conditioned upon the procedure chosen by the operator. There are consumer as well as baker preferences for types of pie crust that vary from greasy, flaky, rather dark colored crust to the friable, mealy and dry crust that many prefer. To satisfy the requirements of such a range, there must be available a variety of shortening preparations that range from lard through rather soft hydrogenated vegetable fats to those that are quite firm.

In these comments I have sought to point out the characteristics that govern the baker's choice of shortening. We must bear in mind that baking is fundamentally an art as well as a craft. Just as there are whole groups of consumers that prefer a flaky pie crust to a mealy one, likewise there are numbers of bakers who strive for a feathery, flaky cake crumb while others work to attain extremely fine grain and uniformity of cell structure. Recipes and procedure in mixing are as varied as human personalities, so it is quite natural that no particular ingredient, such as shortening, will be universally preferred and by the same token there is no one set of ingredient characteristics which will fit all requirements of many bakers. It may be added that the baker has no definite information supplied to him by shortening manufacturers which will aid him in developing an understanding of shortening. Unlike flour, which he buys on a basis of analytical specifications, his shortening is bought on sample or by brand name. My comments here are evidence of the unsatisfactory relation of buyer and seller; to use brand names here is unwise but in all probability I might convey to you my thoughts in a more illuminating manner if I could use brand names. You then, knowing the characteristic differences between brands, would derive real information which I am unable to explain through my limited knowledge of the intricacies of shortening manufacture. In closing I should like to leave with you a plea to strive toward the development of terms and descriptions that will better classify the commercial shortening preparations submitted to the baker so that he will have a more thorough understanding of what he is using. The baker will then be in a much better position to cooperate with you in solving some of the problems which beset him.

ABSTRACTS

Oils and Fats

Edited by
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SHORTENING. P. Pelshenke. *Fette u. Seifen 46,* 5-8 (1939). The author discusses the interchangeability of fat for bakeries. The 1937 statistics of Berlin yielded the following ratio of fats used: margarine 44, oil 21, tallow 13, butter 9, compound fat 3½, and other 6%.

SEPARATION EMULSIONS. A. Häussler. *Fette u. Seifen 46* 3-5 (1939). The author recommends the use and discusses "trennemulsions" which is a 25% fat emulsion for use in the baking industry. Use of this product assists in the fat economy program.

COLLOID CHEMISTRY ASPECTS OF THE STRUCTURE OF OIL SEEDS. M. Singer. *Seifensieder-Ztg 65,* 882-3 (1938) Review.

QUANTITATIVELY DETERMINING THE STEARIC ACID IN FATS. A. Heiduschka and W. Bohme. *Z. Untersuch. Lebensm. 77,* 33-8 (1938). App. comprising thermostat, filter and extg. equipment is described. About 0.5 g. fat acids are weighed in a 200 Edenmeyer flask, 100 cc. of stearic acid soln. (4.5 acid to 1000 cc. alc.) are added, the soln. is warmed to dissolve all fat and stirred and placed in a bath of 0°. After 6 hrs. filter. The stearic acid is extd. from the filter paper, dried and weighed. The error in the analysis amts. to ± 2%. Fat from various parts of beef and pork were analyzed.

LOSS OF FAT DURING BUTTER MAKING AND PREVENTION OF THIS LOSS. J. S. Francisco. *Agr. Live-stock India 8,* 262-8 (1938). When the concn. of fat in the cream was maintained at 30% a min. amt. of fat was lost in the buttermilk. The optimum temp. of aging was 48-52° F. and that of churning the cream 54-56° F. Loss of fat in the buttermilk was reduced from 0.15% to 0.1%, when cream with 30% fat was churned, by adding 100 cc. of a 0.2% soln. of either citric acid or Na citrate per 100 lb. cream; the flavor, aroma and keeping quality of the butter were improved. *(Chem. Abs.)*

COMPOSITION OF DRYING RATES OF SOYBEAN OILS. H. R. Kraybill, A. W. Kleinsmith, & M. H. Thornton. *Ind. & Eng. Chem. 31,* 218-22 (1939). Analyses of the oils were made as follows: per cent of foots, per cent of break (Gardner method, per cent of phosphatides, acid number, iodine number, refractive index, and drying time before and after removal of the phosphatides and associated compounds. There was a close correlation between the Gardner break and the percentage of phosphatides of the crude oils as calculated from the phosphorus content of the oils.

A STUDY OF THE PASSAGE OF FATTY ACIDS OF FOOD INTO LIPINS AND GLYCERIDES OF THE BODY USING DEUTERIUM AS AN INDICATOR. B. Cavanagh & H. S. Raper *Biochem. J. 33,* 17-21 (1939). Rats were fed with a fat containing 4-5 atoms % deuterium and the distribution of the "deutero-fatty acids" in "lipin" and "glyceride" fractions of liver, kidney, brain and blood determined 6, 10, & 24 hr. after. After 6 hr. D. was present in considerable amount in plasma glycerides, liver glycerides and liver lipins. There was much less in the lipoid fractions of the kidney and plasma and the D was only present in traces in adipose tissue. The D in the liver glycerides decreased more rapidly in 24 hr. than that of the liver lipins. In the lipoid fractions of kidney and brain there were no notable changes in % D between 6 & 24 hr. The results suggest that liver lipins may play a very active part in fat metabolism.

THE BIOLOGICAL VALUE OF CAROTENE IN VARIOUS FATS. E. J. Lease, J. G. Lease, H. Steenbock and C. A. Baumann. *J. Nutr. 17,* 91-102 (1939). When excessive amts. of carotene or vitamin A were fed in lard, soy bean oil, cottonseed oil, devitaminized butterfat and a hydrogenated vegetable fat, no marked differences in storage were obtained. Approx. equal growth responses were obtained when 1 microgram of carotene

daily was fed in cottonseed oil, soy bean oil, lard, decolorized butterfat, coconut oil or crude peanut oil. Inferior growth was obtained on triolein, linseed oil and "refined" peanut oil, but the rate of cure of ophthalmia was essentially the same on all oils.

PARTIAL HYDROGENATION OF FISH OILS. X. THE COMPONENTS OF A PARTIALLY HYDROGENATED SARDINE OIL. MASAKICHI TAKANO. *J. Soc. Chem. Ind. Japan 41,* Suppl. binding 328-9 (1938); cf. *C. A.* 32, 9534[9]. A sardine oil of n_D^{25} — 1.4786, I no. 176.4, sapon. no. 187.1 and whose fat acids gave 36.24% ether insol. bromides was hydrogenated to the point at which the insol. bromides disappeared. The product showed n_D^{25} — 1.4735, m.p. 18-23, I no. 104.3 and sapon. no. 183.9. The fat acids were investigated by the Pb-salt method of separation followed by distn. of the methylated esters. The Mg and Li salts of the fractions were further fractional crystd. in alc. and acetone, and the character of the fractions detd. The calcd. composition was satd. acids: C_{14} 4-5, C_{16} 11-12, C_{18} 8-9, C_{20} 1, C_{22} 1 and C_{24} trace (total 26-27%); unsatd. acids of the oleic acid series: C_{16} 3-4, C_{18} 21-22, C_{20} 6-7 and C_{22} 2-3 (total 36-37%); solid unsatd. acids 19-20 and acids of the linoleic and linolenic series 17-18%.

RAT ACRODYNIA AND THE ESSENTIAL FATTY ACIDS. F. W. Quackenbush, B. R. Platz and H. Steenbock. *J. Nutr. 17,* 115-126 (1939). Aeration or ultraviolet radiations did not destroy the activity in peanut oil. It was resident in the fatty acid fraction. Cures were produced with ½ drop of wheat germ oil, corn oil or Wesson oil, 10 drops of coconut oil or 25 drops of butterfat. The lesions were not prevented nor cured with hydrogenated coconut oil. The unsap. fraction from wheat germ oil was devoid of potency; the ethyl esters prepd. from the soap fraction contd. all of the activity. When the unsatd. fatty acids were fractionally crystallized from acetone, the highest potency was obtained with the fraction separating between -50 and -75° C. One-half drop of ethyl linoleate per day cured the dermatitis completely. The ethyl ester of elaidinized linoleic acid was found to be inactive.

SELECTIVE BACTERIOSTATIC ACTION OF SODIUM LAURYL SULFATE AND OF "DREFT." J. M. Birkeland and E. A. Steinhaus. *Proc. Soc. Exptl. Biol. & Med. 40,* 86-88 (1939). From the expts. recounted, it is apparent that Na alkyl sulfate and the com. prepn. "Dreft" possess a high degree of bacteriostatic selectivity. The growth of Gram positive bacteria and molds was definitely inhibited while most Gram negative bacteria grew freely in the presence of these substances in nutrient agar.

PATENTS

FOOD SPREAD BASE. A. K. Fisher and L. F. Culkin. U. S. pat. 2,143,651. A base for prepn. of a food spread (margarin) from shortening comprises 63.3-85.6% milk or water, 0.5-15% fat, 7.5-23% salt, and 0.35-2% of water soluble gum.

SHORTENINGS. H. Schou. Brit. 489,111. A 10% sugar soln. is dispersed in fat to the extent of 20% on the basis of fat to yield an improved shortening.

EXTRACTION OF FAT. J. C. Kernot. Brit. 468,061. Oil is extd. from butcher's offal by adding water and a wetting agent and subjecting the mixture to high temp. and pressure.

APPARATUS FOR HEATING VEGETABLE OILS. J. Stewart. U. S. 2,141,941. The deodorization app. comprises a means of flowing oil over a coil of pipes that contain heating fluid in a chamber designed so that the oil passes over the heating coil continuously under vacuum conditions.

TREATMENT OF VITAMIN-CONTAINING OILS AND PRODUCTS OBTAINED THEREFROM. H. I. Waterman and J. A. van Dijk (to Imp. Chem. Indus.). U. S. 2,143,587. Vitamin oils are concentrated and rendered more stable by high vacuum distn. to obtain a distillate contg. most of the vitamin and hydrogenating this distillate under conditions which cause deodorization and partial satn.

PURIFICATION OF TALL OIL. E. M. Frankel and A. Pollak. U. S. 2,143,345. Tall oil is distd. under vacuum to yield a distillate of fat acids and abietic acid, and the latter is separated from the fat acids by crystallization.

PROCESSES OF PREPARING HIGHER FATTY ALDEHYDES. A. W. Ralston and R. J. Vander Wal. U. S. 2,145,801. Fatty aldehydes are prepared by the action of formaldehyde vapors on soap.

PROCESSES OF SEPARATING NITRILE HYDROCARBON MIXTURES. A. W. Ralston and W. O. Pool. (Armour & Co.). U. S. 2,145,802-4. Selective solvents e.g. phenols, amines, etc., are used in the processes.

EXTREME PRESSURE LUBRICANT. A. W. Ralston (to Armour & Co.). U. S. 2,141,142. The lubricants comprise mineral lubricating oil to which is added a small amt. of the reaction product, obtained by reacting S_2Cl_2 with an aliphatic nitrile of at least 9 carbon atoms, at a temp. not in excess of 135° C.

NITRILES. R. Greenhalgh and Imperial Chemical Industries Ltd. Brit. 488,036. To manuf. nitriles, phosgene is reacted with a primary amide of a monobasic fat acid having at least 8 carbon atoms.

GLYCERIN. Henkel & Cie. Ger. 667,988 Cl. 6b Gr. 30. Addn. to 664,576. Ethers (ex. diethylenedioxyde) or their derivs. are used for extg. glycerol from mash in the method of prepg. glycerine by fermentation.

TREATMENT OF FIBROUS MATERIALS INCLUDING LEATHER. N. V. Chem. Fabr. Servo, and M. D. Roxenbroek. Brit. 475,478. Solutions of soaps which are prepared from elaidinised fatty acids (E.g. elaidic acid) and are rendered substantially neutral to phenolphthalein by the presence of free fatty acid (effected. e.g., by addition of mineral acid) are used for wetting, dispersing, etc. purposes, being more effective than the normal alkaline solutions. Salts of sulphonated polycyclic aromatic hydrocarbons e.g. $C_{10}H_6$ $Pr.SO_3Na$, may be present.