

Smalley Foundation Committee Report

Cooperative Meal Samples for the Season 1929-1930

By H. C. MOORE, *Chairman*

THE following tables give a summary of the results of cooperative analytical work of the Smalley Foundation for oil and ammonia for the past year. The work was concluded with sample No. 30, reported on April 16, 1930. There were 96 collaborators participating this year, as compared with 91 and 102 for the years 1927-28 and 1928-29 respectively.

In table No. I is shown the standing of the 45 collaborators who reported oil determinations on all samples. In the two preceding years 42 and 46 respectively reported on all samples. Table No. II shows the corresponding standing of the 75 collaborators who reported ammonia results on all samples. This number compares with 63 and 74 respectively in the two preceding years. Table No. III gives the combined average standing for both oil and ammonia for the 45 collaborators who reported both oil and ammonia on all samples. In the two preceding years 42 and 46 collaborators reported oil and ammonia results on all samples. Table No. IV gives the summary of results of other collaborators who failed to report on all samples, but whose results deserve recognition. Table No. V gives an idea of the degree of uniformity of results for oil and ammonia separately on the 30 samples. The best general agreement for oil is found in the case of sample No. 29, and for ammonia on sample No. 23; the poorest agreement for oil is in the case of sample No. 23, and for ammonia on sample No. 2. This table shows the maximum, minimum and average number of collaborators in the case of oil and ammonia within the three ranges chosen for all samples.

The Awards

THE awards for the best work on the thirty samples are the same as for several seasons past, and as published in the Cotton Oil Press in 1923. The prize winners are as follows:

The Battle cup for the highest efficiency in the determination of both oil and ammonia is awarded to No. 53, Southwestern Laboratories, Dallas, Texas, whose average is 99.956½ percent. The certificate for second place goes to No. 20, Dr. W. F. Hand, State Chemist, A & M College, Mississippi, whose average effi-

ciency is 99.926 percent. The corresponding percentages for the two previous years were 99.934 and 99.919½, 99.874 and 99.848 percent respectively. The collaborators will recall that the present cup was furnished by the late Dr. H. B. Battle, after he had been awarded permanently the original cup, having won it on three different occasions. This is the fourth award of this cup. In 1926-27 it was awarded to Dr. W. F. Hand, State Chemist, A & M College, Mississippi; in 1927-28 to Mr. E. H. Tenent, International Sugar Feed Co., Memphis, Tennessee; and in 1928-29 to Geo. W. Gooch Laboratories, Los Angeles, California.

The certificate for the highest efficiency in the determination of oil is awarded to No. 53, Southwestern Laboratories, Dallas, Texas, whose average is 99.938 percent, and the certificate for second place goes to No. 20, Dr. W. F. Hand, whose average is 99.918 percent. The corresponding percentages for the two preceding years were 99.920 and 99.895, 99.839 and 99.791 percent respectively. The certificate for the highest efficiency in the determination of ammonia is awarded to No. 47, Mr. George K. Redding, The Larrowe Milling Co., Rossford, Ohio, whose average is 99.984 percent, and the certificate for second place goes to No. 53, Southwestern Laboratories, whose average is 99.975 percent. The corresponding percentages for the two previous years were 99.979 and 99.965, 99.974 and 99.965 percent respectively. In accordance with the resolution adopted by the American Oil Chemists' Society, the identity of the other collaborators will not be disclosed. The foregoing comparisons show that the percentage efficiency for both oil and ammonia, as well as for the combined oil and ammonia work is higher than for the past two years. The method for determining the standing of the various collaborators and their percent efficiency is the same as that used for several years past, and is fully described in the January, 1923, issue of the Cotton Oil Press, Vol. VI, No. 9, Page 33. The same rule has also been used as heretofore in calculating the accepted averages. This method is described in the May, 1929, issue of Oil & Fat Industries, Page 25.

The Samples

THERE have been fewer complaints from the collaborators regarding the samples during this past year than in any previous year, and the chairman feels that the committee and all the collaborators wish to thank Mr. Law for his careful work in the preparation and handling of the samples. Mr. Law has asked to be advised if there is any doubt as to the uniformity of the samples, and the chairman has passed on to him the two or three complaints received this season. The collaborators were given the opportunity to be advised by wire collect if their reports are not received at the appointed time each week, or in case there seems to be a typographical error in their reports. Only 43 took advantage of this offer and there have been one or two misunderstandings in this respect, where collaborators thought that they had asked to be notified by wire, but the chairman had received no such request so was obliged under our rules to accept only such results as are received before the report goes to press, which includes Tuesday of each week. Results received between Tuesday noon and the time the copy is sent to the printer early Wednesday morning have been accepted, but these results are not counted in making up the accepted average. The number of results received after the average has been calculated might possibly change this average as much as .01, although this condition would rarely occur.

The chairman has received several recommendations during this past year that results for nitrogen be reported in place of ammonia. This matter was submitted to the committee, who voted as not in favor of this change, at least for another year. Nitrogen values are replacing ammonia values quite generally, particularly in fertilizer practice, and it is recommended that some thought be given to this proposed change in our method of reporting before the next series of samples begins, about September, 1930.

No reference has been made in this report to the moisture results, as these are being referred to in the report of the chairman of the Moisture Committee.

Summary

THIS year's report of the Smalley Foundation shows much progress. While not quite as many collaborators were enrolled as in the preceding year, the percent efficiency is higher and the value of this work is becoming more fully appreciated each season. The chairman wishes to again emphasize that the purpose of the cooperative work is not to provide a

contest to win a prize, but to improve the quality of the analytical work of those taking part. It is hoped that future years will show continued progress. In concluding, the chairman wishes to thank the collaborators and the members of the committee for their cooperation in this important work.

Personnel of committee:

H. C. MOORE, *Chairman*
G. WORTHEN AGEE
C. A. BUTT
L. B. FORBES
N. C. HAMNER
L. C. HASKELL
G. K. WITMER

TABLE I—OIL RESULTS, ALL SAMPLES
(Average analysis, Oil 6.475)

Rank	An. No.	Points off	Av. per sample	Efficiency	
1	53	12	.0040	99.938	
2	20	16	.0053	99.918	
3	59	22	.0073	99.887	
4	86	24	.0080	99.877	
5	79	32	.0107	99.835	
6	2	33	.0110	99.831	
7	50	39	.0130	99.799	
8	58	49	.0163	99.748	
9	35	52	.0173	99.733	
10	80	57	.0190	99.705	
11	{ 80	60	.0200	99.691	
	{ 84	60	.0200	99.691	
13	62	61	.0203	99.685	
14	42	64	.0213	99.671	
15	88	65	.0217	99.655	
16	47	67	.0223	99.656	
17	33	71	.0237	99.634	
18	85	74	.0247	99.618	
19	19	81	.0270	99.583	
20	81	82	.0273	99.578	
21	56	86	.0287	99.557	
22	12	92	.0307	99.526	
23	91	100	.0333	99.485	
24	71	108	.0360	99.445	
25	43	112	.0373	99.424	
26	21	116	.0387	99.403	
27	67	119	.0397	99.387	
28	35	123	.0410	99.366	
29	69	124	.0413	99.362	
30	54	126	.0420	99.351	
31	{ 41	128	.0427	99.340	
	{ 49	123	.0427	99.340	
33	39	150	.0500	99.228	
34	70	155	.0517	99.200	
35	64	168	.0550	99.135	
36	52	174	.0580	99.105	
37	66	184	.0613	99.054	
38	51	199	.0663	98.975	
39	55	201	.0670	98.965	
40	1	205	.0683	98.944	
41	34	214	.0713	98.893	
42	48	249	.0830	98.718	
43	61	301	.1003	98.450	
44	57	313	.1043	98.389	
95.862		2.677	803	13	45

TABLE II—AMMONIA RESULTS,
ALL SAMPLES
(Average analysis, Ammonia 7.98)

Rank	An. No.	Points off	Av. per sample	Efficiency
1	47	4	.0013	99.984
2	53	6	.0020	99.975
3	91	8	.0027	99.966
4	55	10	.0033	99.959
5	86	11	.0037	99.954
6	3	21	.0040	99.949
7	{ 27	13	.0043	99.946
	{ 40	13	.0043	99.946
9	78	14	.0047	99.941
10	{ 20	16	.0053	99.934
	{ 36	16	.0053	99.934
12	{ 38	20	.0067	99.916
	{ 85	20	.0067	99.916
14	25	22	.0073	99.909
15	{ 59	23	.0077	99.904
	{ 71	23	.0077	99.904
17	12	26	.0087	99.891
18	88	27	.0090	99.887
19	{ 9	28	.0093	99.884
	{ 72	28	.0093	99.884
21	{ 43	29	.0097	99.879
	{ 62	29	.0097	99.879
23	{ 4	32	.0107	99.866
	{ 56	32	.0107	99.866
25	{ 28	33	.0110	99.862
	{ 48	33	.0110	99.862
27	{ 50	34	.0113	99.859
	{ 79	34	.0113	99.859
29	{ 80	35	.0117	99.854
	{ 83	35	.0117	99.854
31	39	35	.0120	99.850
32	58	37	.0123	99.846
33	52	38	.0127	99.841
34	{ 2	39	.0130	99.837
	{ 49	39	.0130	99.837
	{ 54	39	.0130	99.837
	{ 64	39	.0130	99.837
38	{ 16	42	.0140	99.825
	{ 24	42	.0140	99.825
40	{ 1	43	.0143	99.821
	{ 10	43	.0143	99.821
42	19	45	.0150	99.812
43	84	46	.0153	99.808
44	{ 8	47	.0157	99.803
	{ 42	47	.0157	99.803
46	76	48	.0160	99.800
47	61	54	.0180	99.775
48	{ 23	57	.0190	99.762
	{ 33	57	.0190	99.762
50	17	59	.0197	99.753
51	35	61	.0203	99.746
52	{ 21	65	.0217	99.728
	{ 34	65	.0217	99.728
	{ 74	65	.0217	99.728
55	46	66	.0220	99.724
56	70	68	.0227	99.716
57	81	69	.0230	99.712
58	69	71	.0237	99.703
59	{ 7	74	.0247	99.691
	{ 95	74	.0247	99.691
	{ 11	77	.0257	99.678
	{ 51	77	.0257	99.678
61	{ 57	77	.0257	99.678

TABLE II (continued)

Rank	An. No.	Points off	Av. per sample	Efficiency
64	41	80	.0267	99.666
65	29	92	.0307	99.615
66	30	95	.0317	99.602
67	5	97	.0323	99.595
68	77	111	.0370	99.536
69	15	121	.0403	99.495
70	14	131	.0437	99.453
71	96	132	.0440	99.449
72	22	136	.0453	99.432
73	66	149	.0497	99.377
74	67	179	.0597	99.252
75	13	198	.0660	99.173

Table III—Oil and Ammonia Results

All Samples		
Rank	Analyst	Efficiency
1	53	99.956½
2	20	99.926
3	86	99.915½
4	59	99.895½
5	79	99.847
6	{ 2	99.833½
	{ 36	99.833½
8	50	99.829
9	47	99.820
10	40	99.818½
11	58	99.797
12	62	99.782½
13	80	99.780
14	88	99.776
15	85	99.767
16	84	99.749½
17	42	99.737
18	91	99.725½
19	56	99.711½
20	12	99.708½
21	33	99.698
22	19	99.697½
23	71	99.674½
24	43	99.651½
25	81	99.645
26	54	99.594
27	49	99.588½
28	21	99.565½
29	35	99.556
30	39	99.539
31	69	99.532½
32	41	99.503
33	64	99.486
34	52	99.473
35	55	99.462
36	70	99.458
37	1	99.382½
38	51	99.326½
39	67	99.319½
40	34	99.313
41	48	99.290
42	66	99.215½
43	61	99.112½
44	57	99.033½
45	13	97.517½

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Activated Carbons

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retain traces of soap in refined oil, as evidenced by the following tests on refined coconut oil of a known soluble soap content (indicated as sodium oleate).

	Percent Soluble Soap (estimated as sodium oleate)
Refined coconut oil	0.0152%
Same coconut oil decolorized with 1% of imported activated carbon A	none
Same coconut oil decolorized with 1% of domestic activated carbon X	none
Same coconut oil decolorized with 1% of domestic carbon Y	0.0030%
Same coconut oil decolorized with 1% of imported activated carbon B	0.0046%
Same coconut oil decolorized with 1% of imported activated carbon C	0.0055%

Thus it may be seen that all of the five samples of activated carbon used exerted a strong effect of soluble soap reduction, two of the five completely eliminating any final trace of soap in the oil, while the minimum reduction was 0.0097% out of 0.0152%.

The use then of as large a percentage of activated carbon as profitably may be employed from a decolorizing standpoint, and the reduction of decolorizing temperatures to a minimum, would appear to assist the edible oil refiner, especially if he is not properly equipped for vacuum decolorizing. Apparently the presence of such carbon in decolorizing tends to aid in the complete elimination of those objectionable traces of soaps and other impurities, dissolved or held in colloidal suspension in the oil.

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Tables IV—Results of Other Collaborators Whose Results Deserve Recognition

Anal'yst	No. samples reported on	Points off	
		Oil	Ammonia
6	29	—	28
18	23	—	42
25	29	—	63
32	29	30	34
37	26	447	66
45	27	—	51
60	23	247	70
63	29	47	7
65	26	187	36
73	23	88	59
75	29	—	115
82	29	—	93
87	20	140	36
89	28	315	100
90	28	497	196
92	29	143	96
93	26-27	503	62
97	21-24	380	154

Table V
Showing Degree of Uniformity of Results Reported

	report- ing	No. ± .10	No. ± .05	No. ± .02	Sample No.
OIL					
Max. deg.	55	49	39	20	29
Min. "	55	38	24	16	23
Aver. "	54	44	34	18	—
AMMONIA					
Max. deg.	89	88	79	47	23
Min. "	90	81	69	39	2
Aver. "	88	85	73	43	—

OIL & FAT Statement of Ownership
Statement of the ownership, management, circulation, etc., required by Act of Congress of August 24, 1912, of Oil & Fat Industries, published monthly at New York, N. Y. for April 1, 1930.

State of New York; County of New York.
Before me, a Notary Public in and for the State and county aforesaid, personally appeared Alan Porter Lee, who having been duly sworn according to law, deposes and says that he is the Editor of the Oil and Fat Industries and the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation) etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, and business manager are: Publishers, MacNair-Dorland Co., Inc., 136 Liberty St., New York, N. Y.; Editor, Alan Porter Lee, 136 Liberty St., New York N. Y.; Managing Editor, None; Business Manager, Grant A. Dorland 136 Liberty St., New York, N. Y.

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[Signed] Alan Porter Lee.

Sworn to and subscribed before me this 18th day of March, 1930.

Al. J. Ruggiero, Notary Public, Kings Co., No. 509 Reg. No. 1162; Cert. filed in N. Y. Co., No. 309 Reg. No. 1R242; Commission expires March 30th, 1931.

[SEAL]