

constituent (e.g., tobacco seed oil and linoleic acid concentrates). Agreement for lards and tallows falls within the limits of error in the two methods. The precision, sensitivity, and scope of the spectrophotometric method is, however, far superior to that of the thiocyanometric method in detecting and estimating low proportions of polyunsaturated constituents in fatty materials, and furnishes a valuable means of following changes in these constituents.

Summary

Existing ultraviolet spectrophotometric methods have been modified for application primarily to the detection and estimation of low proportions of conjugated and nonconjugated unsaturated constituents in fats, oils, and soaps. The method is applicable also to fatty materials having high proportions of these constituents.

Modifications include corrections for absorption by interfering substances, use of alkaline glycerol as an isomerization medium in the analytical procedure, and correction of absorption data on the isomerized product for absorption by conjugated constituents in the material before isomerization.

The presence of small proportions of highly unsaturated conjugated and nonconjugated compounds

is established in lards, tallows, tallow soaps, and highly purified esters and acids. Tall oil fatty acids are shown to contain approximately 10% of conjugated diene acids and a small amount of linolenic acid.

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Report of the Committee on Uniform Methods and Cooperative Work 1944-45

THE Uniform Methods Committee met at Memphis, Tenn., on May 10, 1945, to consider such reports as had been received from various committees of the Society. Present, E. B. Freyer, J. J. Ganucheau, J. T. R. Andrews, and the chairman of the Committee. V. G. Mehlenbacher and G. Worthen Agee were present by invitation.

Oil Characteristics Committee. The report of the Oil Characteristics Committee was approved with the following changes. Correct the typographical errors as follows: Under refractive index for lard, the values should be reversed to read: "1.459-1.461" in order to bring them into harmony with the presentation of other data. Under specific gravity of Chinese Vegetable Tallow, "99/15/5C" should read "99/15.5C." Inasmuch as the Society has no method for determining the "setting point," it was decided to delete reference to it under "Babassu Palm Kernel Oil."

Color Committee. The Color Committee submitted a report of its Sub-Committee, which had been working on better methods for evaluating the color of oil. The statement was made in this report that progress was being made on the problem of photoelectric measurement of oil colors. This report was approved with the suggestion that the work be continued.

The Color Committee recommended that the word "brightness" replace the word "colors" in the last sentence under "Determination" on page 17 of our methods. This was also approved.

Refining Committee. The Refining Committee submitted a comprehensive report of the work which they

have been carrying on through the past year. The following conclusions and suggestions were made:

The extensive experimental program carried on this year by the Sub-Committees did not lead to the development of a single suitable method for the several types of extracted soybean oil. Progress has been made, however, and several procedures show considerable promise. The following program is indicated for next year:

1. A complete report of this year's work carried out on the glass kettle refining method by Mr. Sorensen's Sub-Committee will be available before the next meeting of the Committee which is now tentatively planned for June, 1945. A decision should be made at that time as to whether further attention should be given to this method.
2. Work should be continued on the Centrifugal method.
3. Attempts should be continued to work out a modified cup method which will be applicable to the several types of extracted soybean oil.

The program as submitted was approved.

The Cellulose Yield Committee. This committee recommended that a sample be sent out at least four times during the next year to all laboratories equipped to run the test and who desire to get in on the check analyses. No other suggestions were made and the recommendation was approved.

Soybean Analysis Committee. This committee recommended that further work to improve the methods be carried on as follows:

1. Study the use of a grinding mill which will eliminate regrinding and which need not be adjusted by the operator.
2. Study the composition and nature of the additional material which is extracted by petroleum ether after regrinding a sample which initially was very finely ground.

These recommendations were likewise approved.

Bleach Test Committee. The recommendations of this committee follow:

On p. 17a. Rewrite section under REFINED OILS-BLEACHING, as follows:

(a) *Apparatus.* Scale, weights, refining cups and stirring machine are to be similar to those specified under REFINING, but with T-shaped paddles one-half inch wide instead of one inch wide.

Gas burners or electric heaters to heat the oil in the cups.

Official Fuller's Earth. This is obtained from the secretary of the American Oil Chemists' Society. A fresh supply must be used each year beginning August 1.

Official Activated Clay (for Refined Bleached Color on Crude Soybean Oil). This is obtained from the secretary of the American Oil Chemists' Society. Renewal of the supply is to be in accordance with information on the container label.

(b) *Determination.* Cottonseed and Other Oils, except Soybean—Weigh 300 grams of refined oil into a refining cup; heat to 120° C., and add 6% of Official Fuller's Earth. Stir mechanically at 250 r.p.m. (plus or minus 10) for five minutes, not allowing temperature to fall below 105° C.

Filter through an unused filter paper of fine texture. After sufficient oil has passed the filter to insure clearness, collect a sample for color reading. Cool and read color immediately as prescribed under COLOR.

Soybean Oil. Method I. (Adopted as tentative, May, 1942.) Weigh 300 grams of refined oil into a refining cup; add 6% of Official Fuller's Earth and, using mechanical agitation at approximately 250 r.p.m. heat immediately to 120° C., taking not more than five minutes. Then stir mechanically at 250 r.p.m. (plus or minus 10) for five minutes, not allowing temperature to fall below 105° C.

Filter through an unused filter paper of fine texture. After sufficient oil has passed the filter to insure clearness, collect a sample for color reading. Cool and read color immediately as prescribed under COLOR.

Refined Bleached Color on Crude Soybean Oil. Method II. Some abnormal types of soybean oil, notably green oils containing excessive amounts of chlorophyll, do not respond well to bleaching with Official Fuller's Earth. When trading rules may so specify, the freshly-refined oil shall be bleached for grading purposes by using 4% of Official Activated Clay under the same test conditions just given under Method I.

NOTE. Since the bleaching response of refined soybean oil samples against activated clay has been shown to deteriorate appreciably in as little as one or two weeks' time (and quite markedly, over longer periods), Method II is considered inapplicable to grading refined soybean oil for trading purposes. Whenever that may be necessary, Method I should be used. Method I and Method II do not yield the same bleaching results.

After some discussion it was voted to delete all reference to trading rules in the proposed addition to the present methods.

The Bleach Test Committee chairman then presented the following revision for the two paragraphs above headed "Method II":

Method II (for Refined Bleached Color on Crude Soybean Oil). Use 4% of Official Activated Clay under the same test conditions given in Method I.

NOTE. Method I is inapplicable to certain oils having an unusually high chlorophyll content (green types). Method II is not recommended for use on commercial refined soybean oil unless it has been refined within a few days. Method II is designed especially for use on green type and damaged crudes after test refining. Method I and Method II do not give the same bleaching results.

The changes proposed by the Bleach Test Committee were approved after making the revision noted above.

It was also decided that the grade of filter paper be specified. Mr. Mehlenbacher consented to check with Schleicher and Schuell with a view of getting their method for testing and grading filter papers and drawing up suitable A.O.C.S. methods for the purpose. This offer was accepted by the committee.

The Uniform Methods Committee recommended looking into the suggestion made by Mr. Andrews that earth might be added to the cold oil (as in Method II) when bleaching any or all oils. Dr. Freyer agreed to study this matter.

Sulfonated Oil Committee. The methods of analysis for "Sulfonated and Sulfated Oils" submitted by this committee and revised by Mr. Mehlenbacher were approved. Attention, however, was called to the fact that there were no sampling instructions or methods given for this type of material.

This completes the reports received from the various committees. Inasmuch as the method for lint on cottonseed hulls on page 4 of the methods and the method for testing soap wrapper papers on page C-1 were obsolete, it was decided to delete these from our methods.

The remainder of the meeting was taken up with the report from Mr. Mehlenbacher on the rewriting of our methods and a discussion of the various suggested changes. The committee voted approval of a 6" x 9" page with type of a size to correspond with the sample submitted by the printer. Approval was voted for the use of abbreviations and simplified spelling as standardized by the Association of Official Agricultural Chemists. For example: "thru," "thoroly," "ml," and "lb" (note omission of periods on the last two).

The various sections of the revised and rewritten methods will run about as follows:

1. Sampling and Analysis of Oil Bearing Products.
2. Sampling and Analysis of Oil Mill By-Products. (Cake, Meals, Meats, Lint and Hulls.)
3. Sampling and Analysis of Commercial Fats and Oils. (Includes Crude Oils, Olive Oil, etc.)
4. Analysis of Sulfonated and Sulfated Oils.
5. Sampling and Analysis of Glycerin.
6. Sampling and Analysis of Commercial Soaps.
7. Specifications. (Petroleum ether, Ovens, Thermometers, etc.)
8. Recommended Standards for Various Oils.
9. Composition and Characteristics of Various Oils.

Illustrations and drawings will be numerous and of high quality. Each method will be complete on separate page or pages. A serial numbering system will be used to keep methods, new methods, and revisions in proper order.

For final approval of these methods the various committees of the Society acquainted with the work will have an opportunity of making suggestions or corrections. Then the methods will be submitted to the Uniform Methods Committee, members of which will vote on their adoption.

Inasmuch as their was no spring meeting of the Society, the action taken by the Uniform Methods Committee, as noted herein, will have to be brought before the next meeting of the Society for final approval.

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E. B. FREYER	C. P. LONG
J. J. GANUCHEAU	J. J. VOLLERTSEN,
	<i>Chairman.</i>