Abstracts from Other Journals

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Solidification Points of Edible Fats. T. Meyer. (*Z. Unters, Lebensm.*, 1926, 52, 461-465.)—Time-temperature curves have been plotted, according to the method of Mohr, for the following oils: Palm kernel, coconut, arachis, neutral lard, oleomargarine, butter fat, and hardened whale oil. The solidification points were obtained from the maxima and minima observed on the curves, the curve for each fat being characteristic. The results are correlated with the m. pts. of the high and low m. pt. glyceride known to be present in the fats. A mean deviation of less than $\pm$ 0·1° C. is obtained if the experimental conditions are standardized; *i.e.*, 35 c.c. of the fat at 50° C. contained in a 50 c.c. beaker are placed in a water-bath so that the level of the fat is 2 cm. below that of the water. The temperature of the cooling water (usually 15° C.) influences the nature of the curves, especially in the case of neutral lard. The method will distinguish between margarine and butter, except in the case of a mixture such as oleomargarine (4 parts), palm kernel oil (3 parts) and hardened whale oil (3 parts).

New Value for the Determination of Butter Fat. F. v. Morgenstern. (*Z. Unters. Lebensm.*, 1926, 52, 385-388.)—In order to eliminate the influence of the caprylic and other acids, except butyric acid, obtained on saponification of butter fat (*cf.* Kuhlmann and Grossfeld, ANALYST, 1926, 51, 305) the soap solution may be treated with copper sulphate and filtered. Five grms. of the fat are saponified with 2 c.c. of potassium hydroxide solution (750 grms. KOH per litre) and 10 c.c. of glycerin, and the soap solution cooled and diluted with 100 c.c. of water. The liquid is then cooled to 20° C., well shaken with 10 c.c. of coconut soap solution and 60 c.c. of copper sulphate solution (50 grms. of the crystallized salt per 600 c.c.), and, after 2 to 3 hours, filtered through a large plain filter paper. The filtrate should amount to 100 c.c. and, if necessary, the copper soap must be stirred with a glass rod. The 100 c.c. of filtrate are distilled with 50 c.c. of dilute sulphuric acid (12·5 c.c. of the concentrated acid per litre) and a little pumice in a Reichert-Meissl distilling flask, 110 c.c. of distillate being collected and titrated with 0·1 *N* sodium hydroxide solution. The number of c.c. of the alkali required is the titration value or copper value. Occasionally filtration from the copper soap fails to yield 100 c.c. of filtrate; in such cases the copper value is proportional to the volume of filtrate titrated.

For copper values 1, 1·1, 1·2 and 1·3, the respective percentages of butter fat in the sample are 0, 0·5, 1·5 and 2. Each further addition of 0·1 to the copper value corresponds with an increase of 1 per cent. of butter fat. Good results are obtained with mixtures of butter fat with coconut butter or rape oil in varying proportions.

Theory of the Hardening of Oils by Hydrogenation. H. P. Kaufmann and E. Hansen-Schmidt. (*Ber.*, 1927, 60, 50-57.)—A selective hydrogenation, in which the more highly unsaturated glycerides are converted into less unsaturated glycerides, is more suitable for fats intended for food than a complete

hardening in which the whole of the unsaturated constituents are hydrogenated. The nature of the changes effected during the hydrogenation of an oil can be studied by means of the thiocyanogen absorption process (ANALYST, 1925, 50, 577, 634; 1926, 51, 157) used in conjunction with the test for iso-oleic acid, as adapted to hydrogenated oils by Williams and Bolton (ANALYST, 1924, 49, 460). For example, a sample of arachis oil, with an iodine value of 85.8, and thiocyanogen value of 69.4, was hydrogenated in an autoclave at 200°C., with nickel as cataylst. The samples taken at intervals of 15 minutes gave the following values, the hardening being complete after 135 minutes, when the fat melted at 30.5° C.

Minutes.	Beginning	15	30	45	60	75	90	105	135
Thiocyanogen value ...	69.3	70.8	70.2	69.1	69.3	72.1	71.0	71.9	72.1
Iodine value	85.8	86.1	81.2	79.0	78.5	75.1	74.6	72.0	72.6

It will be seen that the values for the thiocyanogen absorption remained constant (within the limits of experimental error) throughout the hydrogenation. The amounts of saturated glycerides and unsaponified matter had also not been increased during the process, whereas the linolic acid had disappeared, for at the end of the hydrogenation the thiocyanogen and iodine values had become the same. The hardening process therefore had apparently been due to the formation of glycerides of less highly unsaturated fatty acids. A study of the fatty acids separated from the final product by Twitchell's lead salt and alcohol method confirmed this. The hardened fat was calculated to consist of 51 per cent. of glycerides of oleic acid, 32.8 per cent. of glycerides of solid isomers of oleic acid, and 16.5 per cent. of glycerides of saturated fatty acids with unsaponifiable matter. In the hydrogenation of the linolic acid only less unsaturated fatty acids had been formed.

In an analogous experiment with sunflower seed oil (thiocyanogen value, 72.8; iodine value, 117) the composition of a sample taken after 210 minutes, when the thiocyanogen and iodine values had become practically the same, was determined. The liquid fatty acids (separated by the lead salt and alcohol method) consisted solely of oleic acid in an amount practically the same as in the original oil (about 33 per cent.). The solid fatty acids had an iodine value of 49.6 and consisted of 28 per cent. of saturated acids and 34 per cent. of iso-oleic acids, calculated on the total fatty acids. The iso-oleic acids had been derived from the linolic acid, which had also yielded 15 per cent. of saturated acids.

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Titles of Article on Fats and Oils from Journal of Society of Chemical Industry.

Solidification Points of Edible Fats—T. Meyer.

Hydrogenation of Oleic acid with Activated Hydrogen—H. I. Waterman and S. H. Bertram.

Oxidation and Hydrolysis of Light Wood Oil—P. O. Powers, A. Lowry and W. A. Hamor.

Effects of Moisture on Waxes —Lee and Lowry.

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Determination of Fatty Matter in Vegetable Products—Terroim, Le Page, Véchat and Wolff.

Auto-oxidation of Oils—Moreau, Dufraisse and Chaud.