cut April 21; 12-18 in. high, *a*	86.09	3.23	1.13	4.51	3.42	1.62	23.25	8.10	32.41	24.56	11.68	. . . do	103
104	Cut April 29; 18-30 in. high, *a*	80.90	2.68	1.24	8.36	4.84	1.98	14.06	6.52	43.75	25.29	10.38	. . . do	104
105	Cut May 7; dough state, *a*	76.50	2.21	0.96	10.62	7.84	1.87	9.44	4.11	45.15	33.32	7.98	. . . do	105
106	Cut May 18; mature, *a*	69.33	3.01	1.24	14.14	10.33	1.95	9.81	4.07	46.10	33.66	6.36	. . . do	106
	Smut Grass (*Sporobolus indicus*):													
107	Cut June 4; in full bloom, *a*	74.02	3.13	1.25	14.39	5.20	2.01	12.07	4.83	55.33	20.02	7.75	S.C.Ex Sta.1An.Rept.1888,p.132	107
	LEGUMES.													
108	Alfalfa, lucern (*Medicago sativa*): Cut May 17; flowers just beginning	81.93	4.22	0.81	7.33	3.57	2.14	23.38	4.48	40.53	19.76	11.85	KyExSta1An.Rept.1889-90,p.18	108

109	Cut May 22; just in bloom	73.65	4.44	0.79	12.46	6.63	2.03	16.86	3.00	47.27	25.15	7.72	. . . do	109
110	Cut June 13; most of the heads withered	68.04	4.74	0.66	16.37	8.05	2.14	14.83	2.07	51.22	25.19	6.69	. . . do	110
	Grown on irrigated soil:													
111	Cut April 20; 8-10 in. high, *a*	70.16	7.27	1.83	8.66	8.23	3.85	24.37	6.14	29.02	27.56	12.91	Texas Ex. Sta. Bul. 20, 1892	111
112	Cut April 29; *a*	75.65	4.85	1.26	7.97	7.28	2.99	19.93	5.18	32.72	29.87	12.30	. . . do	112
113	Cut May 11; in bloom, *a*	69.35	5.88	1.49	9.81	10.31	3.16	19.18	4.89	31.98	33.61	10.34	. . . do	113
114	Cut May 30; mature, *a*	62.44	5.75	1.35	14.60	12.86	3.00	15.31	3.61	38.85	34.23	8.00	. . . do	114
115	Cut May 30; second growth, *a*	75.25	5.84	0.76	8.14	6.24	3.77	23.56	3.10	32.88	25.20	15.26	. . . do	115
	Not irrigated:													
116	Cut April 3; *a*	77.58	5.78	1.41	9.05	3.73	2.45	25.80	6.30	40.32	16.64	10.94	. . . do	116
117	Cut April 21; *a*	81.59	4.72	1.33	6.17	4.24	1.95	25.68	7.25	33.50	22.98	10.59	. . . do	117
118	Cut May 11; *a*	71.74	4.91	1.86	10.67	8.55	2.27	17.37	6.60	37.74	30.25	8.04	. . . do	118
	All analyses (11) Maximum	81.93	7.27	1.86	16.37	12.86	3.85	25.80	7.25	51.22	34.23	15.26		
	All analyses (11) Minimum	62.44	4.22	0.66	6.17	3.57	1.95	14.83	2.07	29.02	16.64	7.72		
	All analyses (11) Average	**73.40**	**5.31**	**1.23**	**10.11**	**7.25**	**2.70**	**20.57**	**4.78**	**37.82**	**26.41**	**10.42**		
	Average of 23 American analyses of Alfalfa, from Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**71.75**	**4.84**	**0.97**	**12.39**	**7.39**	**2.66**	**17.10**	**3.40**	**43.90**	**26.20**	**9.40**		
	Bur Clover (*Medicago maculata*):													
119	Cut April 3; before blooming	79.51	5.25	1.58	7.91	3.14	2.61	25.61	7.73	38.56	15.34	12.76	Texas Ex. Sta. Bul. 20, 1892	119
120	Cut April 21; seeds forming	84.32	4.42	1.65	4.95	2.70	1.96	28.18	10.50	31.56	17.21	12.55	. . . do	120
121	Cut May 5; mature	73.81	5.53	1.95	10.53	5.86	2.32	21.12	7.44	40.19	22.36	8.89	. . . do	121
	Red Clover (*Trifolium pratense*):													
122	Cut May 28; in full bloom	75.25	3.79	0.92	12.77	5.34	1.93	15.31	3.71	51.59	21.57	7.82	KyExSta 1An.Rept.1889-90,p.17	122
123	Cut June 13; in full bloom	77.58	3.40	0.63	11.88	4.98	1.53	15.17	2.80	53.01	22.19	6.83	. . . do	123
	Average	**76.42**	**3.59**	**0.78**	**12.32**	**5.16**	**1.73**	**15.24**	**3.25**	**52.30**	**21.88**	**7.33**		
	Average of 43 American analyses of Red Clover, from Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892.	**70.79**	**4.41**	**1.13**	**13.45**	**8.12**	**2.10**	**15.30**	**3.90**	**45.80**	**27.80**	**7.20**		
	Vetch (*Vicia sativa*):													
124	Cut April 21; in full bloom, *a*	85.54	4.13	0.59	5.75	2.53	1.46	28.63	4.11	39.65	17.50	10.11	S.C.Ex.Sta.1An.Rept,1888p.123	124
125	Cut May 7; pods half developed, *a*	76.44	4.74	0.83	11.39	4.49	2.11	20.12	3 52	48.35	19.04	8.97	. . . do	125
	Cowpea Vines:													
126	Black and yellow varieties, equal parts, probably the peas were removed, *c*	72.81	1.85	0.21	7.86	15.27	2.00	6.80	0.77	28.91	56.16	7.36	N. C Ex. Sta. Rept. 1879, p. 115	126
	OTHER FORAGE PLANTS.													
	Prickly Comfrey (*Symphytum officinale*)													
127	Cut in flower after heavy rains, *a*	95.63	1.21	0.15	1.56	0.41	1.04	27.69	3.43	35.57	9.45	23.86	SC Ex Sta 1 Au Rep. 1888, p. 123	127

ANALYSES OF SOUTHERN FEEDING STUFFS—Continued.

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash		
	GREEN FODDER—Continued:													
	OTHER FORAGE PLANTS—continued:													
	Rag Weed (*Ambrosia artemisiæfolia*)													
128	Cut Oct. 2, after blooming, poor quality, *c*	61.00	3.93	2.13	15.16	13.35	4.43	10.07	5.45	38.90	34.22	11.36	SC Ex Sta 1 An Rep. 1888, p. 146	128
	Ramie (*Bœhmeria nivea*)													
129	Cut Aug. 3, shortly after blooming, *c*	77.94	2.18	0.90	8.36	7.12	3.50	9.85	4.07	37.85	32.37	15.86	SC Ex Sta 1 An Rep. 1888, p. 161	129
	Cactus:													
130	"Cactus," no description	88.85	1.16	0.39	6.40	1.26	1.94	10.40	3.50	57.40	11.30	17.40	Texas Ex. Sta. Bul. 35, 1895	130
131	Fruit of cactus, fresh	80.30	2.58	2.77	7.31	5.28	1.76	12.73	14.01	37.53	26.82	8.91	. . . do	131
	SILAGE.													
	Corn (maize) silage:													
132	Cut just after passing roasting-ear stage, *a*	60.93	3.21	1.82	17 84	13.77	2.43	8.23	4.65	45.66	35.24	6.22	Ala. Ex. Sta. Bul. 5, 1889	132
133	"Cut corn in good condition"	74.31	0.52	0.30	15.26	9.06	0.55	2.05	1.16	59.40	35.26	2.13	Ark Ex.Sta. 2 An.Rep. '89, p. 6	133
134	"Whole corn in poor condition"	52.52	1.41	0.53	31.47	12.62	1.45	2.98	1.12	66.26	26 59	3.05	. . . do	134
135	Corn in first silk	83.17	2.06	1.28	7.07	5.11	1.31	12.34	7.61	41.91	30.36	7.78	Ky. Ex. Sta. Bul. 5, no date	135
136	No description	82.78	1.57	0.73	8.36	5.22	1.34	9.11	4.25	48 53	30.33	7.78	. . . do	136
137	do	74.94	2.04	0.64	12.26	7.51	2.61	8.14	2.54	48.94	29.96	10.42	La Ex. Sta. Bul. 17, 1888	137
138	do	95.19	0.45	0.21	2.32	1.48	0.35	9 37	4.20	48.41	30.72	7.30	N. C. Ex. Sta. Rep. 1882, p 136	138
139	do, *a d e*	70 27	2.24	0.73	18.10	7.44	1 22	7.52	2.47	60.88	25.01	4.12	N. C Ex. Sta. Bul. 87d, 1892	139
140	do, *a d e*	73.01	2.05	0.67	17.23	5.91	1.13	7.58	2.49	63.85	21.89	4.19	. . . do	140
141	do, *a d e*	72.67	2.05	0 72	13.66	9.77	1.13	7.49	2.62	49.99	35.74	4.16	. . . do	141
142	Whole corn, silo first opened, *c*	77.43	1.58	0.51	13.09	5.89	1.50	7.00	2.26	58.00	26.09	6.65	SC. Ex. Sta. 2 An. Rep. 1889, p. 168	142
143	Whole corn, silo, half empty, *c*	69.21	1 50	0.36	14.32	10.39	4.22	5.13	1 17	46.23	33.76	13.71	. . . do	143
144	Whole corn, silo nearly empty, *b*	64.86	2.13	1 24	20.04	9.11	2.62	6.13	3.54	56 94	25.93	7 46	. . . do	144
145	No description	71.14	3.06	0.96	16.96	6.40	1.48	10.62	3.34	58.74	22.16	5.14	S.C.Ex.Sta.5 An.Rep.1892, p. 17	145
146	do, *b*	81.45	1.18	1.06	9.19	5.65	1.47	6.36	5.72	49.51	30.46	7.95	Tenn.Ex.Sta.Bul. 3, Vol. V, '92	146
147	New corn, tasseling	78.81	2.24	0.89	12.59	4.15	1.32	10.39	4.21	59.58	19.58	6.24	Rep.Dept.Agr.U.of T. '82, p. 136	147
148	Corn cut in silk	78.77	2.45	0.92	11.75	4.84	1.27	11.53	4.33	55.33	22.81	6.00	. . . do	148
149	do	76.38	1.84	0.98	11.64	6.93	2.23	7.78	4.15	49.30	29.32	9.45	Tenn Ex Sta. Bul 2, Vol. IX, '96	149
150	No description, *b*	73.11	1.78	1.56	15.73	6.48	1.34	6.62	5.81	58.49	24.11	4.97	. . . do	150
151	No description	74.17	2.15	1.03	13.75	6.28	1.72	8.26	3.47	53.20	24.32	6.65	. . . do	151
152	Cut after kernels had become hard	60.06	3.90	2.38	12.42	16.64	4.06	9.75	5.45	31.05	41.60	10.15	Texas Ex. Sta. Bul. 6, 1889	152

153	do	67.42	2.62	3.07	15.41	10.17	2.31	8.04	6.35	47.30	31.22	7.09	. . . do	153
154	do	66.46	2.37	1.58	16.16	10.96	2.47	7.07	4.71	48.18	32.68	7.36	. . . do	154
155	do	62.54	3.34	2.35	18.02	10.76	2.99	8.91	6.27	48.11	28.73	7.98	. . . do	155
156	do	65.00	2.88	2.00	16.49	10.80	2.63	8.23	5.71	47.09	30.86	7.51	. . . do	156
157	do	65.45	2.74	1.71	18.83	9.30	1.97	7.93	4.95	54.50	26.92	5.70	. . . do	157
158	do	65.52	3.36	2.73	16.05	9.61	2.73	9.74	7.92	46.55	27.87	7.92	. . . do	158
159	do	67.00	3.31	2.20	11.97	12.02	3.50	10.03	6.67	36.27	36.42	10.61	. . . do	159
160	do	71.80	3.14	1.22	6.39	14.54	2.91	11.13	4.33	22.66	51.56	10.32	. . . do	160
161	do	70.61	2.70	1.53	8.56	13.51	3.09	9.19	5.21	29.12	45.97	10.51	. . . do	161
162	do	51.34	4.35	2.51	28.57	10.17	3.06	8.94	5.16	58.71	20.90	6.29	. . . do	162
163	do	67.28	2.42	2.19	12.56	13.01	2.54	7.40	6.69	38.40	39.76	7.75	. . . do	163
164	do	62.30	2.80	2.53	16.86	12.11	3.40	7.43	6.71	44.72	32.12	9.02	. . . do	164
165	do	65.50	2.32	1.44	15.31	12.62	2.91	5.72	4.17	44.38	36.29	8.44	. . . do	165
166	do	49.37	3.25	2.76	22.73	17.51	4.38	6.42	5.45	44.90	34.58	8.65	. . . do	166
167	do	62.00	3.27	2.28	14.38	14.30	3.77	8.61	6.00	37.84	37.63	9.92	. . . do	167
168	do	69.11	2.92	1.58	11.74	11.94	2.74	9.45	5.11	38.01	38.56	8.87	. . . do	168
169	do	65.50	3.67	1.47	14.81	11.28	3.27	10.63	4.26	42.93	32.70	9.48	. . . do	169
170	Yellow Field Corn	63.00	2.75	1.91	21.06	9.11	2.17	7.43	5.16	56.93	24.62	5.86	. . . do	170
171	do	70.95	2.25	2.02	15.01	8.49	1.28	7.74	6.95	51.67	29.23	4.41	. . . do	171
172	All Field Corn	75.52	2.00	1.46	13.67	5.78	1.57	8.17	5.96	55.84	23.62	6.41	. . . do	172
173	do	79.95	1.62	1.30	9.05	6.45	1.63	8.08	6.48	45.14	32.17	8.13	. . . do	173
174	do	74.59	2.18	1.63	11.92	7.85	1.83	8.58	6.41	46.92	30.89	7.20	. . . do	174
175	Corn, no description	83.31	1.19	0.47	9.05	4.67	1.31	7.13	2.82	54.22	27.98	7.85	Miss. Ex. Sta. Bul. 8, 1889	175
176	Maize Fodder, no description	69.86	1.88	1.55	21.00	4.83	0.88	6.25	5.14	69.65	16.02	2.94	Va. Ex. Sta. Bul. 5, 1890	176
	All analyses (45) Maximum	95.19	4.35	2.98	31.47	17.51	4.38	12.34	7.92	69.65	51.56	13.71		
	All analyses (45) Minimum	49.37	0.45	0.21	2.32	1.48	0.35	2.05	1.12	22.66	16.02	2.13		
	All analyses (45) Average	70.15	2.37	1.46	14.68	9.16	2.18	8.08	4.83	49.35	30.46	7.28		
	Average of 99 American Analyses of Corn (maize) Silage, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	79.10	1.67	0.79	11.07	5.99	1.38	8.00	3.80	53.00	28.60	6.60		
	Sorghum Silage:													
177	Millo Maize, no description	74.67	2.23	0.68	12.72	7.88	1.82	8.80	2.68	50.21	31.11	7.20	S C. Ex. Sta. 5 An. Rep. 1892, p. 17	177
178	No description	72.19	2.27	1.10	16.30	6.64	1.50	8.15	3.97	58.58	23.89	5.41	. . . do	178
179	Cut very young before heading	82.85	1.86	0.77	9.31	3.82	1.39	10.86	4.50	54.21	22.30	8.13	Rep. Dept Agr. U. of T. 1882, p136	179
180	No description	70.07	1.76	1.98	10.76	12.61	2.82	5.88	6.62	35.95	42.13	9.42	Texas Ex. Sta. Bul. 6, 1889	180
181	Orange Cane	77.81	1.05	1.50	9.99	8.10	1.55	4.73	6.76	45.02	36.51	6.98	Texas Ex. Sta. Bul. 13, 1890	181
182	do	82.49	0.87	1.09	7.88	6.53	1.14	4.97	6.22	45.01	37.29	6.51	. . . do	182
183	do	82.52	1.00	0.81	8.29	6.16	1.22	5.72	4.63	47.42	35.24	6.99	. . . do	183
184	Durra (Dhoura) Corn	76.79	1.31	0.76	11.14	7.84	2.16	5.64	3.27	48.00	33.78	9.31	. . . do	184
185	do	80.72	1.18	0.63	8.73	6.86	1.88	6.12	3.27	45.28	35.58	9.75	. . . do	185
186	do	81.65	1.25	0.68	8.62	6.28	1.52	6.81	3.71	46.98	34.22	8.28	. . . do	186
187	Kaffir Corn	65.41	2.50	1.41	16.25	11.08	3.35	7.23	4.08	46.98	32.03	9.65	. . . do	187
188	do	66.27	2.06	1.16	17.00	10.93	2.58	6.11	3.44	50.39	32.41	7.65	. . . do	188

ANALYSES OF SOUTHERN FEEDING STUFFS—Continued.

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash		
	SILAGE—CONTINUED.													
	Sorghum Silage—continued:													
189	Kaffir Corn	69.92	1.75	1.63	12.38	11.59	2.73	5.82	5.42	41.16	38.53	9.07	Texas Ex. St. Bul. 13, 1890	189
190	Mixed Sorghum	71.75	1.53	0.93	13.57	10.44	1 78	5.41	3.29	48.04	36.96	6 30	. . . do	190
191	do	66.76	1.68	2.75	17.86	8.94	2.01	5.05	8.27	53.73	26 90	6.05	. . . do	191
192	do	77.77	1.00	2.06	12.66	5.47	1.04	4.50	9.26	56.95	24.61	4 68	. . . do	192
193	No description	83.81	1.04	0.28	7.98	5.50	1 39	6.42	1.73	49.30	33.97	8.58	Miss. Ex. Sta. Bul. 8, 1889	193
	All analyses (17) Maximum	83.81	2.50	2.75	17.86	12.61	3.35	10.86	9.26	58.58	42.13	8.13		
	All analyses (17) Minimum	65.41	0.87	0.28	7.88	3.82	1.04	4.50	1.73	35.95	22.30	4.68		
	All analyses (17) Average	**75.50**	**1.55**	**1.19**	**11.85**	**8.04**	**1.87**	**6.37**	**4.77**	**48.42**	**32.80**	**7.64**		
	Average of 6 American Analyses of Sorghum Silage, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**76.07**	**0.80**	**0.30**	**15 38**	**6.40**	**1.05**	**3 30**	**1.30**	**64.20**	**26 80**	**4.40**		
194	Teosinte Silage: No description	66.77	2.54	0 79	13.60	12.33	3.97	7.64	2.38	40.93	37.10	11.95	. . . do	194
	Cow-pea Vine Silage:													
195	In poor condition, particulars unknown	47.78	3.56	1.22	28.04	14.50	4.90	6.81	2.34	53.70	27.76	9.39	Ark. Ex. Sta. 2 An Rep. 1889, p. 6	195
196	Whip-poor-will Pea Vines	81.64	2.40	0.80	7.60	5.57	1.99	13.06	4.38	41.34	30.38	10.84	N. C. Ex. Sta Rep. 1883, p. 138	196
197	No description	76.91	3.05	2.13	7.59	6.36	3.96	13.21	9.23	32.87	27.54	17.15	Texas Ex. Sta. Bul. 6, 1889	197
	Average	**68.78**	**3.00**	**1.38**	**14 41**	**8.81**	**3 62**	**11.03**	**5.31**	**42.64**	**28 56**	**12.46**		
198	Sorghum and Corn (maize) mixed, mostly sorghum, corn cut in ear	66.04	2.81	3.15	16.18	9.11	2.71	8.27	9.28	47.64	26.83	7.98	. . . do	198
199	Sorghum and Cow-pea Vines, mixed, *b*	67.99	2.98	1.80	16.55	7.11	3.57	9.31	5.63	51.70	22.21	11.15	Tenn Ex Sta Bul 3, Vol. V, 1892	199
200	Clover Silage, no description	50.80	5.25	1.66	25.50	12.96	3.83	10.66	3.38	51.83	26.35	7.78	Rep Dept Agr U. of T. '82, p. 136	200
201	Soja Bean Silage, no description, *a dc*	74.20	4.05	2.23	6.98	9.70	2.84	15.71	8.66	26.96	37.65	11.02	N. C. Ex. Sta. Bul. 87d, 1892	201

	HAY AND OTHER DRIED COARSE FODDERS.													
	CORN (MAIZE) FODDER.													
	Leaves, Tops and Husks:													
202	Cut green, ears left to ripen in shock	15.44	8.30	1.65	44.63	23.40	6.58	9.81	1.96	52.78	27.67	7.78	Ky. Ex. Sta. Bul. 5, no date	202
203	Cut when corn was just ripe	16.23	4.85	1.36	46.18	24.91	6.47	5.79	1.62	55.13	29.74	7.72	do	203
204	No description	18.00	4.30	1.32	43.94	25.44	7.00	5.24	1.61	53.58	31.03	8.54	do	204
	Corn (maize) Leaves:													
205	No description *a h k*	11.00	9.76	2.50	48.68	18.48	9.58	10.97	2.80	54.70	20.77	10.76	Ark. Ex. Sta. Bul. 24, 1893	205
206	No description *a d e*	10.72	9.61	3.95	45.65	22.86	7.21	10.76	4.43	51.13	25.60	8.08	N.C. Ex. Sta. Bul. 87d, 1892	206
207	Pulled Fodder	27.11	10.04	1.48	38.79	16.66	5.92	13.77	2.03	53.23	22.85	8.12	N. C. Ex. Sta. Bul. 90b, 1893	207
208	No description	7.17	14.03	2.67	37.25	26.64	12.24	15.11	2.87	40.14	28.70	13.18	Texas Ex. Sta. Bul. 19, 1891	208
	Average	14.00	10.86	2.65	42.59	21.16	8.74	12.65	3.03	49.80	24.48	10.04		
	Average of 17 American analyses of Corn Leaves, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	29.97	6.02	1.37	35.70	21.40	5.54	8.60	2.00	51.00	30.50	7.90		
	Corn (maize) Tops:													
209	No description *a h k*	11.00	6.91	1.63	49.67	23.32	7.47	7.77	1.83	55.81	26.20	8.39	Ark. Ex. Sta. Bul. 24, 1893	209
210	No description	8.48	11.38	2.65	41.74	27.58	8.17	12.43	2.89	45.61	30.14	8.93	Texas Ex. Sta. Bul. 19, 1891	210
	Average	9.74	9.15	2.14	45.70	25.45	7.82	10.10	2.36	50.71	28.17	8.66		
211	Leaves and Tops together, no descript'n	7.52	12.10	2.46	42.97	26.75	8.20	13.08	2.66	28.92	46.47	8.87	do	211
212	Uneaten butts, *a h k*	11.00	3.03	0.91	45.02	35.88	4.16	3.40	1.02	50.58	40.32	4.68	Ark. Ex. Sta. Bul. 24, 1893	212
	Corn Fodder:													
213	No description	10.50	8.59	1.52	48.77	24.75	5.87	9.60	1.69	54.50	27.65	6.56	La. Ex. Sta. Bul. 17, 1888	213
214	No description, *a h k*	11.00	5.65	1.17	46.03	29.41	6.74	6.35	1.32	51.71	33.05	7.57	Ark. Ex. Sta. Bul. 24, 1893	214
215	No description	7.26	4.94	2.98	54.16	23.16	7.50	5.32	3.21	58.40	24.98	8.09	N. C. Ex. Sta. Rept., 1889, p. 46	215
216	Brazilian flour corn, stover	34.62	4.17	1.15	36.83	19.23	4.00	6.38	1.76	56.33	29.42	6.11	Ga. Ex. Sta. Bul. 13, 1891	216
	Corn (maize) Husks, field-cured:													
217	Corn Shucks, *c*	9.50	3.00	0.46	57.19	26.95	2.90	3.31	0.51	63.20	29.78	3.20	S.C.Ex.Sta.2 An.Rep.'89,p. 161	217
218	do *b*	8.98	2.06	0.49	53.92	32.30	2.25	2.25	0.54	59.25	35.49	2.47	do	218
219	do *b*	8.52	2.00	0.61	55.88	30.33	2.66	2.19	0.67	61.08	33.15	2.91	do	219
220	Corn husks, *b*	6.23	3.73	0.90	56.62	29.61	2.91	3.98	0.93	60.38	31.58	3.13	Tenn.Ex.Sta.Bul.3,Vol.IX,'96	220
221	do *a h k*	11.00	2.83	0.62	52.70	29.88	2.97	3.18	0.70	59.21	33.57	3.34	Ark. Ex. Sta. Bul. 24, 1893	221
	All analyses (5) Maximum	11.00	3.73	0.90	57.19	32.30	2.97	3.98	0.93	63.20	35.49	3.34		
	All analyses (5) Minimum	6.23	2.00	0.46	52.70	26.95	2.25	2.19	0.51	59.21	29.78	2.47		
	All analyses (5) Average	8.85	2.72	0.61	55.26	29.82	2.74	2.98	0.67	60.62	32.72	3.01		
	Average of 16 American analyses of Corn Husks, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	50.90	2.49	0.72	28.34	15.79	1.76	5.00	1.40	57.90	32.20	3.50		

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitrogen-free Extract	Fiber	Ash	Protein	Fat	Nitrogen-free Extract	Fiber	Ash		
	HAY AND OTHER DRIED COARSE FODDERS.—CONTINUED.													
	HAY OF CEREAL GRASSES.													
	Sorghum, whole plant, "cured:"													
222	Amber Cane, cut in bloom	43.62	3.91	3.34	25.74	20.21	3.18	6.94	5.92	45.65	35.85	5.64	Ga. Ex. Sta. Bul. 13, 1891	222
223	White Millo Maize, cut in bloom	45.20	2.87	2.85	25.73	20.53	2.82	5.23	5.20	46.96	37.46	5.15	...do	223
224	Yellow Millo Maize, ...do	50.18	4.14	2.05	22.75	17.06	3.82	8.31	4.12	45.66	34.25	7.66	...do	224
225	Kaffir Corn ...do	51.76	3.02	2.05	17.48	22.51	3.18	6.25	4.24	36.24	46.67	6.60	...do	225
226	Rural Branching Sorghum do	41.14	4.86	3.09	24.38	23.15	3.38	8.26	5.25	41.42	39.33	5.74	...do	226
227	Link's Hybrid Sorghum ...do	47.20	4.41	3.01	22.81	19.20	3.37	8.35	5.70	43.21	36.36	6.38	...do	227
228	Amber Cane, seed in "dough"	41.70	3.17	2.93	32.22	17.03	2.95	5.44	5.03	55.26	29.21	5.06	...do	228
229	White Millo Maize ...do	38.65	2.99	2.55	34.29	18.59	2.93	4.87	4.15	55.90	30.30	4.78	...do	229
230	Yello Millo Maize ...do	43.24	2.79	2.11	29.40	19.58	2.88	4.92	3.72	51.79	34.50	5.07	...do	230
231	Kaffir Corn ...do	52.10	2.54	1.82	20.11	21.03	2.40	5.30	3.80	41.98	43.91	5.01	...do	231
232	Rural Branching Sorghum do	50.15	2.29	2.05	25.10	17.51	2.90	4.60	4.11	50.36	35.11	5.82	...do	232
233	Link's Hybrid Sorghum ...do	38.60	2.41	2.82	32.45	20.39	3.33	3.93	4.60	52.84	33.20	5.43	...do	233
234	Amber Cane, cut Aug. 21, seeds green, *k*	10.00	1.88	2.69	52.91	30.51	2.40	2.09	2.32	59.02	33.90	2.67	N. C. Ex. Sta. Rept. 1882, p. 130	234
235	Amber Cane, cut Sept. 2, seeds turning black, *k*	10.00	1.73	2.77	61.54	19.79	4.17	1.92	3.08	68.38	21.90	4.63	...do	235
236	Durra Corn, cut Sept. 1st, *k*	10.00	7.63	3.51	55.65	18.56	5.25	8.48	3.90	61.17	20.62	5.83	...do	236
237	Durra Corn, cut Sept. 11th, *k*	10.00	7.28	3.01	54.77	20.30	4.64	8.09	3.34	60.86	22.56	5.15	...do	237
238	Durra Corn, no description, *i, j*	10.26	4.44	1.76	44.41	33.41	5.72	4.95	1.96	49.49	37.23	6.37	N. C. Ex. Sta. Rept. 1889, p. 46	238
239	Kaffir Corn ...do *i, j*	10.94	3.31	2.50	47.40	30.37	5.48	3.71	2.80	53.23	34.11	6.15	...do	239
240	Broom Corn ...do *i, j*	9.41	3.87	1.85	42.37	36.76	5.74	4.27	2.04	46.77	40.58	6.34	...do	240
241	Early Orange ...do *i, j*	10.02	3.69	5.47	49.64	27.76	3.42	4.10	6.08	55.17	30.85	3.80	...do	241
242	Early Amber ...do *i, j*	10.49	5.20	4.27	45.19	30.68	4.17	5.81	4.77	50.49	34.27	4.66	...do	242
243	Chicken Corn, before heading	13.63	7.50	0.96	34.80	32.82	10.29	8.68	1.11	40.29	38.01	11.91	Miss. Ex. Sta. 1 An. Rept., 1888	243
244	Chicken Corn, just headed	9.43	6.25	2.17	42.80	34.62	4.73	6.90	2.39	47.26	38.23	5.22	...do	244
	All analyses (23) Maximum	52.10	7.63	5.47	61.54	36.76	10.29	8.68	6.08	68.38	46.67	11.91		
	All analyses (23) Minimum	9.41	1.73	0.96	17.48	17.03	2.40	1.92	1.11	36.24	20.62	2.67		
	All analyses (23) Average	28 60	4 01	2 65	38 67	24 92	4 35	5 71	3 90	50 41	34 28	5 70		
	Sorghum—Seed Heads:													
	Amber Cane, cut when seed were ripe													
245		20.15	7.04	3.08	58.42	8.82	2.49	8.81	3.86	73.16	11.05	3.12	Ga. Ex. Sta. Bul. 13, 1891	245

246	White Millo Maize, cut when seed were ripe	19.86	7.97	2.63	52.17	13.90	3.47	9.95	3.28	65.10	17.34	4.33	. . . do	246
247	Yellow Millo Maize cut when seed were ripe	21.32	9.01	3.36	51.54	11.53	3.24	11.45	4.27	65.50	14.66	4.12	. . . do	247
248	Kaffir Corn, cut when seed were ripe	24.18	8.43	3.90	47.77	13.16	2.56	11.12	5.14	63.00	17.36	3.38	. . . do	248
249	Rural Branching Sorghum . . do . .	20.20	8.26	3.88	51.68	13.62	2.96	10.35	4.86	64.76	16.32	3.71	. . . do	249
250	Link's Hybrid Sorghum, cut when seed were ripe	19.90	9.11	3.46	52.25	12.34	2.94	11.38	4.32	65.23	15.40	3.67	. . . do	250
251	Kaffir Corn, no description	16.23	6.92	2.86	65.18	6.79	2.02	8.26	3.42	77.81	8.10	2.41	N. C. Ex. Sta. Rept. 1889, p. 46	251
252	White Millo Maize . . do	15.66	8.18	2.81	63.15	8.45	1.75	9.69	3.33	74.89	10.02	2.07	. . . do	252
253	Yellow Millo Maize . . do	15.66	7.62	2.79	62.78	8.47	2.68	9.03	3.31	74.44	10.04	3.18	. . . do	253
254	No description	12.50	7.00	3.33	53.19	18.10	5.88	8.00	3.38	61.22	20.68	6.72	Texas Ex. Sta. Bul. 13, 1890	254
	All analyses (10) Maximum	24.18	9.11	3.90	65.18	18.10	5.88	11.45	5.14	77.81	20.68	6.72		
	All analyses (10) Minimum	12.50	6.92	2.63	47.77	6.79	1.75	8.00	3.28	61.22	8.10	2.07		
	All analyses (10) Average	18.57	7.95	3.21	55.81	11.46	3.00	9.89	3.92	68.51	14.10	3.67		
	Sorghum—Stalk:													
255	Amber Cane, "final cutting"	35.72	2.93	3.29	35.96	19.36	2.74	4.56	5.12	55.95	30.11	4.26	Ga. Ex. Sta. Bul. 13, 1891	255
256	White Millo Maize, final cutting	36.36	2.37	2.04	38.88	17.32	3.03	3.72	3.20	61.10	27.22	4.76	. . . do	256
257	Yellow Millo Maize . . . do	38.41	1.94	1.44	37.59	17.70	2.92	3.15	2.34	61.04	28.73	4.74	. . . do	257
258	Kaffir Corn . . . . . do	32.35	4.57	1.48	27.33	30.14	4.13	6.75	2.19	40.40	44.55	6.11	. . . do	258
259	Rural Branching Sorghum, . do	37.61	1.94	1.61	36.78	18.87	3.19	3.11	2.58	58.95	30.24	5.12	. . . do	259
260	Link's Hybrid Sorghum . . . do	35.40	1.86	1.39	40.05	17.73	3.57	2.88	2.15	62.00	27.45	5.52	. . . do	260
261	Cane ripe, no description	68.79	0.84	2.09	20.14	6.14	2.01	2.69	6.69	64.23	19.67	6.72	Texas Ex. Sta. Bul. 13, 1890	261
	All analyses (7) Maximum	68.79	4.57	3.29	40.05	30.14	4.13	6.75	6.69	64.23	44.55	6.72		
	All analyses (7) Minimum	32.35	0.84	1.39	20.14	6.14	2.01	2.69	2.15	40.40	19.67	4.26		
	All analyses (7) Average	43.66	2.35	1.91	33.82	18.18	3.08	3.84	3.43	57.67	29.71	5.32		
	Sorghum Fodder:													
262	Leaves alone, *a*	12.43	9.60	4.55	44.93	23.93	4.56	10.96	5.19	51.31	27.33	5.21	N. C. Ex. Sta. Bul. 97, 1894	262
	Rye—Cut green:													
263	Sown in Nov., cut in boot April 11, *h i*	9.91	13.25	2.95	38.78	28.89	6.22	14.71	3.27	43.05	32.07	6.90	Ark. Ex. Sta. Bul. 28, 1894	263
264	Sown in Nov., cut in blossom April 28, *h i*	9.00	8.31	2.45	38.58	36.40	5.26	9.13	2.69	42.40	40.00	5.78	. . . do	264
	Barley:													
265	Whole plant, ripe	3.40	4.38	2.17	45.08	40.40	4.57	4.53	2.24	46.68	41.82	4.73	N. C. Ex. Sta. Bul. 90b, 1893	265
	HAY OF GRASSES.													
	Rhode Island Bent grass (*Agrostis canina*)													
266	Over ripe	7.12	6.06	1.93	46.28	31.92	6.69	6.52	2.07	49.85	34.36	7.20	. . . do	266
	Red-top, Herd's grass (*Agrostis vulgaris*):													
267	No description	10.00	10.43	2.31	46.76	24.00	6.50	11.59	2.56	51.95	26.67	7.23	Ark. Ex. Sta. 1 An. Rep. '88, p. 131	267
268	From stack, cut when seeds were ripening	9.84	7.25	1.95	46.52	27.45	6.99	8.04	2.16	51.60	30.45	7.75	Ky. Ex. Sta. Bul. 5, no date	268
269	Cut in full bloom	10.96	4.34	1.53	53.74	24.27	5.16	4.87	1.72	60.36	27.26	5.79	. . . do	269

ANALYSES OF SOUTHERN FEEDING STUFFS—Continued.

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitrogen-free Extract	Fiber	Ash	Protein	Fat	Nitrogen-free Extract	Fiber	Ash		
	HAY AND OTHER DRIED COARSE FODDERS—CONTINUED.													
	HAY OF GRASSES—continued.													
	Red-top, Herd's grass—continued:													
270	Cut June 8, 1891, heads showing . .	9.57	11.00	6.38	45.89	22.68	4.48	12.16	7.05	50.75	25.09	4.95	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	270
271	No description, *a*	8.74	6.04	2.24	50.06	28.80	4.12	6.62	2.45	54.85	31.56	4.52	Tenn. Ex. Sta. Bul. 1, Vol. IV, '91	271
	Average, excluding No. 270	**9.89**	**7.01**	**2.01**	**49.27**	**26.13**	**5.69**	**7.78**	**2.22**	**54.69**	**28.99**	**6.32**		
	Average of 7 American analyses of Red-top, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**8.89**	**7.89**	**1.91**	**47.49**	**28.63**	**5.19**	**8.70**	**2.10**	**52.10**	**31.40**	**5.70**		
	Silver Beard Grass (*Andropogon argyreus*):													
272	No description *a*	8.40	3.89	1.83	53.84	28.45	3.59	4.25	2.00	58.77	31.06	3.92	. . . do	272
	Broom Sedge (*Andropogon virginicus*):													
273	No description	9.32	5.12	0.74	44.76	36.06	4.00	5.64	0.82	49.36	39.77	4.41	Miss. Ex. Sta. 1 An. Rept, 1888	273
274	Ripe	3.75	4.37	1.89	39.86	41.40	8.73	4.54	1.96	41.42	43.01	9.07	N. C. Ex. Sta. Bul. 90b, 1893 . .	274
	Aristida oligantha:													
275	No description	9.47	9.87	2.05	26.65	45.81	6.15	10.90	2.26	29.44	50.60	6.80	Texas Ex. Sta. Bul. 2, 1888 . .	275
	Awned bunch grass (*Aristida purpurea*):													
276	No description	7.95	3.94	1.08	46.73	36.26	4.04	4.28	1.17	50.77	39.39	4.39	N. C. Ex. Sta. Bul. 90b, 1893 .	276
	Wire grass (*Aristida* ——):													
277	No description, *a*	10.15	3.28	1.72	53.19	28.71	2.95	3.65	1.91	59.21	31.95	3.28	Fla. Ex. Sta. Bul. 11, 1890 . .	277
	Swamp Cane (*Arundinaria gigantea*):													
278	No description	8.53	11.31	4.10	30.66	35.00	10.40	12.36	4.48	33.53	38.26	11.37	N. C. Ex Sta. Bul. 90b, 1893 .	278
	Tall Oatgrass (*Arrhenatherum avenaceum*)													
279	No description	10.68	8.69	3.30	44.48	27.85	5.00	9.73	3.69	49.80	31.18	5.60	Ark. Ex. Sta. 1 An. Rep. '88, p. 131	279
280	do	13.55	7.94	3.99	23.65	40.62	10.25	9.19	4.62	46.99	27.35	11.85	La. Ex. Sta. Bul. 19, 28., 1892 . .	280
	Cheat ("*Bromus schraderi*")?													
281	Cut when seeds were nearly ripe *a* .	8.41	8.00	1.96	48.29	26.45	6.89	8.74	2.14	52.72	28.88	7.52	Ky. Ex. Sta. 5 An. Rept. 1892	281
	Sand-spur grass (*Cenchrus tribuloides*): *													
282	Cut Sept. 12, 1890, *a*	15.30	5.26	1.90	45.66	27.88	4.00	6.21	2.24	53.90	32.93	4.72	Fla. Ex. Sta. Bul. 11, 1890 . .	282
	Bermuda grass (*Cynodon dactylon*):													
283	Cut Aug. or Sept, 1889	7.14	10.75	2.90	50.71	25.02	3.48	11.58	3.12	54.61	26.95	3.74	Ga. Ex. Sta. Bul. 7, 1890 . .	283
284	Field cured, *a*	10.36	8.75	2.19	48.46	21.65	8.59	9.76	2.44	54.07	24.14	9.59	S. C. Ex. Sta. 1 An. Rep. '88, p. 123	284
285	Cut July 9, 1891	11.10	7.12	2.54	44.49	28.26	6.49	8.01	2.85	50.05	31.79	7.30	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	285

* Ash, less CO_2

	Orchard grass (*Dactylis glomerata*):													
286	No description	10.47	10.40	2.50	42.46	28.94	5.23	11.61	2.79	47.43	32.33	5.84	Ark. Ex. Sta. 1 An. Rep. '88, p. 131	286
	From stack, cut in bloom about													
287	June 1	11.80	8.17	2.26	33.54	38.33	5.90	9.26	2.56	38.03	43.46	6.69	Ky. Ex. Sta. Bul. 5, no date	287
288	Nearly ripe	5.25	6.69	2.60	41.13	38.43	5.90	7.06	2.74	43.41	40.56	6.23	N. C. Ex. Sta. Bul. 90b, 1893	288
289	No description	12.82	7.82	3.70	28.35	36.56	10.75	8.97	4.24	41.94	32.52	12.33	La. Ex. Sta. Bul. 19, (2s.) '92	289
	Average	10.09	8.27	2.76	36.37	35.57	6.94	9.23	3.08	42.70	37.22	7.77		
	Average of 10 American analyses of Orchard grass, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	9.87	8.09	2.63	41.05	32.39	5.97	9.09	2.90	45.40	36.00	6.70		
	Danthonia compressa:													
	"Sample includes many flowering													
290	culms	9.61	8.81	3.05	44.37	29.78	4.38	9.75	3.37	49.10	32.94	4.84	Tenn. Ex. Sta. Bul. 4, Vol. II, '89	290
291	Sample, chiefly leaf-blades	8.50	8.25	3.73	49.22	27.37	2.93	9.00	4.08	53.92	29.80	3.20	. . . do	291
	Ragi Millet (*Eleusine coracana*):													
292	No description	16.09	2.40	3.00	51.84	20.65	6.02	2.86	3.58	61.77	24.61	7.18	Ala. Ex. Sta. Bul. 60, 1895	292
	Crow-foot grass (*Eleusine Ægyptiaca*)?													
293	No description, *a*	11.73	8.32	1.58	50.22	20.75	7.40	9.43	1.79	56.89	23.51	8.38	Fla. Ex. Sta. Bul. 11, 1890	293
	Bull grass "(*Eleusine Indica*)?"													
294	No description	12.20	7.44	2.35	49.70	21.53	6.78	8.47	2.68	56.61	24.52	7.72	. . . do	294
	Yard goose grass (*Eleusine Ægyptiaca*)?													
295	In flower	5.01	12.75	2.20	35.74	33.75	10.55	13.42	2.31	37.63	35.53	11.11	N. C. Ex. Sta. Bul. 90b, 1893	295
	Beard grass (*Erianthus alopecuroides*):													
296	Over ripe	5.15	4.06	1.85	53.74	32.00	3.20	4.28	1.95	56.66	33.74	3.37	. . . do	296
	Twisted beard grass (*Erianthus contortus*):													
297	No description	8.47	4.13	4.75	39.75	40.27	2.63	4.51	5.19	43.43	44.00	2.87	. . . do	297
	Wild Rye (*Elymus Canadensis*):													
298	Cut July 9, 1891	10.82	3.94	0.86	48.23	32.68	3.47	4.42	0.96	54.09	36.64	3.89	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	298
	Elymus striatus:													
299	Cut July 9, 1891	12.21	11.62	0.38	39.24	27.51	9.04	13.24	0.43	44.70	31.33	10.30	. . . do	299
	Smooth Rye grass (*Elymus Virginicus*):													
300	Cut June 8, 1891	10.76	8.75	5.36	49.65	21.77	3.71	9.81	6.01	55.62	24.40	4.16	. . . do	300
	Fowl Meadow grass (*Glyceria nervata*):													
301	No description, *i j*	10.12	8.69	2.30	44.42	27.93	6.54	9.66	2.56	49.43	31.08	7.27	N. C. Ex. Sta. Rept. 1889, p. 46	301
	Velvet grass (*Holcus lanatus*):													
302	No description	12.76	10.50	3.65	26.45	34.59	12.05	12.03	4.18	39.66	30.32	13.81	La. Ex. Sta. Bul. 19 (2s.) 1892	302
	Cut grass (*Leersia oryzoides*):													
303	No description	9.42	6.56	1.95	44.39	28.60	9.08	7.24	2.15	49.01	31.58	10.02	Miss. Ex. Sta. 1 An. Rept. 1888	303
	False Rice ("*Leersia Virginica*")?													
304	Just out of flower	5.02	8.75	2.45	41.48	31.65	10.65	9.21	2.58	43.67	33.33	11.21	N. C. Ex. Sta. Bul. 90b, 1893	304
	English Rye grass (*Lolium perenne*):													
305	No description	14.23	7.78	3.24	25.20	39.12	10.52	9.07	3.78	45.62	29.27	12.26	La. Ex. Sta. Bul. 19 (2s.), 1892	305
306	Cut July 1, 1891	11.15	12.06	7.11	39.15	23.61	6.92	13.58	8.00	44.06	26.57	7.79	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	306
	Italian Rye grass (*Lolium Italicum*):													
307	No description	10.00	13.50	3.08	30.36	29.58	13.48	15.00	3.42	33.74	32.87	14.97	N. C. Ex. Sta. Rept. 1889, p. 46	307

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash		
	HAY AND OTHER DRIED COARSE FODDERS.—CONTINUED.													
	HAY OF GRASSES—continued.													
	Nimble Will (*Muhlenbergia diffusa*):													
308	No description	13.27	6.25	2.33	41.82	29.88	6.45	7.20	2.68	48.24	34.45	7.43	Miss. Ex. Sta. 1 An. Rept. 1888	308
	Muhlenbergia Mexicana:													
309	Not yet in bloom	10.65	8.00	2.32	42.38	29.61	7.04	8.96	2.59	47.44	33.14	7.87	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	309
	False Red-top (*Panicum agrostoides*):													
310	Nearly ripe	8.46	7.50	1.57	38.18	33.13	11.16	8.19	1.71	41.72	36.19	12.19	N. C. Ex. Sta. Bul. 90b, 1893	310
	Bitter grass (*Panicum amarum*):													
311	Nearly ripe	7.52	10.37	1.95	41.83	29.66	8.67	11.22	2.11	45.23	32.07	9.37	. . . do	311
	Two-edged Panic grass (*Panicum anceps*)													
312	Nearly ripe	4.28	5.94	1.55	46.03	35.37	6.83	6.21	1.62	48.09	36.95	7.13	. . . do	312
313	No description	11.21	7.50	1.05	40.82	32.52	6.90	8.45	1.18	45.97	36.63	7.77	Miss Ex Sta. 1 An. Rep. 1888, p. 33	313
	Fall Panic (*Panicum autumnale*):													
314	No description	15.07	12.19	2.02	38.80	28.65	3.27	14.35	2.38	45.69	33.73	3.85	. . . do	314
	Hair grass (*Panicum capillare*):													
315	No description	12.17	6.88	2.14	38.21	34.45	6.15	7.83	2.44	43.51	39.22	7.00	. . . do	315
	Panicum clandestinum:													
316	Cut July 9, 1891	10.90	10.50	1.33	42.43	28.30	5.54	11.79	1.49	48.74	31.76	6.22	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	316
	Creeping Panic (*Panicum dichotomum*):													
317	Nearly ripe	10.32	7.00	1.55	42.61	33.42	5.10	7.81	1.73	47.50	37.27	5.69	N. C. Ex. Sta. Bul. 90b, 1893	317
	Crab grass (*Panicum filiforme*):													
318	No description	12.43	7.50	1.60	42.25	30.12	6.10	8.56	1.82	48.25	34.40	6.97	Miss. Ex. Sta. 1 An. Rept. 1888	318
	Broad-leafed Panic (*Panicum latifolium*):													
319	Nearly ripe	4.38	5.00	1.88	41.41	43.50	3.83	5.23	1.97	43.31	45.49	4.00	N. C. Ex. Sta. Bul. 90b, 1893	319
320	Panicum microcarpon, ripe	9.18	7.31	2.58	44.75	28.85	6.70	8.10	2.86	49.64	31.98	7.42	. . . do	320
	Knee grass (*Panicum proliferum*):													
321	In flower	8.73	13.50	3.26	41.51	25.32	7.68	14.79	3.57	45.49	27.74	8.41	. . . do	321
	Crab grass (*Panicum sanguinale*):													
322	No description, *a*	10.65	8.32	2.25	41.89	27.62	9.27	9.31	2.52	46.89	30.91	10.37	Fla. Ex. Sta. Bul. 11, 1890	322
323	Cut Aug. or Sept., 1889	5.52	9.50	2.16	49.11	26.40	7.31	10.05	2.29	51.98	27.95	7.73	Ga. Ex. Sta. Bul. 7, 1890	323
324	No description	6.81	5.88	2.23	48.58	28.20	8.30	6.31	2.39	52.14	30.26	8.90	Miss. Ex. Sta. 1 An. Rept. 1888	324
	Switch grass (*Panicum virgatum*):													
325	Cut June 16, 1895, *b*	10.83	6.81	1.92	15.11	30.26	5.07	7.64	2.15	50.59	33.93	5.69	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	325

326	Ripe	8.02	7.44	1.48	43.95	33.45	5.66	8.09	1.61	47.78	36.37	6.15	N. C. Ex. Sta. Bul. 90 b, 1893	326
327	Wild Panicum (*Panicum verrucosum*): Nearly ripe	5.74	8.56	2.60	44.85	31.05	7.20	9.08	2.75	47.59	32.94	7.64	. . . do	327
328	Barn-yard grass (*Paspalum floridanum*): No description	8.56	6.25	0.96	50.23	29.75	4.25	6.83	1.05	54.93	32.54	4.65	Miss. Ex. Sta. 1 An. Rept. 1888	328
329	Louisana grass (*Paspalum platycaule*): No description, *a*	10.33	7.44	1.80	45.38	29.30	5.75	8.29	2.01	50.62	32.67	6.41	Fla. Ex. Sta. Bul. 11, 1890	329
330	Bull grass (*Paspalum purpurascens*): No description	10.90	6.25	2.63	40.89	32.73	6.60	7.01	2.95	45.89	36.73	7.42	N. C. Ex. Sta. Bul. 90b, 1893	330
331	Kodo Millet (*Paspalum scrobiculatum*): No description	14.75	1.92	2.10	46.71	30.57	3.95	2.25	2.46	54.80	35.86	4.63	Ala. Ex. Sta. Bul. 60, 1895	331
332	Pearl Millet (*Pennisetum typhoideum*): Whole plant, cut in bloom	49.50	2.49	2.08	22.49	20.05	3.39	4.94	4.11	44.53	39.70	6.72	Ga. Ex. Sta. Bul. 13, 1891	332
333	. . . do	39.80	2.97	2.55	26.73	23.90	4.05	4.94	4.24	44.40	39.70	6.72	. . . do	333
334	. . do . . seed ripe	25.60	4.31	2.34	34.66	28.76	4.33	5.80	3.15	46.58	38.65	5.82	. . . do	334
335	No description *i j*	9.90	8.31	1.66	33.04	34.74	12.35	9.22	1.84	36.67	38.56	13.71	N. C. Ex. Sta. Rept. '89, p. 46	335
336	Headed out	9.27	7.15	1.60	38.01	35.42	8.55	7.88	1.76	41.90	39.04	9.42	. . . do	336
	All analyses (5) — Maximum	49.50	8.31	2.55	38.01	35.42	12.35	9.22	4.24	46.58	39.70	13.71		
	All analyses (5) — Minimum	9.27	2.49	1.60	22.49	20.05	3.39	4.94	1.76	36.67	38.56	5.82		
	All analyses (5) — Average	**26.81**	**5.05**	**2.05**	**30.99**	**28.57**	**6.53**	**6.56**	**3.02**	**42.81**	**39.13**	**8.48**		
	Timothy (*Phleum pratense*):													
337	Very ripe; not well cured, bleached by rains, seeds mostly shelled out	12.27	4.24	1.42	45.46	33.58	3.03	4.83	1.62	51.82	38.28	3.45	Ky. Ex. Sta. Bul. 5, no date	337
338	Taken from stack, nearly ripe when cut, affected by drouth	8.05	6.03	2.07	48.78	29.97	5.10	6.56	2.25	53.05	32.59	5.55	. . . do	338
339	From stack, cut at ripening of seed	9.17	4.86	1.49	47.82	32.33	4.33	5.35	1.64	52.65	35.59	4.77	. . do	339
340	Cut in ripening stage	13.97	4.73	0.97	39.19	38.46	2.68	5.50	1.13	45.55	44.71	3.11	. . . do	340
341	Cut in ripening stage	15.54	4.80	1.62	38.45	35.89	3.70	5.68	1.92	45.53	42.49	4.38	. . . do	341
342	Choice Timothy, Memphis, Tenn., market, *a*	10.35	6.48	2.27	45.05	30.05	5.80	7.23	2.53	50.25	33.52	6.47	Ark. Ex. Sta. Bul. 24, 1893	342
343	Timothy No. 1, Memphis, Tenn., market, *a*	10.80	7.69	2.57	42.64	30.25	6.05	8.62	2.88	47.80	33.92	6.78	. . . do	343
344	Timothy, no description	15.10	7.97	2.00	44.13	26.50	4.32	9.36	2.35	51.99	31.22	5.08	Ark. Ex. Sta. 1 An. Rept. '88, p. 133	344
345	Ripe and in good condition	9.77	4.74	1.48	51.12	28.21	4.68	5.26	1.64	56.65	31.26	5.19	Ky. Ex. Sta. 1 An. Rep, '89-90, p. 16	345
346	Cut in full bloom, 2 tons per acre	11.13	4.56	1.80	51.27	27.10	4.14	5.13	2.03	57.69	30.49	4.66	. . . do	346
347	Cut in full bloom, taken from stack January 1	13.52	4.34	1.41	48.30	27.61	4.82	5.02	1.63	55.85	31.93	5.57	. . . do	347
348	Cut when most of blooms had fallen	9.56	4.75	2.75	49.60	29.24	4.10	5.25	3.04	54.85	32.33	4.53	. . . do	348
349	No description	14.51	8.38	3.48	34.25	29.63	9.75	9.80	4.07	40.07	34.66	11.40	La. Ex. Sta. Bul. 19 (2s) 1892	349
	All analyses (13) — Maximum	15.54	8.38	3.48	51.27	38.46	9.75	9.80	4.07	57.69	44.71	11.40		
	All analyses (13) — Minimum	8.05	4.24	0.97	34.25	26.50	2.68	4.83	1.13	40.07	31.22	3.11		
	All analyses (13) — Average	**11.82**	**5.66**	**1.95**	**45.08**	**30.68**	**4.81**	**6.43**	**2.21**	**51.06**	**34.84**	**5.46**		
	Average of 68 American analyses of Timothy, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**13.18**	**5.87**	**2.47**	**45.08**	**29.03**	**4.37**	**6.80**	**2.99**	**51.70**	**33.50**	**5.10**		

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash		
	HAY AND OTHER DRIED COARSE FODDERS.—CONTINUED.													
	HAY OF GRASSES—continued.													
350	American Canary grass (*Phalaris arundinacea*): No description	5.11	3.54	2.19	52.11	31.68	5.37	3.75	2.31	54.89	33.39	5.66	N. C. Ex. Sta. Bul. 90b, 1893	350
351	Canary grass (*Phalaris intermedia*): No description	13.25	10.21	3.09	24.56	38.69	10.20	11.77	3.56	28.31	44.60	11.76	Texas Ex. Sta. Bul. 2, 1888	351
352	Texas Blue grass (*Poa arachnifera*): No description	10.68	11.76	4.21	34.35	30.28	8.72	13.16	4.71	38.47	33.90	9.76	La. Ex. Sta. Bul. 19, (2s) '92	352
353	English Blue grass (*Poa compressa*): Cut before heading	9.00	30.33	5.83	28.01	16.50	10.33	33.33	6.41	30.78	18.13	11.35	Ky. Ex. Sta. Bul. 5, no date	353
354	Cut when heading	10.78	7.50	1.87	47.33	25.53	6.99	8.41	2.08	53.05	28.62	7.84	Ky Ex.Sta. 1 An. Rep.'89-90,p.15	354
355	Cut in bloom	10.62	6.31	1.43	45.03	30.34	6.27	7.06	1.60	50.38	33.95	7.01	. . . do	355
356	Seed fully formed	7.97	7.62	1.81	46.49	26.07	10.04	8.28	1.97	50.51	28.33	10.91	. . . do	356
357	No description, cut July 1, '91	6.27	11.65	3.32	44.27	21.98	12.51	12.43	3.54	47.24	23.45	13.34	Tenn.Ex.Sta.Bul.3,Vol.IX,'96	357
358	No description, cut June 15, '95, *b*	9.37	7.81	2.96	50.00	24.00	5.86	8.62	3.27	55.17	26.47	6.47	. . . do	358
359	Kentucky Blue-grass (*Poa pratensis*): Cut two weeks after ripening; taken from stack, not well cured	16.09	7.07	2.02	43.37	26.76	4.69	8.42	2.40	51.69	31.90	5.59	Ky. Ex. Sta. Bul. 5, no date	359
360	Cut before heading, about 5 in. high	11.07	23.38	5.14	33.08	19.22	8.11	26.29	5.78	37.20	21.61	9.12	. . . do	360
361	Cut before blooming, but well headed	8.78	16.31	3.66	33.84	29.09	8.32	17.88	4.01	37.10	31.89	9.12	. . . do	361
362	Cut May 29, '86, in bloom	9.39	10.43	2.42	50.42	19.60	7.74	11.51	2.67	55.65	21.63	8.54	Ky.Ex.Sta.1 An.Rep'89-90,p.14	362
363	No description	12.15	8.00	3.35	42.78	23.56	10.16	9.11	3.81	26.81	48.70	11.57	La. Ex. Sta. Bul. 19 (2s) '92	363
364	Yellow Pigeon grass (*Setaria glauca*): Nearly ripe	3.20	5.00	3.80	47.48	31.77	8.75	5.16	3.93	49.05	32.82	9.04	N. C. Ex. Sta. Bul. 90b, 1893	364
365	German or Hungarian Millet (*Setaria Germanica*) Scribn: Cut immediately after full blossom	9.54	7.81	2.37	47.81	25.82	6.65	8.63	2.62	52.86	28.54	7.35	Ky. Ex. Sta. Bul. 5, no date	365
366	Cut July 18, as for hay, *a**	3.22	5.94	1.76	48.35	33.44	7.29	6.14	1.82	49.96	34.55	7.53	Ky.Ex.Sta.5 An. Rept.'92, p.11	366
367	Cut July 4, *i*	6.70	7.87	2.45	43.53	30.85	8.60	8.43	2.62	46.68	33.06	9.21	La. Ex. Sta. Bul. 7 (2s) '90	367
368	Cut June 30, *i*	10.22	8.75	2.92	40.51	25.90	11.70	9.74	3.25	45.13	28.85	13.03	. . . do	368
369	No description, *i j*	10.82	6.75	1.83	47.61	26.60	6.39	7.57	2.05	53.39	29.83	7.16	N. C. Ex. Sta. Rept. '89, p. 46	369
370	No description, *i j*	9.92	10.62	2.71	45.60	22.38	8.77	11.79	3.01	50.63	24.84	9.73	. . . do	370
371	No description	8.27	8.93	3.51	48.08	24.26	6.95	9.73	3.83	52.42	26.44	7.58	Tenn.Ex.Sta.Bul.3,Vol.IX,'96	371
372	do	9.71	9.12	3.64	48.83	23.56	5.14	10.10	4.03	54.07	26.11	5.69	. . . do	372
373	do	7.10	8.14	3.06	49.45	26.96	5.59	8.76	3.29	53.23	28.70	6.02	. . . do	373

*Ash, less CO_2

374	do	7.73	9.88	3.23	50.04	23.79	5.33	10.71	3.50	54.24	25.78	5.77	. . . do	374
375	do	7.91	9.43	3.23	48.01	24.94	6.48	10.24	3.51	52.14	27.08	7.03	. . . do	375
376	do	10.01	10.00	3.60	48.35	21.65	6.39	11.12	4.00	53.72	24.06	7.10	. . . do	376
377	do	7.63	10.13	2.78	47.39	25.94	6.13	10.97	3.01	51.30	28.08	6.64	. . . do	377
378	do	8.78	9.00	3.03	46.98	26.20	6.01	9.86	3.32	51.51	28.72	6.59	. . . do	378
379	do	8.73	10.06	3.14	46.29	25.51	6.27	11.02	3.44	50.72	27.95	6.87	. . . do	379
	All analyses (15) Maximum	10.82	10.62	3.64	50.04	33.44	11.70	11.79	4.03	54.24	34.55	13.03		
	All analyses (15) Minimum	3.22	5.94	1.76	40.51	21.65	5.14	6.14	1.82	45.13	24.06	5.69		
	All analyses (15) Average	8.42	8.83	2.88	47.13	25 83	6.91	9.65	3.15	51.47	28.18	7.55		
	Average of 12 American analyses of Hungarian Grass, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	7.66	7.46	2.12	49.05	27.72	5.99	8.10	2.39	53.10	30.09	6.50		
	Golden Millet (*Setaria Italica*) Scribn:													
380	Cut July 4, *i*	6.52	7.50	3.75	41.53	31.95	8.75	8.02	4.01	44.43	34.18	9.36	La. Ex. Sta. Bul. 7, (2s) '90	380
381	No description, *a*	11.04	11.56	2.28	40.20	26.82	8.10	12.99	2.56	45.20	30.15	9.10	N. C. Ex. Sta. Bul. 97, '94 . . .	381
	Wild Millet (*Setaria viridis*):													
382	Cut July 1, 1891	8.51	12.12	4.92	41.70	24.35	8 40	13.25	5.38	45.58	26.61	9.18	Tenn Ex.Sta. Bul.3, Vol.IX, '96	382
	Johnson grass (*Sorghum halepense*):													
383	No description, *a*	11.56	6.04	1.28	38.31	34.41	8.40	6.83	1.45	43.32	38.91	9.49	Ala. Ex. Sta. Bul. 5, 1889 . . .	383
384	No description, cut Aug. or Sept	6.10	4.35	1.78	47.11	35.45	5.21	4.63	1.90	50.17	37.75	5.55	Ga. Ex. Sta. Bul. 7, 1890 . . .	384
385	No description, *i j*	10.50	7.44	2.28	40.49	31.09	8.20	8.31	2.55	45.24	34.74	9.16	N. C. Ex. Sta. Rept., 1889, p. 46	385
386	No description	12.31	5.77	1.67	44.80	30.30	5.15	6.58	1.90	51.10	34.55	5.87	N. C. Ex. Sta. Bul. 97, 1894 . .	386
387	No description	7.57	8.70	2.38	44.32	29.82	7.21	9.41	2.57	47.96	32.26	7.80	Miss. Ex. Sta. 1 An. Rept. '88 .	387
388	Over ripe	9.80	4.18	1.36	44.34	35.72	4.60	4.63	1.51	49.16	39.60	5.10	. . . do	388
	All analyses (6) Maximum	12.31	8.70	2.38	47.11	35.72	8.40	9.41	2.57	51.10	39.60	9.49		
	All analyses (6) Minimum	6.10	4.18	1.28	38.31	29.82	4.60	4.63	1.45	43.32	32.26	5.10		
	All analyses (6) Average	9.64	6.08	1.79	43.23	32.80	6.46	6.73	1.98	47.83	36 30	7.16		
	Marsh Grass Hay (*Spartina sp.*):													
389	No description	13.50	6.00	2.80	32.08	34.32	11.30	6.93	3.23	37.08	39.67	13.09	N. C. Ex. Sta. Bul. 90b, '93 . .	389
	Cord grass (*Spartina juncea*):													
390	No description	7.47	3.62	2.15	54.28	27.53	4.95	3.91	2.32	58.67	29.75	5.35	. . . do	390
	Marsh Cord grass (*Spartina polystachya* var. *glabra*):													
391	Just out of flower	10.02	3.94	1.30	45.96	35.45	3.33	4.38	1.44	51.08	39.40	3.70	. . . do	391
	Salt Marsh grass (*Spartina stricta*):													
392	No description *a c*	17.92	5.03	0.80	47.25	19.37	9.63	6.13	0.98	57.56	23.60	11.73	S.C.Ex. Sta.1An.Rept1888, p.124	392
	Drop-seed grass *Sporobolus asperifolius*:													
393	No description	9.97	5.62	1.17	42.57	35.87	4.80	6.24	1.30	47.29	39.84	5.33	Miss. Ex. Sta. 1 An. Rept. 1888	393
	False Red-top (*Triodia sesleroides*):													
394	Just out of flower	8.50	6.56	1.60	33.22	41.35	8.77	7.17	1.74	36.32	45.19	9.58	N. C. Ex. Sta. Bul. 90b, 1893 .	394
	Gamma grass (*Tripsacum dactyloides*):													
395	Nearly ripe	13.48	4.69	1.69	35.90	37.67	6.57	5.42	1.96	41.49	43.53	7.60	. . . do	395
396	No description	7.63	8.22	1.74	45.07	30.73	6.61	9.88	1.88	47.81	33.27	7.16	. . . do	396

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash		
	HAY AND OTHER DRIED COARSE FODDERS.—CONTINUED.													
	HAY OF GRASSES—continued.													
350	American Canary grass (*Phalaris arundinacea*): No description	5.11	3.54	2.19	52.11	31.68	5.37	3.75	2.31	54.89	33.39	5.66	N. C. Ex. Sta. Bul. 90b, 1893	350
351	Canary grass (*Phalaris intermedia*): No description	13.25	10.21	3.09	24.56	38.69	10.20	11.77	3.56	28.31	44.60	11.76	Texas Ex. Sta. Bul. 2, 1888	351
352	Texas Blue grass (*Poa arachnifera*): No description	10.68	11.76	4.21	34.35	30.28	8.72	13.16	4.71	38.47	33.90	9.76	La. Ex. Sta. Bul. 19, (2s) '92	352
353	English Blue grass (*Poa compressa*): Cut before heading	9.00	30.33	5.83	28.01	16.50	10.33	33.33	6.41	30.78	18.13	11.35	Ky. Ex. Sta. Bul. 5, no date	353
354	Cut when heading	10.78	7.50	1.87	47.33	25.53	6.99	8.41	2.08	53.05	28.62	7.84	Ky Ex.Sta. 1 An. Rep.'89-90, p.15	354
355	Cut in bloom	10.62	6.31	1.43	45.03	30.34	6.27	7.06	1.60	50.38	33.95	7.01	. . . do	355
356	Seed fully formed	7.97	7.62	1.81	46.49	26.07	10.04	8.28	1.97	50.51	28.33	10.91	. . . do	356
357	No description, cut July 1, '91	6.27	11.65	3.32	44.27	21.98	12.51	12.43	3.54	47.24	23.45	13.34	Tenn.Ex.Sta.Bul.3,Vol.IX,'96	357
358	No description, cut June 15, '95, *b*	9.37	7.81	2.96	50.00	24.00	5.86	8.62	3.27	55.17	26.47	6.47	. . . do	358
	Kentucky Blue-grass (*Poa pratensis*):													
359	Cut two weeks after ripening; taken from stack, not well cured	16.09	7.07	2.02	43.37	26.76	4.69	8.42	2.40	51.69	31.90	5.59	Ky. Ex. Sta. Bul. 5, no date	359
360	Cut before heading, about 5 in. high	11.07	23.38	5.14	33.08	19.22	8.11	26.29	5.78	37.20	21.61	9.12	. . . do	360
361	Cut before blooming, but well headed	8.78	16.31	3.66	33.84	29.09	8.32	17.88	4.01	37.10	31.89	9.12	. . . do	361
362	Cut May 29, '86, in bloom	9.39	10.43	2.42	50.42	19.60	7.74	11.51	2.67	55.65	21.63	8.54	Ky.Ex.Sta.1 Au.Rep'89-90,p.14	362
363	No description	12.15	8.00	3.35	42.78	23.56	10.16	9.11	3.81	26.81	48.70	11.57	La. Ex. Sta. Bul. 19 (2s) '92	363
	Yellow Pigeon grass (*Setaria glauca*):													
364	Nearly ripe	3.20	5.00	3.80	47.48	31.77	8.75	5.16	3.93	49.05	32.82	9.04	N. C. Ex. Sta. Bul. 90b, 1893	364
	German or Hungarian Millet (*Setaria Germanica*) Scribn:													
365	Cut immediately after full blossom	9.54	7.81	2.37	47.81	25.82	6.65	8.63	2.62	52.86	28.54	7.35	Ky. Ex. Sta. Bul. 5, no date	365
366	Cut July 18, as for hay, *a**	3.22	5.94	1.76	48.35	33.44	7.29	6.14	1.82	49.96	34.55	7.53	Ky.Ex.Sta.5 An. Rept.'92, p.11	366
367	Cut July 4, *i*	6.70	7.87	2.45	43.53	30.85	8.60	8.43	2.62	46.68	33.06	9.21	La. Ex. Sta. Bul. 7 (2s) '90	367
368	Cut June 30, *i*	10.22	8.75	2.92	40.51	25.90	11.70	9.74	3.25	45.13	28.85	13.03	. . . do	368
369	No description, *i j*	10.82	6.75	1.83	47.61	26.60	6.39	7.57	2.05	53.39	29.83	7.16	N. C. Ex. Sta. Rept. '89, p. 46	369
370	No description, *i j*	9.92	10.62	2.71	45.60	22.28	8.77	11.79	3.01	50.63	24.84	9.73	. . . do	370
371	No description	8.27	8.93	3.51	48.08	24.26	6.95	9.73	3.83	52.42	26.44	7.58	Tenn.Ex.Sta.Bul.3,Vol.IX,'96	371
372	do	9.71	9.12	3.64	48.83	23.56	5.14	10.10	4.03	54.07	26.11	5.69	. . . do	372
373	do	7.10	8.14	3.06	49.45	26.66	5.59	8.76	3.29	53.23	28.70	6.02	. . . do	373

*Ash, less CO_2

374	do	7.73	9.88	3.23	50.04	23.79	5.33	10.71	3.50	54.24	25.78	5.77	. . . do	374
375	do	7.91	9.43	3.23	48.01	24.94	6.48	10.24	3.51	52.14	27.08	7.03	. . . do	375
376	do	10.01	10.00	3.60	48.35	21.65	6.39	11.12	4.00	53.72	24.06	7.10	. . . do	376
377	do	7.63	10.13	2.78	47.39	25.94	6.13	10.97	3.01	51.30	28.08	6.64	. . . do	377
378	do	8.78	9.00	3.03	46.98	26.20	6.01	9.86	3.32	51.51	28.72	6.59	. . . do	378
379	do	8.73	10.06	3.14	46.29	25.51	6.27	11.02	3.44	50.72	27.95	6.87	. . . do	379
	All analyses (15) Maximum	10.82	10.62	3.64	50.04	33.44	11.70	11.79	4.03	54.24	34.55	13.03		
	All analyses (15) Minimum	3.22	5.94	1.76	40.51	21.65	5.14	6.14	1.82	45.13	24.06	5.69		
	All analyses (15) Average	8.42	8.83	2.88	47.13	25 83	6.91	9 65	3.15	51.47	28.18	7.55		
	Average of 12 American analyses of Hungarian Grass, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	7.66	7.46	2.12	49.05	27.72	5.99	8.10	2.30	53.10	30 00	6.50		
	Golden Millet (*Setaria Italica*) Scribn:													
380	Cut July 4, *i*	6.52	7.50	3.75	41.53	31.95	8.75	8.02	4.01	44.43	34.18	9.36	La. Ex. Sta. Bul. 7, (2s) '90	380
381	No description, *a*	11.04	11.56	2.28	40.20	26.82	8.10	12.99	2.56	45.20	30.15	9.10	N. C. Ex. Sta. Bul. 97, '94 . . .	381
	Wild Millet (*Setaria viridis*):													
382	Cut July 1, 1891	8.51	12.12	4.92	41.70	24.35	8 40	13.25	5.38	45.58	26.61	9.18	Tenn Ex.Sta. Bul.3, Vol.IX, '96	382
	Johnson grass (*Sorghum halepense*):													
383	No description, *a*	11.56	6.04	1.28	38.31	34.41	8.40	6.83	1.45	43.32	38.91	9.49	Ala. Ex. Sta. Bul. 5, 1889 . . .	383
384	No description, cut Aug. or Sept	6.10	4.35	1.78	47.11	35.45	5.21	4.63	1.90	50.17	37.75	5.55	Ga. Ex. Sta. Bul. 7, 1890 . . .	384
385	No description, *i j*	10.50	7.44	2.28	40.49	31.09	8.20	8.31	2.55	45.24	34.74	9.16	N. C. Ex. Sta. Rept., 1889, p. 46	385
386	No description	12.31	5.77	1.67	44.80	30.30	5.15	6.58	1.90	51.10	34.55	5.87	N. C. Ex. Sta. Bul. 97, 1894 . .	386
387	No description	7.57	8.70	2.38	44.32	29.82	7.21	9.41	2.57	47.96	32.26	7.80	Miss. Ex. Sta. 1 An. Rept. '88 .	387
388	Over ripe	9.80	4.18	1.36	44.34	35.72	4.60	4.63	1.51	49.16	39.60	5.10	. . . do	388
	All analyses (6) Maximum	12.31	8.70	2.38	47.11	35.72	8.40	9.41	2.57	51.10	39.60	9.49		
	All analyses (6) Minimum	6.10	4.18	1.28	38.31	29.82	4.60	4.63	1.45	43.32	32.26	5.10		
	All analyses (6) Average	9.64	6.08	1.79	43.23	32.80	6.46	6.73	1.98	47.83	36 30	7.16		
	Marsh Grass Hay (*Spartina sp.*):													
389	No description	13.50	6.00	2.80	32.08	34.32	11.30	6.93	3.23	37.08	39.67	13.09	N. C. Ex. Sta. Bul. 90b, '93 . .	389
	Cord grass (*Spartina juncea*):													
390	No description	7.47	3.62	2.15	54.28	27.53	4.95	3.91	2.32	58.67	29.75	5.35	. . . do	390
	Marsh Cord grass (*Spartina polystachya* var. *glabra*):													
391	Just out of flower	10.02	3.94	1.30	45.96	35.45	3.33	4.38	1.44	51.08	39.40	3.70	. . . do	391
	Salt Marsh grass (*Spartina stricta*):													
392	No description *a c*	17.92	5.03	0.80	47.25	19.37	9.63	6.13	0.98	57.56	23.60	11.73	S.C.Ex. Sta.1An.Rept1888, p.124	392
	Drop-seed grass *Sporobolus asperifolius*:													
393	No description	9.97	5.62	1.17	42.57	35.87	4.80	6.24	1.30	47.29	39.84	5.33	Miss. Ex. Sta. 1 An. Rept. 1888	393
	False Red-top (*Triodia sesleroides*):													
394	Just out of flower	8.50	6.56	1.60	33.22	41.35	8.77	7.17	1.74	36.32	45.19	9.58	N. C. Ex. Sta. Bul. 90b, 1893 .	394
	Gamma grass (*Tripsacum dactyloides*):													
395	Nearly ripe	13.48	4.69	1.69	35.90	37.67	6.57	5.42	1.96	41.49	43.53	7.60	. . . do	395
396	No description	7.63	8.22	1.74	45.07	30.73	6.61	9.88	1.88	47.81	33.27	7.16	. . . do	396

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitrogen-free Extract	Fiber	Ash	Protein	Fat	Nitrogen-free Extract	Fiber	Ash		
	HAY AND OTHER DRIED COARSE FODDERS.—CONTINUED.													
	HAY OF GRASSES—continued.													
	Gamma grass (*Tripsacum dactyloides*):													
397	Leaves only, cut July 1, 1891	9.47	12.75	5.26	37.81	25.21	9.50	14.09	5.81	41.76	27.85	10.49	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	397
	Broad-leafed False Fescue (*Uniola latifolia*):													
398	Half ripe	6.75	9.06	2.72	39.01	34.50	7.96	9.71	2.91	41.85	37.00	8.53	N. C. Ex. Sta. Bul. 90b, 1893	398
	Sea grass (*Uniola paniculata*).													
399	No description	1.78	4.70	4.13	54.18	30.51	4.70	4.89	4.20	55.06	31.06	4.79	. . . do	399
	Wild Rice grass (*Zizania aquatica*):													
400	Ripe	7.29	1.75	1.41	44.43	33.63	11.49	1.89	1.52	47.93	36.27	12.39	. . . do	400
	HAY OF MIXED MEADOW GRASSES.													
	Timothy and Red-top:													
401	Cut at ripening of seeds	10.32	6.32	1.62	44.08	33.15	4.51	7.05	1.81	49.15	36.96	5.03	Ky. Ex. Sta. Bul. 5, no date	401
402	Stored in barn; cut when nearly ripe	11.15	4.67	2.34	41.95	34.84	5.05	5.26	2.63	47.21	39.21	5.69	. . . do	402
403	Cut when red-top in bloom; timothy riper	11.57	5.21	1.50	38.53	38.41	4.78	5.89	1.69	43.57	43.44	5.41	. . . do	403
404	Mostly Timothy and Orchard grass	8.22	7.50	3.30	41.97	33.60	5.41	8.17	3.60	45.73	36.61	5.89	Ga. Ex. Sta. Bul. 7, 1890	404
405	Arkansas Prairie Hay, Memphis, Tenn	11.20	5.34	2.23	44.46	29.97	6.80	6.01	2.51	50.06	33.77	7.65	Ark. Ex. Sta. Bul. 24, 1893	405
406	Hay, no description	11.84	6.06	1.58	37.91	35.75	6.86	6.87	1.79	43.02	40.54	7.78	Miss. Ex. Sta. Bul. 8, 1889	406
	HAY OF LEGUMES.													
	Clover Hay (*Trifolium pratense*):													
407	Red Clover hay, cut in full bloom*	9.80	14.22	3.68	38.91	25.53	7.86	15.76	4.08	43.14	28.30	8.72	Ky. Ex. Sta. Bul. 5, no date	407
408	Taken from stack, cut in bloom*	9.98	15.81	2.92	35.11	28.42	7.76	17.56	3.24	39.01	31.57	8.62	. . . do	408
409	Red Clover, cut in bloom*	10.04	12.08	2.63	38.69	28.90	7.66	13.43	2.92	43.01	32.13	8.51	. . . do	409
410	Red Clover, cut in bloom*	10.70	10.63	2.62	43.42	26.32	6.31	11.90	2.93	48.63	29.47	7.07	. . . do	410
411	Clover hay, cut in bloom*	11.63	14.22	2.42	35.29	29.95	6.49	16.09	2.74	39.94	33.89	7.34	. . . do	411
412	Red Clover, cut when half of blooms had turned brown*	13.75	9.89	1.77	43.43	24.07	7.09	11.49	2.05	50.35	27.90	8.21	. . . do	412
413	Medium Red Clover	14.00	13.52	5.27	34.51	27.50	5.20	15.72	6.12	40.13	31.98	6.05	Ark. Ex. Sta. 1 An Rept. '88, p. 131	413
414	Cut May 22, in full bloom	9.83	15.75	2.03	41.66	22.30	8.43	17.47	2.25	46.20	24.73	9.35	Ky. Ex. Sta. 1 An Rept '89-90, p. 17	414

*Salted when stored.

415	Cut July 30, sample from shock, not perfectly cured	26.07	10.36	2.57	38.95	16.48	5.57	14.02	3.48	52.68	22.29	7.53	. . . do 415
416	"Saplin Clover," cut when blossoms commenced to show, stored in barn	11.80	13.28	2.04	43.65	21.38	7.85	15.06	2.31	49.49	24.24	8.90	. . . do 416
417	Cut when a few heads were turning brown	10.87	9.22	4.18	44.44	24.31	6.98	10.34	4.69	49.86	27.28	7.83	. . . do 417
418	Not described, *a*	19.20	10.07	2.84	39.05	22.16	6.68	12.46	3.52	48.32	27.43	8.27	Ky. Ex. Sta. 5 An. Rept. '92, p. 13 418
419	Red Clover hay, nearly ripe	8.47	10.62	3.26	35.04	36.40	6.21	11.60	3.56	38.28	39.77	6.79	N. C. Ex. Sta. Bul. 90b, 1893 . . 419
420	Second cutting	7.63	12.86	2.19	38.56	32.17	6.59	13.94	2.37	41.74	34.82	7.13	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96 420
421	No description	12.85	14.87	5.49	32.07	25.28	9.44	17.06	6.30	36.81	29.00	10.83	La. Ex. Sta Bul. 19, (2s) '92 421
	All analyses (9) Excluding Nos. 407 to 412 — Maximum	26.07	15.75	5.49	44.44	36.40	9.44	17.47	6.30	52.68	39.77	10.83	
	All analyses (9) Excluding Nos. 407 to 412 — Minimum	7.63	9.22	2.03	32.07	16.48	5.20	10.34	2.25	36.81	22.29	6.05	
	All analyses (9) Excluding Nos. 407 to 412 — Average	**13.41**	**12.28**	**3.32**	**38.66**	**25.34**	**6.99**	**14.19**	**3.84**	**44.83**	**29.06**	**8.08**	
	Average of 38 American analyses of Red Clover Hay, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**15.26**	**12.32**	**3.32**	**38.20**	**24.75**	**6.15**	**14.50**	**3.90**	**45.20**	**29.10**	**7.30**	
	Crimson Clover (*Trifolium incarnatum*):												
422	No description, *a d e*	10.85	16.06	2.29	37.15	25.45	8.20	18.01	2.57	41.67	28.55	9.20	N. C. Ex. Sta. Bul. 87d, 1892 . . 422
423	No description	5.91	15.13	1.50	42.64	27.16	7.66	16.08	1.59	45.32	28.87	8.14	N. C. Ex. Sta. Bul. 90b, 1893 . . 423
424	Hay one year old, *a*	11.46	15.04	2.01	38.49	26.73	6.27	17.00	2.27	43.46	30.19	7.08	N. C. Ex. Sta. Bul. 97, 1894 . . 424
425	No description	13.37	14.04	4.06	29.28	26.25	13.00	16.20	4.68	33.82	30.30	15.00	La. Ex. Sta. Bul. 19, (2s) '92 425
426	No description, *b*	14.30	12.75	3.01	30.61	30.23	9.10	14.88	3.51	35.72	35.27	10.62	Va. Ex. Sta. Bul. 44, 1894 . . . 426
	All analyses (5) — Maximum	14.30	16.06	4.06	42.64	30.23	13.00	18.01	4.68	45.32	35.27	15.00	
	All analyses (5) — Minimum	5.91	12.75	1.50	29.28	25.45	6.27	14.88	1.59	33.82	28.55	7.08	
	All analyses (5) — Average	**11.18**	**14.60**	**2.57**	**35.64**	**27.16**	**8.85**	**16.43**	**2.92**	**40.00**	**30.64**	**10.01**	
	Alsike Clover (*Trifolium hybridum*):												
427	Cut when fully ripe	10.42	12.25	1.66	43.49	24.36	7.82	13.67	1.85	48.55	27.20	8.73	Ky. Ex. Sta. 1 An Rept '89-90, p. 18 427
428	No description	11.46	9.16	2.30	45.93	25.05	6.10	10.35	2.60	51.88	28.28	6.89	Ark. Ex. Sta. 1 An Rept. '88, p. 131 428
	Mammoth Clover (*Trifolium medium*):												
429	No description	4.24	10.00	2.20	35.56	43.65	4.35	10.44	2.30	37.14	45.58	4.54	N. C. Ex. Sta. Bul. 90b, 1893 . . 429
	White Clover (*Trifolium repens*):												
430	Cut Aug. or Sept	7.20	17.07	2.21	47.34	21.67	4.51	18.39	2.38	51.01	23.36	4.86	Ga. Ex. Sta. Bul. 7, 1890 . . . 430
	English Clover Hay:												
431	No description	10.00	10.80	2.49	28.29	41.44	6.98	12.00	2.77	31.43	46.04	7.76	N. C. Ex. Sta. Rept. 1883, p. 96 431
	Bush Clover (*Lespedeza*): No variety stated. Samples cut in October; nearly mature:												
432	From poor upland, *i*	12.85	10.79	2.56	44.35	23.65	5.80	12.38	2.93	50.90	27.14	6.65	Miss. Ex. Sta. 1 An. Rept. '88, p. 32 432
433	do	13.50	12.34	2.38	41.26	25.17	5.35	14.26	2.75	47.70	29.11	6.18	. . . do 433
434	From low ground	14.67	12.97	3.01	35.87	27.67	5.81	15.20	3.53	42.03	32.43	6.81	. . . do 434
435	do	13.80	12.56	2.54	45.15	20.47	5.48	14.57	2.95	52.38	23.75	6.35	. . . do 435
	Average	**13.71**	**12.16**	**2.62**	**41.66**	**24.24**	**5.61**	**14.10**	**3.04**	**48.25**	**28.11**	**6.50**	

ANALYSES OF SOUTHERN FEEDING STUFFS—Continued.

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nit-free Extract	Fiber	Ash	Protein	Fat	Nit-free Extract	Fiber	Ash		
	HAY AND OTHER DRIED COARSE FODDERS—CONTINUED.													
	HAY OF LEGUMES—continued.													
	Japan Clover (*Lespedeza striata*):													
436	No description	12.82	13.84	3.44	30.63	26.45	12.82	15.88	3.95	35.13	30.34	14.70	Ark.Ex.Sta.1 AnRept.'88,p.131	436
	Bush Clover (*Lespedeza violacea*):													
437	Ripe	10.37	5.62	2.06	36.72	40.83	4.40	6.27	2.30	40.97	45.55	4.91	N. C. Ex. Sta. Bul. 90b, 1893 .	437
	Alfalfa, lucern (*Medicago sativa*):													
438	No description	12.42	15.25	2.18	33.77	29.42	6.96	17.41	2.49	38.56	33.59	7.95	N. C. Ex. Sta. Rept. 1889, p. 46	438
439	Cut in Aug. or Sept	7.26	20.28	2.06	39.02	27.41	3.97	21.87	2.22	42.07	29.55	4.29	Ga. Ex. Sta. Bul. 7, 1890 . . .	439
440	do	7.20	18.62	2.02	38.10	30.99	3.07	20.06	2.18	41.05	33.40	3.31	. . . do	440
441	No description	7.15	15.62	2.30	33.78	34.10	7.05	16.82	2.47	36.40	36.72	7.59	N. C. Ex. Sta. Bul. 90b, 1893 . .	441
442	do	10.94	12.25	3.51	34.09	31.05	8.16	13.75	3.94	38.29	34.86	9.16	La.Ex.Sta. Bul. 19, (2s) 1892	442
	All analyses (5) Maximum	12.42	20.28	3.51	39.02	34.10	8.16	21.87	3.94	42.07	36.72	9.16		
	All analyses (5) Minimum	7.15	12.25	2.02	33.77	27.41	3.07	13.75	2.18	38.29	29.55	3.31		
	All analyses (5) Average	8.99	16.49	2.42	35.75	30.60	5.84	17.98	2.66	39.28	33.62	6.46		
	Average of 21 American analyses of Alfalfa, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	8.44	14.28	2.15	42.68	25.01	7.44	15.60	2.40	46.60	27.30	8.10		
	Bur Clover (*Medicago maculata*):													
443	No description	11.15	12.65	4.15	30.97	31.76	9.32	14.24	4.67	34.86	35.74	10.49	. . . do	443
	Sweet Clover (*Melilotus alba*):													
444	First year's growth, cut for hay, *a**	9.69	19.31	3.20	44.78	16.44	6.58	21.39	3.54	49.58	18.21	7.28	Ky.Ex.Sta. 5 An.Rept.'92, p. 11	444
	Lathyrus sylvestris:													
445	No description	6.31	17.57	3.48	33.46	32.70	6.48	18.75	3.72	35.71	34.90	6.92	Va. Ex. Sta. Bul. 20, 1892 . . .	445
	Serradella (*Ornithopus sativus*):													
446	Cut Aug. 24, and just going out of bloom, *a**	9.47	12.50	2.11	38.64	25.50	11.78	13.81	2.33	42.68	28.17	13.01	Ky.Ex.Sta.5 An.Rept. '92, p. 11	446
447	Cut July 1, 1891	11.74	15.97	2.95	42.01	17.61	9.72	18.09	3.34	47.61	19.95	11.01	Tenn.Ex.Sta.Bul.3, Vol.IX,'96	447
	Cowpea Vines (*Dolichos*):													
448	Whip-poor-will Pea, Sown June 13: Cut Aug. 7, *a, b, h, j, k*	11.00	17.17	2.16	36.76	22.19	10.72	19.29	2.43	41.30	24.93	12.05	Ark. Ex. Sta. Bul. 24, 1893 . .	448

*Ash, less CO_2.

449	Cut Aug. 14, *a, b, h, j, k*	11.00	15.70	2.28	35.07	25.94	10.01	17.64	2.56	39.40	29.15	11.25	. . . do	449
450	Cut Aug. 20, *a, b, h, j, k*	11.00	15.52	2.30	33.30	27.91	9.97	17.44	2.58	37.42	31.36	11.20	. . . do	450
451	Cut Aug. 26, *a, b, h, j, k*	11.00	13.80	2.46	37.24	27.70	7.80	15.50	2.77	41.84	31.13	8 76	. . . do	451
452	Cut Sept. 2, *a, b, h, j, k*	11.00	10.18	2.46	39.25	30.12	6.99	11.44	2.77	44 10	33.84	7.85	. . . do	452
453	Cut Sept. 8, *a, b, h, j, k*	11.00	9.76	2.42	39.75	30.17	6.90	10.97	2.72	44.66	33.90	7.75	. . . do	453
454	Cut Sept. 14, *a, b, h, j, k*	11.00	9.21	2.20	41.09	30.39	6.11	10.35	2.47	46.17	34.14	6.87	. . . do	454
	Varieties not given:													
455	"Advanced stage of growth," *a*	11.41	10.07	1.57	39.28	30.70	6.97	11.37	1.77	44.36	34.64	7.86	Ark. Ex. Sta. 3 An. Rep. '90, p. 138	455
456	Cut Sept. 11, '88, just before blooming, *a*	7.84	22.66	5.79	32.78	19.75	11.18	25.08	6.28	35.08	21.43	12.13	Ga. Ex. Sta. Bul. 4, 1889	456
457	Cut Sept. 11, '88, when in first bloom, *a*	8.94	20.85	4.15	33.07	23.51	9.48	22.92	4.55	36.26	25.85	10 42	. . . do	457
458	Cut Sept. 11, '88, with green pods, *a*	8.42	19.22	3.52	38.08	23.30	7.46	20.95	3.84	41.68	25.40	8.13	. . . do	458
459	Cut Sept. 11, 88, with mature pods, *a*	8.90	16.09	3.64	41.76	23.14	6.47	17.54	3.97	46.22	25.22	7.05	. . . do	459
460	Cut Sept. 1, pods beginning to harden	10.00	12.93	2.92	47.65	19.08	7.42	14.37	3.24	53.02	21.12	8.25	N. C. Ex. Sta. Rept. 1882, p. 128	460
461	Cut Sept. 11, pods hard, but still green	10.00	11.27	3.81	51.58	18.08	5.26	12.52	4.23	57.31	20.09	5.85	. . . do	461
462	No description *i, j*	14.54	12.56	1.75	39.91	23.68	7.56	14.69	2.05	46.69	27.72	8.85	N. C. Ex. Sta. Rept. 1889, p. 46	462
463	No description *a, d, e*	11.26	12.63	1.33	40.46	29.57	4.75	14.24	1.50	45.57	33.33	5.36	N. C. Ex. Sta. Bul. 87d, 1892	463
464	Cut in bloom, crop '88, *c, j*	10.11	16.05	3.63	47.00	16 53	6.68	17.86	4.04	52.28	18.39	7.43	SC. Ex. Sta. 2 An. Rep. 1889, p. 170	464
465	Cut, pods forming, crop '88, *c, j*	11.33	17.67	2.71	44.86	16 42	7.01	19.93	3.06	50.58	18.52	7.91	. . . do	465
466	Cut, pods formed, crop '88, *c, j*	9.43	19.38	4.54	29.50	26.31	10.84	21.38	5.01	32.59	29.05	11.97	. . . do	466
467	No description	10.01	12.68	5.81	38.34	22.54	10.62	14.00	6.45	42.75	25.00	11.80	Texas Ex. Sta. Bul. 6, 1889	467
	All analyses (20) Maximum	14.54	22.66	5.81	51.58	30.70	11.18	25.08	6.45	57.31	34.64	12.13		
	All analyses (20) Minimum	7.84	9.21	1.33	29.50	16.42	4.75	10.35	1.50	32.59	18.39	5.36		
	All analyses (20) Average	**10.46**	**14.77**	**3.07**	**39.34**	**24.35**	**8.01**	**16.47**	**3.42**	**43.96**	**27.21**	**8.94**		
	Average of 8 American analyses of Cowpea Vine Hay, Ex. Sta. Bul 11, U. S. Dept. Agr., 1892	**10.69**	**16.57**	**2.90**	**42.22**	**20.09**	**7.53**	**18.60**	**3.20**	**47.20**	**22.50**	**8.50**		
	Soja Bean (*Soja hispida*):													
468	No description	6.73	17.50	6.90	31.77	32.30	4.80	18.76	7.40	34.07	34.63	5.14	N. C. Ex. Sta. Bul. 90b. 1893	468
469	Cut Aug. 21, in bloom, *k*	10.00	11.56	2.31	45.04	24.58	6.51	12.84	2.57	50.05	27.31	7.23	N. C. Ex. Sta. Rep. 1882, p 122	469
470	Cut Sept. 1, just in pod, *k*	10.00	12.97	3.40	42.15	25.38	6.10	14.41	3.78	46.83	28.20	6.78	. . . do	470
471	Cut Sept. 11, pods developed, *k*	10.00	12.99	3.46	50.13	18.34	5.08	14.43	3.85	55 70	20 38	5.64	. . . do	471
472	No description, *h, i, j*	12.03	14.90	3.00	38.89	24.84	6.34	16.94	3.41	44.21	28.24	7.20	Ga. Ex. Sta. Bul. 17, 1892	472
473	Hay, no description, *a*	17.38	15.53	2.66	32.53	25.55	6.35	18.80	3.22	39.36	30.93	7.69	N. C. Ex. Sta. Bul. 97, 1894	473
474	Cut Aug. 5, in bloom, *c*	8.56	15.44	3.15	40.41	25.85	6.59	16.88	3.44	44.20	28.27	7.21	SC Ex Sta 2 An Rep. 1889, p. 179	474
	All analyses (7) Maximum	17.38	17.50	6.90	50.13	32.30	6.59	18.80	7 40	55.70	34.63	7.69		
	All analyses (7) Minimum	6.73	11.56	2.31	31.77	18.34	4.80	12.84	2.57	34.07	20.38	5.14		
	All analyses (7) Average	**10 67**	**14.41**	**3.55**	**40.13**	**25.27**	**5.97**	**16.15**	**3 95**	**44.92**	**28.28**	**6.70**		
	Beggar Weed (*Desmodium molle*):													
475	Lower part of plant, mainly stalk from plant 5 ft. high, in seed, *a*	9.84	7.00	2.30	40.79	36.12	3.95	7.76	2.55	45.25	40 06	4.38	Fla. Ex. Sta. Bul. 11, 1890	475
476	Upper part of plant, mainly leaves and branches, from plant 5 ft. high in seed, *a*	9.13	15.75	3.35	39.34	26.46	5.97	17.33	3.69	43.29	29.12	6 57	. . . do	476

		Fresh or Air-Dry Material.						Water-free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash		
	HAY AND OTHER DRIED COARSE FODDERS.—Continued.													
	HAY OF LEGUMES—continued.													
	Beggar Weed (*Desmodium molle*):													
477	Lower part of plant, mainly stalk from plant 2 ft. high, not yet in seed, *a*	8.64	5.25	1.15	47.53	34.95	2.48	5.74	1.26	52.03	38.26	2.71	Fla. Ex. Sta. Bul. 11, 1890	477
478	Upper part of plant, mainly leaves and branches, from plant 2 ft. high, not yet in seed, *a*	9.06	19.42	4.88	40.52	19.62	6.50	21.36	5.37	44.54	21.58	7.15	. . . do	478
	Vetch (*Vicia sativa*):													
479	Cut Aug. or Sept. 1889	7.60	20.25	3.60	39.36	26.01	3.18	21.92	3.89	42.60	28.15	3.44	Ga. Ex. Sta. Bul. 7, 1890	479
480	No description	10.00	16.43	2.71	42.18	23.26	5.42	18.25	3.01	46.87	25.84	6.03	N. C. Ex. Sta. Rept. 1883, p. 96	480
	Peanut Vines (*Arachis hypogæa*):													
481	Spanish Peanut, vines cut before blooming	32.62	8.55	4.24	31.20	16.68	6.71	12.69	6.30	46.30	24.75	9.96	Ga. Ex. Sta. Bul. 13, 1891	481
482	Georgia Peanut, vines cut before blooming	29.78	8.82	4.10	35.38	13.97	7.95	12.57	5.84	50.38	19.89	11.32	. . . do	482
483	Spanish Peanut, "cut when first was ripe"	31.43	8.03	3.31	30.01	19.51	7.71	11.71	4.82	43.77	28.46	11.24	. . . do	483
484	Georgia Peanut, "cut when first was ripe"	32.38	6.70	3.53	24.25	24.41	8.73	9.91	5.22	35.86	36.10	12.91	. . . do	484
485	No description	6.25	10.31	5.46	50.36	20.33	7.29	11.00	5.82	53.73	21.68	7.77	N. C. Ex. Sta. Bul. 90b, 1893	485
486	No description, *a*	10.44	10.31	3.57	42.92	25.96	6.80	11.52	3.99	47.92	28.98	7.59	N. C. Ex. Sta. Bul. 97, 1894	486
487	No description, *c, i, j*	7.83	10.83	1.69	43.56	20.38	15.71	11.75	1.84	47.26	22.11	17.04	Tenn. Ex. Sta. Bul. 2, Vol. IV, '91	487
	All analyses (7) Maximum	32.62	10.83	5.46	50.36	25.96	15.71	12.69	6.30	53.73	36.10	17.04		
	All analyses (7) Minimum	6.25	6.70	1.69	24.25	13.97	6.71	9.91	1.84	35.86	19.89	7.59		
	All analyses (7) Average	**21.53**	**9.08**	**3.76**	**36.81**	**20.18**	**8.70**	**11.59**	**4.83**	**46.46**	**26.00**	**11.12**		
	HAY OF MISCELLANEOUS PLANTS.													
	Sweet Potato Vine (*Batatas edulis*):													
488	Yellow Nansemond, *a*	10.00	11.56	3.06	38.09	26.06	11.23	12.84	3.40	42.33	28.96	12.47	Ark. Ex. Sta. 3 An. Rep. '90	488
489	Yellow Yam, *a*	10.92	16.25	1.67	34.43	28.08	8.65	18.24	1.87	38.66	31.52	9.71	. . . do	489
490	Yellow Yam, *a*	8.80	10.31	4.82	48.36	19.95	7.76	11.24	5.26	53.31	21.73	8.46	Ga. Ex. Sta. Bul. 4, 1889	490
491	Spanish Sweet Potato, *a*	7.66	10.93	7.18	46.45	20.75	7.03	11.85	7.78	50.25	22.50	7.62	. . . do	491

492	Early Jersey	46.32	4.87	2.30	24.02	17.28	5.21	9.08	4.27	44.75	32.20	9.70	Ga. Ex. Sta. Bul. 13, 1891	492
493	Southern Queen	47.15	4.43	2.28	25.71	14.48	5.95	8.38	4.32	48.65	27.39	11.26	. . . do	493
494	Georgia Yam	41.55	7.67	2.12	29.28	13.59	5.79	13.12	3.62	50.10	23.26	9.90	. . . do	494
495	Pumpkin Yam	39.82	11.98	0.75	13.29	15.17	18.99	19.90	1.25	22.09	25.21	31.55	. . . do	495
496	Poplar Root	40.62	7.93	2.24	32.70	10.02	6.49	13.35	3.78	55.07	16.88	10.92	. . . do	496
	All analyses (8) excluding No. 495. Maximum	47.15	16.25	7.18	48.36	28.08	11.23	18.24	7.78	55.07	32.20	12.47		
	All analyses (8) excluding No. 495. Minimum	7.66	4.43	1.67	24.02	10.02	5.21	8.38	1.87	38.66	16.88	7.62		
	All analyses (8) excluding No. 495. Average	**26.63**	**9.24**	**3.21**	**34.88**	**18.78**	**7.26**	**12.26**	**4.29**	**47.89**	**25.55**	**10.01**		
	Spurry (*Spergula arvensis*):													
497	Cut June 28, 60 days from planting, *b*	11.05	10.28	6.31	48.19	16.58	7.59	11.56	7.09	54.18	18.64	8.53	Ala. Ex. Sta. Bul. 49, 1893 . .	497
498	Cut June 14, in full bloom, *a*[3]	8.69	12.81	3.33	40.38	22.14	12.65	14.03	3.65	44.22	24.24	13.86	KyExSta 5An.Rept.1892,p.11 .	498
	Heron's Bill (*Erodium cicutarium*):													
499	Cut June 8, in flower	12 94	11.87	5.21	40.53	20.34	9.11	13.63	5.99	46.55	23.37	10.46	Tenn.Ex.Sta.Bul.3,Vol.IX,'96	499
	Pursely (*Portulaca oleracea*):													
500	Cut Sept. 6, in bloom, *a*	11.92	22.30	4.20	24.48	14.18	22.92	25.32	4.77	27.79	16 10	26.02	Fla. Ex. Sta. Bul. 11, 1890 . .	500
	Cotton-head Weed (*Froelichia Floridana*):													
501	Cut Aug. 22, in bloom, *a*	10.79	3.94	1.92	45.75	32.55	5.05	4.42	2.15	51.28	36.49	5.66	. . . do	501
	Buckwheat (*Fagopyrum esculentum*;													
502	Whole plant, ripe	6.63	5.62	1.20	34.42	44.50	7.63	6.02	1.28	36.87	47.66	8.17	N. C. Ex. Sta. Bul. 90b, 1893 .	502
	Spanish Moss (*Tillandsia usneoides*):													
503	No description, *a*	14.85	5.07	2.43	48.20	25.35	4.10	5.95	2.85	56.61	29.78	4.81	Fla. Ex. Sta. Bul. 11, 1890 . .	503
	Horned Sedge (*Rynchospora corniculata*):													
504	Ripe and seeds badly shattered . . .	8.81	4.75	2.07	39.80	34.80	9.77	5.21	2.27	43.64	38.16	10.72	N. C. Ex. Sta. Bul. 90b, 1893 .	504
505	No description	5.85	6.37	2.95	48.38	31.92	4.53	6.76	3.13	51.40	33.90	4.81	. . . do	505
	Sedge (*Cyperus flavescens*):													
506	No description	8.08	5.56	6.08	38.00	25.50	16.78	6.05	6.61	41.34	27.74	18.26	. . . do	506
	Soja Bean Vine Stalks:													
507	Cut Aug. 21, in bloom, *k*	10.00	3.04	0.72	8.32	73.21	4.71	3.38	0.80	9.25	81.34	5.23	N. C. Ex. Sta. Rept. 1882, p. 122	507
	Cotton Plant:													
508	Cut Oct. 12, after most of the lint and seed had been picked	6.51	6.06	2.62	44.18	35.33	5.30	6.48	2.80	47.26	37.79	5.67	. . . do	508
509	Cotton stalks, burs and roots, mature . .	12.77	7.31	2.27	42.35	27.55	7.75	8.38	2.60	48.55	31.59	8.88	N. C. Ex. Sta. Rept. 1889, p. 46	509
510	Cotton Plants, young plants, some bolls open, *c*	7.36	9.13	3.92	42.84	30.94	5.81	9.85	4.23	46.25	33.40	6 27	Tenn.Ex.Sta.Bul.5,Vol.IV,'91	510
511	Stems of Cotton plant, young, *c*	10.06	4.91	0.81	35.01	45.13	4.08	5.45	0.90	38.93	50.18	4.54	. . . do	511
512	Empty bur or capsule of cotton plant, after cotton had been picked, *c* . .	11.92	6.96	1.38	39.90	32.50	7.34	7.84	1.57	45.36	36.90	8.33	. . . do	512
	STRAW.													
	Oat Straw:													
513	From Red Rust-proof Oats, crop '89, *c*	7.24	4.19	2.98	52.90	27.69	5.00	4.50	3.21	57.05	29.85	5.39	SC Ex Sta 2 An Rep. 1889, p. 141	513
514	From Georgia Grazing Oats, *b*	8.65	4.31	2.71	39.47	38.88	5.98	4.74	2.96	43.20	42.56	6.54	. . . do	514
515	From Red Rust-proof Oats, crop '88, *a*, *b*	8.55	3.06	1.66	44.96	35.86	5.91	3.38	1.82	49.13	39.21	6.46	. . . do	515
516	Unknown variety, *a*, *b*	8.10	3.94	1.63	41.80	38.91	5.62	4.31	1.78	45.45	42.34	6.12	. . . do	516

*Ash, less CO_2

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitrogen-free Extract	Fiber	Ash	Protein	Fat	Nitrogen-free Extract	Fiber	Ash		
	HAY AND OTHER DRIED COARSE FODDERS.—CONTINUED.													
	STRAW—continued.													
	Oat Straw—Continued:													
517	From Red Rust-proof Oats, crop '89, *b*	8.24	3.59	2.86	43.04	38.24	4.03	3.92	3.12	46.90	41.67	4.39	S.C.Ex.Sta.2nd Rept.1889, p.141	517
	All analyses (5) Maximum	8.65	4.31	2.98	52.90	38.91	5.98	4.74	3.21	57.05	42.56	6.54		
	All analyses (5) Minimum	7.24	3.06	1.63	39.47	27.69	4.03	3.38	1.78	43.20	29.85	4.39		
	All analyses (5) Average	**8.16**	**3.82**	**2.37**	**44.43**	**35.91**	**5.31**	**4.17**	**2.58**	**48.34**	**39.13**	**5.78**		
	Average of 12 American analyses of Oat Straw, Ex. Sta. Bul. 11, U. S.Dept. Agr., 1892	**9.22**	**3.95**	**2.31**	**42.36**	**37.03**	**5.13**	**4.40**	**2.50**	**46.80**	**40.70**	**5.60**		
	Rice Straw:													
518	No description, *a*, *c*	5.88	4.36	2.00	44.57	30.89	12.30	4.63	2.12	47.36	32.82	13.07	S C.Ex.Sta.2An.Rep.1889,p.144	518
519	Lowland straw	3.66	4.68	1.74	50.90	28.31	10.71	4.86	1.81	52.84	29.38	11.11	N. C. Ex. Sta. Rept. 1882, p. 91	519
520	No description, *a*	8.97	4.72	1.87	32.22	32.25	19.97	5.19	2.05	35.39	35.43	21.94	La. Ex. Sta. Bul. 9, 1887	520
521	Hand separated	9.02	4.69	1.91	37.74	33.19	13.45	5.15	2.10	41.49	36.48	14.78	N. C. Ex. Sta. Bul. 90b, 1893	521
522	No description	11.97	5.86	2.08	33.72	38.61	7.76	6.65	2.36	38.32	43.86	8.81	do	522
	All analyses (5) Maximum	11.97	5.86	2.08	50.90	38.61	19.97	6.65	2.36	52.84	43.86	21.94		
	All analyses (5) Minimum	3.66	4.36	1.74	32.22	28.31	7.76	4.63	1.81	35.39	29.38	8.81		
	All analyses (5) Average	**7.90**	**4.86**	**1.92**	**39.83**	**32.65**	**12.84**	**5.30**	**2.09**	**43.08**	**35.59**	**13.94**		
	Wheat Straw:													
523	No description	14.10	3.22	1.38	34.50	42.50	4.30	3.75	1.61	40.16	49.47	5.01	Ark Ex.Sta.1An.Rep.'88,p.131	523
	Cowpea Vine Straw:													
524	From Memphis, Tenn., *a*	9.55	8.75	1.55	44.80	29.20	6.15	9.68	1.71	49.53	32.28	6.80	Ark. Ex. Sta. Bul. 24, 1893	524
	Cowpea Vine Stems, Whip-poor-will Pea:													
525	Cut Sept. 14, *a*, *b*, *h*, *j*, *k*	11.00	6.11	0.87	37.98	38.39	5.65	6.87	0.98	42.67	43.13	6.35	do	525
	Cowpea Vine Leaves:													
526	Whip-poor-will Pea, cut Sept. 14, *a*, *b*, *h*, *j*, *k*	11.00	16.38	6.98	41.05	14.24	10.35	18.40	7.85	46.12	16.00	11.63	do	526
527	Cowpea Hulls, Whip-poor-will Pea: Cut Sept. 14, *a*, *b*, *h*, *j*, *k*	11.00	4.09	0.45	40.14	41.40	2.92	4.60	0.51	45.10	46.51	3.28	do	527

	Soja Bean Vine Straw:												
528	Peas removed, crop '88, *c*	5.72	4.00	0.80	36.20	49.41	3 87	4.25	0.85	38.18	52.62	4.10	S.C.Ex.Sta 2 An.Rept.1889,p179	528
	German Millet Straw:												
529	Cut when ripe and thrashed, about one-fourth of the seeds remaining with straw	14.22	2.55	0.94	32.77	45.87	3.65	2.96	1.10	38.21	53.47	4 26	Ky. Ex. Sta. Bul. 5, no date	529
	ROOTS, BULBS, TUBERS AND OTHER VEGETABLES.												
	Irish Potatoes (*Solanum tuberosum*):												
530	Early Rosè	74.63	2.68	1 17	19.78	0.98	0.76	10.56	4.61	77.97	3 86	3.00	Ala. Ex. Sta. Bul. 2, 1888	530
531	New Giant	83.59	2.84	1.36	10.32	0.98	0.91	17.31	8.29	62.88	5.97	5.55	. . . do	531
532	Sunlit Star	81.39	1.96	0.92	13.71	0.87	1.15	10.53	4.94	73.67	4.68	6.18	. . . do	532
533	White Star	75.18	2.62	1.94	18.59	0.78	0.89	10.56	7.84	74.90	3.14	3.59	. . . do	533
534	Pearl of Savoy	78.46	3.06	0.88	15.87	0.77	0.96	14.21	4.08	73.68	3.57	4.46	. . . do	534
535	Morning Star	80.17	3.06	0.83	14.28	0.56	1.10	15.43	4.19	72.01	2.82	5.55	. . . do	535
536	Thorburn	75.11	2.62	0.57	20.16	0.70	0 84	10.53	2.29	81.00	2.81	3 37	. . . do	536
537	Great Eastern	80 56	2.03	0.98	14.77	0.80	0.86	10.44	5.04	75.98	4.12	4.42	. . . do	537
538	Garfield	81.08	1.97	1.04	14.75	0.82	0.34	10.42	5.50	77.95	4.33	1.80	. . . do	538
	All analyses (9) Maximum	83 59	3.06	1.94	20.16	0.98	1.15	17.31	8.29	81.00	5.97	6.18		
	All analyses (9) Minimum	74.63	1.96	0.57	10.32	0.56	0.34	10.42	2.29	62.88	2.81	1.80		
	All analyses (9) Average	**78.91**	**2.54**	**1.08**	**15.80**	**0.80**	**0.87**	**12.22**	**5.20**	**74.45**	**3.92**	**4.21**		
	Average of 12 American analyses of Irish Potatoes, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**78.89**	**2.14**	**0 10**	**17.36**	**0.56**	**0.95**	**10.10**	**0.50**	**82.20**	**2.70**	**4.50**		
	Sweet Potatoes (*Batatas edulis*):												
539	Red Burmuda for stock feeding, *a*	61.25	3.44	0.52	32.78	1.01	1.00	8.89	1.34	84.60	2.60	2 57	Ala. Ex. Sta. Bul. 5, 1889	539
540	Shanghai or California Yam, *a, d, e*	65.35	1.37	0.64	30.28	0.98	1.38	3.95	1.85	87.40	2.83	3.97	Ark.Ex.Sta.3 An.Rep.'90,p.125	540
541	Red Nansemond, *a, d, e*	71 80	1.38	0.40	24.42	1.05	0.95	4.90	1.40	86.61	3.74	3.35	. . . do	541
542	Red Bermuda, *a, d, e*	69.76	1.05	0.42	26.85	0.92	1.00	3.45	1.39	88.80	3.05	3.31	. . . do	542
543	Southern Queen, *a, d, e*	70.00	0.98	0.32	26.47	1.15	1.08	3.25	1.08	88.23	3.83	3.61	. . . do	543
544	Yellow Yam, *a, d, e*	71.13	1.63	0.24	24.52	1.45	1.03	5.61	0.81	84.93	5.02	3.63	. . . do	544
545	Poplar Spanish, *a, d, e*	58.87	2.23	0.48	35.60	1.37	1.45	5.44	1.15	86.55	3.33	3 53	. . . do	545
546	Early Nansemond, *a, d, e*	75.66	1.16	0.29	21.00	0.96	0.93	4.75	1.17	86.33	3.94	3.81	. . . do	546
547	Early Jersey, *a, d, e*	75.65	1.29	0.32	20.70	1.07	0 97	5.31	1.33	84.97	4.39	4.00	. . . do	547
548	Early Jersey, *e*	71.26	1.90	0.29	23.98	1.38	1.19	6.60	1.02	83.44	4.80	4.14	Ga. Ex. Sta. Bul. 13, 1891	548
549	Southern Queen, *e*	70.40	1.48	0.30	25.08	1.52	1.22	5.03	1.00	84.72	5.13	4.12	. . . do	549
550	Georgia Yam, *e*	72.32	1.03	0.27	24.37	1.11	0.90	3.73	0.96	88.05	4.01	3.25	. . . do	550
551	Pumpkin Yam, *e*	73.26	1.27	0.22	23.26	1.10	0 89	4.72	0.84	86.99	4.11	3.34	. . . do	551
552	Poplar Root, *e*	71.60	1.16	0.30	25.06	1.03	0.85	4.08	1.04	88.24	3.63	3.01	. . . do	552
553	New Jersey, *h*	66.55	1.58	0.60	29.31	0.89	1.07	4.72	1 79	87.63	2.66	3 20	La. Ex. Sta. Bul. 13, 1892	553
554	Georgia Yam, *h*	65.03	2.49	1.32	29.34	0.80	1.02	7.12	3.77	83.91	2.29	2.91	. . . do	554
555	Pumpkin Yam, *h*	67.83	1.95	0.75	27.41	0.99	1.07	6.06	2.33	85.20	3.08	3.33	. . . do	555

ANALYSES OF SOUTHERN FEEDING STUFFS—Continued.

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitrogen-free Extract	Fiber	Ash	Protein	Fat	Nitrogen-free Extract	Fiber	Ash		
	ROOTS, BULBS, TUBERS & OTHER VEGETABLES.—Continued.													
	Sweet Potatoes—Continued:													
556	Vineless, *h*	63.55	1.36	0.64	32.43	0.85	1.17	3.73	1.76	88.97	2.33	3.21	La. Ex. Sta. Bul. 13, 1892	556
557	Delaware, *h*	69.45	2.08	1.29	25.24	0.71	1.23	6.81	4.22	82.63	2.32	4.02	. . . do	557
558	Spanish Yam, *h*	60.85	1.75	1.06	34.29	1.03	1.02	4.47	2.71	87.58	2.64	2.60	. . . do	558
559	Barbadoes, *h*	62.33	1.51	0.54	33.66	0.86	1.10	4.01	1.43	89.36	2.28	2.92	. . . do	559
560	Southern Queen, *h*	63.30	1.62	0.57	32.60	0.87	1.04	4.41	1.55	88.84	2.37	2.83	. . . do	560
561	Norton, *h*	61.43	1.71	0.72	33.97	1.09	1.08	4.43	1.86	88.08	2.83	2.80	. . . do	561
562	Shanghai or California, *h*	65.18	1.69	0.98	30.16	0.95	1.04	4.85	2.81	86.59	2.75	3.00	. . . do	562
563	Red Nansemond, *h*	63.46	1.47	0.73	32.05	0.98	1.31	4.02	2.00	87.72	2.68	3.58	. . . do	563
564	Sugar, *h*	58.46	1.71	0.63	37.14	0.96	1.10	4.11	1.54	89.39	2.31	2.65	. . . do	564
565	Peabody, *h*	66.06	1.41	0.62	30.08	0.74	1.09	4.15	1.82	88.64	2.18	3.21	. . . do	565
566	Dog River, *h*	67.00	1.00	0.74	29.00	1.05	1.21	3.03	2.24	87.85	3.18	3.70	. . . do	566
567	Georgia Bucks, *a*	73.31	1.20	0.30	23.24	0.77	1.18	4.51	1.13	87.05	2.89	4.42	S.C.Ex.Sta.1An.Rept,1888p.135	567
	Freshly dug Potatoes, taken during drouth:													
568	Pumpkin, *e, h*	69.19	2.62	1.09	23.97	1.55	1.58	8.51	3.53	77.81	5.03	5.12	Texas Ex. Sta. Bul 28, 1893	568
569	Norton	66.69	2.13	0.91	27.13	1.56	1.58	6.40	2.73	81.45	4.68	4.74	. . . do	569
570	Shanghai, *e, h*	75.44	2.56	0.69	18.82	1.05	1.44	10.43	2.81	76.63	4.27	5.86	. . . do	570
571	Delaware, *e, h*	78.26	2.07	0.64	17.06	1.21	0.76	9.52	2.94	78.40	5.65	3.49	. . . do	571
572	Peabody, *e, h*	79.04	2.21	0.55	15.38	1.69	1.13	10.55	2.62	73.38	8.06	5.39	. . . do	572
573	Early Golden, *e, h*	74.70	2.17	1.66	18.81	1.44	1.22	8.58	6.56	74.35	5.69	4.82	. . . do	573
574	Yellow Jersey, *e, h*	64.62	4.37	1.30	26.99	1.58	1.14	12.36	3.67	76.29	4.46	3.22	. . . do	574
575	Black Spanish, *e, h*	65.39	2.99	1.41	27.33	1.78	1.10	8.65	4.07	78.97	5.14	3.17	. . . do	575
576	Red Bermuda, *e, h*	75.81	2.39	1.03	18.62	0.92	1.23	9.88	4.26	76.98	3.80	5.08	. . . do	576
577	Extra Early Carolina, *e, h*	67.88	3.68	0.88	25.50	1.00	1.06	11.45	2.73	79.39	3.11	3.32	. . . do	577
578	Yellow Yam, *e, h*	58.85	3.56	1.25	33.42	1.69	1.23	8.66	3.03	81.22	4.10	2.99	. . . do	578
579	Southern Queen, *e, h*	61.58	1.02	0.71	34.42	1.13	1.14	2.65	1.84	89.60	2.95	2.96	. . . do	579
580	Tennessee, *e, h*	68.83	0.99	1.12	30.40	0.80	0.86	2.90	3.28	88.98	2.34	2.50	. . . do	580
581	Negro Choker, *e, h*	68.23	1.71	1.23	26.67	0.81	1.35	5.38	3.87	83.97	2.53	4.25	. . . do	581
582	Brazilian, *e, h*	67.23	1.63	1.00	28.31	0.71	1.13	4.97	3.05	86.39	2.15	3.44	. . . do	582
583	Vineless, *e, h*	75.32	2.72	0.94	19.16	0.76	1.10	11.02	3.82	77.64	3.07	4.45	. . . do	583
584	Nansemond, *e, h*	74.81	2.17	1.02	22.72	1.35	0.93	7.76	3.62	80.60	4.79	3.29	. . . do	584
585	Early Bunch Yam, *e, h*	75.23	2.87	0.84	20.82	1.20	1.04	10.73	3.14	77.77	4.18	3.88	. . . do	585

586	Bunch Yam, *c, h*	68.85	2.91	0.98	24.87	1.37	1.02	9.34	3.15	79.86	4.39	3.26	. . . do . . . 586
	All analyses (48) Maximum	79.04	4.37	1.66	37.14	1.78	1.58	12.36	6.56	89.60	8.06	5.86	
	All analyses (48) Minimum	58.46	0.98	0.22	15.38	0.71	0.76	2.65	0.81	73.38	2.15	2.50	
	All analyses (48) Average	**68.34**	**1.93**	**0.74**	**26.76**	**1.11**	**1.12**	**6.25**	**2.37**	**84.15**	**3.62**	**3.61**	
	Average of 6 American analyses of Sweet Potatoes, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**71.07**	**1.49**	**0.37**	**24.78**	**1.27**	**1.02**	**5.20**	**1.40**	**86.30**	**3.60**	**3.50**	
	Mangolds (*Beta vulgaris, Mangel-wurtzel*)												
587	No description	92.54	1.41	0.06	4.26	0.76	0.97	18.95	0.83	57.12	10.19	12.91	S.C.Ex.Sta.7 An.Rept.1894,p.11 587
588	do	91.07	1.14	0.06	5.98	0.85	0.90	12.74	0.75	66.96	9.49	10.06	. . . do . . . 588
589	do	90.82	1.27	0.06	6.12	0.77	0.96	13.79	0.65	66.69	8.41	10.46	. . . do . . . 589
590	do	91.90	1.47	0.08	4.84	0.76	0.95	18.16	0.99	59.69	9.44	11.72	. . . do . . . 590
591	do	92.41	1.28	0.06	4.67	0.72	0.86	16.90	0.73	61.50	9.49	11.38	. . . do . . . 591
	All analyses (5) Maximum	92.54	1.47	0.08	6.12	0.85	0.97	18.95	0.99	66.96	10.19	12.91	
	All analyses (5) Minimum	90.82	1.14	0.06	4.26	0.72	0.86	12.74	0.65	57.20	8.41	10.06	
	All analyses (5) Average	**91.75**	**1.31**	**0.06**	**5.18**	**0.77**	**0.93**	**16.11**	**0.79**	**62.39**	**9.40**	**11.31**	
	Average of 9 American analyses of Mangolds, from Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**90.85**	**1.39**	**0.16**	**5.68**	**0.87**	**1.05**	**15.20**	**1.70**	**62.10**	**9.50**	**11.50**	
	Sugar Beets:												
592	Taken from pits in spring	88.77	2.04	0.09	6.99	0.89	1.22	18.19	0.76	62.25	7.89	10.91	Ky. Ex. Sta. Bul. 5, no date . . 592
	Cabbages:												
593	Collards, fed during Feb. and March, *a*	85.76	5.75	0.75	4.38	1.81	1.55	40.34	5.26	30.77	12.73	10.90	Ala. Ex. Sta. Bul. 5, '89, p. 48 593
	Tomatoes:												
594	Trophy, picked Sept. 9, ripe, *h*	93.34	1.04	0.47	3.65	1.16	0.34	15.68	7.05	54.80	17.40	5.07	Va. Ex. Sta. Bul. 4, 1890 . . . 594
	Okra Pods:												
595	No description	6.00	4.75	0.79	32.86	47.60	8.00	5.05	0.84	34.97	50.63	8.51	N. C. Ex. Sta. Bul. 90b, 1893 . . 595
	FRUITS AND MELONS.												
	Strawberries:												
596	Indiana, picked May 21*	91.51	1.04	0.54	5.02	1.27	0.62	12.17	6.46	59.25	14.90	7.22	Tenn. Ex. Sta. Bul. 4, Vol. II, '89 596
597	Jumbo, picked May 21*	90.83	0.96	0.60	5.69	1.37	0.55	10.41	6.60	62.06	14.92	6.01	. . . do . . . 597
598	May King, picked May 22*	90.13	1.10	0.62	6.06	1.43	0.66	11.19	6.26	61.40	14.41	6.74	. . . do . . . 598
599	Agriculturist, picked May 22*	91.25	0.98	0.62	5.40	1.17	0.58	11.17	7.07	61.64	13.46	6.66	. . . do . . . 599
600	Cornelia, picked May 23*	90.42	0.94	0.48	6.00	1.53	0.63	9.83	4.97	62.58	16.06	6.56	. . . do . . . 600
601	Legal Tender, picked 23*	90.29	0.99	0.62	6.16	1.33	0.61	10.17	6.41	63.38	13.71	6.33	. . . do . . . 601
602	Bidwell, picked May 24*	89.43	1.24	0.85	5.82	1.99	0.67	11.66	8.07	55.06	18.80	6.41	. . . do . . . 602
603	Primo, picked May 24*	89.98	1.09	0.68	5.88	1.68	0.69	10.88	6.92	58.57	16.77	6.86	. . . do . . . 603
604	Nameless, picked May 25*	92.43	0.76	0.63	4.28	1.46	0.44	9.99	8.31	56.74	19.17	5.79	. . . do . . . 604
605	Mrs. Garfield, picked May 25*	91.22	0.95	0.56	5.41	1.28	0.58	10.76	6.44	61.73	14.52	6.55	. . . do . . . 605

*In *loc. cit.*, sugars and free acid given.

ANALYSES OF SOUTHERN FEEDING STUFFS—Continued.

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitrogen-free Extract	Fiber	Ash	Protein	Fat	Nitrogen-free Extract	Fiber	Ash		
	FRUITS AND MELONS.—CONTINUED.													
	Strawberries—Continued:													
606	Kentucky, picked May 25*	87.72	1.01	0.92	7.99	1.64	0.72	8.24	7.39	65.04	13.41	5.92	Tenn. Ex. Sta. Bul. 4, Vol. II, '89	606
607	Jucunda, picked May 25*	90.44	1.10	0.80	4.67	2.26	0.73	11.30	8.38	48.99	23.71	7.62	. . . do	607
608	Perry Seedling, picked May 27*	89.71	1.11	0.50	6.06	1.80	0.82	10.76	4.99	58.84	17.46	7.95	. . . do	608
609	Boone, picked May 27*	91.35	0.88	0.79	4.31	1.97	0.70	10.16	9 12	49.94	22.71	8.07	. . . do	609
610	Manchester, picked May 28*	91.05	0.99	0.43	5.86	1.30	0.37	10.98	4.81	65.52	14.53	4.16	. . . do	610
	All analyses (15) Maximum	92 43	1.24	0.92	7.99	2 26	0.82	12.17	9.12	65.52	23.71	8.07		
	All analyses (15) Minimum	87.72	0.76	0.43	4.28	1.17	0.37	8 24	4.81	48.99	13.41	4.16		
	All analyses (15) Average	**90.52**	**1.01**	**0.64**	**5.64**	**1.57**	**0.62**	**10.65**	**6.81**	**59.38**	**16.57**	**6.59**		
	Average of 19 American Analyses of Strawberries, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**90 84**	**0.95**	**0.68**	**5.50**	**1.43**	**0.60**	**10.40**	**7.40**	**60.10**	**15.60**	**6.50**		
	GRAIN AND OTHER SEEDS.													
	Corn (maize) Kernels:													
	Dent varieties:													
611	White Dent, *c*	9.85	9.63	4 27	73.16	1.58	1.51	10.68	4.74	81.16	1.75	1.67	S. C. Ex. Sta. 2 An. Rep. '89, p. 157	611
612	do *b*	9.95	9.63	4.68	72.36	1.75	1.63	10.68	5.17	80.39	1 95	1.81	. . . do	612
613	do	10.30	9.44	4.40	72.21	1.68	1.97	10.50	4.90	80.53	1.87	2.20	. . . do	613
614	do	13.24	9.94	4.32	69.74	1.46	1.30	11.45	4.98	80.38	1.69	1.50	. . . do	614
515	do	14.90	8.69	4.66	69 12	1.39	1.24	10.21	5.48	81.22	1.63	1.46	. . . do	615
616	do	14.26	8.94	5.40	68.71	1.30	1.39	10.44	6.30	80.12	1.52	1.62	. . . do	616
617	do	13.46	8.38	5.30	70.15	1.33	1.38	9.70	6.12	81.05	1.54	1.59	. . . do	617
618	do *b*	13.70	8.50	4.55	70.47	1.53	1.25	9.85	5.27	81.66	1.77	1.45	. . . do	618
	Average of 8 Dent varieties	**12.46**	**9.14**	**4.70**	**70.74**	**1.50**	**1.46**	**10 44**	**5.37**	**80.81**	**1.72**	**1.66**		
	Average of 86 American analyses of White Dent Corn Grain, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**10 56**	**10 25**	**5.02**	**70 40**	**2.24**	**1.53**	**11.50**	**5.60**	**78.60**	**2.60**	**1.70**		

*In *loc. cit.*, sugars and free acid given.

	Unclassified varieties:													
619	Variety not stated	14.15	10.36	3.79	68.82	1.68	1.20	12.07	4.41	80.17	1.96	1.39	Ala. Ex. Sta. Bul. 25, 1891	619
620	Variety not stated, *h*, *i*, *j*	10.15	9.86	4.93	71.33	2.11	1.62	10.97	5.49	79.39	2.34	1.81	Ga. Ex. Sta. Bul. 17, 1892	620
621	Corn grown in Ga. from Ky. seed	11.75	9.29	4.52	70.99	1.85	1.60	10.52	5.12	80.46	2.09	1.81	Texas Ex. Sta. Bul. 15, 1891	621
622	Corn grown in Ga. from Texas seed	12.02	10.18	5.20	69.40	1.82	1.38	11.57	5.91	78.87	2.08	1.57	do	622
623	Corn grown in Ga. from Ga. seed	12.32	10.18	5.05	69.16	1.80	1.49	11.62	5.76	78.90	2.07	1.65	do	623
624	Flat grain, white corn, Fannin Co	10.34	9.97	5.38	71.18	1.80	1.33	11.13	6.00	79.38	2.01	1.48	Texas Ex. Sta. Bul. 20, 1892	624
625	Red corn, Concho Valley	10.27	10.44	5.82	70.35	1.96	1.16	11.64	6.49	78.40	2.18	1.29	do	625
626	White corn, do	11.78	10.18	5.00	69.76	1.92	1.36	11 54	5 68	79.06	2.18	1.54	do	626
627	White corn, Ellis Co	9.69	11.18	3.94	71.77	2.02	1.40	12 38	4.36	79.47	2.24	1.55	do	627
628	White corn, Hopkins Co	9.79	10.12	5.26	70.87	2.62	1.34	11.22	5.84	78.56	2.90	1.48	do	628
629	White corn, Early Flower, Hopkins Co	10.54	10.12	4.62	71.27	2.15	1.30	11.32	5.17	79.64	2.41	1.46	do	629
630	White corn, Free Milling, Kaufman Co	10.14	8.82	3.82	73.56	2.42	1.24	9.81	4.25	81.87	2.69	1.38	do	630
631	Yellow corn, Fannin Co	10.48	10.31	5.68	70.24	1.85	1.44	11.52	6.34	78.46	2.07	1.61	do	631
632	Yellow corn, Red River Co	9.73	10.42	4.09	72.52	1.94	1 30	11.54	4.53	80.34	2.15	1.44	do	632
633	Yellow corn, Ellis Co	9.47	10.36	4.19	72.64	2.00	1.34	11.45	4.63	80.23	2.21	1.48	do	633
634	Strawberry corn, Red River Co	10.63	10.12	5 55	70 03	2.23	1.44	11.32	6.21	78.36	2.50	1.61	do	634
635	Strawberry corn, Concho Valley	12.22	7.60	4.90	71.63	2.08	1.57	8.66	5.58	81.59	2.38	1.79	do	635
636	Hickory, Kaufman Co	11.82	9.50	4.74	70.70	1.94	1.30	10.77	5.38	80.18	2.20	1.47	do	636
637	Jeff Welborn's Conscience corn	10.85	9.19	5.66	71.44	1.73	1.13	10.30	6.35	80.14	1.94	1.27	do	637
638	Laming's Improved Early corn	9.85	12.00	4.44	70.16	2.01	1.54	13.32	4.92	77.82	2.23	1.71	do	638
639	Aboriginal corn, El Paso Co	10.29	10.93	6.50	69.01	1.76	1.51	12.18	7.24	76.94	1.96	1.68	do	639
640	"Brazilian flour corn," no descripti'n	13.28	10.88	2.49	68.56	1.96	2.83	12.55	2.87	79.06	2.26	3.26	Ga. Ex. Sta. Bul. 13, 1891	640
	All analyses (29), excluding No. 640. Maximum	14.90	12.00	6.50	73.56	2.62	1.97	13.32	7.24	81.87	2.90	2.20		
	All analyses (29), excluding No. 640. Minimum	9.47	7.60	3.79	68.71	1.30	1.13	8.66	4.25	76.94	1.52	1.27		
	All analyses (29), excluding No. 640. Average	**11.31**	**9.80**	**4.85**	**70.79**	**1.85**	**1.40**	**11.05**	**5.47**	**79.82**	**2 08**	**1.58**		
	Average of 208 American analyses of all varieties of Corn (maize) Kernels, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**10 89**	**10.49**	**5.35**	**69.70**	**2.05**	**1.52**	**11.70**	**6.10**	**78.10**	**2.40**	**1.70**		
	Oats:													
641	Variety not stated	10.55	14.41	4.67	56.80	10.45	3.12	16.10	5.21	63 50	11.70	3.49	Ala. Ex. Sta. Bul. 25, 1891	641
642	Red Rust-proof Oats, crop '89, *c*	9.64	9.94	5.50	62.61	9.78	2.53	11.00	6.08	69.30	10.82	2.80	S.C. Ex. Sta. 2 Rep. '89, p. 140	642
643	Georgia Grazing Oats, *b*	9.31	10.81	6.47	61.17	9.34	2.90	11.94	7.13	67.43	10.30	3.20	do	643
644	Red Rust-proof Oats, crop '88, *a*, *b*	9.35	11.94	5.13	62.39	8.80	2 59	13 19	5.66	68.80	9.71	2.64	do	644
645	do '89, *b*	10.02	12.50	5.33	57.10	12.37	2.68	13.88	5.92	63.47	13.75	2.98	do	645
646	White Oats, Clay Co	9.10	11.06	6.00	55.89	13.74	4.21	12.17	6.60	61.49	15.11	4.63	Texas Ex. Sta. Bul. 20, 1892	646
647	White Oats, Ellis Co	9.59	9.56	6.35	56.36	13.73	4.41	10.57	7.02	62.34	15.19	4.88	do	647
648	White Oats, Amarillo Co	9.72	12.89	4.76	53.88	14.41	4.34	14.27	5 27	59.70	15.98	4.80	do	648
659	Red Oats, Amarillo Co	9.21	11.50	5.96	55.94	13.03	4.36	12.67	6 56	61.61	14.36	4.80	do	6 9
650	Red Oats, Fannin Co	10.22	8.81	5.74	58.02	12.75	4 46	9.81	6.39	64.63	14.20	4.97	do	650
651	Oats, Red River Co	9.91	9.69	5.79	59.39	11.64	3.58	10.75	6.43	65.93	12.92	3.97	do	651
652	Red Rust-proof, Pecos Co	8.89	7.81	5.89	59.09	13.42	4.90	8.58	6.47	64.85	14.73	5.37	do	652

ANALYSES OF SOUTHERN FEEDING STUFFS—Continued.

		Fresh or Air-Dry Material.						Water-Free Substance.					
		Water	Protein	Fat	Nitrogen-free Extract	Fiber	Ash	Protein	Fat	Nitrogen-free Extract	Fiber	Ash	REFERENCES.
	GRAIN AND OTHER SEEDS.—CONTINUED.												
	Oats—Continued:												
653	Red Rust-proof, Fannin Co	10.19	11.25	5.49	57.69	11.58	3.80	12.53	6.11	64.23	12.90	4.23	Texas Ex. Sta. Bul. 20, 1892 . 653
	All analyses (13) Maximum	10.55	14.41	6.47	62.61	14.41	4.90	16.10	7.13	69.30	15.96	5.37	
	All analyses (13) Minimum	8.89	7.81	4.67	53.88	8.80	2.39	8.58	5.21	59.70	9.71	2.64	
	All analyses (13) Average	**9.67**	**10.94**	**5.62**	**58.18**	**11.93**	**3.66**	**12.11**	**6.22**	**64.41**	**13.20**	**4.06**	
	Average of 29 American analyses of Oats, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**10.98**	**11.80**	**4.96**	**59.74**	**9.54**	**2.98**	**13.20**	**5.60**	**67.00**	**10.80**	**3.40**	
	Barley:												
654	From Pecos Co	10.10	10.06	2.48	67.24	6.18	3.94	11.19	2.76	74.80	6.87	4.38	Texas Ex. Sta Bul. 20, 1892 . 654
655	From Amarillo Co	10.14	12.19	2.08	65.15	7.04	3.40	13.57	2.31	72.51	7.83	3.78	. . . do . . . 655
656	From Menard Co	6.26	11.87	1.52	71.59	5.92	2.84	12.66	1.62	76.37	6.32	3.03	. . . do . . . 656
657	From Clay Co	10.53	10.62	2.43	68.80	4.98	2.64	11.87	2.71	76.90	5.56	2.96	. . . do . . . 657
658	From Ellis Co	10.87	12.37	2.27	61.65	7.28	5.56	13.88	2.54	69.17	8.17	6.24	. . . do . . . 658
	All analyses (5) Maximum	10.87	12.37	2.48	71.59	7.28	5.56	13.88	2.76	76.90	8.17	6.24	
	All analyses (5) Minimum	6.26	10.06	1.52	61.65	4.98	2.64	11.19	1.62	69.17	5.56	2.96	
	All analyses (5) Average	**9.58**	**11.42**	**2.15**	**66.89**	**6.28**	**3.68**	**12.63**	**2.39**	**73.95**	**6.95**	**4.08**	
	Average of 10 American Analyses of Barley, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**10.85**	**12.37**	**1.84**	**69.79**	**2.74**	**2.41**	**13.90**	**2.09**	**78.40**	**3.09**	**2.70**	
	Rye:												
659	From Pecos Co	7.47	10.43	2.15	75.00	2.50	2.45	11.27	2.32	81.06	2.70	2.65	Texas Ex. Sta. Bul. 20, 1892 . 659
660	From Amarillo Co	11.21	14.00	2.18	67.72	2.64	2.25	15.76	2.45	76.29	2.97	2.53	. . . do . . . 660
661	From Menard Co	10.20	13.87	1.77	69.49	2.88	1.79	15.45	1.97	77.37	3.21	2.00	. . . do . . . 661
	Average	**9.63**	**12.77**	**2.03**	**70.74**	**2.67**	**2.16**	**14.16**	**2.25**	**78.24**	**2.96**	**2.39**	
	Average of 6 American analyses of Rye, from Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**11.59**	**10.58**	**1.66**	**72.64**	**1.67**	**1.86**	**11.99**	**1.90**	**82.20**	**1.90**	**2.10**	

	Sorghum Seed:												
662	Chicken Corn Seed	14.87	10.62	2.65	58.86	8.70	4.30	12.47	3.11	69.15	10.22	5.05	Miss. Ex. Sta. Bul. 8, 1889	662
	Wheat:													
663	Mediterranean, Ellis Co	10.66	13.33	2.15	69.51	2.36	1.99	14.92	2.40	77.81	2.64	2.23	Texas Ex. Sta. Bul. 20, 1892	663
664	Mediterranean, Clay Co	7.97	12.31	1.90	73.32	2.81	1.69	13.38	2.06	79.67	3.05	1.84	. . . do	664
665	Mediterranean, Hopkins Co	11.43	12.25	2.05	69.65	3.02	1.60	13.83	2.31	78.64	3.41	1.81	. . . do	665
666	Mediterranean, Pecos Co	10.15	11.62	2.46	71.18	2.54	2.05	12.93	2.74	79.22	2.83	2.28	. . . do	666
667	Red Wheat, Concho Co	8.87	17.56	1.84	67.06	2.73	1.94	19.26	2.02	73.59	3.00	2.13	. . . do	667
668	Red Chaff Wheat, Hopkins Co	10.98	12.43	2.28	69.73	2.66	1.92	13.96	2.56	78.33	2.99	2.16	. . . do	668
669	May Wheat, Hopkins Co	12.01	12.31	2.36	69.08	2.41	1.83	14.00	2.68	78.50	2.74	2.08	. . . do	669
670	Swamp Wheat, Fannin Co	10.41	12.81	2.01	70.79	2.46	1.52	14.30	2.24	79.01	2.75	1.70	. . . do	670
671	Blue-bearded Wheat	10.78	11.56	2.35	70.81	2.54	1.96	12.96	2.65	79.35	2.84	2.20	. . . do	671
672	Chinella Wheat, El Paso Co	10.19	12.12	1.95	71.53	2.24	1.97	13.49	2.17	79.66	2 49	2.19	. . . do	672
673	Sonora Wheat, Pecos Co	10.40	9.93	2.45	72.66	2.60	1.96	11.08	2.73	81.10	2.90	2.19	. . . do	673
	All analyses (11) Maximum	12.01	17.56	2.46	73.32	3.02	2.05	19.26	2.74	81.10	3.41	2.28		
	All analyses (11) Minimum	7.97	9.93	1.84	67.06	2.24	1.52	11.08	2.02	73.59	2.49	1.70		
	All analyses (11) Average	10.35	12.57	2.16	70.48	2.58	1.86	14.01	2.41	78.63	2.88	2 07		
	Average of 310 American analyses of Wheat, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	10.52	11.87	2.09	71 90	1.79	1.83	13.30	2.30	80 40	2.00	2.00		
	Rice:													
	Cleaned and ready for market:													
674	Bought on market, *a*, *c*	12.13	8.31	0.27	78 69	0.18	0.42	9.44	0.31	89.57	0.21	0.47	S C.Ex Sta.2An Rept.1889,p.144	674
675	Clean Rice, *a*	12.85	7.52	0.88	78.05	0.47	0.73	8.63	0.44	89.55	0.54	0.84	La. Ex. Sta. Bul. 24, no date	675
	Average	12 49	7.91	0.33	78.37	0 33	0.57	9.04	0.37	89.56	0.37	0.66		
	Average of 10 American analyses of Rice, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	12.44	7.44	0 35	79.20	0.19	0.38	8.50	0 40	90.50	0 20	0.40		
	Rough Rice:													
676	No description, *a*	10.95	7.44	2.58	64.30	9.28	5.45	8.24	2.88	72.34	10.42	6.12	. . . do	676
677	Georgetown, S. C., *a*, *c*	11.34	7.25	1.51	68.89	6.74	4.27	8.19	1.70	77.70	7 60	4.81	S C.Ex.Sta. 2 An.Rept '89, p.144	677
	Average	11.15	7.34	2.04	66.60	8.01	4.86	8.21	2.29	75.02	9.01	5.47		
678	Rice from the stones, *a*	12.12	8.09	2.10	72.11	3.03	2.55	9.21	2.39	82.05	3 45	2.90	La. Ex. Sta. Bul. 24, no date	678
679	Pounded Rice, *a*	12.42	8.14	2.50	72.01	2.55	2.38	9.29	2 85	32.23	2.91	2.72	. . . do	679
680	Rice from cooling floor, *a*	12.75	7.74	1.05	76.92	0.72	0.82	8.88	1.23	88.13	0.82	0.94	. . . do	680
681	Rice grain, no description, *a*	7.86	9.75	2.00	77.40	1.50	1.49	10.58	2.17	84.00	1.63	1.62	N. C. Ex Sta. Bul. 90b, 1893	681

ANALYSES OF SOUTHERN FEEDING STUFFS—Continued.

		Fresh or Air-Dry Material.						Water-Free Substance.					
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash	REFERENCES.
	GRAIN AND OTHER SEEDS.—CONTINUED.												
	Cowpeas:												
682	Clay pea, *a*	13.96	21.03	1.29	55.43	5.35	2.94	24.43	1.50	64 43	6.22	3.42	Ala. Ex. Sta. Bul. 5, 1889 . . 682
683	Whip-poor-wil pea, Aug. 20, *a, b, h, j, k*	11.00	28.75	0.97	49.50	6 03	3.75	32 30	1.09	55.62	6.78	4.21	Ark. Ex. Sta. Bul. 24, 1893 . . . 683
684	Whip-poor-will pea, Aug. 26, *a, b, h, j, k*	11.00	25.70	1 01	53.13	5.54	3.62	28.88	1.13	59.70	6.22	4.07	Ark. Ex. Sta. Bul. 24, 1893 . . . 684
685	Whip-poor-will pea, Sept. 8, *a, b, h, j, k*	11.00	23.29	1.16	56.61	4.89	3.05	26.16	1.31	63.61	5.49	3.43	. . . do 685
686	Whip-poor-will pea, cut Sept. 14, *a, b, h, j, k*	11.00	23.38	1.32	56.48	4.79	3.03	26.27	1.48	63.46	5.38	3.41	. . . do 686
687	Whip-poor-will pea, cut Sept. 14, *a, b, h, j, k*	11.00	22.88	1.29	57.00	4 75	3.08	25.71	1.45	64.04	5.34	3.46	. . . do 687
688	Variety not given, *h, i, j*	12 84	21.94	1.76	55.37	5.16	2.93	25.17	2.02	63.53	5.92	3.36	Ga. Ex. Sta. Bul. 17, 1892 . . . 688
689	Black cowpea, fresh seeds	20.85	20.08	1.28	50.51	4.34	2.94	25.37	1.62	63.81	5.48	3.72	N. C. Ex. Sta Rep. 1879, p. 113 689
690	Yellow cowpea, fresh seeds, *c*	19.20	23.02	1.37	48.07	5.03	3.31	28.50	1.68	59 49	6.23	4.10	. . . do 690
691	No description, crop '88, *a*	12.26	22.78	1.24	56.00	4.13	3.59	25.96	1.41	63.83	4.71	4.09	S. C. Ex. Sta. 2 An. Rept. 1889, p. 178 691
692	White brown-eye	10.85	25.43	1.93	55.11	3.24	3.44	28.53	2.16	61.82	3.63	3.86	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96 692
693	Clay pea	10.62	25.00	1.59	55.55	3.82	3.42	27.97	1.78	62.15	4.27	3.83	. . . do 693
694	White Crowder	11.82	24.25	1.88	55.23	3.46	3.36	27.50	2.13	62.64	3.92	3.81	. . . do 694
695	Lady	11.40	26.06	1.79	54.66	2.68	3.41	29.42	2.02	61.69	3.02	3.85	. . . do 695
696	Unknown	10.51	26.39	1.52	53.61	4.18	3.79	29.49	1.70	59.90	4.67	4.24	. . . do 696
697	Red Ripper	10.18	25.98	1.71	54.85	3.70	3.58	28.92	1.90	61.07	4.12	3 99	. . . do 697
698	Wonderful	10.20	25.88	1.59	54.55	4.13	3.65	28.82	1.77	60.75	4.60	4.06	. . . do 698
699	Whip-poor-will	11.36	24.05	1.47	55.60	4.12	3.40	27.13	1.66	62.72	4.65	3.84	. . . do 699
700	Black Pea	10.22	24.44	2.01	56.06	3.79	3.48	27.22	2.24	62.44	4.22	3.88	. . . do 700
	All analyses (19) Maximum	20.85	28.75	2.01	57.00	6.03	3.79	32.30	2.24	64.43	6.78	4.24	
	All analyses (19) Minimum	10.18	20.08	0.97	48.07	2.68	2.93	24.43	1.09	55.62	3.02	3.36	
	All analyses (19) Average	**12.17**	**24.23**	**1.48**	**54.39**	**4.38**	**3.35**	**27.57**	**1.69**	**61.93**	**4.99**	**3.82**	
	Average of 5 American analyses of Cowpea, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**14.81**	**20.75**	**1.44**	**55.72**	**4.06**	**3.22**	**24.30**	**1.70**	**65.50**	**4.70**	**3.80**	
	Peanuts (*Arachis hypogæa*):												
701	Ground pea, hulls removed, Va. variety, *a*	7.02	26.70	42.59	19.38	2.49	1.82	28.70	45.78	20.85	2.69	1.98	Ala. Ex. Sta. Bul. 5, 1889. . . 701

702	Spanish Peanut, kernel of fruit, * .	13.15	27.95	35.76	17.74	3.04	2.36	32.18	41.17	20.43	3.50	2.72	Ga. Ex. Sta. Bul. 13, 1891 . . .	702
703	Georgia Peanut . . . . . do†	12.85	26.57	37.59	19.05	2.04	1.90	30.49	43.13	21.86	2.34	2.18	. . . do	703
704	Kernel of fruit, no description . . .	4.87	29.07	48.79	12.42	2.93	1.90	30.57	51.29	12.97	3.18	1.99	N. C. Ex. Sta. Bul. 90b, 1893 . .	704
705	Kernel of fruit, recleaned white, *c*, *i*, *j*	3.87	27.55	47.44	16.56	2.28	2.30	28.65	49.35	17.23	2.37	2.40	Tenn. Ex. Sta. Bul. 2, Vol. IV, '91	705
706	Kernel of fruit, farmer's stock white, *c*, *i*, *j*	4.86	25.75	46.24	18.36	2.40	2.39	27.07	48.60	19.30	2.52	2.51	. . . do	706
	All analyses (6) { Maximum . .	13.15	29.07	48.79	19.38	3.04	2.39	32.18	51.29	21.86	3.50	2.72		
	Minimum . .	3.87	25.75	35.76	12.42	2.04	1.82	27.07	41.17	12.97	2.34	1.98		
	Average . . .	7.77	27.27	43.07	17.25	2.53	2.11	29.61	46.55	18.77	2.77	2.39		
	Soja Bean (*Soja hispida*):													
707	Not described, *h*, *i*, *j*	8.32	35.24	20.48	25.86	4.84	5.26	38.44	22.34	28.21	5.28	5.73	Ga. Ex. Sta. Bul. 17, 1892 . .	707
708	Yellow bean, variety pallida	10.13	34.63	17.98	30.50	3.69	3.07	38.53	20.02	33.94	4.10	3.41	N. C. Ex. Sta. Rept., 1882, p. 121	708
709	Not described, *a*	10.00	35.25	16.89	30.69	2.45	4.72	39.17	18.77	34.10	2.72	5.24	S.C. Ex. Sta. 1An. Rept. 1888, p. 135	709
	Average	9.48	35.04	18.45	29.02	3.66	4.35	38.72	20.38	32.08	4.03	4.79		
	Average of 8 American analyses of Soja Bean, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	10.80	33.98	16.85	28.89	4.79	4.69	38.10	19.60	32.20	5.40	5.30		
	Velvet Bean:													
710	No description, *a*, *h*	11.93	18.81	6.29	53.50	7.45	2.02	21.36	7.14	60.75	8.46	2.29	Fla. Ex. Sta. Bul. 35, 1896 . .	710
	Cotton Seed, raw:													
711	Variety not given	10.11	7.40	20.77	33.21	24.61	3.90	8.23	23.11	36.95	27.37	4.34	Ala. Ex. Sta. Bul. 25, 1891 . .	711
712	No description *a*, *d*, *e*	17.51	14.48	19.38	25.43	20.30	2.90	17.56	23.50	30.81	24.61	3.52	N.C. Ex. Sta. Bul. 87d, 1892 . .	712
713	No description, *c*	7.04	19.18	21.62	26.44	22.43	3.29	20.61	23.26	28.47	24.13	3.53	Tenn. Ex. Sta. Bul. 5, Vol. IV, '91	713
714	No description	9.99	21.70	18.92	17.31	28.74	3.34	24.11	21.02	19.23	31.93	3.71	Texas Ex. Sta. Bul. 6, 1889 . .	714
	Average, excluding No. 711	11.52	18.45	19.97	23.06	23.82	3.18	20.76	22.59	26.17	26.89	3.59		
	Average of 25 analyses of Cotton Seed compiled from various sources by ourselves	9.92	19.38	19.45	23.94	22.57	4.74	21.52	21.59	26.58	25.05	5.26		
	Cotton Seed, cooked:													
	Roasted cottonseed:													
715	No description, *a*, *d*, *e*	9.32	16.09	22.48	25.82	24.03	2.26	17.75	24.80	28.44	26.51	2.50	N. C. Ex. Sta. Bul. 87d, 1892 . .	715
716	No description	2.92	17.75	32.70	21.10	16.81	8.72	18.26	33.70	21.74	17.32	8.98	Texas Ex. Sta. Bul. 15, 1891	716
	"Cooked cottonseed":													
717	Probably boiled	54.08	10.41	9.41	12.82	10.61	2.67	22.67	20.50	27.92	23.10	5.81	Miss. Ex. Sta. Bul. 8, 1889 . .	717
	Kernels of cottonseed:													
718	Separated by hand, short staple, *c* .	6.27	29.25	36.55	19.52	4.38	4.03	31.21	39.00	20.82	4.67	4.30	N. C. Ex. Sta. Dept. 1882, p. 91	718
719	No description	6.04	33.06	36.58	15.81	3.09	5.42	35.18	38.94	16.83	3.29	5.76	Tenn. Ex. Sta. Bul. 3, Vol. II, '89	719
720	English Blue-grass Seed	8.87	12.75	1.47	51.49	19.75	5.67	13.99	1.62	56.50	21.67	6.22	Ky. Ex. Sta. 1 An. Rept. 1889-90, p. 15	720
	Okra Seed:													
721	No description	7.06	21.25	15.12	24.41	26.35	5.81	22.86	16.26	26.28	28.35	6.25	. . . do	721

*Hulls, 22 per cent.; kernels, 78 per cent. †Hulls, 27 per cent.; kernels, 73 per cent.

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash		
	GRAIN AND OTHER SEEDS.—CONTINUED.													
	Sunflower Seed; kernels:													
722	Mammoth Russian, hulls removed	6.90	29.37	43.92	13.00	2.65	4.16	31.54	47.17	13.98	2.84	4.47	N. C. Ex. Sta. Bul. 90b, 1893	722
723	Black Giant	6.85	31.56	41.75	15.94	2.50	1.40	33.89	44 82	17.11	2.68	1.50	N. C. Ex. Sta. Bul. 90b, 1893	723
	Average	**6 88**	**30.46**	**42.84**	**14.47**	**2.57**	**2.78**	**32.71**	**46.00**	**15.54**	**2.76**	**2.99**		
	MILL PRODUCTS.													
	MILL PRODUCTS FROM CORN (MAIZE).													
	Corn (maize) Meal. Unbolted:													
724	Not described	12.07	8.42	4.47	71.74	2.05	1.25	9.57	5.08	81.60	2.33	1.42	Ark. Ex. Sta. 1AnRep.'88,p.133	724
725	do	12.47	7.37	3.35	72.81	2.44	1.56	8.42	3.83	83.18	2.79	1.78	N. C. Ex. Sta. Bul. 90b, 1893	725
726	do *a*	12.68	8.81	4.39	71.25	1.55	1.32	10.08	5.03	81.60	1.78	1.51	N. C. Ex. Sta. Bul. 97, 1894	726
727	From country mills	9.66	8.47	4.44	74.35	1.77	1.31	9.35	4.90	82.35	1.95	1.45	Tenn.Ex.Sta.Bul.3,Vol.IX,'96	727
728	From Knoxville City Mills	10.56	8.71	4.67	72.89	1.78	1.39	9.74	5.22	81.49	1.99	1.56	do	728
729	From Knoxville City Mills	11.46	8.85	4.42	72.43	1.58	1.26	10.00	5.00	81.81	1.77	1.42	do	729
730	Scott Bros. Mills, Knoxville, Tenn	9.63	8.63	4.59	74.07	1.66	1.42	9.55	5.08	81.96	1.84	1.57	do	730
731	Limestone Mills, Limestone, Tenn	10.07	9.19	4.43	73.47	1.60	1.24	10.22	4.93	81.70	1.78	1.37	do	731
732	Sweetwater Mills, Sweetwater, Tenn	11.36	9.16	3.57	73.18	1.50	1.23	10.33	4.03	82.56	1.69	1.39	do	732
733	J. A. Kirk, Greeneville, Tenn	10.52	9.16	4.40	73.13	1.56	1.23	10.25	4.92	81.72	1.74	1.37	do	733
734	Lenoir Milling Co., Lenoir City, Tenn	5.74	8.72	3.95	79.60	0.86	1.13	9.25	4.19	84.45	0.91	1.20	do	734
735	Average of 2 analyses	16.38	8.09	2.44	70.10	1.47	1.52	9.68	2.92	83.82	1.76	1.82	Va. Ex. Sta. Bul. 5, 1890	735
	All analyses (13) Maximum	16.38	9.19	4.67	79.60	2.44	1.56	10.33	5.22	84.45	2.79	1.82		
	All analyses (13) Minimum	5.74	7.37	2.44	70.10	0.86	1.13	8.42	2.92	81.49	0.91	1.20		
	All analyses (13) Average	**11.46**	**8.59**	**3 97**	**73.01**	**1.64**	**1.33**	**9.71**	**4.46**	**82.47**	**1.85**	**1.51**		
	Average of 77 American analyses of Corn Meal, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**14.98**	**9.17**	**3.77**	**68.76**	**1.90**	**1.42**	**10.80**	**4.40**	**81.00**	**2.20**	**1.60**		
	Corn Chops:													
736	No description	9 03	12.06	11.93	58.76	4.58	3.64	13.26	13.11	64.59	5.04	4.00	S. C. Ex. Sta. SAn Rept.'95 p52	736

737	From Moore & Jones, Memphis, Tenn	9.19	10.54	4.51	72.26	2.02	1.48	11.61	4.97	79.57	2.22	1.63	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	737
738	No description	15.94	8.56	2.93	62.36	8.66	1.55	10.18	3.48	74.20	10.30	1.84	Miss. Ex. Sta. Bul. 8, 1889	738
	Average	11.39	10.39	6.46	64.46	5.08	2.22	11.68	7.19	72.79	5.85	2.49		
	Average of 12 American analyses of "Hominy Chops or Baltimore Meal" Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892*	11.05	9.75	8.28	64.60	3.84	2.48	11.10	9.30	72.60	4.30	2.80		
	Corn (maize) and cob meal:													
739	Not described, *a*	14.65	7.87	3.56	63.16	7.20	3.56	9.22	4.17	74.01	8.43	4.17	Ark. Ex. Sta. 3 An. Rept. '90, p138	739
740	do *a*	18.90	7.53	3.06	64.44	4.78	1.29	9.28	3.77	79.47	5.89	1.59	Ky. Ex. Sta. 5 An. Rept. '92, p. 12	740
741	do *a*	12.43	7.90	3.33	67.10	8.00	1.24	9.03	3.79	76.63	9.14	1.41	N. C. Ex. Sta. Bul. 97, 1894	741
	"Feed Meal," J. M. Stone & Co.,													
742	Nashville	9.04	9.19	6.50	64.77	8.36	2.14	10.10	7.15	71.22	9.18	2.35	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	742
743	Average of 2 analyses	19.20	5.45	3.24	61.60	9.06	1.45	6.75	4.01	76.23	11.21	1.80	Va. Ex. Sta. Bul. 5, 1890	743
	All analyses (6) Maximum	19.20	9.19	6.50	67.10	9.06	3.56	10.10	7.15	79.47	11.21	4.17		
	All analyses (6) Minimum	9.04	5.45	3.06	61.60	4.78	1.24	6.75	3.77	71.22	5.89	1.41		
	All analyses (6) Average	15.57	7.23	3.82	63.78	7.74	1.86	8.52	4.49	75.63	9.18	2.18		
	Average of 6 American analyses, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	15.08	8.45	3.53	64.86	6.62	1.46	10.00	4.10	76.40	7.80	1.70		
	Yellow Corn Meal as prepared for													
744	whiskey distillery	11.49	8 81	4.50	72.62	0.76	1.82	9.93	5.07	82.10	0.86	2.04	Tenn Ex Sta Bul 3, Vol. IX, '96	744
	White Corn Meal as prepared for whisky													
745	distillery	13.28	9.44	4.50	70.55	0.99	1.24	10.88	5.19	81.36	1.14	1.43	do	745
	Corn, Cob and Shuck, (entire ear):													
746	No description	7.26	6.68	4.37	66.68	12.36	2.65	7.20	4.71	71.90	13.33	2.86	Texas Ex. Sta. Bul. 6, 1889	746
	MIXED FEEDS.													
747	Bran, shorts and corn meal	11.09	15.90	3.79	60.99	4.29	3.94	17.88	4.26	68 60	4.83	4.43	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	747
748	Bran and shorts	8.91	15.90	4.82	58.18	7.48	4.71	17.46	5.29	63.87	8.21	5.17	do	748
749	Bran, shorts and corn meal	9.37	13.07	4.28	65.51	4.17	3.60	14.43	4.72	72.28	4.60	3.97	do	749
	"Pratt food for stock and poultry":													
750	Wheat bran, corn meal and fenugreek	10.15	16.00	7.40	54.86	5.21	6.38	17.81	8.23	61.06	5.80	7.10	do	750
	Settle's Dairy Food for cow:													
751	Wheat bran, feed meal (maize), C. S. meal, oat and wheat screenings	7.15	18.19	5.75	55.28	6.42	7.21	19.59	6.19	59.54	6.91	7.77	do	751
	Dairy Feed:													
752	Wheat bran, feed meal, C. S. meal, oats and wheat screenings	7.07	20.63	7.55	52.48	5.93	6.34	22.20	8.12	56.48	6.38	6.82	do	752
	Stock Feed:													
753	Nearly all wheat bran, some C. S. meal and corn meal	7.83	17.81	6.17	55.21	7.11	5.87	19.32	6 69	59.90	7.72	6.37	do	753

*Adds in water-free subs. 100.1.

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash		
	MILL PRODUCTS.—Continued.													
	MIXED FEEDS—continued.													
754	Jones' Cow Feed: "30 per cent. bran, 20 per cent. C. S. meal, 15 per cent. ground C. S. hull meal, 17 per cent. ground corn, 15 per cent. shipstuff, 2 per cent. salt, 1 per cent. powders"	7.91	18.25	4.95	49.56	13.38	5.95	19.82	5.37	53.82	14.53	6.46	Tenn.Ex.Sta.Bul.3,Vol.IX '96	754
755	"Chop." wheat bran with the addition of some corn bran, and oat screenings	9.60	16.19	4.55	56.44	7.92	5.30	17.92	5.03	62.43	8.76	5.86	. . . do	755
756	"Chop," wheat bran with some oat and wheat screenings	8.73	16.44	3.95	58.93	6.95	5.00	18.02	4.33	64.55	7.62	5.48	. . . do	756
757	"Chop," wheat bran some corn bran oat and wheat screenings	7.93	15.69	4.57	58.99	7.03	5.79	17.04	4.96	64.07	7.64	6.29	. . . do	757
758	"Chop, mixed corn and bran:" Wheat bran, corn bran, oat and wheat screenings	7.26	13.91	4.08	68.00	3.77	2.98	15.00	4.40	73.32	4.07	3.21	. . . do	758
759	Wheat bran, corn bran, some oat screenings	9.59	14.47	4.18	64.65	4.08	3.03	16.01	4.62	71 51	4.51	3.35	. . . do	759
	"Mixed Feed." No description:													
760	Blue-grass Commission Co., Lexington, Ky	9.41	11.56	4.89	65.07	4.66	4.41	12.76	5.40	71.82	5.15	4.87	Ky.Ex.Sta. 5An.Rept.1892,p. 12	760
761	do	9.73	11.06	4.36	66.90	4.06	3.89	12.25	4.83	74.11	4.50	4.31	. . . do	761
	MILL PRODUCTS FROM OATS.													
762	Oat Meal, no description	10.48	12.37	4.80	57.93	10.31	4.11	13.83	5.36	64.71	11.51	4.59	N. C. Ex. Sta. Bul. 90b, 1893 . .	762
763	Ground Shelled Oats, *a*	13.80	13.45	4.58	56.21	8.50	3.46	15.61	5.31	65.21	9.86	4.01	KyExSta 5An.Rept.1892,p.12 .	763
	MISCELLANEOUS MILL PRODUCTS.													
764	Kaffir Flour: No description	16.75	6.62	3.82	69.47	1.16	2.18	7.95	4 59	83.45	1.39	2.62	N. C. Ex. Sta. Rept. 1889, p. 46	764
765	Okra Meal: No description	10.53	23.19	22.62	25.91	12.28	5.47	25.92	25.29	28.96	13.72	6.11	N. C. Ex. Sta. Rept. 1883, p. 96	765

766	Japan Pea Meal: No description	8.17	9.85	12.68	63.13	2.95	3.22	10.72	13.81	68.75	3.21	3.51	...do	766
767	Potato Flour: No description	9.98	3.41	0.95	80.51	2.25	2.90	3.79	1.06	89.43	2.50	3.22	S.C.Ex.Sta. 7 Rept. 1894, p. 11	767
	BY-PRODUCTS AND WASTE MATERIAL.													
	BY-PRODUCTS FROM CORN (MAIZE).													
	Corn (maize) Cob, Dent varieties:													
768	Field cured, *c*	6.97	2.19	0.39	60.11	29.05	1.29	2.35	0.42	64.61	31.23	1.39	SC.Ex.Sta.2 An.Rep.1889,p.161	768
769	Field cured, *b*	8.29	1.63	0.21	56.32	32.19	1.36	1.75	0.23	61.46	35.08	1.48	...do	769
770	Field cured, *b*	8.04	2.00	0.29	54.52	33.93	1.22	2.19	0.32	59.27	36.89	1.33	...do	770
771	Brazilian flour corn cob	11.25	1.47	0.90	39.82	36.91	9.65	1.66	1.01	44.87	41.59	10.87	Ga. Ex. Sta. Bul. 13, 1891	771
	Average excluding 771	7.77	1.94	0.30	56.98	31.72	1.29	2.10	0.32	61.78	34.40	1.40		
	Average of 18 American analyses of Corn (maize) Cobs, Ex. Sta. Bul.11, U. S. Dept. Agr., 1892	10.68	2.37	0.52	54.89	30.13	1.41	2.70	0.60	61.40	33.70	1.60		
	Corn Bran:													
772	From country mills, S. C., *c*	9.85	8.38	2.75	67.54	10.35	1.13	9.30	3.05	74.92	11.48	1.25	SC Ex.Sta.2An.Rept.1889,p.141	772
	Gluten Meal:													
773	By-product from the manufacture of glucose	8.45	30.81	8.79	50.03	0.77	1.15	33.65	9.59	54.66	0.84	1.26	La. Ex. Sta. Bul. 25, no date	773
774	"A new feed, apparently the hull or bran corn grain"	10.89	15.94	7.44	54.29	9.73	1.71	17.89	8.35	60.92	10.92	1.92	Ky.Ex.Sta.1AnRept'89-90,p.15	774
	Hominy Waste:													
775	"This is the germ, etc., of the corn"	6.31	11.63	10.65	63.68	4.60	3.13	12.41	11.37	67.97	4.91	3.34	Ky.Ex.Sta.1 AnRept'89-90,p.19	775
776	do	10.78	12.25	12.13	55.33	6.68	2.83	13.73	13.60	62.01	7.49	3.17	...do	776
777	Hominy mill feed	6.92	10.06	8.68	66.65	3.92	3.77	10.80	9.32	71.62	4.21	4.05	N. C. Ex. Sta. Bul. 90b, 1893	777
	Average	8.01	11.31	10.49	61.89	5.06	3.24	12.31	11.43	67.20	5.54	3.52		
	BY-PRODUCTS FROM SORGHUM.													
	Kaffir Middlings:													
778	No description	16.72	8.62	2.68	69.43	1.09	1.46	10.35	3.22	83.38	1.30	1.75	N. C. Ex. Sta. Rept. 1889, p. 46	778
	BY-PRODUCTS FROM OATS.													
779	Prepared Oats, from Muscatine Oat Meal Co., Muscatine, Iowa	6.29	9.88	3.96	54.23	19.95	5.69	10.54	4.23	57.87	21.29	6.07	Tenn.Ex.Sta.Bul.3,Vol.IX,'96	779

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitrogen-free Extract	Fiber	Ash	Protein	Fat	Nitrogen-free Extract	Fiber	Ash		
	BY-PRODUCTS AND WASTE MATERIAL.—CONTINUED.													
	BY-PRODUCTS FROM WHEAT.													
	Wheat Bran, unclassified.													
780	No description, *a*	12.81	17.28	4.17	52.23	8.02	5.49	19.81	4.79	59.91	9.20	6.29	Ala. Ex. Sta. Bul. 5, 1889	780
781	No description	13.17	14.65	3.80	52.97	8.20	7.21	16.87	4.38	61.01	9.44	8.30	Ark. Ex Sta l An Rept. '88, p. 133	781
782	No description, *a*	13.70	13.93	3.70	57.88	5.87	4.92	16.14	4.29	67.07	6.80	5.70	Ky. Ex. Sta. 5 An. Rept. '92, p. 13	782
783	No description	11.35	14.50	3.27	54.62	9.68	6.58	16.36	3.69	61.61	10.92	7.42	N. C. Ex. Sta. Bul. 90b, 1893	783
784	No description	10.33	14.13	4.30	58.35	8.05	4.84	15.76	4.80	65.07	8.98	5.39	S.C. Ex. Sta. 7An. Rept 1894, p. 11	784
785	No description	10.90	12.56	3.73	57.93	10.54	4.34	14.10	4.19	65.01	11.83	4.87	. . . do	785
786	No description	10.00	9.44	2.47	58.01	16.83	3.25	10.49	2.74	64.45	18.70	3.62	. . . do	786
787	Sold by Knoxville City Mills as "extra" *b*	8.76	16.44	4.07	57.53	7.67	5.53	18.02	4.46	63.05	8.41	6.06	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	787
788	Sold by Knoxville City Mills	9.47	15.69	4.66	57.96	7.35	4.87	17.33	5.15	64.02	8.12	5.38	. . . do	788
789	do	8.59	16.38	4.27	57.32	7.84	5.60	17.92	4.67	62.71	8.58	6.12	. . . do	789
790	Scott Bros. Mills, Knoxville	7.65	16.35	4.95	59.50	6.36	5.19	17.70	5.36	64.44	6.88	5.62	. . . do	790
791	J. M. Stone & Co., Nashville	9.31	16.13	4.85	56.68	7.41	5.62	17.78	5.35	62.50	8.17	6.20	. . . do	791
792	Liberty Mill Co., Nashville	8.54	16.38	4.14	57.68	7.68	5.58	17.91	4.53	63.06	8.40	6.10	. . . do	792
793	Model Mill Co., Nashville	8.11	16.88	4.80	57.28	7.30	5.63	18.38	5.22	62.33	7.94	6.13	. . . do	793
794	W. R. Cornelius & Co., Nashville	7.61	15.25	4.90	58.71	7.77	5.76	16.51	5.30	63.54	8.42	6.23	. . . do	794
795	Moore & Jones, Memphis	8.67	17.28	4.31	58.58	6.66	4.50	18.92	4.72	64.14	7.29	4.93	. . . do	795
796	"Extra," Knoxville City Mills	7.75	15.28	3.95	57.39	8.79	6.84	16.46	4.28	62.22	9.53	7.41	. . . do	796
797	Twin City Mills, Bristol, Tenn	9.75	15.97	4.46	58.66	6.45	4.71	17.69	4.94	65.00	7.15	5.22	. . . do	797
798	do	9.55	16.50	4.19	58.15	6.80	4.81	18.24	4.63	64.29	7.52	5.32	. . . do	798
799	Ajax Milling Co., Gallatin, Tenn	6.43	15.10	4.53	64.44	5.21	4.29	16.14	4.84	68.86	5.57	4.59	. . . do	799
800	Lenoir Milling Co., Lenoir City, Tenn	5.71	18.47	3.93	60.44	6.55	4.90	19.58	4.17	64.10	6.95	5.20	. . . do	800
801	Average of 2 analyses	12.97	13.35	2.28	57.28	8.68	5.44	15.34	2.62	65.82	9.97	6.25	Va. Ex. Sta. Bul. 5, 1890	801
802	No description	13.52	16.56	5.41	51.61	8.33	4.57	19.15	6.25	59.68	9.64	5.28	Miss. Ex. Sta. Bul. 8, 1889	802
	All analyses (24) Maximum	13.70	18.47	5.41	64.44	16.83	7.21	19.81	6.25	68.86	18.70	8.30		
	All analyses (24) Minimum	5.71	9.44	2.28	51.61	5.21	3.25	10.49	2.62	59.68	5.57	3.62		
	All analyses (24) Average	**9.90**	**15.32**	**4.05**	**57.43**	**8.03**	**5.27**	**17.00**	**4.50**	**63.74**	**8.93**	**5.83**		
	Average of 87 American analyses of Wheat Bran, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**11.91**	**15.42**	**4.03**	**53.87**	**8.99**	**5.78**	**17.40**	**4.50**	**61.30**	**10.20**	**6.60**		

	Shorts:												
803	From Knoxville City Mills	8.73	17.84	4.90	57.33	6.30	4.90	19.55	5.37	62.81	6.90	5.37	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	803
804	Scott Bros. Mills, Knoxville	9.68	15 82	4.85	62.61	3.65	3.39	17.52	5.37	69.32	4.04	3.75	. . . do	804
805	Moore & Jones, Memphis	10.21	17.25	3.06	65.54	2.07	1.87	19.21	3.40	73.01	2.30	2.08	. . . do	805
	Average	**9.54**	**16.97**	**4.27**	**61.83**	**4.01**	**3.38**	**18.76**	**4.71**	**68.38**	**4.41**	**3.74**		
	Average of 12 American analyses Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**11.81**	**14.92**	**4.51**	**56.72**	**7.40**	**4.64**	**16.80**	**5.10**	**64 50**	**8.40**	**5.20**		
	Wheat Middlings:													
806	Ship-stuff	6.98	14.35	5.90	63.32	5.45	4.00	15.43	6.34	68.07	5.86	4.30	. . . do	806
807	City Mills, Knoxville, Tenn	8.90	19.13	4.59	57.70	5.41	4.27	21.00	5.04	63.33	5.94	4.69	. . . do	807
	Average	**7.94**	**16 74**	**5.25**	**60.51**	**5.43**	**4.13**	**18.21**	**5.69**	**65 70**	**5.90**	**4.50**		
	Average of 31 American analyses, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**12.10**	**15.62**	**3.97**	**60.42**	**4.60**	**3.29**	**17.80**	**4.50**	**68.70**	**5.20**	**3 80**		
	BY-PRODUCTS FROM RICE.													
	Rice Bran. 1st by-product:													
808	No description	9.96	13.56	10.90	49.32	7.00	9.26	15.06	12.10	54.79	7.77	10.28	La. Ex. Sta. Bul. 9, 1887	808
809	do	9.56	11.81	9.50	50.46	9.85	8.82	13.05	10.50	55.81	10.88	9.76	. . . do	809
810	No description, *a*	10.67	11.29	9.97	46.02	10.95	11.10	12.64	11.16	51.51	12.26	12.43	La. Ex. Sta. Bul. 24, no date	810
811	No description	8.78	10.93	8.20	41.93	17.76	12.40	11.98	8.99	45.97	19.47	13.59	N. C. Ex. Sta. Rept. 1882, p. 91	811
	Average	**9.74**	**11 90**	**9.64**	**46 93**	**11.39**	**10.40**	**13.18**	**10 68**	**52 02**	**12.60**	**11.52**		
	Rice Flour. 2nd by-product:													
812	No description	10.34	5.95	1 92	58.32	16.92	6.55	6.63	2.14	65.06	18.87	7.30	N. C. Ex. Sta. Bul. 90b, 1893	812
813	do	10.32	14.00	13.49	51.22	6.12	4.85	15.61	15.04	57.12	6.82	5.41	N. C. Ex. Sta. Rept. 1882, p. 91	813
814	No description, *a*, *c*	10.92	11.63	10.39	49.20	9.05	8.81	13.06	11.66	55.23	10.16	9.89	SC Ex Sta 2 An Rep. 1889, p. 144	814
815	No description, *a*, *c*	9.23	11.94	10.41	48.25	11.04	9.13	13.15	11.47	53.16	12.16	10.06	. . . do	815
	Average	**10.20**	**10.88**	**9.05**	**51.75**	**10.78**	**7.34**	**12.11**	**10.08**	**57.64**	**12.00**	**8.17**		
	Rice Polish. 3rd by-product:													
816	No description	9.00	11.37	6.50	59.90	5.86	7.37	12.49	7.14	65.83	6.44	8.10	La. Ex. Sta. Bul. 9, 1887	816
817	do	9.33	11.38	8.00	45.54	14.45	11.30	12.55	8.82	50.23	15 94	12.46	. . . do	817
818	No description, *a*	10.63	10.94	7.02	63.34	2.62	5.45	12.24	7.85	70.88	2.93	6.10	La. Ex. Sta. Bul. 24, no date	818
819	No description	11.21	12.93	7.69	62.96	2.41	2.80	14.56	8.66	70.92	2.71	3.15	N. C. Ex. Sta. Rept., 1882, p. 91	819
820	do	11.20	11.20	2.10	64.99	6.59	3.92	12.61	2.36	73.20	7 42	4.41	N. C. Ex. Sta. Bul. 90b, 1893	820
	All analyses (5) Maximum	11.21	12.93	8.00	64.99	14.45	11.30	14.56	8.82	73.20	15.94	12.46		
	All analyses (5) Minimum	9.00	10.94	2.10	45.54	2.41	2.80	12.24	2.36	50.23	2.71	3.15		
	All analyses (5) Average	**10.27**	**11.56**	**6.26**	**59.35**	**6.39**	**6.17**	**12.89**	**6.97**	**66.21**	**7.09**	**6 84**		

ANALYSES OF SOUTHERN FEEDING STUFFS—Continued.

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash		
	BY-PRODUCTS AND WASTE MATERIAL.—CONTINUED.													
	BY-PRODUCTS FROM RICE—continued.													
	Rice Hulls, or Chaff:													
821	Containing grains of broken rice, *a*	12.58	7.25	5.88	42.11	20.58	11.60	8.29	6.73	48 17	23.54	13.27	Fla. Ex. Sta. Bul. 13. 1891 . .	821
822	Hulls of upland rice	8.50	3.12	0.55	38 74	38.57	10.52	3.41	0.60	42.34	42.15	11.50	N. C. Ex. Sta. Rept., 1882, p. 91	822
823	Chaff, hand separated	8.42	2.19	0.67	31.83	37.95	18.94	2.39	0.73	34.76	41.44	20.68	N. C. Ex. Sta. Bul. 90b, 1893 . .	823
824	Chaff, no description	9.32	1.61	0.68	39.15	41.23	8.01	1.77	0.74	43.20	45.46	8.83	. . . do	824
	Average, excluding No. 821	8.75	2.31	0 63	36.57	39.25	12.49	2 52	0 69	40.10	43.02	13.67		
	BY-PRODUCTS FROM COTTONSEED.													
	Cottonseed Meal:													
825	No description, *a*	8.47	47.72	8.22	21.83	7.28	6.48	52.12	8.98	23.86	7.96	7.08	Ala. Ex. Sta. Bul. 5, 1889 . .	825
826	do	9.55	44.22	8.76	23.77	6.50	7.20	48.88	9.70	26.28	7.18	7.96	Ark. Ex. Sta. 1 An Rept. '88, p. 133	826
827	do *a*	11.36	42.00	7.36	23.73	9.85	5.70	47.39	8.30	26.77	11.11	6.43	Ark Ex. Sta. 3 An. Rep. '90, p. 138	827
828	do	7.35	43.50	11.23	26.13	5.42	6.37	46.95	12.12	28.20	5.85	6.88	Ky. Ex. Sta. 1 An Rept '89-90, p. 19	828
829	do	8.85	43.12	19.53	20.58	4.03	3.89	47.31	21.42	22.58	4.42	4.27	N. C. Ex. Sta. Rept. '82, p. 102	829
830	do	8.93	42.69	17.46	21.79	6.03	3.10	46.88	19.18	23.94	6.62	3.38	. . . do	830
831	do	6.31	41.87	22.01	19.49	4.30	6.02	44.69	23.49	20.80	4.59	6.43	. . . do	831
832	do	6.93	40.06	10.18	28.05	7.93	6.85	43.04	10.94	30.14	8.52	7.36	N. C. Ex. Sta. Bul. 80 c, 1891 . .	832
833	do *a*, *d*, *e*	7.71	37.88	11.07	31.07	5.63	6.64	41.04	12.00	33.67	6.10	7.19	N. C. Ex. Sta. Bul. 87d, 1892 .	833
834	do *a*, *d*, *e*	8.35	39.37	10.37	29.27	5.97	6.67	42.96	11.32	31 93	6.51	7.28	. . . do	834
835	do *a*, *d*, *e*	7.97	37.81	9.69	31.99	6.05	6.49	41.08	10.53	34.76	6.58	7.05	. . . do	835
836	do *a*	7.03	39.35	11.84	29.54	6.48	5.76	42.33	12.73	31.77	6.97	6.20	N. C. Ex. Sta. Bul. 97, '94 . .	836
837	do *a*	8.32	43.27	9 42	26.44	6.17	6.38	47.20	10.27	28.84	6.73	6.96	N. C. Ex. Sta. Bul. 118, '95 . .	837
838	do *a*	7.30	49.58	11.03	21.91	2.94	7.24	53.48	11.90	23.63	3.17	7.81	S. C. Ex. Sta. 2 An. Rept, 1889 p. 148	838
839	do *a*	6.54	45.50	8.79	25.98	6.03	7.16	48.69	9.41	27.79	6.45	7.66	. . . do	839
840	do *a*	8.57	46.80	7.97	25.33	4.64	6.69	51.19	8.72	27.70	5.07	7.32	. . . do	840
841	do	8.56	38.95	10.98	27.88	7.35	6.28	42.59	12.01	30.49	8.04	6.87	S. C. Ex. Sta. 8 An. Rep. 1895, p. 52	841
842	do	8.34	39.25	10.99	27.86	7.15	6.41	42.82	11.99	30.39	7.80	7.00	. . . do	842
843	do	8.97	43.64	9.13	25.49	6.11	6.46	47.93	10.03	28.22	6.72	7.10	S. C. Ex. Sta 7 An. Rept. 1894, p 11	843
844	do	8.96	40.69	9.39	26.85	7.71	6.40	44.69	10.31	29.50	8.47	7.03	. . . do	844
845	do	5.57	46.06	9.59	27.42	5.11	6.25	48.78	10.16	29.03	5.41	6.62	. . . do	845
846	do	7.79	46.81	8.18	26.20	4.64	6.38	50.76	8.87	28.41	5.04	6.92	. . . do	846
847	do	5.73	44.50	11.74	25.27	5.18	7.58	47.21	12.45	26.81	5.49	8.04	Tenn. Ex. Sta. Bul. 3, Vol. II, '89	847

848	do *c*	7.47	47.30	9.26	24.10	4.53	7.04	51.12	10.01	26.37	4.90	7.60	Tenn Ex Sta. Bul. 5, Vol. IV, '91	848
849	do *b*	6.66	41.31	11.65	27.06	7.18	6.11	44.26	12.48	29.00	7.68	6.58	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	849
850	Chattanooga Oil Mills	7.91	42.22	10.52	27.46	4.81	7.08	45.85	11.42	29.82	5.22	7.69	. . . do	850
851	do	6.38	41.10	11.00	28.43	6.75	6.34	43.90	11.75	30.37	7.21	6.77	. . . do	851
852	Nashville Oil Mills	5.64	42.47	11.79	27.63	5.87	6.60	45.01	12.49	29.28	6.22	7.00	. . . do	852
853	Hanauer Oil Works, Memphis	6.31	42.44	11.03	27.22	5.70	7.30	45.29	11.78	29.05	6.08	7.80	. . . do	853
854	DeSoto Oil Works, Memphis	6.10	41.38	12.44	27.37	5.75	6.96	44.07	13.25	29.15	6.12	7.41	. . . do	854
855	Crescent Oil Works, Memphis	8.19	30.38	7.47	35.25	12.85	5.86	33.08	8.14	38.40	14.00	6.38	. . . do	855
856	Valley Oil Works, . . . do	6.72	42.25	11.17	27.13	5.70	7.03	45.29	11.98	29.08	6.11	7.54	. . . do	856
857	Gayoso Oil Works, . . . do	6.12	40.38	13.64	27.03	5.83	7.00	43.01	14.53	28.79	6.21	7.46	. . . do	857
858	Southern C. S. Oil Co . . do	6.10	43.35	10.92	26.61	5.71	7.31	46.17	11.63	28.34	6.08	7.78	. . . do	858
859	Crescent C. S. Oil Mill . . do	9.13	40.72	8.97	27.75	6.33	7.10	44.81	9.87	30.54	6.97	7.81	. . . do	859
860	Tenn. Cotton Oil Co . . . do	6.28	42.66	10.54	27.75	5.38	7.39	45.52	11.25	29.61	5.74	7.88	. . . do	860
861	do . . . . . do	6.44	42.63	11.06	27.26	5.61	7.00	45.56	11.82	29.14	6.00	7.48	. . . do	861
862	do . . . . . do	6.56	41.63	12.02	26.77	5.71	7.28	44.59	12.86	28.65	6.11	7.79	. . . do	862
863	do . . . . . do	6.63	43.03	11.31	26.61	5.39	7.03	46.09	12.11	28.50	5.77	7.53	. . . do	863
864	do . . . . . do	4.37	44.94	12.50	26.57	4.33	7.29	47.00	13.07	27.78	4.53	7.62	. . . do	864
865	No description	6.55	47.19	11.33	22.89	4.44	7.60	50.50	12.12	24.50	4.75	8.13	Texas Ex. Sta. Bul. 6, 1889	865
866	No description	8.40	40.68	8.64	26.41	8.07	7.80	44.41	9.43	28.83	8.81	8.52	Miss. Ex. Sta. Bul. 8, 1889	866
867	Average of 2 analyses	7.17	45.08	9.15	23.57	8.31	6.72	48.56	9 87	25.39	8.95	7.23	Va. Ex. Sta. Bul. 5, 1890	867
	All analyses (44) Maximum	11.36	49.58	22.01	35.25	12.85	7 80	53.48	23.49	38.40	14.00	8.50		
	All analyses (44) Minimum	4.37	30.38	7.36	19.49	2.94	3.10	33.08	8.14	20.80	3.17	3.38		
	All analyses (44) Average	**7.40**	**42.57**	**10.92**	**26.34**	**6.16**	**6.61**	**45.97**	**11.79**	**28.44**	**6.66**	**7.14**		
	Average of 410 analyses of Cottonseed Meal, compiled from all available sources by ourselves	**8.52**	**43.26**	**13.45**	**22.31**	**5 44**	**7.02**	**47 29**	**14.70**	**24.39**	**5.95**	**7.67**		
	Average of 38 American analyses of Cottonseed Meal, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	**8.17**	**42.31**	**13.08**	**23.65**	**5.62**	**7.17**	**46.10**	**14.20**	**25.80**	**6.19**	**7.80**		
	Cottonseed Meal (undecorticated):													
868	No description, *b*	7.71	37.19	7.45	29.73	11.47	6.45	40 30	8.07	32.21	12.43	6.99	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	868
869	Consumers Cotton Oil Co, Little Rock, Ark	6.35	28.60	7.02	34.64	17.57	5.82	30.54	7.49	37.00	18.76	6.21	. . . do	869
	Average	**7.03**	**32.90**	**7.23**	**32.19**	**14.52**	**6.13**	**35.42**	**7.78**	**34.60**	**15.60**	**6.60**		
870	Cottonseed meal from roasted cottonseed	3.53	24.00	33.61	22.57	11.11	5.18	24.87	34.83	23.44	11.50	5.36	N. C. Ex. Sta. Bul. 90b, 1893	870
	Cottonseed Cake (decorticated):													
871	Planters Oil Mill, Greenwood, Miss	6.10	38.44	20.93	23.43	4.61	6.49	40.94	22.29	24.95	4.91	6.91	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	871
872	Refuge Oil Works, Vicksburg, Miss	6.15	43.69	12.19	25.81	4.82	7.34	46.54	12.98	27.50	5.16	7.82	. . . do	872
873	Box Cake, DeSoto Oil Co., Memphis, Tenn	6.51	43.41	10.34	27.30	5.10	7.34	46.44	11.06	29.20	5.45	7.85	. . . do	873
874	Plate Cake, DeSoto Oil Co., Memphis, Tenn	6.07	38.10	15.34	27.18	6.63	6.68	40.56	16,33	28.94	7.06	7.11	. . . do	874

		Fresh or Air-Dry Material.						Water-free Substance.						
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash	REFERENCES.	
	BY-PRODUCTS AND WASTE MATERIALS.—CONTINUED.													
	BY-PRODUCTS FROM COTTONSEED—CON.													
	Cottonseed Cake (decorticated)—Cont'd:													
875	New Braunfels Oil Co., New Braunfels, Texas	6.22	52.85	9.19	22.92	3.23	5.59	56.36	9.80	24.44	3.44	5.96	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	875
876	Valley Oil Co., Memphis, Tenn	6.28	46.66	8.29	26.91	4.65	7.21	49.79	8.85	28.71	4.96	7.69	do	876
877	Dyersburg Oil Co., Dyersburg, Tenn	4.99	46.97	13.14	23.82	4.08	7.00	49.44	13.83	25.08	4.29	7.36	do	877
878	Southern Oil Co., Memphis, Tenn	6.42	52.79	6.76	23.38	5.12	5.53	56.41	7.23	24.98	5.47	5.91	do	878
	All analyses (8) Maximum	6.51	52.85	20.93	27.30	6.63	7.34	56.41	22.29	29.20	7.06	7.85		
	All analyses (8) Minimum	4.99	38.10	6.76	22.92	3.23	5.53	40.56	7.23	24.44	3.44	5.91		
	All analyses (8) Average	6.09	45.36	12.02	25.10	4.78	6.65	48.31	12.80	26.72	5.09	7.08		
	Average of 429 analyses of Cottonseed Cake (decorticated) compiled from various sources by ourselves	8.62	44.09	14.23	20.85	5.16	7.05	48.24	15.57	22.83	5.65	7.71		
	Cottonseed Hulls:													
879	No description	12.76	2.78	2.17	34.51	44.84	2.94	3.49	2.49	39.55	51.40	3.37	Ala. Ex. Sta. Bul. 25, 1891	879
880	do	10.05	3.46	1.44	38.12	44.35	2.58	3.85	1.60	42.31	49.36	2.88	Ark. Ex. Sta. Bul. 9, 1889	880
881	do	10.55	4.83	0.80	30.82	50.48	2.52	5.40	0.89	34.46	56.43	2.82	Ark. Ex. Sta. 3 An. Rep. '90, p. 138	881
882	Cottonseed hulls, manufactured at Athens, Ga	9.96	3.56	0.75	32.03	51.40	2.30	3.96	0.83	35.57	57.09	2.55	Ga. Ex. Sta. Bul. 7, 1890	882
883	Cottonseed hulls, purchased in Nashville, Tenn., *a*	9.28	4.37	2.20	39.28	42.01	2.86	4.82	2.32	43.50	46.20	3.16	Ky. Ex. Sta. 5 An. Rept. '92, p. 13	883
884	Hulls separated from kernels by hand, *c*	9.16	2 19	0.58	38.67	47.12	2.28	2.41	0.64	42.57	51.87	2 51	N. C. Ex. Sta. Rept. 1882, p. 99	884
885	No particulars	11.44	4.37	5.41	35.52	40.33	2.93	4.94	6.11	40.11	45.53	3.31	N. C. Ex. Sta. Bul. 80c, 1891	885
886	do *a*, *d*, *e*	16.73	3.68	2.85	37.12	37.85	1.77	4.42	3.42	44.58	45.45	2.13	N. C. Ex. Sta. Bul. 87d, 1892	886
887	do *a*, *d*, *e*	15.83	4.36	3.28	36.41	38.08	2.24	5.17	3.89	43.16	45.13	2.65	do	887
888	do *a*, *d*, *e*	15.26	3.70	2.49	37.04	39.43	2.08	4.37	2.94	43.71	46.52	2.46	do	888
889	do *a*	12.35	4.22	2.74	35.56	43.48	1.65	4.82	3.13	40.57	49.60	1.88	N. C. Ex. Sta. Bul. 97, 1894	889
890	do *a*	11.71	5.44	4.83	33.40	44.18	2.46	6.16	5.45	35.56	50.04	2.79	N. C. Ex. Sta. Bul. 118, 1895	890
891	Standard Oil Co., Columbia, S. C., *a*	11.50	4.65	2.60	40.15	38.90	2.20	5.19	2.95	45.21	43.85	2.80	N. C. Ex. Sta. 9 An. Rep. '96, p. 148	891

892	From Memphis, Tenn	7.25	3.75	1.54	41.75	42.83	2.88	4.04	1.66	45.01	46.18	3.11	Tenn. Ex. Sta. Bul. 3, Vol. II, '89.	892
893	From Memphis, Tenn., *b*	7.97	3.81	1.28	40.51	41.36	5.07	4.14	1.39	44.03	44.94	5.50	Tenn Ex. Sta. Bul. 3, Vol. IX, '96	893
894	Chattanooga C. S. Oil Mill	9.41	3.85	1.43	44.84	37.61	2.86	4.25	1.58	49.49	41.52	3.16	. . . do	894
895	From Chattanooga C. S. Oil Mills	8.99	4.38	2.64	45.12	36.02	2.85	4.81	2.90	49.58	39.58	3.13	. . . do	895
896	Southern Cotton Oil Co., Memphis, Tenn	8.28	3.88	2.38	45.72	37.29	2.45	4.23	2.59	49.85	40.66	2.67	. . . do	896
897	Crescent Cotton Oil Co., Memphis, Tenn	7.71	4.78	2.60	45.40	37.07	2.44	5.18	2.82	49.19	40.17	2.64	. . . do	897
898	Valley Oil Mills, Memphis, Tenn	7.84	3.94	1.88	44.99	38.98	2.37	4.28	2.04	48.82	42.29	2.57	. . . do	898
899	Cleaned C. S. hulls from Tennessee Cotton Oil Co., Memphis, Tenn	6.00	9.44	2.32	42.15	37.68	2.41	10.04	2.47	44.84	40.09	2.56	. . . do	899
900	No description	13.01	4.68	1.14	28.86	47.88	4.43	5.38	1.31	33.18	55.04	5.09	Texas Ex. Sta. Bul. 6, 1889	900
901	do	9.96	5.06	2.27	12.41	66.95	3.35	5.62	2.52	13.78	74.36	3.72	Texas Ex. Sta. Bul. 13, 1890	901
902	do	9.98	5.37	2.28	26.74	52.71	2.92	5.96	2.53	29.71	58.56	3.24	. . . do	902
	All analyses (24) Maximum	16.73	9.44	5.41	45.72	66.95	5.07	10.04	6.11	49.85	74.36	5.50		
	All analyses (24) Minimum	6.00	2.19	0.58	12.41	36.02	1.65	2.41	0.64	13.78	39.58	1.88		
	All analyses (24) Average	10.53	4.36	2.22	36.88	43.28	2.73	4.86	2.49	41.19	48.41	3.05		
	Average of 22 analyses of C. S. Hulls compiled from various sources by ourselves	11.36	4.18	2.22	34.19	45.32	2.73	4.72	2.50	38.57	51.13	3.08		
	Average of 4 American analyses, Ex. Sta. Bul. 11, U. S. Dept. Agr., 1892	10.41	4.04	2.02	36.52	44.42	2.59	4.50	2.20	40.90	49.50	2.90		
	Cottonseed Hull Bran:													
903	Johnson & Co., Memphis	8.60	3.29	1.49	50.00	34.17	2.45	3.60	1.63	54.70	37.39	2.68	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	903
904	Crescent Cotton Oil Co., Memphis, Tenn	6.83	18.64	9.63	31.61	26.91	6.38	20.00	10.34	33.93	28.88	6.85	. . . do	904
905	Tenn. Fiber Co., Memphis, Tenn	7.34	3.31	1.11	50.24	35.60	2.40	3.57	1.19	54.22	38.43	2.59	. . . do	905
906	Crescent Cotton Oil Co., Memphis, Tenn	7.88	4.16	2.20	47.11	35.65	3.00	4.52	2.39	51.14	38.69	3.26	. . . do	906
907	Tenn. Fiber Co., Memphis, Tenn	8.03	3.94	1.83	51.88	32.05	2.27	4.28	2.00	56.40	34.85	2.47	. . . do	907
	Average, excluding No. 904	7.96	3.67	1.66	50.06	34.12	2.53	3.99	1.80	54.12	37.34	2.75		
	Average of 8 analyses compiled from various sources by ourselves	11.66	12.01	3.06	39.22	30.99	3.06	13.60	3.46	44.40	35.08	3.46		
	Cottonseed Feedstuff:													
908	Manufactured by Tenn. Fiber Co., Memphis, Tenn	6.21	22.65	5.97	41.09	19.65	4.43	24.15	6.37	43.80	20.96	4.72	. . . do	908
	BY-PRODUCTS FROM LINSEED.													
	Linseed Meal:													
909	No descri tion, *a*	10.30	25.58	5.29	46.64	6.67	5.52	28.52	5.90	51.99	7.44	6.15	Ky. Ex. Sta. 5 An. Rept. '92, p. 12	909

ANALYSES OF SOUTHERN FEEDING STUFFS—Continued.

		Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.	
		Water	Protein	Fat	Nitrogen-free Extract	Fiber	Ash	Protein	Fat	Nitrogen-free Extract	Fiber	Ash		
	BY-PRODUCTS AND WASTE MATERIALS.—CONTINUED.													
	BY-PRODUCTS FROM PEANUTS.													
	Peanut Cake:													
910	Tenn. Cotton Oil Co., Memphis, Tenn	6.30	41.75	10.15	34.57	3.58	3.65	44.56	10.83	36.89	3.82	3.90	Tenn. Ex. Sta. Bul. 3, Vol. IX, '96	910
911	do	6.26	52.31	9.50	24.64	3.43	3.86	55.81	10.13	26.29	3.66	4.11	. . . do	911
	Average	6.28	47.03	9.83	29.61	3.50	3.75	50.19	10.48	31.59	3.74	4.00		
	Average of 2,785 analyses from the tables of Drs. Dietrich and Konig	10.74	46.85	7.89	24.34	5.29	4.89	52.49	8.84	27.26	5.93	5.48		
	Peanut Hulls:													
912	Spanish Peanut, hulls of fruit*	19.20	5.81	1.68	11.57	58.00	3.74	7.19	2.08	14.32	71.78	4.63	Ga. Ex. Sta. Bul. 13, 1891	912
913	Georgia Peanut, . . . do . . . †	20.62	3.96	1.68	8.41	62.95	2.38	4.99	2.12	10.59	79.30	3.00	. . . do	913
914	No description	10.78	8.63	0.92	18.49	56.54	4.64	9.67	1.03	20.73	63.37	5.20	N. C. Ex. Sta. Bul. 90b, 1893	914
915	Re-cleaned White, *c*	8.81	5.85	1.22	15.63	66.64	1.85	6.42	1.34	17.14	73.07	2.03	Tenn. Ex. Sta. Bul. 2, Vol. IV, '91	915
	Average	14.85	6.06	1.38	13.52	61.04	3.15	7.07	1.64	15.70	71.88	3.71		
	Roots of Peanut Vines:													
916	Spanish Peanuts	29.62	6.18	3.03	24.99	29.32	6.86	8.78	4.31	35.50	41.66	9.75	Ga. Ex. Sta. Bul. 13, 1891	916
917	Georgia Peanuts	28.74	5.44	2.28	22.09	34.62	6.83	7.63	3.20	31.00	48.59	9.58	. . . do	917
	MISCELLANEOUS BY-PRODUCTS.													
	Hulls of Sunflower Seeds:													
918	Mammoth Russian	10.00	3.75	1.56	27.52	54.87	2.30	4.17	1.73	30.58	60.96	2.56	N. C. Ex. Sta. Bul. 90b, 1893	918
919	Black Giant	10.50	4.37	3.41	27.09	52.00	2.63	4.88	3.81	24.69	63.69	2.93	. . . do	919
	China Berries:													
920	Berries from the tree, Melia Azedarach, *a*, *c*	16.52	7.50	6.61	42.23	23.01	4.13	9.00	7.92	50.55	27.58	4.95	S. C. Ex. Sta. 2 An. Rep. '89, p. 150	920
	Okra Hulls:													
921	No description	13.09	10.62	6.03	31.37	35.75	3.14	12.22	6.94	36.09	41.14	3.61	N. C. Ex. Sta. Rep. 1883, p. 96	921
922	Sorghum Bagasse, *a*	11.25	3.44	1.44	50.47	30.52	2.88	3.87	1.62	56.87	34.40	3.24	N. C. Ex. Sta. Bul. 97, 1894	922
923	Brewery Feed	74.12	7.75	1.93	11.54	3.55	1.11	29.95	7.46	44.59	13.71	4.29	S. C. Ex. Sta. 8 An. Rep. '95, p. 52	923
924	Distillery Slops	93.70	1.85	0.85	2.82	0.88	0.19	29.37	13.81	44.09	9.20	3.02	Ky. Ex. Sta. Bul. 4, no date	924

* Hulls, 32 per cent.; kernels, 78 per cent. † Hulls, 37 per cent.; kernels, 73 per cent.

TABLE XX.

AVERAGE COMPOSITION OF SOUTHERN AND AMERICAN FEEDING STUFFS.

	Number of Analyses.	Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash	
GREEN FODDER.													
CEREAL GRASSES.													
Corn (maize) fodder, all varieties.													
Southern analyses, all of unclassified varieties	5	74.62	2.00	0.70	15.46	5.73	1.49	8.06	2.74	60.61	22.72	5.87	
American analyses, all varieties; 2 of unclassified varieties	126	79.33	1.82	0.54	12.17	4.98	1.16	8.80	2.60	58.91	24.10	5.60	2 Southern analyses, included in American average.
Sorghum, whole plant:													
Southern analyses, all varieties	45	69.39	1.63	1.58	16.80	8.79	1.81	5.30	5.33	55.14	28.30	5.93	
American analyses, all varieties	11	79.40	1.34	0.48	11.56	6.13	1.09	6.50	2.30	56.20	29.70	5.30	1 Southern analysis included in American average.
Rye Fodder:													
Southern analyses, time of cutting not given	4	78.39	3.71	0.83	10.05	5.17	1.85	17.42	3.79	45.95	23 78	9.06	
American analyses, time of cutting not given	7	76.57	2.60	0.59	6.85	11.59	1.80	11.10	2.50	29.20	49.50	7.70	No Southern analyses included.
OTHER GRASSES.													
Kentucky Blue-grass (*Poa pratensis*):													
Southern, all analyses, different stages of growth	5	65.58	3.82	1.16	18.68	8.55	2.21	11.61	3.44	53.72	24.72	6.51	
American, all analyses, different stages of growth	18	65.07	4.12	1.30	17.59	9.14	2.78	11.80	3.70	50.30	26.20	8.00	2 Southern analyses included in average.
LEGUMES.													
Alfalfa (*Medicago Sativa*):													
Southern, all analyses, different stages of growth	11	73.40	5.31	1.23	10.11	7.25	2.70	20.57	4.78	37.82	26.41	10.42	
American, all analyses, different stages of growth	23	71.75	4.84	0.97	12.39	7.39	2.66	17.10	3.40	43.90	26.20	9.40	No Southern analyses included.

AVERAGE COMPOSITION OF SOUTHERN AND AMERICAN FEEDING STUFFS—Continued.

	Number of Analyses.	Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash	
GREEN FODDER—CONTINUED.													
LEGUMES—continued.													
Red Clover (*Trifolium pratense*):													
Southern analyses, in full bloom . .	2	76.42	3.59	0.78	12.32	5.16	1.73	15.24	3.25	52.30	21.88	7.33	
American, all analyses, different stages of growth	43	70.79	4.41	1.13	13.45	8.12	2.10	15.30	3.90	45.80	27.80	7.20	No Southern analyses included.
SILAGE.													
Corn (maize) Silage:													
Southern, all analyses	45	70.15	2.37	1.46	14.68	9.16	2.18	8.08	4.83	49.35	30.46	7.28	
American, all analyses	99	79.10	1.67	0.79	11.07	5.99	1.38	8.00	3.80	53.00	28.60	6.60	4 Southern analyses included in average.
Sorghum Silage:													
Southern, all analyses	17	75.50	1.55	1.19	11.85	8.04	1.87	6.37	4.77	48.42	32.80	7.64	
American, all analyses	6	76.07	0.80	0.30	15.38	6.40	1.05	3.30	1.30	64.20	26.80	4.40	No Southern analyses included.
HAY AND OTHER COARSE FODDERS.													
Corn (maize) Leaves:													
Southern analyses, not described . .	4	14.00	10.86	2.65	42.59	21.16	8.74	12.65	3.03	49.80	24.48	10.04	
American analyses, field cured . . .	17	29.97	6.02	1.37	35.70	21.40	5.54	8.60	2.00	51.00	30.50	7.90	No Southern analyses included.
Corn (maize) Husks:													
Southern analyses, field cured . . .	5	8.85	2.72	0.61	55.26	29.82	2.74	2.98	0.67	60.62	32.72	3.01	
American analyses, field cured . . .	16	50.90	2.49	0.72	28.34	15.79	1.76	5.00	1.40	57.90	32.20	3.50	No Southern analyses included.
OTHER GRASSES.													
Red-top (*Agrostis vulgaris*):													
Southern, all analyses	4	9.89	7.01	2.01	49.27	26.13	5.69	7.78	2.22	54.69	28.99	6.32	
American, all analyses	7	8.89	7.89	1.91	47.49	28.63	5.19	8.70	2.10	52.10	31.40	5.70	2 Southern analyses included in average.
Orchard Grass (*Dactylis glomerata*):													
Southern, all analyses	4	10.09	8.27	2.76	36.37	35.57	6.94	9.23	3.08	42.70	37.22	7.77	
American, all analyses	10	9.87	8.09	2.63	41.05	32.39	5.97	9.00	2.90	45.40	36.00	6.70	2 Southern analyses included in average.

OTHER GRASSES.													
Timothy (*Phleum pratense*):													
Southern, all analyses	13	11.82	5.66	1.95	45.08	30.68	4.81	6.43	2.21	51.06	34.84	5.46	
American, all analyses	68	13.18	5.87	2.47	45.08	29.03	4.37	6.80	2.90	51.70	33.50	5.10	6 Southern analyses included in average.
German or Hungarian Millet (*Setaria Germanica*) Scribn:													
Southern, all analyses	15	8.42	8.83	2.88	47.13	25.83	6.91	9.65	3.15	51.47	28.18	7.55	
American, all analyses	12	7.66	7.46	2.12	49.05	27.72	5.99	8.10	2.63	53.10	30.00	6.50	1 Southern analysis included in average.
LEGUMES.													
Red Clover (*Trifolium pratense*):													
Southern, 9 analyses at different stages of growth	9	13.41	12.28	3.32	38.66	25.34	6.99	14.19	3.84	44.83	29.06	8.08	
American, 38 analyses at different stages of growth	38	15.26	12.32	3.32	38.20	24.75	6.15	14.50	3.90	45.20	29.10	7.30	7 Southern analyses included in average.
Alfalfa (*Medicago sativa*):													
Southern, all analyses	5	8.99	16.40	2.42	35.75	30.60	5.84	17.98	2.66	39.28	33.62	6.46	
American, all analyses	21	8.44	14.28	2.15	42.68	25.01	7.44	15.60	2.40	46.60	27.30	8.10	2 Southern analyses included in average.
Cowpea Vine (*Dolichos*):													
Southern, all analyses	20	10.46	14.77	3.07	39.34	24.35	8.01	16.47	3.42	43.96	27.21	8.94	
American, all analyses	8	10.69	16.57	2.90	42.22	20.09	7.53	18.60	3.20	47.20	22.50	8.50	3 Southern analyses included in average.
STRAW.													
Oat Straw:													
Southern, all analyses	5	8.16	3.82	2.37	44.43	35.91	5.31	4.17	2.58	48.34	39.13	5.78	
American, all analyses	12	9.22	3.95	2.31	42.36	37.03	5.13	4.40	2.50	46.80	40.70	5.60	No Southern analyses included.
ROOTS, BULBS, TUBERS & OTHER VEGETABLES.													
Potatoes, Irish:													
Southern, all analyses	9	78.91	2.54	1.98	15.80	0.80	0.87	12.22	5.20	74.45	3.92	4.21	
American, all analyses	12	78.89	2.14	0.10	17.36	0.56	0.95	10.10	0.50	82.20	2.70	4.50	No Southern analyses included.

AVERAGE COMPOSITION OF SOUTHERN AND AMERICAN FEEDING STUFFS—Continued.

	Number of Analyses.	Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash	
ROOTS, BULBS, TUBERS & OTHER VEGETABLES.—CONTINUED.													
Potatoes, Sweet.													
Southern, all analyses	48	68.34	1.93	0.74	26.76	1.11	1.12	6.25	2.37	84.15	3.62	3.61	
American, all analyses	6	71.07	1.49	0.37	24.78	1.27	1.02	5.20	1.40	86.30	3.60	3.50	1 Southern analysis included in average.
Mangolds (*Mangel-wurtzel*):													
Southern, all analyses	5	91.75	1.31	0.06	5.18	0.77	0.93	16.11	0.79	62.39	9.40	11 31	
American, all analyses	9	90.85	1.39	0.16	5.68	0.87	1.05	15.20	1.70	62.10	9.50	11.50	No Southern analyses included.
FRUITS AND MELONS.													
Strawberries:													
Southern, all analyses	15	90.52	1.01	0.64	5.64	1.57	0.62	10.65	6.81	59.38	16.57	6.59	
American, all analyses	19	90.84	0.95	0.68	5.50	1.43	0.60	10.40	7.40	60.10	15.60	6.50	15 Southern analyses included in average.
GRAIN AND OTHER SEEDS.													
Corn (maize) Grain:													
Southern, dent varieties	8	12.46	9.14	4.70	70.74	1.50	1.46	10.44	5.37	80.81	1.72	1.66	
American, dent varieties	86	10.56	10.25	5.02	70.40	2.24	1.53	11.50	5.60	78.60	2.60	1.70	No Southern analyses included.
Southern, all analyses	29	11.31	9.80	4.85	70.79	1.85	1.40	11.05	5.47	79.82	2.08	1.58	
American, all analyses	208	10.89	10.49	5.35	69.70	2.05	1.52	11.70	6.10	78.10	2.40	1.70	No Southern analyses included.
Oats:													
Southern, all analyses	13	9.67	10.94	5.62	58.18	11.93	3.66	12.11	6.22	64.41	13.20	4.06	
American, all analyses	29	10.98	11.80	4.96	59.74	9.54	2.98	13.20	5.60	67.00	10.80	3.40	No Southern analyses included.

Barley:													
Southern, all analyses	5	9.58	11.42	2.15	66.89	6.28	3.68	12.63	2.39	73.95	6.95	4.08	
American, all analyses	10	10.85	12.37	1.84	69.79	2.74	2.41	13.90	2.00	78.40	3.00	2.70	No Southern analyses included.
Rye:													
Southern, all analyses	3	9.63	12.77	2.03	70.74	2.67	2.16	14.16	2.25	78.24	2.96	2.39	
American, all analyses	6	11.59	10.58	1.66	72.64	1.67	1.86	11.90	1.90	82.20	1.90	2.10	No Southern analyses included.
Wheat:													
Southern all analyses	11	10.35	12.57	2.16	70.48	2.58	1.86	14.01	2.41	78.63	2.88	2.07	
American, all analyses	310	10.52	11.87	2.09	71.90	1.79	1.83	13.30	2.30	80.40	2.00	2.00	100 analyses by U. S. Dept. Agr., of Southern grown wheat, included in average.
Rice, clean:													
Southern, all analyses	2	12.49	7.91	0.33	78.37	0.33	0.57	9.04	0.37	89.56	0.37	0.66	
American, all analyses	10	12.44	7.44	0.35	79.20	0.19	0.38	8.50	0.40	90.50	0.20	0.40	No Southern analyses included.
Cowpeas:													
Southern, all analyses	19	12.17	24.23	1.48	54.39	4.38	3.35	27.57	1.69	61.93	4.99	3.83	
American, all analyses	5	14.81	20.75	1.44	55.72	4.06	3.22	24.30	1.70	65.50	4.70	3.80	2 Southern analyses included in average.
Soja Beans:													
Southern, all analyses	3	9.48	35.04	18.45	29.02	3.66	4.35	38.72	20.38	32.08	4.03	4.79	
American, all analyses	8	10.80	33.98	16.85	28.89	4.79	4.69	38.10	19.00	32.20	5.40	5.30	1 Southern analyis included in average.
MILL PRODUCTS.													
Corn Meal:													
Southern, all analyses	13	11.46	8.59	3.97	73.01	1.64	1.33	9.71	4.46	82.47	1.85	1.51	
American, all analyses	77	14.98	9.17	3.77	68.76	1.90	1.42	10.80	4.40	81.00	2.20	1.60	No Southern analyses included.
Corn Chop:													
Southern, all analyses	3	11.39	10.39	6.46	64.46	5.08	2.22	11.68	7.19	72.79	5.85	2.49	
American, all analyses*	12	11.05	9.75	8.28	64.60	3.84	2.48	11.10	9.30	72.60	4.30	2.80	No Southern analyses included.
Corn and Cob Meal:													
Southern, all analyses	6	15.57	7.23	3.82	63.78	7.74	1 86	8.52	4.49	75.63	9 18	2 18	
American, all analyses	6	15.08	8.45	3.53	64 86	6.62	1.46	10.00	4.10	76.40	7.80	1.70	No Southern analyses included.

*Adds in water-free substance 100.1.

AVERAGE COMPOSITION OF SOUTHERN AND AMERICAN FEEDING STUFFS—Continued.

	Number of Analyses.	Fresh or Air-Dry Material.						Water-Free Substance.					REFERENCES.
		Water	Protein	Fat	Nitfree Extract	Fiber	Ash	Protein	Fat	Nitfree Extract	Fiber	Ash	
BY-PRODUCTS AND WASTE MATERIALS.													
Corn (maize) Cob:													
Southern, dent varieties	3	7.77	1.94	0.30	56.98	31.72	1.29	2.10	0.32	61.78	34.40	1.40	
American, all analyses	18	10.68	2.37	0.52	54.89	30.13	1.41	2.70	0.60	61.40	33.70	1 60	No Southern analyses included.
Wheat Bran:													
Southern, all analyses	24	9.90	15.32	4.05	57.43	8.03	5.27	17.00	4.50	63.74	8.93	5.83	
American, all analyses	87	11.91	15.42	4.03	53.87	8.99	5.78	17.40	4.50	61.30	10.20	6.60	1 Southern analysis included in average.
Shorts:													
Southern, all analyses	3	9.54	16.97	4.27	61.83	4.01	3.38	18.76	4.71	68.38	4.41	3.74	
American, all analyses	12	11.81	14.92	4.51	56.72	7.40	4.64	16.80	5.10	64.50	8.40	5.20	1 Southern analysis included in average.
Ship-stuff:													
Southern, all analyses	2	7.94	16.74	5.25	60.51	5.43	4.13	18.21	5.69	65.70	5.90	4.50	
American, all analyses	31	12.10	15.62	3.97	60.42	4.60	3.29	17.80	4.50	68.70	5.20	3.80	No Southern analyses included.

In order that these tables may be of practical use to those desiring to calculate rations for feeding stock, the digestibility of the various foods must be known, and as the digestibility of but few Southern grown foods has as yet been determined, we insert a table taken from the Eighth Annual Report Massachusetts Hatch Experiment Station, 1896, showing the digestibility of American feed stuffs as determined by experiments made in the United States.

We have no intention of entering into a discussion of the science of stock feeding in this bulletin. This has already been done in former bulletins of this Station, and for such a discussion we refer the reader to Bul. No. 2, Vol. VI, "The Rational Use of Feeding Stuffs;" "Winter Dairying in Tennesse." We give, however, a few facts and figures on feeding to enable those desiring to do so to use the analyses of feeding stuffs herein reported. We quote freely from Bul. No. 2, Vol. VI, of this Station, and from the Second Annual Report of the South Carolina Experiment Station, 1889.

"A chemical analysis merely states the amount of each ingredient present, without any reference to its availability for nourishing the animal."[1] Thus, table XX shows that corn meal contains 9.17% crude protein, or 9.17 lbs. per 100 lbs. of meal, but in table XXI, it will be found that only 60% of this crude protein is digestible, or we may say that of the 9.17 lbs. of crude protein contained in every 100 lbs. of corn meal, only about 5½ lbs. are of any known value to the animal.

"The determination of the degree of digestibility of the several constituents of fodders is a slow and tedious process. It is briefly as follows: The materials in their passage through the alimentary canal are in part absorbed, passing thus into the circulation, and thence are used up in the functions of nutrition. Those proteins remaining undigested pass on through the canal and are voided in solid form. By analysis, then, of the material fed to the animal and of the residue voided in solid form, both having been weighed, the amount of each constituent that has been absorbed (digested) may be determined."[1]

The results of a number of experiments, made as outlined above, are shown in table XXI.[2]

(1.) 2nd An. Rept. S. C. Ex. Sta., 1889, p. 122.

(2.) From the Eighth Annual Report of the Hatch Experiment Station of the Massachusetts Agricultural College. Compiled by J. B. Lindsey.

TABLE XXI.—TABLES OF THE DIGESTIBILITY OF AMERICAN FEED STUFFS.

I. Experiments with Ruminants.

KIND OF FODDER.	Number of Different Samples.	Number of Single Trials.	Dry Matter (Per Cent).	Organic Matter (Per Cent).	Crude Cellulose (Per Cent).	Crude Fat (Per Cent).	Crude Protein (Per Cent).	Extract Matter (Per Cent).
HAY AND DRY COARSE FODDERS.								
Timothy hay (in bloom)	3	5	55.6—65.7 60	56.4—66.8 60	55.8—62.1 58	51.5—61.8 57	50.3—60.4 56	57.5—71.8 63
Timothy hay (past bloom)	5	10	47.0—61.1 53	48.4—62.3 54	37.2—56.8 47	34.6—61.1 53	38.8—50.4 45	55.6—66.9 60
Timothy hay (average all trials)	11	25	57	58	52	60	48	63
Hay of mixed grasses (medium in protein*)	1	2	. .	. .	49	50	40	58
Hay of mixed grasses (rich in protein)	4	14	54—62 58	. . . .	56—66 60	44—57 49	56—64 59	56—63 59
Rowen (mixed grasses)	1	4	. . . .	63—67 65	65—68 66	44—50 46	68 70 69	63—68 65
Rowen (chiefly timothy)	1	4	. . . .	62—67 64	62—73 66	48—51 49	66—69 68	60—65 63
Average (both samples)	. .	. .	. .	65	66	47	68	64
Salt hay of black grass (*Juncus Gerardi*)	1	2	57—62 60	. . . .	57—64 60	37—46 41	62—63 63	53—59 56
High-grown salt hay (largely *Spartina juncea*)	1	2	51—55 53	. . . .	46—55 50	42—51 47	62—63 63	52—55 53
Bunch grass (*Spartina juncea*, with *Spartina stricta*, var. *glabra*)	1	2	55—57 56	. . . .	48—56 52	27—36 31	61—63 62	54—55 54
Low meadow fox grass (*Spartina juncea*)	1	2	52—54 53	. . . .	49—53 51	17—30 24	. . 57	51—52 52
Meadow, swale or swamp hay	1	2	38—40 39	. . . .	30—36 33	. . 44	31—37 34	. . 46

Hay of vetch and oats	1	2	58—58 58	. . . .	65—67 66	17—20 19	60—61 60	54—54 54
Clover and timothy hay (poorly cured)	1	2	54.3—55.3 55	. . . .	52—54.4 53	. . 58	37.5—37.9 38	. . 60
Hungarian hay	1	2	64.3—65.8 65	65.9—66.8 66	66.8—68.5 68	. . 64	. . 60	66.9—67.4 67
Hay of blue-joint grass (past bloom) *Calamagrostis Canadensis*)	1	1	40	42	37	37	57	43
Hay of blue-joint grass (bloom)	1	2	66.7—70.5 69	68.1—71.5 70	71.5—73.4 72	51.4—53.3 52	68.2—72.3 70	66.4—70.9 69
Hay of orchard grass (ten days after bloom)	1	1	54	56	58	54	59	54
Hay of orchard grass (stage not given)	1	2	57.5—60 59	. . . .	60—66.7 64	55.4—57.4 56	60—60.8 60	55.3—57.3 56
Average of both samples	2	3	56	56	61	55	60	55
Hay of red top	2	3	57.6—62.3 60	59.3—63.6 61	60.8—61.8 61	44.2—58.8 51	60.4—62.4 61	59.1—65.2 62
Dried pasture grass	1	1	71	. .	77	60	72	73
Oat straw	1	2	49—51.7 50	50.8—53.2 52	57.2—58 58	35.5—41 38	. . . .	51.8—54.6 53
Barley hay	1	4	59	62	62	41	65	63
HAY OF LEGUMES.								
Soja-bean hay	1	2	61.9—62.7 62	. . . .	59.5—62.1 61	18.7—39.7 29	70.1—72.1 71	66.1—71.5 69
Peanut-vine hay	1	2	59.5—60.2 60	. . . .	51.2—52.6 52	62.1—69.8 66	63—63.6 63	69.3—69.7 70
Cowpea-vine hay (fair quality)	1	2	. . 59	. . . .	41.2—44.6 43	46.4—53.7 50	63.9—65.1 65	. . 71
Clover hay (late bloom, fair quality)	1	2	54.4—55.5 55	55.9—56.4 56	43.8—49 46	51.8—54.8 53	49.3—59.1 55	63.3—64.8 64

* Below 10 per cent.

KIND OF FODDER.	Number of Different Samples.	Number of Single Trials.	Dry Matter (Per Cent).	Organic Matter (Per Cent).	Crude Cellulose (Per Cent).	Crude Fat (Per Cent).	Crude Protein (Per Cent).	Extract Matter (Per Cent).
HAY OF LEGUMES—continued.								
Clover hay (good quality)	1	2	50.8—53.5 52	51.6—54.3 53	46.6—49 48	40—48 43	47—52.2 49	56.8—58.9 58
White clover hay (bloom)	1	1	66	67	61	51	73	70
Scarlet clover hay (*T. incarnatum*)	2	6	56.8—65.4 62	. . . .	32—58.1 41	35.1—54 44	64—70 66	52—73.6 60
Alsike clover (*T hybridum*)	2	3	61.1—64.3 62	62—65.2 63	51—58.7 53	35.1—69.3 50	64—69.2 66	66.5—74.1 71
Alfalfa (lucerne) (late bloom)	1	2	. .	. .	49	54	77	64
Alfalfa (lucerne) (stage not given)	1	1	. .	. .	43	48	69	72
CORN FODDER (PARTIALLY AIR DRY).								
Corn stover (whole plant)	1	4	61.1—62 62	. . . .	64.8—68.3 67	48.1—55.8 52	49.6—54.8 52	62.5—64.5 64
Corn stover (tops and blades)	1	2	59—60.5 60	. . . .	71.1—71.7 71	70.6—71.9 71	54.2—56.6 55	61.9—62.6 62
Corn stover (leaves of	1	2	54.8—56.2 56	. . . .	54.3—67 61	60.6—65.4 63	43.1—68.8 56	57.1—60.6 59
Corn stalk (below ear)	1	2	64—69 67	. . . .	71—75 74	79—80 80	15—27 21	65—73 69
Topped stover (part above ear)	1	2	52—58 55	. . . .	69—72 71	62—65 64	17—27 22	50—57 54
Corn husks	1	2	71—73 72	. . . .	78—81 80	23—42 33	24—35 30	75 . .
Corn leaves (below ear)	1	2	62—67 65	. . . .	75—80 78	52—59 56	28—41 35	66—70 68

Flint corn fodder (ears just forming)	1	3	69—72 70	71—73 71	72—73 72	63—71 67	69—73 70	71—73 71
Flint (mature) field corn fodder	4	9	68—73 71	71—75 73	69—80 76	59—77 70	59—79 65	69—78 73
Dent (mature) field corn fodder	5	10	63—70 68	. . . .	43—61 54	72—82 78	43—61 53	68—81 76
Average both kinds	. .	. .	70	. .	65	74	59	74
Dent (in milk) field corn fodder	5	11	58.8—66 63	. . . .	50—71 64	67—79 75	44—51 50	61—69 66
Dent (immature, Burrill and Whitman, coarse)	1	4	51—64 57	. . . .	45—74 59	66—84 76	20—36 27	57—66 61
Dent (immature, no ears formed)	4	8	61—70 65	63 -71 67	63—77 71	59—72 66	57—67 62	57—70 64
Sweet corn fodder (mature)	3	6	60—71 67	62—74 70	70—77 74	63—71 74	54—73 64	57—73 68
MISCELLANEOUS DRY SUBSTANCES.								
Hay of wild oat grass (*Danthona spicata*)	2	3	59.6—68.3 64	61.2—69 1 65	65.1—70.6 68	38.2—62.8 50	48.6—68 58	62.1—68.8 65
Hay of witch grass (*Triticum repens*)	2	4	59.9—62.7 61	61—64.3 62	56.4—67.6 62	53.6—60 57	49.5—64.2 58	62.1—69.9 66
Hay of buttercups (*Ranunculus acris*)	1	2	56	57	41	70	56)	67
Hay of white weed (*Leucanthemum vulgare*)	1	2	58	58	46	62	58	67
Cat's-tail millet (*Penniselum spicatum*)	1	2	61.1—63.6 62	. . . .	64.7—68.4 67	44.7—47.6 46	60.6—64.6 63	58.3—60 59
Johnson-grass hay	1	1	55	. .	58	39	45	54
Sorghum fodder (leaves)	1	2	59.9—66.3 63	. . .	64.9—75.9 70	46.3—47.1 47	59.5—62.2 61	62.5—66.6 65
Sorghum bagasse	1	1	61	. .	64	46	14	65
Cotton-seed hulls (fed alone)	4	13	35—47.5 41	. . . .	.54—57.6 47	58.2—89.3 79	.00—24.6 6	12.9—45.7 34

TABLES OF THE DIGESTIBILITY OF AMERICAN FEED STUFFS—Continued.

KIND OF FODDER.	Number of Different Samples.	Number of Single Trials.	Dry Matter (Per Cent).	Organic Matter (Per Cent).	Crude Cellulose (Per Cent).	Crude Fat (Per Cent).	Crude Protein (Per Cent).	Extract Matter (Per Cent).
MISCELLANEOUS DRY SUBSTANCES—continued.								
Cotton-seed hulls when fed with cotton-seed meal (7 to 1 and 6 to 1)	1	3	41 . .	. . . .	33—40 38	. . 78	. . . .	48—50 49
Cotton-seed hulls when fed with cotton-seed meal (4 to 1 to 1½ to 1)	3	11	43—48 45	. . . .	43—50 46	66—80 76	. . . .	49—57 51
Cotton-seed feed (hulls and meal, 7 to 1 and 6 to 1)	1	3	45—46 46	. . . .	34—40 37	81—82 82	44—46 45	50—51 50
Cotton-seed feed (hulls and meal, 4 to 1 to 1½ to 1)	3	11	52—56 55	. . . .	43—49 46	84—86 85	61—65 62	49—56 54
GREEN FODDERS.								
Dent corn fodder (immature)	4	11	64—74 68	. . . .	60—76 67	37—83 68	56—80 66	64—79 71
Dent corn fodder (in milk)	3	9	70	. .	64	78	61	76
Dent corn fodder (glazing)	5	9	67	. .	51	78	54	75
Dent corn fodder (mature)	2	4	65	. .	55	73	51	72
Average (glazing and mature)	7	13	66	. .	52	76	53	74
Dent corn fodder (ears glazing, Burrill and Whitman, coarse)	1	2	51—54 52	. . . .	46—47 46	74—82 78	20—28 24	87—61 59
Sweet corn fodder (milk)	1	2	77—78 77	. . . .	74—76 75	73—74 74	77—78 77	80—81 81
Early amber sorghum (just after blossom)	1	2	60.9—61.7 61	. . . .	41.7—45.3 42	67 . .	37.7—42.5 40	70.4—70.8 71
Sorghum in blossom (variety not stated)	1	2	73.1—73.3 73	. . . .	74—75 75	81.3—81.6 81	51.1—55.7 53	78.2—78 78
Average both samples	2	4	67	. .	59	74	46	74

Green grass (young)	1	1	69	. .	74	55	65	72
Same (dry)	1	1	71	. .	77	60	71	73
Pasture grass	1	2	71.9—75.6 74	. . . .	74.6—76.5 76	74—74.9 74	74—76.5 75	73.8—77.1 75
Average of three samples	. .	. .	71	. .	76	63	70	73
Soiling barley (full bloom)	1	2	. . . .	62—71 66	49—64 56	61—63 62	69—71 70	69—76 73
Barley and peas (full bloom)	1	2	. . . .	55—65 60	55—65 60	38—49 44	73—81 77	56—67 61
Soiling rye (formation of head)	1	2	73.2—74 74	. . . .	78.9—80.4 80	73.6—74.8 74	78.6—79.7 79	69.7—71.4 71
Hungarian grass (probably in bloom)	1	4	61—67 63	63.4—68.8 66	65.4—71.7 68	47.8—56 52	59.4—66.4 62	63.5—68.4 66
Soiling clover (late blossom)	1	2	64.9—67.3 66	. . . .	52.3—52.9 53	63—66.1 65	65.8—68.3 67	76.1—79.3 78
Scarlet clover (late bloom)	1	3	. . . .	68—70 69	54—58 56	63—69 66	. . 77	74—75 74
Average two samples clover	2	5	66	67	55	66	73	77
CORN SILAGE.								
Dent silage (immature)	5	13	60—68 64	. . . .	71—78 70	64—85 71	42—65 54	60—70 66
Dent silage (milk)	4	12	60—74 65	. . . .	45—80 64	78—90 87	45—63 52	63—73 69
Dent silage (average of both)	9	26	65	. .	68	79	53	67
Dent silage (stage uncertain, North Carolina)	1	4	53—67 60	. . . .	43—64 56	55—79 70	19—34 24	61 76 68
Flint silage (ears glazing)	4	11	68—78 75	66—80 77	75—79 77	. . 82	48—73 65	71—83 79
Fine crushed silage (steers)	1	2	60.4—68 64	. . . .	72—78 75	75—77 76	32—44 38	60—70 65

TABLES OF THE DIGESTIBILITY OF AMERICAN FEED STUFFS—Continued.

KIND OF FODDER.	Number of Different Samples.	Number of Single Trials.	Dry Matter (Per Cent).	Organic Matter (Per Cent).	Crude Cellulose (Per Cent).	Crude Fat (Per Cent).	Crude Protein (Per Cent).	Extract Matter (Per Cent).
CORN SILAGE—continued.								
Fine crushed silage (sheep)	1	2	51.5—56 54	. . . .	59.5—67.7 64	67.5—69 68	21—22 21.5	52.6—57.3 55
Corn silage (raw, ears mature)	1	1	. .	. .	59	86	45	71
Same (cooked)	1	1	. .	. .	70	87	39	75
Sweet corn ensilage (occasional ears mature)	1	2	66.6—69.6 68	68 5—71.7 70	68.4—73.7 71	82.3—84.6 83	52.7—55.2 54	70.7—73 72
Soja-bean ensilage	1	2	52.2—65.8 59	. . . .	47.1—62.5 55	66.4—77.3 72	71.3—80.2 76	45.9—58.2 52
ROOTS, TUBERS, ETC.								
Potatoes	1	3	73.3—80.1 77	74 6—81 2 78	. . . . .	13 . .	43.4—45.4 44	87.3—93.4 91
Sugar beets	1	2	94.2 - 94.8 95	97.6—99 9 99	88.5—113 100	46.4—53.5 50	90—92.6 91	99.8—100 100
Mangolds	1	2	77.1—80 79	82.7—87 85	26.8—58.8 43	. . . . .	69.7—79.8 75	90.8—91.9 91
English flat turnips	1	2	90.7—94.9 93	93.2—99 96	89.2—117 100	82.5—92.5 98	84.5—95 90	96—97 97
Ruta-bagas	1	2	84.4—90 87	89.2—93 91	61—87.5 74	76.8—91.6 84.2	74.7—85.9 80.3	94.4—95.1 95
GRAINS AND SEEDS.								
Corn meal (maize)	2	5	83—98 88	. . . .	. . . . .	80—98 92	40—77 60	85—100 93
Corn and cob meal	1	3	74—83 79	. . . . .	2—86 45	82—85 84	43—65 53	86—91 88

Pea meal	1	2	85—88 87	86—89 88	25—26 26	52—57 55	80—86 83	93—94 94
Raw cotton-seed	1	2	63—69 66	. . . .	65—86 76	. . 87	66—70 68	49—50 50
Roasted cotton-seed	1	2	53—58 56	. . . .	62—69 66	68—75 72	44—50 47	50—53 51
Soja-bean meal	1	2	75—82 79	. . . .	28—50 50	81—90 85	89—91 90	71—73 72
Cotton-seed meal	2	6	67—82 76	. . . .	. . 32	87—100 93	83—96 88	44—75 64
BY-PRODUCTS.								
Gluten meal	1	2	85—90 87	86—92 89	. . 33	86—90 88	83—90 87	88—94 91
Chicago gluten meal	1	2	87—89 88	. . . .	. . . .	92—94 93	87—91 89	93—94 93
King gluten meal	1	2	79—82 81	. . . .	. . . .	91—97 94	. . 91	78—81 79
Average gluten meals	3	6	85	. .	. .	92	89	88
Buffalo gluten feed (one lot)	1	2	76—80 78	. . . .	40—46 43	81—82 81	84—86 85	78—84 81
Buffalo gluten feed (another lot)	1	2	87—88 87	. . . .	84—94 89	92—95 93	87—87 87	87—87 87
Peoria gluten feed	1	2	84—87 86	. . . .	59—97 78	76—82 79	81—85 83	90—90 90
Chicago maize feed	1	2	83—85 84	. . . .	68—76 72	90—90 90	83—84 84	84—87 85
Winter-wheat bran	1	3	57—66 62	. . . .	00—56 27	51—80 64	75—79 77	62—76 65
Spring-wheat bran	1	2	62—63 63	. . . .	22—25 24	76—76 76	78—82 80	70—71 70
Average all wheat brans	4	9	60	63	22	71	78	68

TABLES OF THE DIGESTIBILITY OF AMERICAN FEED STUFFS—Continued.

KIND OF FODDER.	Number of Different Samples.	Number of Single Trials.	Dry Matter (Per Cent).	Organic Matter (Per Cent).	Crude Cellulose (Per Cent).	Crude Fat (Per Cent).	Crude Protein (Per Cent).	Extract Matter (Per Cent).
BY-PRODUCTS—continued.								
Wheat middlings*	1	2	72.6—72.2 75	75.1—79.3 77	. . . .	84.1—86.1 85	78.4—79.4 79	80.7—84.5 83
Wheat middlings*	1	2	79.48—85.63 83	. . . .	32.57—40.06 36	81.71—87.98 85	81.83—87.75 85	84.43—91.08 88
New-process linseed meal	1	3	73—83 80	. . . .	49—100 74	90—98 93	86—88 85	82—87 84
Old-process linseed meal	1	3	75—82 79	. . . .	38—71 57	85—92 89	86—93 89	76—79 78
Atlas meal	1	2	80—80 80	. . . .	95—116 106	90—92 91	73—73 73	84—85 84
Rye meal	1	2	85—90 87	. . . .	. . . .	63—65 64	83—85 84	89—94 92
Peanut feed	1	2	32—32 32	. . . .	10—13 12	89—90 90	70—71 71	41—58 49
Malt sprouts	1	1	67	68	34	100	80	69
Dried brewers' grain	1	2	62—62 62	. . . .	50—55 53	89—93 91	78—81 79	59—59 59
Corn cobs	1	2	59—60 59	. . . .	65—66 65	44—56 50	13—22 17	60—60 60

II. Experiments with Swine.

Maize kernels (whole)	1	1	83	83	38	46	69	89
Maize meal	2	2	89.5–89.7 90	91.3–92.1 92	29.4–48.7 39	77.6–81.7 80	86.1–89.9 88	93.9–94.2 94
Maize meal (with cobs)	1	1	76	77	29	82	76	84
Pea meal	1	1	90	92	78	50	89	95
Barley meal	1	1	80	80	49	57	81	87
Wheat (whole)	1	?	72	. .	30	60	70	74
Wheat (cracked)	1	?	82	. .	60	70	80	83
Wheat shorts	1	2	74–79 77	. . . .	25–48 37	. . . .	71–75 73	85.5–88 87
Wheat bran	1	2	53.7–68.6 61	. . . .	29.6–39.1 34	65.4–78.1 72	74.4–75.8 75	56–75 66

*Probably different products.

LITERATURE.—The following publications have been consulted in compiling the tables of the digestibility of American feed stuffs:—

Report of Storrs School (Connecticut) Experiment Station, 1894.—Reports of the Maine State Experiment Station for 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894.—Reports of the New York Experiment Station, 1884, 1888, 1889.—Reports of the Pennsylvania Experiment Station, 1887, 1888, 1889, 1890, 1891, 1892, 1893.—Bulletins Nos. 80 *c*, 81, 87 *d*, 97 and 118 of the North Carolina Experiment Station.—Bulletin No. 16, Utah Experiment Station.—Bulletin No. 3 of the Wisconsin Experiment Station for 1884, and Sixth Annual Report, 1889.—Bulletin No. 8 of the Colorado Experiment Station.—Bulletins Nos. 26 and 36 of the Minnesota Experiment Station.—Bulletin No. 6 of the Oregon Experiment Station.—Bulletins Nos. 13, 15 and 19 of the Texas Experiment Station.—Bulletin No. 20 of the Maryland Experiment Station.—Eleventh and Twelfth Annual Reports (1893 and 1894) of the Massachusetts State Experiment Station.—Report of Hatch Experiment Station, 1895.

[1] "That feeding of domestic animals may be done economically, and therefore profitably, two things are necessary: first, to know what and how much to feed for a given purpose, whether to maintain the strength and vigor of the work animal, to promote the growth of a young or the increase of weight of a mature animal, etc.; and, second, to know the composition of food-stuffs available for the purpose intended.

"That a food-stuff or combination of food-stuffs may be properly suited to the wants of the animal body, the essential nutritive constituents must be accompanied by a certain proportion of non-nutrients which have their proper office in the animal economy.

"Obviously more or less food, and perhaps food of a different character, is best for the same animal fed for different puposes or under different conditions. No fixed or unvarying rules can be laid down; but the work of the chemist and of the student of the problems of animal nutrition have made possible such intelligent economies as will enable us to get better results and realize more profits.

"The table of feeding standards given below is a summary of the amount of digestible nutrients required by a thousand pounds, live weight, of farm animals.[2] If from the total weight of a food stuff we subtract the water and the ash, we obtain the *total of organic matter* in Table XXII. Under the head of digestible constituents of the fodder are stated the number of pounds each of crude protein, carbo-hydrates and fat required, which, added together, give the figures stated under the head of *total nutritive matter*. Under the head *nutritive ratio*, are figures now to be explained.

"The table here given states results obtained by very careful and therefore trustworthy experiments made in Germany, and which have been found practically correct for that country, its climate, its animals, the food-stuffs there used and the conditions there existing. Until we have in this country worked out for ourselves a sufficient number of digestion experiments to justify us in modifying the figures determined by the Germans for their own use, we cannot go far wrong in adopting the standards printed in Table XXII.

(1.) Bul. 2, Vol. VI, 1893, Tenn. Ex. Sta.

(2.) Of course it will be understood that for an animal weighing more or less than 1,000 pounds the total weight of the ration is correspondingly increased or decreased.

TABLE XXII.

FEEDING STANDARDS.

Pounds per Day Required for 1000 lbs. Live Weight.

KIND OF ANIMAL.	Total Dry Organic Matter	DIGESTIBLE CONSTITUENTS OF THE FODDER.			Amount of Nutritive Matter	Nutritive Ratio
		Albuminoids (Proteins)	Carbo-hydrates, (fiber and nitrogen-free extract matter	Fat.		
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs:	
Oxen at rest in stall	17.5	0.7	8.0	0.15	8.85	1: 12.0
Horses, at light work	20.0	1.5	9.5	0.40	11.40	1: 7.0
Horses, at medium work	21.0	1.7	10.7	0 60	13.00	1: 7.0
Horses, at hard work	24.0	2.4	12.5	0.80	15.70	1: 6.0
Milch Cows	24.0	2.5	12.5	0 40	15.40	1: 5.4
Fattening Oxen, 1 period	27.0	2.5	15 0	0.50	18.00	1: 6.5
Fattening Oxen, 2 period	26.0	3.0	14 8	0.70	18.50	1: 5.5
Fattening Oxen, 3 period	25 0	2.7	14.8	0.60	18.10	1: 6.0
Fattening Sheep, 1 period	26.0	3.0	15.2	0.50	18.70	1: 5.5
Fattening Sheep, 2 period	25.0	3.5	14.4	0.60	18.50	1: 4.5
Fattening Swine, 1 period	36.0	5.0	27.5		32.50	1: 5.5
Fattening Swine, 2 period	31.0	4 0	24.0		28.00	1: 6.0
Fattening Swine, 3 period	23.5	2.7	17.5		20.20	1: 6.5
GROWING CATTLE.						
Age—Months. / Average Live Weight, per head						
2 to 3 / 150 lbs.	22.0	4.0	13.8	2.0	19 8	1: 4.7
3 to 6 / 300 lbs.	23.4	3.2	13.5	1.0	17.7	1: 5.0
6 to 12 / 500 lbs.	24.0	2.5	13.5	0.6	16.6	1: 6.0
12 to 18 / 700 lbs.	24.0	2.0	13.0	0 4	15.4	1: 7.0
18 to 24 / 850 lbs.	24.0	1.6	12.0	0.3	13.9	1: 8.0
GROWING SHEEP.						
5 to 6 / 56 lbs.	28.0	3.2	15.6	0.8	19.6	1: 5.5
6 to 8 / 68 lbs.	25.0	2.7	13.3	0.6	16.6	1: 5.5
8 to 11 / 76 lbs.	23 0	2.1	11 4	0.5	14.0	1: 6.0
11 to 15 / 82 lbs.	22.5	1.7	10 9	0.4	13.0	1: 7.0
15 to 20 / 86 lbs.	22.0	1.4	10.4	0.3	12.1	1: 8.0
GROWING SWINE—FATTENING.						
2 to 3 / 50 lbs.	42.0	7.5	30.0		37 5	1: 4.0
3 to 5 / 100 lbs.	34.0	5.0	25.0		30.0	1: 5 0
5 to 6 / 125 lbs.	31.5	4.3	23.7		28.0	1: 5.5
6 to 8 / 170 lbs.	27.0	3.4	20.4		23.8	1: 6.0
8 to 12 / 250 lbs.	21.0	2.5	16.2		18.7	1: 6.5

[1] "Note that the first animal named in the table is the 'ox at rest in the stall.' The German experimenters hold that 0.7 pounds of crude protein are necessary to make good the daily waste of muscular tissue of an idle ox weighing 1,000 pounds; and that to warm the body and keep up vital action 8 pounds of digestible carbo-hydrates and 0.15 pounds of fat are necessary; and that these amounts of nutritive elements are sufficient to maintain the ox in health without loss of live weight. If the ox is required to work there will necessarily be more waste of muscle to make good; and there will be greater demand for heat and force-formers, the fat and carbo-hydrates. The heavily-worked ox must have, in order to do the work and maintain its live weight, three and a half times as much of crude protein, one and a half times as much carbo-hydrates and three and one-third times as much fat as when idle. If the protein is disproportionately increased, or if there fed is a much larger proportion of carbo-hydrates and the protein be greatly reduced, the ox will lose flesh and strength and be less capable of work. These standards for feeding, prepared mainly by Prof. Emil Wolff, indicate a certain ratio of muscle-forming nutrients to those which are heat-formers, which must be observed to promote the desired results. In the case of the ox at rest the *nutritive ratio* is stated as 1 to 12, meaning that to maintain the ox from day to day he should be fed one part of protein (nitrogenous matter), to twelve of carbo-hydrates and fat (non-nitrogenous matters). As heretofore explained, fat is assumed to be 2½ times the equivalent of an equal weight of the carbo-hydrates. Multiply 0.15 by 2½ and add to the carbo-hydrates and we have 8.37, The ratio is therefore as 0.7 to 8.37, or as 1 to 12 in round numbers.

"The *nutritive ratio* is a sort of statement in brief of the limits, near to which we must manage to arrange the proportional amounts of nitrogenous and non-nitrogenous constituents of a daily ration.

"An illustration or two will clearly explain the use of these tables.[2]

"In the cotton-growing districts of this State it is the common practice to feed working horses and mules corn in the ear and mixed hay; eight to ten ears of corn (three pounds of grain),

(1) Tenn. Ex. Sta. Bul. 2, Vol. VI, 1893.

(2) We have changed slightly the figures given in the original, as the tables used in this bulletin for composition and digestibility of feeding stuffs vary a little from those used in the original bulletin.

morning, noon and night, with hay *ad libitum*. A healthy working horse will eat, besides the corn, about fourteen pounds of hay daily.

In Table XXII we find that a horse weighing 1,000 pounds requires per day 21 pounds of organic dry matter, 1.7 pounds protein, 0.60 pound fat and 10.7 carbo-hydrates.

In Table XX we find, under the head "percentage composition," that corn contains of water 10.9 per cent., and ash 1.5 per cent., with 87.6 per cent. of dry organic matter; under the head of "per cent. digestible matter," Table XXI, that 60 per cent. of the protein, 92 per cent. of the fat, and 93 per cent. of the carbo-hydrates (nitrogen-free extract matter and fiber) are digestible.

	Total Dry Organic Matter.	Protein	Digestible Fat.	Carb-hyd.
9 lbs. corn	7.88	0.57	0.44	6 00
14 lbs. hay (timothy)	11.5	0 39	0.21	6.08
	19.38	0.96	0.65	12.08
Required	21.00	1.70	0.60	10.70

Comparing the ration usually fed to our moderately-worked farm horses with the requirements of the German feeding standard, we note a deficiency of about two pounds of organic dry matter, and 0.74 pound of protein, with an excess of 1.38 pounds of carbo-hydrates, 0.05 pound of fat.[3] The standard requires a nutritive ratio of 1:7; the corn and hay, fed as above stated, has a ratio 1:7.5. If the "standard" is to be accepted as such, we may argue that a horse steadily, though moderately, worked upon the ration so common on Tennessee farms, will gradually lose flesh.

"Very few farm horses are worked continuously for any long period; but we all know how quickly the work-stock on most of our farms are reduced in flesh during the plowing season. We should endeavor to feed in such manner as to enable the horse to do the required work without 'getting poor' and losing strength.

"We have used the following rations with satisfactory results, the horses doing continuous and heavy work. The figures are for 1,000 pounds live weight of animal.[4]

(3) From figures given from corn meal.

(4) These rations are reproduced here, with no change in figures, from Tenn. Ex. Sta. Bul. 2, Vol. VI, and are calculated from data published in that bulletin.

"1.—Corn 4 lbs., oats 8 lbs., mixed and ground together; this mixed with 12 lbs. of chaffed hay. Hay in manger, about 3 lbs. during the night. Dry matter, 21.9 lbs. Nutritive ratio, 1:8.4.

"2.—Corn 4 lbs., oats 8 lbs., as in No. 1; mixed with 12 lbs. prime clover hay chaffed. Dry matter, 19.4 lbs. Nutritive ratio, 1:7.

"3.—Corn 4 lbs., oats 8 lbs., as in No. 1. Corn fodder (blades) 8 lbs. Hay in manger, of which the horse will consume about 5 lbs. Dry matter, 20.2 lbs. Nutritive ratio, 1:7.5.

"4.—Corn in the ear, 9 lbs. (about 27 average ears). Corn fodder (blades) 12 lbs. Hay in manger, of which the horse will consume 3 to 6 lbs. Dry matter, 21.2 lbs. Nutritive ratio, 1:8.5.