ABSTRACTS

Oils and Fats

Edited by
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The deterioration of fat in foods. C. H. Lea. *J. Soc. Chem. Ind. 58,* 479-84 (1939). The spoiling of the flavor of fats is usually due to one of two causes, either the presence of undesirable microbes or the direct oxidation of the fats.

Various fats used in deep-fat frying of dough mixtures at high altitudes. E. J. Thiessen. *Food Res. 4,* 135-143 (1939). Judges could rarely distinguish the fats, the frying mediums for doughnuts, with the exception of lard. Only the cheaper grade of lard was rated undesirable. Fats used in frying showed consistent decreases in the I no. and smoking point but increases in acidity. The smoking points of unused fats were approx. the same at low and high altitudes. Fat absorption is not dependent upon the kind of frying fat, since the absorption of fat in doughnuts was found to be approx. the same for 4 different fats using the same formula and frying temp. The amt. of fat absorbed varied with formula changes, the temp. used in cooking, and the amt. of mixing. Formula modifications were necessary for rich cake doughnuts at an altitude of 7,200 ft. to prevent the cracking of doughnuts and a high fat absorption while cooking.

The effectiveness of colored samples of cellophane in retarding the oxidation of olive oil. H. L. G. Barton and A. Daviess. *J. Soc. Chem. Ind. 58,* 189-3T (1939). A study has been made of the protective properties of 12 different colored samples of cellophane in relation to the acceleration by light of the oxidation of olive oil. The samples showing the most protection were found to be deep red, orange, violet, grass-green, and lemon yellow. The remainder showed relatively low protection and it is noteworthy that they were all of a very lightly dyed or pigmented type.

The occurrence and structure of hexadecenoic (palmitoleic) acid in soya-bean oil. T. P. Hilditch and H. Jasperson. *J. Soc. Chem. Ind. 58,* 187-9T (1939). Complete analysis of the mixed fatty acids from a large quantity of soya-bean oil has shown that Δ^9-hexadecenoic acid is present to the extent of about 0.5%. This establishes that the hexadecenoic acid of the seed fat is identical with that present in the fats of animals and fishes, and also suggests that the values obtained in previous analyses of seed fats are probably somewhat higher than the true figure.

The dilatation value of hydrogenated oils. A. G. Willsmer. *Soap, Perfumery & Cosmetics 12,* 501-3, 534 (1939). Equal parts of a hard fat (m.p. 50° C.) and liquid oil (m.p. 10° C.) does not, of course, give a mixture with a melting-point of 30° C. This phenomenon is due to the mutual solubility of the various "solid phases" of each oil and/or fat in question, and their own partial point of crystallization, which results in retarded sweating. In natural mixtures of oils, fats and waxes, this has always been a sore point with works chemists in the production of non-sweating lipsticks, non-hardening creams, etc. With a hardened fat, unless hardened to satn. you will thus always have a ratio of liquid phase to solid phase at any given temp., and this ratio is known as the dilation number, at the temp. required. The test is carried out by measuring the vol. of a weighed quantity of fat at an exact temp. well above its m. p., solidifying the fat, then again measuring its vol. at an exact temp. well below its m.p. Its vol. is then again measured just below its m.p., and from these figures the dilatation is calcd. Apparatus is described. The dilation is calcd. from the formula:

$$C - \frac{\frac{1}{2}(A + B)}{W} \times \frac{1{,}000}{1} = \text{Dil. at } 30^\circ \text{ C.}$$

where

A = vol. at 40° C.
B = vol. at 20° C.
C = vol. at 30° C.
W = wt. of fat.

A note on the digestion of margarine. G. A. Hartwell. *J. Soc. Chem. Ind. 58,* 165-7T (1939). It was found that different brands of margarine are digested by pancreatic lipase at different rates, and that some varieties which were rapidly digested gave curves nearly equal to that obtained for butter. On the other hand, some samples were digested slowly, but even these gave better curves than that of olive oil, which has previously been shown to digest at approx. the same rate as beef, mutton and bacon fats.

The influence of low and high planes of nutrition on the composition and synthesis of fat in the pig. T. P. Hilditch, C. H. Lea and W. H. Pedelty. *Biochem. J. 33,* 493-504 (1939). On a restricted diet the deposition of fat is not only slower, but the fat produced is softer, owing to increase in the small proportions of linoleic acid present, together with some increase in the proportion of oleic acid. Comparison of the amts. of each component acid in the total fats present in the diets with those in the body fats of the animals shows substantial synthesis of glycerides of palmitic, oleic and stearic acids, in the av. proportion of 1 mol. palmitic to 1.9 mol. C_{18} acids. The minor components hexadecenoic and (possibly) myristic acid may also be mainly formed by synthesis, but linoleic and unsatd. C_{20-22} acids in the depots are derived only from ingested fats.

The relation of dietary fat to thiamin requirements of growing rats. F. E. Stirn, A. Arnold and C. A. Elvehjem. *J. Nutr. 17,* 485-95 (1939). The evidence indicates that when the carbohydrate component of a thiamin-free ration is isocalorically replaced by natural fats or synthetic fatty acid esters the resultant diet will alleviate the polyneuritic syndrome of thiamin deficient rats. No marked differences have been observed between olive oil, coconut oil, autoclaved peanut oil, autoclaved lard and autoclaved cottonseed oil as judged by the growth records of the rats. Synthetic fatty acid esters, tricaproin and triacetin, were also effective in alleviating the polyneuritic syndrome of thiamin deficient rats.

The dietary prevention of fatty livers, compounds related to choline. A. P. Platt. *Biochem. J. 33,* 505-11 (1939). Of the compounds studied (betaine, cholamine, creatine, choline methyl ether and tetra (β-hydroxyethyl) ammonium chloride) only betaine was found to possess lipotropic properties. Its activity in fatty liver prevention was estimated to be approx. 30% of that of choline. The relationship of these results to the theory that choline acts by enabling lecithin formation to take place is discussed.

Fatty acid oxidation in liver. L. F. Leloir & J. M. Munoz. *Biochem. J. 33,* 734-46 (1939). The action of liver slices on normal fatty acids with 1-8 C atoms was studied. The rates of disappearance (-Q) of the different acids are: formic 1.5, acetic 5, propionic 2, butyric 9, valeric 2, hexanoic 6, heptanoic 3; octanoic 6.

Esters of *α-tocopherol.* V. Demole, O. Isler, B. H. Ringier, H. Salomon and P. Karrer. *Helv. Chim. Acta 22,* 65-8 (1939). C. A. *33,* 3819. The dubious reports as to the physiol. activity of α-tocopherol esters and the ready accessibility of synthetic *dl-α*-tocopherol (I) have led to the prepn. and biol. testing of several of these esters in comparison with esters of natural tocopherol. The caproate, stearate, succinate and benzoate of I were prepd. similarly. With the exception of the stearate all are viscous oils which can be distd. unchanged in high vacuum. Rat expts. show that all the esters have vitamin E activity.

PATENTS

Process for purifying vegetable and animal oils. D. I. Ashworth (to the DeLaval Separator Co.) U. S. 2,157,882. The free fatty acids are removed from vegetable and animal oils and the color is improved by mixing the oil with alkylolamines, separating the reaction products formed and any uncombined reagent, mixing the partly refined oil with dilute NaOH and separating reaction products and remaining reagent. The product is made free of cloudiness and acids and will not substantially deteriorate on standing.

Method of bleaching oils and fats. W. M. Urbain and L. B. Jensen (to Indus. Pats. Corp.). U. S. 2,158,163. A mixt. of H_2O_2 and a nitrite is used as a bleaching agent for fats and oils.

Cake batter and shortening for making same. B. R. Harris (to Procter & Gamble Co.). U. S. 2,158,775. The product is a cake batter emulsion including flour, sugar, shortening and aq. material, and having as a constituent a sulfated triglyceride of a formula having at least one sulfate group attached to a double carbon at a double bond of an unsatd. fat acid radical and having at least one fat acid radical without a hydrophylic substituent.

Process for extracting oils or fat containing substances and the like. J. Riechert. U. S. 2,158,-427. This continuous app. for counter-current extn. of oil seeds with solvent contains grinding equipment in successive steps. The solvent is in contact with the charge during grinding.

Process of treating oils. W. Hassard (D. B. Boyd). U. S. 2,160,861. The drying power of marine and animal oils is increased by treatment with a soln. of $KMnO_4$ and a mineral acid and separating the oil from the emulsion.

Soluble oils. D. R. Merriss (to Union Oil Co.). U. S. 2,158.374. Polymerized products of castor oil, castor oil fat acids and other castor oil derivs. are used as emulsifiers for spray oils employed in the spraying of citrus fruits and for similar uses in oiling of textiles.

Diesters of unsaturated glycols and processes of preparing the same. A. W. Ralston and W. M. Selby (to Armour & Co.). U. S. 2,157,144. The process deals with preparing diesters of unsatd. glycols by reacting a fatty acid chloride having 12 to 18 C atoms with an alkali metal while in solvent inert to the fatty acid chloride.

ABSTRACTS

Soaps

Edited by M. L. SHEELY

Instability of ammonium salts of higher fatty acids. *J. Chem. Soc. 1939,* 230. Neutral soaps were found to lose ammonia readily and to pass into the more stable acid soaps. Melting points of the soaps were determined as follows:

Carbon atoms in acid	7	8	10	11	12	13	14	15	16	17	18
Melting point (degrees)	45	54	68	72	77	81	84	86	89	91	93

Effect of soaps in increasing the water-solubility of essential oils. Adrien Albert. *J. Soc. Chem. Ind. 58,* 196 (1939). The soaps of saturated acids appear to promote emulsification rather than dissolution, while the latter effect is favored by some of the soaps derived from unsaturated acids. A comparison of the oleates and linoleates suggests that the presence of more than one double linking may be advantageous. Potassium appears to have advantages over ammonium soaps. Soaps have an extraordinarily selective action, no two of them aiding the dissolution of exactly the same group of oils. Oil of eucalyptus was dissolved by means of six soaps, whereas oils of turpentine and cloves did not lend themselves to dissolve readily.

Methyl cellulose in soap making. Paul I. Smith. *Am. Perfumer 38,* 3, 45-6 (1939). By using methylcellulose as a filler for both hard and soft soaps it is claimed that the fat acid content can be reduced 30 to 32%. This cellulose is a felt-like fibrous dry mass sold in compressed blocks from 1 lb. to 11 lb. and even in 2-cwt. bales. It is not readily inflammable and is sol. only in boiling water, and the soln. is very resistant to most chemicals and does not affect the pH of another soln. A soln. of 1 part in 15 parts of water can be incorporated to an extent of 10-20% in soap while crutching. The lather is said to be improved, but the lather in too large a quantity hinders the detergency.

New method for determining glycerol in filled soaps. W. Schulze. *Fette u. Seifen 46,* 66-9 (1939) Certain colloidal products, e.g. Tylose, used, as fillers in soaps interfere with the detn. of glycerol by the usual dichromate method. These interfering substances are left behind when the glycerol is allowed to diffuse out of a soln. of the soap sample through a parchment membrane. In order approx. to equalize the osmotic pressure, the diffusion vessel was filled, not with pure water, but with a soln. of pure soap of suitable concn. Tests with known amts. of glycerol showed that the glycerol concn. was the same in the solns. on either side of the membrane after 48 hrs. If the soap sample contains sugar or similar dialyzable substance, their presence must be considered when the glycerol detn. is carried out. (*Chem. Abs.*)