

Report Of The Oil Characteristics Committee For 1938-39

THIS committee is continuing its work on cottonseed oil and submits a report from the laboratory of Mr. J. J. Vollertsen on five samples of Texas Oil and three from Georgia, completely analyzed in accordance with the policy of the committee to secure as much continuous and related data as possible on single samples.

A tentative specification for refined North American Cottonseed oil has also been drafted, to read as follows:

Recommended A.O.C.S. Standard for Refined North American C/S Oil. Refined Cottonseed Oil shall be

cottonseed oil refined with alkali, obtained from cottonseed by expression or extraction, shall be free from admixture with other oils or fats and shall meet the following specifications:

Specific Gravity @ 25/25 C.	0.916 to 0.918
Index of Refraction @ 25 C.	1.468 to 1.472
Iodine Value (Wijs)	106 to 113
* Saponification Value	190 to 198
Unsaponifiable Matter (FAC)	Not more than 1.5%
Titre *	32° C. to 36° C.
Free Fatty Acidity (as oleic)	Not more than 0.25%
Clarity *	Free from visible moisture and suspended matter and shall stay clear at 70° F. for at least 3 hours.

* Except for South Texan oils, which shall have an iodine value of not less than 99, a titre of not less than 30°C. and, though free and clear of visible moisture and suspended matter, may nevertheless not pass the cloud test at 70°F.

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REPORT OF THE OIL CHARACTERISTIC COMMITTEE

Analysis of Cottonseed Oil from Texas

Sample No. 1 was from Robestown, No. 2 was from Corpus Christi, No. 3 was from Paris, No. 4 was from Sweetwater and No. 5 was from Plain View, all located in the State of Texas. This work was conducted for the Vegetable Oil Characteristics Committee of the American Oil Chemists' Society. The samples were refined in the Laboratory according to the N.C.P.A. and then analyzed, as follows:

ITEMS	METHOD	No. 1	No. 2	No. 3	No. 4	No. 5
1. Free Fatty Acid (as oleic) (%)	A.O.C.S.	0.04	0.04	0.04	0.04	0.04
2. Unsaponifiable Matter (%)	A.O.C.S.	0.45	0.46	0.45	0.45	0.48
3. Titer (°C)	A.O.C.S.	36.9	35.9	31.2	32.8	34.8
4. Specific Gravity (25/25°C)	A.O.C.S.	.91608	.91609	.91608	.91610	.91609
5. Specific Gravity (50/25)	A.O.C.S.	.90645	.90646	.90645	.90647	.90647
6. Refractive Index (at 25°C)	A.O.C.S.	1.46898	1.46893	1.46928	1.46923	1.46970
7. Refractive Index (50°C)	A.O.C.S.	1.46389	1.46383	1.46418	1.46413	1.46446
8. Iodine Number (Of Oil) (Wijs)	A.O.C.S.	100.0	101.0	103.5	103.0	106.0
9. Iodine Number (Of mixed Fatty Acids)	A.O.C.S.	104.0	105.0	107.5	107.2	110.0
10. Thiocyanogen Value (Of Oil)		61.5	61.8	62.3	62.5	63.4
11. Thiocyanogen Value (Of Mixed Fatty Acids)		64.3	64.7	64.8	65.5	66.7
12. Saponification Value (Of Oil)	A.O.C.S.	192.5	192.5	192.5	193.0	192.0
13. Acetyl Value	A.O.C.S.	12.2	12.2	12.2	12.0	12.1
14. Reichert Meissl Number	A.O.C.S.	.30	.30	.25	.40	.40
15. Polenske Number	A.O.C.S.	.20	.20	.20	.30	.30
16. Cloud (°F)	A.S.T.M.	38	42	36	38	36
17. Pour (°F)	A.S.T.M.	35	35	30	30	30
18. New York Cloud Test		All Cloudy in less than 1 hour				
19. Color Lovibond (5¼") 35 Y — Red	N.C.P.A.	6.0	4.6	5.1	4.6	4.0
20. Color N.P.A. (slightly dark)		1½	1½	1½	1½	1½
21. Smoke Point (°F)	A.O.C.S.	420	425	425	430	430
22. Flash (°F)	A.S.T.M.	615	615	610	615	615
23. Fire (°F)	A.S.T.M.	675	670	670	670	670
24. Viscosity (at 100°F) (Sec.)	A.S.T.M.	178	176	178	177	175
25. Viscosity (at 210°F) (Sec.)	A.S.T.M.	54	54	54	54	54

GLYCERIDES IN THE OIL BASED ON THE THIOCYANOGEN VALUE

Linoleic (%)	44.5	45.3	47.6	46.8	49.2
Oleic (%)	26.7	26.2	24.5	25.6	24.2
Saturated (%)	28.8	28.5	27.9	27.6	26.6

Fatty Acids in the Fatty Acids Based on the Thiocyanogen Value

Linoleic (%)	45.8	46.6	49.3	48.2	50.0
Oleic (%)	28.6	28.4	25.7	27.6	27.2
Saturated (%)	25.6	25.0	25.0	24.2	22.8

Acknowledgment should be made to the following men for their kind co-operation in supplying the various types of cottonseed oil analyzed above:

Richard H. Blythe, Southland Cotton Oil Co., Paris, Texas.
A. K. Schwartz, South Texas Cotton Oil Co., Houston, Texas.
P. Fox, Sweetwater Cotton Oil Co., Sweetwater, Texas.
Horace Hawkins, Plainview Branch, West Texas C. O. Co., Plainview, Texas.

ANALYSIS OF COTTON SEED OIL FROM GEORGIA

Samples of crude cotton seed oil produced in Northern Georgia, Rome Oil Mill Production. Submitted by the Lookout Oil and Refining Company, Chattanooga, Tennessee plant. This work was also conducted for the oil Characteristics Committee of the American Oil Chemists' Society.

	METHOD	SAMPLE NO.		
		1	2	3
Specific Gravity (25/25°C)	A.O.C.S.	0.9168	0.9168	0.9165
Specific Gravity (50/25°C)	A.O.C.S.	0.9014	0.9014	0.9012
Refractive Index (25°C)	A.O.C.S.	1.46972	1.46970	1.46974
Refractive Index (50°C)	A.O.C.S.	1.46262	1.46260	1.46261
Color (Lovibond 5/4" Yellow	N.C.P.A.	35	35	35
Red	N.C.P.A.	5.0	4.8	5.5
Free Fatty Acids (%)	A.O.C.S.	0.03	0.03	0.03
Saponification Number	A.O.C.S.	195.6	194.6	195.6
Acetyl Value	A.O.C.S.	7.5	9.7	8.0
Unsaponifiable Matter (%)	A.O.C.S.	0.55	0.54	0.50
Reichert Meissl Number	A.O.C.S.	0.40	0.45	0.40
Polenske Number	A.O.C.S.	0.50	0.53	0.50
Viscosity at 100° F (Sec.)	A.S.T.M.	187	188	186
Viscosity at 210° F (Sec.)	A.S.T.M.	56	57	55
Smoke Point (°F)	A.O.C.S.	435	435	435
Flash (°F)	A.S.T.M.	615	610	600
Fire (°F)	A.S.T.M.	665	665	665
Titer (°C)	A.O.C.S.	34.1	34.8	31.6
Solid Fatty Acids (%)	A.O.C.S.	24.65	24.76	25.30
Iodine Value (Of oil) (Wijs)	A.O.C.S.	109.7	109.2	108.2
Iodine Value (Of mixed fatty acids) ¹ (Wijs)	A.O.C.S.	114.9	114.4	114.0
Iodine Value (Of solid fatty acids) (Wijs)	A.O.C.S.	3.3	3.6	4.9
Thiocyanogen Value (Of Oil)	A.O.C.S.	64.5	63.9	63.6
Thiocyanogen Value (Of mixed fatty acids)	A.O.C.S.	67.9	67.8	66.7
Thiocyanogen Value (Of solid fatty acids)	A.O.C.S.	2.3	2.4	3.9
N.Y.P.E. Cold Test (Hours to Cloud)	—	2½	2½	2½
Cloud (°F)	A.S.T.M.	28	30	28
Pour (°F)	A.S.T.M.	25	25	25
Fatty Acids (based on thiocyanogen results)				
Linoleic Acid (%)		51.89	51.41	51.12
Oleic Acid (%)		24.29	24.63	22.54
Saturated Acids (%)		23.82	23.96	26.34
Fatty Acids (based on lead-salt-ether results)				
Iso-oleic Acid (%)		0.90	0.99	1.37
Lin-oleic Acid (%)		50.50	50.30	50.10
Oleic Acid (%)		25.75	26.13	25.97
Saturated Acids (%)		23.75	23.57	23.93

¹Calculated

Report Of The Moisture Committee

THE report of this Committee made before the 1938 Spring Meeting of the Society concerned itself with a study of the drying interval necessary for the drying of cottonseeds and cottonseed meal when the Freas forced draft oven, type 601233, was used. This report appeared in the August 1938 issue of OIL AND SOAP.

At that time a drying interval of four hours was recommended for cottonseeds, and a drying interval of three hours for cottonseed meal. The Uniform Methods and Planning Committee, however, felt that further work should be done in an attempt to establish whether a shorter drying interval could be used for cottonseed meal.

Mr. C. P. Brenner has conducted a number of tests on this matter and his report is attached hereto.

The Moisture Committee has considered the results obtained by Mr. Brenner and feels that there is a reasonable doubt that complete drying is obtained in the 2-hour intervals used by Mr. Brenner. It will be noted, however, that in the

3-hour drying time, satisfactory drying was obtained. The Committee, therefore, recommends that the 3-hour drying interval, recommended for cottonseed meal in 1938, be retained.

C. P. Brenner
N. C. Hamner
A. D. Rich
H. L. Roschen, Chairman.

C. P. BRENNER REPORT
Continuation of the Study of the Efficiency of the Forced Draft Oven — Type 601-233.

Conducted for the Moisture Committee of the A.O.O.S.

This report is an addition to the reports of the Moisture Committee, Oil and Soap, August 1938, in which it was found that this type of oven would dry 108 (full load) five-gram samples of Cottonseed meal in three hours at 101 degrees Centigrade.

It was suggested that further work be done to determine if it was possible to reduce the drying time of cottonseed meal to two hours at 101 degrees Centigrade.

A two hour drying time at 101

degrees C. for a fully loaded oven cannot be recommended.

This recommendation is based on the following results:

Freas Oven — 101 degrees C., 2 hrs., Max. 6.36, Min. 6.08, average 6.18%, 108 samples.

Dekhotinsky — 105 degrees C., 3 hrs., average 6.36%, 12 samples.

Freas Oven — 101 degrees C., 2 hrs., Max. 6.40, Min. 6.08, average 6.23%, 108 samples.

Dekhotinsky — 105 degrees C., 3 hrs., average 6.36%, 12 samples.

To confirm the work previously reported, another test was run using a three hour drying time.

Freas Oven — 101 degrees C., 3 hrs., average 6.45%, 108 samples.

Dekhotinsky — 105 degrees C., 3 hrs., average 6.41%, 12 samples.

In view of the fact that the samples were to remain in the oven only two hours it was thought advisable to take note of the room temperature. This test was conducted at a room temperature of 20 degrees C. with an outside temperature of 0 degrees Centigrade.