

Report of the Spectroscopy Committee

October 20, 1947

IN ITS May 15, 1947 report the Spectroscopy Committee pointed out that a detailed method of analysis for fats has been drawn up and submitted to the collaborators for use on a series of five oils. These oils were soybean, linseed, cottonseed, beef fat, and lard, which had previously been examined by the methods of Brice *et al.* and Mitchell *et al.* Since the last meeting of the Society nine collaborators have reported results on the oils submitted. In the attached table are shown the data obtained. Comparison of the data in the table with those obtained and reported previously shows that the use of the detailed method has resulted in a considerable increase in reproducibility of results.

The use of the detailed method has indicated several places wherein changes should be made. These changes will be made, and a series of new samples

will be submitted to the collaborators for examination. The Committee will concentrate its efforts toward determination of conjugated constituents, arachidonic, linolenic, and linoleic acids. The determination of iodine value and the calculation of oleic and saturated acids will be eliminated in order to streamline the method to give only those figures which are actually determined by the spectrophotometric procedure. If the results of this work indicate that an excellent degree of reproducibility is always obtained, the Committee hopes to study actively the accuracy of the results. It may be necessary to apply the detailed procedure to pure acids and to modify the procedure in accordance with the results obtained.

R. H. FERGUSON R. T. O'CONNOR
 B. F. DAUBERT B. W. BEADLE
 R. T. MILNER R. C. STILLMAN, chairman

SUMMARY OF COLLABORATIVE ANALYSES
 A.O.C.S. Spectroscopy Committee, 1947

Collaborator	Iodine Value	% Arachidonic	% Linolenic	% Linoleic	% Oleic	% Saturated	Conjugated Tetraene	Conjugated Triene	Conjugated Diene
Soybean Oil									
1.....	140.8	0.02	8.05	57.0	16.9	17.9	0.00	0.003	0.18
2.....	140.2	0.052	7.30	54.3	23.9	14.1	0.0005	0.0007	0.334
3.....	141.4	0.03	8.05	56.9	17.7	17.2	0.000	0.002	0.20
4.....	141.2	0.038	8.22	55.6	19.5	16.4	0.000	0.002	0.24
5.....	139.8	0.18	8.4	56.6	14.7	20.0	0.00	0.01	0.21
6.....	139.64	0.052	7.98	52.56	24.9	14.51	0.00	0.002	0.00
7.....	140.9	0.03	7.78	57.18	17.4	17.4	0.00	0.00	0.17
8.....	140.9	0.03	8.08	56.9	17.0	17.8	0.00	0.002	0.19
9.....	140.9	0.00	8.29	57.0	16.3	18.2	0.00	0.003	0.22
Avg. Value.....	140.6	0.05	8.02	56.0	18.7	17.1	0.00	0.0027	0.19
Linseed Oil									
1.....	189.5	0.00	49.9	15.8	27.0	6.92	0.016	0.007	0.28
2.....	188.3	0.072	45.1	19.9	30.8	4.08	0.014	0.0063	0.323
3.....	190.2	0.03	49.9	17.3	24.0	8.6	0.015	0.005	0.32
4.....	189.8	0.10	49.9	17.2	23.4	9.0	0.016	0.0052	0.40
5.....	188.0	0.25	51.7	16.6	15.9	15.0	0.00	0.00	0.46
6.....	189.33	0.084	50.68	17.36	20.9	10.93	0.01	0.006	0.00
7.....	189.43	0.05	47.98	17.68	28.31	5.70	0.010	0.01	0.26
8.....	189.4	0.07	49.5	17.8	23.2	9.1	0.014	0.006	0.28
9.....	189.4	0.00	49.9	17.1	23.4	9.1	0.013	0.005	0.43
Avg. Value.....	189.1	0.07	49.4	17.4	24.1	8.7	0.012	0.006	0.31
Cottonseed Oil									
1.....	112.0	0.00	0.00	54.5	13.8	31.2	0.00	0.018	0.45
2.....	112.0	0.0098	0.00	49.2	23.8	26.1	0.000	0.017	0.786
3.....	112.8	0.00	0.00	54.9	13.9	30.8	0.000	0.015	0.45
4.....	112.4	0.002	0.000	54.8	13.7	31.0	0.000	0.016	0.52
5.....	110.8	0.00	0.00	57.6	6.0	35.9	0.00	0.02	0.54
6.....	112.24	0.00	0.00	49.73	24.7	25.59	0.00	0.010	0.00
7.....	112.45	0.00	0.00	54.63	14.2	30.78	0.00	0.020	0.39
8.....	112.5	0.00	0.00	54.4	14.3	30.9	0.00	0.016	0.40
9.....	112.45	0.00	0.00	54.8	13.7	31.0	0.00	0.016	0.52
Avg. Value.....	112.2	0.001	0.00	53.8	15.3	30.4	0.00	0.016	0.45
Beef Fat									
1.....	45.6	0.08	0.47	1.57	44.7	52.6	0.003	0.015	0.058
2.....	45.5	0.088	0.418	1.25	45.1	52.5	0.0024	0.016	0.666
3.....	45.9	0.07	0.45	1.36	45.5	52.1	0.003	0.016	0.60
4.....	45.6	0.056	0.46	1.49	44.9	52.5	0.0026	0.015	0.60
5.....	45.4	0.07	0.47	1.41	44.5	52.7	0.00	0.01	0.64
6.....	45.5	0.084	0.45	2.22	44.4	52.89	0.0021	0.010	0.00
7.....	45.6	0.07	0.42	1.53	44.87	52.50	0.00	0.01	0.60
8.....	45.6	0.06	0.44	1.50	45.0	52.5	0.003	0.017	0.56
9.....	45.6	0.06	0.42	1.67	44.6	52.7	0.001	0.016	0.61
Avg. Value.....	45.6	0.07	0.44	1.56	44.8	52.6	0.002	0.014	0.54
Lard									
1.....	69.4	0.37	0.60	13.2	47.1	38.5	0.00	0.001	0.21
2.....	69.2	0.369	0.538	11.6	50.1	37.2	0.0000	0.0003	0.240
3.....	69.7	0.37	0.64	12.3	48.9	37.5	0.000	0.000	0.23
4.....	69.5	0.50	0.46	12.8	47.8	38.3	0.000	0.000	0.23
5.....	68.4	0.35	0.61	12.5	43.1	41.0	0.00	0.00	0.23
6.....	68.7	0.42	0.69	12.18	48.2	38.5	0.00	0.00	0.00
7.....	69.35	0.33	0.64	12.08	49.2	37.5	0.00	0.00	0.21
8.....	69.4	0.41	0.47	12.7	48.2	38.0	0.00	0.00	0.22
9.....	69.35	0.35	0.50	13.3	46.9	39.7	0.00	0.00	0.25
Avg. Value.....	69.2	0.39	0.57	12.5	47.7	38.5	0.00	0.0001	0.20