ABSTRACTS . . . . R. A. Reiners, Editor

• Oils and Fats

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New method for determining peroxide. S. Arrhenius(Kgl. Veterinarhogskolan, Stockholm). *Acta Chem. Scand.* 9, 715–17 (1955)(in English). To determine tert-BuOOH colorimetrically, add 10 ml. of 0.01 *M* vanillin (in 70% sulfuric acid) to 1 ml. or less of an aqueous solution of the peroxide. After 20 hours in a water bath at 37°, dilute with 20 ml. of ethanol. Measure the color at 600 mμ with a spectrophotometer. The color precipitates when diluted with water and redissolves in concentrated acid. If 70% sulfuric acid is the diluent, the absorption maximum shifts to 560 mμ. The Beer-Lambert law is obeyed at peroxide concentrations less than 10^{-8} *M*. Dilution errors may be important. (*C. A.* **50**, 3156)

Dehydration of the methyl ester of ricinoleic acid. V. V. Korshak and A. A. Ivanova. *Zhur. Priklad Khim.* **28**, 523–32 (1955); *J. Appl. Chem. U.S.S.R.* **28**, 495–502(1955)(English translation). Dehydration of methyl ricinoleate in the presence of 2% sodium bisulfate and zinc was studied. With sodium bisulfate at 250° dehydration reaches 88.6%, yielding mainly the intramolecularly dehydrated product containing 17.4% ester with conjugated double bonds; at 275° 29.1% conjugated esters are formed; at this temperature zinc gives optimum results as the dehydration catalyst. At 275° both catalysts aid the intermolecular dehydration; both catalysts promote cleavage of triglycerides of castor oil, yielding free acids. (*C. A.* **50**, 3221)

Analytical study of the unsaponifiable fraction of cotton and soybean oils and its application to the investigation of these oils. F. C. Auñon(Servicio Algodón, Servilla, Spain). *Bol. inst. nacl. invest. agron.*(Madrid). 15, 187–239(1955). A method of analysis and identification of oils by the examination of their unsaponifiables is described. Three fractions obtained by fractional crystallization of the unsaponifiables were chromatographed on a silica column and eluted with petroleum ether, benzene, ethyl ether, and methyl alcohol. Fractions obtained were steroids, carotenes, high molecular weight fatty alcohols, terpenes, fat-soluble vitamins, and hydrocarbons. The rotatory power values of the steroids were constant and characteristic for each type of oil, and it is proposed as a means of identification of oils. Mixtures of cotton and soybean oil were successfully analyzed by this method. (*C. A.* **50**, 3780)

Preparation of a solution of potassium hydroxide in ethanol which remains colorless. S. H. Bertram. *Chem. Weekblad* **51**, 677(1955). Add 5 ml. aluminum butylate or aluminum isopropylate per liter of ethanol with stirring, decant from the precipitated aluminum hydroxide and add potassium hydroxide. The solution contains a little butyl alcohol or isopropyl alcohol, but is free from aldehyde impurities. It is suitable for most purposes, e.g. the determination of saponification values of oils and fats. (*C. A.* **50**, 3780)

Oxidative rancidity in frozen fish. H. L. A. Tarr(Pacific Fisheries Exptl. Sta., Vancouver, B. C.). *Chemistry in Can.* **7**(12), 39–41(1955). A review with 22 references. (*C. A.* **50**, 3668)

Bleaching of vegetable fats and oils. S. H. Bertram. *Rev. fermentations et inds. aliment.* **10**, 203–5(1955). The substances contributing to the color of vegetable fats and oils are described and evaluated; these are vitamin A, the carotenes, xanthophylls, lycopenes, neoluteine, the chlorophylls, tocopherols, gossypol, and salts of Fe and Mn. The bleaching effects of oxidation, hydrogenation, high temperatures, adsorbents, and deacidification on these are discussed. (*C. A.* **50**, 3779)

Utilization of cashew-kernel rejections. S. C. Sethi and J. S. Aggarwal(Natl. Chem. Lab. India, Poona). *Oils & Oilseeds J.* (India) **8**(3), 5–6(1955). During the isolation of kernels from Indian raw cashew nuts, a substantial amount of waste material in the form of small fragments or coarse powder is obtained. Extraction of finely powdered small fragments and coarse powder, respectively, with petroleum ether(b.p. 40–60°) gave bland yellow oils with the following characteristics: yield 44.2, 30.6%; sp gr.(30°) 0.9099, 0.9033; n_D^{25} 1.4679, 1.4682; acid value 4.9, 11.8; saponification value 188.1, 189.9; iodine value 87.3, 93.9; unsaponifiable matter 0.62%, 0.59%. The fatty-acid fractions obtained by saponification of the oils from small fragments and coarse powder, respectively, with alcoholic KOH had the following composition: saturated acids 19.23, 18.81; linolenic 0.35, 0.45; linoleic 19.63, 24.1; oleic 60.79, 56.64%. Propyl gallate was a very effective stabilizer for these oils when it was used in the amount of 0.03% of the oil. Small fragments and coarse powder cakes remaining after petroleum ether extraction contained 24.33 and 23.2% protein, respectively. Oil extracted from small fragments and coarse powder is satisfactory for edible purposes and can be used as a substitute for almond oil to some extent, while the extraction residue can be used in chocolate manufacturing and as a cattle or poultry feed. (*C. A.* **50**, 2993)

Action of ultrasonic waves on reductase and peroxidase of cow milk. A. Ferlazzo(Univ. Messina, Sicily), G. Lombardo, and G. Cuzzocrea. *Il lattante* **26**, 504–15(1955). Inhibitions of milk reductase and peroxidas were observed proportional to the length and intensity of the ultrasonic treatment. (*C. A.* **50**, 4272)

The effect of fat and emulsifiers in dough of superfine wheat flour on the properties of the bread crumb. J. van der Lee and E. H. Wiebenga. *Brot u. Gebäck* **9**, 135–7(1955). Röntgenograms and water content during storage up to 10 days at 28° are given for a flour-water-salt-yeast bread to which was added 4% of various additives, including shortening, lecithin, glycerol monostearate, and a concentrated mixture of diacetyl tartaric acid esters of mono and diglycerides known as T.E.M. The röntgenograms suggest that during storage the starch in bread undergoes a progressive change like a crystallization called retrogradation. Glycerol monostearate and T.E.M. were the most effective in retarding this change and to a lesser extent the loss of water from the crumb. (*C. A.* **50**, 3663)

Mixed monolayers of isodextropimaric and normal long-chain fatty acids. H. H. Bruun(Åbo Akad., Åbo, Finland). *Acta Chem. Scand.* **9**, 712–14(1955)(in English). Previous data (C. A. **49**, 12916) on average area per molecule in mixed monolayers of isodextropimaric acid and normal long-chain fatty acids(myristic, palmitic, stearic, arachidonic, behenic, and lignoceric) were extended to monolayers containing higher ratios of isodextropimaric acid to fatty acids. In each case the average area per molecule is greater in the mixed monolayer than would be expected for an ideal mixture, except for mixtures involving myristic acid. The expansions are greatest for layers containing palmitic acid and decrease as the chain length of the fatty acid increases. The maximum expansion occurs at progressively lower fatty acid contents as the chain length increases. It is suggested that the hydrocarbon part of the mixed monolayer be considered as composed of 2 layers, the upper layer formed by parts of the flexible fatty acid chains projecting above the molecules of isodextropimaric acid and the lower layers by densely packed molecules of isodextropimaric acid and the lower parts of the fatty acid chains. The expanding effect is then due to contact between the thermally agitated chains in the upper layer, maximum expansion occurring when the chain ends just come in contact. (*C. A.* **50**, 3035)

Clarifies oil quickly to up fry quality. R. Bloomberg(Special Food Eng. Correspondent, Seattle, Wash.). *Food Eng.* **28**(3), 86(1956). Time required to clarify 2500-gallon batch of frying oil has been reduced from 2 hours to 18 minutes by the use of a gyratory separator that has a 200-mesh stainless-steel screen cloth with 0.0029 in. openings. As a result, the oil is clarified more frequently, free fatty acids content is considerably lower, and quality of the frozen fried potato products is improved.

World production estimates for fats and oils. *Monthly Bull. of Agr. Economics and Statistics*(FAO of the United Nations). 5(2), 1–24(1956). World production estimates for fats and oils, in prewar years and in 1948–55, are presented in detail. These new estimates have been made after a detailed review of information available in Food and Agriculture Organization records of the United Nations and in governmental and non-governmental publications.

Antioxidants for vitamin A in fish-liver oil. II. Antioxidative properties of hydroxychromones and hydroxychromans. T. Kawai, T. Shimizu, and H. Chiba. *J. Pharm. Soc. Japan* **75**, 274–7 (1955). 6-Hydroxy-2-methylchromone, 6-hydroxy-2-methylchroman, 6-hydroxy-2, 3-dimethylchroman, and 7,8-dihydroxy-2-methylchroman were prepared. Antioxidative efficacies of the first two were rather weak, while the last two showed powerful preventive action equal to that of nordihydroguaiaretic acid. (*C.A.* 50,1788)

Manufacturing dry oil. S. M. Shtal'berg. *Trudy Vsesoyuz. Nauch. Issledovatel. Inst. Molochnoi Prom.* **1953**(14), 35–48; *Referat. Zhur. Khim.* **1953**, 9919. Dry oil is a crumbly, cottony powder which is cream colored and consists of spherical particles covered with an albumin film which protects the fat from damage. The oil is prepared from natural creams and from emulsions of melted oil in milk freed from fat by drying them with a spraying method. The most stable emulsions are obtained in a homogenizer. Condensation of the dry oil during packing leads to the removal of a considerable amount of air, which can cause oxidation of the milk fat. Following is the average composition of the finished product: 76% fat, 22% dry, nonfat substances, and 2% moisture. In a vacuum apparatus the original mixture is refined to a concentration of 50% dry substances. The condensed mixture is dried with temperature of the air as follows: incoming, 160–5°; in the spraying zone, 75–85°; outgoing, 70–85°. In hermetic packing the dry oil retains its properties up to 12 months at a temperature not over 10°, up to 10 months at room temperature, and 6 months under nonhermetic conditions. Dry oil is suitable for preparing ordinary oil, creams, and milk. (*C. A.* **50**, 4422)

The fat content of Mettwurst (German sausage). Bäurle(Natl. Inst. Food Invest., Karlsruhe, Ger.). *Die Fleischwirtschaft* **7**, 593–601(1955). Extensive information from 24 references and analyses of 182 samples show that Mettwurst is a processed meat product and as such should not contain over 50% fat unless the manufacturer adequately labels the product with a statement regarding the excess fat. (*C. A.* **50**, 4421)

Catalytic saponification of oils and fats. I. Cottonseed-oil. Yi-San Wang and Lun-Shin Wei. *Chemistry*(Taiwan) **1955**, 113–23. The effectiveness of the catalysts was in the following order: 1-naphthol>2-naphthol>*p*-cresol>*m*-cresol>cresylic acid >*o*-cresol>thymol>phenol>*p*-nitrophenol. The relative order of the surface tension of the oil after the addition of catalyst was (figures in the parentheses are relative values of controls without catalyst): 2-naphthol and *p*-cresol<*m*-cresol (0.5970) <cresylic acid (0.646)<oil without catalyst (1.000)<1-naphthol (1.096)<phenol (1.172)<*o*-cresol (1.253)<thymol (3.728). The experimental data are related to molecular structure of the phenols, but the surface-tension measurements, in many cases, are not in accordance with the interfacial tension theory of saponification. (*C. A.* **50**, 4531)

Bleaching of fatty acids obtained from neutralized soap stock. M. P. Bespyatov and A. S. Sibeleva(Polytech. Inst., Kharkov). *Masloboino-Zhirovaya Prom.* **21**(7), 37(1955). Fatty acids recovered from soap stock by acidification are saponified with NaOH and the resulting soap paste is treated with several successive portions of H_2O_2 or NaOCl at 40–50°. (*C. A.* **50**, 4531)

Methods of analyzing sperm-whale oil and its derivatives. A. S. Moldavskaya and E. S. Dimitrieva. *Masloboino-Zhirovaya Prom.* **21**(7), 30–2(1955). The stepwise determination of sperm-whale oil constants, such as acetyl, acid, and saponification number, and their use in calculation of the percentage of triglycerides, free fatty acids, and higher alcohol and waxes in sperm-whale oil is described. (*C. A.* **50**, 4531)

Determination of total gossypol and its derivatives in raw cottonseed oil. V. P. Rzhekhin and M. A. Chudnovskaya. *Masloboino-Zhirovaya Prom.* **21**(7), 27–30(1955). An empirical colorimetric method is designed for estimating quantity of bound gossypol derivatives formed in raw cottonseed oil when held for 2½–3 hours at 145°. The method is suitable for control analysis in refining of the oil (*C. A.* **50**, 4531)

The stabilization of fats, fatty oils, and oil-soluble vitamins. K. Bucher. *Bull. Galencia* **14**, 155–69, 189–203(1951). Types of fat deterioration, kinetics of fat oxidation, mechanism of antioxidant action, classification of fat antioxidants (natural phenolic compounds, synthetic phenolic compounds, nonphenolic, and synergists), and antioxidants for protection of vitamins A and D were reviewed. (*C. A.* **50**, 4529)

Composition of Greek cotton seeds. P. Katsoulis. *Chimika Chronika* **20**, 150–3(1955). The data concern the chemical composition of 54 samples of cottonseeds. The various constants of the oil extracted from them are given but no definite conclusions are drawn with regard to the variation. (*C. A.* **50**, 4530)

Mechanism of the conversion of cis to trans modifications of the unsaturated higher fatty acid esters by nitrogen dioxide. N. A. Khan(Univ. of Minnesota, Minneapolis). *J. Chem. Phys.* **23**, 2447–8(1955). NO_2 was very effective in causing the formation of the *trans* isomer of Me oleate at room temperature, whereas NO and N_2O were ineffective. The following mechanism was proposed: The NO_2 molecule, by virtue of polarization of the double bond, may partially draw the π electrons toward itself forming a molecule complex and allowing the *cis* molecule free rotation about the activated C–C bonds until it comes to the position of greatest stability. Under these latter conditions, the molecule in the stabilized position may tend to pull back its π electrons and revert to the stable *trans*-form and liberate NO_2. (*C. A.* **50**, 3861)

Diffusion coefficients of fatty acids and monobasic phosphoric acids in decane. J. R. White(Socony-Vacuum Labs., Paulsboro, N. J.). *J. Chem. Phys.* **23**, 2247–51(1955). The following diffusion coefficients $\times 10^6$ were measured in decane at 30.0°: BzOH 11.75, caproic acid 10.38, 2-ethylhexanoic acid 8.17, caprylic acid 8.88, capric acid 7.77, lauric acid 7.04, myristic acid 6.41, palmitic acid 5.80, stearic acid 5.33, oleic acid 5.50, didecyl phosphate 4.40, didodecyl phosphate 3.95, di-8-octadecenyl phosphate 3.35. The Stokes-Einstein hydrodynamic relation adjusted by an empirical coefficient represents the magnitude and variation of diffusion coefficients in the series of fatty acids if corrections are made for solute association and non-sphericity. The unmodified Stokes-Einstein equation predicts diffusion coefficients lower than those measured by a factor of approximately 2. (*C. A.* **50**, 3849).

Macauba oil and its industrial utilization. Moacir Silva. *Rev. quim. ind.*(Rio de Janeiro) **24**, 118–20(1955). Comparison is made between the oil of macaúba palm *(Acrocomia sclerocarpa)* and the oils of *A. totai* from Paraguay and *A. aculeata* from Trinidad (called Gru-Gru); the latter 2 have already been described. The fruit of *Acrocomia sclerocarpa* from Minas Gerais has the following composition, which does not differ appreciably from the 2 other species: epicarp 28%, mesocarp pulp oil 24, mesocarp endocarp 42%, almond 6%. The oil from the pulp is used only by local inhabitants. The seed-kernel oil shows the following characteristics: d^{15} 0.9212, n^{15} 1.4631, f.p. 23.6°, solidification point 18.3°, acid no. 3.40, saponification no. 239.70, ester no. 236.30, iodine no. (Hanus) 23.60, glycerol calculated 12.76. It is suggested that *Acrocomia sclerocarpa* and *A. totai* are identical trees. Their seed kernels give 65% of oil which is suitable for soap manufacturing and as a food. The pulp oil could be utilized for edible purposes or as a raw material for production of palmitic and oleic acid. (*C. A.* **50**, 2992)

On the Halphen Reaction for linseed oil. G. B. Martinenghi and G. Balestrini. *Olearia* **10**, 5–8(1956). The old Halphen Reaction used for detecting linseed oil in edible oils often gives rise to abnormal precipitates of doubtful significance. Experimental tests have been made which show that various interpretations may be given, above all with soya and rape-seed oils. The presence of free acids modifies the reaction. This would show the need for reexamining the conditions under which the reaction takes place, defining the methods by which it is made, and possibly extending it to acid oils and fatty acids. The studies are being continued.

The separation and determination of microquantities of lower aliphatic acids, including fluoroacetic acid. F. Bergmann and Ruth Segal(Dept. Pharmacology, The Hebrew Univ., Hadassah Medical School, Jerusalem, Israel). *Biochem. J.* **62**, 542–546 (1956). Fluoroacetate can be separated from formate and other straight-chain fatty acids by paper chromatography of the hydroxamates in ammoniacal ethanol-pyridine-water. Hydroxamic acids can be determined quantitatively by direct iodine oxidation to nitrite, which is used to form a red azo dye. The method has a lower limit of 0.5 micrograms/ml. of final solution. The new procedure involves two-dimensional paper chromatography of the hydroxamic acids, extraction, and formation of the dye.

Composition of delphinium seed oil. Mary J. Chisholm and C. Y. Hopkins(Div. of Pure Chem., National Research Council, Ottawa, Canada). *Can. J. Chem.* **34**, 459–464(1956). The fatty oil of delphinium seed(*Delphinium hybridum*[Hort.]) was examined. Fresh seed gave an oil composed mainly of glycerides but having 2.8% of free fatty acids. The oil from older seed contained about 50% of free fatty acids, apparently as a result of lipase action in the seed. The total fatty acids were found to include *cis*-11-eicosenoic acid (18%) and eicosadienoic acid(1%), the latter identified as tetrahydroxyeicosanoic acid. Other acids that were identified and the estimated percentages were: 9-hexadecenoic 1, palmitic 4, linoleic 16, oleic 53, and stearic 1. Spectrophotometric analysis indicated presence of 2.5% of octadecatrienoic acid. Eicosoic acids have not been observed previously in the seed oils of this plant family*(Ranunculaceae)*.

Oil from the seeds of "hippophae rhamnoides L." III. Some experiments on refining, hydrogenation and drying of the oil;

possible utilization of interfacial tension as a refining test. H. P. Kaufmann and A. Vazquez Roncero(Deutsches Institut fur Fettfossschung, Munster i. W.(Alemania). *Grasas y Aceites* 7, 21–26(1956). It was found that crude and refined oils show a characteristic behavior in their interfacial tension toward water. This fact was demonstrated with mixtures prepared of pure glycerides and sterines or phosphatides. Based upon this fact it is possible that a new physico-chemical method can be developed to test degree of refining. Other experiments were carried out on catalytic hydrogenation of the oil and of its drying properties, with the results obtained agreeing with the theoretical values to be expected from the fatty acid mixture used.

Physico-chemical studies on ground olive pastes. I. Interfacial phenomena oil-vegetable water (alpechin) (laboratory studies). J. M. Martinez Moreno, C. Gomez Herrera, and Srta. C. Janer del Valle. *Grasas y Aceites* 7, 5-20(1956). The olive oil extraction methods depending on surface properties, give high quality products but they also have serious drawbacks in that not all ground olive pastes can be treated in accordance with these principles. For this reason the system formed by the two liquid phases in the olive paste(oil and vegetable water) and several types of metallic surfaces, have been studied. The results show that in spite of the phenomenon's complexity it is possible to obtain better yields by studying the theoretical basis for such extractions.

Component acids of suinsh blubber and liver fats. S. P. Pathak, P. N. Suwal, and C. V. Agarwal(Dept. Industrial Chemistry, Banares Hindu Univ., India). *Biochem. J.* 62, 634–637(1956). The composition of blubber and liver fats of suinsh*(Platanista gangetica)* has been studied. The composition of suinsh-blubber fat in percentages of total fatty acid is: lauric, 0.3; myristic, 4.0; palmitic, 14.1; stearic, 7.3; unsaturated fractions are C_{14}, 4.2; C_{16}, 22.1; C_{18}, 39.5; C_{20}, 5.4; and C_{22}, 3.1. The composition of suinsh liver fat in percentages of total fatty acids is: myristic, 7.8; palmitic, 7.5; stearic, 4.5; unsaturated fractions are C_{14}, 5.8; C_{16}, 13.4; C_{18}, 30.6; C_{20}, 26.3; and C_{22}, 4.1.

Configuration of 9, 10-dihydroxystearic acid. W. J. Gensler and H. N. Schlein(Dept. of Chem., Boston University). *J. Am. Chem. Soc.* 78, 169–172(1956). 9,10-Dihydroxyoctadecanedioic acid, m.p. 121–122°, is shown to be the racemic form by resolution with brucine. The half-ester of this acid is reduced with sodium and alcohol to 9,10,18-trihydroxystearic acid. This acid is tosylated, the 18-tosyloxy derivative is converted to the 18-iodo compound, and the iodo group is removed with zinc to give *threo*-9,10-dihydroxystearic acid, m.p. 94.5–95°.

The loss of carotene from dried green crops during storage. The gradient of loss through a stack. V. H. Booth(Dunn Nutritional Lab., Milton Road, Cambridge). *J. Sci. Food Agr.* 7, 114–19(1956). Samples were taken in March from various spots in a commercial-type stack of dry lucerne meal in paper bags built in October. Moisture was determined immediately. Carotene contents were determined spectrophotometrically after chromatography of light-petroleum extracts on aluminum oxide. During storage, considerably more carotene(up to 43%) was lost from the middle sack than from the outer sack(average 16%). Only 8% of the initial carotene was lost in the meal in the outermost few cm. of the paper sacks exposed to air. Only part of the higher loss at the center of the stack was due to the fact that the temperature there was about 7° higher than in the outer sacks. The major cause of the different rates of loss was the protective effect of moisture taken up by the meal from air at the outer edges of the stack. This conclusion was supported by results of experiments in which dry and moistened meals were stored in polyethene bags, and in which meal was stored in a 2.5 meter tube open at one end. Loss of carotene was lowest in the higher moisture samples, and in the meal near the open end of the tube. The desirability of storing green crop meal of higher moisture content in order to increase carotene stability is discussed briefly.

Some seed fats of the Santalaceae family. H. H. Hatt and R. Schoenfeld(Div. Industrial Chem., Commonwealth Scientific and Industrial Research Orgn., Box 4331, G. P. O., Melbourne, Australia). *J. Sci. Food Agr.* 7, 130–3(1956). Seed fats of *Santalum acuminatum*(the sweet quandong), *S. murrayanum*(the bitter quandong), and *S. spicatum*(Australian sandalwood) were examined. Yields, properties, and compositions are reported; only the fat from the sweet quandong was examined in detail. This was calculated to contain the following percentages of fatty acids: palmitic, 3; stearic, 1; oleic, 50; linolenic, 2; and ximenynic, 44. Ximenynic acid(an octadecenynoic acid) was present in quantity in all three of the seed fats. Although oleic acid contents were high in all cases, linoleic acid was present only in small amounts or was absent. It is suggested that linolenic and ximenynic acids have a common precursor and that, in the *Santalum* genus, ximenynic acid is an intermediate between linolenic and oleic acids.

The component acids and glycerides of Erythrina indica seed fat. S. P. Pathak and L. M. Dey(Dept. Industrial Chem., College of Technology, Banarus Hindu Univ., Banaras, India). *J. Sci. Food Agr.* 7, 200–3(1956). Kernels of seeds from *Erythrina indica* yielded 17.8% of an oil. Its characteristics are reported. The glyceride composition was determined by crystallization of the fat from acetone and ether, and by ester-fractionation. The fatty acid composition(% by wt.) was: palmitic, 8.2; stearic, 8.0; arachidic, 4.3; behenic, 13.3; hexadecenoic, 3.1; oleic, 45.6; linoleic, 7.1; eicosenoic, 9.8; and lignoceric, 0.6. The glyceride composition was: 10.1% monounsaturated-disaturated; 79.4% diunsaturated-monosaturated; and 10.5% triunsaturated.

Novel antioxidant and inhibited wax composition. J. M. Robertson(The Texas Co.). *U. S. 2,741,563.* An antioxidant for use in wax and food compositions consists of the following (as parts by wt.): *tert*-butyl hydroxyanisole, 3 to 6; propyl gallate, 0.5 to 2; citric acid, 0.5 to 2; and ascorbic acid, 0.5 to 2.

Recovery of glycerol. J. Blair, W. A. Caldwell and T. A. McLellan(Imperial Chem. Indus., Ltd.). *U. S. 2,741,638.* A process is described for the recovery of glycerol from a concentrated fermentation mixture by adding an inert, inorganic solid and distilling the glycerol from the mixture under reduced pressure.

Method of extracting oil from mature, fresh coconut meats. P. Robledano(The Coconut Processes Inc.). *U. S. 2,742,487.* A mixture of oily and aqueous constituents is obtained by pressing fresh coconut meats. The extract is centrifuged without prior fermentation. The resulting cream is cooled until the aqueous phase is frozen and the emulsion has broken. The mixture is then warmed to 80° to 120°F. and centrifuged so as to recover the neutral oil.

Process for rendering animal fats. E. J. Dufault(Canada Packers, Ltd.). *U. S. 2,742,488.* Fatty tissues of animals are treated so as to denature fat-splitting enzymes. Walls of the fat cells are ruptured by mechanical disintegration. The mixture is then deaerated *in vacuo* at temperatures sufficient to liquefy the fat while retaining a large percentage of the moisture in the mass. Inert gas is admitted and then the mixture is coagulated by heating. The liquefied fat is finally separated.

Dehydrating and defatting animal tissues. F. G. Low(E. I. du Pont de Nemours & Co.). *U. S. 2,742,489.* Water and fat are simultaneously removed from animal tissue by comminuting the tissue, rolling the particles to flakes from 1/16 to 3/4 in. thick, extracting the flakes with a water immiscible fat solvent at 60° to 130°, and then distilling water and solvent from the extract.

Nickel catalyst for the hydrogenation of fats and oils. Shizuo Takumi. *Japan, 7012.* $NiSO_4 \cdot 6H_2O$ (280 g.) or 290 g. $Ni(NO_3)_2 \cdot 6H_2O$ in 2 liters of water is made weakly acid with sulfuric acid. An aqueous solution of sodium silicate is added until the ratio of $Ni:SiO_2$ is 3:1. The solution is heated, made alkaline, the precipitate filtered, washed, calcined and converted to nickel formate, which is heated with 200–750 ml. of refined hydrogenated oil at 230–50° for 1 hour with hydrogen. A small amount of Cu salt may be used together with nickel salt. (*C. A.* 50, 3784)

Recovering of solvent from extracted cake in the process of solvent extraction of fats and oils. Akiyoshi Tamaoki(Chiyoda Chemical Industries Equipment Co.). *Japan, 7237.* Hexane extracted soybean cake is dried to 0.05% of solvent with a rotary drier. During the drying carbon dioxide is passed through the drier and the gaseous mixtures of hexane and carbon dioxide are condensed to recover most parts of the solvent, and the vapor is led into the bottom of a carbon dioxide absorption tower where $3N$ ethanol amine is sprayed from the top. The hexane vapor comes out at the top of the tower and is cooled to −10° to recover the solvent. The loss of hexane is maintained to 0.3–0.4% in the whole process. The carbon dioxide is recovered and recycled. (*C. A.* 50, 3784)

Milk free of animal fats. Don A. F. Almeda. *Span. 217,452.* Animal milk is separated from the cream, and the skim milk has vegetable fat incorporated into it with an agitator which forms a stable emulsion of particle size like that of the cream in milk. Various oils, as listed in *Span. 217,450*, can be used. They may be partially hydrogenated first. Vitamin D can be added also. This milk product can be used for making cheeses, cream, pastry, candy, and chocolate. It is safer for adult consumption because cholesterol has been removed. (*C. A.* 50, 3673)

Preparation of azelaic acid from unsaturated fatty acids. I. Chlorohydrination of the double bond and further hydrolysis. Tadashi Kobayashi and Shoji Miyazaki(Govt. Chem. Ind. Research Inst. Tokyo). *Repts. Govt. Chem. Ind. Research Inst. Tokyo* 49, 73–7(1954). Into commercial oleic acid in 1 equivalent of aqueous sodium hydroxide was passed chlorine gas, and simultaneously just enough aqueous sodium hydroxide was added to absorb the hydrochloric acid produced. After the reaction was over, the pH was adjusted to 7 with sodium carbonate and the sodium chlorohydroxyoleate salted out with sodium chloride and heated 5 hours at 150° with 1.5 molar equivalents of aqueous sodium hydroxide and heating to form 37% 9,10-dihydroxystearic acid, m.p. 90–2° (from ethyl ether).

II. Oxidation of 9,10-dihydroxystearic acid with chromic acid. *Ibid.* 78–81. To 198 ml. mixed CrO_3 and sulfuric acid (196 g. and 376 g. per liter) was added slowly with stirring 30 g. of 9,10-dihydroxystearic acid at about 60° and the mixture was kept at 85–90° for 3 hours to form 45% azelaic acid, m.p. 105–6°.

III. Oxidation of sperm whale fatty acid with chromic acid. *Ibid.* 82–4. Into 210 ml. mixed acid of CrO_3 and H_2SO_4 (153 g. and 425 g. per liter) was poured slowly with stirring 30 g. sperm whale fatty acid at 80–90° and the mixture was kept at 80–90° for 6–7 hours to form 23.4% of dibasic (m.p. 89–96°) and 27.6% pelargonic acid. (*C. A.* 50, 3221)

A new preparation of 5-oxocapric acid. R. Lukes and J. Plesek (Vysoká škola chem.-technol., Prague). *Chem. Listy* 49, 1095–6 (1955); *Collection Czechoslov. Chem. Communs.* 20, 1253–5 (1955)(in German). The preparation of $AmCO(CH_2)_3CO_2H$ is described as an example of a general method of preparation of δ-keto acids by nitrosation fission of 1-alkyl-2-cyclopentanones. (*C. A.* 50, 4023)

Synthesis of unsaturated α-lecithins. I. L-α-(Dioleyl)-lecithin. E. Baer, D. Buchnea and A. G. Newcombe(Banting and Best Dept. of Medical Research, Univ. of Toronto). *J. Am. Chem. Soc.* 78, 232–236(1956). A procedure permitting the synthesis of the optically pure enantiomeric forms of unsaturated α-lecithins has been developed. The synthesis of L-α(dioleyl)-lecithin is described and its infrared spectrum, solubilities and other physical data are reported. The catalytic reduction of the L-α-(dioleyl)-lecithin offers a new route for the preparation of L-α-(distearoyl)-lecithin.

Multiple action lubricating composition. L. K. Schuster and H. Aurand. *U. S. 2,739,915.* A relatively stable, multiple action lubricating composition is described for use to reduce friction and lubricate the surface of a steel work piece during cold working. The composition is prepared from 21.6% of an organic amide lubricant which is made from 1 mole of a monoglyceride and 2 moles of fatty amide, 9.6% of phosphoric acid (70%), 18.8% of an acid zinc phosphate, and 50.0% water. The monoglyceride and amide are derived from mixed saturated and monounsaturated C_{16-18} fatty acids.

Solvent treatment. H. H. Young and H. C. Black(Swift & Co.). *U. S. 2,740,799.* Monoglycerides formed by the superglycerination of refined fats are purified by the removal of materials which tend to cause reversion of flavor and odor. For this purpose, the monoglyceride is dissolved in a short chain aliphatic ketone by heating. The mixture is cooled so that two phases separate, one of which contains the reversion-causing materials. Purified monoglycerides are recovered.

Coated nut meats. H. F. Neumann(Colgate-Palmolive Co.). *U. S. 2,742,364.* A process is described for the application of a molten bonding agent to nut meats. The bonding agent consists of at least one edible partial ester of an aliphatic alcohol with a higher fatty acid.

Thermal cleavage of ricinoleic acid and derivatives. F. Vierhapper and A. F. Orlicek(Zellwolle Lenzing A.-G.). *Austrian 184,174.* Ricinoleic acid, its esters, or mixtures of ricinoleic acid and its esters, obtained by re-esterification of castor oil with monovalent alcohols, especially MeOH, are decomposed by subjecting the gaseous starting materials to 450–600° for approximately 1 second at less than 300 mm. pressure, preferably by passing the gas mixture through tubes of approximately 5.0 cm. x 625 cm. and a flow of velocity of 0.1 g. per sec./sq. cm. section of the tube. The decomposition products are fractionated in columns to obtain heptanal and 11-dodecenoic acid or its ester, the unaltered starting materials being recycled. (*C. A.* 50, 4202)

Adipic dinitrile. Badische Anilin- and Soda-Fabrik Akt.-Ges. *Brit. 731,458.* Adipic dinitrile containing as an impurity 1-cyano-2-iminocyclopentane is purified by treating at temperatures below 120° with at least equivalent amounts (based on the amount of the impurity present) of acids. Satisfactory acids include sulfuric, phosphoric, hydrochloric, formic and many organic acids. The acids may form stable addition compounds with ketones or nitriles and form salts with the imino compound in the absence of water or split up the imino compound in the presence of water to form 1-cyano-2-cyclopentanone and the ammonium salt of the acid used. The adipic acid thus treated is then purified by fractional distillation. (*C. A.* 50, 3499)

Aliphatic dicarboxylic acids. H. Heinze, Elly Jagla, F. Kögler, and K. Rumscheidt(Badische Anilin-and Soda-Fabrik Akt.-Ges.). *Ger. 844,144.* The known process of preparing aliphatic dicarboxylic acids, such as adipic acid or its homologs, by oxidation of cyclic compounds, such as cyclohexanol, cyclohexanone, cyclohexylamine, or esters of cyclohexanol, at about 40–70° with HNO_3 in the liquid phase is carried out continuously by mixing the liquid starting materials in the lower part of a vertically installed reaction vessel and leading the mixture during the oxidation step from the bottom to the top at such a rate that the oxidation is achieved when the reaction mixture is drawn off from the top. (*C. A.* 50, 2660)

Waxy fatty acid diamides. Emil Finck and Georg Hummel (Badische Anilin- and Soda-Fabrik Akt.-Ges.). *Ger. 934,767.* The process of preparing waxy diamides of fatty acids by treating fatty acids or their functional derivatives with cycloaliphatic *p*-diamines corresponding to *Ger. 932,965* is improved by working in the presence of dicarboxylic acids capable of forming polyamides and, possibly, of optional aliphatic or aromatic diamines. (*C. A.* 50, 3499)

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• Biology and Nutrition

F. A. Kummerow, Abstractor
Joseph McLaughlin, Jr., Abstractor

Influence of esterification with palmitic and acetic radicals on the stability of vitamin A in aqueous microdispersion. R. Ponci and F. Gialdi(Univ. Pavia, Italy). *Il Farmaco* (Pavia) *Ed. sci.* 10, 766–71(1955). The palmitic ester of vitamin A is more stable than the acetic ester and permits the preparation of microdispersions which may be sterilized and are stable for a long time. The difference is attributed to the different solubilities in lipides in the presence of surface-active agents. (*C. A.* 50, 4458).

Contents of vitamin E in Swedish butter. V. Hellström and R. Andersson. *Vår föda* 7, 33–6(1955). Contents of tocopherol for butter from various locations and at different seasons are tabulated. Average values in γ per g. are February to June 1953, 15.7; August to September 1953, 27.0; November 1953 to May 1954, 14.7; July to October 1954, 24.8; November 1954 to June 1955, 12.5. (*C. A.* 50, 3667)

The total tocopherol (vitamin E) content of Dutch butter (with reference to the carotene and vitamin A contents). C. I. Kruisheer(Govt. Dairy Sta., Leiden). *Neth. Milk Dairy J.* 9, 275–90(1955). Tocopherol in butter samples from 18 different locations ranged from 8 to 34 (average 20) γ per g. butter and was in the pasture period 20–34 (average 24) and in the period of stable feeding 8–15 (average 12) γ per g. butter. There was no correlation between tocopherol and carotene in butter during the summer and a positive one during winter. The correlation between tocopherol and vitamin A was positive but of variable significance. No statistical basis was found for an antioxidant action of tocopherol during storage of the butter at —20° for 8–12 months, but summer butter seemed to incline more to oxidation defects than winter butter (*C. A.* 50, 3667)

Inositol-containing lipides. J. N. Hawthorne(Univ. Birmingham, Engl.). *Biochim. et Biophys. Acta* 18, 389–93(1955). Inositol phosphates released on hydrolysis of soybean, groundnut, and ox brain inositides were separated chromatographically. The inositol phosphatides of soybean and groundnut appeared to be identical. Inositol monophosphate, linked glycosidically to galactose or arabinose, was found in the hydrolysis products. Inositol diphosphate could not be isolated. It is suggested that in brain diphospho inositide glycerol esterifies both phosphates of inositol diphosphate. *Acetobacter suboxydans* attacked none of the inositol monophosphates studied, at least one of which had a free axial hydroxyl group (*C. A.* 50, 4260)

Polarographic determination of vitamin A. W. Keller and F. Weiss (Humbolt Univ., Berlin). *Z. anal. Chem.* 148, 26–9 (1955). Heyrovsky and Hasselbach (*C. A.* 43, 6692) have described a relatively easy polarographic procedure for determining carotene in vegetables. After this the carotene is iodized and the iodized product gives the e.m.f. curve as an anodic stage. The curves thus obtained are a function of the concentrations. With a mixture of gasoline and benzine as solvent and ammonium nitrate and methanol as conducting solution and iodation of a nearly saturated solution of iodine in gasoline, it was found that under similar conditions, vitamin A likewise shows an oxidation stage dependent upon the concentration. Anhydrous methanol proved a suitable solvent and a 1% solution of ammonium nitrate in methanol as addition electrolyte. The required iodine solution was prepared by dissolving 0.4% iodine in anhydrous methanol. (*C. A.* 50, 2083)

Use of high-fat diet in cases of fatty liver. G. M. Mindrum and Leon Schiff (Univ. of Cincinnati Coll. of Med., Cincinnati, O.). *Gastroenterology* 29, 825–36 (1955). Patients with fatty liver can absorb and utilize large amounts of dietary fat. During the period of high-fat intake the patients may show progressive clinical improvement along with the disappearance of excess liver fat and return of liver-function tests to normal. (*C. A.* 50, 3576)

Absorption and accumulation of vitamin A in newborn rats. J. C. Radice and Elena Musmanno. *Semana méd.* (Buenos Aires) 1955, II, 874–9. Investigations showed that newborn rats contain exceedingly small amounts of vitamin A in the body. The amount increased by ingestion of vitamin A, especially from the colostrum. Feeding vitamin A to pregnant rats gave litters with a higher content in the livers. An increase takes place during the first days of life. (*C. A.* 50, 1998)

Influence of thiamine on liver fat and free methionine. L. Castellani (Univ. Genoa, Italy) and G. Bertola. *Arch "E. Maragliano" patol e clin.* 10, 541–5 (1955). In 15 male adult guinea pigs injected with 10 mg. thiamine daily for 10 days the total fat, phospholipide, water, and free methionine contents of liver were 47.02, 20.72, 721 mg. per g. and 1.09 mg. % (controls 39.72, 21.21, 713, and 1.56) respectively. The fat increase is ascribed to enhanced synthesis, and the methionine decrease to its higher utilization for transmethylation processes. (*C. A.* 50, 1999)

Transport form of decanoic acid-1-C^{14} in the lymph during intestinal absorption in the rat. R. Blomstrand (Univ. Lund, Sweden). *Acta Physiol. Scand.* 34, 67–70 (1955). Only a minor part of the labeled decanoic acid was transported via the thoracic duct after absorption. The major portion of the C^{14} activity in the lymph lipides was in the form of triglycerides and the remainder as phospholipides. No significant amount of free decanoic acid was found in the lymph. (*C. A.* 50, 2789)

Transportation form of decanoic acid-1-C^{14} in portal and inferior vena cava blood during absorption in the rat. B. Borgström. *Acta Physiol. Scand.* 34, 71–4 (1955). Decanoic acid-1-C^{14} was fed to rats and the radioactivity of different lipide fractions of the portal and the inferior vena cava blood determined. The concentration of lipide C^{14} was 4.0- and 2.3-fold greater in the portal blood than in the vena cava in two experiments. The largest part of the activity in the portal blood, as well as in the inferior vena cava blood, was found in the form of free decanoic acid (64 and 74% of activity as the free acid). The concentration of the free acid in the portal blood during absorption was 4 to 5 mg. per 100 cc. (*C. A.* 50, 2789)

The relation of tocopherol content of animal tissues to types and amounts of vitamin E fed. Mary L. Quaife (Distillation Products Inds., Rochester, N. Y.). *Congr. intern. biochim., Résumés communs., 2e Congr. Paris* 1952, 221. In rats fed increasing amounts of *d*-α-tocopherol, concentration of *d*-α-tocopherol in tissues increased with the amounts fed. The order of uptake in different tissues in diminishing order was: liver, body fat, skeletal muscle, and blood serum. The log of *d*-α-tocopherol concentration in the liver 3 days after dosage varied with the log of the amount fed. The slope of the curve was approx. 0.7, possibly permitting a new method of measuring vitamin E activity. Liver storage at 3 days, relative to *d*-α-tocopherol as unity, was *d*-α-tocopheryl acetate 1.0, *dl*-α-tocopherol 0.43, *dl*-α-tocopheryl acetate 0.49, and *d*-γ-tocopherol 0.025. The maximum uptake of *d*-α-tocopherol by the rat liver and body fat was at about 24 hrs. after feeding free or esterified *d*-α-tocopherol. It was 3 times greater for *d*-α-tocopherol than for its ester. Body fat also took up more free than esterified *d*-α-tocopherol. The liver may temporarily contain as much as 10% of the dose of *d*-α-tocopherol, but body fat stores less than 1%. (*C. A.* 50, 2000)

New olive oil emulsion for lipase and new observations concerning serum lipase. H. Tauber (Univ. of North Carolina, Chapel Hill). *Proc. Soc. Exptl. Biol. Med.* 90, 375–8 (1955). The preparation of a stable olive oil emulsion with the aid of gum acacia and Carbopol 934 is described. With this substrate (in phosphate buffer of pH 6.56) serums of different species of mammals showed different lipase activities. Some had no activity. Wheat germ lipase splits olive oil only slightly. Highly purified cholinesterase is almost inert, hence is not involved in fat digestion. Hemoglobin is a powerful inhibitor of serum lipase and crude lime bean trypsin inhibitor is a powerful activator. A method for demonstrating antilipase in serum is presented. Serum lipase is different from pancreatic lipase. (*C. A.* 50, 3512)

The use of radioactive-labeled protein and fat in the evaluation of pancreatic disorders. W. W. Shingleton, M. H. Wells, G. J. Baylin, J. M. Ruffin, and A. Saunders (Duke Univ. School of Med., Durham, N. C.). *Surgery* 38, 134–42 (1955). Studies in dogs after pancreatectomy with labeled protein and fat showed marked impairment of digestion and absorption as revealed by blood radioisotope levels. Digestion and absorption of I^{131}-labeled protein did not occur during the test period of 3 hrs. in the stomachs of dogs with experimental pyloric obstruction. Of 10 patients with proved chronic pancreatic disease (either relapsing pancreatitis, carcinoma, or cystic fibrosis) 9 showed some impairment of digestion and absorption after ingestion of protein labeled with I^{131}. A more marked impairment of digestion and absorption was found in 9 patients given a test meal of I^{131}-labeled fat. Studies to date indicate that the use of a test meal of I^{131}-labeled fat in patients with suspected chronic pancreatic disease will yield information of real value in diagnosis and therapy of these disorders. (*C. A.* 50, 4355).

Will fat emulsions given intravenously promote protein synthesis? Metabolic studies on normal subjects and surgical patients. T. B. Van Itallie, F. D. Moore, R. P. Geyer, and F. J. Stare (Harvard School of Public Health, Boston, Mass.). *Surgery* 36, 720–31 (1954). Studies are described on the metabolic effects of 15% fat emulsions administered intravenously to 2 healthy volunteer subjects and 2 surgical patients. In 1 normal subject on a diet inadequate in calories and marginal with respect to protein intake, N and K deficits diminished appreciably when intravenous fat was given and increased when the period of fat administration terminated. In a 2nd normal subject on a diet inadequate both in calories and protein, no effect of intravenous fat on N balance was discernible when the caloric intake was decreased by approximately 70% as a result of discontinuance of intravenous fat administration. However, cessation of fat administration was followed by a marked increase in K excretion. Two surgical patients who had undergone sub-total gastrectomy were given enough intravenous fat for the 6-day period following surgery (inclusive of the operative day) to maintain their caloric intakes in the 1800–2000 calorie range. The extra calories from this source did not measurably alter the characteristic metabolic response pattern to this type of surgical procedure. (*C. A.* 50, 4319)

Diverse malformations of the rat fetus in relation to the time of administration of vitamin A in excess. A. Giroud and M. Martinet. *Compt. rend. soc. biol.* 149, 1088–90 (1955). Administration of large doses of vitamin A to the pregnant rat results in a complex assortment of abnormalities in the fetuses. Some differences in these abnormalities observed after giving the vitamin at different stages of gestation are described. (*C. A.* 50, 4324)

Rates of synthesis and the transport of plasma fatty acid fractions in man. S. R. Lipsky, J. S. McGuire, Jr., P. K. Bondy, and E. B. Man (Yale Univ.). *J. Clin. Invest.* 34, 1760–5 (1955). The rate of incorporation of acetate-1-C^{14} into the fatty acids of the phospholipide and nonphospholipide fractions of the plasma of man were determined under normal circumstances. Since the formation and turnover of the fatty acids of the nonphospholipides was much more rapid than that of the phospholipide, it can be that the former serve as the major vehicle for the transport of fatty acids in the plasma. A similar study was made under conditions whereby the utilization of acetate for the biosynthesis of cholesterol was significantly decreased by prefeeding with large quantities of squalene. This failed to alter the incorporation of acetate into the fatty acids. Hence the acetate normally used for cholesterol synthesis when large quantities of squalene are administered does not appear to contribute materially to the formation of fatty acids. (*C. A.* 50, 4343)

Intestinal absorption of phospholipides in the rat. R. Blomstrand(Univ. Lund, Sweden), *Acta Physiol. Scand.* **34**, 147–57 (1955). The intestinal absorption of phospholipides was studied by feeding rats with lymph fistulas phospholipides containing oleic acid-1-C^{14}, palmitic acid-1-C^{14}, glycerol-C^{14}, or P^{32}. The recoveries of the absorbed radioactivity were the same whether oleic acid-1-C^{14} or palmitic acid-1-C^{14} was incorporated into the phospholipides. The major activity in the lymph lipides was associated with the glycerides, but after feeding phospholipides containing either oleic acid-1-C^{14} or palmitic acid-1-C^{14} a greater amount of activity was obtained in the phospholipides than after feeding oleic acid-1-C^{14} or palmitic acid-1-C^{14} as glycerides or as the free acid. A small amount of the lymph glyceride glycerol was derived from the fed phospholipide glycerol, suggesting a synthesis from a partial glyceride. The relative specific activity of the lymph phospholipide glycerol was about 30%, indicating that a significant amount of the fed phospholipides had been absorbed without previous splitting of the glycerol-phosphate linkages. Thus extensive hydrolysis of the phospholipides takes place during absorption, but this is not complete. (*C. A.* **50**, 2790)

Intestinal absorption of phospholipides in the rat in the absence of bile. R. Blomstrand(Univ. Lund, Sweden). *Acta Physiol. Scand.* **34**, 158–61(1955). In the absence of bile, about 68% of the fed labeled phospholipides were absorbed. Only about ⅓ of the normal amount of labeled fatty acids were transported via the thoracic duct in the absence of bile. (*C. A.* **50**, 2790)

Studies on the origin of milk fat. 1. The location of tritium in stearic acid produced by the catalytic addition of tritium to elaidic acid. R. F. Glascock and L. R. Reinius(The National Inst. for Res. in Dairying, Univ. of Reading, England). *Biochem. J.* **62**, 529–534(1956). Stearic acid labeled with tritium by catalytic addition, with a palladium-black catalyst, was fed to a goat, and the unsaturated fatty acids of the fat from two milk samples were separated by the lead-salt method. These were found to be radioactive. From these unsaturated acids, after dilution with carrier oleic acid, dihydroxystearic acid was prepared. This was found to be radioactive thus formally proving the biological conversion of stearic into oleic acid in the goat. The dihydroxystearic acid from each sample was decomposed into pelargonic aldehyde and azelaic semialdehyde. The significance of the findings is discussed.

2. The secretion of dietary long-chain fatty acids in milk fat by ruminants. R. F. Glascock, W. G. Duncombe and L. R. Reinius. *Ibid.* **62**, 535–541(1956). Tritium-labelled stearic acid was administered orally, either as free acid or as triglyceride, to lactating goats, and to a cow, and the appearance of radioactivity in milk fat and its distribution in milk constituents were studied. Measurable activity was found in the milk fat 4 hours after administration of labelled fat, the maximum specific activity occurring within 24 hours. Activity was still detectable in milk fat secreted up to 37 days after administration. High specific activities were found in the long-chain acids, both saturated and unsaturated, of milk glycerides and phospholipids. The results obtained suggest that the contribution of dietary fat to milk fat was not more than about 25% and that the characteristic short-chain acids of the milk fat of ruminants do not arise mainly by degradation of long-chain acids.

Effects of vitamin E, N,N^1-diphenyl-para-phenylene diamine, and fish liver oil on reproduction in turkeys. L. S. Jensen, J. S. Carver, and J. McGinnis(Dept. Poultry Science, State College of Washington, Pullman). *Proc. Soc. Exp. Biol. & Med.* **91**, 386–388(1956). Fish liver oil added to the diet greatly accentuated a deficiency of vitamin E in turkey breeders. A reduction in fertility due to a vitamin E deficiency was suggested. Both *alpha* tocopheryl acetate and DPPD counteracted the deleterious effect of fish oil on hatchability. With fish oil in the diet, tocopherol levels of the yolks of eggs were not appreciably increased by either vitamin E or DPPD even though hatchability was near maximum.

The total extraction of Parathion from olive oil and its specification. T. Lassandro Pepe and G. Storace. *Olearia* **10**, 9-11 (1956). In view of the danger of the toxic effects of even minimal doses of Parathion(3 p.p.m.) may have on the human organism, and of the difficulty of its total extraction from olive oils obtained from olives that have been sprayed with that insecticide, the authors propose a method of total extraction for purpose of strict dosage. Their method is based on the fact that Parathion and olive oil react differently to petroleum ether. To assure total extraction the authors avail themselves of the T.L.P. apparatus devised by one of them, and which is usually employed for determining other substances.

Decrease of coenzyme A content in fatty liver. Clara Severi and A. Fonnesu(Institute of General Pathology, Univ. of Milan, Italy). *Proc. Soc. Exp. Biol. & Med.* **91**, 368–370(1956). Coenzyme A has been estimated in both normal and CCl_4-fatty livers. The level of coenzyme A is decreased in fatty livers as compared with normal controls. The possible role of this change in the formation of fatty liver is discussed.

Acetal phosphatides in the adipose tissue of newborn rats. C. L. Yarbro and C. E. Anderson(Dept. of Biochem. and Nutrition, School of Med., Univ. of North Carolina, Chapel Hill). *Proc. Soc. Exp. Biol. and Med.* **91**, 408–409(1956). The changes in the acetal phosphatide, phospholipid and total lipids have been followed in the adipose tissues and livers of newborn rats over first three weeks of life. As the adipose tissue fills with fat, the acetal phosphatide and total phospholipid, initially quite elevated, decrease rapidly to only trace amounts by the fifth to eighth day of life. These results indicate that acetal phosphatides and phospholipids are involved in some manner in the laying down of fat in adipose tissue.

Role of vitamin E (α-tocopherol) in poultry nutrition and disease. A review of recent literature. S. R. Ames(Research Lab., Distillation Products Industries, Division of Eastman Kodak Co., Rochester, New York). *Poultry Sci.* **35**, 145–159(1956). In evaluating the vitamin E adequacy of a poultry feed one must consider not only the α-tocopherol content of the components of that feed but also the stability of the α-tocopherol in the feed and the availability of the α-tocopherol to the particular species which will consume it.

Metabolic factors and the development of fatty livers in partial threonine deficiency. Dorothy Arata, Gyda Svenneby, J. N. Williams, Jr., and C. A. Elvehjem(Dept. of Biochem., College of Ag., Univ. of Wis., Madison, Wis.). *J. Biol. Chem.* **219**, 327–333(1956). The relative rates of fat accumulation and endogenous oxidation in the liver from animals fed a diet partially deficient in threonine have been studied. The content of liver DPN as well as the effect of adding excess DPN *in vitro* on endogenous liver oxidation was also studied. From correlation of all of our results, it has been concluded that both a defect in DPN production and the improper metabolism of endogenous DPN in the liver are major factors in liver fat accumulation in a partial threonine deficiency.

Trichloroethylene-extracted and expeller-type meat scraps and tallow in the diets of young chickens. S. L. Balloun, G. A. Donovan, and R. E. Phillips(Dept. of Poultry Husbandry, Iowa State College, Ames, Iowa). *Poultry Sci.* **35**, 163–167(1956). Dietary additions of tallow improved chick growth, the improvement being less marked when the diet contained expeller-type meat scraps. When chicks were grown to 12 weeks, 2 or 4 per cent tallow in the diet improved feed conversions.

The effect of insulin on the pathways of conversion of glucose to fatty acids in the liver. J. M. Felts, Ruth G. Doell, and I. L. Chaikoff(Dept. of Physiology of the Univ. of California School of Medicine, Berkeley, Calif.). *J. Biol. Chem.* **219**, 473–478 (1956). The fractions of the fatty acid-C^{14} that arose via the Embden-Meyerhof and alternative pathways were estimated from the relative conversions of carbons 1 and 6 of glucose to fatty acids. The injection of insulin in the diabetic rat resulted in a 3-fold increase in the fraction of the fatty acid-C^{14} that arose via the phosphogluconate oxidation pathway.

Reproduction and lactation of rats fed glyceryl trilaurate-containing diets. L. P. Dryden, P. F. Gleis, and A. M. Hartman (Dairy Husbandry Research Branch, United States Dept. of Ag., Beltsville, Maryland). *J. Nutrition* **58**, 335–339(1956). Experiments were carried out with rats fed certain diets containing glyceryl trilaurate plus methyl linoleate as a fat source. With such diets, other workers have found a deficiency of an unidentified factor required by the female rat to rear her young successfully. No such deficiency was found in the present work.

Effect of diet on the ether-extract content of chicken muscles. R. W. Lewis, P. E. Sanford, T. A. Ericson and R. E. Clegg (Kansas State College, Manhattan). *Poultry Sci.* **35**, 132–137 (1956). The muscle ether-extract content of chicks was significantly influenced by the type of diet fed from 0 to 8–10 weeks of age. Birds fed a low-fat purified-type diet deposited more ether-extractables in light and dark muscles than those fed diets of higher fat content which contained natural ingredients.

Absorption of vitamin A in aqueous and oil solutions by depleted New Hampshire chicks. R. L. Squibb, J. E. Braham, and N. S. Scrimshaw(Instituto Agropecuario Nacional, Instituto de Nutricion de Centro America Y Panama, Guatemala, C. A.). *Poultry Sci.* **35**, 73–76(1956). A total of 468 New Hampshire chicks were depleted for studies on the absorption rates of aqueous and oil soluble vitamin A. The subcutaneous injection of 1,800 I. U. in an oil solution increased serum levels to 5 μg./100 ml. after a four-day period while 7,500 I. U. injected subcutaneously or intramuscularly increased serum levels to 33 μg./100 ml. and 29 μg./100 ml., respectively, after a 7-day period. When 7,500 I. U. of vitamin A in aqueous solution was injected intramuscularly, maximum absorption was observed in a 24-hour period and an average level of 66 μg./100 ml. obtained. When 7,500 I. U. of an aqueous or oil soluble vitamin A were given orally, maximal serum levels of 50 μg./100 ml. and 51 μg./100 ml., respectively, were observed within 24 hours.

The absorption of plant sterols and their effect on serum and liver sterol levels. L. Swell, T. A. Boiter, H. Field, Jr. and C. R. Treadwell(Dept. of Biochem., School of Medicine, George Washington Univ., Washington, D. C.). *J. Nutrition* **58**, 385–398(1956). The data in the present study suggest that plant sterols are absorbed through the same mechanism as cholesterol and that plant sterols may be converted to cholic acid, cholesterol, or a cholesterol intermediate in the intestine or liver.

The determination of higher fatty aldehydes in tissues. J. B. Wittenberg, S. R. Korey, and F. H. Swenson(Dept. of Biochem. and the Division of Neurology of the Dept. of Medicine, Western Reserve Univ., Cleveland, Ohio). *J. Biol. Chem.* **219**, 39–47 (1956). A specific method for the estimation of the higher fatty aldehydes present in tissue lipides is presented. By reaction of *p*-nitrophenylhydrazine with lipides, the aldehydes are converted to their *p*-nitrophenylhydrazones, which are estimated colorimetrically; 0.1 to 7 μ moles of aldehydes may be measured. Only the higher aldehydes of tissues are determined quantitatively. Lower aldehydes and keto acids do not interfere. Data on the aldehyde content of rat tissues and rat liver particulate fractions are presented.

Ether-soluble catabolites in keratinous tissue. A. Bollinger and R. Gross(Gordon Craig Research Lab., Dept. of Surgery, Univ. Sydney, Australia). *Research Correspondence* **9**, S13–S14(1956). Extraction of plucked feathers from doves and pigeons with ether or other organic solvents yielded about 2% by wt. of solid substances which contained about 30% steroids and about 30% fatty acids. These lipides were apparently not derived from the preen glands but may be by-products of the process of keratinization. The occurrence of similar products in other species is discussed briefly.

The chemical composition and nutritional value of bacon. L. C. Baker(The Lyons Labs., Cadby Hall, Kensington, W. 14). *J. Sci. Food Agr.* **7**, 179–86(1956). Data, including fat contents, are presented for various cuts of fresh pork, bacons and hams cured in different ways, and the effect of frying on the chemical composition and nutritive value of bacon.

Need for research on soybean oil meal. L. L. McKinney and J. C. Cowan(Northern Utilization Research Branch, Agr. Research Service, U. S. Dept. Agr., Peoria, Ill.). *Soybean Digest* **16**(6), 14–16(1956). The increased availability of high-protein feed concentrates during the past 20 years is due primarily to soybean oil meal which now accounts for about 50% of the total. The nutritive value of soybean oil meal is reviewed and discussed with respect to known and unknown vitamins, the estrogenic activity of the isoflavone fraction, and the saponins.

Seed meal detoxification. E. Eagle and F. A. Norris(Swift & Co.). *U. S. 2,740,718.* Toxic pigment glands in cottonseed meal are exposed and rendered substantially non-toxic by heating the meal with an aqueous solution of salts selected from the group: sodium sesquicarbonate, sodium carbonate peroxide, sodium chloride, trisodium phosphate, and sodium hypochlorite.

Method of forming a confection. A. A. Horvath. *U. S. 2,740,-720.* The confection is prepared from a sugar base which contains a complex of lecithin with the proteinaceous residue of alcohol-extracted soya.

Process of concentrating carotene and tocopherol in palm oil by thermal diffusion. A. L. Jones and E. C. Milberger(The Standard Oil Co.). *U. S. 2,741,643.* A thin film of palm oil is passed between two surfaces made of heat-conductive inert material placed 0.01 to 0.15 inches apart. One surface is heated to a higher temperature than the other so as to maintain a temperature gradient across the film of oil. The temperature of the hottest surface is not over 300°F. and that of the cooler not below 105°. A film of carotene- and tocopherol-enriched fraction forms near the cooler surface and can be separated from the lighter-colored fatty acid-enriched fraction which concentrates adjacent to the hotter surface.

Method of obtaining carotene from palm oil. P. Blaizot(Inst. de Recherches pour les Huiles et Oleagineux). *U. S. 2,741,644.* Palm oil is subjected to alkaline alcoholysis with a low molecular weight alcohol. Glycerin is removed. The esters are distilled below 110° at a pressure of 0.001 to 0.0001 mm. Hg in a short path distillation apparatus. The undistilled residue contains a high content of biologically active natural carotenes.

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• Drying Oils and Paints

Raymond Paschke, Abstractor

The action of boron fluoride on linseed oil. Anon. *Paint Varnish Production* **46**(2), 30(1956). A report of recent work by J. Petit and J. Cazes.

The 1955 review of the paint industry. Anon. *Paint Varnish Production* **46**, 6(1956). This review covers under 38 headings resins, pigments, plasticizers, solvents, derivatives, raw materials, intermediates, various coatings, application, chemical reactions, manufacture, handling, safety, testing, and miscellaneous subjects. Included are subject, author, and advertiser index, suppliers and trade name directories, and a list of trade associations.

Isocyanates in surface coatings. W. E. Allsebrook(Lewis Berger Ltd.). *Paint Manuf.* **25**, 459(1955). Developed particularly in Germany, isocyanate products, although expensive, have interesting properties as surface coatings. Here, the author reviews the development of these materials and the wide range of their uses, giving details of experimental work. The scope of their application is extensive, including wood, rubber and fabric surfaces.

New copolymer drying oil. A. P. Antykov. *Zhur Priklan. Khim* **28**, 1215(1955). A drying-oil compound was prepared from the dicyclopentadiene fraction obtained during purification of aromatic compounds. This fraction b. 55–173° for some specimens and 41–172° for others obviously contained higher condensation products and other hydrocarbons; its I no. ranged from 127 to 372. This substance was formulated with equal weights of natural drying oils(from linseed, sunflower, and other similar sources), and in the presence of 0.03–0.05% PbO_2, BaO_2, or H_2O_2 forms colorless, water-resistant, elastic shiny films. The product can be recommended for outdoor uses. (*C. A.* **50**, 3776)

An evaluation of organic coatings for use in cathodically protected domestic hot-water tanks. B. G. Brand, F. W. Fink, G. A. Hudson, and E. R. Mueller(Battelle Memorial Institute). *Paint Varnish Production* **46**(1), 25(1956). The chief requirements of organic coatings in this use are alkali resistance, and water impermeability. Coatings based on epoxy-phenolic resin combinations appear to offer promise for use in coating cathodically protected hot-water tanks.

Resistance to weathering of gray paints applied by brushing and spraying. K. Buser. *Werkstoffe U. Korrosion* **6**, 281(1955). The brushed coats weathered better than the sprayed ones. (*C. A.* **50**, 2186)

Effect of gamma radiation on the stress-strain properties of unpigmented soya alkyd resin wet films. L. L. Carrick and S. C. Sun(U. of Mich.). *Paint Varnish Production* **46**(2), 30(1956). The indications are that gamma irradiation in the tested dosage has little effect on the physical properties of soya-bean oil alkyd resin films submitted to gamma irradiation in the wet state. The gamma radiation moderately reduces the induction drying period of wet films. The maximum loads and the breaking loads for irradiated wet films of the soya-bean oil alkyd investigated occur at nearly the same elongation value.

The paint chemists in industry. R. C. Covington(Midwestern Color Works, Minneapolis, Minnesota). *Minnesota Chemist* **8** (2), 9(1956). The role of the chemist in changing the manufacture of paint from an art to a science is discussed. The important milestones are described.

Colorimetric measurements on phthalocyanine pigments. G. Ghisolfi. *Ind. vernice*(Milan) **9**, 181(1955). (*C. A.* **50**, 2987)

The relationship between gloss and surface roughness of paint films. M. Hess(Mander Brothers Ltd., Wolverhampton, Eng.). *Oil Colour Chemists' Assoc. J.* **39**, 185(1955). It is shown that a measurable relationship exists between surface roughness and degree of gloss or mattness of paint films. A type of instrument is described with which investigations of surface roughness have been carried out. Suggestions are made for further applications of the method used, particularly for the prediction of the life of paint films from observations of the development of surface roughness.

Oxidation and dehydration of fats to obtain drying oils. II. The dehydration of hydroxylated fats. J. M. Huesa Lopez(Inst. grasa, Seville, Spain). *Grasas y aceites* **6**, 23(1955). Experiments are reported on the dehydration of castor oil with $CuSO_4$ as a catalyst, and on oxidized grape seed and cotton seed oils with WO_3 as catalyst. (*C. A.* **50**, 2187)

The effect of impact tests on life of paint systems. M. Kronstein and W. H. Kapfer(N. Y. Univ.). *Paint Varnish Production* **46**(4), 33(1956). Methods were developed and applied to four groups of zinc and iron phosphate pre-treatments, for the purpose of studying the impact resistance of coating systems. These systems consisted of a steel surface which was pretreated with a metal phosphate and then painted with an organic coating. By means of the electrographic print technique, permanent records were obtained, which have been found to agree well with direct visual evaluation of the test panels. A method of comparing the results of the electrographic printing records by measuring their change in reflectance during the salt-fog exposure of the panels is described.

Blown oils in the paint and ink industries. J. Huesa Lopez. *Grasas y aceites*(Seville, Spain) **6**, 187(1955). A review with 19 references. (*C. A.* **50**, 2185)

Studies on stand oil formation. A. Maschka and G. Muller(Inst. Technol., Vienna). *Monatsch* **86**, 397(1955). Boiling of eleostearic acid results in an intermolecular Diels-Alder condensation with formation of cyclohexene dicarboxylic acids. β-Eleostearic acid and its Me ester dissolved in freshly distilled Me stearate, was heated for 8–12 hours under oxygen-free CO_2. The course of reaction was followed by determination of conjugated dienes and trienes, iodine no., molecular weight d_4^{40} and n_D^{40}. The reaction product was analyzed by fluorescence chromatography of the benzene solution adsorbed on Al_2O_3. At 285° the concentration of conjugated diene goes through a maximum after the conjugated trienes have almost disappeared; this suggests formation of additional conjugated diene by thermal isomerization. This effect is practically eliminated at 250°, when the reaction is characterized by an initial rise in conjugated diene, concurrent with a sharp decrease in conjugated triene; the iodine no. (a measure of the sum of dienes and trienes) remains almost consistent. The dimeric reaction product is a highly viscous yellow oil; the determination of the conjugated diene indicates that both possible condensation mechanisms (depending on whether the lone double bond involved in the Diels-Alder condensation is a central or a terminal one) take place to an equal extent. No trimers or bicyclic compounds were found. The rate of stand oil formation of the eleostearic acid is nearly double that of the Me ester. The reaction follows 2nd-order kinetics. (*C. A.* **50**, 1335)

Application of a radioactive method in the paint industry. J. Petit and R. Lumbroso. *Peintures, pigments, vernis* **31**, 876 (1955). An elementary discussion of the properties of α- β-, and γ-radiations is given. The leaching of toxic ions in an antifouling paint was studied by preparing a $ZnCrO_4$ pigment containing 250-day Zn^{65}. Glass was painted with a compound containing linseed oil 25, turpentine 10, pigment 65, and cobalt drying agent 0.2%. Soaking in fresh and in 4% NaCl salt water showed that 20% of the zinc was leached in the first 9 days with no further leaching up to 150 days. The radioactive decay curve of the paint samples showed a 12.5-hour decay; this indicates Cu as a probable impurity in the ZnO starting material. (*C. A.* **50**, 2987)

Drying by infrared radiation generated by electroconductive glass. E. Plumat and E. Deliere(Union verreries mecan. belg., Gilly). *Ind. Chim. belge* **20**, 961(1955). (*C. A.* **50**, 617)

Changes of coatings under light and heat. Light- and heat-resistant coatings. B. F. H. Scheifele. *Deut. Farben-Z.* **9**, 341 (1955). The degree of changes occurring in a coating subjected to heat or light is affected by prevailing temperature, by wave length of the incident radiation, and by atmospheric conditions; the ability of the coating to absorb or radiate light or heat is only a secondary factor. The literature on the effect of light and heat is reviewed. (*C. A.* **50**, 1335)

Chlorinated rubber paints. F. K. Shankweiler(Hercules Powder Co.). *Paint Varnish Production* **46**(4), 27(1956).

Vinyl resins for industrial coatings. R. M. Thakkar(Nat. Carbon Co. Ltd., Bombay, India). *Paintindia* **5**(10), 33(1956). A review.

The use of contrast ratio in the measurement of hiding power. D. Tough(Imp. Chem. Ind. Ltd., Manchester, Eng.). *Oil Colour Chemists' Assoc. J.* **39**, 169(1955).

New method of softening-point determination of varnish resins. J. Trnka. *Chem. Průmysl* **5**, 168(1955). (*C. A.* **50**, 3776)

Dielectric constant of coatings. F. H. W. Wachholtz(Chemisch-Tech. Adviesburo, Haarlem, Neth.). *Deut. Farben-Z.* **9**, 417(1955). (*C. A.* **50**, 2988)

The drying of printing inks. R. Walter. *Deut. Faben Z.* **9**, 387 (1955). Printing inks are dried by oxidation, heat polymerization, capillarity of the paper, evaporation, and steam (moisture-set), or combinations of these. (*C. A.* **50**, 1335)

Changing frontiers in the analytical chemistry of paint materials. C. Whalley(Paint Res. Station, Teddington, England). *Oil Colour Chemists' Assoc. J.* **39**, 193(1956). Applications of new analytical techniques to the analysis of paint materials are reviewed. These techniques include microchemical methods, colorimetric methods, paper and vapour-phase chromatographic separations, and the use of ion-exchange resins and "complexones" or chelating reagents. The value of the techniques is illustrated by analytical procedures for various components of the paint system.

Drying oil for paints and varnishes. A. Carrillo Arocena and E. Crespo Riges. *Span. 212,341.* A neutral, polycyclic compound with drying properties is obtained by fractionation and thermal isomerization of pine rosin. (*C. A.* **50**, 2989)

Detergents

Lenore Petschaft Africk, Abstractor

The surface and interfacial viscosity of soap solutions. B. C. Blakey and A. S. C. Lawrence(Univ. Sheffield, Engl.). *Discussions Faraday Soc.* **18**, 268–76(1954). Monolayers of pure soap solutions at an air interface were studied by an oscillating-disk method, by which Newtonian viscosity could be distinguished from systems showing anomalous surface viscosities. For Newtonian liquids, the plot of log amplitude vs. no. of swings gives a straight line whose slope is related to the viscosity. By this method, the absence of surface viscosity for solutions of pure Na laurate was confirmed, since the method is extremely sensitive to amphiphilic impurities(about 1 part in 1 million of soap solutions(1%) gives a 1:1 complex film with the soap and large increases in surface viscosity). The high surface plasticity of an impure soap was reduced by a frothing method in which the impurity that is responsible for the surface plasticity is removed in the froth. Drying of hexadecyl pyridinium bromide over P_2O_5 in vacuo and extraction with ether in a Soxhlet for 90 hrs. resulted in a pure soap solution, as shown by the surface-plasticity measurements. Although amphiphiles of long hydrocarbon chain length produce non-Newtonion surface viscosity in soap solutions, the surface viscosity undergoes a decrease beyond the critical micelle concentration. This is attributed to solution of the amphiphile from the monolayer into the interior of the soap solution. No surface plasticity is found at an interface between soap solution and hydrocarbon(toluene) even when an amphiphile is present (*C. A.* **49**, 14430)

The use of synthetic fatty acids for soap manufacture. N. M. Bokov(Fat-Oil Combine, Krasnodar). *Masloboino-Zhirovaya Prom.* **21**(7), 18–20(1955). The physical characteristics of toilet and household soaps of 72 and 60% fatty acid content were affected but slightly by synthetic fatty acids in amounts and chain lengths as follows: 7–8% of C_7–C_9(I) or C_{10}–C_{16}(II); up to 15% of C_{17}–C_{21}(III) + I or II and 4–5% of II and III; whereas 40–47% soap containing 4–5% of II and III or the 40% soap made entirely of I, II or III would not congeal and remained soft and pasty. (*C. A.* **50**, 4531)

Diffusion measurements in the study of the structure of soap solutions. N. Brudney and L. Saunders. *J. Pharm. and Pharmacol.* **7**, 1012–20(1955). A minimum in the overall diffusion coefficient/concentration curve for the Na dodecyl sulfate occurs at a concentration limit close to the critical micelle concentration. Relative concentrations of simple soap and micelles are calculated. Differential diffusion rates for K laurate in concentrated solution indicate that the increase after the minimum point is due to electrical effect. (*C. A.* **50**, 4531)

Soaps in synthetic rubber. D. Druesedow(B. F. Goodrich Chemical Co., Akron, Ohio). *Soap and Chem. Specialties* **32**(4), 41–4 (1956). The use of soaps in synthetic rubber manufacture is reviewed. On a percentage basis, the soap used is about 6% of the rubber production. The large volume soaps now used are rosin soaps, fatty acids, mixed rosin acid-fatty acid soaps, and potassium tall oil soaps. Future problems and developments are outlined.

Soap fitting. H. Manneck(Imhausen-Werke G.m.b.H., Witten, Ger.). *Seifen-Öle-Fette-Wachse* **81**, 429–31(1955). The corresponding concentrations of NaOH, Na_2CO_3, NaCl, fatty acids, and total electrolytes are determined for the neat soaps and nigers from the same fat charge containing 15% "Leimfette" (coconut, palm-kernel, and similar fats). These data can be used to make adjustments during the soap-fitting process. (*C. A.* **50**, 5311)

Measuring crude glycerine quality. C. S. Miner, Jr. (Miner Laboratories, Chicago, Ill.). *Soap and Chem. Specialties* 32(4), 45–7(1956). Attempts have been made to find tests which will detect poor quality glycerine crudes. Crudes are defined as those that will not give distilled glycerine of satisfactory quality in normal refining operation. The tests that showed some promise include: (1) Determine nitrogen content of crude. (2) Distill with steam under vacuum. Observe foaming. (3) Measure color in distillate. (4) Heat distillate at 125°C. for two hours. Measure color. Results are listed. Some correlation was possible with these tests but none of them offer conclusive testing procedures.

Soil-resistant treatment of fabrics. J. M. Salsbury, T. F. Cooke, E. S. Pierce and P. B. Roth (Am. Cyanamid Co., Bound Brook, N. J.). *Am. Dyestuff Reptr.* **45**, 190–202(1956). The mechanism of dry soiling is considered and the action of a soil-resistant finish is proposed. A laboratory method for measuring the dry-soiling properties of fabric is described. Methods are given for applying soil-resistant materials in the laboratory and under commercial conditions. The results of laboratory tests are compared with actual wear tests on carpets made of a number of different fibers. A newly developed soil-resistant finish is described. In small quantities it greatly reduces the soiling properties of fabric. The main advantages of the soil retardant over earlier types are said to be a softer hand and little or no effect on the light fastness of dyes.

Concentration determination of surface-active textile assistants in aqueous solutions. H. Schwerdtner. *Textile u. Faserstofftech.* **5**, 569–72(1955). Methods for determining anionic and cationic surface-active agents in aqueous solutions are reviewed, and the author's own method is described (titration with Rose Bengale as indicator) which is especially applicable to the quantitative determination of aliphatic anionic substances with 10–20 carbon atoms in their chain. Practical examples are given and results are tabulated. 20 references.

Foaming agents in aqueous solution. G. E. Villar and M. Soto. *Bol fac. ing. y agrimensura Montivideo* **6**, 219–30(1955). An apparatus is described for determining the comparative foaming action of surface-active agents. A glass tube 40 cm. long by 2.5 cm. in diameter was used with 20 ml. of solution, and air was injected at a constant rate of 40 ml./min. for a period of 2 minutes. Various types of porous diffusers were tried but were troublesome. The most satisfactory method of injecting air was to use a glass tube with a measured orifice. Increasing the size of the orifice increased the bubble size and resulted in less stability and volume of foam. Decreasing the orifice size had the opposite effect. With a 2.5 mm. diameter orifice, the concentration of foaming agent was plotted against volume of foam. A critical concentration is reached, probably representative of saturation in the interphase film, beyond which final foam volume remains constant despite increase of foaming-agent concentration in the liquid. The main disadvantage of the data obtained is that it is all strictly comparative and of use only when comparing one agent against others under similar conditions. (*C. A.* **50**, 2902)

Determination of triphosphate in commercial triphosphate and detergents built with triphosphate. H. J. Weiser, Jr. (Procter & Gamble Co., Cincinnati, Ohio). *Anal. Chem.* **28**, 477–81 (1956). Tris(ethylenediamine) cobalt(III) ion has been shown to be a precipitant for triphosphate ion in an acid solution. A tendency for pyrophosphate to coprecipitate was reported. Compensation for such interference is made in this method by use of a calibration curve and carefully controlled precipitation conditions. The reproducibility of the method was determined by carrying out replicate determinations on commercial triphosphate and triphosphate built anionic detergents.

Rational methods of producing high quality refined soap. H. Zilski (Braunschweig, Ger.). *Soap, Perfumery, Cosmetics* **29**, 309–11(1956). A new type of soap plodder, the MIAG Strangpilator, is described.

Acid guanidine soap. Jirô Mikumo, Yoshio Mitsui, and Tôru Kusano (Nagoya Univ.). *J. Chem. Soc. Japan, Ind. Chem. Sect.* **58**, 595–6(1955). It was found that acid guanidine soap was formed by equimolecular addition of stearic acid with guanidine stearate in organic solvents. Recrystallization from organic solvents (e.g. acetone-methanol) showed no change in the composition and properties. Its m.p. was 71.3–72.9°. Its formula is $RCOO\cdot C(NH_2)_2\cdot RCOOH$.

Synthetic detergent compositions. P. T. Vitale and Muriel E. Liftin (Colgate-Palmolive Co.). *U. S. 2,733,213–4.* It has been discovered that the simultaneous presence of higher aliphatic amide type compounds and tripolyphosphates in synthetic detergent compositions of the alkyl aryl sulfonate type gives valuable detersive characteristics to such compositions in both hard and soft water.

Non-soap synthetic detergent bar. A. H. Lewis (California Research Corp.). *U. S. 2,734,870.* A synthetic detergent bar having excellent physical and detersive properties is prepared by forming a mixture of molten paraffin wax and a higher fatty acid, heating the mixture to a temperature in the range 250 to 325°F., dissolving an alkyl benzene sulfonate detergent having 10 to 20 carbon atoms in its alkyl group in the hot mixture and cooling the solution to form a macroscopically homogeneous solid.

Method of producing solid soap products from potash soaps and products obtained thereby. M. L. Sheely and E. P. Glynn (Armour & Co). *U. S. 2,738,335.* A solid soap product from tallow fatty acids is made by converting tallow fatty acids having a titer of at least 40° to their potassium salts to obtain a potassium tallow soap containing considerably greater than 4% by weight of water, reducing the water content of the potassium tallow soap to within the range of 1 to 4% water by weight, and forming the potassium tallow soap into a solid soap product in marketable condition and substantially nonhygroscopic.

Improvements in detergent compositions. Diversey Corp. *Brit. 741,453.* A washing composition comprised of finely divided particles of alkaline material, which does not powder during storage, causes the pH of its water solution to be below 8 during the period that the particles are in direct contact with the skin. Each particle is coated with a neutral coating resulting from the reaction of a coating of a sulfonic acid with a portion of the alkaline detergent. Substantially all of the coating dissolves before the alkaline material is reached, resulting in less skin irritation.

Improvements in detergent compositions. Unilever Ltd. *Brit. 741,454.* A germicidally potent detergent composition consists of soap or anionic soapless detergent or non-ionic soapless detergent, or a mixture thereof, and a minor proportion of a thiuram sulfide such as N-tetramethyl thiuram disulfide.

Synthetic detergent in tablet form for domestic and industrial use. Pagani and C. S. A. *Brit. 741,637.* A synthetic detergent in tablet form for domestic and industrial use consists of a powdered detergent material and a substance capable of developing a gas on contact with water such as bicarbonate and boric acid to increase solubility of the tablet.

Liquid-detergent compositions. Colgate-Palmolive-Peet Co. *Brit. 742,567.* It has been found that, if a liquid detergent consists essentially of an aqueous solvent medium, a detergent comprising a water-soluble salt of an alkyl sulfuric acid ester, having from 10 to 14 carbon atoms in the alkyl groups, and, as a builder for the detergent, an ammonium salt of an amide-polyphosphoric acid, such a liquid detergent does not salt out. The detergent and the builder are present in such proportions that the composition is homogeneous.

Cleaning compositions containing tarnish inhibitors. E. E. Ruff (Lever Brothers Co.). *U. S. 2,733,215.* Polyphosphate and detergent compositions which normally tarnish copper, and nickel and copper alloys are provided with a tarnish inhibitor such as hydroxamic acid or water-soluble salts.

Process of treating soap particles. R. E. Compa (Colgate-Palmolive Co.). *U. S. 2,738,332.* Soap particles are treated to minimize dust and/or to reduce the tendency of the soap to lump in use by spraying on the surface of the preformed water-soluble soap particles with the aid of agitation, an aqueous solution of a water-soluble salt of a higher fatty acid monosulfate monoglyceride and drying the particles.

Surface-active compounds and detergent compositions containing same. H. A. Goldsmith (Colgate-Palmolive Co.). *U. S. 2,738,333.* An improved detergent composition consists of a higher alkyl aryl sulfonate detergent, and a higher fatty acid ester of a N-hydroxyalkyl urea.

Process of producing a synthetic detergent of good color. H. S. Sylvester (Colgate-Palmolive Co.). *U. S. 2,738,365.* A synthetic detergent of good color is produced by admixing a water-soluble alkali metal silicate and an alkali metal hypochlorite with an aqueous slurry of a water-soluble salt of an organic sulfuric acid reaction product possessing detersive properties, said silicate and hypochlorite being used in amounts sufficient to effect bleaching of said salt and a reduction in viscosity in the slurry of the organic sulfuric acid reaction product.