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The assistance of L. H. Mason and Miss Janina Nowakowska in performing several analyses by gas chromatography, and the advice and encouragement of E. L. Griffin are gratefully acknowledged.

REFERENCES

1. Barson, N., and Beyer, G. H., Chem. Eng. Progress, *49*, 243–252 (1953).
2. Brice, B. A., Swain, M. L., Herb, S. F., Nichols, P. L. Jr., and Riemenschneider, R. W., J. Am. Oil Chemists' Soc., *29*, 279–287 (1952).
3. Freeman, S. E., U.S. 2,278,309 (1942).
4. Gloyer, S. W., Ind. Eng. Chem., *40*, 228–239 (1948).
5. Goebel, C. G., U.S. 2,482,761 (1949).
6. Goebel, C. G., J. Am. Oil Chemists' Soc., *24*, *65–68* (*1947*).
7. Kadesch, R. G., J. Am. Oil Chemists' Soc., *31*, 568–573 (1954).
8. Moore, D. T., Ind. Eng. Chem., *43*, 2348–2355 (1951).
9. Sutton, W. J., and Moore, H. E., J. Am. Oil Chemists' Soc., *30*, 449–451 (1953).
10. Teeter, H. M., Bell, E. W., O'Donnell, J. L., Danzig, M. J., and Cowan, J. C., J. Am. Oil Chemists' Soc., *35*, 238–240 (1958).

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# Erratum

IN THE PAPER, "Determination of the Extent of Oxidation of Fats" (J. Am. Oil Chemists' Soc., *34*, 606, 1957), the conversion factor reported for 1 millimol of peroxide to millimols of aldehyde by thermal decomposition of peroxide in rapeseed oil has been found to be too high. By using vacuum and helium instead of pyrogallol-washed nitrogen, which apparently was not oxygen-free, during the thermal decomposition the conversion factor 0.3 was obtained.

The equation given for the calculation of the oxidation degree will be

$$\text{aldehyde value} + 3 \times \text{the peroxide value}$$

The values for the effect of bleaching and of total refining in reducing the content of oxidation products will become 20–40% and 45%, respectively.

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# • *Letter to the Editor*

SOME TIME AGO I discovered a method for detecting coconut oil in the presence of other fats and oils. I have not seen the reaction mentioned in the literature as a rapid qualitative test for coconut, and I would like to give the details to your Society for comment.

The test consists simply of shaking vigorously a small quantity of the fat or oil with an equal quantity of alcoholic caustic potash. In the presence of coconut oil as little as 5% distinct "fruity" odor results.

The method has been extensively tested in this laboratory, and we have found that in all cases the results have been conclusive.

J. GASH
Provincial Traders Pty. Ltd.
Brisbane, Australia

[Received May 19, 1959]

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

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

## • Fats and Oils

BRANCHED-CHAIN FATTY ACIDS. II. ALKALI FUSION OF SOME BRANCHED-CHAIN FATTY ACIDS. R. Lukes and J. Hofman (Czechoslov. akad. věd, Prague). *Collection Czechoslov. Chem. Communs.* 24, 744-54 (1959). (*C. A.* 53, 11202)

INCREASE OF ACTIVITY OF HYDROGENATION CATALYST FOR MAKING HARD ISOÖLEIC ACID. G. I. Kolesnidov (Inst. Food Ind., Krasnodar). *Izvest. Vysshikh Ucheb. Zavedenii, Pishchevaya Tekhnol.* **1958**(5), 48-52. With the same type of catalyst, development of isoölates in hydrogenation of oil is greater the greater the activity of the catalyst. A nickel-copper combination catalyst induced much greater isoölates development than did catalyst derived from nickel formate, even when the catalytic activities were equal. (*C. A.* 53, 10805)

ACTIVITY OF BINARY HYDROGENATION CATALYSTS. B. N. Tyutyunnikov and I. Z. Koshel (Polytech. Inst., Kharky). *Masloboino-Zhirovaya Prom.* 25(2), 14-5 (1959). The productivity of nickel as a catalyst in nickel-cobalt mixture was found to vary with the nickel content of the mixture. At 25% level it was appreciably lower, and at 50% and above slightly higher than the productivity of nickel alone. The low catalytic activity of cobalt was not improved by the addition of copper. (*C. A.* 53, 10805)

NICKEL CATALYST FOR THE HYDROGENATION OF OILS. II. D. D. Nanavati and J. S. Aggarwal (Natl. Chem. Lab., Poona). *J. Proc. Oil Technologists' Assoc. India, Kanpur* 12, 83-91 (1958). Nickel formate catalyst, when supported on neutral carriers of the type, Hyflo-Supercel, decolorizing carbon, or silica gel (*catalyst; carrier* ratio of 2:1) was found to be preferable for increasing the rate of hydrogenation of oils to unsupported catalyst. These neutral supports were superior to acid carriers of the type of fuller's earth or kieselguhr both as regards consistency of hydrogenated product and selectivity of hydrogenation. Supercel was the most satisfactory of the tested supports. The basic carbonate of nickel was also tried and produced satisfactory hydrogenated oils except that they required more time for hydrogenation as compared to the corresponding formate catalyst. (*C. A.* 53, 10805)

SYNTHESIS OF SOME OCTENOIC ACIDS. J. A. Knight and J. H. Diamond (School of Chem. and the Eng. Exper. Station, Georgia Inst. of Techn.). *J. Org. Chem.* 24, 400-03 (1959). The preparation and properties of *trans*-4- and -6- and of *cis*-3-, -4-, and -6-octenoic acids are reported in this paper. The freviously reported isomers, *trans*-3- and *cis*-2-octenoic acids, are also reported in this paper. The *cis* acids were prepared by the catalytic semihydrogenation of the corresponding octynoic acids. The *trans* acids were obtained either directly or indirectly starting with a *trans* alkenoic acid obtained by a Knoevenagel condensation. Physical properties, including infrared spectra, were determined for all of the acids and most of the intermediates. The infrared spectra of the *trans* compounds showed strong absorption in the region of 10.2-10.35 microns. None of the *cis* compounds showed absorption in this region.

An Improved Procedure for Preparing Glycerol Ethers. S. C. Gupta and F. A. Kummerow (Dept. of Food Technology, University of Illinois, Urbana, Ill.). *J. Org. Chem.* 24, 409-11 (1959). In the present method for the preparation of glycerol ethers, the procedures of Davis *et al.* and that of Baer and Fischer were combined. The stearyl *p*-toluenesulfonate was condensed with the potassium salt of 1,3-benzylideneglycerol or of 1,2-isopropylideneglycerol in benzene. By this modified procedure, the crude glycerol ethers from stearyl alcohol were obtained in 90–96% yield on the basis of stearyl *p*-toluenesulfonate.

Rectified Olive Oils and Epoxides. B. Foresti (Univ. Catania, Sicily), M. Jacona and A. Giuffrida. *Boll. inform. ind. olearia e. saponiera* 4, 89–97 (1958). So-called "A" and "B" rectified olive oil were shown not to contain epoxide substances. These were found in small amounts in some stages of the refining process (0.35% during the autoclaving of husk oil), but they disappeared after the treatment with bleaching earths and active carbon. (*C. A.* 53, 10806)

Determination of the Acid Number of Vegetable Oils by the Potentiometric Titration Method. V. M. Akimov and O. A. Ulitin (Inst. Food Ind., Krasnodar). *Izvest. Vysshikh Ucheb. Zavedenii, Pishchevaya Tekhnol.* **1958**(5), 162–6. Apparatus and method are described, and it is recommended for dark-colored fatty oils. (*C. A.* 53, 10806)

Utilization of Cottonseed Cake and Other By-Products and Co-Products of the Cottonseed-Oil Industry. T. V. Subba Rao (Tata Oil Mills Co. Ltd., Bombay). *Oils & Oilseeds J.* (India) 10(12), 4–9 (1958). A review with 29 references. (*C. A.* 53, 10806)

Chemical Composition and Physiochemical Properties of Oil Obtained from Cottonseeds Type 01298. P. A. Artamonov (All-Union Fats Sci. Research Inst., Moscow) and A. S. Mamedov. *Masloboino-Zhirovaya Prom.* 25(2), 8–9 (1959). The constant of cottonseed oil from Azerbaijanian seeds type 01298 and Central Asian seeds, respectively, are given as follows: $d^{20/4}$ 0.9197, 0.9251; viscosity 10.62, 11.20; *n* 1.4710, 1.4720; solidification point −3, 0; flash point 308,—; iodine number 110.20, 106.75; thiocyanogen number 65.20, 63.57, and saponification number 190.40, 189.50. The seeds contained, respectively: saturated acids (palmitic, stearic, and arachidonic) 21.61, 25.25; oleic 26.98, 22.55; and linoleic acid 47.03, 47.60%. (*C. A.* 53, 10806)

Researches on the Value of Seeds of the Common Castor-Oil Plant (Ricinus Communis) from Polish Cultures in 1949. Z. Leyko and J. Purzycka-Wolińska. *Zeszyty Nauk. Szkoły Głównej Gospodarstwa Wiejskiego, Warszawa. Rolnictwo* No. 2, 65–74 (1957) (English summary). The content of oil averaged in whole seeds 44.2% and in kernel 56.2%. Saponification value was 179.3, iodine number 86.0, index of refraction 1.477–1.478, and acid number below 3. (*C. A.* 53, 10807)

Field Trials with Oenothera Lamarckiana and Chemical Investigations of the Oil from Its Seeds. P. Mazhdrakov and As. Popov. *Bulgar. Akad. Nauk. Izvest. Khim. Inst.* 5, 209–16 (1957) (Rusian and German summaries). The seeds contained 22.0–25.8% oil having the following characteristic values: $n^{25/D}$ 1.4760–1.4763, acid number 1.5–2.5, iodine number (Kaufman) 150–151.6, hexabromide number 8.5, saponification number 191.6–192.3. It is a yellow-green oil with no specific odor; when cooled to 0° it does not give a precipitate; it contains 10.6% oleic acid, 73.8% linoleic acid, 6.5% saturated fatty acids, and 2.6% linolenic acid. It belongs in between the drying and semidrying oils and can be used as a valuable substitute of linseed oil. (*C. A.* 53, 10807)

Removal of Phosphoric Ester Residues from Olive Oil. I. Parathion. B. Foresti (Univ. Catania, Sicily) and A. Giuffrida. *Boll. inform. ind. olearia e saponiera* 4, 67–73 (1958). Laboratory experiments for removing parathion residues from olive oil by extraction with water-acetone are reported. The optimal water content of acetone was 10%. The extraction temperature had no practical influence. The acid content of oil did not influence the extraction equilibrium. The process allowed the lowering of the above residue to harmless levels. (*C. A.* 53, 10808)

Influence of Alkali Refining on the Unsaponifiable of Low-Grade Pressed Olive Oil. A. Cucurachi (Staz. Agrar. Sper., Bari, Italy). *Ann. sper. agar.* (Rome) 12, 1469–81 (1958) (English summary). During alkali refining of low-grade pressed olive oil, there is a slight increase in unsaponifiable in the neutral oil, followed by decreases during decolorizing and deodorizing. In the foots and oil extracted from the bleaching earth, the unsaponifiable is approximately 1½ times that in the neutral oil. Ethyl ether extracts more unsaponifiable than does petroleum ether; however, with the exception of sterols, the material soluble only in ethyl ether was not identified. Hydrocarbons are increased by refining and bleaching, not being carried down in the foots or adsorbed by the bleaching earth, but are decreased by deodorization. Approximately 87% of the paraffin hydrocarbons consist of squalene. The sterol content is reduced during neutralization and bleaching and appear in the foots and bleaching-earth extract. Sterol content is not affected by deodorization. (*C. A.* 53, 10808)

A Method of Determination of the Oil Yield of the Pastes from the Demargarination. G. B. Martinenghi (Studio ricerche olii, Milan). *Olii minerali, grassi e saponi, colori e vernici* 36, 37–40 (1959). The pastes show a different composition according to the method of demargarination, and may contain waxes, pseudo-resins, sterols, phosphatides, and other unsaponifiable matters, so that the yield in oil is not coincident with the true oil content. A method for measuring the oil content is suggested. (*C. A.* 53, 11861)

The Rate of Paraffin Oxidation and the Quality of the Acids Produced as Affected by the Catalyst Content [of the Mixture]. A. A. Perchenko. *Masloboino-Zhirovaya Prom.* 25(2), 22–4 (1959). The time required to oxidize paraffins at 130–107° by atmospheric oxygen with 0.01 and 0.14% of potassium permanganate and manganese dioxide, respectively, as the catalysts up to the point when the reaction mixture contained 36–8% of insoluble fatty acids, was minimal and resulted in the production of acids of good quality. The rate of oxidation was decreased, however, and the quality of acids produced significantly declined, when permanganate and manganese dioxide were maintained at 0.02 and 0.035 to 0.07% levels, respectively. Increase in permanganate and manganese dioxide concentrations up to 0.14 and 0.35% and above resulted in retardation of the oxidative processes. (*C. A.* 53, 10805)

Oil Contents of Japanese Rapeseeds Cultivated in 1955. Toshimi Akiya and Osamu Nakayama (Food Research Inst., Tokyo). *Shokuryô Kenkyûsho Kenkyû Hokoku* 11, 1–3 (1956). Determinations of water and oil in 130 samples were made. (*C. A.* 53, 10806)

Industrial Utilization of the Waste Liquors from Extraction of Olive Oil. Growing of Yeasts for Animal Feed. J. A. Fiestas Ros de Ursinos (Inst. Grasa y sus Derivados, Seville, Spain). *Grasas y aceites* (Seville, Spain) 9, 248–58 (1958). Yield of yeast equivalent to 45% of the sugar content of the olive waste water were obtained with *Torulopsis utilis* and ammonium sulfite as the source of nitrogen. From 40 g. of yeast (dry weight 22%) and 13 g. of nitrogen per 100 g. of sugar the indicated yields were produced in 7–8 hours. The amount of aeration was not significant. (*C. A.* 53, 10808)

Insecticide Residues in Olive Oils. Maria E. Alessandrini, G. F. Lanforti, G. C. Ramelli, and A. Sampaolo. *Rend. ist. super sanitá* 21, 1097–115 (1958). Samples of olive oils from various olive orchards, treated in the 1957 campaign against *Dacus oleae*, showed decreasing insecticide residues as compared with previous campaigns resulting from improved techniques. (*C. A.* 53, 10808)

Glycolipides of Higher Animals. K. Lauenstein (Univ. Cologne, Ger.). *Colloq. Ges. physiol. Chemie 8, Mosbach/Baden* **1957**, 147–54 (Pub. 1959). A review with 36 references. (*C. A.* 53, 11563)

Interaction of Lipases and Lipoxidases in the Oxidation Process of Fats. V. L. Kretovich, M. P. Popov, and D. A. Cheleev (Technol. Inst. Food Ind., Moscow). *Izvest. Vysshikh Ucheb. Zavedenii, Pishchevaya Tekhnol.* **1958**(5), 23–7. Hydrolysis of soybean and corn oils with lipase of the castor-oil plant increased the rate of their oxidation by lipoxidase. Hydrolysis of oat oil only slightly stimulated its oxidation by lipoxidase. (*C. A.* 53, 11697)

A Study of Polyunsaturated Acids in Olive Oils and the Possibility of Identifying Adulteration of Virgin Olive Oils with the Refined Oils. F. Albonico and M. Vitagliano (Univ. Naples). *Olearia* 12, 5–15 (1959). Thirty-one virgin olive oils had iodine numbers from 76.4 to 84.4, average 79.6; conjugated dienes 0.078–0.189% (average 0.125); oleic acid 67.2–75.8% (72.7); linoleic 4.17–10.43% (6.7); linolenic 0.48-0.96% (0.66); no conjugated trienes, tetraenes or arachidonic acid were found. It is concluded that no relation can be shown between geographical location and polyunsaturated acids; that adulteration by seed oils such as soya or peanut is difficult to prove; and that adulteration by refined olive oil can be detected as low as 5% because of the presence of the trienes in the latter. (*C. A.* **53**, 11697)

Olive Oil Deacidified with Ion-Exchange Resins. B. Foresti and G. D'Arrigo. *Olearia* 12, 16–8 (1959). Analysis of an olive oil that was mixed with Zerolit FF for four hours and filtered show that total acidity as oleic acid drops from 4.3 to 0.006% and that iodine number, unsaponifiable material, total hydrocarbons, squalene, sterols, β-carotene, and tocopherols remain essentially the same. (*C. A.* **53**, 11698)

Fat Content of Animal Rations. B. Maymone (Ist. Sper. Zootecnico, Rome). *Ann. sper. agrar.* (Rome) 12, Suppl. 1–11 (1958) (English summary). A review with 24 references. (*C. A.* **53**, 11707)

Verification of Virgin Olive Oil Purity by Spectrofluorimetry. F. DeFrancesco. *Olearia* 12, 19–22 (1959). The spectrofluorimetric curves (RCA 931A) are distinctive enough to identify easily the type of oil and any possible adulteration of virgin oil with as low as 5% refined oil. (*C. A.* **53**, 11698)

The Pretreatment of Cocoa Butter for the Determination of Its Melting Point. J. F. Reith (Univ. Utrecht, Neth.). *Rev. intern. chocolat.* **13**, 466–8 (1958) (in English). The two pretreatments of cocoa butter investigated are (A) the method accepted by a conference at Paris in 1955 and (B) the Steiner method (*C. A.* **51**, 9476). In A, about 50 g. of dry cocoa butter (melted 50–60° and filtered) is poured into a beaker placed in a water bath at 25° and stirred constantly (about ½ hour) until a paste is obtained. The beaker is then placed in a water bath at 32–3° and the cocoa butter stirred until it is changed into a liquid turbid cream which is poured into molds of a temperature of 20–2° and stored at that temperature for at least two hours. In B the paste (as obtained in A) is placed in molds at 32° and stored 1–2 days at 32° and then for at least two hours at 20–2°. To determine the melting point a sample of the treated cocoa butter is placed (about 10 mm. from the bottom) in a U-shaped capillary tube (1.4–1.5 mm. in diameter), tied to a thermometer that is graduated in 0.1°, and the whole heated slowly in a beaker of water placed in a water bath. The flow melting point is the temperature at which the cocoa butter is sinking into the bottom of the capillary tube and the final melting point is when no turbidity can be seen. B is not recommended because the melting points found after this pretreatment are: (1) less reproducible than those found after A, (2) higher than found by the methods used in trade laboratories, whereas the results after A are about the same, (3) obtained at least one day later than by A, and (4) arbitrary as well as those obtained from A. (*C. A.* **53**, 11692)

Characteristics of Separate Fractions of Vegetable Oil Subjected to Molecular Distillation. II. N. I. Kozin and Yu. D. Zlatopol'skaya. *Sbornik Nauch. Rabot Moskov. Inst. Narod. Khoz.* **1956**(8), 32–46; *Referat. Zhur., Khim.* **1957**, Abstr. No. 2758. Linseed, hempseed, corn, cotton, soybean, peach kernel, peanut, and mustard seed oil were distilled at $10^{-3}$ mm. mercury pressure and temperature of 120–200°, and fractions obtained over 20° intervals are analyzed. (*C. A.* **53**, 11863)

A Rapid Method for the Determination of Fat in Cereals. D. B. West and A. F. Lautenbach (J. E. Siebel Sons' Co., Chicago). *Proc. Am. Soc. Brewing Chemists* **1957**, 56–9. A method is described and equipment is illustrated for determining the oil content of cereal adjuncts. The procedure is based on a column extraction with petroleum ether. It is quick and accurate, and the ease of duplicability of results was demonstrated in a series of tests with a number of corn products. (*C. A.* **53**, 11684)

The Fat Constants in Wheat Flour. M. I. Bagrina and N. A. Rudakova. *Sbornik Stud. Nauch. Rabot Moskov. Inst. Narod. Khoz.* (Moscow Gosudarst. Izdatel. Torgovoĭ Lit.) **1956**, 82–6; *Referat. Zhur., Khim.* **1957**, Abstr. No. 17608. The fat constants of flour of different brands differ only a little from each other. Fresh flour had the same fat content as flour after storage. (*C. A.* **53**, 11686)

Effect of Synthetic Antioxidants on Stability of Milk Fat and Sweet-Cream Butter. M. Zalashko. *Molochnaya Prom.* **20**(2), (1959). The well-known fat antioxidants are reëvaluated. The esters of gallic acid, especially propyl and dodecyl gallates, were highly effective in prolonging the induction period of milk fat and sweet-cream butter during their exposures to ultraviolet light and heat at 102°. (*C. A.* **53**, 11691)

The Kinetics of Destabilization of High-Fat Cream (Emulsion) During Its Solidification. A. K. Grishchenko (Technol. Inst. Refrigeration Ind., Leningrad). *Izvest. Vysshikh Ucheb. Zavedeniĭ, Pishchevaya Tekhnol.* **1958**(5), 124–8. Amount of separation of free fat depends on the final temperature of cooling, duration of exposure to the temperature, concentration of fat in the cream, and stability of adsorbed-hydrated film on the fatty globules. These relations are graphically presented for cream of 70–85% fat. (*C. A.* **53**, 11692)

Influence of the Emulsifier on Structure Formation in Margarine Emulsion. N. A. Petrov, L. E. Chernenko, and V. E. Markovich (Technol. Inst. Food Ind., Moscow). *Izvest. Vysshikh Ucheb. Zavedeniĭ, Pishchevaya Tekhnol.* **1958**(5), 39–42. Three emulsifiers prepared by esterification of $C_{16}$ and $C_{18}$ fatty acids with glycerol, lecithin, and oxypolymerized oil emulsifier were compared in hydrogenated fat and margarine (hydrogenated fat plus 16% water) with regard to improving plasticity or thixotrophy. Oxypolymerized oil was the poorest emulsifier. The presence of water (16%) improved plasticity 1.5 times. In tests on binary combinations of emulsifiers certain combination may give maximum effect, and 2 maximums were evident in various ratios of certain binary systems. (*C. A.* **53**, 11692)

Efficiency of Antioxidants for Increasing the Induction Period of Butterfat. O. G. Kotova (Dairy Inst., Vologda). *Izvest. Vysshikh Ucheb. Zavedeniĭ, Pishchevaya Tekhnol.* **1958** (5), 53–6. Propyl gallate and dihydronorguaiaretic acid efficiently inhibited oxidation of butterfat. The antioxidant effect of these is improved when carotene is also present. Very efficient extension of the induction period of butter is obtainable by wrapping in aluminum foil. (*C. A.* **53**, 11692)

Determination of Phosphorus and Neutral Glycerides in the Course of Refining Peanut Oil. Part I. R. Carlotti (Inst. Corps Gras). *Rev. Franç. Corps Gras* **6**, 289–301 (1959). An analytical study of peanut oil refining has been made. Methods of determining phosphorus of various types and establishment of a coefficient of conversion of phosphorus to lecithin has been made. Phosphorus has been determined colorimetrically by measurement of phosphomolybdate concentrations. Neutral glycerides have been determined by chromatographically separating them from other components on alumina columns using chloroform as solvent (20 g. alumina were used per 0.5 g. of oil). The removal of phosphorus by degumming, and the decolorization and deodorization of peanut oil were also discussed.

Some Aspects of Viscosity Determinations with Capillaries. A. Pochan, *Chim. et ind.* **81**, 667–80 (1959). Experimental results obtained by the author with the tensiometer-viscosimeter A.R.P. (an apparatus which allows in one manipulation, at various temperatures, the absolute determination of viscosity and capillary tension of liquids) invalidate the present theory on surface tensions. As far as industrial practice is concerned, the Poiseuille law may be considered as a good approximation, but on a scientific ground a thorough study of capillary phenomena is necessary.

Paper Chromatographic Separation of Phosphatides. L. Hornkammer, H. Wagner, and G. Richter (Pharmaceutical Inst., Univ. Munich). *Biochem. Z.* **331**, 155–161 (1959). Using a specially prepared formaldehyde paper and a butanol-glacial acetic acid-water mixture as solvent, crude phospholipids (phosphatides) were reproducibly separated. Malachite green was found to be a new specific reagent for detection of lysophosphatides. $R_f$ values are reported for 17 phosphatide prepations.

Rationalization in the Oil Industry. W. Demper (Hamburg). *Fette, Seifen, Anstrichmittel* **61**, 354–56 (1959). The author explains that the application of modern apparatus and rationalized oil extraction and oil refining processes can lead to economic improvement of the various units. The roller mills with hydraulic pressing equipment, filters for the bleaching equipment and deodorizing plants are among the suggested equipment.

Status of Fat Deterioration. J. P. Wolff (Inst. Crops Gras, Paris). *Rev. Franç. Corps Gras* **6**, 275–288 (1959). The reactions of fats with oxygen and peroxide formation was examined with the aid of ultraviolet spectroscopy. The effects of spontaneous hydrolysis, thermal polymerization and lipase hydrolysis, as well as chemical changes taking place during refining and production of the oils were also examined. The stability and physical properties of the oils were discussed.

Analytical Detection of Synthetic Antioxidants in the Edible Oils. II. Separation and Identification of Synthetic Antioxidants Through Thin-Film Chromatography. A. Seher (German Inst. for Fat Research, Münster). *Fette, Seifen, Anstrichmittel* **61**, 345–51 (1959). The difficulties in the detection of synthetic antioxidants in edible oils, described in earlier papers have been overcome by making use of thin-film chromatography. The use of phosphomolybdic acid for coloring the analyzed substances makes the method very sensitive. The method has wide application and is not affected by the presence of other natural products in the oils.

Preparation of Erucic Acid. J. Pasero, M. Naudet, and M. J. Perrot (Nat. Fat Laboratory, ITERG, Science Faculty, Marseille). *Rev. Franç. Corps Gras* **6**, 301–3 (1959). A method for the preparation of highly purified erucic acid is described. The method is as follows: A 10% solution of rapeseed oil acids in acetone is cooled for 16 hours at −20° and filtered. The filtrate is discarded, and the crystals are redissolved in acetone to make a 10% solution and recrystallized at −20° for 16 hours. Yield of purified erucic acid based on starting acids was 42.5%, and had an iodine value of 75 (theory 75.2) and a melting point of 33.2° (theory 33°).

Deactivation of Catalysts by Poisoning or Fouling. J. E. Germain (Sciences de Lille). *Genie Chimique* **81** 129–39 (1959). The reasons for loss of activity are numerous; they may be internal or external. The former are caused by the modification of the catalysts and are termed ''irreversible aging.'' External causes are due to the action of some substances (poisons) during the reaction. This may be confined to the surface (adsorption), or may extend in depth. Chemical reactions may also occur, such as carburization or oxidation, as well as some fouling due to a layer of polymerized carbonaceous matter.

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## • Fatty Acid Derivatives

Fatty Aldehydes. IV. Preparation of Fatty Aldehydes Containing More Than One Double Bond. H. P. Kaufmann and A. Kirschnek. *Fette, Seifen, Anstrichmittel* **60**, 1125–32 (1958). Linoleic, linolenic, and eleostearic aldehydes and their derivatives are prepared. (*C. A.* **53**, 10018)

Syntheses of Unsaturated Fatty Aldehydes. H. K. Mangold (The Hormel Inst., Univ. of Minn.). *J. Org. Chem.* **24**, 405–07 (1959). Oleyl-, linoleyl- and linolenyl-aldehydes were prepared by a modified Grundmann synthesis. The procedure can be used for the preparation of radioactive aldehydes on a milligram scale.

Fatty Acid Amido Derivatives. H. W. Zussman (Geigy Ind. Chemicals, Ardsley, N. Y.). *Soap Chem. Specialties* **35**(4), 51–2 102–3 (1959). Descriptive. (*C. A.* **53**, 11861)

Epoxy Fatty Hydrazides. T. W. Findley (Swift & Co.). *U. S. 2,892,848.* Hydrazides are prepared by the reaction of hydrazine with epoxidized ethenoid $C_{10-22}$ fatty acid esters containing 1 to 3 oxirane groups.

Esters of Unsaturated Acids. J. Southwood and K. Bricknell (Distillers Co. Ltd.). *Brit. 806,197.* An improved method is given for preparation of lauryl esters of acrylic acids, useful as copolymers with methyl methacrylate for oil additives. (*C. A.* **53**, 11227)

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## • Biology and Nutrition

Metabolic Studies in Atherosclerosis. I. Metabolic Pathway of Carbon-14-Labeled α-Tocopherol. J. Sternberg and E. Pascoe-Dawson (Univ. Montreal). *Can. Med. Assoc. J.* **80**, 266–75 (1959). A firmer basis for the use of accurate dosages of α-tocopherol was established. (*C. A.* **53**, 10415)

Influence of Dietary Fat on Oxidation of Cholesterol by Liver Mitochondria. D. Kritchevsky, M. W. Whitehouse, and E. Staple (Univ. of Pennsylvania, Philadelphia). *Arch. Biochem. Biophys.* **80**, 221–2 (1959). In the absence of mitochondria there was no oxidation of cholesterol-26-$C^{14}$. Mitochondrial oxidation of the terminal carbon atoms of cholesterol was much greater in rats fed large amounts of saturated fats than in rats fed equivalent amounts of unsaturated fats. (*C. A.* **53**, 10417)

Aggravation of Cholesterol Atherosclerosis in Rabbits by Free Unsaturated Fatty Acids. G. Rona, C. I. Chappel, and R. Gaudry (Ayerst, McKenna and Harrison, Ltd., Montreal). *Can. J. Biochem. and Physiol.* **37**, 479–83 (1959). An unsaturated fatty acid preparation containing 90–95% linoleic acid was tested on cholesterol-induced hypercholesterolemia and atherosclerosis in the rabbit. The rabbits, treated with cholesterol dissolved in the unsaturated fatty acid, revealed a significantly higher hypercholesterolemia and more marked atherosclerosis than the rabbits that were treated with cholesterol dissolved in the same amount of olive oil. (*C. A.* **53**, 10419)

The Effect of Unsaturation of Dietary Fat and of Antioxidants on the Development of Liver Damage. L. S. Valberg, Rose A. Young, and J. M. R. Beveridge (Queen's Univ., Kingston). *Can. J. Biochem. and Physiol.* **37**, 493–9 (1959). The addition of unsaturated fatty acids, even in small amounts, to diets low in vitamin E, selenium, and the sulfur-containing amino acids greatly accelerated the development of acute liver necrosis in rats. (*C. A.* **53**, 10419)

Dietary Cholesterol and Plasma Cholesterol Levels in Man. J. M. R. Beveridge, W. F. Connell, H. L. Haust, and G. A. Mayer (Queen's Univ., Kingston). *Can. J. Biochem. and Physiol.* **37**, 575–82 (1959). It is concluded that relatively small amounts of dietary cholesterol, depending on the nature of fat with which it is associated, can effect highly significant increases in plasma cholesterol in man. It is suggested that the substance with which cholesterol reacts is a specific type of triglyceride. (*C. A.* **53**, 10419)

Effects of Exercise on Blood Cholesterol in Middle-Aged Men. H. J. Montoye, W. D. Van Huss, Wilma D. Brewer, Evelyn M. Jones, Margaret A. Ohlson, E. Mahoney, and H. Olson (Michigan State Univ., East Lansing). *Am. J. Clin. Nutrition* **7**, 139–45 (1959). Supervised exercise showed no effect in three months on subjects with normal initial serum levels. Three high level subjects showed a decrease following exercise. Change in total serum cholesterol generally accompanied a change in body weight regardless of exercise status. Free serum cholesterol showed the same trends as total cholesterol but it was not so closely related to weight changes. (*C. A.* **53**, 10421)

Normal Values of Plasma Lipides. N. Zollner (Univ. Munchen, W. Ger.). *Deut. med. Wochschr.* **84**, 386–92 (1959). From a review of the literature the following normal values for the concentration of various lipides in human plasma in mg. % were derived: total fatty acids 190–450; neutral fatty acids 0–200; neutral fat 0–200; total cholesterol 150–260; free cholesterol 35–90; lipide phosphorus 6–10; total phospholipides 150–250; saponifiable phospholipides 120–230; lecithins 120–230; cephalins 0–20; sphingomyelins (nonsaponifiable phospholipides) 10–30; plasmalogen 2.2–3.0; carotenoids 0.025–0.250; total lipides 400–700; and free fatty acids in milliequivalent per liter of 0.31–1.21. (*C. A.* **53**, 10423)

Correlation Between Carbohydrate and Fat Metabolism and Their Disturbances. O. Wieland (Univ. Munich, Ger.). *Colloq. Ges. physiol. Chemie 8, Mosbach/Baden* **1957**, 86–118 (Pub. 1958). A review with 102 references. (*C. A.* **53**, 11563)

Lipide Metabolism. II. Effect of High-Protein Diets on the Development of Experimental Atherosclerosis and the Role Played by Glucose-Cyclo-Acetoacetate. M. C. Nath and A. Saikia (Nagpur Univ.). *Indian J. Med. Research* **47**, 73–81 (1958). Prolonged feeding of high-protein diets to rats resulted in gradual development of hypercholesterolemia and atherosclerosis; elevated plasma total cholesterol/lipide phosphorus; decreased iodine values, fat content, and methionine concentration in liver, and decreased tissue phospholipide. Injection of hydrolyzed glucose-cyclo-acetoacetate into animals maintained on a high-protein diet caused improvement of the above symptoms. (*C. A.* **53**, 10416)

Observations on the Protective Effect of Dietary Fat Against Selenium Poisoning in Rats. R. D. Romanowski, R. L. Larson, A. W. Halverson, and O. E. Olson (S. Dakota Agr. Expt. Sta., Brookings). *Proc. S. Dakota Acad. Sci.* **37**, 76–80 (1958). The toxicity of selenium to male albino rats on different quantitative carbohydrate (dextrose) and fat (lard) diets was studied. With 2.75 $\gamma$ selenium/calorie, which permitted growth, rats on the diet with added fat but without added carbohydrate showed in most instances somewhat better growth and more normal livers than those rats on diets with added carbohydrate. (*C. A.* **53**, 11549)

Effect of Dietary Fats on Blood Coagulation and Their Possible Significance in Arteriosclerosis. B. Kommerell and H. D. Berger (Städt. Krankenhaus, Stuttgart-Bad Cannstatt, Ger.). *Klin. Wochschr.* **36**, 795-800 (1958). A review with 94 references. (*C. A.* **53**, 11556)

A Rapid Method for the Study of the Effect of Unsaturated Fatty Acids on Cholesterol Metabolism in Rats. J. G. Hauge and R. Nicolaysen (Univ. Oslo, Norway). *Acta Physiol. Scand.* **45**, 19-25 (1959). A method is presented for simultaneous production of essential fatty acid deficiency and hypercholesteremia in young rats. (*C. A.* **53**, 11557)

Serum Cholesterol Depressive Effect of Linoleic, Linolenic Acids, and of Cod Liver Oil in Experimental Hypercholesterolemic Rats. J. G. Hauge and R. Nicolaysen (Univ. Oslo, Norway). *Acta Physiol. Scand.* **45**, 26-30 (1959). In young rats, linoleic acid, linolenic acid, whole cod liver oil, and the polyunsaturated fatty acids of cod liver oil depressed serum cholesterol. The activity of the products were polyunsaturated fatty acids > whole cod liver oil; whole cod liver oil ≅ linolenic acid; linolenic acid > linoleic acid. (*C. A.* **53**, 11557)

Influence of Dietary Cholesterol, Cod Liver Oil, and Linseed Oil on Cholesterol and Polyenoic Fatty Acids in Tissues from Fasted and Nonfasted Chicks. H. Dam, G. Kristensen, G. K. Nielsen, and E. Søndergaard (Polytech. Inst., Copenhagen). *Acta Physiol. Scand.* **45**, 31-42 (1959). Fasted chicks on fat-free diet without cholesterol showed significantly higher plasma cholesterol than nonfasted chicks on the same diet. There was no difference in cholesterol content of tissues between fasted and nonfasted chicks. Without dietary cholesterol, there was no difference in tissue cholesterol values between cod liver oil- and linseed oil-fed chicks; with 1% dietary cholesterol, linseed oil caused greater cholesterol values for plasma and tissues than did cod liver oil. Fat-free diets caused a higher polyenoic fatty acids content in liver of fasted chicks than of nonfasted chicks; with all other diets there was no significant difference in polyenoic fatty acids values between fasted and nonfasted groups. (*C. A.* **53**, 11557).

Essential Fatty Acids in Therapy. J. Cottet. *Algérie méd.* **62**, 47-88 (1958). A review dealing particularly with the hypocholesterolemic effect of corn oil. (*C. A.* **53**, 11558)

A Further Note on the Unmasking of Lipids in the Cell. Brij L. Gupta (Dept. Zool., Panjab Univ., Hoshiarpur, India). *Experientia* **15**, 223 (1959). The triglycerides found in the interior of some lipid bodies (the oocytes) appear masked when one uses dyes on the lipids. This may be because of the presence of a concentric layer of water molecules between the phospholipid molecules and triglyceride molecules. This shield interposed by the water is destroyed by a solution of 1% phenol and thus the "mask" disappears.

Contribution to Fat Synthesis. Vera von Brand (Medical Clinic, Univ. Munich). *Biochem. Z.* **331**, 162-171 (1959). The incorporation of carboxyl labeled $C^{14}$-sodium acetate into total fat, neutral fat, and phosphatides was studied using a soluble enzyme system from livers of normally fed and starving pigeons. In the normally fed pigeon acetate incorporation into phosphatides amounts to only 5% of the incorporation into total fat; in starving pigeons this increases to an average of 21% with a decreased incorporation into total fat. A quantitative determination of the synthesized $C^{14}$ phosphatides and neutral fats showed a decreased neutral fat:phosphatide ratio in starving animals. Determination of the dry weight of both fat fractions showed a larger yield of phosphatides compared to neutral fat in starved as well as normally fed pigeons. The specific activity of phosphatides and neutral fats were different. The activity of the phosphatides was always higher than that of the neutral fats in starved animals. This suggests a preferential formation of phosphatides in starvation in agreement with *in vitro* experiments.

The Phosphatide Content in the Growing Brown Adipose Tissue of Young Rats. H. Langer and H. Langer-Schierer (Munchen, Luisenstr. 14 Zool. Inst. der Univ.). *Zeitschrift fur Physiologische Chemie* **315**, 80 (1959). In the growing brown adipose tissue of young rats there is a completely parallel relationship between the phosphatide content and the amount of lipid-free dry substance. At birth almost the same relative proportions are already present as in the mature animal, whereas the storage of depot fats occurs later. In starvation, the total lipid content of the tissue is reduced to about a tenth of normal, the phosphatide content stays almost unchanged. This confirms the assumption that phosphatides in brown adipose tissue are present in the cytoplasm and its preformed constituents and not in the vacuoles as storage material.

Further Observations on Lipide Stimulation of Bacterial Growth. K. Hofmann, W. M. O'Leary, C. W. Yoho, and T. Y. Liu (Biochem. Dept., Univ. of Pittsburgh, School of Med., Pittsburgh, Penna.). *J. Biol. Chem.* **234**, 1672-77 (1959). Cells of *Lactobacillus arabinosus* and *Lactobacillus casei* failed to produce measurable amounts of *cis*-vaccenic acid when lactobacillic acid replaced biotin in their culture medium. Attempts to demonstrate the presence of "fatty acid dehydrogenase" activity in three lactic acid organisms were unsuccessful.

Heterogeneity in the Turnover Rates of Liver Cholesterol Esters. P. D. Klein and R. A. Martin (Div. of Biol. and Med. Res., Argonne Nat. Lab., Lemont, Ill.). *J. Biol. Chem.* **234**, 1685 87 (1959). The digitonides of various cholesterol esters have been shown to have different specific activities 30 minutes after injection of sodium acetate-1-$C^{14}$. In order of decreasing activity were esters of oleic, linoleic, saturated, and arachidonic acids. After 4 hours, all esters have approximately the same activity, indicating that comparable portions of each of the esters have been replaced. It is concluded that the turnover rates of cholesterol esters in liver are heterogeneous. Some of the implications of these findings in the regulation of cholesterol metabolism are discussed.

Labile Fatty Acids of Rat Diaphragm Muscle and Their Possible Role as the Major Endogenous Substrate for Maintenance of Respiration. E. M. Neptune, Jr., H. C. Sudduth, and D. R. Foreman (Naval Medical Res. Inst., Nat. Naval Med. Center, Bethesda 14, Md.). *J. Biol. Chem.* **234**, 1659-60 (1959). The data contained in this communication are consistent with the concept that endogenous labile fatty acids may well be the major source of substrate for the support of resting respiration of rat diaphragm *in vitro*. These findings do not exclude some active role for carbohydrate metabolism in this tissue; indeed, in the presence of added glucose there is a suggestion of a slightly greater fall in total fatty acid, but the experimental design did not permit precise definition of the significance of this effect.

Effect of Dietary Protein and Energy Levels on the Utilization of Vitamin A and Carotene. Ellen M. Olsen, J. D. Harvey, D. C. Hill and H. D. Branion (Dept. of Nutrition, Ontario Agr. Coll., Guelph, Ontario, Canada). *Poultry Sci.* **38**, 942-49 (1959). The influence of the protein and energy level of the diet on the utilization of vitamin A and carotene, as judged by liver storage, was studied in two experiments. The findings showed an inverse relationship between protein level and vitamin storage, indicating a higher vitamin A requirement at a higher level of protein. Increasing the energy level resulted in better growth and a greater storage of the vitamin in the liver. However, this increased storage may not be due to the higher energy level as such, but to the higher fat content of the diets. The diet variations had little effect on the composition of breast muscle, except that the fat content of the muscle of birds on low energy diets was the lowest of the various groups. Judging from growth data, the vitamin A requirement of the birds in these experiments was met by a level of 600 I.U. per pound of diet.

Utilization and Stability of Commercial Vitamin A Supplements. Ellen M. Olsen, J. D. Harvey, D. C. Hill and H. D. Branion (Dept. of Nutrition, Ontario Agr. Coll., Guelph, Ontario, Canada). *Poultry Sci.* **38**, 929-39 (1959). Four experiments were conducted to compare the availability to chicks, and stability during storage in mixed feeds, of several commercial dry vitamin A products, cod liver oil, and dehydrated cereal grass, using liver storage of vitamin A, growth and mortality as criteria. The results indicate that, in short term experiments, growth may not be a reliable criterion for evaluation of vitamin A availability. Judging by liver storage of vitamin A, gelatin coated preparations were superior to preparations in which the vitamin was coated with wax or fat, or was adsorbed to vegetable protein. Feeding oils and dehydrated cereal grass were the poorest sources. The data from stability tests indicated some deterioration of the vitamin in all preparations, and, although definite conclusions were difficult to draw, the superiority of gelatin preparations was indicated.

Metabolism of Tritium-Labeled Diethylstilbestrol by Steers. G. E. Mitchell, Jr., A. L. Neumann, and H. H. Draper (Dept. Animal Sci., Univ. of Ill. Urbana, Ill.). *J. Agr. and Food Chem.* **7**, 509-12 (1959). A study has been made of the distribution of radioactivity in the tissues and excreta of a bile-fistulated steer after a single small oral dose of tritium-labeled stilbestrol, and of an intact steer after stilbestrol administration for 11 days. Approximately 20% of the administered radioactivity was excreted in the urine and 30% was recovered from the feces. Only traces of activity were found in the bile of the fistulated animal. Separation of the radioactivity into free phenolic and conjugated fractions revealed that stilbestrol was present in urine and bile primarily in conjugated form. The radioactive phenolic material was identified as stilbestrol, and its concentration in parts per billion was 0.30 for lean meat, 0.35 for fat, 9.12 for liver, and 4.15 for kidney.

A NUTRITION SURVEY OF THE ARMED FORCES OF THE REPUBLIC OF KOREA. R. R. Williams, W. J. McGanity, G. F. Combs, Z. I. Kertesz (Interdepartmental Comm. on Nutr. for Nat. Defense, Nat. Inst. of Health, Bethesda, Md.). *J. Nutrition* **68**, Suppl. 1 (1959). Skin-fold measurements of Koreans combined with weight measurements show very low incidence of serious underweight and essentially no obesity.

EFFECT OF TOCOPHEROL SUPPLEMENTATION OF SWINE RATIONS ON THE STORAGE LIFE OF FROZEN PORK. M. V. Zaehringer, S. V. Bring, C. A. Rickard, and W. P. Lehrer, Jr. (Depts. of Home Econ. Res. and Animal Husbandry, Univ. of Idaho Agr. Exp. Station, Moscow, Idaho). *Food Tech.* **13**, 313–17 (1959). Chops from swine fed either animal or plant protein, and 0, 6, or 12 g. daily of a vitamin E feed supplement for a period of 2, 4, or 6 weeks, were analyzed fresh and after 3, 6, 9, and 12 months of frozen storage. Feeding 12 g. of supplement was more effective than 6 g., and a 6-week period was more effective than either a 4- or a 2-week period in retarding peroxide development.

STUDIES ON THE ELECTRON TRANSFER SYSTEM. XXV. THE ISOLATION AND PROPERTIES OF A LIPOFLAVOPROTEIN WITH DIAPHORASE ACTIVITY FROM BEEF HEART MITOCHONDRIA. D. M. Ziegler, D. E. Green, and K. A. Doeg (Inst. for Enzyme Res., Univ. of Wisc., Madison, Wisc.). *J. Biol. Chem.* **234**, 1916–21 (1959). The isolation of lipoflavoprotein from beef heart muscle mitochondria is described. Lipide accounts for 85 to 88 per cent of the dry weight of the enzyme. The flavin (flavin adenine dinocleotide) content of the flavoprotein is 13.6 mumoles per mg. of protein which corresponds to a minimal molecular weight of 74,000 in terms of protein and 474,000 in terms of both protein and lipide. Both the Straub diaphorase and Mahler's cytochrome *c* reductase appear to be derived from this lipoflavoprotein. A method of fractionating lipoproteins with organic solvents is described.

CAROTENOIDS OF BRASSICA NAPUS. A. E. Joyce (Ministry of Agr., Fisheries & Food, Exptl. Factory, Aberdeen). *J. Sci. Food Agr.* **10**, 342–8 (1959). Chromatographic and spectroscopic examination of extracts from sprouted rutabagas showed the presence of two fluorescent polyenes, $\eta$-carotene, $\beta$-carotene, $\zeta$-carotene, $\gamma$-carotene, neurosporene, lycopene, seven poly *cis*-lycopenes and three tri-*cis*-lycopenes. One nonhydrocarbon pigment was also present.

BUILD-UP AND REGRESSION OF INHIBITORY EFFECTS OF CHOLIC ACID ON IN VITRO LIVER CHOLESTEROL SYNTHESIS. W. T. Beher and Gizella D. Baker (Henry Ford Hospital, Detroit, Mich.). *Proc. Soc. Exptl. Biol. Med.* **101**, 214–17 (1959). Results of this study of dietary cholic acid in rats indicate that the cholic acid initially elevates liver cholesterol levels. This, in turn, leads to inhibition of acetate-1-$C^{14}$ incorporation into liver cholesterol.

SECRETION OF CHOLESTEROL BY INTESTINAL MUCOSA IN PATIENTS WITH COMPLETE COMMON BILE DUCT OBSTRUCTION. S. H. Cheng and M. M. Stanley (Univ. Louisville School of Med., Louisville, Ky.). *Proc. Soc. Exptl. Biol. Med.* **101**, 223–5 (1959). In 3 patients with complete obstruction of biliary and pancreatic ducts, cholesterol "secretion" by intestinal mucosa was 250 to 400 mg. daily.

QUANTITATIVE STUDY OF ESTROGEN-INDUCED ATHEROSCLEROSIS IN COCKERELS. C. T. Caldwell and D. E. Suydam (Upjohn Co. Kalamazoo, Mich.). *Proc. Soc. Exptl. Biol. Med.* **101**, 299–302 (1959). Young cockerels were injected intramuscularly with estradiol cyclopentylpropionate (ECP) in cottonseed oil. Changes in degree of atherosclerosis, serum lipids, lipoproteins and polysaccharide values were determined. Data indicate that feminizing changes and some degree of atherosclerosis result from ECP dosage levels lower than those required to produce hypercholesterolemia. Continuation of the experiment for 56 days showed some regression of atheroma.

CHOLESTEROL ESTERASE ACTIVITY OF PLEUROPNEUMONIALIKE ORGANISMS. P. F. Smith (Univ. Penn. School of Med., Philadelphia). *J. Bacteriol.* **77**, 682–9 (1959). Both lipase and cholesterol esterase activities were demonstrated in various pleuropneumonialike organisms. Strains requiring a lipoprotein growth factor possessed considerably greater esterase activity than strains not requiring this factor. Surface active compounds and coenzyme A stimulate activity. Activity is associated with cellular debris after sonic lysis. The reaction appeared to be specific for fatty acid esters of 3-$\beta$-hydroxy-$\Delta$-5-sterols.

VITAMIN E FORTIFIED ANIMAL FEEDS. J. G. Baxter (Eastman Kodak Co.). *U. S. 2,891,864.* A vitamin E ($\alpha$-tocopherol) composition for use in fortifying animal feeds is prepared from vegetable oil deodorizer sludge by acylating the sludge without removing sterols, glycerides or fatty acids. The acylated product is blended with a dry, inert, powdered carrier material.

FOOD COMPOSITIONS HAVING HYPERCHOLESTEROLEMIC ACTIVITY. James M. R. Beveridge (Queen's University). *Can. 567,202.* The compositions consist essentially of at least one edible fat in which is uniformly incorporated $\geqq$ 0.75% by weight of a plant sterol in excess of that present in the edible fat. The most effective plant sterol is sitosterol, preferably $\beta$-sitosterol. Ten per cent excess plant sterol incorporated in the edible fat has been effectively used. (*C. A.* **53**, 11711)

TOXICITY OF FISH OIL. III. Noboru Matsuo (Tokyo Med. Coll.). *Seikagaku* **29**, 769–72 (1957–58).

IV. ACTIONS OF THE ETHYL ESTERS OF HIGHLY UNSATURATED FATTY ACIDS ON PROTEINS AND AMINO ACIDS. *Ibid.* 773–7.

V. SOME CONSIDERATIONS ON THE OXIDATION OF HIGHLY UNSATURATED FATTY ACIDS. *Ibid.* 807–12.

VI. TOXICITY OF OXIDIZED COMMERCIAL LIVER OILS. *Ibid.* 812–15.

VII. PRODUCTION OF THE SO-CALLED SEBORRHEA. *Ibid.* 816–18.

VIII. TOXICITY OF FISH OIL POLYMERIZED BY HEATING IN CARBON DIOXIDE. *Ibid.* 885–91.

IX. TOXICITY OF FISH OIL POLYMERIZED BY HEATING IN THE AIR. *Eiyô to Shokuryô* **10**, 255–9 (1957–8). (*C. A.* **53**, 11550)

## • Paints and Drying Oils

EXAMINATION OF RUBBERSEED OIL FOR USE IN COATING COMPOSITIONS. Mohammad Aslam and Hassan Imam (Pakistan Council Sci. & Ind. Research, Karachi). *Pakistan J. Sci. Ind. Research* **1**, 224–7 (1958). Only 8% of the potentially available 260,000 tons of rubberseed oil (from seeds of *Hevea brasiliensis*) is utilized. The seeds contain 41.8% shell and 58.2% kernel which contains 37% oil. Seeds vary greatly in quality of oil they give, depending on color of kernel. Rubberseed oil with drying properties between those of linseed and soybean was used to make tack-free finishes; these compare favorably with similar varnishes made from linseed oil. (*C. A.* **53**, 11857)

RELATION BETWEEN THE VISCOSITY OF POLYMERIZED DRYING OIL AND ITS TEMPERATURE. B. N. Shakhkel'dyan (Polygraph. Inst., Moscow). *Masloboino-Zhirovaya Prom.* **25**(3) 38–40 (1959). A nomograph to compute the viscosities of drying oils at different temperatures and the related data are given. (*C. A.* **53**, 11856)

COATING COMPOSITION VEHICLES PREPARED FROM ACIDULATED SOAP STOCKS. R. M. Christenson and R. F. Borman (Pittsburgh Plate Glass Co.). *U. S. 2,891,919.* An acidulated soap stock is esterified with a polyhydric alcohol at 150° to 300°. The resultant ester is reacted with 2 to 8% by wt. of an $\alpha,\beta$-ethylenically unsaturated polycarboxylic acid. The product is blown with air or oxygen in the presence of a metallic drier until substantially all of the antioxidants have been destroyed. The product is suitable for use as a vehicle for coatings.

ALKYD GELS. J. Rinse (J. W. Ayers & Co.). *U. S. 2,892,780.* An alkyd gel is prepared by the reaction at 100° to 250° of a saturated fatty acid modified alkyd resin containing free hydroxyl groups with an aluminum acylate.

## • Detergents

CARBONIZING INVESTIGATIONS. VI. A COMPARISON OF DIFFERENT TYPES OF SURFACE-ACTIVE AGENTS IN LABORATORY CARBONIZING. W. G. Crewther and T. A. Pressley (Wool Research Labs., C.S.I.R.O., Melbourne, Australia). *Textile Research J.* **29**, 482–6 (1959). Eighty-eight nonionic surface-active agents, all containing polyoxyethylene as the hydrophilic group, and some anionic and cationic agents have been tested in the laboratory to determine the extent to which they protect wool from loss of tensile strength during carbonizing. Nonionic agents in which the lipophilic portion consists of polyoxypropylene provided little protection even at the highest concentrations tested, whereas nonionic agents containing an alkyl or aryl hydrocarbon group were generally effective. With the latter compounds, the length of the polyoxyethylene group influenced the optimal concentration of the reagent. Anionic agents were ineffective at low concentration; cationic agents were comparable in their effects with nonionic agents.

Dialcoylbenzenesulfonates as Detergents. F. V. Nevolin, G. I. Nikichin, A. D. Petrov, G. A. Kral-Osinkina, and V. D. Vorobiev. *Parfums, cosmet., savons* 2, 62–6 (1959). In a number of sodium decyl- and dodecylbenzenesulfonates, the introduction of isomeric dialcoyl groups, especially with 6–8C atoms produced less detergency than monoalcoyl groups of equal surface activity. Passage from sulfonate of *p*-dihexylbenzene to sulfonate of *p*-dioctylbenzene raised the surface tension and lowered detergency by formation of insoluble calcium salts. The detergency can be increased by the use of branched chains of the hydrocarbon groups and the addition of $Na_2CO_3$. Sulfonols of the same detergency as those prepared from $C_6H_6$ or toluene can be obtained from tetramers of propylene or amylene. (*C. A.* **53**, 10809)

Specialty Surfactants. D. E. Gushee (Ind. Eng. Chem.) and O. L. Scherr (Process Chemicals Co., Santa Fe Springs, Calif.). *Ind. Eng. Chem.* **51**, 798–804 (1959). The manufacture of specialty surfactants by Process Chemicals is described. These consist of lauryl sulfates, fatty alkanol amide condensates, glycerol fatty acid esters, polyethylene glycol fatty acid esters, polyethylene glycol fatty alcohol polyethers and amine polyethers, and quaternary ammonium compounds. Details of manufacture, flow sheets, equipment requirements and analytical control methods are discussed.

Mechanism of Detergency. R. P. Harker. *J. Textile Inst.* **50**, T 189–222 (1959). The removal of oily soils from textile fibers—polytetrafluoroethylene, polythene, Terylene, 6,6-nylon, jute, wool, raw wool, and glass—has been followed, using a microscope equipped with a cell capable of directing a stream of detergent at the fiber at a chosen temperature. It was observed that the more polar a fiber the more easily oily soil is removed from its surface. If the soil or the fiber is very apolar, then addition of polar substances to the soil will make it more easily removable. A theoretical basis for the observed mechanism of scouring is suggested in many cases.

Adsorption of Labeled Sodium Carboxymethylcellulose by Textile Fibers. J. W. Hensley and C. G. Inks (Wyandotte Chem. Corp., Wyandotte, Mich.). *Textile Research J.* **29**, 505–13 (1959). A carbon-14 labeled sodium carboxymethylcellulose (CMC) has been employed to measure its adsorption by textile fibers, and in the case of cotton, to investigate the relationship between adsorption and detergency action. Adsorption of CMC by cotton was found to depend on the presence of excess cations in solution, increasing with cation concentration and valence. Equilibrium adsorption of CMC in the presence of excess cations was found to have a zero temperature coefficient. Variation of pH within the alkaline range had no significant effect. Limited measurements with fibers other than cotton indicated little or no adsorption by wool, Orlon, or acetate (in the presence of excess cations). There was significant adsorption by nylon and rayon, but this adsorption was greatly reduced by addition of an alkylaryl sulfonate. Detergency evaluations with the labeled CMC and with unlabeled material indicate that CMC adsorbed on cotton has a significant action in preventing redeposition of particulate soil materials. The adsorption and detergency data indicate that the quantity of CMC required to form a monomolecular layer on cotton fibers may be on the order of 400–500 micrograms per gram of cotton.

The Development of Surface-Active Materials of the Aliphatic System Classified According to Their Source Materials. H. Machemer. *Melliand Textilber.* **40**, 56–65, 174–9 (1959). A review of surface-active materials developed from aliphatic raw materials. α-Branched hydrophobic groups with complex substituents, such as the Guerbert synthesis provides, are suitable as surface-active components. These can result from the condensation of alcohols or aldehydes with alcoholates. Low-molecular alcohols, like PrOH or BuOH, require pressure above atmospheric; 1-hexanol or the lower fatty alcohols condense at normal pressure, while higher alcohols like 1-octadecanol condense at low pressure. Aldehydes with α-branched chains like 2-ethylbutyraldehyde enter easily into the Cannizzaro-Tischenko reaction with good yields of high-molecular products capable of reaction if the water resulting from the reaction is distilled off under reduced pressure. In practice, α-branched alcohols are employed instead of aldehydes, which form reaction mixtures with the ketones. 84 references. (*C. A.* **53**, 10808)

Sugar Detergents. N. Pilpel. *Research* **12**, 68–74 (1959). A new class of synthetic detergents, based on sucrose esters, is now commercially available. Their development is described and their chemical and physical properties compared with those of alkylaryl sulfonates and a nonionic surface active agent produced by condensing tall oil with polyoxyethylene. Their introduction may help to solve certain difficulties which have occurred in the treatment of sewage. 27 references.

The Graying of Cotton Fiber. E. Szmidtgal. *Fette, Seifen, Anstrichmittel.* **60**, 1132–9 (1958). The "graying" effect of various detergents, soap, and various additives after repeated washing of soiled cotton is described. The swatches were resoiled after each washing and evaluated after 10 washings. The addition of carboxymethylcellulose (I) prevents graying when dodecylbenzene sulfonate is used alone and in combination with soap, even at a concentration of 3 g./l. I deposits a protective coating on the fiber, thus weakening the additive forces of soil to film. (*C. A.* **53**, 10809)

Deposition of Soiling Matter from Some Detergent Systems. III. Nonaqueous Systems. R. E. Wagg (Brit. Launderer's Research Assoc., Hendon, Engl.). *J. Textile Inst.* **49**, T 561–T 565 (1958). Under appropriate conditions certain solvent-soluble long-chain fatty acid salts, surface-active agents, oil and petroleum additives, and diphenylamine reduce the deposition of soiling matter on wool. The beneficial action of triethanolamine oleate in white spirit solvent was dependent on concentration and on the moisture content of the wool. Fatty acids, aliphatic amines, and certain surface-active compounds had little effect. Some materials increased deposition. (*C. A.* **53**, 9701)

Detergents and Textiles. C. F. Ward. *Textile Weekly* **59**, 469–70, 473, 534–6 (1959). Chemical bleaching compounds in detergents, accidental damage, beneficial features of modern powders, and shade changes are reviewed. (*C. A.* **53**, 9701)

Adsorption and Desorption of Carbon Soil on Cotton, Wool, and Perlon in Tetrachloroethylene. H. Wendell (Boehme Fettchem., G.m.b.H., Dusseldorf, Ger.). *Kolloid Z.* **163**, 11–15 (1959). Adsorption of C on wool, cotton, and Perlon in tetrachloroethylene depends on the moisture in the system; desorption under like conditions is little influenced by moisture changes. Various types and concentrations of surfactant additions show different adsorption and desorption of C soil in those fibers. Shaking a soiled and clean fabric swatch (wool, cotton, or Perlon) in the same launderometer jar for 4 hrs. shows that adsorption and desorption are nearing equilibrium values. Velocities and final C concentrations depend on type and quantity of fiber and added surfactant. (*C. A.* **53**, 11846)

Method of Making a Synthetic Detergent in Cake Form. G. Barsky (E. F. Drew & Co., Inc.). *U.S. 2,886,585.* A cake of synthetic which is coherent, does not tend to disintegrate, does not slime and is not affected by humidity in the atmosphere, is prepared by adding to the reaction product of a hydroxyethylsulfonic acid salt with a higher fatty acid, and amount of water insufficient to dissolve the product at room temperature, heating the mixture to form at least a paste, and cooling to room temperature.

Soaps and Other Perfumed Compositions Containing Dihydroterpinyl Acetate. A. T. Fiore, G. C. Kitchens, and H. C. Saunders (The Givaudan Corp.). *U.S. 2,889,254.* A toilet soap having good odor stability, freshness and natural odor as opposed to a "chemical" odor is prepared by incorporating from about 0.02 to 1.5% by weight of dihydroterpinyl acetate into the soap.

Process for Making Detergent Compositions. H. Tecklenburg (Procter and Gamble Co.). *U.S. 2,889,283.* A speckled, colored, granular detergent composition is produced continuously by subjecting the detergent granules to an air lift to form a continuously flowing stream, continuously diverting a fraction of the screened granules, spray-treating the diverted fraction with a water-soluble dye, introducing the so-treated granules in the air lift, and combining the treated with the untreated granules.