Report of the Smalley Foundation Committee

Cooperative Meal Samples for the Season 1928-1929

By H. C. MOORE, *Chairman*

THE following five 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. 33, reported on April 17, 1929. The number of collaborators participating this year is 102, as compared to 75, 78, 88 and 91 for the four preceding years.

In Table No. I is shown the standing of the 46 collaborators who reported oil determinations on all samples. In the previous year 42 reported on all samples, as compared to 43, 35, 29 and 36 respectively in the four preceding years. Table No. II shows the corresponding standing of the 74 collaborators who reported ammonia results on all samples. This number compares with 63, 65, 52 and 42 in the four preceding years. Table No. III gives the combined average standing for both oil and ammonia for the 46 collaborators who reported both oil and ammonia on all samples. In the previous year 42 collaborators reported oil and ammonia results on all samples, as compared to 43, 35, 29 and 36 respectively for the four preceding years. Table No. IV gives the summary of results of other collaborators who have failed to report on all samples, but whose results deserve recognition. Table No. V gives an idea of the range of agreement 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. 12, and for ammonia on sample No. 6; the poorest agreement for oil is in the case of sample No. 27, and for ammonia on sample No. 13. 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 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. 85, Geo. W. Gooch Laboratories, Los Angeles, California, whose average is 99.874 per cent. The certificate for second place goes to No. 21, Dr. W. F. Hand, State Chemist of Mississippi, whose average efficiency is 99.848 per cent. The corresponding percentages for the two previous years were 99.934 and 99.899½, 99.919½ and 99.901 per cent, respectively. The collaborators will recall that the present cup was generously furnished by Dr. H. B. Battle of Montgomery, after he had been awarded permanently the original cup, having won it on three different occasions. This year is the third award of this cup. It was awarded to Dr. W. F. Hand, State Chemist, A. & M. College, Mississippi, in 1926-27; to Mr. E. H. Tenent, International Sugar Feed Co., Memphis, Tenn., in 1927-28.

The certificate for the highest efficiency in the determination of oil is awarded to No. 85, Geo. W. Gooch Laboratories, Los Angeles, whose average is 99.839 per cent, and the certificate for second place goes to No. 63, Mr. D. B. McIsaac, International Vegetable Oil Co., Savannah, whose average is 99.791 per cent. The corresponding percentages for the two previous years were 99.920 and 99.895, 99.878 and 99.852 per cent, respectively. The two certificates for the highest efficiency in the determination of ammonia are awarded to No. 5, Mr. R. D. Caldwell, Armour Fertilizer Works, Atlanta, Georgia, and No. 52, Southwestern Laboratories, Dallas, Texas, who are tied for first place, their average efficiency being 99.974 per cent. No. 48, Mr. George K. Redding, The Larrowe Milling Co., Rossford, Ohio, and No. 96, Mr. Landon C. Moore, Dallas, Texas, are tied for second place, their average efficiency being 99.965 per cent. The corresponding percentages for the two previous years were 99.970 and 99.965, 99.996 and 99.988 per cent. In accordance with the resolution adopted by the American Oil Chemists' Society, the identity of the other collaborators will not be disclosed. It will be observed from the foregoing that the percentage efficiency for ammonia determinations during the past year is very nearly as high as that for the previous year, but the efficiency for the oil results does not compare quite as favorably with those for the previous year.

The method for determining the standing of the various collaborators and their per cent efficiency is the same as has been 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

also has been used as heretofore in calculating the accepted averages, as follows:

All results are listed in an ascending order from the lowest to the highest and a preliminary average calculated after omitting results which are obviously extreme. Next, all results within plus or minus 0.10 per cent from the preliminary average are taken and a new average called "A" is calculated. In other words, if 7.50 is the preliminary average, then all results from 7.40 to 7.60 inclusive are taken. Next is found the largest number of results within the "A" group which are within a range of 0.10 per cent, (that is, say 7.40 to 7.50 inclusive, 7.41 to 7.51 inclusive, or 7.45 to 7.55 inclusive, etc.) and the results in this group used to calculate average "B." The accepted average is the average of "A" and "B" taken to the nearest 0.01. In case this calculated average should be exactly half way between two values 0.01 apart, then the "B" result is favored, that is, in case the "A" result is 7.500 and "B" 7.510 and the average of "A" and "B" 7.505, the average would be 7.51. In order that this report may be published in the May issue of *Oil & Fat Industries,* the chairman has been obliged to complete his calculations before receiving replies from the collaborators, giving their record of "points off" on all samples, and it is hoped that these tabulations are correct, but he will gladly acknowledge any errors which may appear.

There have been very few complaints from the collaborators regarding the samples during this past year, and the chairman feels sure that the committee, as well as all the collaborators, wish to thank Mr. Law for his painstaking work in the preparation and handling of the samples. Mr. Law, however, has requested that he be advised if there is any doubt as to the uniformity of the samples, and the chairman has passed on to him the few comments that have been received. An opportunity has been afforded all the collaborators to be advised by wire collect in case 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 51 have taken advantage of this offer. There have been one or two misunderstandings in this respect where collaborators have understood that they were marked to be wired in such cases, when no such request had been received by the chairman, and the chairman has been 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 which have been received early Wednesday morning before the copy is sent to the printer have been accepted; however these results are not counted in making up the accepted average. It is, of course, possible that the number of results received after the average has been calculated might change this result as much as .01, although this condition would rarely occur.

This year's report of the Smalley Foundation shows considerable progress in the number of collaborators enrolled, even though the per cent efficiency is not quite as high as in the two preceding years, when an unusually high efficiency record was established. The value of the cooperative work is becoming more and more appreciated and enlisting the interest of an increasingly larger number of state, commercial and works laboratories, including in the latter those of the oil, fertilizer and milling industries. The chairman wishes to remark once more that the purpose of the Smalley Foundation is through cooperative work to improve the quality and standard of analytical work in determining oil and ammonia, and not to provide a prize contest. It is believed that it will be generally agreed that in this respect

Table I—Oil Results, All Samples
(Average analysis, Oil 6.84)

Rank	An. No.	Points off	Av. per sample	Efficiency
1	85	33	.0110	99.839
2	63	43	.0143	99.791
3	78	46	.0153	99.774
4	21	47	.0157	99.770
5	47	49	.0163	99.762
6	79	51	.0170	99.751
	87	51	.0170	99.751
8	64	54	.0180	99.737
9	73	58	.0193	99.718
10	1	60	.0200	99.707
11	48	62	.0207	99.697
12	88	81	.0270	99.605
13	81	87	.0290	99.576
	94	87	.0290	99.576
15	32	92	.0307	99.551
16	35	95	.0317	99.536
17	68	107	.0357	99.478
18	22	109	.0363	99.469
19	50	112	.0373	99.455
20	41	114	.0380	99.445
21	52	119	.0397	99.420
22	82	123	.0410	99.400
23	46	124	.0413	99.396
24	84	131	.0437	99.361
25	51	134	.0447	99.347
26	36	137	.0457	99.332
27	83	138	.0460	99.327
28	42	139	.0463	99.323
	53	139	.0463	99.323
30	55	143	.0477	99.303
31	3	153	.0510	99.254
32	40	155	.0517	99.243
33	96	159	.0530	99.225
34	66	167	.0557	99.185
35	90	203	.0677	99.010
36	69	205	.0683	99.000
37	54	224	.0747	98.905
38	44	231	.0770	98.872
39	86	237	.0790	98.844
40	49	253	.0843	98.766
41	2	255	.0850	98.756
42	13	326	.1087	98.411
43	77	336	.1120	98.360
44	91	361	.1203	98.240
45	92	749	.2497	96.350
46	14	846	.2820	95.875

Rank	An. No.	Points off	Av. per sample	Efficiency
58	35	81	.0270	99.648
59	39	85	.0283	99.631
60	88	96	.0320	99.583
61	29	97	.0323	99.578
	91	97	.0323	99.578
63	74	101	.0337	99.560
64	92	102	.0340	99.556
65	16	108	.0360	99.530
66	17	118	.0393	99.488
67	42	121	.0403	99.474
	82	121	.0403	99.474
69	60	124	.0413	99.462
70	15	125	.0417	99.456
71	32	130	.0433	99.435
72	14	132	.0440	99.426
73	76	137	.0457	99.404
74	77	218	.0727	99.050

Table II—Ammonia Results, All Samples
(Average analysis, Ammonia 7.67)

Rank	An. No.	Points off	Av. per sample	Efficiency
1	5	6	.0020	99.974
	52	6	.0020	99.974
3	48	8	.0027	99.965
	96	8	.0027	99.965
5	10	14	.0047	99.939
	81	14	.0047	99.939
7	30	15	.0050	99.935
8	6	16	.0053	99.931
	47	16	.0053	99.931
10	8	17	.0057	99.926
	21	17	.0057	99.926
	64	17	.0057	99.926
13	55	18	.0060	99.922
14	78	20	.0067	99.913
15	85	21	.0070	99.909
16	65	23	.0077	99.900
17	7	24	.0080	99.886
18	11	25	.0083	99.892
19	13	26	.0087	99.887
20	26	28	.0093	99.879
	66	28	.0093	99.879
22	84	29	.0097	99.874
23	73	30	.0100	99.870
24	4	31	.0103	99.866
25	1	33	.0110	99.857
	53	33	.0110	99.857
27	90	34	.0113	99.853
28	22	35	.0117	99.848
	44	35	.0117	99.848
	62	35	.0117	99.848
	69	35	.0117	99.848
	94	35	.0117	99.848
33	46	37	.0123	99.840
34	51	38	.0127	99.835
35	28	39	.0130	99.831
	89	39	.0130	99.831
37	87	43	.0143	99.814
38	3	44	.0147	99.808
39	79	45	.0150	99.805
40	24	48	.0160	99.791
41	2	49	.0160	99.787
	12	49	.0163	99.787
	18	49	.0163	99.787
	54	49	.0163	99.787
45	36	50	.0167	99.782
46	41	53	.0177	99.769
47	43	55	.0183	99.761
48	83	57	.0190	99.752
49	68	59	.0197	99.743
50	25	60	.0200	99.739
51	23	62	.0207	99.730
52	63	64	.0213	99.722
53	50	65	.0217	99.717
54	75	69	.0230	99.700
55	40	70	.0233	99.696
56	86	72	.0240	99.687
57	49	78	.0260	99.661

the Smalley Foundation continues to accomplish its purpose. It is quite apparent that much further progress is possible in the direction of more uniform results for moisture, although improvement has been noted in these results, due very largely, undoubtedly, to continued thought and study of this matter and the improvement in drying ovens now available. In conclusion the chairman wishes to thank the collaborators and the members of the committee for their cooperation at all times.

Table III—Oil and Ammonia Results, All Samples

Rank	Analyst	Efficiency
1	85	99.874
2	21	99.848
3	47	99.846½
4	78	99.843½
5	64	99.831½
6	48	99.831
7	73	99.794
8	87	99.782¼
9	1	99.782
10	79	99.778
11	81	99.757½
12	63	99.756½
13	94	99.712
14	52	99.697
15	22	99.658½
16	46	99.618
17	84	99.617½
18	55	99.612½
19	68	99.610½
20	41	99.607
21	96	99.595
22	35	99.592
23	51	99.591
24	53	99.590
25	88	99.594
26	50	99.586
27	36	99.557
28	83	99.539½
29	66	99.532
30	3	99.531
31	32	99.493
32	40	99.469½
33	82	99.437
34	90	99.431½
35	69	99.424
36	42	99.398½
37	44	99.360
38	54	99.346
39	2	99.271½
40	86	99.265½
41	49	99.213½
42	13	99.149
43	91	98.909
44	77	98.705
45	92	97.953
46	14	97.650½

Table IV—Results of Other Collaborators Whose Results Deserve Recognition

Analyst	No. samples reported on	Points off Oil	Points off Ammonia
9	29	—	33
19	27	—	101
20	28	167	96
27	25	—	40
33	29	—	97
34	27-28	81	92
37	22	—	38
56	24	97	30
57	26	200	50
58	21	—	28
61	20	254	60
67	26	274	222
70	25	242	34
72	20-21	409	94
80	29	38	23
93	24	40	108
95	26	—	60
99	29	209	74
100	22-26	120	42
101	27	—	18

Table V

	No. Collaborators reporting	No. Results ± .10	No. Results ± .05	No. Results ± .02	Sample No.
		OIL			
Max. uniformity	63	50	37	20	12
Min. "	55	40	21	9	27
Av. "	59	45	31	16	—
		AMMONIA			
Max. uniformity	96	96	81	49	6
Min. "	91	79	66	37	13
Av. "	93	86	76	46	—