Preparation of Methyl Esters of Substituted Phenylstearic Acids. For the preparation of the substituted phenylstearic acid esters, a modification of the procedure used by Roe, Parker, and Swern (6) was employed. Typical of these preparations is the one using m-cresol as the added phenol. A mixture of 28.2 g (0.1 mole) of oleic acid and 43.2 g (0.4 mole) of m-cresol was added slowly, with rapid stirring, to a flask containing 60 g (0.624 mole) of methanesulfonic acid. As only a very slight exotherm was observed, no external cooling was necessary. Stirring of the reaction mixture was continued for 6 hr. At the conclusion of this period, the contents of the reaction flask were poured on to cracked ice. After standing overnight, the organic layer was extracted with ether and the ether solution freed of acid by washing with 20% aqueous sodium sulfate solution. The ether extract, after drying over anhydrous sodium sulfate, was evaporatively distilled. The excess of m-cresol in the residue was removed by reduced pressure distillation. The resulting crude substituted stearic acid was esterified by adding 40 ml of absolute methanol, 0.8 g of p-toluenesulfonic acid, and refluxing the mixture for 8 hr. After washing out the catalyst the ester was recovered in the usual manner. The crude ester was vacuum fractionated using a flask equipped with an alembic head. The fraction boiling between 165–205C (mostly 199–203C) at 0.08 mm was the main product. The weight of the fraction was 28 g (69% yield).

In the preparation of the 2-naphthol addition product, the excess of naphthol was not removed prior to esterification.

Results and Discussion

None of the inorganic acids which were tried gave results comparable to those reported by Roe, *et al.* (6) when using sulfuric acid. With polyphosphoric acid, even when a moderately good yield was obtained, difficulties were experienced in washing and isolating the products. With methanesulfonic acid, however, much better results were obtained. By the use of this solvent-catalyst for adding phenol to oleic acid, not only were good yields of reasonably pure products obtained, but the product color was so satisfactory that purification by distillation seemed unnecessary. Generally satisfactory yields were obtained also with m-cresol, phenetole, anisole, and t-butylcatechol. With these compounds, yields were two to four fold those previously obtained with sulfuric acid. Moreover, by use of methanesulfonic acid catalysis, β-naphthol and nonylphenol have been added to oleic acid.

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ABSTRACTS

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• Fats and Oils

LESQUEROLIC ACID. A NEW HYDROXY ACID FROM LESQUERELLA SEED OIL. C. R. Smith, T. L. Wilson, T. K. Miwa, H. Zobel, R. L. Lohmar, and I. A. Wolff (Northern Regional Research Laboratory, Peoria, Ill.). *J. Org. Chem.* **26**, 2903–5 (1961). This paper describes the isolation and structural identification of an unknown C_{20} hydroxy acid analogous to ricinoleic acid which has been found to be (+) 14-hydroxy-*cis*-11-eicosenoic acid or for convenience lesquerolic acid. It has been found to be a major constituent in *Lesquerella lasiocarpa* seed oil (40–45%). This acid was separated as its methyl ester using countercurrent distribution. The isolated lesquerolic acid was identified by using well-known techniques such as iodine value, infrared absorption, permanganate-periodate oxidation, etc.

RESEARCH PROGRESS IN SOYBEAN UTILIZATION 1959–1960. J. C. Cowan and W. C. Witham (Northern Regional Research Laboratory, Peoria, Ill.). *Soybean Dig.* 22(2), 12–16 (1961). This paper reviews work done at the Northern Laboratory on the flavor stability of soybean oil. Work done on the effect of linolenic acid and the unsaponifiables as precursors for the reversion flavor is discussed. Results of work using hydrazine to reduce selectively linolenic acid are given. Also a method for determining the dimer content of an oxidized soybean oil is reported. Amino acid analysis of various soybean protein fractions has been undertaken.

A UNIQUE FATTY ACID FROM LIMNANTHES DOUGLASII SEED OIL: THE C_{22} DIENE. M. O. Bagby, C. R. Smith, T. K. Miwa, R. R. Lohmar, and I. A. Wolff (Northern Regional Research Laboratory). *J. Org. Chem.* **26**, 1261-5 (1961). The C_{22} dienoic fatty acid of *Limnanthes douglasii* seed oil (representing 10% of the total fatty acid) is shown to be the previously unknown *cis*-5-*cis*-13-docosadienoic acid.

SYNTHESIS OF ARACHIDONIC ACID. A. I. Rachlin, N. Wasyliw, and M. W. Goldberg (Hoffmann-La Roche Research Laboratories, Nutley, N. J.). *J. Org. Chem.* **26**, 2688–93 (1961). A method of synthesizing arachidonic acid from acetylenic intermediates is given. The diynes used were C_{10} hydrocarbon with triple bonds at 6–7, 9–10 position and a C_9 bromochloro fragment with triple bonds at 2–3, and 6–7 position. Coupling these two fragments and semihydrogenating the tetrayne to the tetraene and using the terminal chlorine atom as a lever to introduce the 20th atom as a carboxyl group gave arachidonic acid. The properties of the methyl ester were found to be practically identical with those of the naturally occurring acid except for the presence of a small amount of conjugation and some *trans* isomer.

RHEOLOGICAL METHODS FOR STUDYING THE PHYSICAL PROPERTIES OF EMULSIFIER FILMS AT THE OIL-WATER INTERFACE IN ICE CREAM. P. Sherman (T. Wall & Sons Ltd., London W. 3, England). *Food Technol.* **15**, 394–9 (1961). The viscosity data given indicate that the fat globules are surrounded by a rigid film, so that the flow properties of the emulsions resemble those of suspensions of solid spheres in liquid media. The milk proteins are involved in the development of the rigid layer at the oil-water interface, probably through lipoprotein complex formation. The rigid interfacial layer, which may be hydrated, is of substantial thickness with respect to the dimensions of the oil globules.

LIPID OXIDATION IN HEAT-STERILIZED BEEF. Marelynn W. Zipser, and Betty M. Watts (Dept. of Food and Nutrition, Florida State University, Tallahassee). *Food Technol.* **15**, 445–7 (1961). Lipid oxidation decreases as the internal temperature of ground beef round is increased. The production of antioxidant active substances is responsible for the oxidative stability. The quantity of total lipids or polyunsaturated fatty acids was not markedly changed by extensive heat treatment. Pigment destruction was progressive as heat treatment increased, but in no case was the pigment destroyed completely.

EFFECT OF CIS-TRANS ISOMERIZATION ON THE UREA INCLUSION COMPOUND-FORMING ABILITY OF A MOLECULE; STUDY OF THE MALEATE-FUMARATE SYSTEM. J. Radell, J. W. Connolly, and W. R. Cosgrove (Wright Air Development Division, Wright-Patterson Air Force Base, Ohio). *J. Org. Chem.* **26**, 2960–3 (1961). Several maleates and fumarates were investigated to determine their ability to form urea inclusion compounds. Olefinic esters of both acids will form inclusion compounds; however, the shortest chain required to stabilize a particular ester was related to the over-all cross-sectional diameter of the ester. The fumarates, having the more slender conformation, form complexes more readily than the maleates.

Review of biochemical properties of milk and the lipide deterioration in milk and milk products as influenced by natural varietal factors. V. N. Krukovsky (Dept. of Dairy and Food Science, Cornell University, Ithaca, N. Y.). *J. Agr. Food Chem.* **9**, 439–47 (1961). The author reviews the biochemical processes which control palatability and nutritive value of milk and milk products. Loss of palatability may be caused by splitting of fat in raw milk by lipase, which gives a rancid odor and bitter taste, and by other chemical reactions, enhanced by specific substances or by exposure of milk to light, which result in metallic-to-fishy, oily, and cardboard-like flavors. Several methods are given to produce palatable and nutritious milk and milk products.

Separation of geometric isomers and isologues of fatty acid esters by counter-current distribution. H. J. Dutton, C. R. Scholfield, and E. P. Jones (Northern Regional Research Laboratory). *Chem. & Ind.* (London) **1961**, 1874–6. Automatic countercurrent distribution between isooctane and 0.2 molar silver nitrate in 90% methanol has been applied to mixtures of isomers from isomeric and isologous C_{18} fatty acid methyl esters. Methyl oleate can be separated from methyl elaidate. Selenium-isomerized methyl linoleate is resolved into *trans, trans, trans-cis* and *cis-trans*, and *cis,cis* isomers. Methyl linoleate partially conjugated with alkali is separated into *cis,cis*-unconjugated, *trans,cis*- and *cis,trans*-conjugated, and *trans, trans*-conjugated isomers.

The isolation and characteristics of trans-octadec-16-enoic acid from butterfat. R. P. Hansen and N. June Cooke (Dept. of Sci. and Ind. Res., Wellington, New Zealand). *Biochem. J.* **81**, 233–7 (1961). *Trans*-octadec-16-enoic acid was isolated from a sample of summer butter in an amount of approximately 0.2% of the total weight of fatty acids. The techniques employed included fractional distillation *in vacuo*, low-temperature crystallization, and purification by chromatography on a silicic acid column.

Process for the methylation of vegetable oil soapstocks. P. H. Eaves and J. J. Spadaro (U.S.A., Sec'y of Agriculture). *U. S. 3,010,977.* A homogeneous mixture of vegetable oil soapstocks in methyl alcohol solution is heated for 10 to 20 minutes at a temperature of 115 to 125C and at a pressure sufficient to maintain the methyl alcohol in the liquid state, in the presence of 1–5% of a Twitchell-type catalyst. At least 5 moles of methyl alcohol are used for each mole of total fatty acids present. The unreacted methanol and the water are flash-evaporated from the reaction mixture.

Method for preparing a granular oil-free phosphatide product. P. F. Davis and M. A. Fello (Central Soya Co., Inc.). *U. S. 3,012,888.* A method is described for maintaining a granular oil-free phosphatide product which contains about 95% phosphatide and is free flowing and free of deterioration. The phosphatide is treated with an aqueous solution of a reducing saccharide to form a hexane-soluble product, the saccharide being present at a concentration of from 1–5% by weight of the phosphatide. The resulting mixture is dried, and the dried product is granulated.

Synthetic cocoa butter substitute. H. J. Dutton and C. R. Scholfield (Sec'y of Agriculture, U.S.A.). *U. S. 3,012,890.* Substantially equal quantities of tripalmitin and tristearin are reacted with glycerol in the presence of triacetin and sodium methoxide catalyst. The random mixture of 1,3-diglycerides thus formed is separated and crystallized, and the 2-hydroxyl groups are acylated with oleyl chloride.

Cocoa butter substitute. R. L. Best, C. J. Soeters, A. C. Davies, and S. Paul (Lever Bros. Co.). *U. S. 3,012,891.* A fat composition suitable for replacing 25–50% of the cocoa butter in chocolate and other kinds of confectionery containing cocoa butter is composed of a mixture of (a) a fat selected from the class consisting of palm oil and fractions thereof of iodine value at least 25 and dilatation not greater than 600 at 35 C and (b) a shea butter fraction of iodine value not greater than 80 and dilatation not less than 1,900 at 20C and not less than 1,500 at 35C.

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• Fatty Acid Derivatives

Phase properties of mixtures of 9- and 10-oxo-octadenoic acids and of 9- and 10-hydroxyocta-decanoic acids. C. C. Cocchrane and H. J. Harwood (The Armour Industrial Chemical Co.). *J. Org. Chem.* **26**, 1278–82 (1961). Pure homolog-free samples of 9- and 10-oxo- and the corresponding hydroxy-octadecanoic acids have been prepared and phase diagrams for mixtures of the isomers have been established. That for the oxo acids is a simple eutectic system; that for the hydroxy acid shows compound formation at a 1:1 ratio of components. From these diagrams the identity of various preparations of the four compounds reported in this literature is discussed. Evidence for preferential reactivity at the 9- or 10-position of the eighteen carbon fatty acid molecule which was based upon conclusions regarding the identity of the oxo or hydroxy acids is invalidated.

Catalytic hydrogenation of cis-6,7-epoxyoctadecanoic acid. S. P. Fore and W. G. Bickford (Southern Regional Research Laboratory, New Orleans, La.). *J. Org. Chem.* **26**, 2104–5 (1961). The catalytic hydrogenation of 9,10-epoxyoctadecanoic acid (I) and certain of its esters results in the selective formation of the 10-hydroxy acid. Thus it was postulated the reaction proceeds by the oxonium ion intermediate mechanism and the specificity was due to the electrophilic-COO-group. Recently the acetate of (I) was studied and found to give equimolar proportions of the 9- and 10-hydroxy isomers. This was believed to be due to the difference in distance from the point of addition to the -COO-group. Thus, *cis* 6,7-epoxyoctadecanoic (II) acid was prepared from petroselinic acid and hydrogenated using 10% palladium on carbon in an acetic acid solvent. The products were found to contain equimolar quantities of 6- and 7-hydroxy acids. Thus, it is concluded that hydrogenation of (II) differs from that of (I) and it was postulated that the increase in distance of the addition center to the acyl oxygen in (II) does not permit the influence of the -COO-group to operate.

Fumaric acid composition. S. P. Raffensperger and T. T. Takashima (General Foods Corp.). *U. S. 3,009,810.* A fumaric acid-containing composition having an increased rate of solubility is prepared by mixing a partial long-chain fatty acid ester of a polyoxyethylene derivative of a hexitol anhydride derived from sorbitol with fumaric acid powder. *U. S. 3,009,811*, Adipic acid composition, describes a similar product containing adipic acid.

Polyvalent metal soap coating and method of manufacture. H. R. Dalton. *U. S. 3,009,890.* A polyvalent metal soap of a fatty acid having from 6–18 carbon atoms is dispersed undissolved throughout an organic liquid dispersion medium inert to the soap. Also present is a synthetic resin binder which is soluble in the organic solvent but inert to it and also inert to the soap. The binder is capable of holding the soap dispersed undissolved in it after the mixture is applied to the surface and of binding the soap to the surface even after evaporation of the solvent. The opacity of this coating is displaceable wherever the coating is placed under impact pressure such as by application of a writing stylus or typewriter key.

Lubricating greases prepared from epoxy fatty acid materials. G. W. Eckert (Texaco Inc.). *U. S. 3,009,878.* A lubricating grease composition consists of a lubricating oil thickened by a metal soap of an epoxy fatty acid.

Lubricating grease thickened with indigo and soap mixture. J. R. Roach (Texaco Inc.). *U. S. 3,009,879.* The described grease consists of a mineral lubricating oil thickened to a grease consistency by 5–20% by weight of indigo in finely divided form and 5–20% of a mixture containing (1) a sodium or lithium soap of fatty acids containing from 12 to 16 carbon atoms, (2) sodium or lithium pectate, and (3) a sodium or lithium salt of fatty acids containing from 1 to 5 carbon atoms.

Neomycin salt of higher fatty acids. J. K. Dale (Upjohn Co.). *U. S. 3,013,007.* Described is a neomycin fatty acid salt in which the fatty acid contains from 12 to 18 carbon atoms.

Conversion of acids to alcohols having one less carbon atom and esters thereof. E. A. Blair and J. J. Melchiore (Sun Oil Co.). *U. S. 3,013,038.* A liquid reaction mixture consisting of an acid having the formula RCH_2COOH in which R is a saturated aliphatic hydrocarbon radical having 1 to 25 carbon atoms and a cobalt salt of a fatty acid is contacted with gaseous oxygen at a temperature of at least 100C and at a pressure sufficient to maintain the acid in liquid state. The acid is thus converted partly to an alcohol having the formula RCH_2OH and partly to an ester having the formula RCH_2OOCCH_2R.

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• Biology and Nutrition

Elevation of γ-aminobutyric acid in brain: selective inhibition of γ-aminobutyric-α-ketoglutaric acid transaminase.

C. F. Baxter and E. Roberts (City of Hope Med. Center, Duarte, Calif.). *J. Biol. Chem.* **236**, 3287–94 (1961). An elevation of levels of γ-aminobutyric acid in the brains of rats, cats, and monkeys was observed after the intraperitoneal injection of nonlethal doses of hydroxylamine. Of all species tested, only the mouse failed to respond to hydroxylamine in a similar manner. The response to hydroxylamine was studied in rats as a function of dosage and time. The largest and most rapid elevation of γ-aminobutyric acid was noted in areas of brain which had high levels of glutamic acid decarboxylase activity. Elevation of γ-aminobutyric acid persisted in some areas for as long as 24 hours.

INSECTICIDE CONTENT OF DIET AND BODY FAT OF ALASKAN NATIVES. W. F. Durham *et al.* (U. S. Public Health Service, Wenatchee, Wash.). *Science* **134**, 1880–81 (1961). A study was made of the DDT and DDE content of the diet and body fat of native Alaskans who lived in isolated, primitive areas and had minimal contact with insecticides. No DDT or DDE was detected in any of the native Alaskan foods with the exception of two white owls, both of which contained low levels of DDE. Eskimos store considerably less DDT and DDE in their body fat than the general population in the United States. These low dietary levels and the resultant low levels in body fat are consistent with previously published data on the relationship between intake and storage of DDT.

EFFECT OF NUCLEIC ACID METABOLITES ON LIPOLYSIS IN ADIPOSE TISSUE. V. P. Dole (Rockefeller Inst., New York, N. Y.). *J. Biol. Chem.* **236**, 3125–30 (1961). It has been observed that nucleic acids, nucelotides, and nucleosides inhibit the lipolytic action of epinephrin on adipose tissue, whereas purine and pyrimidine bases increase it. Further studies, described in the present report, have shown this interaction to be quite specific for lipolysis (uptake and esterification of fatty acids being unaffected), but not limited to epinephrin (other lipolytic hormones are also inhibited by ribonucleic acid). The chemical nature of this interaction remains undefined, although a number of possibilities can be excluded. Perhaps, fundamental to an understanding of the phenomena is the distinction between esterification of fatty acids taken up from the medium (not affected by ribonucleic acid) and net re-esterification of acids in the lipolytic pool (increased by ribonucleic acid).

COMMINUTED MEAT EMULSIONS—THE CAPACITY OF MEATS FOR EMULSIFYING FAT. C. E. Swift, C. Lockett, and A. J. Fryar (Meat Lab., Ag. Res. Service, U. S. Dept. of Ag., Beltsville, Md.). *Food Tech.* **15,** 468–73 (1961). A method of emulsifying liquefied fat in saline suspensions of meat or meat proteins was used in investigating the factors that influence the capacity of meat to emulsify fat, the characteristics of emulsions, and the relative efficiency of proteins as stabilizers. The capacity of meat, comminuted to an optimum extent, was increased by increasing the proportion of saline phase, increasing the rate of addition of fat, and decreasing the rate of mixing and the temperature (18C was the lowest investigated). The effects of variables corresponded with concepts of emulsion theory and technology, especially those pertaining to emulsions stabilized by rigid membranes. Emulsions of marked viscosity and stability to heating were prepared. Saline solutions of water-soluble and salt-soluble proteins were also used in preparing emulsions. The salt-soluble proteins were more effective than those extracted by water. The participation of the latter proteins was dependent on the addition of sodium chloride.

SEX AS REGULATOR OF TRIGLYCERIDE METABOLISM IN THE MOSQUITO. E. Van Handel and P. T. M. Lum (Entomological Res. Center, Florida State Board of Health, Vero Beach). *Science* **134,** 1979–80 (1961). The female mosquito, in contrast to the male mosquito or the male and female housefly, synthesizes triglycerides when maintained on glucose; after 7 days the amount of triglycerides in the female may be 50 times that in the male. Polyunsaturated fatty acids are absent from the newly synthesized triglycerides.

IMPROVED PROCEDURE FOR THE ISOLATION OF HUMAN PLASMINOGEN. D. L. Kline and J. B. Fishman (Yale University School of Med., New Haven, Conn.). *J. Biol. Chem.* **236**, 3232–34 (1961). A modification of the acid extraction method of plasminogen purification is described and two additional steps have been added. The modification consists in a precipitation by the addition of phosphate buffer, pH 8.5, to the plasminogen solution which has been adjusted to pH 9.0 instead of precipitation at pH 6.0. The two additional steps involve (a) extraction of plasminogen with 0.1 *M* lysine at pH 5.5 followed by dialysis against 0.001 *M* HCl to remove the lysine, and (b) precipitation of plasminogen at pH 2.0 by the addition of solid NaCl to a final concentration of 1.0 *M*. With this new procedure the increase in specific activity as compared to serum is about 400 times. The simplicity of the original method has been retained and reproducibility is satisfactory.

COPPER AND IRON CONTENT OF ICE CREAM AND MELLORINE AND ITS SIGNIFICANCE IN THE DEVELOPMENT OF OXIDATIVE FLAVOR DEFECTS. C. Vanderzant and A. H. Miah (Texas Ag. and Exp. Station, College Station). *Food Tech.* **15,** 515–20 (1961). An analysis of 107 samples of ice cream and mellorine showed that the chocolate-flavored samples usually contained more copper and iron than the vanilla or strawberry samples. Means of the copper content of the vanilla, strawberry, and chocolate samples were, respectively, 0.305, 0.390, and 1.160 ppm. No relation could be established between oxidative flavor defects and the copper or iron content of the samples. The addition of 0.82 ppm of copper after homogenization caused a metallic flavor in vanilla ice cream after 11 days of storage at −25 C. When copper was added before homogenization the rate of development of oxidative flavor defects was much slower. Iron did not seem to be involved in the development of a metallic off-flavor.

BILE ACIDS. XVI. METABOLISM OF CHOLANIC ACID-24-C^{14} IN THE RAT. P. D. Ray, E. A. Doisy, Jr., J. T. Matschiner, S. L. Hsia, W. H. Elliott, S. A. Thayer, and E. A. Doisy (St. Louis University School of Medicine, St. Louis, Mo.). *J. Biol. Chem.* **236**, 3158–62 (1961). The distribution of C^{14} and the nature of the labeled metabolites were investigated after intraperitoneal administration of cholanic acid-25-C^{14} acid to normal rats and rats with ligated or cannulated bile ducts. Most of the administered C^{14} was excreted in the feces of the normal animals. β-Muricholic acid was isolated as a labeled metabolite from the urine of the animals with ligated bile ducts. From bile, 7α-hydroxycholanic acid, chenodeoxycholic acid, and α- and β-muricholic acids were identified as labeled metabolites. Since 3α-hydroxycholanic acid was not detected and 7α-hydroxycholanic acid was positively identified, it is suggested that the metabolism of cholanic acid is initiated by hydroxylation at carbon 7.

THE FATTY ACID POOL IN ADIPOSE TISSUE. V. P. Dole (Rockefeller Inst., New York, N. Y.). *J. Biol. Chem.* **236**, 3121–24 (1961). The heptane-soluble, organic acid pool in fat pads is composed of long-chain fatty acids produced by lipolysis of intracellular fat. This pool can discharge acids into an incubation medium, or contract by re-esterification, but it seems not to be entered by fatty acids taken up from the medium.

CONVERSION OF Δ^7-CHOLESTENOL-4-C^{14} AND 7-DEHYDROCHOLESTEROL-4-C^{14} TO CHOLESTEROL. G. J. Schriepfer, Jr., and I. D. Frantz, Jr. (University of Minnesota, Minneapolis). *J. Biol. Chem.* **236**, 3137–40 (1961). The conversion of Δ^7-cholestenol-4-C^{14} and 7-dehydrocholesterol-4-C^{14}, prepared by chemical synthesis, to cholesterol by cell-free homogenates of rat liver has been demonstrated. The latter reaction did not require the presence of molecular oxygen. The incorporation of 7-dehydrocholesterol-4-C^{14} into liver cholesterol by the intact rat has also been demonstrated. The conversion of Δ^8-cholestenol-4-C^{14}, which was also prepared by chemical synthesis, to cholesterol by rats could not be detected after administration by injection into portal vein or by feeding.

FATTY ACID COMPOSITION OF THE DIGLYCERIDES FROM LIPOLYZED MILK FAT. R. G. Jensen, J. Sampugna, and G. W. Gander (Dept. of Animal Industries, Storrs Ag. Exp. Sta., Univ. of Conn., Storrs). *J. Dairy Sci.* **44**, 1983–8 (1961). The diglycerides in eight samples of lipolyzed milk were isolated by silicic acid column and thin-layer chromatography and identified by infrared spectrophotometry. The average recovery of diglycerides was 93.3%. Controls contained negligible quantities. Fatty acids, identified by gas-liquid chromatography, were: palmitate, 29.5%; oleate, 24.4%; myristate, 13.2%; stearate, 8.4%; and at least 16 others commonly found in milk fat. The fatty acid composition of the diglycerides was different in some respects from that in the intact control milk fat. About 70% of the monoglycerides was recovered and similar data are reported for these compounds.

COMPARATIVE HYDROLYSIS OF PRIMARY AND SECONDARY ESTER POSITIONS OF MODEL COMPOUNDS OF GLYCEROL BY MILK LIPASES. G. W. Gander, R. G. Jensen, and J. Sampugna (Dept. of Animal Industries, Ag. Exp. Sta., Storrs, Conn.). *J. Dairy Sci.* **44,** 1980–2 (1961). Both positional isomers of dichloropropanol, diethoxypropanol, and propanol were esterified with butyric and palmitic acid and the resulting esters subjected to milk lipase action. Since insignificant hydrolysis occurred when the fatty acid was esterified in the 2 position, milk lipase probably is specific for the primary ester position.

CONTRIBUTIONS TO THE STUDY OF MARINE PRODUCTS. L. PHOSPHOLIPIDS OF SPONGES. R. A. Landowne and W. Bergmann (Dept. of Internal Medicine, Yale University, New Haven, Conn.). *J. Org. Chem.* **26,** 1257–61 (1961). The phospholipid fractions of two sponges, *Lissodendoryx* (I) and *Speciospongia vesparia* (II) have been isolated and characterized. That from (I) was found to consist of sphinegosine phosphate fatty acid esters, free of choline and sugars; that from (II) was a lecithin containing aldehyde in an enol ether linkage.

Incorporation of 2-C^{14}-mevalonic acid and 2-C^{14}-acetic acid into lipids of mycobacteria. T. Ramasarma and T. Ramakrishnan (Indian Institute of Science). *Biochem. J.* **81**, 303–8 (1961). Labeled mevalonic acid and acetic acid were incorporated into the lipids of *Mycobacterium tuberculosis* and *Mycobacterium phlei.* The C^{14}-activity was distributed in saponifiable and unsaponifiable matter. It appeared that mevalonic acid did not serve as a precursor of the isoprenoid side chain of vitamin K_2. The majority of C^{14}-activity from mevalonic acid was found in an unidentified component of *Mycobacterium tuberculosis* lipids which appears to be more polar than are hydrocarbons in elution properties.

Soap in animal feed. E. B. Patterson, R. E. Gray, and E. E. Rice (Swift & Co.). *U. S. 3,010,828.* A high energy and pelletable complete animal feed contains about 2.5% sodium soap and a sufficient additional amount of fatty material to raise the fat content of the final product to at least 7.5% of the complete feed product.

Fatty food composition. L. H. Berndt and O. J. Krett (National Dairy Products Co.). *U. S. 3,010,830.* The described composition contains: (1) 10–45% of a fat having an iodine value between 5 and 15; (2) 0.5–5.0% of an emulsifier consisting of more than 50% monoglyceride; (3) 0.15–0.5% of gum stabilizer; (4) 1–3% of sodium and calcium caseinates, ratio of sodium to calcium caseinate being in the range of 0.5:1.5.

• Drying Oils and Paints

Compositions from trimellitic anhydride, epoxys and fatty acids. J. R. Stephens and R. E. Van Strien (Standard Oil Co.). *U. S. 3,012,979.* A resin suitable for preparation of air drying films is prepared by reacting (1) a condensate of a 1,2-epoxide and trimellitic anhydride, in a molar ratio such that the condensate has an acid number of 0 to 15 and a hydroxyl number of 150 to 250 with (2) an unsaturated fatty acid containing from 10 to 30 carbon atoms in an amount such that theoretically all of the hydroxyl groups present in the condensate are reacted with carboxyl groups in the fatty acid. The reaction is conducted at a temperature between 150 and 275 C until the resin product has an acid number between 20 and 50.

Method of preparing a drying oil, and alkali esters of all-trans-8,10,12,octadecatrienoic acid. C. R. Smith, Jr., C. A. Glass, and I. A. Wolff (Sec'y of Agriculture, U.S.A.). *U. S. 3,013,037.* Dimorphotheca seed oil is subjected to reflux under nitrogen for about 1 to 2 hours with a dehydrating agent selected from the group consisting of glacial acetic acid and 0.2% of *p*-toluenesulfonic acid in xylene.

Process for the production of rapidly drying esters. J. J. Zonsveld (Shell Oil Co.). *U. S. 3,013,999.* A copolymer of allyl alcohol and a vinyl-aromatic compound containing 15 to 85% by weight of the vinyl-aromatic material is reacted with an ester of an alkyl alcohol having from 1 to 4 carbon atoms and a fatty acid material containing more than 70% octadecatrienoic acid having 3 conjugated double bonds. The reaction is conducted in the presence of 0.01 to 1% of an ester interchange catalyst and at a temperature of 150-250C.

• Detergents

Detergent compositions. D. W. Clarke and D. B. Hester (Procter & Gamble Co.). *U. S. 3,009,882.* A detergent composition which possesses heavy-duty cleansing power and which is characterized by a high density, depressed sudsing action, and resistance to caking consisting of the following: (1) 4–40% of a water-soluble alkali metal salt of a sulfuric reaction product having in its molecular structure an alkyl radical having from 8 to 18 carbons and a radical selected from the group consisting of sulfonic or sulfuric acid ester radicals, (2) at least an equal weight of alkali metal polyphosphate, and (3) as a suds depressant and caking inhibitor, 2–20% of a mixture of (a) 1–10% of at least 2 compounds having acyl radicals of different carbon atom content (saturated fatty acids having from 14 to 31 carbons or water-soluble alkali metal soaps of such acids), at least 50% of which contain at least 16 carbons, and (b) a water-insoluble compound comprising the reaction product of about 45 mols of propylene oxide with about 1 mol of butyl alcohol, having a molecular weight of about 2650. This material is present in an amount of 1–10% by weight.

Dishwashing detergents. D. Price (Consultant to Assoc. Am. Soap & Glycerine Producers, Inc.). *Soap Chem. Specialties* **37**, (11), 51–4, 108–10 (1961). The article discusses the factors involved in the dishwashing process: nature of the soils to be removed; type of detergent used; water conditions; need for efficient planning and layout; dishwashing machines; training and supervision of personnel. One of the most important is the proper selection and use of detergents and sanitizers. For hand dishwashing the author recommends a high foaming detergent; for mechanical dishwashing a low-foamer. A new development is rinse aids, low-foaming nonionic detergents which provide quicker and more uniform draining and drying of the utensils. Another advance is the development and use of detergent-sanitizers which combine cleansing and sanitizing action through the use of a synthetic detergent in conjunction with a bactericide. The iodophors are especially valuable for this use.

Evaluation of four hospital detergent-sanitizers. L. J. Vinson (Lever Bros. Co.), P. Dineen, and W. Schneider. *Soap Chem. Specialties* **37**(11), 61–4, 110–11 (1961). Testing methods are described in demonstrating the effectiveness of polybrominated salicylanilides in four hospital antiseptic preparations: laundry and hard surface sanitizer, aerosol spray, surgical scrub, and cleanser-disinfectant. All products were shown to have outstanding activity against *staphylococci,* including the antibiotic resistant strains. The aerosol spray and the cleanser-disinfectant which contains a second germicide, lauryl diethylene triamine, were also very active against gram-negative bacteria and molds. Primary irritation, sensitization and oral toxicity studies indicated that each product, even at many times use levels, exhibits little or no toxicity or irritation under standard testing conditions for either animals or humans.

Alkaline cleaning composition. J. W. Carroll (Pennsalt Chemicals Corp.). *U. S. 3,010,907.* A non-foaming alkaline cleaning composition consists of: (1) a major proportion of an inorganic alkaline material such as caustic soda, caustic potash, sodium carbonate or bicarbonate, alkali metal silicate, or alkali metal carbonate; (2) 0.05 to 5% by dry weight of an alkyl phenolethylene oxide condensation detergent; and (3) 0.01–1.0% of a defoamer.