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## Letter to the Editor

May 6, 1958

AT THE SPRING MEETING of the American Oil Chemists' Society, in April 1958, in Memphis the Statistical Committee received a suggestion that articles of a statistical nature that are submitted to the Journal be reviewed by this committee prior to their publication. Inasmuch as the committee is not represented on the editorial board of the Journal and has no real jurisdiction in this matter, it is obvious, from a practical standpoint, that such a procedure must await implementation by the Journal Committee.

The Statistical Committee is nevertheless immediately concerned that the high standard exhibited by previous articles be met by those papers which are clearly statistical or which attempt to make quantitative conclusions. The committee is willing to act in

an advisory capacity in any matter pertaining to statistics and concerning the Society and, in particular, offers its services to contributors to the Journal. We hope, by this letter, to impress upon these contributors the desirability of including adequate statistical treatment of appropriate data and of soliciting statistical aid in such cases. The committee stands ready to review papers on request and, where the need is clearly indicated, will offer recommendations. In this manner we wish to be of service to the Journal and to the Society.

W. E. LINK, chairman  
700 Investors Building  
Minneapolis, Minn.

# ABSTRACTS . . . R. A. REINERS, Editor

ABSTRACTORS: Lenore Petschaft Africk, R. R. Allen, S. S. Chang, Sini'tiro Kawamura, F. A. Kummerow, and Dorothy M. Rathmann

## • Oils and Fats

**The oxidation of unsaturated compounds. IX. The effects of structure on the rates and products of oxidation of unsaturated compounds.** F. R. Mayo, A. A. Miller, and G. A. Russell (Gen. Elec. Res. Lab. and Stanford Res. Inst.). *J. Am. Chem. Soc.* **80**, 2500-07 (1958). The relative rates of reaction of some unsaturated compounds with one atmosphere of oxygen have been investigated, using one monomer at a time, and using two monomers at a time (to yield a terpolymer with oxygen). The close correspondence between the two sets of data indicates that the reactivity of the double bond toward a peroxide radical is the principal factor governing the over-all rate of reaction. The organic part of the peroxide radical (M in MO<sub>2</sub>) has a small but significant effect on the propagation reactions of the peroxide radical. The products of oxidation of unsaturated compounds are considered, using the data in this report and in the literature.

**Studies on seed fats of Cucurbitaceae family. II. The Component fatty acids of *Trichosanthes cucumerina*, Linn.** S. A. Patel, S. Bhattacharyya and M. M. Chakrabarty (Univ. College of Science & Technology, Calcutta). *J. Indian Chem. Soc.* **35**, 67-71 (1958). The seed fat of *Trichosanthes cucumerina* contains 11.87% saturated fatty acids, 32.59% oleic acid, 19.83% linoleic acid, and 35.46% conjugated triene acid calculated as  $\alpha$ -elaeostearic acid. A considerable amount of arachidic acid was found.

**Isolation of methyl monohydroperoxido-9-octadecynoate from the autoxidized methyl 9-octadecynoate.** N. A. Khan (East Regional Laboratories, Pakistan Council of Scientific & Industrial Research, Tejgaon, Dacca, East Pakistan). *J. Org. Chem.* **23**, 606-7 (1958). Methyl stearolate was reported to react with oxygen and yield monohydroperoxide with the triple bond intact during the initial stages of autoxidation. Methyl hydroperoxide-9-octadecynoate was isolated as the sole product from autoxidized methyl stearolate.

**Infrared investigation of the location of the ethylenic bonds in the newly discovered palustric acid.** H. H. Brunn (Univ. Uppsala, Swed.). *Acta Chem. Scand.* **11**, 907-9 (1957). The palustric acid isolated from the oleoresin of *Pinus palustris* and *P. caribaea* is an intermediate product in isomerization of levopimaric acid to abietic acid. The infrared absorption spectrum of palustric acid, obtained by potassium bromide disc technique, indicated that the double bonds are most probably between carbon atoms 7-8 and 13-14. (*C. A.* **52**, 9030)

**Structure of sterculic acid.** J. P. Varma, Sharda Dasgupta, Bhola Nath, and J. S. Aggarwal (Natl. Chem. Lab. India, Poona). *J. Sci. Ind. Research* **16B**, 162-7 (1957). The structure of sterculic acid is established as  $\omega$ -(2-n-hexylecyclopropyl)-9,10-decenoic acid. (*C. A.* **52**, 8975)

**The composition of isano oil.** A. Seher (Univ. Münster i. W., Ger.). *Arch. Pharm.* **287**, 548-55 (1954). The oil of isano nut kernels contains stearic, isanic, elaidic, and linolenic acids. (*C. A.* **52**, 8946)

**Autoxidation of 2-ethyl-1-hexene.** K. Morikawa (Yokohama Natl. Univ.). *Bull. Fac. Eng. Yokohama Natl. Univ.* **6**, 87-94 (1957). The autoxidation of 2-ethyl-1-hexene was carried out at 10, 20, 30, 40, 50, and 80°, and the hydroperoxides produced were separated by silica gel-chromatography and decomposed by ferric ions or reduced by sodium acid sulfate to the corresponding ketones or alcohols. (*C. A.* **52**, 8932)

**Bear Fat.** H. Steger and F. Püschel (Inst. Tierzuchtforsch. h., Dummerstorf, Rostock, Ger.). *Pharmazie* **12**, 821-5 (1957). The body fat, intestinal fat, and kidney fat was examined from 3-year old brown bears (*Ursus arctos*) living on a vegetarian diet in a zoo. In the order of body fat, intestinal fat, and kidney fat, the following properties are: specific gravity (20°/20°) 0.9184, 0.9191, 0.9195; melting point (flowing) 25.7°, 34.2°, 36.6°; (clear) 35.2°, 39.2°, 40.2°;  $n_{D_20}$  51.6, 51.4, 51.4; acid number 0.85, 1.1, 0.76; saponification number 200.0,

200.0, 198.2; ester number 199.2, 199.9, 197.7. Other determinations for body fat were: Reichert Meissl number 0.87; Hehner number 94.0; iodine number (Kaufmann) 68.18; thiocyanogen number (Kaufmann) 56.48; total fatty acids 94.14%; saturated fatty acids (Bertram) 31.8%; solid fatty acids (Twitchell) 31.2%; liquid fatty acids (Twitchell) 61.9%; lecithin 0.06%. The amounts in body fat, intestinal fat, and kidney fat of the fatty acids was linoleic 13-15%; oleic 43-50%; linolenic, none; myristic, very small amount; palmitic 29-33%; stearic, body fat 0.58%, intestinal fat 2.44%, kidney fat 6.69%. The non-saponifiable contents were: 0.06% of body fat and 0.08% of intestinal fat and kidney fat. (*C. A. 52, 8314*)

**Fifth annual meeting of the International Oil Mill Superintendents Association, Mexican Division-Matamoros. Introduction.** O. J. Jones. *Oil Mill Gaz.* 62(10), 9(1958).

**Purpose of the I.O.M.S.A.** H. E. Wilson. *Ibid.* 9.

**Cottonseed and its importance in the industry of oils.** J. G. Ramirez (Ind. Jabonera Esperanza S. A., Tamps, Mex.). *Ibid.* 9-10.

**Fundamentals and new developments in screw presses.** A. W. French. *Ibid.* 10-12.

**Progress on the development of a commercial process for the removal of grossypol from cottonseed during processing.** A. C. Wamble. *Ibid.* 12, 14.

**Ten years review of oil milling.** G. O. Briggs and D. F. Starr. *Ibid.* 14-15.

**Some facts about sesame.** G. Martinez S. (Anderson, Clayton & Co., Mexico, D.F.). *Ibid.* 15, 17.

**Cotton linters.** F. Simmons. *Ibid.* 17. (*C. A. 52, 8591*)

**Separation of cholesterol from the unsaponifiable matter of wool grease.** T. Miyakawa and T. Nakaoka (Yoshinori Hasebe). *Japan 5376(56)*. Unsaponifiable matter (1 kg.) of wool grease is dissolved in 2.4 kg. warm (55°) acetone or methyl alcohol with stirring, cooled to 15°, filtered, and the filtrate evaporated. Acetic ester (2.7 kg.) is added and the mixture heated, kept at 35°, and filtered. To the filtrate, 100 g. dodecyl alcohol, 1,3-dimethyltetradecyl alcohol, or octadecane-1,2-diol is added. The mixture is warmed to 20°, filtered, and the residue recrystallized from ethyl acetate to give 180 g. cholesterol, melting point 145-8°. (*C. A. 52, 9633*)

**Differentiation between animal and vegetable fats.** H. Sulser and O. Högl (Eidg. Gesundheitsamt., Bern, Switz.). *Mitt. Gebiete Lebensm. u. Hyg.* 48, 248-58 (1957). Reverse-phase paper chromatography is carried out with the unsaponified fraction of fats. The  $R_f$  value of pure cholesterol was 0.42. Whale fat, pork fat, cattle body fat, cattle kidney fat, and butter fat showed the presence of cholesterol at  $R_f$  values between 0.41 and 0.44. Pure ergosterol had an  $R_f$  of 0.89,  $\gamma$ -sitosterol 0.38, and  $\beta$ -sitosterol 0.34. Hardened peanut oil showed the presence of  $\gamma$ - and  $\beta$ -sitosterol at the expected  $R_f$  values and that of two unidentified sterols with  $R_f$  values of 0.42 and 0.28. The plant sterol with the  $R_f$  of 0.42 gives a gray-blue color with antimony trichloride which differs from that of cholesterol. (*C. A. 52, 8589*)

**Technique for studying the catalytic peroxide formation in autoxidizing fats.** A. R. S. Kartha (Maharaja's Coll., Ernakulam). *J. Sci. Ind. Research* 16B, 515-16 (1957). Autoxidation in the presence of antioxidants gives only nonreactive and noncatalytic peroxides; in their absence, catalytic peroxides are also formed as shown by increasing oxygen absorption rates after the induction period. The proportion of catalytic peroxides is not related to the peroxide values, and present results give no indication of their amount. (*C. A. 52, 8590*)

**Separation of fatty acids by partition chromatography.** K. Kismarton. *Élelmészeti Ipar* 9, 165-75 (1955). Experiments were conducted on original hydrophile silica gel, on silica gel made water-repellent by alkoxysilane, and on paper. Tilose was mixed with the silica gel to reduce flow resistance. Palmitic, stearic, and oleic acids could be separated from their binary mixtures by both column systems. In paper chromatography, it was found that the  $R_f$  values of the individual fatty acids were remarkably closer to one another in a ternary mixture than if run by themselves. The chromatographic separation of the long-chain fatty acids was greatly influenced by the adsorption of the solvent and solution. (*C. A. 52, 8591*)

**Some physicochemical properties of saturated fatty acids.** V. K. Tsykovskii. *Mastoboino-Zhirovaya Prom.* 24(1), 25-30 (1958). Tabulated data are given concerning physicochemical properties of saturated fatty acids and some of their derivatives. Twelve references. (*C. A. 52, 8591*)

**The occurrence of 6,9,12,15-octadecatetraenoic acid in herring oil, and its isolation.** E. Klenk and H. Brockerhoff (Univ. Cologne, Ger.). *Z. Physiol. Chem.* 307, 272-7 (1957). The

principal constituent of the  $C_{18}$  polyunsaturated fatty acids was identified in herring-oil preparations. The bulk of tetraenoic acids in herring oil is 6,9,12,15-octadecatetraenoic acid. No pentaene acid is present. (*C. A. 52, 8591*)

**Refining olive oil containing residual parathion.** I. Maria E. Alessandrini and F. Palazzo. *Rend. ist. super. sanità* 20, 113-37 (1957). The usual refining methods do not eliminate parathion from olive oil, although some is removed during bleaching. With 5 to 196 parts per million of parathion, the parathion content of the oil was reduced only by 14.73-29.57%. These results were unaffected by the free-fatty-acid content of the oil. However, parathion can be reduced to the corresponding amine by sodium hyposulfite which is nearly completely removed by the subsequent decolorization and deodorization steps. Tests were made on both laboratory and pilot-plant scale. (*C. A. 52, 8592*)

**Method of refining aqueous glycerol solution and its effect on distilling properties of glycerol.** M. V. Irodov and V. M. Makhinya. *Mastoboino-Zhirovaya Prom.* 24(1), 18-23 (1958). Foaming was prevented when neutralized glycerol solution was refined either with anionic and cationic agents, or charcoal. Sodium, and especially calcium, soaps of lower fatty acids from coconut oil were found to be mainly responsible for the extensive foaming of glycerol solution and the synthesis of high-molecular-weight esters during the distillation. (*C. A. 52, 8592*)

**A rapid method of determining the oil content of the seed and iodine values of the oil from small samples of flaxseed.** V. E. Comstock and J. O. Culbertson (Minnesota Agr. Expt. Sta., St. Paul). *Agron. J.* 50, 113-14 (1958). Press 1 g. dry flaxseed at 20,000 pounds and determine the iodine value of the oil in a calibrated refractometer. Extract the crushed seed with petroleum ether, dry, and weigh. The loss in weight is attributed to the oil removed by pressing and solvent extraction. This method is not as accurate as conventional large-sample methods, due largely to sampling errors, but it has sufficient accuracy for plant selection. (*C. A. 52, 8593*)

**Ongokéa (or Isano) oil.** G. Dupont, R. Dulou, and F. Pouliquen (E.N.S., 24, Rue Lhomond, Paris). *Bull. soc. chim. France* 1957, 1495-8. Ongokéa oil, obtained from the nuts by various solvents in 40-50% yield, was methanolized and subjected to adsorption chromatography on aluminum oxide and silica gel. The eluted fractions were studied by chemical and infrared analysis. (*C. A. 52, 8593*)

**Turbidity temperature: a significant figure for judging the purity of sesame oil.** P. S. Nataraja Sarma and G. Balasubrahmanyam (King Inst., Guindy). *Current Sci. (India)* 26, 248-9 (1957). The iodine value, butyro-refractometer reading, and turbidity temperature of genuine samples and mixtures of sesame oil and peanut oil have been determined. It is suggested that turbidity temperature may be considered as a significant criterion for judging the purity of sesame oil. (*C. A. 52, 8593*)

**Effect of active ventilation on the quality and preservation of freshly harvested sunflower seeds with high oil content.** V. M. Kopeikovskii and V. G. Shcherbakov (Inst. Food Ind., Krasnodar). *Mastoboino-Zhirovaya Prom.* 24(1), 8-11 (1958). Changes in the respiratory and lipolytic activities of sunflower seed with high oil content, their moisture content, acid degree, germination, and keeping quality were studied at the time of harvest and at the end of two hundred hours' ventilation period (11-12 hours per day) with outside air (58.7% humidity). Lipolytic activities and moisture contents (also to some extent acid degree) were reduced to a minimum at the end of drying period, while germination and keeping quality were significantly improved. The changes were attributed to completion of the ripening process. (*C. A. 52, 8594*)

**The glycerol outlook.** E. S. Pattison. *Soap Chem. Specialties* 34(3), 47-50, 133, 135 (1958). Production, market, and uses in industry are reviewed. (*C. A. 52, 8594*)

**Substitute for edible fats in the manufacture of linoleum.** E. V. Orobchenko, N. P. Konshin, and E. A. Orobchenko (Technol. Inst. Food and Refrigeration Ind., Odessa). *Mastoboino-Zhirovaya Prom.* 24(1), 31-2 (1958). To preserve the edible fats for human consumption, the following method is briefly described for the manufacture of linoleum from distillation residue in the paraffin oxidation process. Heat distillation residue with constant stirring, with added tung oil and litharge as a catalyst, at 200-20° for 30-50 minutes. Then add phthalic anhydride in a steel vat at the point when the mixture becomes soluble in an equal volume of ethyl alcohol, and heat the mixture at 230° with constant stirring until it gels. Film the hot gel over cork or sawdust spread on the metal surface. (*C. A. 52, 8585*)

**Preparation of an iodized oil opaque to x-rays.** C. Maiorovici and F. Danciu. *Farmacia (Bucharest)* 4, 126-30(1956). Poppy-seed oil, freshly prepared from Romanian poppy seeds, was treated in petroleum ether with gaseous hydrogen iodide, washed, and neutralized and treated with sodium acid sulfite. The oil obtained corresponds to the British and Russian pharmacopeias. (*C. A.* 52, 8468)

**Flour lipides: a note on the acetone-soluble fraction.** H. Zentner (Bread Research Inst. Australia, Sydney). *Chem. & Ind. (London)* 1958, 129-30. Lipide-protein or lipide-polypeptide complexes were found in the acetone extracts of flour and freshly washed wheat gluten, but only in the presence of water. (*C. A.* 52, 8404)

**Microwave dielectric measurements on indigenous oils at 3 cm.** A. Vyas (Univ. Lucknow). *J. Sci. Ind. Research* 16B, 481-3 (1957). The dielectric constants, tangents of the loss angle, free space attenuations, and dielectric conductivities of turpentine, linseed, sesame, mustard and peanut oils were reported. (*C. A.* 52, 8592)

**Detection of rancidity in biscuits.** S. N. Mitra and A. R. Sen (W. Bengal Public Health Lab., Calcutta). *J. Proc. Inst. Chemists* 29, 265-6(1957). Rancidity in biscuits can be detected by a modified Kreis test. The modified test agrees well with rancidity as evaluated organoleptically and by alcohol acidity. (*C. A.* 52, 8405)

**Computation of an average diameter of the fat particle and the height of aperture during homogenization of milk.** S. Kazakov. *Molochnaya prom.* 19(1), 38(1958). A simple relation between the height of an aperture under the valve during the homogenization process and the average diameter of the resulting fat globules derived from Baranovskii's data is discussed. (*C. A.* 52, 8405)

**Manufacturing of cocoa-butter substitute.** M. K. Yakubov (Polytech. Inst., Khrakov). *Masloboino-Zhirovaya Prom.* 24(1), 12-16(1958). Temperature of hydrogenation, catalyst, the degree of hydrogen dispersion, and the rate of hydrogen passage through cottonseed oil during the hydrogenation process, as factors controlling the manufacture of cocoa-butter substitute, are reviewed. (*C. A.* 52, 8406)

**Fat extraction and its influence on the vitamin content of the meal.** B. Johannessen. *Meldinger Sildolje-og Sildomelind. Forskningsinst.* 1954, 49-52. With hexane and tetrachloroethylene as solvents, fat was extracted, at about 12°, from ordinary herring meal, whole meal, and the product obtained by the Nygard method. Tests showed that the use of these solvents caused no destruction of riboflavin and vitamin B<sub>12</sub> in the meal. Nor did extraction with carbon tetrachloride at 70°, for about two hours, affect these vitamins or niacin. (*C. A.* 52, 8414)

**The oil of *Seriola quinqueradiata* I. Properties of the oil contained in various parts of a sample caught in February.** 1. The oil of the ordinary and red meats. H. Tsuyuke (Nippon Univ., Tokyo). *Nippon Suisangaku Kaishi* 22, 490-4(1956-57). Outer and inner meats in different sections along the length of *Seriola quinqueradiata* are analyzed for oil content, and the iodine number, saponification number, unsaponifiable (%), vitamin A content, average molecular weight, solid fatty acids content, and the acidity of the oil are determined.

II. Properties of the oil contained in various part of some samples from *Seriola quinqueradiata* caught in April. H. Tsuyuki and M. Okuno. *Ibid.* 495-9. Similar data are presented for the pyloric appendages, liver, spleen, head meat, head skin, eyeball, ovary, and testis. (*C. A.* 52, 9631)

**Utilization of the liver oil of deep sea sharks. XII. Preparation of polymerized product from squalene. I. Polymerization of squalene with acid clay as the catalyst.** H. Higashi, S. Izeki, and M. Asano (Tokai Regional Fisheries Expt. Sta., Tokyo). *Nippon Suisangaku Kaishi* 22, 378-82(1956-57). Polymerization of squalene thirty minutes at 200° yielded 56-8% polymer of iodine number 263.3 and averaged molecular weight 620. This was reduced at 100-150 atmospheres in the presence of Raney nickel to yield a product suitable for increasing the viscosity of squalene. A mixture of squalene 79, reduced polymerized product of squalene 16, and camillia oil 5% is a suitable lubricant for watches. (*C. A.* 52, 9631)

**Purification of technical monoglycerides by liquid-liquid extraction technique.** R. Basu Roy Choudhury (Presidency Coll., Calcutta). *Sci. and Culture* 23, 310-11(1957). Monoglycerides were extracted from an acid-free and glycerol-free glyceride mixture by the use of 80% ethyl alcohol and petroleum ether according to the separation scheme of Bush and Densen. The alcohol extract contained monoglycerides; the hydrocarbon layer contained the di- and triglycerides. (*C. A.* 52, 9631)

**The antioxidative and synergistic effect of phytates in autoxidation of fats.** F. Linow. *Ernährungsforschung* 2, 772-8(1957). Sodium dodecylphosphate was found to have no antioxidant effect in metal-free solutions nor did it provide synergism with nordihydroguaiaretic acid and dodecylgallate, the two antioxidants used. However, sodium dodecylphosphate does inhibit the effect of ferric ions and cupric ions, possibly by a metal scavenging process. (*C. A.* 52, 9632)

**An estimate of the peroxide number of autooxidized fat.** K. Barthel. *Ernährungsforschung* 2, 769-71(1957). It is suggested that the peroxide numbers of autooxidized fats be reported as Lea numbers according to the original definition. Conversion tables for converting peroxide numbers are presented. (*C. A.* 52, 9632)

**The standardization of olive oil.** S. A. Kaloyereas. *Chim. Chronika (Athens, Greece)* 21, 255-6(1956). In view of the legislation in Greece concerning the sale of mixtures of olive oil with various seed oils, the author points out the measures to be taken for the preparation of high quality olive oil and its characterization. (*C. A.* 52, 9632)

**Fermentations. Chromatographic analysis of volatile fatty acids.** R. Jolivet (Mention Univ., Algeria). *Ann. inst. agr. et serv. recherches expt. agr. Algérie* 10(6), 51 pp.(1957). Volatile fatty acids, obtained from steam distillation of acidified fermentation mixtures, were determined qualitatively and quantitatively by chromatography of ethylamine salts followed by conductometric determinations. (*C. A.* 52, 9509)

**Surface-active substance in bread baking.** H. A. Nikolaev. *Khlebopekar. i Konditer. Prom.* 2(1), 3-7(1958). A discussion, incorporating the work of other authors, on the effect of surface-active agents (such as phosphatides, gelatin, mono- and diglycerides, and polyoxyethylene stearates) on the properties of wheat-flour doughs and breads is presented. Addition of about 1-2% of surface-active agents changes the elastic properties of dough and increases the volume of bread. Different kinds of flour possess variable quantities of surface-active agents, which are related to the lipo-protein complex of the gluten. The investigation of a greater number of surface-active agents and their influence on the structure and quality of bread products was recommended. (*C. A.* 52, 9463)

**Silicones may affect cake quality.** P. E. Ramstad (Gen. Mills Inc., Minneapolis, Minn.). *Cereal Sci. Today* 3, 64-5(1958). Baking failures in whole-egg cakes have been traced to presence of traces of certain silicone compounds. Contamination of flour, sugar, cocoa, dried milk, shortening, or other cake ingredients indicate the importance of checking the use of these silicone compounds in any application where trace amounts may get into the cake. (*C. A.* 52, 9464)

**Stabilization of cocoa butter for the determination of its melting point.** E. H. Steiner (Brit. Food Mfg. Assoc., Leatherhead, Engl.). *Rev. intern. chocolat.* 12, 230-1(1957). The normal, stable form of cocoa butter has a melting point of 34-35°. Melting of the fat and subsequent crystallization at 25° leads to a less stable, crystalline form with melting point about 1° lower. Storage of crystallized fat for 1-2 days at 32° restores the original melting point. Melting point values obtained in this way showed less variation when measured calorimetrically than when determined by method of mercury flotation. Average values were 34.5° for the temperature of 98% liquid phase and 35° for complete melting on mercury. (*C. A.* 52, 9476)

**Wax acids.** (South African Coal, Oil and Gas Corp. Ltd.). *Brit. 787,921*. Wax acids are produced by first oxidizing paraffin or Fischer-Tropsch waxes having a melting point >75° (preferably 86-105°) and a molecular weight ≥650 with free oxygen at <145° to an acid number of 5-25 and a saponification number of 10-60. The esters so produced are hydrolyzed, and the alcohols are oxidized to carboxylic acids. (*C. A.* 52, 8596)

**Substitutes for olein.** Ludwig Mannes (Henkel & Cie. G. m. b. H.). *Ger. 879,455*. Fatty acids with 12-18 carbon atoms and branched chains, produced by condensation of univalent aliphatic alcohols in the presence of condensation agents at >150° and oxidation of the branched alcohols are suitable substitutes; they have a similar viscosity to olein, low freezing points, give a negative Mackey test, and are very resistant to autoxidation. (*C. A.* 52, 8595)

**Dispersions of oil and fats.** van Hees, G. m. b. H. *Ger. 919,779*. The dispersions are prepared by emulsifying the hot oils or fats with hot water and an emulsifying-agent solution such as water-poor pyro-, meta-, or polyphosphates or their mixtures. The dispersion was stable for a long time without separation of the fat from the water. It may be diluted with cold or hot water. (*C. A.* 52, 9632)

**Filtration and decolorizing of oils.** G. Proto. *Ital. 511,343*. A mechanical arrangement is given for the filtration of vegetable oils and fats with decolorizing clay followed by solvent extraction and recovery of the clay. (*C. A. 52, 8596*)

**Separation of solid fatty acids from mixtures of fatty acids.** F. Sasakawa, M. Fukushima, and Y. Furumishi (Nippon Soda Co.). *Japan 5532('56)*. The gum prepared from syōyu (a kind of Japanese sauce) is used as an additive for separation of solid fatty acids from a mixture of fatty acids. (*C. A. 52, 9633*)

**An edible, hardened oil from fish oil.** H. Marumo and S. Tomiyama. *Japan 6527('56)*. A low-grade fish oil is purified by alkali and hydrogenated as usual. Then the hardened oil is treated with acetic anhydride and deodorized to yield an edible, hardened oil. (*C. A. 52, 9479*)

**Purification of rice-bran oil having high acidity.** N. Kumagai and K. Sakurai (Vacuum Oil Industry Co.). *Japan 6736('56)*. Rice-bran oil is treated with acid and adsorbent and then esterified with glycerol in the presence of stannous chloride, zinc chloride, or zinc fluoride as catalyst at 180° for three hours under a pressure of 20 mm. Hg. The resulting neutral oil is removed by molecular distillation. (*C. A. 52, 9633*)

**Fat molding base.** T. Takayanagi *Japan 8588('56)*. Octadecyl formate (80 grams) in 200 grams petroleum ether and 20 grams bleached Japan wax in 100 grams petroleum ether are mixed well, the petroleum ether is evaporated, and the residue is dried, washed with warm water, filtered, and solidified to give a fat molding base.

*Japan 8589('56)*. Octadecyl formate (80 grams) and 20 grams bleached Japan wax are heated at 100° with air-blowing, washed with warm water, and solidified to give a fat molding base which is useful as the base for suppository of chocolate. (*C. A. 52, 9633*)

**Antifoaming agent.** U. Hasegawa. *Japan 8676('56)*. Rice-bran oil of acid number 30 (100 cc.) is heated to <100° with 200 g. calcium carbonate, and then 400 g. powdered calcium oxide and 50 g. rice bran are mixed in to give an antifoaming agent. (*C. A. 52, 9634*)

**Deodorization of bleached Japan waxes.** T. Wachi. *Japan 1121('57)*. A copper salt, e.g., copper acetate, copper carbonate, or copper formate, is added to molten bleached Japan wax in an amount of 0.01–0.1% and let stand for three to nine hours at 80° to decompose the organic peroxides present. The wax is then washed with dilute oxalic acid to remove the remaining copper salt and steam distilled. (*C. A. 52, 9634*)

## FATTY ACID DERIVATIVES

**Condensation products from fatty acids and rosin acids.** J. Donatus v. Mikusch (F. Thörl's Vereinigte Harburger Ölfabrik A.-G.). *Ger. 895,978*. The preparation of condensation products from fatty and rosin acids which are useful for the manufacture of durable paints or as constituents of plastic masses, insulating varnishes, binding agents, etc., is described. Drying oils are prepared from acid natural resins or from free fatty acids of tall oil, soybean oil, rapeseed oil, corn oil, etc. Higher fatty acid or rosin acid-containing mixtures are heated with fatty acids which contain carbonyl groups, or with their derivatives, especially oils containing them, e.g. oiticica oil or an oxidized oil in which carbonyl groups have been formed by oxidation. During this process, the content of free fatty acid decreases accompanied by splitting off of water. Heating takes place in an inert atmosphere, e.g. carbon dioxide at 150–320°, in the presence of small amounts of basic substances, such as caustic alkali or caustic lime, and (or) finely dispersed metals, such as zinc or tin. The fatty acid is partly replaceable by multivalent alcohols. To control the reaction, non-polymerizing or slowly polymerizing oils or resins, e.g. linseed oil, are used. (*C. A. 52, 9628*)

**Liquid-phase esterification of oleic acid and isobutyl alcohol.** W. C. Ling and Christie J. Geankoplis (Ohio State Univ., Columbus 10, Ohio). *Ind. Eng. Chem. 50, 939–42(1958)*. Experiments were performed to determine the liquid-phase reaction rate kinetics of isobutyl alcohol and oleic acid, using sulfuric acid as a catalyst. The esterification reaction with no catalyst present could be represented by a simple second-order kinetic equation. The reaction of *n*-butyl alcohol with oleic acid is faster than that of isobutyl alcohol with no catalyst present. With catalyst present the reverse was true. This could be due to the different methods used to purify the starting material, oleic acid. The average rate constant, *k*, for an assumed second-order reaction is a linear function of catalyst concentration and of the molar ratio of alcohol to oleic acid. Log *k* was proportional to 1/*T*. A final empirical equa-

tion was derived to predict the conversion with an average deviation of ±5.8%.

## • Biology and Nutrition

**Determination of total blood cholesterol.** D. Giarnieri (Univ. Catterino, Italy). *Ricerca sci. 27, 389–91(1957)*. A modified Liebermann-Burchard procedure is recommended. (*C. A. 52, 9276*)

**Determination of carotene in foods.** A. Inezedy and E. Demel. *Élelmészeti Ipar 10, 221–5(1956)*. A procedure for the determination of carotene in foods is described. (*C. A. 52, 8401*)

**Rapid colorimetric method for the determination of tocopherol and tocopheryl acetate in plasma.** G. Rindi (Univ. Pavia, Italy). *Intern. Z. Vitaminforsch. 28, 225–34(1958)*. Total tocopherol in plasma is determined colorimetrically by a modified ferric chloride- $\alpha,\alpha'$ -dipyridyl reaction after alkaline saponification in the presence of ascorbate to prevent oxidation of the tocopherol. Free tocopherol is determined by the same colorimetric reaction on another sample of the plasma. Esterified tocopherol is calculated by difference. A correction is made for interference by carotene. (*C. A. 52, 9278*)

**Chemistry and biology of lipides. XXVI. Fractionation of group lipide mixtures of pig stomach and pig lung by precipitin reaction.** H. Numabe (Tohoku Univ., Sendai). *Tohoku J. Exptl. Med. 66, 263–79(1957)*. A group lipide mixture AO and group-specific lipides A and O were prepared from pig stomachs. A lipide mixture BO and group-specific lipide B were prepared from pig lungs. Each preparation was electrophoretically homogeneous; the boundaries of the group-specific lipides migrated with mobilities identical with those of the respective lipide mixtures. The group-specific lipides, A, O, and B were composed of the same components qualitatively and quantitatively as the respective materials (AO and BO) from which they were separated. These findings provide further evidence that the group-specific lipides are chemical entities and not mixtures of lipide and group mucopolysaccharide. (*C. A. 52, 9250*)

**Nutritive value of fish oil.** T. Kaneda, H. Sakai, S. Ishii, and K. Arai. *Tokai-ku Suisan Kenkyushō Kenkyū Hōkoku No. 12, 73 pp. (1955)*. Highly unsaturated acids show a toxic effect on the growth of animals owing to the oxidized products of the unsaturated acids. Highly unsaturated acids contained in fresh fish are not detrimental to animals. All oxidized unsaturated fatty acids were found harmful. The most toxic components in oxidized unsaturated fatty acids are the peroxides at the beginning of the autoxidation, peroxide-free products of autoxidized highly unsaturated acids are not toxic. When samples of fish oil were slightly hydrogenated or polymerized and compared with the original oils, the treated oils were found, as anticipated, more nutritious than the unprocessed oil. (*C. A. 52, 9338*)

**Cholesterol metabolism in gonadectomized rats.** R. D. Coleman, Yu-Min Chen, and R. B. Alfin-Slater (Univ. S. California, Los Angeles). *Circulation Research 6, 172–7(1958)*. Male and female rats, half of which were gonadectomized at weaning, were placed on a control diet containing fat or on a fat-free diet. Gonadectomy in males and females on the control diet did not result in significant differences in plasma or liver cholesterol concentrations. Only slight changes occurred in adrenal cholesterol and in total lipide levels of adrenals and liver. In animals on the fat-free diet, the increased cholesterol concentration of the liver was greatly depressed by gonadectomy; total liver lipide was decreased, but plasma cholesterol and adrenal lipide were increased. In the gonadectomized female, liver cholesterol was increased. Gonadectomy favored esterification of cholesterol with more saturated fatty acids in the liver, and synthesis of cholesterol from 1-C<sup>14</sup>-labeled acetate in liver slices decreased. All changes were more pronounced in males. In general, gonadectomy reversed sex differences in lipide metabolism. (*C. A. 52, 9344*)

**Constitution of the polyethylenic fatty acids of the phosphoaminolipides and glycerides of the total liver and of the hepatic cellular structures of the rat. I. Case of the rat submitted to a standard balanced diet or deprived of choline and supplemented with D. A. B. (p-dimethylaminoazobenzene).** Dorothea Charlotte Haimovici (Inst. recherches Cancer, Villejuif, France). *Arch. sci. physiol. 11, 169–78(1957)*. Unsaturated fatty acid residues of hepatic glycerides and phosphatides of rats fed a diet containing 10% lard and 0.8% walnut oil were measured spectrophotometrically. The fats of the mitochondria and microsomes

were tested separately but the results were not greatly different from those of the total liver lipides. Fatty acids of the phosphatides containing 6, 5, 4, 3, 2, 1, and 0 double bonds were, respectively, in % of the total fatty acids: 1.5, 2.5, 21, 2, 14, 7, and 52; similarly, for the glycerides: 0, 0, 3.5, 0, 11, 40, and 45.5. The fatty acid composition of rat livers with hepatomas induced by removing choline and adding D. A. B. to the diet was not significantly different from that of normal rats.

II. *Ibid.* 185-95. Substitution of lard by cottonseed oil in the diet resulted in negligible changes in the composition of the hepatic phosphatides, but amounts of unsaturated acid residues, particularly the dienes, in the glycerides increased. Prolonged fasting decreased the amount of unsaturated fatty acids in phosphatides but increased the amount in glycerides. Rats fed a high-protein, low-lipide diet (1% calcium linoleate) exhibited wider variation in composition of hepatic lipides. There was generally observed a decrease in the amounts of tetraenes in the residual phospholipides after removal of mitochondria and microsomes and an increase in the amounts of dienes in the residual glycerides. (*C. A.* 52, 9336)

**Relations of diet, blood clotting, and total serum lipides.** F. Fidanza (Univ. Naples), R. Buzina, M. Talarico, and O. Tieri. *Rass. med. sper.* 4, 229-33 (1957). The results of a comparative inquiry among Naples people are reported. Two groups of individuals—bank, industry and business people, and harbor workers—were compared for diet and blood data. The diet was different as to the lipide proportion: 31.9 and 23.2%, respectively, for the two groups. The clotting time and the prothrombin time were considerably lower in the first group. Total blood lipides averaged 837 and 637 mg. %, respectively. (*C. A.* 52, 9365)

**Diet, blood clotting, total serum cholesterol, and  $\alpha$ - and  $\beta$ -lipoprotein cholesterol.** F. Fidanza (Univ. Naples), R. Buzina, N. Iliceto, M. Mancini, and P. Oriente. *Rass. med. sper.* 4, 256-60 (1957). In two groups of people like those of the preceding abstract total,  $\alpha$ - and  $\beta$ -lipoprotein cholesterol averaged 213, 172 and 40 and 180, 139, and 41 mg. %, respectively. Data on blood clotting were confirmed. (*C. A.* 52, 9365)

**The biochemical causes of lecithin reduction in egg doughs.** III. L. Acker and E. Lück (Univ. Inst. Lebensmittelchem., Frankfurt a.-M., Ger.). *Z. Lebensm.-Untersuch. u. Forsch.* 107, 143-52 (1958). The decomposition of lecithin in egg doughs during storage cannot be wholly explained on the basis of phospholipase-D action. A simple mixture of hard-wheat dust and dried egg yolks shows a lecithin decrease on storage, whereas there is no lecithin loss when heated dust is used in the mixture. This demonstrates that enzymes are involved in the decrease of lecithin. Lecithin losses also occur in mixtures of pure lecithin and wheat dust. In stored doughs, increasing moisture contents increase lecithin losses. (*C. A.* 52, 8405)

**Nontransfer of trans fatty acids from mother to young.** Patricia V. Johnston, O. C. Johnson, and F. A. Kummerow (Univ. of Illinois, Urbana). *Proc. Soc. Exptl. Biol. Med.* 96, 760-2 (1957). Rats were fed 15% of hydrogenated margarine stock containing 40.7% of trans fatty acids to stock their body fat with these acids. Less than 0.5% of trans fatty acids was found in fat extracted from newborn young of mothers whose carcass fats contained 23-7% of trans fatty acids. The amount of trans fatty acids in the carcass fats of the young was markedly increased when they were allowed to suckle mother milk for nine days. (*C. A.* 52, 8304)

**Biochemistry of essential fatty acids. The reputed variation of fatty acid content of body lipides as a function of dietary fat.** H. Wagner, Esther Seelig, and K. Bernhard (Univ. Basel, Switz.). *Schweiz. med. Wochschr.* 87, 1423-7 (1957). Young male rats were fed a basic diet of casein, sugar, etc., and 10% sunflower seed oil, olive oil, margarine, or butter. Margarine containing 75% of saturated fatty acids or butter rich in stearic and palmitic acids have no influence on the fatty acids in the lipides of liver and carcass. Olive oil with 80% of oleic acid also does not change the fatty acid composition as is the case after feeding a diet without fat or a low-fat diet. Linoleic acid increased markedly in liver and carcass after a diet containing sunflower seed oil. (*C. A.* 52, 8306)

**Fatty-acid composition of rats after feeding butter, margarine, and olive and sunflower-seed oils.** H. Wagner (Univ. Basel, Switz.). *Intern. Z. Vitaminforsch.* 28, 192-3 (1957). When the fat in the ration was butter or margarine, the saturated fatty acids in the lipides of the liver and body (depot) fat were but 10% above those in rats on a fat-free ration. A ration containing olive oil with its high oleic acid content increased the content of that acid in the liver and depot fats but slightly. A ration containing sunflower-seed oil with its high

linoleic acid content markedly increased the content of that acid in liver and depot fats. A ration containing rapeseed oil with a high erucic acid content increased the content of that acid in liver and depot fats but slightly. (*C. A.* 52, 9339)

**The oxidation of fatty acids in hypolipide diet.** C. Arena (Univ. Padua, Italy). *Acta Paediat. Latina* 10, 603-8 (1957). In rats administered a hypolipide diet, fatty acid oxidases in liver (method of Lehninger) were found to decrease sharply after the eighth week, in comparison with normal diet controls. This is ascribed to a lowered synthesis of phospholipides following the decrease of unsaturated fatty acids in foods. (*C. A.* 52, 8307)

**Histochemical research on liver fats and lipase, and histological research on pancreas of rats fed a low-protein diet.** F. Cantarutti (Univ. Padua, Italy) and P. L. Ferrari. *Acta Paediat. Latina* 10, 736-49 (1957). The main finding was an early drop of liver lipase beginning at the lobule periphery and progressing towards the centrolobular zone. The fat infiltration of liver followed the same pattern, but later. The first signs of atrophy of the acinous cells of the pancreas were evidenced later than liver lipase. (*C. A.* 52, 8308)

**Kinetics of fatty acid dehydrogenation.** J. G. Hauge (Central Inst., Blindern-Oslo, Norway). *Acta Chem. Scand.* 10, 1044 (1956). An investigation of the kinetics of the first dehydrogenation step of the fatty acid cycle in pig liver, using 2,6-dichloroindophenol as the electron acceptor, indicates a 3-step mechanism whereby electrons are passed from substrate to a primary dehydrogenase, thence to a specific electron-transferring flavoprotein, and finally to indophenol, the enzyme-substrate interaction following Michaelis-Menten behavior. The pH optimum range is from 6.8 when the transfer step is rate-determining to 7.6-8.4 when the primary dehydrogenases are rate determining. The observed Michaelis constants and turnover numbers give the kinetic characteristics of the total substrate-enzyme-acceptor system. (*C. A.* 52, 8311)

**Studies in normal adults for variation in serum lipides with sex, age, relative body weight, and with body build.** H. Lindholm (Kristianstad Central Hosp., Swed.). *Scand. J. Clin. & Lab. Invest.* 8(23), 1-95 (1956). The total lipides, phospholipides, total cholesterol, and the free cholesterol: total cholesterol ratio and phospholipid: total cholesterol ratio did not vary with relative body weight or build. Total lipides, phospholipides, total and free cholesterol increased linearly with age in females. In males, these serum constituents increased up to the age of fifty and then remained stationary. After age fifty the values for the above constituents among females were higher than for males. (*C. A.* 52, 8316)

**The pathogenesis of arteriosclerosis.** E. Moschowitz. *Am. J. Cardiol.* 1, 295-9 (1958). A discussion covering biochemical factors. (*C. A.* 52, 8350)

**Influence of concentration of mineral nutrients on fat synthesis of *Penicillium aurantiobrunneum*.** J. Singh and G. Singh (Univ. Panjab, Hoshiarpur). *J. Sci. Ind. Research* 16C, 219-20 (1957). Optimum yields of fat in mycelial mats of *Penicillium aurantiobrunneum* were obtained in the presence of 0.45 gram ammonium nitrate, 0.088 gram potassium sulfate, 0.25 gram magnesium sulfate, 0.73 gram sodium monobasic orthophosphate in a medium also containing 30 sucrose, 0.45 zinc sulfate and 0.005 ferric chloride per 100 milliliters. Yields of fat as high as 20.6% were obtained. (*C. A.* 52, 8267)

**Relation of dietary dioenoic acid content to that in mouse carcass fat.** S. B. Tove and F. H. Smith (N. Carolina State Coll., Raleigh). *Proc. Soc. Exptl. Biol. Med.* 97, 92-5 (1958). Ether-extracted soybean-oil meal has been found to contain sufficient residual dioenoic acids to account for the previously observed increased carcass fat dioenoic acids of animals that ingested the meal. Studies were made, with mice, on the carcass-fat levels of dioenoic acids obtained as the dietary dioenoic acid levels varied from 0 to 1.6%. Between dietary level of 0.1 and 0.8% dioenoic acids a curvilinear response was obtained and became linear when the log of dietary intake was plotted against the log of carcass fat level. At a dietary level of 1.6% dioenoic acids a disproportionately higher level was found in the carcass fat. (*C. A.* 52, 9337)

**Application of rapeseed oil for nutrition.** F. Lindlar (Univ. Basel, Switz.). *Intern. Z. Vitaminforsch.* 28, 195 (1957). In a dog fed rapeseed oil, the percent of erucic acid in the total fatty acids of the fat of the following tissues was determined by paper chromatography: pericardial 24.2, peritoneal 14.2, perirenal 18.3, mesenteric 21.2, subcutaneous 17.3, skin 4.9, tongue 11.1, spleen 3.5, pancreas 8.4, testicles 6.9, adrenals 18.7, small intestine 4.2, and large intestine 4.9; erucic acid was not present in the lipides of the brain, yellow bone marrow, and blood corpuscles; those of the blood plasma contained 13.0%. As to

the liver, lungs, and kidneys, the neutral fat of each contained approximately 7% erucic acid; it was not found in either their glycerol phosphatides or their protagon. (*C. A.* 52, 9340)

**Ethyl esters of linseed-oil fatty acids. Effect on serum lipides in atherosclerosis.** E. Linko (Univ. Turku, Finland). *Ann. Med. Internae Fenniae* 46, 129-36(1957). Ethyl esters of linseed-oil fatty acids were added (100 g./day) to the standardized diet of twelve atherosclerotic heart patients to determine the effect on the total serum cholesterol,  $\beta$ -lipoprotein fraction, and total phospholipides. In seven patients decreases occurred in total serum cholesterol,  $\beta$ -lipoprotein fraction and total phospholipides during the two-week test, while in four the response was uncertain and in one there was an increase in the values. (*C. A.* 52, 9342)

**Optimum level of fat in the diet.** S. C. Balasubramanian, S. N. Ghosh, and K. P. Basu (Indian Dairy Research Inst., Bangalore). *Indian J. Med. Research* 46, 79-86(1958). There were no differences in growth of young weanling albino rats fed for eight weeks on isocaloric diet supplemented with 0, 2, 5, 10, or 20% butterfat, sesame oil, or peanut oil. (*C. A.* 52, 9343)

**Control of serum cholesterol by experimental diets.** A. F. Kieglow (1801 Eye St., N.W., Washington 6, D. C.). *J. Am. Geriatr. Soc.* 6, 134-9(1958). Thirty-eight patients with hypercholesterolemia (average serum cholesterol was 358 mg./100 ml.) were given a diet low in animal and total fat with added unsaturated vegetable (soybean) oil. Within several weeks there was an average reduction of 25% in serum cholesterol, and in 20 of the patients the reduction was greater than 25%. (*C. A.* 52, 9345)

**Serum lipids in South African Bantu and White Subjects.** R. M. Bloomberg, F. Lazarus, Irene Mroost, and Rhoda Schneider (Clin. Lab., Med. Centre, Jeppe St., Johannesburg, South Africa). *Circulation*, 17, 1021-1028(1958). Normal South African Bantus differ from white Europeans in lipoprotein pattern as well as in total serum cholesterol. Urban Bantus have higher  $\alpha$ -lipoprotein cholesterol concentrations and lower  $\beta$ -lipoprotein cholesterol than whites. Young rural Bantus have lower  $\alpha$ -lipoprotein cholesterol than young urban Bantus, and both have lower  $\beta$ -lipoprotein cholesterol than old urban Bantus. These differences may be related to standards of living and are thought to be of value in defining the "ideal" levels for both cholesterol fractions.

**The enzymatically catalyzed release of choline from lecithin.** E. Einset and W. L. Clark (Dept. Biochem. and Nutrition, Cornell Univ., Ithaca, N. Y.). *J. Biol. Chem.* 231, 703-15(1958). A soybean phospholipide was hydrolyzed in the presence of several inorganic salts by phospholipase D from carrots. The enzyme, which catalyzes the release of choline from lecithin, was activated by several ions, among which calcium ion was the most potent.

**Effects of exercise on blood (plasma) concentrations of vitamin A, carotene and tocopherols.** R. W. Hillman and M. C. Rosner (State Univ. of N. Y. College of Med. at New York City, Brooklyn). *J. Nutrition*, 64, 605-613(1958). Plasma levels of vitamin A, carotene and tocopherol were determined before and following a two-step exercise test on 30 occasions in 14 subjects, including 14 tests in a single subject. The mean vitamin A level increased after exercise; the mean carotene and tocopherol levels decreased after an initial transitory elevation. Considerable variation was observed in respect to time, direction and magnitude of individual changes induced. There was no apparent correlation between changes noted in the plasma levels and the physical condition of the subjects as estimated by the two-step test.

**Relation of saturated, medium- and long-chain triglycerides to growth, appetite, thirst and weight maintenance requirements.** H. Kaunitz, C. A. Slanetz and Ruth E. Johnson (Columbia University, New York, N. Y.) and V. K. Babayan and George Barsky (E. F. Drew and Co., Inc., Boonton, N. J.). *J. Nutrition* 64, 513-524(1958). Triglycerides of saturated, medium-chain (6 to 12 carbons) fatty acids (MCT) and of saturated, long-chain (14 to 18 carbons) acids (LCT), which had been prepared from coconut and other palm kernel oils were studied in feeding experiments on rats receiving a purified diet with 30% casein. Their effects on growth, food and water intakes, weight maintenance requirements, and the testicular fat body were compared with those of lard and fat-free diets.

**Metabolism of glycerolipides: A comparison of lecithin and triglyceride synthesis.** W. E. M. Lands (Dept. Biol. Chem., Univ. of Mich., Ann Arbor, Michigan). *J. Biol. Chem.* 231, 883-88(1958). In lung tissue slices, glycerol-C<sup>14</sup> produces triglycerides and phospholipides with similar specific activities, whereas acetate-C<sup>14</sup> leads to much higher activity in the phospholipides. These results suggest that the diglyceride unit of

the phospholipides is metabolically different in some respects from that of the triglycerides. Possible schemes are presented to account for these observations.

**Carotene utilization and cholesterol metabolism as influenced by added choline and vitamin B<sub>12</sub> to diets containing yeast or a synthetic vitamin mixture.** Helen Mayfield and R. R. Roehm (Dept. Home Ec. Research, Montana State College, Ag. Exptl. Station, Bozeman). *J. Nutrition*, 64, 571-586(1958). The serum cholesterol level of female rats receiving no choline for 18 days was not significantly different from that of rats receiving 30, 60, 100, 250 or 360 mg. of choline per 100 gm. of diet. Male rats receiving no choline had significantly lower serum cholesterol than did those receiving the choline supplements.

**Use of Annatto for coloring butter.** R. R. Riel and C. A. Gibson (Chem. Div., Science Service, and Animal Husbandry Div., Dept. Agr., Ottawa, Canada). *J. Dairy Sci.* 41, 624-629(1958). A comparison was made of the effect of annatto and coal-tar color on the chemical quality of stored butter. Commercial conditions were duplicated by selecting two levels of cream quality, two levels of copper, and two storage treatments. Flavor was evaluated by official graders and by a panel of 15 persons. The surface color was determined with photoelectric reflection meter and also with Dyeco color standards. Peroxide values were determined by the ferric thiocyanate method; aldehyde values by the rosaniline method; acid degrees by titration; copper content by the carbamate method, and vitamin A by the Carr-Price method. No flavor difference was attributable to the type of color. The preformed vitamin A content of the butter was not affected by the type of color, copper level, or storage.

**Effect of age, sex and feeding regimen on fat digestibility in individual rats as determined by a rapid extraction procedure.** R. L. Squibb, A. Aguirre, J. E. Braham, N. S. Scrimshaw, and E. Bridgforth (INCAE, Guatemala, C. A.). *J. Nutrition*, 64, 625-634(1958). A rapid procedure for the extraction of the fecal fat of rats used in digestion trials is presented. Data obtained by this method demonstrate a marked variation among individual rats of both sexes in the digestion of fat. This variation appears to be greater in adult males; however, restricting the fat intake of the adult male to that of the female lessened the variation. When fed *ad libitum*, mature females digested more fat than males. This sex difference was not apparent when the fat intake of the males was restricted to that of the females or when young growing rats of either sex were kept on *ad libitum* or restricted feeding regimens. Since variations in utilization were found to occur with the type of fat, sex and age of the rats and feeding regimen, the importance of standardizing procedures for determining fat digestion coefficients with rats is indicated.

**Fatty liver of portal type: Cured by lysine plus tryptophan.** G. P. Vennart, V. P. Perna and W. B. Stewart (Dept. Path., College of Physicians and Surgeons, Columbia Univ., New York, N. Y.). *J. Nutrition*, 64, 635-638(1958). Portal fatty metamorphosis in young rats subsisting on diets in which protein is derived solely from corn is reversed by the addition of tryptophan plus lysine to the diet.

## • Drying Oils and Paints

**Structure of drying oils treated with cyclopentadiene.** R. Poisson and J. Petit. *Peintures, pigments, vernis* 34(2), 63(1958). The product of the reaction between drying oils and cyclopentadiene is a complex mixture of oil polymers, the monomer, and Diels-Alder condensates of one molecule of cyclopentadiene with drying-oil polymer or monomer. (*C. A.* 52, 8583)

**Paints and varnishes based on fatty acid esters of epoxy resins.** G. Nedej. *Peintures, pigments, vernis* 34, 111-15(1958). Review comparing epoxy esters with modified alkyds, indicating the former's superiority with respect to hardness, adhesion, and resistance to water and alkali. (*C. A.* 52, 9625)

**Epoxy Esters. Relationship of structure to plasticizer performance.** R. M. Brice and W. M. Budde (Archer-Daniels-Midland Co., Minneapolis 2, Minn.). *Ind. Eng. Chem.* 50, 869-70(1958). Nine epoxidized esters were prepared, to determine the effect on plasticizing properties of various functional groups and their placement in the fatty molecule. Performance was correlated with the number, relative position, and spatial configuration of the oxirane groups, and the presence of carbon-carbon double bonds. Internally positioned oxirane groups in long chains are superior to terminal oxirane groups in short

chains in both stabilizing and plasticizing efficiency. The presence of readily polymerizable unsaturation (vinyl or acrylic esters) diminishes compatibility following exposure to heat or light. The *trans* isomer of a *cis-trans* pair is generally the poorer plasticizer, especially in low temperature properties. Soapy water tends to extract the more polar plasticizers; the reverse is true of gasoline and mineral oil.

**Epoxidized esters of glycols and pentaerythritol. Application as plasticizers for poly-(vinyl) chloride.** E. J. Hensch and A. G. Wilbur (Celanese Corp. of America, Summit, N. J.). *Ind. Eng. Chem.* 50, 871-2 (1958). Alkyl epoxystearates and epoxidized oils are widely used as plasticizer-stabilizers for poly(vinyl chloride). Little attention has been given to epoxy plasticizers from polyols other than glycerol. Epoxidized pentaerythritol tetraester of tall oil fatty acid is very resistant to extraction losses and to migration to nitrocellulose lacquer. Epoxidized propylene glycol and butylene glycol esters are very similar to di-2-ethylhexyl phthalate in plasticizing properties, though less volatile. Substitution of tall oil fatty acids for oleic acid in the preparation of each epoxidized ester gave better compatibility with poly(vinyl chloride) and poorer low-temperature performance. Epoxidized derivatives of glycols and pentaerythritol offer new and useful plasticizer-stabilizers with a combination of properties not heretofore available.

## • Detergents

**Indigo method for evaluating surface-active agents.** K. Hintzmann and W. Langmann. *Melliand Textilber* 38, 1055-59 (1957). A method is described for the evaluation of the dispersing and protective colloidal efficiency of surface-active agents. Varying amounts of the substance under test are added to a solution of indigo in its leuco form. Air is then blown through a system to oxidize the indigo, a part of which forms a coarse precipitate and the rest remains as a clear blue colloidal solution. The concentration of indigo remaining in solution is estimated colorimetrically. Other things being equal, the amount of indigo which remains in solution is proportional to the dispersing power of the surface-active agent. There is good agreement between experimental results and theoretical equations derived from first principles.

**Persistence, biological, and physicochemical effects of surface-active agents in soil.** K. C. Ivarson (Univ. Microfilms). Publ. No. 22527, 123 pp.; *Dissertation Abstracts* 17, 2113 (1957). (*C. A.* 52, 1525)

**Turbidity and viscosity measurements on some cationic detergents in water and in sodium chloride solutions.** L. M. Kushner, W. D. Hubbard, and R. A. Parker. *Bur. Stand. J. Res.*, 59, 113-119 (1957). Light scattering and viscosity measurements were made on solutions of dodecylamine hydrochloride, dodecyltrimethylammonium chloride, and tetradecyltrimethylammonium chloride in water and in sodium chloride solutions. From the data, the micellar weight and intrinsic viscosity of the micelles of each detergent was calculated. The effect of the concentration of sodium chloride on these values is discussed.

**The mode of action of non-ionic levelling agents.** W. Luck (Badische Anilin und Soda-Fabrik AG Ludwigshafen A Rhein.). *J. Soc. Dyers and Colourists* 74, 221-33 (1958). Successful results in dyeing depend on a series of simultaneous equilibria. The formation of micelles by non-ionic levelling agents has been demonstrated spectroscopically and the micellar size determined. The equilibrium conditions in the formation of complexes between dyes and levelling-agent micelles have been studied. These conditions are intimately related to the equilibrium between dye and fibre. The latter equilibrium has been investigated with dyeings on polyamides. Study of the simultaneous equilibria dye-fibre and dye-levelling agent gives a clear picture of the nature of the retarding and levelling action of textile auxiliaries. The equilibrium between auxiliary and dye decreases the association of the latter. Results obtained in previous diffusion studies, however, have been interpreted as indicating increased association of dyes on addition of levelling agents. These results have been re-examined, and shown to be in accordance with the theories developed in the present paper.

**Physical chemical study of the isotropic solution of sulfur olive-oil soap.** J. M. Martinez Moreno and R. C. Barroso (Univ. Seville). *Grassas y aceites*. (Seville, Spain) 9, 149-51 (1957). An isotropic diagram of the system of "sulfur" olive-oil soap, NaCl, and water was prepared and compared with published diagrams of other soap systems. The form of the isotropic region is shown to be similar irrespective of the fatty acid used. (*C. A.* 52, 7370)

**Effect of the aromatic principles on toilet soap during storage.** S. A. Moldavskaya and E. S. Dmitrieva (Factory "Svoboda" Moscow). *Masloboino-Zhirovaya Prom.* 23(9), 24-7 (1957). Sixteen synthetic aromatic principles and 4 essential oils were tested for their effects at 0.5% level on the quality of toilet soap during storage. Isoeugenol and methyl anthranilate (I) were found to be mainly responsible for the darkening of soap during storage. Soap containing I developed spots also. Ionone, coumarin, acetylanisole, muscatel, sage oil and coriander oil affected but slightly the quality of soap during storage in either open containers or protected from the light. The data are given. (*C. A.* 52, 3370)

**Surface tension and detergency of mixtures made of soap and synthetic detergents.** F. V. Nevolin, G. A. Kral'-Osikina and M. V. Orekhova. *Masloboino-Zhirovaya Prom.* 24, 23-5 (1958). Detergency of soap was found to be appreciably reduced in the presence of added (10-70%) primary and secondary alkyl sulfates or benzene-sulfonate. (*C. A.* 52, 8594)

**Surface tension and surface transition of dilute aqueous solutions of lauryl alcohol in sodium lauryl sulfate.** J. Ross and M. B. Epstein (Colgate Palmolive Co., Jersey City, N. J.). *J. Phys. Chem.* 62, 533-5 (1958). Measurements of the surface tension of sodium lauryl sulfate solutions have been made below the critical micelle concentration over a range of temperatures. In the presence of dissolved lauryl alcohol, definite transitions are observed, the temperatures at which they occur agreeing with the values found by other methods for the same compositions. In the absence of lauryl alcohol, transitions were not observed over the range examined (15 to 45°). The process is a surface transition from a condensed to an expanded state analogous to that observed with insoluble monolayers of certain long chain compounds having polar heads, such as fatty alcohols and fatty acids. Over the transition region, calculated heats of surface extension are much higher than over adjacent regions.

**Adsorption complexes of polymers with ions of wetting agents.** S. Saito. *Kolloid-Z* 154, 19-29 (1957). Adsorption of the wetting agents Na dodecyl sulfate, Aerosol OT, dodecylamine HCl, dodecyltrimethylammonium chloride, octadecyltrimethylammonium chloride, hexadecylpyridinium chloride, and polyethylene glycol dodecyl ether of nonionic polymers poly(vinylpyrrolidone), poly(vinyl alcohol), methylcellulose, hydroxyethylcellulose, starch, polyethylene glycol, and polypropylene glycol was determined with the aid of dialytic methods. Solubilization of the dye Yellow OB and viscosity of the solutions were also measured as was the optical spectrum of the solubilized dye. Only the anions of the wetting agents are adsorbed on the polymers, especially above the critical micelle concentration. The polar part of the anion is probably adsorbed on an O atom in the polymer. The polymers usually exert a strong synergistic effect in the solubilization of the dye by a wetting agent; this effect is always associated with an increase in viscosity in the polymer solution with increased concentration of wetting agent. The processes of adsorption and solubilization are similar to those of micelle formation. (*C. A.* 52, 5005)

**The determination of a non-ionic detergent in soap mixtures.** C. B. Stuffs (J. Bibby & Sons Ltd.). *Soap, Perfumery & Cosmetics* 31, 369-70 (1958). An outline is given of a method developed for the determination of a non-ionic detergent in soap mixtures. It involves the separation of the non-ionic detergent from the mixture, formation of a phosphomolybdic acid complex and subsequent gravimetric determination.

**Laundering procedures in the commercial laundry and in the home.** J. F. Warner and E. Artim. *Am. Dyestuff Reporter* 47, 187-90 (1958). The level of washability which a fabric will withstand satisfactorily depends upon the fabric properties, the manner in which it is dyed, and the finishing treatments which it receives in the mill. The amount and type of soil picked up by a textile article will be determined by the conditions arising in consumer use; which will, in turn, indicate the type of washing process which must, on the average, be used for adequate soil removal.

**Method for determination of sodium and potassium soaps in their mixtures.** M. N. Zaliopo (Factory "Svoboda" Moscow). *Masloboino-Zhirovaya Prom.* 23(9), 27-9 (1957). A method is described with examples for determination of K and Na soaps in a toilet-soap stick. (*C. A.* 52, 3370)

**Process of making fungicidal, bactericidal, and detergent compositions.** S. Birtwell and F. L. Rose (Imperial Chemical Industries, Ltd.). *U. S. 2,830,006*. A fungicidal, bactericidal and detergent composition is prepared by the interaction of a hexamethylenediamine salt with p-chlorophenyldieyandiamide in the presence of a non-ionic detergent as a solvent, said detergent being a condensation product of ethylene oxide and octylcresol.