4. The centrifugal method gives higher refined bleached colors with the recommended 30° Be' lye, but with weaker lyes the refined bleached colors are closer to those obtained by the cup methods.

AND WHEREAS, There are several disadvantages to the centrifugal method which must be considered; namely,

1. Additional equipment will be needed over the present, facilities for the A. O. C. S. cup method.
2. There will probably be need for changes in equipment design necessary to place the centrifugal method on a completely practical basis.
3. Under present conditions, the securing of new equipment is uncertain.
4. There will be difficulties involved in synchronizing the centrifugal method with procedures followed on other oils.

AND WHEREAS, The ultimate centrifugal refining loss test should correlate with commercial practice,

BE IT RESOLVED, That the A. O. C. S. Refining Committee suggest that at some future date the work on the development of the centrifugal refining method be continued at the Northern Regional Research Laboratory under the direction of Dr. R. T. Milner.

(2) WHEREAS, The present A. O. C. S. cup methods for hydraulic and extracted soybean oils have produced unsatisfactory results in many cases.

AND WHEREAS, The trading experience of the industry for many oils has been based upon the cup refining methods of the A. O. C. S.,

BE IT RESOLVED, That the Refining Committee continue their studies on modifications of the present A. O. C. S. cup methods which are now under way in Sub-Committees with the Northern Regional Research Laboratory collaborating in this work at the present time ,and the new recommended procedures be subjected to collaborative work for possible adoption at the earliest time, if possible by September 1, 1943. Such methods to be tentative and subject to further modifications as conditions warrant.

Mr. Taylor moved that these resolutions be adopted; seconded by Mr. Durkee. They were carried.

Mr. Kruse offered the following resolution:

The present method for expeller oil is satisfactory and gives reproducible results. Modifications of the present methods for extracted and hydraulic oils would improve these from the standpoint of reproducibility and such modifications will be presented at the earliest possible time.

This was seconded by Mr. Sorenson, and carried.

Another meeting of this Committee will be called as soon as additional data are available for consideration.

BOOK REVIEW

"Practical Emulsions," by H. Bennett, Editor-in-Chief, *The Chemical Formulary*; Technical Director, Glyco Products Company, Inc. Chemical Publishing Company, Inc., Brooklyn, New York, 1943; 462 pp. illustrated; 15 x 22 cm. Price $5.00.

This is a highly practical book which makes no attempt to delve into the theoretical aspects of emulsions. It concisely sets forth much helpful information on the production and preservation of good emulsions.

The book is divided into two parts. The first is concerned with emulsifying agents, type of emulsions, methods, formulation, equipment, stability of emulsion, and a discussion of several of the more important technical emulsions such as asphalt, cosmetic, detergent, lubricating, latex, food, leather and paint, polish and wax emulsions. Also included in this section is a chapter on dispersing and wetting agents. The section finally contains a list of some 600 emulsifying agents and 1,000 emulsions with references to their composition or source, and a list of demulsifying and defoaming agents.

The second part of the book gives formulas and methods for making many types of emulsions. Among them are agricultural sprays, cutting and soluble oils, cleaners and soaps, as well as emulsions in the fields of asphalts, cosmetics, drugs, foods, lacquers, leather, lubricants, medicines, paints, paper, polishes, resins, and textile.

H. C. BLACK,

Abstracts

Oils and Fats

Edited by
M. M. PISKUR and SARAH HICKS

TESTING EDIBLE OILS. Official methods of analysis in Portugal. *Oil & Colour Trades J. 104,* 130 (1943).

NEW METHODS FOR DETERMINATION OF FAT IN FOODS. A. Schloemer and K. Rauch. *Z. Untersuch. Lebensm. 83,* 289-305 (1942). Extn. of fat from milk by the Grossfeld method, in which the sample is hydrolyzed with HCl in presence of $CHCl:CCl_2$ gave results on fat content and the butyric acid no. of the extd. fat that agreed with those using the Gerber fat detn. method. Replacing the $CHCl:CCl_2$ with CCl_4 at first gave lower results, but on increasing the time of heating for hydrolysis and adjusting the ratio of reagents results were obtained which agreed with those of the Gerber and the Roese-Gottleib methods. The modified method for milk is as follows: 10 g. milk, 10 cc. CCl_4, 15 cc. concd. HCl and some pumice stone are refluxed 20 mins. After cooling add 10 cc. 96% alc. and 40 cc. benzine, shake vigorously for 15 secs. and allow to stand 15 mins. The wt. of fat is detd. in a 25 cc. aliquot from the fat soln, phase and the results are obtained with the use of Table 4, p. 336 of "Anleitung zur Untersuch. Lebensm." The new method produces less carmelization of lactose than the method using $CHCl:CCl_2$ or the Schmid-Bondzynski-Ratzlaff method. With dried milks 2 g. of sample, 10 cc. HCl, 10 cc. CCl_4 and 10 cc. alc. should be used as reagents and the addn. of the alc. should be followed by a 5 min. addnl. refluxing. In work on cheese, the Grossfeld Hoth method was as reliable and simpler than any modification of the CCl_4 method. Procedures for the use of the new method on dried eggs and bakery products were also prepd.

NEW METHOD FOR DETERMINING FAT IN CHEESE. J. Grossfeld and A. Zeisset. *Z. Untersuch Lebensm. 84,* 193-201 (1942), Bring 5 g. sample, 6x6-cm. "Zellglass," some pumice stone and 10 cc. 25% HCl to a boil in a reflex app. After 10 min. add 20 cc. CCl_4. Boil 10 min., cool to 20°, add 30 cc. benzine (b.p. 60-70°), shake ½ min. and allow to stand over night. Amt. of fat in a 25 cc. aliquot is detd. and fat content is read from Table 4 in "Anleitung zur Untersuch. Lebensm.," p. 384. The method checks well with the international method and requires less reagents.

NEW METHOD FOR DETERMINING FAT IN FAT-RICH FAT PREPARATIONS. A. Schloemer and M. Schink. *Z. Untersuch. Lebensm. 84,* 202-6 (1942). The above method was modified for use on butter by using 5 g. sample 5 cc. 25% HCl and 50 cc. benzine but no CCl_4. Results check those obtained by methods similar to the Roese-Gottlieb.

HEATING CURVES OF TRISTEARIN. G. B. Ravich. *Compt. rend. acad. sci. U. R. S. S. 36,* 275-7 (1942). *Chem. Abs.*

DETERIORATION OF LUBRICATING OILS. Soybean lecithin as an inhibitor. J. J. Jacobs and D. F. Othmer. *Ind. Eng. Chem. 35,* 883-9 (1943).

FORTIFICATION OF OIL, FAT, AND FLOUR. Stability of added carotene and effect of antioxidants. P. W. Morgal, L. W. Byers, and E. J. Miller. *Ind. & Eng. Chem. 35,* 794-7 (1943).

A COLORIMETRIC METHOD FOR THE DETERMINATION OF FAT-PEROXIDES AND ITS APPLICATION IN THE STUDY OF THE KEEPING QUALITY OF MILK POWDERS. R. A. Chapman and W. D. McFarlane. *Can. J. Research 21B,* 133-9 (1943).

LIPOID OXIDASE IN SOYBEAN MEALS. R. J. Sumner and D. K. Tressler. *Ind. Eng. Chem. 35,* 921 (1943). In most cases the high temperatures reached in processing are sufficient to inactivate the peroxidizing factor completely. Considerable lipoxidase activity is found in a sample of solvent process meal extracted at 150° F. and in a special enzyme preparation used in the brewing industry. The results indicate that soybean meals made by conventional processing methods should not produce enzymic destruction of vitamin A or carotenoids.

FAT OXIDATION IN EXPERIMENTAL ANIMAL DIETS. D. F. Clausen, R. H. Barnes, and G. O. Burr. *Proc. Soc. Exptl. Biol. & Med. 53,* 176-8 (1943). Lard containing 0.1% gum guaiac had a somewhat longer induction period. Storing of diets at low temperatures is to be recommended. Studies on the keeping quality of fats in different food mixtures have indicated certain prooxidant and antioxidant characteristics among the dietary components. The relative keeping time of fats added to various dietary mixtures is given and the importance of careful preservation of experimental diets is stressed.

SOME EFFECTS OF HIGH FAT DIETS ON INTESTINAL ELIMINATION. 1. H. L. Wikoff and S. D. Koonce. *Am. J. Digestive Dis. 10,* 266-70 (1943). Ten and 20% addns. of lard, cottonseed oil, olive oil, linseed oil, menhaden oil, Crisco, bayberry tallow, cocoa butter, or tributyrin to the standard rat food were the combinations fed. Constipation resulted from feeding the rats mixtures of standard rat food with cocoa butter and with the bayberry tallow. More soap was present in the feces following the diets which had produced constipation than in any other cases. The added fats which caused constipation (Cocoa butter and bayberry tallow) had lower I. No. than the other fats fed. The only exception was tributyrin, which had no effect on elimination and had practically no I. No. The I. Nos. of the soaps isolated from the feces of the constipated animals were much lower than in any other case. None of the other fats fed produced any effects on intestinal elimination in the rats. Diarrhea could not be produced by feeding fats to rats; no laxative action was noted even when 2 cc. doses of castor oil were given by stomach tube. Diets consisting of 20% tributyrin added to standard rat food were relished by rats, although previous investigators have reported tributyrin as toxic and so distasteful that rats refused to eat concns. of as low as 5% tributyrin added to a standard rat food.

THE COMPARATIVE NUTRITIVE VALUE OF BUTTER AND SOME VEGETABLE FATS. H. J. Deuel, Jr., Eli Movitt, and L. F. Hallmann. *Science 98,* 139-40 (1943). These experiments indicate that on an adequate vitamin intake the fats studied are of equal nutritional value for growing rats. They explain how the greater growth of weanling rats on a butter diet in experiments where *ad. lib.* feeding is employed may result simply from a greater food consumption due to the preference of rats for butter flavor. Diets containing all these fats were used with equal efficiency in transformation to body tissue.

NON-CALORIC FUNCTIONS OF DIETARY FATS. G. O. Burr and R. H. Barnes. *Physiol. Revs. 23,* 256-78 (1943). There are ample reasons for recommending that the fat intake be not reduced much below the normal established by habit. To give the best results added fats must be fresh. Rancidity renders them unpalatable, destructive to other vital foods, and possibly slightly toxic in themselves. Frequently the preservation of a mixed food is largely a matter of the prevention of fat deterioration.

THE EFFECT OF SIMULTANEOUS MINERAL AND CHOLINE DEFICIENCIES ON LIVER FAT. P. Handler. *J. Biol. Chem. 149,* 291-3 (1943). Young male rats fed a low protein, high fat diet deficient in choline and minerals grew slowly for 2 weeks and at the end of this time their livers were moderately fatty. In the following 2 weeks the animals declined in wt. and the liver fat content returned towards normal. These effects were not due merely to the level of food consumption, since choline-deficient animals given adequate amounts of mineral salts but whose food consumption was restricted to that of the mineral-deficient animals continued to grow slowly and developed markedly fatty livers in the same period.

LIVER GLYCOGEN AND LIPIDS IN FASTED AND GLUCOSE-FED RATS. C. R. Treadwell, H. C. Tidwell, and B. G. Grafa, Jr. *J. Biol. Chem. 149,* 209-15 (1943). In unfasted male and female rats receiving a diet high in fat and low in protein and lipotropic factors, the livers contained significantly greater amounts of glycogen and lipids than the livers of those on a diet high in fat and protein. The level of the liver glycogen was independent of the amount of fat in the liver. The animals having fatty livers exhibited an increased rate of glycogenolysis during fasting and a decreased glycogenesis following a standard dose of glucose. There was no change in the total lipids of the liver during a 36-hour fast.

THIXOTROPIC BEHAVIOR OF OILS. R. N. Weltmann. *Ind. Eng. Chem. Anal. Ed. 15,* 424-9 (1943). Various types of oils in the viscosity range of 1 to 800 poises were measured on a rotational viscometer capable of imparting shearing stresses over a wide range. From these oils, flow curves were obtained extending from low to high rates of shear. All these oils showed a definite thixotropic behavior and exhibited all the characteristics of thixotropic plastics above a certain rate of shear designated as "the limiting rate of shear." Below this critical point the oils behaved like true Newtonian liquids showing no signs of thixotropic structure. The limiting rates of shear were found to be related to the measured true Newtonian

viscosities of the oils. The product of limiting rate of shear and viscosity was a constant for all the oils tested.

PATENTS

PROCESS OF DEEP FAT FRYING. H. C. Black (Industrial Patents Corporation). *U. S. 2,322,187.* In the process of deep fat frying, the steps comprise adding about 0.001% to 1% of a non-toxic org. sulphonate salt to fatty acid triglyceride and heating the triglyceride to a deep fat frying temperature for a substantial period.

OLEANINOUS PREPARATION. H. C. Black (Industrial Patents Corporation). *U. S. 2,322,186.* A process for improving the resistance to foaming of oleaginous materials comprises adding H_3FO_4 to a substantially dry oleaginous material in the presence of the nickel hydrogenation catalyst.

ADSORBENT AND TREATMENT OF OIL THEREWITH. C. C. Winding (Tide Water Associated Oil Co.). *U. S. 2,322,555.* A decolorizing agent for fats and oils is manufd. by calcinating $MgCO_3$ at 300-450 to yield an active MgO compn.

OIL EXTRACTION. (The Schwarz Engineering Company, Inc.) U. S. *2,325,327-8.*

APPARATUS FOR EXPRESSING OIL FROM OIL-BEARING MATERIALS. (The V. D. Anderson Company.) *U. S. 2,325,357.* This expeller press is designed so that express oil is used as a cooling medium for the pressing mechanism, thus preventing production of high colored oil due to overheating.

METHOD AND APPARATUS FOR OIL PURIFICATION. E. H. Carruthers (The Sharples Corporation). *U. S. 2,324,763.*

MANUFACTURE OF MARGARINE AND COOKING FATS. (Co-operative Wholesale Society Limited.) *U. S. 2,325,393.* A method of manufacturing margarine and cooking fats comprises providing a fat in the solid state and working the same, then addg. aq. liquid thereto and working said fat and liquid mechanically to form a plastic mass, said fats remaining in the solid state at the end of said working, then addg. to said mass a glyceride oil and continuing working said mixt. to form a homogeneous mass, and thereafter packaging the product.

MOLDING APPARATUS FOR INDIVIDUAL EDIBLE SPREADS. C. Doering and H. H. Doering. *U. S. 2,323,523.*

PROCESS OF PRODUCING FAT-SOLUBLE VITAMIN CONCENTRATES. L. O. Buxton (National Oil Products Co.). *U. S. 2,324,063.* A process of producing fat-soluble vitamin concentrates of high potency comprises admixing the unsapon. fraction of a fat-sol. vitamin-containing marine oil with a substantially completely deaerated mixt. of halogenated hydrocarbon solvent and a substantially anhyd. $Ca(OH)_2$ adsorbent, agitating the mass to accelerate adsorption of the vitamins, eluting the adsorbed vitamins by means of a mix. of non-polar and a polar organic solvent and distg. off the solvent from the concd. vitamin fraction.

PHYTOSTEROLS FROM TALL OIL BY EXTRACTION WITH SO_2. J. E. Mitchell (Colgate-Palmolive-Peet Company). *U. S. 2,324,012.*

UNSATURATED DEGRADATION PRODUCTS OF STEROLS AND A METHOD OF PRODUCING THE SAME. (Schering Corporation.) *U. S. 2,323,584.*

ISOLATION OF STEROLS FROM FATS AND OILS. L. Yoder (Iowa State College Research Foundation). *U. S. 2,322,906.* A process for the separation of cholesterol from the non-saponifiable fraction of oily or fatty substrates, comprises dissolving such substrate in a fat-dissolving non-alcoholic solvent, and treating such solution with a hydrogen halide to precipitate therefrom the acid addition product of cholesterol.

MANUFACTURE OF PAPER AND BOARD. S. Musher (Musher Foundation, Inc.). *U. S. 2,324,529.* A heat treated coating of a starch lecithin mixt. is applied to the cardboard for packaging products susceptible to oxidative rancidity.

LUBRICATING OIL, ETC. (The Standard Oil Co.). *U. S. 2,323,670.* A mineral oil containing a small amount of tetra methyl diamino diphenyl methane and sodium lauryl sulfate.

PROCESS AND PRODUCT. (E. I. du Pont de Nemours & Co.) *U. S. 2,323,111.* The esters of N-thiomethylanide or similar amides and fat acids are prepd. for use as pesticides, rubber chemical, etc.

OIL AND WATER EMULSION CONTAINING ELECTROLYTES. K. R. Brown (Atlas Powder Company). *U. S. 2,322,822.* An emulsion comprises an oil phase, a water phase, an electrolyte, and a mannide monoester of a fatty acid with at least 6 carbon atoms as an emulsifier.

PARTIAL ESTERS OF ETHERS OF POLY-HYDROXYLIC COMPOUNDS. (Atlas Powder Company.) *U. S. 2,322,821.* An emulsifier consisting essentially of a hexide monoester of a fatty acid having at least 6 carbon atoms.

MONOESTERS OF INNER ETHERS OF HEXAHYDRIC ALCOHOLS (SHORTENING EMULSIFIER).K. R. Brown (Atlas Powder Company). *U. S. 2,322,820.* A surface active ester product consisting essentially of a mixture of a hexitan fatty acid monoester, and a hexide fatty acid monoester, said fatty acid having at least 6 carbon atoms.

Abstracts

Soaps

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COOPERATIVE STUDIES ON A LABORATORY METHOD FOR EVALUATING SYNTHETIC DETERGENTS. J. B. Crowe. *Am. Dyestuff Reptr. 32,* 237-41 (1943).

SORPTION OF WATER VAPOR BY SOAP CURD. J. W. McBain and W. W. Lee. *Ind. & Eng. Chem. 35,* 784-7 (1943). Anhydrous soap, pure or commercial, takes up to 1 or 2% of water according to a sorption mechanism of physical type. Except for sodium oleate, the curd or supercurd then suddenly forms a hemihydrate, which again takes up water more rapidly (10 or 12%) according to a sorption law until another phase forms. At low temperatures these new phases are higher hydrates; that is, they are masses of crystalline fibers containing much larger amounts of water. The higher hydrates readily revert to hemihydrate when the relative humidity falls by