

Proposed Thiosulphate Number for Olive Oil

By WALLACE H. DICKHART

THIS article is written for the sole purpose of suggesting the possibility of a new characteristic test for olive oil. It is a modification of a test proposed in 1923. See the detection of olive oil in some refined vegetable oils." (Dickhart*)

Reagents

FROM previous experiments the following method was decided upon: Solution "A." Pour slowly one part of concentrated sulphuric acid into four parts of absolute alcohol, placing the graduate in cold water if necessary to reduce the temperature. Solution "B." A two percent alcoholic solution of furfural. It has been suggested that this solution be made from freshly redistilled furfural. It is advisable to make solutions "A" and "B" as you need them. Solution "C." A tenth normal sodium thiosulphate. The same solution that is normally used to determine the Iodine value. Reagent "D." Carbon tetrachloride.

Proposed Modification

WEIGH into a four ounce oil bottle 7.05 grams of olive oil, add from an accurate pipette 5 cc. of Solution "A," shake, then cork if more than one sample is to be tested. Place

10 cc. of cold water to the mixture, shake and cool the bottle, either under the tap water or in a beaker of cold water. When the mixture is at room temperature add 5 cc. of carbon tetrachloride, and titrate the red color, with tenth normal thiosulphate solution with vigorous agitation, until it is of the same milky color as a blank which should be run at the same time, using either corn or cottonseed oil.

The reason for selecting 7.05 grams of oil as a unit is because two samples of oil can be weighed at the same time for different determinations, one for the free fatty acid, and the other for the thiosulphate number.

Proposed Thio Numbers

RECENTLY a sample of oil marked "Olive Oil" gave a thio no. of 1.59. The iodine value was determined and found to be 134.0. This unknown indicated that the thio no. could be used to detect olive oil in a mixture containing from 5% to 10% olive oil in other oils.

It would seem that from the above figures the limits for a virgin oil would vary from 4 to 4.5 thiosulphate number, for refined deodorized oils from 3.50 to 4.00, and for untreated bleached foots oil from 5 to 6. These numbers

		<i>Experimental Data</i>			
Marked Virgin oil	Thio No.	Iodine No.	Valenta Index	Coin Test	F.F.A.
" " "	3.69 cc.	86.3	1.4629	Negative	0.45%
" " "	4.28 "	82.7	1.4635	"	0.40%
" " "	4.48 "	86.5	1.4620	"	0.50%
" Pulp Ref. Deo.	3.23 "	87.0	1.4620	Positive	0.45%
" French Ref.	3.90 "	87.4	1.4630	Negative	0.48%
" Rapeseed	0.00 "	104.3	1.4675	"	0.50%
(10% Olive Oil and 90% Rapeseed Oil)	1.59 "	102.9	1.4670	"	
(90% Olive Oil and 10% Rapeseed Oil)	4.78 ¹ "	87.1	1.4640	"	
Unknown Olive Oil	5.28 "	84.8	1.4630	"	0.70%
" " "	3.48 "	82.4	1.4630	"	0.50%
" " "	5.48 "	84.6	1.4632	Positive	0.40%
" " "	6.18 "	87.9	1.4623	"	3.40%

the bottle in boiling water (100° C) for three minutes, shaking lightly each minute. When the bottle is placed in the boiling water it will reduce the temperature for a few seconds. Start the time from the point of reboiling. After three minutes remove the bottle, and add

are arbitrary and only a suggestion for experimental work.

The chart shows very little difference in the index except with the rapeseed and the mixture of 90% rapeseed and 10% olive oil. The

(Turn to page 33)

Senators Renew Proposals For Higher Oil Duties

Jones and Thomas Offer Amendments From Senate Floor

THE never-ceasing fight to place prohibitive tariff rates on the importation of all classes of foreign animal and vegetable oils is now being prosecuted from the floor of the Senate itself, according to the Washington service of "Oil & Fat Industries" and "Soap."

Repeatedly defeated in Committees of both the House of Representatives and the Senate, the effort has now taken the form of Senate Floor Amendments. Not content with placing prohibitively high specific duties on all the oils which they could list by name, the proponents of these advances have provided a blanket clause which would tax all listed oils at 45% ad valorem, if such rate should be higher than the specific rate, and a second blanket clause taxing all other animal, fish and vegetable oils, not specially provided for, at 45% ad valorem.

The proposed amendments are quoted in full as follows:

Amendment

Proposed by Mr. Jones to the bill (H.R. 2667). On pages 23-34 strike out all of paragraph 53 and insert the following:

Par. 53. Oils, animal and fish: Cod, herring, and menhaden, 2 cents per pound; whale, 2-7/10 cents per pound; seal, 2-4/10 cents per pound; sperm, crude, 2-2/10 cents per pound; sperm, refined or otherwise processed, 4-4/10 cents per pound; cod-liver, 3 cents per pound; cod-liver, 5-6/10 cents per pound; spermaceti wax, 6 cents per pound; wool grease containing more than 2 per centum of fatty acids, 1 cent per pound; wool grease containing 2 per centum or less of fatty acids and not suitable for medicinal use, including adept lanae, hydrous or anhydrous, 3 cents per pound: PROVIDED, That the rate of duty on all of the foregoing oils and fats shall in no case be *less* than 45 per centum ad valorem; all other animal and fish oils, fats, and greases not specially provided for, 45 per centum ad valorem.

Amendments

Proposed by Mr. Thomas of Idaho to the bill (H.R. 2667).

On page 24, strike out lines 10 to 19, inclusive, and insert the following:

Par. 54. Oils, vegetable: (a) Castor, 5 cents per pound; hempseed 4-1/2 cents per pound; poppy seed, 8-8/10 cents per pound; rapeseed, 3-7/10 cents per pound; palm, 3-7/10 cents per pound; perilla, 4-6/10 cents per pound; sweet almond, 3-4/10 cents per pound; tung, 5-9/10 cents per pound; vegetable tallow, 3-1/10 cents per pound;

(b) Olive, rendered unfit for use as food or for any but mechanical or manufacturing purposes, by such means as shall be satisfactory to the Secretary of the Treasury and under regulations to be prescribed by him, sulphured or foots, 3-9/10 cents per pound; all other, 7-1/2 cents per pound; olive, not rendered unfit for use as food or for any but mechanical or manufacturing purposes, weighing with the immediate container less than forty pounds, 10-4/10 cents per pound on contents and containers;

(c) none of the foregoing shall be subject to a *less* rate of duty than 45 per centum ad valorem;

(d) linseed or flaxseed, and combinations and mixtures in chief value of such oil, 4-1/2 cents per pound, but not *less* than 55 per centum ad valorem;

(e) all other expressed or extracted oils, not specially provided for, 45 per centum ad valorem.

On page 264, line 20, strike out the comma following the word "Croton," and in line 21 strike out the words "palm, perilla, and sweet almond."

Amendment

Proposed by Mr. Thomas of Idaho to the bill (H.R. 2667). On page 24 strike out lines 20 to 24, inclusive, and insert in lieu thereof the following:

Par. 55. Coconut oil, 3-6/10 cents per pound; cottonseed oil, 3-6/10 cents per pound; peanut oil, 5-4/10 cents per pound; palm-kernel oil, 3-6/10 cents per pound; sesame oil, 5-4/10 cents per pound; and soy-bean oil, 2-8/10 cents per pound:

PROVIDED, That none of the foregoing shall be subject to a *less* rate of duty than 45 per centum ad valorem.

Differential Halogen Absorptions

IT IS claimed that the bromine vapor method of determining the degree of unsaturation of fats and oils compares favorably with the Wijs iodine method, is more rapid and often more complete. The chlorine, bromine and iodine absorptions of the following fats and oils were determined: tung oil and eleostearic acid, linseed oil, rubberseed oil, soy bean oil, coconut oil, corn oil, olive oil, almond oil, whale oil, cod-liver oil, castor oil and ricinoleic acid, peanut oil, fatty acids from peanut oil, oleic acid, fatty acids from parsley seeds, crotonic acid, tiglic acid, maleic acid, fumaric acid, cinnamic acid, cinnamic alcohol, croton oil and the fatty acids from croton oil.

Castor oil and ricinoleic acid absorb more chlorine or bromine than corresponds to the iodine absorption of the Wijs method, probably because of the halogen being substituted for hydrogen as well as absorbed at double bonds. It is suggested that the difference between the values obtained by one hour's absorption by the Wijs and bromine vapor methods may help to indicate the position of the unsaturated bond in the fatty acids of the oleic series. The experiments with substances not oils or fats showed, in general, that the chlorine vapor and bromine vapor methods gave results agreeing closely with the theory except with maleic and fumaric acids, which were very inert under this treatment. *Analyst* 54, 445-53 (1929).

An attempt to establish a factorial relationship between the titer and the refractive coefficient of oils has been unsuccessful, hence it is concluded that hydrogenation cannot be controlled by the refractive index determination, *Maslob, Zhir. Delo* 1928, No. 7, 27-9.

An unconditional most-favored-nation treaty signed between France and Turkey on August 29 carries a reduction in existing rates of twenty percent on coconut oil imports from the former to the latter country. The United States will also receive the benefit of the decrease as this country is a party to the treaty.

Russell Acree, Secretary of the South Carolina Division of the National Cottonseed Products Association, died at his home in Columbia, South Carolina, on October 16. He was a prominent and esteemed member of the Association, formerly engaged in the oil milling business at Darlington, South Carolina.

New Books

THE Fourteenth Annual Edition of the Chemical Engineering Catalog has just been issued by its publishers, The Chemical Catalog Company, 419 Fourth Avenue, New York City. This catalog has become the standard text for equipment purchase reference among chemical manufacturers generally, and the current issue surpasses all previous numbers in variety of equipment and chemicals listed. The catalog is mailed free of charge, on the understanding that it is to be returned upon publication of the succeeding edition, to chemists, chemical engineers, works managers, superintendents and others actually engaged in executive work in the chemical industries.

A prominent firm of chemical manufacturers in New York is offering the trade a complete line of anti-oxidants, for the retardation of oxidation in fats, oils, soaps and other products. It is claimed that these products retard the development of the properties of rancidity, which in some cases are attributable to oxygen absorption. The anti-oxidant materials are oil soluble and may be incorporated directly with the fat or oil to be treated. If desirable they may be used in the form of a solution in a suitable organic solvent. In the case of soaps, it is preferable to add the anti-oxidant to the fat before saponification because subsequent decoloration is minimized by this procedure.

The following data obtained with cottonseed oil and cottonseed oil soap are typical as showing retardation or prevention of oxidation by means of anti-oxidants. After exposure of the samples to pure oxygen observations and determinations were made of the volume of oxygen absorbed, the increase if any in free fatty acid, the odor and the color.

Test No. 1—Cottonseed Oil						
A—Control—No anti-oxidant						
B—Control plus 0.2% anti-oxidant B						
Exposed to pure oxygen at 80°C. for 72 hours.						
	Oxygen Absorbed	Acidity Initial	Acidity Final	(% oleic acid) Gain	Odor After Test	Color After Test
A	1000 cc.	0.15	1.76	1.61	Rancid	Dark
B	110	0.15	0.62	0.47	Trace of Rancidity	No change

Test No. 2—Cottonseed Oil Soap						
C—Control—No anti-oxidant						
D—Control plus 0.2% anti-oxidant A						
E—Control plus 0.2% anti-oxidant B						
Exposed to pure oxygen at 50°C. for 24 hours						
	Oxygen Absorbed	Acidity Initial	Acidity Final	(mg. KOH per gm.) Gain	Odor After Test	Color After Test
C	1050 cc.	0.0	11.2	11.2	Rancid	Very Dark
D	0	0.0	0.0	0.0	Sweet	No change
E	0	0.0	0.0	0.0	Sweet	No change

Notes of the Industry

Meat Packers Convention

THE American Institute of Meat Packers held its twenty-fourth annual convention, at Chicago, October 18-23. The sessions were held at the Drake Hotel, under the Chairmanship of F. S. Snyder, Chairman of the Board of Directors of the Institute. The major interest of the members attending was directed toward the adoption of a code of trade practices, which was the culmination of months of effort on the part of members of the Institute to set up a code of business conduct in line with recommendations made at the 1928 convention.

Other subjects discussed included the new quick-freezing process which gives promise of revolutionizing the methods of meat distribution; the education of the cattle raiser in methods of raising better meat animals; the relation of the chain store to the meat packer and the manner in which such relations affect retail distribution of the packer's products; the improvement of production and merchandising of lard and its standardization; and the education of the consuming public in the proper appreciation of the value of meat in the diet.

The officers and directors elected for the coming year were as follows: Chairman of the Board—F. S. Snyder, Boston, Mass., President—William Whitfield Woods, Chicago, Vice-Chairmen—E. A. Cudahy, Jr., Chicago, D. C. Dickinson, Philadelphia, Jay C. Hormel, Austin, Minnesota, Chester Newcomb, Cleveland, Ohio, A. T. Rohe, New York; Treasurer—Henry Neuhoff, Nashville, Tennessee.

The Vegetable Oil Corporation is erecting a large copra crushing mill at Wilmington, California. It is planned to augment the plant at a later date with machinery for handling cottonseed, sesame seed and other products. The company is preparing to introduce two new shortenings as additions to its present lines of refined coconut oil and margarines.

Experiments by the British government in the growing of tung trees in Ceylon have not been satisfactory. Plantings at Hakgala, Peradeniya and Heneratgoda have made poor showings. Somewhat better results have been obtained at Etvawalla.

In an opinion handed down by Judge Brown of the United States Customs Court, the protests of a Philadelphia importer claiming stearic acid dutiable at 1¼c per pound, were overruled. Stearic acid is classified as dutiable at 25% ad valorem under paragraph one of the Tariff Act of 1922.

Much of the Tunis olive oil producing area was dry during July, siroccos being prevalent and causing considerable damage. Throughout three of the major producing regions, high temperatures and the occurrence of hail storms were responsible for fruit dropping from the trees. On the whole, however, and taking into account the two remaining regions, the crop appears to promise a good volume of fruit. In one region in particular, despite damage from hailstones, the crop was pronounced excellent. *Consular Report.*

M. F. Austin, Manager of the Vegetable Oil Department of W. R. Grace and Co., New York, is now traveling in Japan. He is expected to return to New York early in December.

Bids are being sought for the construction and equipment of a proposed margarine factory at Colombo, Ceylon. The proponents of the project have announced that they propose to install American equipment and adopt American methods of manufacture. British India is regarded as a promising outlet for the margarine produced at this plant, in view of its proximity and the much reduced cost of manufacture as compared with the European product.

The Annual Meeting of the American Association of Textile Chemists and Colorists will be held at the Bellevue-Stratford Hotel in Philadelphia on December 6th and 7th. On Friday, December 6th, the executive council will meet in the afternoon, followed by an open meeting the same evening. All day Saturday, December 7th, will be devoted to the business of the Association and the reading of technical papers related to the industries in which the members are interested, particularly the textile industry. The meeting will close with the Annual Banquet on Saturday evening.

The Archer-Daniels-Midland Company, linseed oil producers, of Minneapolis, have acquired a substantial interest in the Werner G. Smith Company, large importers of china wood oil, of Cleveland, Ohio. The Directors of the Archer-Daniels-Midland company have voted to extend their stockholders the right to subscribe at thirty dollars per share for one new share of stock for each seven shares owned, the proceeds of this subscription to be used to acquire the interest in the Smith company.

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of Oil & Fat Industries, published monthly at New York, N. Y. for October 1, 1929. State of New York; County of New York.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Alan Porter Lee, who, having been duly sworn according to law, deposes and says that he is the Editor of the Oil and Fat Industries and the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, MacNair-Dorland Co., Inc., 136 Liberty St., N. Y. C.; Editor, Alan Porter Lee, 136 Liberty St., N. Y. C.; Managing Editor, none; Business Managers, Grant A. Dorland, 136 Liberty St., N. Y. C.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) MacNair-Dorland Company, Inc., 136 Liberty St., N. Y. C.; Grant A. Dorland, 136 Liberty St., N. Y. C.; Ira P. MacNair, 136 Liberty St., N. Y. C.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is..... (This information is required from daily publications only.)

[Signed] Alan Porter Lee.

Sworn to and subscribed before me this 30th day of September, 1929.

Al. J. Ruggiero, Notary Public, Kings Co., No. 509 Reg. No. 1182; Cert. filed in N. Y. Co., No. 309 Reg. No. 1R242; Commission expires March 30th, 1931. [SEAL.]

Mayonnaise Industry

(From page 18)

purchased of practically equal quality and comparable price. There is much yet to be learned regarding problems of distribution along the lines brought out in this report, and in similar ways. Much educational work must be done before all the manufacturers see the value of such investigations, and are ready to help themselves by helping others. The association, as representing the industry can do many of these things with the cooperation of the manufacturers, both members and non-members, and, now, as before, the Department of Commerce is glad to assist in any way compatible with its duties and abilities.

Distribution

“THE current talk that distribution people are old fogies and that their difficulties are due to their being sound asleep is unfounded,” said Gorton James, Editor of *The Business Week*, speaking at the meeting of Mayonnaise Products Manufacturers' Association at their annual convention at Atlantic City. He went on to say that conditions have changed faster than human institutions can be altered, and with changing conditions must come changed distribution methods. The proportion of families living in apartment houses has increased from 1/3 in 1922 to over 2/3 in 1929. Where there were approximately 35,000 chain store units in 1922, the number in 1929 is about 105,000.

Olive Oil Test

(From page 27)

iodine values all come within the limits of the U.S.P.² except the rapeseed and the 90% rapeseed mixture. Presumably the Thio Numbers, would indicate that olive oil above 4.50 and below 3.50 should be investigated to determine the purity of the oil. It has been found recently by another observer that olive oil gave a pink or red color, pecan oil and grape fruit seed oil a pale pink, cottonseed, sunflower, soya bean, linseed and china wood oils did not give a pink or red color with the above reagents. If sesame oil is present in the olive oil the red color will appear in the cold, and then there is no need for the thio number. When an olive oil contains oil of rosemary, it should be extracted with alcohol to remove the essential oil.

(*) The American Journal of Pharmacy 95, 684 (1923).

(2) The thio number of the olive oil used in the Rapeseed oil mixture.

(*) United States Pharmacopoeia (Tenth Revision).