

REPORT OF

FAT ANALYSIS COMMITTEE

1934-1935

By W. H. IRWIN
Chairman

THE Fat Analysis Committee made a report at the last Fall meeting and, therefore, our report at this time will be brief.

The several changes in the methods adopted at the Fall meeting will be included in the revision of methods which will appear about the first of August.

At the present time the committee has three methods under consideration: 1) The Wiley Melting Point method; 2) the Twitchell method for the determination of liquid and solid fatty acids; and 3) the determination of Tri-stearin in Lard.

WILEY MELTING POINT

The Wiley Melting Point results in different hands have not been in sufficiently good agreement to warrant the adoption of the method. The details of the method have been drawn closer and cooperative samples have been sent out to the committee members. It is hoped that the modifications in the method will result in sufficiently good agreement so that the method may be offered

for tentative adoption to the Fall meeting.

LIQUID AND SOLID FATTY ACIDS

At the Fall meeting it was agreed to send out a modification of the Twitchell method for study by the committee members. It was also agreed at that time that each laboratory would try out this method on a sample of their own choosing, making three separate analyses at intervals of two weeks, and reporting all figures. Later, however, some of the members thought it best that all members of the committee work on the same sample and in this way save some time and work. This sample has gone forward to the various members, but it will be some time before the results are in.

TRI-STEARIN IN LARD

The attention of the committee was called to the fact that in the A.O.A.C. methods, in following method No. 1, which called for solution of the fat in warm ether, it is almost impossible to get a crop

of crystals under the conditions described in the method and even with Method No. 2 there are some difficulties which apparently needed attention.

With this in mind, the committee decided to confine their work to the use of acetone as the solvent. It is hoped that results of this work will be ready for consideration before the Fall meeting.

The chairman realizes that this report does not indicate a great deal of progress, but for the past 2 or 3 years it has been very difficult for the several laboratories interested to handle much cooperative work of this nature, but we hope to make more progress during the interval between this meeting and our Fall meeting.

W. H. Irwin, Chairman
R. W. Bailey
T. C. Law
C. P. Long
H. J. Morrison
M. L. Sheely
L. M. Tolman
H. P. Trevithick
J. J. Vollertsen,
Fat Analysis Committee.

REPORT OF COLOR GLASS DEVELOPMENT COMMITTEE*

AMERICAN OIL CHEMISTS' SOCIETY

By L. M. GILL, Chairman

IN this committee's report as of April 10, last year, the following appeared:

The work of the committee is then proceeding along two lines:

(1) Investigation of possibility of correcting the glasses as now furnished by Lovibond by

grinding and polishing to the proper thickness. In this connection it is to be noted that, with few exceptions, the glasses have in recent years given higher values than their original grading after being calibrated at the Bureau of Stand-

ards. This would accordingly indicate that they could be adjusted to their correct value with a minimum of grinding and polishing.

(2) Investigation of possibility of devising a colorimeter which will function without the

*AS PRESENTED AT THE 26TH ANNUAL MEETING OF THE AMERICAN OIL CHEMISTS' SOCIETY, AT MEMPHIS, MAY 23-24, 1935

use of colored glass but will permit color to be expressed in terms of Lovibond units. No conclusions can be drawn regarding this phase of the work until a report on the data collected by the Bureau of Standards is available.

Referring to No. 1 above, during the fall of 1934, Dr. Dean B. Judd, of the Colorimetry Section of the Bureau of Standards, conducted an experiment in which he reduced the grade of a Lovibond red glass from 4.3 to 4.01 by hand polishing with cloth and rouge.

The results of this test, set forth more in detail in the attached copy of letter, dated November 23, 1934, from Dr. K. S. Gibson, Chief of the Colorimetry Section of the Bureau of Standards, clearly demonstrate the possibility of correcting Lovibond glasses by this method.

In casting about for someone to undertake this work on a commercial basis, the Electrical Testing Laboratories, of New York City, were suggested by Mr. H. P. Trevithick, of the New York Produce Exchange. These laboratories have had a very wide experience in general testing, particularly photometry and other fields very closely allied with the present proposed work. The committee found them very receptive and has received the full cooperation of their expert in this line, Dr. Roger S. Estey.

On April 9, Dr. Estey and your chairman spent an entire day at the Bureau of Standards and through the courtesy and kind assistance of Drs. Gibson and Judd, and Mrs. Haupt, studied in detail the method of calibration of the glasses employed by the Bureau. With this information now in Dr. Estey's hands, together with a series of red glasses being calibrated at the Bureau and to be used by him as reference standards, he expects to be in position to make the members of the society a definite proposal at the May meeting as to what his organization will have to offer and the cost thereof.

As a result of the work already done, the committee feels justified in stating that the correction of the Lovibond glasses is entirely feasible and practical. It is confidently expected that the Electrical Testing Laboratories will be in a position to furnish Lovibond red glasses of any desired denomination from 0.10 by tenths to 1.0 and from 1.0 upward in whole numbers, the maximum variations from the respective N" values as established by the Bu-

reau of Standards being negligible for all practical purposes.

In the past it has not been possible to procure glasses of the value desired. For example, if any particular red glass were ordered it was almost always found after calibration at the Bureau, that it differed from its indicated value by as much as 0.4 or 0.5 of a unit in many cases, and often by considerably more. As now contemplated, the Electrical Testing Laboratories will adjust the grade by polishing down to the required thickness. In other words, when, for example, one orders a 6.0 red glass, he will be able to get a 6.0 red glass, not 6.4, 6.3, or something else.

The N" scale as now established by the Bureau of Standards, insures additivity throughout, eliminates inaccuracies in red numeral, and thus affords a reliable basis on which to make the proposed adjustments.

Also, it has heretofore not been possible, except by the merest chance, to duplicate within any reasonable limits any previous glass which may have been used for some particular purpose and later broken or otherwise rendered unfit for use. This is especially important in the case of intro-company standards for production control at various refineries. The service the Electrical Testing Laboratories expect to render will eliminate this discrepancy.

There will be no duplication of effort as between the work of the Bureau of Standards and the Electrical Testing Laboratories. The function of the latter will be to provide glasses of corrected value, while ultimate certification of accuracy will still be in the hands of the Bureau.

The operation of adjusting the glasses, though not complicated in itself, is purely a cut-and-try procedure. Some idea of the fineness of the technique which must be employed can be gained from the fact that in general the actual change of thickness will amount to only a few thousandths of a millimeter.

It is to be said in their favor that the Electrical Testing Laboratories have approached the problem with considerably less emphasis on the profit motive than would normally be expected. With no tangible evidence to date as to the returns they might anticipate, they have already gone to the expense of sending Dr. Estey to Washington, purchasing a set of red glasses and providing themselves with the

necessary equipment to do this work.

It is earnestly hoped that the cost of adjusting the glasses and the value of such adjustment to members of the American Oil Chemists' Society can be made to converge at some point equitable and satisfactory to all parties concerned. It will therefore be well for the members of the society to bear the foregoing in mind in considering the cost of having their glasses adjusted as compared to the convenience and dependability which such adjustment will afford, not to mention the great saving in time and money which will be effected by making it possible for buyer and seller as well as referee laboratories, to use glasses having practically no significant difference in grade number.

Referring to investigation No. 2 above, Dr. McNicholas has now completed his paper on the relation between the spectral energy distributions of a large number of vegetable oils and of the combination of glasses used in reading their color in Lovibond units. This paper was presented at the May meeting by Dr. Gibson. Its importance cannot be over-estimated. It reveals exceedingly interesting and valuable information on the Lovibond system and charts the course which any attempt at its ultimate perfection for vegetable oil color grading must follow.

Your committee feels very much encouraged by what has been accomplished during the past year. For the first time in the history of Lovibond glasses in the vegetable oil industry it appears that one of the most annoying ills attendant to their use can and will be eliminated.

The chairman of the committee is very much indebted to Dr. K. S. Gibson, Chief of the Colorimetry Section of the Bureau, for his assistance. Also, the committee is indebted to Dr. Gibson's staff, and to Dr. McNicholas, who though now connected with another division, has given freely of his own time in the preparation of the paper referred to in No. 2 investigation.

Submitted by the following members:

Dr. K. S. Gibson,
N. T. Joyner,
Prof. Henry R. Kraybill,
W. A. Welch,
Dr. T. G. Richert,
Philip E. Ronzone,
Arthur Schroeder,
L. M. Gill, Chairman.

DEPARTMENT OF COMMERCE

Bureau of Standards
WASHINGTON

November 23, 1934.

Mr. L. M. Gill, Chairman,
A. O. C. S. Color Glass Development Committee,
Darco Sales Corporation,
60 East 42nd Street,
New York, N. Y.

Subject: Adjustment of Lovibond red glasses.

Dear Mr. Gill:

With reference further to your letter of September 17th, and ours

of September 26th and October 9, 1934, we have obtained the following information:

Dr. Judd has found that it is possible to reduce a given Lovibond grade readily by hand polishing the flashed layer with cloth and rouge. In about 20 minutes of actual polishing, he was able to reduce the N" value of a certain glass from 4.30 to 4.01. The glass was graded four times during the polishing, showing the progressive decrease in N" value, and the total time for polishing and grading was about 90 minutes.

The possibility of reducing Lovibond grades is thus demonstrated. The feasibility of such a procedure on a large scale is, however, open to question. It is a trial-and-error method, requiring the immediate accessibility of an expert grader with the proper instrument. Nevertheless, the fact that it can be done is of considerable interest and I am, therefore, sending the information on to you.

Respectfully,

(Signed) K. S. Gibson, Member.

REPORT OF THE COLOR COMMITTEE*

By G. G. GRANT, Chairman

YOUR Committee on Color for the past year has been asked by the Uniform Methods and Planning Committee to consider the problem of reading colors on crude coconut oil.

The official and tentative methods of the society at present contain a method for refining crude coconut oil and for reading the color of the refined oil. However, since a great deal of trading in this oil is based on F. F. A. and color of the crude, it seems desirable that such color readings should be included in our methods.

The main questions to be considered are the filtration of the crude oil and the ratio of yellow to red to be used.

Since the matter of filtration of oils has been well covered by past refining committees, it is believed that the same method can be applied to the present problem.

From the information your committee has been able to obtain from users of coconut oil relative to the ratio of yellow to red, the following conclusions may be drawn:

1. The yellow reading is impor-

tant in establishing the quality of crude coconut oil.

2. The ratio generally used on normal crudes is about 6 yellow to 1 red.

Mr. H. P. Trevithick, of the Bureau of Chemistry, New York Produce Exchange, has given much consideration to this subject and has submitted a set of ratios which have been found to work out well in practice.

Your committee recommends that a procedure for reading color be included in the tentative method for crude coconut oil as follows:

Crude Color

Melt the oil and filter through one thickness of approved filter paper at a temperature not above 35° C until completely free from turbidity. Read the color, using the following ratios of yellow to red:

Up to	
3.0 Red	6 Yellow to 1 Red
4.0 Red	25 Yellow to 1 Red
5.0 Red	30 Yellow to 1 Red
6.0 Red	35 Yellow to 1 Red
7.0 Red	40 Yellow to 1 Red
8.0 to 11.0 Red	50 Yellow to 1 Red

12.0 to 15.0 Red	70 Yellow to 1 Red
16.0 to 20.0 Red	100 Yellow to 1 Red
21.0 and above	150 Yellow to 1 Red

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*.

No new colorimeters have been submitted for inspection. However, one of the members, Mr. G. W. Agee, has been in correspondence with Dr. P. E. Klopsteg of Central Scientific Company, which may result in some future development.

We have also had a communication from Tintometer, Ltd., of England, asking for specifications. The specifications have been forwarded to them and we may, in time, have another Tintometer submitted by them.

THE COLOR COMMITTEE,

G. W. Agee,
J. J. Lappen
H. P. Trevithick
H. C. Dormitzer,
M. G. Boulware,
G. G. Grant, Chairman.

*AS PRESENTED AT THE 26TH ANNUAL MEETING OF THE AMERICAN OIL CHEMISTS' SOCIETY, AT MEMPHIS, MAY 23-24, 1935