60	112	99.465
25	113	99.459
14	133	99.365
61	144	99.312
89	145	99.307
71	168	99.197
74	186	99.111
80	201	99.039
5	226	98.920
40	361	98.275

TABLE NO. II
Determination of Nitrogen

Analyst No.	Points off	Per Cent Efficiency
26	1	99.996
9-60	2	99.990
50-59	3	99.985
2-76-83	4	99.981
29	6	99.971
86	7	99.966
12-23-32-67	8	99.960
11-70	9	99.956
31-53-62-69-77	10	99.951
6-10-15-28-30-85	11	99.945
24	12	99.941
7	13	99.937
14-43-88	14	99.931
66	15	99.926
17-68	16	99.922
18-65	19	99.907
61-71	20	99.901
78	22	99.892
80	23	99.886
1	26	99.872
27-55	27	99.867
39	30	99.853
73	31	99.848
72	33	99.838
42-57	35	99.828
16	36	99.823
33-84	38	99.813
13	40	99.804
20	43	99.789
63	44	99.783
89	49	99.760
75	50	99.754
4	56	99.724
21	61	99.701
52	70	99.656
74	75	99.631
5	88	99.568
25	93	99.543
40	274	98.654

TABLE NO. III
Determination of Oil and Nitrogen

Analyst No.	Per Cent Efficiency
50	99.964
69-23	99.942
17-7	99.935
86	99.933
66	99.932
77	99.926
83	99.924
24	99.918
2	99.912
31	99.904
65	99.899
70	99.897
28-59	99.887
32	99.882
10	99.880
67	99.873
88	99.865
15	99.856
9	99.854
18	99.853
6	99.849
68	99.847
62	99.837
11	99.830
26	99.826
57	99.823
76	99.821
27	99.798
12	99.787
1	99.778
55	99.774
21	99.772
13	99.766
78	99.765
20	99.761
39	99.760
63	99.756
16	99.749
60	99.728
33	99.701
84	99.684
4	99.674
72	99.661
75	99.653
14	99.648
61	99.607
71	99.549
89	99.534
25	99.501
80	99.463
74	99.371
5	99.244
40	98.465

TABLE NO. IV
Special Table

Analyst No.	Points off	Per Cent Efficiency
	Determination of Oil	
3	45	99.785
8	55	99.738
19	75	99.641
64	87	99.584
90	96	99.541
	Determination of Nitrogen	
79	32	99.842
3	36	99.823
19	42	99.794
64	44	99.783
90	47	99.769
8	90	99.558
45	93	99.543
	Determination of Oil and Nitrogen	
3		99.804
19		99.718
64		99.684
90		99.655
8		99.648

Personnel of Committee:
L. B. Caldwell
T. C. Law
W. C. Moor
J. N. Pless
E. H. Tenent
M. E. Whitten
J. J. Vollertsen, Chairman

Report of the Color Committee for 1938-39

YOUR Committee was requested to rearrange and rewrite the method or rules for determining the colors of oils and fats. This has been done, and the revised and rearranged method is attached. You will note that all reference to Color Reading is now under one head.

The method is in general the same, but it is a little more specific and has included all the specifications of the Color Reading Booth. It will be noticed that the optional use of the prismatic eyepiece has been omitted from the rules. This question was studied by the Committee for several years. It was the opinion then and is still the opinion, supported by the Bureau of Standards, that the prismatic eyepiece introduces more errors, due to the fact that no two prisms are identical and therefore do not reflect the same amount of light, nor the rays of light in the same direction.

Color Reading tubes are now available and far superior to those the industry has here-to-fore been able to obtain. Too much emphasis can not be placed upon the colorless tube.

We recommend that the incoming Color Committee consider the advisibility of the followng:

1. Adopting one and only one instrument as a standard for all Color Reading.
2. Having the Color Reading tubes checked as to the presence of coloring in the glass and for adherence to the specifications.
3. Painting the interior of the tintometer white, instead of the present dull black.
4. Specifying standard of illumination on the Magnesia Block. This has been studied by one member of your Committee, and it is his opinion that the illumination on the Magnesia Block should be between 15 and 22 ft. candles. This member of the Committee suggests that other work be done on this question in order that his work might be checked, and supported by the results obtained by other members of the Committee.

The necessity of improving the methods of determining the color of cottonseed meal, and the advisibility of changing the standards were also called to the attention of this Committee. It is recommended that the Society appoint a Special Committee to undertake this investigation, or that they designate this Color Committee to undertake the work. There is a question as to whether or not work of this nature be undertaken by a general color committee.

Respectfully submitted,
H. P. Trevithick
Harry Stevenson
James J. Lappen
N. T. Joyner
L. M. Gill
R. S. Estey
G. Worthen Agee
W. D. Hutchins, Chairman

COLOR

(a) Apparatus — Light Bulb. — 100-watt frosted Mazda Daylight Lamp.

Magnesia Block. — To be used as light reflector in the tintimeter, shall be 1″ x 2 3/4″ in size.

Tintometer. — Enclosed Wesson Type consisting of a lightproof box with dull black interior containing 100-watt blue frosted electric light bulb, the block of magnesia with white reflecting surface set at a proper angle to reflect the light vertically upward through the tube containing the sample of oil and through the standard color glasses alongside the tube of oil, and receptacles for holding the tube of oil and the color glasses. An eyepiece with dull black interior finish fits over the oil tube and color glasses so that the light passing through both may be observed simultaneously. Only the simple eyepiece without prisms is to be used.

Blue prints showing the details of the tintometer may be obtained through the Secretary of The American Oil Chemists' Society.

The use of the Stevenson type colorimeter, which conforms to the above specifications, but contains a magazine for holding the color glasses, is approved.

The colorimeter should be placed in a booth or cabinet approximately 40 inches wide and 30 inches deep, closed on three sides and the top. The ceiling should be 84 inches above the floor.

The inside of the booth should be painted a dull neutral gray, free from blue or red, equal in value or brilliance to a chromatic mixture of 75% black and 25% white. The top of the colorimeter, and table tops and other horizontal surfaces should be painted a dead black.

The booth may be illuminated by a 15 watt daylight bulb mounted in the ceiling in an indirect fixture so that no direct rays strike the colorimeter or the eye of the reader. The level of illumination in the booth, at the colorimeter, should not be less than 1 nor more than 5 foot candles.

No direct external light should enter the entrance to the booth. If necessary the entrance should be closed with a black or gray lightproof curtain or door.

Lovibond Color Glasses-Red and yellow, of suitable numbers to match the color of the oils to be examined. Red glasses must be standardized by the U. S. Bureau of Standards or Electrical Testing Laboratories, but the actual color value does not have to be the exact numerical number shown on the glasses. The minimum standard set shall consist of the following numbers of red and yellow glasses:

Red:

0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 2.0 2.5 3.0 3.5 4.0 5.0 6.0 7.0 7.6 8.0 9.0 10.0 11.0 12.0 16.0 20.0

Yellow:

1.0 2.0 3.0 5.0 10.0 20.0 15.0 35.0

Laboratories analyzing corn and soybean oils shall have 50.0 and 70.0 yellow glasses in addition to the above.

Color Tubes. — These shall have a flat smooth polished bottom of clear, colorless glass and shall be of the following dimensions:

Length, 154 mm. over all, inside diameter 19 mm. outside diameter 22 mm., and shall be provided with a mark to indicate an oil column of 133 mm.

(b.) Determination. — Fill a tube (see paragraph above) with the oil to be examined to a depth of 133 mm. Oil must be at a temperature of 20° to 24° C. and must be absolutely clear and transparent. Filter through good heavy grade, close texture, white filter paper at 20° to 24° C. if necessary to remove turbidity to permit matching the color, and in such cases note on your report that filtering was necessary. If, however, the oil or fat under examination is not completely liquid at 20° C., heat until completely liquified, and read the color at a temperature not more than 10° C. above that at which it becomes completely liquefied. Place the tube containing the oil in the tintometer and place alongside of it such yellow and red glasses (see paragraph (a)) as are necessary for making comparison desired, observing the colors of the oil and the glasses through the eyepiece.

Crude Oils of the Coconut Type. — Melt the oil in water at a temperature not exceeding 50° C. and filter through approved filter paper at a temperature not above 35° C. until completely free from turbidity. Read the color using proper ration of yellow to red listed below:

In matching the colors, use only one yellow glass, 35 yellow for refined cottonseed oil and refined peanut oil; 70 yellow for refined soya bean oil; not more than 2 red glasses up to and including 13.0 red, and not more than 3 red glasses above 13.0 red.

The ratio of yellow to red in determining color shall be as follows, except where Rules specifies that the yellow and/ or red to be used in determining given grades.

If the above ratios fail to give a satisfactory match, this fact should be noted and a second reading made, using the amount of yellow required for a good match. Report both readings.

Report the numbers of the yellow and red glasses which match the color of the oil; or if a standard combination is specified (as prime for example) report whether the oil is prime or off as compared with the standards.

Cottonseed Oil —	10 Yellow to 1 Red up to 3.5 Red 35 Yellow for 3.5 Red or higher.
Peanut Oil	Same as above
Coconut Oil Crude Oil	Up to 3.9 red use 6 Yellow to 1 Red 4.0 to 4.9 red 25 Yellow 5.0 to 5.9 red 30 Yellow 6.0 to 6.9 red 35 Yellow 7.0 to 7.9 red 40 Yellow 8.0 to 10.9 red 50 Yellow 11.0 to 14.9 red 70 Yellow 15.0 to 19.9 red 100 Yellow 20.0 and above 150 Yellow
Refined Oil	Same as Crude Coconut Oil
Palm Kernel Oil	Same as for Coconut Oil
Corn Oil	Same as for Cottonseed Oil
Soyabean Oil	10 Yellow to 1 Red, where red is less than 3.5 Red 70 Yellow for Red 3.5 or more
Tallows, Greases, Fatty Acids, etc.	10 Yellow to 1 Red where Red is less than 3.5 35 Yellow where Red is 3.5 to 5.0 70 Yellow where red is more than 5.0