Report of the Oil Characteristics Committee 1944-45

THIS committee collects data on the various oils and fats dealt with in this country for the purpose of setting up, whenever possible, such standards of purity as can be recommended to the trade as useful guides in its activity.

Since 1937 we have published informative data on Cottonseed Oil of various types, Rice Bran, Kapok, Acorn and Stillingia Oils. In addition, standards have been established on most of the common oils and fats: North American cottonseed oil, castor, cod liver, corn, peanut, rapeseed, sesame, tung, soyabean, perilla, linseed, palm kernel, sunflower, cocoanut, palm, whale, teaseed, and oiticica oils and cocoa butter.

Recently we have drawn up specifications for neatsfoot oil, North American lard and beef tallow, which are however still subject to further consideration.

The values for neatsfoot oil, lard, and tallow returned to this committee for further revision have been changed slightly to meet several objections and as finally passed upon, are as in Table I.

The values given in Table II for Babassu Kernel and Patua Palm Oils and for Chinese Vegetable Tallow have been approved for "Informative Data" and not as recommended standards.

TABLE I

	Neatsfoot Oil	Beef Tallow	North American Lard
Spec. Gravity @ 99/15.5 C.	0.860-0.865	0.860-0.870	0.858-0.864
@ 25/25 C.	0.906-0.912	0.903-0.907	0.908-0.913
nD @ 40 C.	1.458-1.461	1.454-1.458	1.461-1.459
Iodine Value (Wijs)	69-76	40-48	55-75
Saponification Value	190-199	190-199	190-199
Unsaponifiable Matter (FAC)	Max. 0.8%	Max. 1.0%	Max. 0.8%
Titer (°C.)	20-30	40-46	36-43*
Pour Point (ASTM) (°F.)	20-40	....	....

*Some lards from the southern United States may run somewhat lower in titer.

TABLE II

	Babassu Palm Kernel	Patua Palm	Chinese Vegetable Tallow
Spec. Gravity @ 25/25 C.	0.916-0.918	0.916-0.918	0.856-0.860 @ 99/15.5 C
nD @ 40 C.	1.449-1.451	1.464-1.468 (@ 25)	1.454-1.457
Iodine Value (Wijs)	14-18	75-80	18-38
Saponification Value	247-251	190-193	199-207
Unsaponifiable Matter (FAC)	Max. 0.8%	Max. 0.8%	Max. 1.5%
Titer (°C.)	22-23	17-19	44-54
R.-M. Value	5.8-6.2	....	....
Polenske Value	10-12	....	....
Setting (solid) Point (°C.)	22-24	....	....

M. F. LAURO, *Chairman.*

Abstracts

Oils and Fats

Edited by
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EXTREME ULTRAVIOLET ABSORPTION SPECTRA OF THE FATTY ACIDS. I. I. Rusoff, J. R. Platt, H. B. Klevens and G. O. Burr. *J. Am. Chem. Soc. 67*, 673-8 (1945). A study of naturally occurring fatty acids and their isomers and derivs. shows the large effects of the no. and position of double bonds on absorption spectra. Geometric isomerism and esterification exert smaller effects. The absorption of light by oils at very short wave lengths is directly dependent upon the fatty acid compn. of the oil.

THE SPECTROGRAPHIC DETERMINATION OF LINOLEIC, LINOLENIC AND ELEOSTEARIC ACIDS. T. P. Hilditch, R. A. Morton and J. P. Riley. *Analyst 70*, 68-74 (1945). The technic of Mitchell, Kraybill *et al.* was applied to the detn. of linolenic and/or linoleic acid in the presence of eleostearic acid, and the authors have illustrated the proposed application of the technic to sunflower seed oil, niger seed oil, linseed oil, tung oil and a mixt. of the 2 last-named oils.

SEPARATION OF CHOLESTEROL FROM DEGRAS. L. Yoder, O. R. Sweeney and L. K. Arnold. *Ind. Eng. Chem. 37*, 374-7 (1945). Wool fat (degras) was sapond. in 52.5 lb. batches by NaOH, and the unsapond. material was extd. from the wet soaps by gravity sepn. with ethylene dichloride. Cholesterol of 97% digitonin precipitability was prepd. from the unsaponifiable ext. in 4-lb. yields per batch by a pilot process based on the formation of the oxalic acid addn. product insol. in ethylene dichloride solns. By-products obtained per batch were 37 lbs. of fatty acids, 14 lbs. of oily unsaponifiable material and 9 lbs. of isocholesterol wax.

THE POLYMORPHISM OF TRISTEARIN AND SOME OF ITS HOMOLOGS. E. S. Lutton. J. Am. Chem. Soc. *67*, 524-7 (1945). Manifestation of different crystal structures by a given triglyceride was clearly established by the classical work of Malkin *et al.*, as the underlying cause of the multiple melting of triglycerides. The names of polymorphic forms were based by Malkin upon X-ray diffraction patterns in a manner to relate logically the triglyceride forms to corresponding forms of other long chain compds. It resulted that the forms for tristearin, etc. were called (by Malkin) γ (glassy), α and β in order of increasing m.p. Unfortunately, according to the present study, there appears to have been a faulty association of X-ray diffraction pattern with m.p. in the work of Malkin. This association was correct in the case of the highest melting β form. However, the lowest melting form (called γ, glassy or vitreous by Malkin) actually exhibits Malkin's α pattern and in accordance with Malkin's original intention is therefore named the α form. The intermediate form (called α by Malkin) actually exhibits Malkin's β' pattern (not reported by him for tristearin, etc., but for mixed glycerides). It is therefore named the β' form. The γ name and pattern and the concept of the glassy state of triglycerides should be eliminated.

MODERN FAT SYNTHESIS. W. Wittka. *Seifensieder-Ztg., Allgem. Öl- u. Fett-Ztg. 1943*, 50-1, 68-9. The production of fat acids from CO, hydrocarbons, alcs., aldehydes, ketones, nitro compds., and metal alkyls is discussed. The problem of fat acid synthesis by oxidation of paraffins has already been solved. Ac-