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ABSTRACTS . . . R. A. REINERS, Editor

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• Oils and Fats

Isomerization of unsaturated fatty-acid esters. I. Effect of catalysts on double-bond migration. J. J. A. Blekkingh, H. J. J. Janssen and J. G. Keppler (Unilever Res. Lab., Vlaardingen, Neth.). *Rec. trav. chim.* **76**, 35–48 (1957). Methyl esters of oleic, elaidic, erucic, petroselenic, physeteric, 10-hendecenoic, 12-acetoxy-9-octadecenoic, and linoleic acids were isomerized by stirring 4 to 10 g. with 0.4 to 1.0 g. nickel catalyst (containing sulfur) in carbon dioxide atmosphere for 8 hours at constant temperature. With nickel catalyst migration of the double bonds occurs predominantly toward the methyl group. No migration was observed with elaidinization catalysts (sulfur dioxide, selenium, nitrogen trioxide) or with alkali isomerization. During simultaneous hydrogenation with platinum catalyst, migration of the double bond in methyl oleate occurred only after reduction of the main portion of the ester.

II. Location of double bonds by oxidative degradation methods. J. G. Keppler. *Ibid.* 49–57. Oxidative degradation methods for location of double bonds based on potassium permanganate in acetic acid, ozonolysis, sodium dichromate and chromic oxide were investigated. A procedure using ionization followed by treatment with silver oxide in alkaline medium was preferred. Analyses of the fission products were by chromatographic methods. (*C. A.* **51**, 10927)

Esterified olive oil and tests for peanut oil. V. Gazzi (Lab. chim. provinciale, Bologna, Italy). *Boll. lab. chim. provinciale (Bologna)* **7**, 150–4 (1956). The presence of peanut oil in rectified B grade olive oil cannot be determined by the usual A.O.A.C.-1955 test or its variations, by Allavena's method, nor by Blanc's method. (*C. A.* **51**, 10786)

Peroxide estimation in fats. L. Hartman (D.S.I.R., Wellington). *J. New Zealand Inst. Chem.* **20**, 132–6 (1956). A review. (*C. A.* **51**, 10925)

Spectrophotometric estimation of chlorophylls and pheophytins in olive oil. Mariano M. Lorenzo. *Anales inst. nacl. invest. agron. (Madrid)* **5**, 295–307 (1956). Maximum coefficients of absorption of chlorophyll a, chlorophyll b, pheophytin a, and pheophytin b occur at wave lengths 6700, 6525, 6775, and 6625 Å., respectively. Beer's law holds at these wave lengths for concentrations of between 0 and 10 p.p.m. Thus, by determining the absorption coefficients for these wave lengths on a sample of olive oil, the contents of the chlorophylls and the pheophytins can be determined by use of equations. A table of absorption coefficients is presented in the original. (*C. A.* **51**, 10927)

Inhibitols of soybean and olive oils. W. Heimann (Tech. Hochschule, Karlsruhe, Ger.). *Fette, Seifen, Anstrichmittel* **58**, 343–7 (1956). Antioxidant compounds of raw soybean and olive oils are isolated by absorption on aluminum oxide. These inhibitols are found in the upper third of the adsorption column. They can be eluted with petroleum ether and are readily soluble in acetone and ethyl ether. The soybean inhibitol is soluble in 96% alcohol while the olive oil inhibitol is only partially soluble. (*C. A.* **51**, 10927)

Polymerized components in sulfur-olive oil. J. Gracián Tous, E. Vioque, and P. de la Maza (Inst. Gras y Sus Derivados, Servilla, Spain). *Fette, Seifen Anstrichmittel* **58**, 353–6 (1956). Sulfur-olive oil foots contain polymerized compounds which could be decomposed by strong hydrolysis. (*C. A.* **51**, 10928)

Reagent splitting: investigations in countercurrent and in a laboratory apparatus. E. Schlenker. *Fette, Seifen, Anstrichmittel* **58**, 356–8 (1956). A laboratory apparatus is described for hydrolysis of fats in which there is no change in volume of the reaction mass due to either condensation or evaporation. Countercurrent hydrolysis does not appear to offer industrial advantages. (*C. A.* **51**, 10926)

Nonsaponifiables from deep-fry fats. Dolores Torres, Toni Trinchese, Sister Emeran Foley and J. V. Karabinos (College of St. Francis, Joliet, Ill.). *Trans. Illinois State Acad. Sci.* **49**, 205–6 (1956). Seven vegetable, animal, and mixed fats which had been used 10–180 days for deep fat frying foods and an unused corn oil were analyzed for nonsaponifiables. The unused corn oil gave 1.5% of nonsaponifiables which gave a strong Lieberman-Burchard test, while the others gave 0.3–1.3% of nonsaponifiables with negative to slightly positive Lieberman-Burchard test. (*C. A.* **51**, 10786)

Contemporary methods for distillation of fatty acids. M. V. Dmitrievskaya (Moscow's Factory "Steol"). *Masloboino-Zhirovaya Prom.* 23(2), 27–32 (1957). Apparatus for the fractional distillation of fatty acids are described. (*C. A.* **51**, 11735)

A study of the palm oil. E. Kellens. *Bull. agr. Congo Belge* **47**, 1611–24 (1956). Spontaneously segregated oil fractions with 4.52 and 2.4% acetone insolubles were hydrogenated with Ni at 170–220° for 15–20 minutes. Their iodine number decreased from 52.4 and 54 to 52–50.9 and 52.9–51.8, the amount of isooleic acid formed was 3.1–7.5%. They had very good organoleptic properties and were very stable; excellent margarine could be compounded with such oils. Fractions with 6.73 and 8.59% acetone insolubles, after hydrogenation and compounding gave somewhat brittle or sticky margarines, but they were of acceptable quality. It is stressed that the weakly hydrogenated palm oil is a natural food, low in *trans* fatty acids. (*C. A.* **51**, 10786)

Lipoxidase-catalyzed oxidation of polyunsaturated fatty acids. W. O. Lundberg (Univ. of Minnesota, Minneapolis). *Fette, Seifen, Anstrichmittel* **58**, 329–31 (1956). The principal normal products of the lipoxidase-catalyzed oxidation of polyunsaturated fatty acids are optically active *cis-trans* conjugated diene hydroperoxides. The lipoxidase oxidation may involve some type of chain oxidation, which must differ from that involved in autoxidation. (*C. A.* **51**, 10602)

Structure of petroselenic acid. A. K. Plisov and A. I. Bykovets. *Trudy Odess, Tekhnol. Inst. Pischchevoi i Kholodil. Prom.* **6**, 51–6 (1955). Petroselenic and petroselaidic acids and methyl, propyl, and benzyl esters of these were prepared and reactions of oxidation, hydrogenation and saponification investigated. Oxidation and hydrogenation of petroselenic acid and its esters proceed with higher speed than that of petroselaidic acid and its esters. Saponification of petroselinates proceeds slower than that of petroselaidates. (*C. A.* **51**, 10370)

Polishing wax. Harm Moes (trading as Firma Chemische Fabriek "De Komeet"). *Dutch 80,341.* To prepare polishing wax in noncoherent powder form, a mixture of waxes containing 50–70% ozocerite and a solvent is indirectly heated in a jacketed kettle and kept fluid and then with the aid of a preheated gas is sprayed in a nonheated chamber. (*C. A.* **51**, 10932)

The difference between olive oil and "sulfur" olive oil. J. Gracian Tous and J. Martel (Inst. Fats and Derivatives, Seville). *Grasas y Aceites* (Seville, Spain) **8**, 3–10 (1957). Olive oil pressed from olives but having high unsaponifiable content, can be distinguished from lower grade solvent-extracted oil or "sulfur" oil by subjecting the unsaponifiable residue insoluble in 85% ethyl alcohol to chromatographic study. The residue in olive oil is largely hydrocarbons and in "sulfur" oil is largely fatty alcohols. The hydrocarbons are soluble in petroleum ether, but the alcohols require a more polar solvent for solution. (*C. A.* **51**, 11738)

Activated carbon from waste materials of the oil industry viz. hulls of neem, castor, and mahus seeds. Om Prakash, T. R. Sharma and Amanullah Khan (H. B. Technol. Inst., Kanpur). *J. Proc. Oil Technologists' Assoc., India, Kanpur* **11**, 58–74 (1955). With CaO, $ZnCl_2$, $CaCl_2$, NaOH, $AlCl_3$, alum and H_3PO_4 as activating agents under different conditions of activator, time and temperature of carbonization, the bleaching power of carbons derived from neem, castor, and mahua seeds was determined. $ZnCl_2$ was found to be the best activator. Many of the products obtained compared favorably with the best of imported activated carbon. (*C. A.* **51**, 11738)

High pressure hydrogenation and sodium reduction of inedible fatty oils. J. G. Kane and K. B. Kulkarni (Univ. Bombay). *J. Proc. Oil Technologists' Assoc., India, Kanpur* **10**, 43–7 (1954). High pressure hydrogenation of various fatty oils yielded 0–70% fatty alcohols. Preliminary refining of an oil slightly increased conversions in most cases. Crude or refined neem oil (*Melia azadirachta*) or its distilled methyl esters could not be converted to alcohols by hydrogenation. Reduction of the oils with sodium resulted in about 90% yields of fatty alcohols in all cases. (*C. A.* **51**, 11736)

Nickel catalyst for the hydrogenation of oils. I. D. D. Nanavati and J. S. Aggarwal (Natl. Chem. Lab. India, Poona). *J. Proc. Oil Technologists' Assoc., India Kanpur* **12**, 13–22 (1956). A comparative study was made of the activity of 5 nickel hydrogenation catalysts prepared at 450–85°F. by using peanut oil and nickel formate. Maximum selectivity was obtained at 348–62°F. and 80–90 lb./ sq. in. pressure with 0.2% nickel A highly unsaturated oil may not hydrogenate to a desired consistency. The hydrogenation of oils containing catalyst-poisoning materials (e.g. mustard oil) is best accomplished by preliminary hydrogenation, removal of catalyst, and rehydrogenation with fresh catalyst. The spent catalyst can be reused 3–4 times. (*C. A.* **51**, 11737)

Some data on the coloring matter of cottonseed oil. T. K. Semendyaeva. *Masloboino-Zhirovaya Prom.* **23**(4), 7–10 (1957). The development of colored gossypol in poor quality cottonseeds, development of colored gossypol and gossy-caerulin during cooking in the presence of sunflower oil and phospholipides, and the color of the final oil were discussed. (*C. A.* **51**, 11737)

Refining cottonseed oil. II. R. de Castro Ramos (Inst. Fats and Derivatives, Serville). *Grasas y Aceites* (Serville, Spain) **8**, 24–7 (1957). A review of the commercial methods. (*C. A.* **51**, 11738)

A new method for economic oil extraction from oil seeds. Y. K. Raghunatha Rao and R. G. Kirshna Murty (Central Food Technol. Res. Inst., Mysore). *J. Proc. Oil Technologists' Assoc., India, Kanpur* **10**, 30–3 (1954). Dried oil seeds, e.g. cottonseed, are extracted with boiling alcohol in a multistage batch process. On cooling, an oil phase separates from the solvent and is evaporated to remove solvent. Light-colored cottonseed oil is recovered at a 99.7% yield. The meal is almost free of gossypol and can be used for stock feeding. The residual oil content of the meal can be regulated as desired. (*C. A.* **51**, 11739)

Industrial cottonseed. M. Z. Podol'skaya and A. I. Gan. *Masloboino-Zhirovaya Prom.* **23**(2), 4–7 (1957). The communication concerns the acid value and oil and gossypol contents of different grades of seeds harvested from medium and fine-fibered cotton plants. The acid value in the seed increases and gossypol decreases with decline in quality, as affected by the maturity of seeds and degradative processes during their drying and storage; not only acid value and gossypol content, but the oil content of seeds from fine-fibered plants are higher than in those of medium fiber. (*C. A.* **51**, 11739)

Radish-seed oil. Om Prakash, Atma Ram, and J. N. Tandon (H. B. Technol. Inst., Kanpur). *J. Proc. Oil Technologists' Assoc., India, Knapur* **11**, 79–80 (1955). The Kannauj variety of radish seed yields about 32.5% of a fatty oil upon extraction with petroleum ether. This oil is nondrying and can be used for soapmaking, illuminating, and edible purposes. The cake contains 35.8% protein and should be useable as a feed stuff and a fertilizer. (*C. A.* **51**, 11738)

Heat treatment of vegetable oils. IV. Determination of the molecular weight of heat-polymerized linseed oil by the osmotic method. Fanny Boyer-Kawenoki and Jean Petit. *Bull. soc. chim. France* **1957**, 690–1. A commercial linseed oil was heat polymerized in a stainless steel container under carbon dioxide atmosphere at 280° for 57 hours. The polymerized oil had: viscosity (at 20°) 498 poises, acid number 11, iodine number 107, *n* 1.4910. The acetone insoluble fraction of the polymerized oil had a molecular weight of 17,000 as determined by static osmotic method. This indicates an approximate degree of polymerization of 20. (*C. A.* **51**, 11738)

Deodorization—intermittent or continuous? I. H. Stage. *Fette, Seifen, Anstrichmittel* **58**, 358–62 (1956). A review and discussion. (*C. A.* **51**, 10927)

Oxidation and dehydration of oil of Antarctic whale. A. K. Plisov and E. G. Tomson. *Trudy Odess Tekhnol. Inst. Pishchevoi i Kholodil. Prom.* **6**, 73–7 (1955). A method was developed for preparing drying oil from whale. Air is blown through the oil at 150° in the presence of 20% by weight of catalyst. The latter is a special green clay activated by heating at 280–300° without blowing air. The product gave a transparent, bright, firm film in 72 hours. (*C. A.* **51**, 10924)

The origin of some organic components of milk. Fat origin. Gian Maria Curto (Univ. Milan). *Biochim. Appl.* **3**, 35–48 (1956). A review with 58 references. The significance of acetic acid as a starting point for the synthesis of lower fat acids, and the mechanism of regulation of lipogenesis in mammary glands are treated. (*C. A.* **51**, 10782)

Priority of Russian science in discovery and industrial utilization of modern methods of catalytic hydrogenation of fats. V. V. Nesmelov. *Trudy Kazan. Khim. Tekhnol. Inst. im. S. M. Kirova* **1951** (16), 61–70. A historical account of early work on liquid phase catalytic hydrogenation done by M. M. Zaitsev in 1872–1906 is presented. (*C. A.* **51**, 11735)

The Wijs reagent for determination of the iodine number of fats. I. Bellucci and R. De Gori (Univ. Siena, Italy). *Ann. chim.* (Rome) **47**, 299–305 (1957). An examination of the purity of commercial samples of ICl_3 showed the presence of 15–25% of HIO_3. Since the latter interferes in fat analysis, preparation of ICl from iodine and chlorine is recommended. ICl from impure ICl_3 might be used if titration were carried out with $NaAsO_2$ instead of $Na_2S_2O_3$. (*C. A.* **51**, 11735)

Manufacture of edible carbonic acid during continuous carbonate-saponification of fats. M. P. Bespyatov, V. I. Polstyanoi and K. P. Svinar (Lenin Polytech. Inst. and Soap Combine Kharkov). *Masloboino-Zhirovaya Prom.* **23**(4), 28–31 (1957). Description with diagrams of an apparatus built in Kharkov for the recovery of carbonic acid. (*C. A.* **51**, 11735)

Purification of natural oleic and linoleic acids. A. S. Gupta and J. S. Aggarwal (Natl. Chem. Lab. India, Poona). *J. Proc. Oil Technologists' Assoc., India, Kanpur* **10**, 34–6 (1954). *cis*-9-Octadecenoic acid of 94–5% purity in 60% yield and 9,12-octadecadienoic acid of 92–3% purity in 65% yield, both free from saturated acids, are prepared from red oil and tobacco-seed fatty acids, respectively, without distillation by urea complex fractionation. (*C. A.* **51**, 11735)

The steam hydration of oils. Yu. I. Litvinov. *Masloboino-Zhirovaya Prom.* **23**(1), 37 (1957). At a Saratov oil combine, oils are processed with steam in their preliminary purification. The oils are pumped into a pipe reactor fitted with a bubbler that delivers steam at a rate necessary to maintain a temperature of 75° to 80°. The product goes to a neutralizer and mixer for flocculation of the foots, thence to the filter. The advantage of the process consists in a shortening of the time of preheating before hydration and neutralization. (*C. A.* **51**, 11736)

Effect of hydrogenated triolein on utilization of essential fatty acids in the rat. Roslyn B. Alfin-Slater, Lilla Aftergood, Lynn Bingemann, G. D. Kryder, and H. J. Deuel, Jr. (Dept. Biochem., Univ. Southern Calif.). *Proc. Soc. Exptl. Biol. Med.* **95**, 521–523 (1957). Rats depleted of essential fatty acids after 16 weeks on a fat-free diet were maintained for 8 weeks thereafter on either a continued fat-free diet, fat-free diets containing 2 levels of hydrogenated triolein (containing 33% of *trans* isomers and no essential fatty acids), fat-free diets containing 2 levels of methyl linoleate, or fat-free diets supplemented with both linoleate and the hydrogenated triolein at the 2 levels. The animals receiving the linoleate supplement alone or the linoleate plus the hydrogenated triolein showed equivalent weight gains over a 8-week period. In the absence of the linoleate there was no aggravation of the deficiency syndrome. No observable antimetabolic activity of the hydrogenated triolein was evident.

Essential fatty acids in the chick. J. G. Bieri, C. J. Pollard, and G. M. Briggs (National Inst. Arthritis and Metabolic Diseases, Bethesda, Md.). *Arch. Biochem. Biophys.* **68**, 300–307 (1957). The polyunsaturated fatty acids in plasma, liver, and hearts of chicks were determined at intervals during essential fatty acid deficiency. The marked decreases in dienoic and tetraenoic acids, and increase in trienoic, were partially corrected by feeding methyl linoleate. The evidence indicates that dienoic acid is converted to tetraenoic and pentaenoic acids, and possibly also to hexaenoic acid.

Characteristics of animal oils and fats: I. Oils and fats derived from land animals. Edited by C. Carola. *Olii Minerali-Grassi E Saponi-Colori E Vernici* **34**, 233–241(1957). After describing the characteristics of the principal vegetable oils and fats, the properties of the principal animal origin fats are examined. The fats discussed are butterfat, silkworm oil, lard, pork fat oil, pork fat stearin, bone fat, neat's foot oil, and tallow.

Effect of unsaturated fat on serum lipids in idiopathic hyperlipemia. M. A. Everett, W. D. Block, F. A. J. Kingery, and A. C. Curtis(Univ. Mich., Ann Arbor). *Proc. Soc. Exptl. Biol. Med.* **95**, 500–502(1957). Two patients with idiopathic hyperlipemia were placed on 2400–2600 calorie diets containing 50 g. of highly purified soybean oil, with or without the addition of a phospholipid concentrate. Marked decreases in serum lipids occurred during the period of administration of diets. The serum lipid decreases were independent of phospholipid concentration in the diet, and believed attributable to the presence of unsaturated fatty acids in the dietary fat. Clinical signs of the disease regressed or disappeared coincident with the decrease in serum lipids.

Effect of dietary fatty acid constituents on the body cholesterol of rats. T. Gerson, F. B. Shorland, Muriel Livingston, and Muriel E. Bell(Fats Res. Lab. Wellington, New Zealand). *Arch. Biochem. Biophys.* **68**, 314–318(1957). The addition of linoleic acid or beef-fat to a "fat-free" diet raised the total cholesterol content of rat tissues. Whereas with linoleic acid, both ester and free-cholesterol content of the tissues were increased, with beef fat the cholesterol ester content was increased, but the free cholesterol content was reduced. The addition of (+)-14-methylhexadecanoic acid to a "fat-free" diet was without effect on the free- and ester-cholesterol contents of the tissues when 0.1 g. per rat per week was fed. Whereas the free-cholesterol content of the tissues of the male and female groups was of the same order, marked differences in ester-cholesterol content were found. The male rats of the linoleic acid and beef-fat groups showed a much greater increase in ester cholesterol than the females.

Studies on the rancidity of olive oil. VI. The thiobarbituric acid test(T.B.A.). R. Gutierrez Gonzalez-Quijano and A. Vargas Romero. *Grasas y Aceites* **8**, 73–75(1957). The T.B.A. test is applied to detect oxidative rancidity in olive oil. The technique is described and the influence of such factors as time of stirring, heating and of temperature is studied. The applicability of Lambert-Beer's law is demonstrated. The test is compared with the peroxide number method by application to a series of samples of olive oils, oxidized by the A.O.M. technique and also by exposure to diffuse light during storage. Results obtained were found to be the same for both methods.

"Home made" laboratory equipment for stability tests in oils and fats by the A.O.M. method. R. Gutierrez Gonzalez-Quijano. *Grasas y Aceites* **8**, 64–66(1957). An apparatus is described for performing A.O.M. tests(Oxygen Active Method). Results reported indicate that after a little practice excellent reproducibility is attainable.

Evaluation of tallows for soap making. (Iodine color value.) M. Loury(Inst. tech. etudes recherches corps gras, Paris). *Rev. franc. corps gras* **4**, 206–9(1957). The color of the liquid soap obtained from a sample of fat by saponification with KOH, in excess, is compared with an aqueous iodine solution. Ten g. of tallow, 10 ml. 1:1 KOH, and 50 ml. ethanol are refluxed for 10 minutes, and sufficient glycerol or glycol is added to obtain a total weight of 100 g. Part of the solution is poured into a test tube and the color evaluated by the volume(in tenth of ml. from a microburet) of an iodine solution containing 4 g. I_2, 10 g. KI, and 1000 g. water, which was added to 15 ml. of water contained in an identical test tube until the 2 tubes match the color. The tabulated results of many tests indicated a certain correlation of this new test with the content of oxyacids of the samples (*C. A.* **51**, 10096)

Regulation of hepatic acetate-1-C^{14} metabolism by short-chain fatty acids. J. Masoro, J. M. Felts, Sylvia S. Panagos, and D. Rapport. *Arch. Biochem. Biophys.* **68**, 270–283(1957). Propionate, isobutyrate, and caproate inhibited all phases of acetate-1-C^{14} metabolism in Wistar rats. Butyrate suppressed acetate utilization and oxidations without affecting the incorporation of acetate-1-C^{14} into fatty acids. This evidence suggests that butyrate increases lipogenesis from acetyl groups. It is proposed that fatty acids exert a regulatory action on acetyl metabolism.

Determination of foaming power. I. L. Mauri. *Grasas y Aceites* **8**, 78–81(1957). A review is made of the laboratory methods for foaming power estimation. The influence on foaming power of chemical constitution, temperature, concentration and addition of strength promoters is discussed.

Component acids of some Indian fresh-water fish fats. S. P. Pathak and V. N. Ojha(Dept. Industrial Chem., Bararas Hindu Univ.). *Biochem. J.* **66**, 193–196(1957). The compositions of the body and visceral fats from belgagra*(Rita buchanani)* and the body fat of hilsa*(Clupondon ilisha)* have been studied. Lithium salt-acetone and lead salt-ethanol fractionations were used to separate the fatty acids into groups differing in unsaturation. Their compositions were studied by methyl ester fractionation. A comparison has been made of the body and visceral fat from belgagra fish. Comparison has also been made between the body fats of Indian and British fresh-water fishes. It has been suggested that, whereas the fishy character of the acids remains the same, there is a possibility of biohydrogenation of unsaturated acids in the body fats of fishes from tropical water.

Detergency of some alkylbenzol-sulfonate mixtures with soaps. J. Profic. *Olii Minerali-Grassi E Saponi-Colori E Vernici* **34**, 230–231(1957). Results are reported on research on mixtures of alkyl-benzene sulfonates with different types of soaps; the components were a dodecylbenzene sulfonate, colza oil soaps, tallow and coconut soaps. Detergency was measured with the Launderometer, operating with a detergent concentration of 5 g./l. on soiled cotton at 70°. In distilled water the soap and the sulfonate do not influence each other very much, showing however a maximum of washing power coinciding with the maximum content of dodecylbenzol-sulfonate. The same results were found with hard water except that there are not such marked differences.

Acetal phosphatides in adipose tissue. C. L. Yarbro and C. E. Anderson(Dept. Biochem., Univ. North Carolina Sch. of Med., Chapel Hill). *Proc. Soc. Exptl. Biol. Med.* **95**, 556–558(1957). Acetal phosphatides, total phospholipid and total lipids have been followed in the adipose tissue and liver of rats undergoing starvation and recovery from starvation. Whenever fat was being rapidly mobilized to or from adipose tissue, acetal phosphatides and total phospholipids were found to be greatly increased.

Preparation of erucic and nervonic acids labelled with carbon-14. K. K. Carroll(Univ. Western Ontario, London, Ontario). *Can. J. Chem.* **35**, 757–760(1957). The malonic ester synthesis of nervonic acid (tetracos-15-enoic acid) has been modified so that the product consists of pure *cis* rather than a mixture of *cis* and *trans* isomers. The modified synthesis has been used in the preparation of C^{14}-labelled erucic and nervonic acids.

Separation and identification of four antioxidants, butylated hydroxyanisole, butylated hydroxytoluene, n-propyl gallate, and nordihydroguaiaretic acids, by paper chromatography. L. C. Mitchell(Div. of Food, Food & Drug Admin., Dept. Health, Educ. & Welfare, Washington 25, D.C.). *J. Assoc. Official Agr. Chemists* **40**, 909–15(1957). Mixtures of the four common antioxidants, BHA, BHT, PG and NDGA, were satisfactorily separated by the application of 2-dimensional paper chromatography in which the paper was pre-impregnated by spraying with an ether solution of the immobile phase(refined soybean oil) and aqueous methanol was employed as the first mobile phase(perpendicularly) and water as the second(horizontally). Spots were located by spraying the chromatogram with a 0.5% solution of phosphomolybdic acid in ethanol followed immediately by exposure to ammonia fumes. It is also possible to separate these antioxidants on a one-dimensional chromatogram with soybean oil as the immobile phase and aqueous methanol as the mobile phase, or aqueous methanol followed by water.

Report on rapid methods for the determination of fat in meat products. E. S. Windham(Div. Veterinary Med., Walter Reed Army Inst. of Research, Washington 12, D.C.). *J. Assoc. Official Agr. Chemists* **40**, 765–7(1957). A comparison was made of three rapid methods(Steinlite, modified Babcock, and perchloric-acetic acid Babcock) and the official method for the determination of fat in samples of ground beef, pork sausage, frankfurter, and beef with gravy. The reproducibility of the rapid methods was comparable to that of the official method. The official method, Steinlite and modified Babcock procedures gave results in good agreement. However, the perchloric-acetic acid Babcock values were about 5% higher. Each of the three methods gives sufficiently accurate values to serve for plant control, market survey or screening use.

Process for margarine manufacture. R. J. McGowan, R. A. Burt and B. F. Teasdale (Canada Packers, Ltd.). *U. S. 2,797,164.* In the manufacture of margarine, liquid fat and aqueous ingredients are mixed to form an emulsion. This emulsion is passed continuously through a chilling stage to provide a supercooled slurry in which crystallization is initiated. This slurry is blended with a recycled portion of slurry which has been subjected to mechanical working. A portion of the blend is held for completion of crystallization under quiescent conditions, and the remainder of the blend is subjected to mechanical working.

Stabilization of oils with β-(carboxymethylmercapto)tricarballylic acid. C. D. Evans and A. W. Schwab (Secy. Agr., U.S.A.). *U. S. 2,797,231.* A glyceride oil is stabilized by the addition of a minor amount of β-(carboxymethylmercapto)tricarballylic acid.

Process for the production of color bodies from fresh vegetables. E. E. Todd. *U. S. 2,799,588.* Vegetables, such as peppers, pimientos, paprika, tomatoes or carrots, are shredded and extracted with water. The extract is treated with plaster of Paris which adsorbs the color bodies so these may be removed in solid form.

Oil-containing microscopic capsules. B. K. Green (The National Cash Register Co.). *U. S. 2,800,458.* Oil is emulsified in an aqueous sol of a gellable hydrophilic colloid. A coacervating salt solution is added so that the colloid forms a protective coating around the oil droplets. Gelation is completed by cooling.

Process for treating a mixture of saturated and unsaturated fatty acids with expanded urea. L. Rosenstein and M. H. Gorin. *U. S. 2,800,466.* Expanded urea, having a bulk density not exceeding 0.5 g./cc. is added to a solution of saturated and unsaturated fatty acids in a neutral solvent. This reagent has a high degree of selectivity for saturated fatty acids of more than eleven carbon atoms. The adduct which forms is separated and decomposed by heating in a neutral solvent at about 110° for 90 to 150 min.

Oxidation-resistant oleaginous materials. W. C. Ellis, Jr. (Stauffer Chemical Co.). *U. S. 2,800,491.* Fatty acids, fats and paraffin wax are stabilized by the addition of a rhodanine.

Extraction of boleko oil. P. C. J. Lambert (Union Chimique Belge, S.A.). *U. S. 2,800,492.* Boleko oil is extracted in two successive stages. The first extraction is with hexane or petroleum ether at temperatures between 15° and 20°. The second extraction is at 35° to 40° by means of acetone or ethyl ether.

Separation of high molecular organic compound mixtures. W. Stein and H. Hartmann (Henkel & Cie, G.m.b.H.). *U. S. 2,800,493.* Mixtures of fatty acids or of carboxylic acid esters having different melting points may be fractionated by suspending the mixture in an aqueous solution of a surface active material and centrifuging at a temperature below the melting point of some of the components of the mixture.

Shortening. E. S. Lutton (The Procter & Gamble Co.). *U. S. 2,801,177.* A plastic shortening is prepared from a partially hydrogenated base stock and a minor amount of a hard stock, and contains crystalline solids predominantly in the beta phase. The base stock has an iodine value between 80 and 95, and at least 87% of the glyceride fatty acids are C_{18}. The hard stock contains not less than 90% of C_{18} fatty acid radicals in the glycerides, and has an iodine value less than 10.

1-Phenyl-3,5-pyrazolidinediones as antioxidants for fats and oils. G. R. Lappin and C. E. Tholstrup (Eastman Kodak Co.). *U. S. 2,801,254.* Fatty material normally subject to oxidation is stabilized by the addition of a substituted 1-phenyl-3,5-pyrazolidinedione.

Method for purifying phosphatidyl ethanolamine. C. R. Scholfield and H. J. Dutton (Secy. Agr., U.S.A.). *U. S. 2,801,255.* A sugar-free, choline-free, alcohol-insoluble fraction from vegetable phosphatides is dissolved in water-saturated chloroform. Methanol is added and the resultant precipitate is discarded. The remaining solution is treated with lead acetate and the precipitated salts are discarded. Phosphatidyl ethanolamine is recovered from the solution.

Hydrolysis of castor oil. E. A. Lawrence and P. Becher (Colgate-Palmolive Co.). *U. S. 2,801,257.* Castor oil is hydrolyzed by a countercurrent treatment with aqueous glycerol solution under pressure at temperatures above 235°. The apparatus is arranged so that fatty acids are withdrawn at the top and aqueous glycerol at the bottom.

Bleaching of fats. Société d'électrochimie, d'électrométallurgie et des aciéries électriques d'Ugine. *Fr. 1,008.* For bleaching of fats, soaps, and similar materials, solutions of alkali metal of alkaline earth chlorites together with phosphoric acids (e.g. ortho-, meta-, or pyro-phosphoric acid) and (or) phosphates in the presence of other acids and acid phosphates are used. (*C. A.* **51**, 10931)

FATTY ACID DERIVATIVES

Long chain hydroxy and dicarboxylic acids from fats. A. S. Gupta and J. S. Aggarwal (Natl. Chem. Lab. India, Poona). *J. Proc. Oil Technologists' Assoc., India, Kanpur* **11**, 81–5 (1955). The occurrence, production, importance and uses of long chain hydroxy and dicarboxylic acids are discussed. Hexadecamethylene-1,16-dicarboxylic acid was prepared from 18-hydroxystearic acid. (*C. A.* **51**, 11735)

Antistatic composition, treatment of shaped articles therewith, and treated articles. E. A. Vitalis (American Cyanamid Co.). *U. S. 2,798,044.* An antistatic composition is prepared from a water-soluble inorganic salt and a bis-ester of sulfosuccinic acid with a higher fatty acid glyceride. The glyceride is derived from animal fats or vegetable oils containing less than 15% by weight of polyunsaturated fatty acids, and consists of not less than 50 mole % of monoglycerides and up to 50 mole % of diglycerides.

Synthetic ester lubricants. A. Bell and G. R. Lappin (Eastman Kodak Co.). *U. S. 2,798,083.* Synthetic lubricants are prepared from a diester of the formula

$$RCOOCH_2C(CH_3)_2CH(OOCR)CH(CH_3)_2$$

wherein each R is a straight or branched chain alkyl group, one R containing 4 to 21 carbon atoms and the other 8 to 21 carbons.

Organic nitrile production. W. G. Toland, Jr. (California Research Corp). *U. S. 2,800,496.* Organic nitriles are produced by the reaction of ammonium sulfates or phosphates with aromatic or saturated aliphatic carboxylic acids, amides or ammonium salts at temperatures above 200°.

9,11,13-Octadecatrienyl-1,4-diol and other alcohols derived from oiticica oil. G. R. Wilson (Ethyl Corp). *U. S. 2,800,516.* High molecular weight alcohols are obtained by reducing oiticica oil with an alkali metal-alcohol mixture.

In situ epoxidation of organic esters with sulfuric and acetic acids. F. P. Greenspan and R. J. Gall (Food Machinery & Chemical Corp.). *U. S. 2,801,253.* An ester of an unsaturated higher fatty acid is epoxidized by successive addition of 0.25 to 1 mole of acetic acid per mole of ethylenic unsaturation, 0.5 to 5% of sulfuric acid based on the combined weight of acetic acid and hydrogen peroxide, and about 1 mole of hydrogen peroxide, and stirring at a temperature between 60° and 110° until the reaction is completed.

Preparation of aliphatic esters. N. O. V. Sonntag (Colgate-Palmolive Co.). *U. S. 2,801,256.* Esters are obtained by the reaction of an aliphatic acid halide with an aluminum alcoholate in an essentially anhydrous medium.

Process for production of α,ω-dicarboxylic acids and esters. R. H. Hasek and E. U. Elam (Eastman Kodak Co.). *U. S. 2,801,263.* An α,ω-dibasic acid lower alkyl ester is obtained by the reaction of an unsaturated acyclic carboxylic acid ester with carbon monoxide and water or a lower alcohol in the presence of a cobalt-containing catalyst at temperatures of 100° to 350° and pressures of 500 to 12,400 p.s.i.

Dehydration of volatile fatty acids through solvents. C. Couter (Lambiotte & Co.). *U. S. 2,801,265.* Volatile fatty acids are extracted from their aqueous solutions with a volatile low-boiling solvent and dehydrated by azeotropic distillation.

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• Biology and Nutrition

A diet restricted in refined cereals and saturated fats: its effect on the serum-lipide level of atherosclerotic patients. E. van Handel, H. Neumann, and Th. Bloem (St. Antoniushove Hosp., Voorburg, Neth.). *Lancet* **272**, 245–6 (1957). A steady drop of serum cholesterol and lipide phosphorus was achieved and maintained when a restricted diet of peanuts, soybean flour to provide addition of fats, legumes to provide a rich source of Mg, Mn, and Cu, and vitamins B including choline was fed to atherosclerosis patients, but only when the initial values were high. (*C. A.* **51**, 10683)

Vitamin D sclerosis of the arteries and the danger of feeding extra vitamin D to older people, with a review on the develop-

ment of different forms of arteriosclerosis. W. F. Donath and C. D. de Langen. *Koninkl Ned. Akad. Wetenschap., Proc. Ser.* **C60**, 15–21(1957). A combination of vitamin D and cholesterol is more effective in producing atheromatosis in rabbits than cholesterol alone. Injected vitamin D_2, alone or in combination with vitamin A, and vitamin D_3 raises the cholesterol and total lipoid content of the blood. (*C. A.* **51**, 10684)

Nutritional value of polymerized fats. L. A. Witting(Univ. of Illinois, Urbana). *Univ. Microfilms(Ann. Arbor, Mich.). Publ.* **No. 18212**, 58 pp. Dissertation Abstr. 16, 1881–2(1956). (*C. A.* **51**, 10786)

Influence of cooking of fats on the growth curve of young rats. D. Selva(Univ. Pavia). *Boll. soc. ital. biol. sper.* 32, 1059–62 (1956). Rats were fed diets containing 15% raw or heated lard, olive oil, or butter, respectively. With lard the growth produced by the cooked fat was greater than that produced by the unheated fat; in the other two cases the growth was less on the cooked material than on the raw. (*C. A.* **51**, 10688)

The nature of the substances in dietary fat affecting the level of plasma cholesterol in humans. J. M. R. Beveridge, W. F. Connel and G. A. Mayer(Queen's Univ., Kingston). *Can. J. Biochem. and Physiol.* **35**, 357–70(1957). It is postulated that the potent plasma cholesterol elevating action of butter fat is at least partially dependent upon the presence of the unsaponifiable fraction. (*C. A.* **51**, 10690)

The role of lipids in baking. IV. Some further properties of flour lipids and defatted flours. M. A. Cookson, M. L. Ritchie, and J. B. M. Coppock(Baking Indus. Reserch Station, Chorleywood, Herts.). *J. Sci. Food Agr.* **8**, 106–16(1957). Recently examined flours were found to have different characteristics from those previously described. Conflicting results on the bread-making qualities of defatted flours are attributed to differences in the wheats and flour extraction rates. Fractionation of flour lipids is described by countercurrent distribution in carbon tetrachloride-methanol-water or *n*-hexane-aqueous methanol systems. The ultraviolet spectra of flour and bread lipids are reported and shown to be useful in estimating the bran content of flour or determining if treated flour has been used in bread making. The acetone-soluble lipids from flour were found to have a marked detrimental effect on loaf volume and crumb softness, but in contrast to previous findings the sediment fractions(acetone insoluble) did not appreciably improve loaf volume although crumb softness was increased. Sitosterol palmitate was isolated and found to give variable results with both undefatted and defatted flours. Further experiments on oxidative treatments indicated that total lipid fraction may be involved in this method of flour improvement but that the lipid which is extractable by carbon tetrachloride is little affected. Dough and baking tests on undefatted and defatted flours to which extracted lipids were added indicated that the original behavior of the flour cannot be fully restored by this addition. Experimental dough and baking tests remain the best means of assessing flour quality for bread making.

A radioactive tracer technique for the study of dough mixing. D. W. E. Axford(British Baking Indus. Research Assoc., Chorleywood, Herts.), J. B. M. Coppock, S. J. Cornford, S. Drysdale, A Harrison and F. P. W. Winteringham. *J. Sci. Food Agr.* **8**, 234–8(1957). The rate of dispersion of fat in a dough-mixing process was studied with fat containing I^{131}. Two methods of assay are described: a liquid-suspension technique and a solid-sample assay. In these experiments, fat was uniformly distributed after about 2 min. of mixing and the mixer operated most efficiently when fully loaded.

A rapid procedure for the chromatographic separation and spectrophotometric estimation of certain pasture lipoids. I. Carotene, xanthophyll and chlorophyll. N. A. Worker(Massey Agr. College, Univ. New Zealand, Palmerston North, New Zealand). *J. Sci. Food Agr.* **8**, 442–4(1957). Pigments are extracted from grass with acetone, transferred to petroleum ether and chromatographed on an aluminum oxide column. Concentrations of carotene and xanthophyll in the eluates are estimated from absorption maxima at 451 and 441 mμ, respectively, and of chlorophylls a and b at 664 and 645 mμ. Recovery experiments with pure pigments over a wide range of concentrations showed losses to be generally less than 3%.

The fatty acid composition of lipids in the muscle and fatty tissues of loin mutton chops. L. Hartman and F. B. Shorland (Fats Research Lab., Dept. Scientific & Indus. Research, Wellington, New Zealand). *J. Sci. Food Agr.* **8**, 428–32(1957). Dissection of lamb chops showed 13.4 to 17.0% bone, 42.2 to 48.5% muscle, and 38.1 to 40.8% fatty tissue. In a sample showing fatty degeneration, the muscle tissue was not apparent and dissection revealed 19.6% bone and 80.4% fatty tissue. In bone-free tissue from normal chops 84.2 to 87.3% of the total fat was concentrated in the fatty tissue. Fatty acids were isolated by ester fractionation techniques. Di- and polyunsaturated acids were identified by spectrophotometric methods. The fatty acid composition of the lipids from adipose and muscle tissue of the chops was found to be similar to that previously reported for depot and muscle fats of sheep. As % of total fatty acids, chop fat and muscle contained respectively: *saturated acids*, C_{14}, 2.9, 0.6–1.4; C_{16} 21.8–22.5, 24.3–26.1; C_{18} 22.6–26.5, 19.1–21.6; C_{20} 0.4–1.6, 0.3–0.8; *unsaturated acids*, C_{14} 0.3–0.4, trace—0.2; C_{16} 3.2–3.8, 0.6–0.8; C_{18} 43.7–45.4, 48.4–49.3; C_{20} 0.8–1.2, 3.2–3.3; *trans-acids* 15.5–15.6, 10.7–11.1. Only a portion of the C_{20} unsaturated acids were present as tetraenoic(arachidonic) acid which is present in higher concentration in muscle lipids than in fatty tissue. Fatty tissue contained more stearic and *trans*-acids but less polyenoic acids than did muscle tissue.

Report on the determination of vitamin A in margarine. K. Morgareidge(Food Research Labs., Inc., Long Island City, N. Y.). *J. Assoc. Official Agr. Chemists* **40**, 876–80(1957). Collaborative studies showed that the single column method of chromatography for vitamin A extracts from margarine can give results agreeing well with those obtained by double column chromatography. Chromatographic-spectrophotometric values tended to be significantly lower than those found by colorimetric assay.

Report on vitamin A in mixed feeds. D. B. Parrish(Kansas Agr. Expt. Station, Manhattan, Kan.). *J. Assoc. Official Agr. Chemists* **40**, 865–76(1957). Collaborative studies were made of three methods for the determination of vitamin A in mixed feeds: a saponification method, a new rapid extraction method, and the first action method. The first appeared to be the best but improvement is needed before any of these methods will be suitable for feed control purposes.

Report on carotene. F. W. Quackenbush(Dept. Biochem., Purdue Univ., Lafayette, Ind.). *J. Assoc. Official Agr. Chemists* **40**, 865(1957). A collaborative test on alfalfa meal check samples showed that Sea Sorb 43 gave essentially the same results as the standard magnesia 2642 specified for the determination of carotene.

Animal fats. VII. The component acids of fats from mouse, porcupine, and rabbit. F. D. Gunstone(The University, St. Andrews) and W. C. Russell. *J. Sci. Food Agr.* **8**, 283–6(1957). Fatty acids were analyzed by low temperature crystallization and fractional distillation of the esters. Mouse and rabbit fats had similar compositions to those of other rodents but porcupine fat differed significantly. As % by wt. of total acids, the compositions of mouse, porcupine and rabbit fats were respectively, myristic acid, 0.2, 5.2, 2.6; palmitic, 26.7, 36.3, 25.1; stearic, 2.6, 11.7, 5.6; arachidic, —, —, 0.4; tetradecenoic, —, 1.5, 2.2; hexadecenoic, 5.6, 3.6, 6.0; hexadecadienoic, —, 0.5, —; octadecenoic, 35.8, 27.1, 58.1; octadecadienoic, 26.2, 13.6, —; octadecatrienoic, 1.9, 0.5, —; "eicosenoic," 1.0, —, —. Iodine values of the total fatty acids were, respectively, 91.6, 52.3, 81.1.

VIII. The component acids of flamingo fat and antelope fat. *Ibid.*, 287–90. Flamingo fat was found to have a composition similar to that of other bird fats. The antelope fat differed from other ruminant fats in having an unusually low content of saturated fatty acids. Mixed acids from flamingo and antelope fats have iodine value of 67.9 and 87.8, respectively. As % by wt. of total fatty acids, the compositions of flamingo and antelope fats were, respectively, myristic acid, —, 2.8; palmitic, 24.8, 20.6; stearic, 7.7, 3.8; arachidic, —, 0.4; tetradecenoic, —, 0.4; hexadecenoic 4.4, 8.4; hexadecadienoic, 0.5, 0.2; octadecenoic, 53.4, 40.5; octadecadienoic, 7.1, 19.2; octadecatrienoic, 0.2, 3.7; "eicosenoic," 1.9, —.

IX. The relation between composition and iodine value. *Ibid.*, 290–7. The compositions of fats from 30 species and birds are summarized. Mathematical equations are suggested for calculating the fatty acid compositions, and shown to be applicable for fats having iodine values in the range of 30 to 90 and containing no C_{20} to C_{22} acids. Most animal fats of this type consist, apart from small quantities of myristic(1 to 5%) and hexadecenoic acids(2 to 7%), of palmitic, stearic, oleic and polyethenoid C_{18}-acids. The amount of palmitic acid is fairly constant(24 to 30%) and changes in iodine value are reflected in changing proportions of the C_{18} acids. Animal fats in the iodine value range of 30 to 60 differ from those in the 60 to 90 range. In the more saturated fats, the polyethenoid acids are present to a limited and fairly constant extent (2 to 4%) while the amount of stearic acid rises and oleic falls with decreasing iodine value. In the more unsaturated fats, the content of stearic acid is fairly constant (5 at 7%) while that of oleic falls and polyethenoid acids rise as the iodine value increases. These conclusions are summarized graphically. Changes in the proportions of fatty acids for fats in the iodine value range of 90 to 30 are parallel to changes which occur during the selective hydrogenation of mixtures of stearate, oleate, and linoleate. "Stearic-rich" depot fats appear to be produced only by ruminants, quasi-ruminants, and ruminant-eating animals.

Oleaginous vitagen preparation. G. W. Campbell. *U. S. 2,797,-185.* A vitamin containing food product is prepared from 2 to 5 parts by weight of fish liver oil, 2 to 5 parts of butter oil, and 1 to 4 parts of rice bran oil.

• Drying Oils and Paints

Wedge-shaped films for paint testing. W. Garmsen (Glasurit-Werke, Hiltrup). *Paint Technol.* 21, 161–4 (1957); translated from *Farbe u. Lack* 60, 257–61 (1954). An apparatus is described for the preparation of both uniform and wedge-shaped films of a desired thickness such that they retain these characteristics after being dried. The wedge-shaped film permits the selection of the exact thickness required in a given test and thus eliminates an important cause of error in evaluating film properties. The use of these films for determining the following properties of decorative paints is described briefly: fineness of grind, flow-out and drying time, gloss and hiding power, hardness and adhesion, flexibility and scratchproofness.

A note on the stability of cold-cure lacquers. W. F. Daggett (Henry Flack, Ltd.). *Paint Technol.* 21, 170 (1957). Cold-curing lacquers were prepared from urea-formaldehyde resins and nondrying castor oil-modified alkyds. A study of acid catalysts showed that the quantity required is determined by the desired hardening rate, the final film properties, the pot-life and the ratio of alkyd to amino resin.

Surfactants in the paint and allied industries. C. D. Moore and M. Bell (Glovers Chemicals Ltd.). *Paint Technol.* 21, 199–203 (1957). The nature and properties of surfactants is reviewed briefly. In the paint industry, they are being used in pigment grinding and wetting, in promoting adhesion, as antistatic agents, as emulsion stabilizers, in putty, in paint removers, and as solubilizing agents for odorless paints.

• Detergents

Experimental spray dryer for product development studies. E. J. Crosby and W. R. Marshall, Jr. (Univ. of Wisconsin, Madison, Wis.). *Chem. Eng. Progress* 53, 347–52 (1957). A small experimental spray dryer has yielded particle sizes in the same range as usually produced in commercial dryers. Concurrent as well as counter-flow drying are possible; air-flow patterns are kept symmetrical at any flow rate by simple external controls. Evaporative loads of 10 lb./hr. are sufficient for most product development studies (including detergents), permit variety of tests within short time. Ten different runs have been made in as little as two hours, permitting establishment of effect of two variables on product properties.

Properties of solutions of mixtures of alkylbenzenesulfonate and soap. F. V. Nevolin, V. M. Makhinya, and A. V. Yushkevich. *Masloboina-Zhirovaya Prom.* 23(1), 27–30 (1957). The pH, surface tension, foaming ability, foam stability, and cleaning properties of mixtures of soap (I) and alkylbenzenesulfonate (II) were determined. The surface tension at total concentrations of 0.25 and 0.5% active materials, respectively, in distilled H_2O exhibited a maximum at a composition of 60% I. At 0.5% concentration in H_2O of 15° hardness, I gave less foam than II, but the foam from I was more stable. The cleaning abilities of the solutions on artificially soiled cotton in a launderometer were determined. In hard water, mixtures of I and II exhibited a sharp minimum in cleaning ability at a composition of 30–40%. II. In distilled water, a maximum was found at a composition depending on the total concentration. The behavior of the mixtures in hard water in the presence of tripolyphosphate was similar to the behavior in distilled water. (*C. A.* 51, 10928)

Diagrams of some commercial soaps of peanut-oil base. A. Prevot (ITERG, Paris). *Rev. franc. corps gras* 4, 263–7 (1957). The phase diagrams at 90° of 3 household soaps prepared in the laboratory from (a) peanut oil (I), (b) I 80 plus coconut oil 20, and (c) I 90 plus resin 10% are traced. In comparison with diagrams where tallow replaces I the soap according to (a) requires less salt for graining out while the soap (b) differs very little. (*C. A.* 51, 11740)

Comparison of the detergent properties of washing powders. K. Ramaszeder and M. Saghy. *Textile Praxis* 12, 169–71 (1957). A synthetic soiling medium of the following composition is used—Emugol oil F 13 (10%) soot (5%), dust (3%), ammonium hydroxide (1%), and calcium carbonate (1%), all quantities being calculated on weight of material. A 50:50 union of wool and viscose rayon is used, the soiled material being dried and examined for white content, washing tests are then carried out in Thermos flasks rotated mechanically, and the washed material is tested for white content. The detergent effect (M%) is calculated from the following formula:

$$M = \frac{W_g - W_v}{W_r - W_v} \times 100$$

(W_r is the white content of clean material; W_v is white content of artificially soiled material; and W_g is the white content of washed material).

Detergents based on tall oil. S. B. Satkowski and W. B. Bennet (Monsanto Chem. Co., Everett, Mass.). *Soap & Chem. Specialties* 33(7), 37–9 (1957). Tall oil-ethylene oxide condensates combine good detergency and low foam characteristics with economy in cost. They were the base material used in the first domestic low-sudsing detergent and their low-foam characteristics are useful also in industrial and laundry operations. In textile processing their uses depend on their lubricating, emulsifying and detergent properties. Their emulsifying properties are also utilized in the field of agricultural pesticide emulsions.

Anionic synthetic detergents and water supply problems. C. N. Sawyer and D. W. Ryckman (Mass. Inst. of Technol., Cambridge, Mass.). *J. Am. Water Works Assoc.* 49, 480–90 (1957). Three different kinds of synthetic detergents (syndets) are described. The discussion is confined to the anionic type. Both sulfates and sulfonates are considered. Their differences and formulas are outlined, as well as the various forms in which they occur (primary, secondary, and tertiary). Most of the water supply problems are due to the resistance to biological degradation of polypropylene benzene sulfonates. The complex phosphates also increase coagulant requirements. (*C. A.* 51, 10800)

Utilization of hydrogenated acid oil obtained from the refinery foots as a raw material for soap manufacture. V. Sreenivasan, V. Lakshmikanathan, and A. Thiagarajan (E. Asiatic Co., India Private Ltd., Madras). *Oils & Oilseeds J.* (India) 9(2), 5–7 (1956). Fatty acids obtained by H_2SO_4 hydrolysis of peanut-oil soapstocks are treated with bleaching earth, hydrogenated with Ni catalyst at 180° and 25 lb./sq. in. pressure, and utilized for soap manufacture. (*C. A.* 51, 10928)

Soil removal and soil-suspending capacity of detergent solutions as function of content of carboxymethylcellulose. J. Stawitz and P. Hopfner. *Seifen-Ole-Fette-Wachse* 82, 261–3, 293–4 (1956). Washing experiments with solutions of 1.2 g./l. alkylsulfonate, 0.5 or 5.0 g./l. Na_2CO_3, 10 g./l. Na silicate 39° Bé., and 0.0–3.0 g./l. carboxymethylcellulose (I) at 50 and 85° show that both the washing effect and the soil-suspending capacity are noticeably increased by increasing I content up to 0.25 g./l.; higher amounts lead to further moderate improvement of soil-suspending capacity. At higher I concentrations, the curves for the washing effect in relation to I concentration show unexplained maximum and minimum. High I concentration increases the washing effect of solutions containing small amounts of alkali at low temperatures to that of more strongly alkaline solutions with the usual addition of 0.1 g. I/l. (*C. A.* 51, 9185)

Isolation and determination by ion exchange technique of nonionic surfactants. L. E. Weeks, M. E. Ginn, and C. E. Baker (Monsanto Chem. Co., Dayton, Ohio). *Soap & Chem. Specialties* 33(8), 47–50, 113, 115 (1957). The nonionic portion of a surfactant mixture can be determined gravimetrically following sorption of ionic surfactants from an aqueous ethanol solution on ion exchange resins. The surfactant anion is first removed by sorption on a basic anion exchange resin and the cation subsequently removed by passage of the solution through an acidic cation exchange resin. The final effluent contains the nonionic agent. A variety of anionic-nonionic surfactant mixtures were analyzed by this method with satisfactory accuracy and reproducibility.

Improvements in synthetic detergents. Boehme Fettchemie G.m.b.H. *Brit. 763,334.* A synthetic bar which has good washing properties and good stability to water consists of a water-soluble alkyl sulfate containing not less than 12 carbon atoms and at least 10% of a polyalkylene oxide or a lipophile radical-containing derivative of molecular weight greater than 6000.

Improvements relating to detergents. Unilever Ltd. *Brit. 766,401.* When thiuram sulfides are exposed to high temperatures for long periods of time, they tend to decompose in soap compositions leading to unpleasant odor and dark color. These disadvantages are reduced by adding to the soap composition, a stabilizing compound such as stannic chloride or other stannic salts to inhibit the decomposition of thiuram sulfide in the absence of any free alkali.

Improvements in germicidal detergents. Unilever Ltd., *Brit. 770,747.* A germicidal detergent composition consists of soap or anionic soapless detergent or nonionic soapless detergents or mixtures thereof, and a minor proportion of a thiuram hexasulfide such as N-tetramethyl thiuram hexasulfide.

Apparatus for making soap. W. L. Morrison (The Union Stock Yard and Transit Co. of Chicago). *U. S. 2,800,398.* An apparatus is described which can receive measured quantities of tallow or fat, measured quantities of alkali and the proper amount of water, and which will automatically heat the fats and water, mix them under proper temperature and time conditions, and automatically discharge the resulting soft soap for immediate household use.

Ammonia-containing detergents. J. L. Perlman (B. T. Babbitt, Inc.). *U. S. 2,801,978.* A dry finely-divided solid ammonia-containing detergent is claimed which is stable, free-flowing and non-caking and contains from about 87 to 99% of ammonium bicarbonate, from about 1 to 3% anhydrous alkali metal polyphosphate and from 0 to 12% dry solid surface active agent such as alkyl aryl sulfonate, alkyl sulfate or other similar organic detergent.

Polyoxypropylene glycol disulfate detergent compositions. R. D. Stayner (California Research Corp.). *U. S. 2,802,789.* A heavy duty anionic, low sudsing detergent consists of a surface-active polyoxypropylene glycol disulfate having a molecular weight from about 1000 to 3000, and 90 to 60 parts, by weight, of an alkaline water-soluble calcium sequestering phosphate salt builder such as sodium tripolyphosphate.

Treatment of soap. L. Coetzer and E. A. Wainwright (Lever Brothers Co.). *U. S. 2,802,793.* The hardness of soap bars which have been obtained by extruding the soap at a temperature not exceeding 35°, is increased by heating the bars by means of alternating current to a temperature of at least 40° but below that at which the soap becomes no longer form-retaining due to melting and then allowing them to cool.