

ABSTRACTS

R. A. REINERS, Editor. ABSTRACTORS: J. G. Endres, J. Iavicoli,

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• Fats and Oils

IDENTIFICATION OF TRACE QUANTITIES OF ANTIOXIDANTS IN POLYETHYLENE. D. F. Slonaker and D. C. Sievers (Res. Lab., Tennessee Eastman Co., Div. of Eastman Kodak Co., Kingsport, Tenn.). *Anal. Chem.* 36, 1130-32 (1964). The identification of trace quantities of phenolic antioxidants in polyethylene has been hampered in the past by difficulties in separating the antioxidant from other soluble components in the polymer. A method has now been developed for isolating and identifying quantities as low as 1 ppm of a phenolic antioxidant in polyethylene. This method can be used when several antioxidants, including synergistic mixtures, are present and/or when proof of the absence of toxic or harmful antioxidants is necessary. The method involves extracting the antioxidant with hexane at 50C and filtering the extract at 0C. The extract filtrate is concentrated by evaporation. The solution is again filtered and concentrated before being extracted with ethyl alcohol. The alcohol solution is treated with phosphomolybdic acid and ammonia. The formation of a blue color confirms the presence of a phenolic antioxidant.

FORCED VOLATILIZATION CLEANUP OF BUTTERFAT FOR GAS CHROMATOGRAPHIC EVALUATION OF ORGANOCHLORINE INSECTICIDE RESIDUES. D. E. Ott and F. A. Gunther (Dept. of Entomology, Univ. of Calif. Citrus Res. Center and Agr. Expt. Sta., Riverside, Calif.). *J. Agr. Food Chem.* 12, 239-43 (1964). A procedure is presented for the completely physical cleanup of butterfat prior to analysis for organochlorine insecticide residues. Two versions of a new device employing a forced volatilization principle have been developed and are described for the cleanup step; subsequent analysis is by means of microcoulometric gas chromatography. The entire method requires about an hour for a 2-g sample, and readily responds to about 0.5 ppm each of seven possible organochlorine insecticide residues in butterfat; methoxychlor is demonstrable at about 10 ppm.

SOLUBILITY OF CHOLESTEROL IN VARIOUS FATS AND OILS. D. Kritchevsky and S. A. Tapper (Wistar Inst. of Anatomy and Biology, Philadelphia, Pa.). *Proc. Soc. Exp. Biol. Med.* 116, 104-7 (1964). The solubility of cholesterol in various fats and oils at 37C has been studied using radioactive cholesterol. The amount of radioactivity present in the supernatant obtained after an excess of cholesterol-4-C¹⁴ and the fat have been shaken for 18 hr is used to assay the amount of cholesterol dissolved. Using both pure and natural triglycerides, it has been shown that the fats and oils composed largely of short chain fatty acids (C₆-C₁₂) have the greatest solubilizing effect. Addition of 2% of pure fatty acids (C₆-C₂₀) to corn oil or coconut oil shows that while all the fatty acids used enhanced cholesterol solubility, highest solubility is obtained when C₆, C₈, C₁₀ or C₁₂ fatty acids are used.

MALONALDEHYDE IN AQUEOUS SOLUTION AND ITS ROLE AS A MEASURE OF LIPID OXIDATION IN FOODS. T. W. Kwon and B. M. Watts (Dept. of Food and Nutr., Florida State Univ., Tallahassee, Fla.). *J. Food Sci.* 29, 294-302 (1964). The kinetics of the production of malonaldehyde by acid hydrolysis of its bis-(diethylacetal) is described, and its ionization constants and polymerization in aqueous solution are explored. The frontier electron method from molecular orbital calculations is utilized for prediction of the reactivities of the compound. The addition complex with bisulfite, the reaction with 2,4-dinitrophenylhydrazine, the dimedone derivative, and the ferric chelates were investigated. Finally, the significance of the acidification on the isolation of the compound from foods and its possible role as a measure of lipid oxidation in food systems are discussed.

CHEMISTRY OF THE OLIVE TREE. I. ORGANIC COMPONENTS. A. Vazquez (Instituto de la Grasa y sus Derivados, Sevilla, Spain). *Grasas y Aceites* 14, 262-270 (1963). A review of olive and olive tree lipids.

RESEARCH ON OIL MILL UNIT PROCESSES. I. CONTROL OF PRESSURE CYCLES. J. M. Martinez (Instituto de la Grasa y sus Derivados, Sevilla, Spain). *Grasas y Aceites* 14, 162-170 (1963). Pressure cycles used for the hydraulic press extraction of olive oil were studied in several commercial oil mills. Large differences were found in the maximum pressure and length of cycle used.

EXPERIMENTAL OIL MILL OF THE INSTITUTO DE LA GRASA. REPORT ON 1961-1963 OPERATIONS. Anon. (Instituto de la Grasa y sus Derivados, Sevilla, Spain). *Grasas y Aceites* 14, 147-161 (1963). The Sima-Baglioni system for extracting olive oil was evaluated. The semi-continuous process consisted of machinery to wash the olives, to grind them to a pulp, to press the pulp for removal of oil and water, to sieve the press cake to remove seeds from the pulp and return the seeds to the grinder, and to centrifugally separate the press liquid into oil and water fractions. Oil recovery with the Sima-Baglioni system averaged 6% higher than with older extraction methods now in use.

UTILIZATION OF SOYBEAN OIL BY-PRODUCTS. F. Ramos (Instituto de la Grasa y sus Derivados, Sevilla, Spain). *Grasas y Aceites* 14, 171-181 (1963). Methods for utilizing soybean oil phosphatides in soapstocks are reviewed.

STANDARD EQUIPMENT PROCESSES CRAMBE SEED. Anon. *Chem. Eng. News* 42(9), 50-52 (1964). Prepress solvent extraction of *Crambe abyssinica* seed oil was successfully tested on a factory scale. Chemical composition and possible uses for both the extracted oil and seed meal are reviewed.

EXTRACTION OF OLIVE OIL BY THE "EXTRAOL" METHOD. D. D. Arino. *Lipidos* 23, 34-36, 77-80 (1963). Review.

INTERESTERIFICATION. E. Servent. *Lipidos* 23, 81-84 (1963). A review on the interesterification of fats and oils.

FORMATION OF GLYCEROL DURING THE STORAGE OF TALLOW. F. Crespo, R. A. Macechi and I. Gallardo (Centro de Investigaciones sobre Grasas y Aceites, Av. Gral. Paz y Constituyentes, Migueletes, Buenos Aires, Argentina). *Revista Argentina de Grasas y Aceites* 5, 48-52 (1963). The hydrolysis of beef tallows containing 0.08-3.6% water and 4.75% free fatty acids was studied for a period of 200 days at 60C. The amount of free fatty acids and glycerine formed were directly related to the amount of water originally present.

STUDY OF MONOGLYCERIDES. II. PREPARATION OF MONOGLYCERIDES FROM ANIMAL OLEOSTEARINE. M. H. Bertoni, G. Karman de Sutton and P. Cattaneo (Facultad de Ciencias, Universidad de Buenos Aires, Argentina). *Revista Argentina de Grasas y Aceites* 5, 43-47 (1963). Glycerolysis of oleostearine by NaOH catalyst at 205C for 2 hr yielded a product containing 49% monoglyceride. One recrystallization from hexane, CCl₄, CHCl₃ or trichloroethylene gave a 77-93% monoglyceride product suitable for use in foods.

IRRADIATION OF RICE BRAN BY GAMMA RAYS. H. Diaz, N. Moundiroff and J. G. Gomez. *Revista Argentina de Grasas y Aceites* 5, 57-60 (1963). Irradiation of rice bran by high energy gamma rays did not inhibit the rapid enzymatic hydrolysis of rice bran oil.

A NEW NATURAL FATTY ACID: 11-HEXADECENOIC ACID. M. E. de Tomas, R. R. Brenner and P. Cattaneo (Facultad de Ciencias, Universidad de Buenos Aires, Argentina). *Revista Argentina de Grasas y Aceites* 5, 53-56 (1963). The seed oil of *Gevuina avellana* was found to contain 22% of 11-hexadecenoic acid. The acid was isolated by distillation of the fatty acid methyl esters. Oxidation by KMnO₄ or ozone yielded pentanoic and undecanedioic acids.

PHYSICAL-CHEMICAL STUDIES ON GROUND OLIVE PASTES. XVII. DESIGN OF ANALYTICAL MODELS FOR PRESSING PASTES. J. M. Martinez, C. Gomez and C. Janer (Instituto de la Grasa y sus Derivados, Sevilla, Spain). *Grasas y Aceites* 14, 197-209 (1963). The rheological phenomena occurring during the hydraulic pressing of ground olive pastes were reduced to analogous model systems made up of electrical components. This allows mathematical analysis of the rheological phenomena using electrical formulas.

KEEPING QUALITY OF A 50:50 MIXTURE OF SOYBEAN AND OLIVE OILS CONTAINING ANTIOXIDANTS. R. Gutierrez (Instituto de la Grasa y sus Derivados, Sevilla, Spain). *Grasas y Aceites* 14, 249-253 (1963). Three commercial antioxidant blends were tested for their effect on the keeping quality of a 50:50 mixture of soybean and olive oils stored at 30C for 14 months.

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Autoxidation was followed by the active oxygen method, peroxide number, and organoleptic panel tests. Oils containing antioxidants showed significantly better keeping quality by all three tests when compared to a control sample without antioxidants.

REFINING LOSSES WITH SUNFLOWER OIL. M. Nosti (Instituto de la Grasa y sus Derivados, Sevilla, Spain). *Grasas y Aceites* 14, 210-216 (1963). Laboratory refining tests were run on 62 samples of sunflower seed oil using 12° Bé lye with 30 minutes agitation at 20C followed by 15 minutes agitation at 65C. Refining losses were unrelated to moisture content of the oils but were approximately equal to 1.91 (% free fatty acids) + 1.16.

PHYSICAL-CHEMICAL STUDIES ON GROUND OLIVE PASTES. XVIII. DETERMINATION OF SURFACE ACTIVE AGENTS IN OLIVE OIL. J. M. Martinez and J. Ruiz (Instituto de la Grasa y sus Derivados, Sevilla, Spain). *Grasas y Aceites* 14, 257-261 (1963). Two analytical methods were developed for detecting traces of sodium sulfonate detergents in olive oil. A CHCl₃ solution of the olive oil was shaken with an aqueous solution of methylene blue. The intensity of the resulting blue color in the CHCl₃/oil phase was used to determine the presence of 1-5 ppm surfactant. Alternatively, the surfactants were removed from the oil using an ion exchange column, subsequently eluted, and measured colorimetrically with methylene blue.

OXIDATION OF MIXTURES OF VIRGIN AND REFINED OLIVE OILS. PRELIMINARY NOTE. J. M. R. de la Borbolla and R. Vazquez (Instituto de la Grasa y sus Derivados, Sevilla, Spain). *Grasas y Aceites* 14, 254-256 (1963). A refined olive oil was mixed with 33% and 67% virgin olive oil. The oxidative stabilities of both mixtures and both original oils were determined using the active oxygen method. The stabilities of the mixtures were not directly related to the stabilities of the original oils.

ACTION OF HEAT ON FATTY MATERIALS. F. Blasi (Escuela de Oleicultura, Bailen 36, Barcelona, Spain). *Lipidos* 23, 40-42, 85-88 (1963). Review.

EFFECT OF THE OIL USED IN CATALYST SLURRIES ON THE CONSISTENCY OF HARDENED COCONUT OIL. J. Pokorný and G. Janíček (Inst. Chem. Tech., Prague). *J. Inst. Chem. Tech. Prague* 5-3, 185-93 (1961). The use of an oil with C₁₈-C₁₈ fatty acids to slurry catalyst for the hydrogenation of coconut oil can contribute 5-7% of fully hydrogenated triglycerides with a melting point of 60C. The presence of these high melting glycerides does not appreciably impair the usefulness of hardened coconut oil as a cocoa butter substitute and may even be advantageous in increasing the hardness of the fat at 20C.

THE ACTIVITY OF VARIOUS PHENOLIC ANTIOXIDANTS IN THE STABILIZATION OF LARD. J. Pokorný, M. Vašáková and J. Pospíšil (Inst. Chem. Tech., Prague). *J. Inst. Chem. Tech. Prague* 5-3, 173-84 (1961). The activities of several groups of antioxidants in the stabilization of lard were compared. Catechol derivatives were found to be equal to or better than the other groups studied: phenolic, hydroquinol and pyrogallol derivatives. Tert-butyl and tert-octyl pyrocatechols are recommended for their good activity, solubility in fats and their structural resemblance to natural antioxidants of the same group. Toxicological properties of these substances remain to be investigated.

THE EFFECT OF AMINO ACIDS AND PROTEINS ON THE STABILITY OF FATS. J. Pokorný, G. Janíček and M. Vašáková (Inst. Chem. Tech., Prague). *J. Inst. Chem. Tech. Prague* 5-3, 161-71 (1961). Among three amino acids studied with regard to their antioxidant activity in lard, glycine and cystine have only a slight effect, respectively favorable and unfavorable, while cysteine has a very powerful inhibiting effect, with synergistic behavior in mixtures with glycine. The induction time in the reaction of peroxide formation is increased by 600% by the presence of 5% cysteine and by 50% when the lard is already protected by 0.05% BHT. The presence of a proteidic carrier enhances the stability of fats, the largest effect being found with extracted soybean meal and smaller effects with casein and albumin.

THE EFFECT OF CHLORELLA ON THE STABILITY OF FATTY FOODS AND FODDER. J. Pokorný, I. Filípek and G. Janíček (Inst. Chem. Tech., Prague). *J. Inst. Chem. Tech. Prague* 5-3, 153-9 (1961). Addition of the dried alga *Chlorella* lowers the stability of fats when they are stored in daylight, probably due to its high chlorophyll content, but has no effect when storage is in the dark. The alga does not affect the activity of natural antioxidants such as tocopherols in sunflower seed oil or of ascorbic acid.

COMPARISON OF FAT CONSISTENCY DETERMINATION BY DILATOMETRIC METHODS AND BY DIFFERENTIAL THERMAL ANALYSIS. J. Pokorný, G. Janíček and I. Zelenka (Inst. Chem. Tech., Prague). *J. Inst. Chem. Tech. Prague* 5-3, 141-51 (1961). The consistency of fat can be estimated from DTA curves by making the simplifying assumption that the temperature differences between the sample and the reference substance are proportional to the rate of melting of solid glycerides. Abrupt changes in the slope of the DTA curve indicate the temperature of beginning and complete melting, the maximum of the curve corresponding to the maximum melting rate. The ratio between the maximum melting rate and the melting range is defined as the coefficient of hardness or brittleness of the fat. There is good correlation between this coefficient and a similar one based on dilatometric data.

PRESERVATIVE ACTION OF SORBIC ACID AND POTASSIUM SORBATE IN MARGARINES. A. Rutkowski and Z. Holeczak (Agr. School., Warsaw, Poland). *J. Inst. Chem. Tech. Prague* 5-3, 129-40 (1961). The effect of various additions of sorbic acid and potassium sorbate on the growth of microorganisms in margarine manufactured by commercial processes and stored at temperatures of 0 and 20C was investigated. The activity of potassium sorbate is higher than that of sorbic acid, especially in suppressing the growth of mold and yeasts. Best results are obtained with a 1:2 mixture of acid and salt, at a total level of 0.1%. Amounts up to 0.05% do not appreciably affect flavor. Both substances have a slight prooxidative effect on the fatty phase of the margarine.

THE EFFECT OF THE CONCENTRATION OF PHENOLIC ANTIOXIDANTS ON THE STABILITY OF LARD. J. Pokorný and M. Vašáková (Inst. Chem. Tech., Prague). *J. Inst. Chem. Tech. Prague* 5-3, 11-19 (1961). The effect of various concentrations of four phenolic antioxidants (tert-butyl, tert-octyl, *p*-cyclohexyl and *o*-phenyl phenol) on the stability of lard was investigated. The differences among these compounds are found to be small, with *p*-cyclohexyl phenol the most effective of the four. The fat attains maximum stability at a cyclohexyl phenol concentration of 1.5%; however the stability curve is relatively flat above 0.5%. All of these phenolic antioxidants have much lower activity than either tocopherols or gallates, whose optimum concentration is ca. 0.05%.

STEREOSPECIFIC BROMINATION FOR THE GAS CHROMATOGRAPHIC DETERMINATION OF ELAIDINIC ACID. G. P. Cartoni *et al.* (Univ. of Naples, Italy). *Riv. Ital. Sostanze Grasse* 40, 653-9 (1963). The method of stereospecific bromination is useful for the quantitative determination of elaidinic acid in fats and oils. Octadecenoic acids, subjected to bromination and partial debromination, yield derivatives that can be resolved by gas chromatography more easily than the original methyl esters. Elaidinic acid concentrations as low as 1% can be detected by this method. The chromatograms have been obtained on glass capillary columns having diethylene glycol succinate as stationary phase and hydrogen flame detector. Retention volumes at 180C are reported for the various components before and after bromination.

QUANTITATIVE SOLVENT FRACTIONATION OF SOLID AND LIQUID FATTY ACIDS, III. G. B. Martinenghi (Res. Inst. Fats and Oils, Milan, Italy). *Olearia* 17, 187-92 (1963). Mixtures of solid and liquid fatty acids from olive oil can be separated almost quantitatively, with yields up to 90%, by double fractionation with symm. dichloroethane at -35C. The method gives considerably less than quantitative yields on both lauric and elaidinic acids. Optimum operating conditions for olive and tallow fatty acids have been determined but the necessary modifications for applicability to other fats and oils have not been investigated.

QUANTITATIVE GAS CHROMATOGRAPHIC ANALYSIS OF FATTY SUBSTANCES. A. Jaforte (Prov. Hyg. Lab., Milan, Italy). *Riv. Ital. Sostanze Grasse* 40, 678-87 (1963). A review with special emphasis on methods of peak area measurement.

THE SEPARATION OF TERPENES AND STEROLS ON THIN LAYERS OF SILICA GEL G IMPREGNATED WITH AgNO₃. P. Capella *et al.* (Exp. Sta. Fats and Oils, Milan, Italy). *Riv. Ital. Sostanze*

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Grasse 40, 645-8 (1963). A thin layer chromatographic method for analyzing mixtures of sterols and triterpenic alcohols is described. The method employs silicic acid plates impregnated with silver nitrate.

SYNTHESIS OF $1-C^{14}$ LABELED POLYUNSATURATED FATTY ACIDS. I. W. Stoffel and E. Vierwirth (Physiol. Chem. Inst., Univ. Cologne, Germany). *Angew. Chem. Internat. Edit.* 2, 94-95 (1963). A generally applicable method for the total synthesis of polyenoic acids containing a $1-C^{14}$ label carboxyl group was given. Linoleic, linolenic and arachidonic acids were synthesized according to the method presented. Use of a nitrile synthesis with sodium- C^{14} cyanide and subsequent acid catalyzed hydrolysis of the nitrile in dimethylsulfoxide solvent gave yields of over 90%. Physical properties of the acetylenic intermediates employed and of the final products are presented.

A RAPID CHEMICAL METHOD FOR QUANTIFICATION OF LIPIDS SEPARATED BY THIN-LAYER CHROMATOGRAPHY. J. S. Amenta (Armed Forces Inst. of Pathology, Washington, D.C.). *J. Lipid Res.* 5, 270-2 (1964). Lipids, separated by thin-layer chromatography, are oxidized in an acid dichromate solution. The reduction in absorbance at $350 m\mu$ is proportional to the amount of lipid. One reagent suffices to quantify all lipid classes to a lower limit of $15 \mu g$ of lipid.

PLASTIC SHORTENING. S. W. Thompson (Lever Brothers Co.). *U.S.* 3,132,951. A plastic shortening comprises 10-12% by weight of a substantially completely hydrogenated lard hard stock and a partially hydrogenated soybean oil base stock having an iodine value of 80-95. The crystalline solids of the shortening are predominantly in the beta phase.

NUTRITIONAL CONFECTIONERS' FATS. C. M. Gooding (Corn Products Co.). *U.S.* 3,133,819. The described product consists of a fat blend comprising at least 80% of an interesterified tropic fat having an iodine value of less than 15, a melting point of less than $115F$ and containing substantially no linoleic acid with the balance of the blend being an unrearranged vegetable oil having natural linoleic acid in glyceridic ester form in which the ratio of linoleic acid + polyunsaturated acid of the linoleic series/oleic acid + monounsaturated acids is at least 2. The confectioners' fat contains 2-15% of natural linoleic acid and has a melting point of 90 to $115F$, an iodine value of 4 to 32, S.C.I. values at $50F$ from 50 to 70, at $70F$ from 40 to 60, at $80F$ of 30 to 50, and at $92F$ from 5 to 25, and has a ratio of linoleic acid to saturated acids of from 0.02 to 0.2.

• Fatty Acid Derivatives

A METHOD FOR RAPID MICROSYNTHESIS OF RADIOACTIVE CHOLESTEROL ESTERS. K. G. Pinter, J. G. Hamilton and J. E. Muldrey (Dept. of Biochem., Tulane Univ. School of Med., New Orleans, La.). *J. Lipid Res.* 5, 273-4 (1964). A simple method for synthesizing esters of labeled cholesterol of high specific activity is described. The formation of acyl chlorides takes 10 min and they are reacted with labeled cholesterol to form the cholesterol esters in another 5 min. Yields were 30-70% and radiopurities of 90-99.5% were achieved.

PREPARATION OF 8-KETO-FATTY ACIDS. F. L. Breusch and A. Kirkarli (Chem. Inst. Univ., Istanbul). *Fette Seifen Anstrichmittel* 65, 995-996 (1963). A series of 8-keto fatty acids with chain length from C_{10} - C_{24} were prepared. The condensation of suberic acid half methyl ester chloride with an n -alkyl iodide and copper-zinc catalyst with subsequent ester saponification was employed. Melting point and analytical data are presented for each compound prepared.

UNDECANO-LACTAN AND A LAURYL LACTAN FROM CYCLOUNDECANOIC ACID. W. Ziegenbein and W. Lang (Laboratories, Chem. Wert, Hüls, A. G., Marl, Germany). *Angew. Chem. Internat. Edit.* 2, 149 (1963). The lactans mentioned above were prepared in good yield by starting with the cyclic acids which were nitrosated with equimolar quantities of nitrosil sulfuric acid, 15-30% oleum at $65-70C$ in chloroform. Physical properties of the resulting products are recorded.

EXAMINATION OF VEGETABLE OILS SULPHURISED WITH SULPHUR CHLORIDE. G. Schiemann, H. Düring and H. Körner. *Deutsche Farben-Z.* 17, 408-17 (1963). The properties of a range of vegetable oils and derivatives treated with S_2Cl_2 have been examined. The S and Cl contents of the products, their dependence on the original I.V. of the oil and changes in sap. value or A.V. have been measured. Treatment of the oils with aqueous $AgNO_3$ removed about 8% of the Cl. The relationships between d , η , n , mol wt and I.V. and the S contents of the sulphurised oils are shown in graphs. (Rev. Current Lit. Paint Allied Ind.)

INFLUENCE OF n -LAURYL MERCAPTAN ON THE CURING OF UNSATURATED POLYESTERS. H. Mewes. *Thesis, Stuttgart* 1962, 117 pp.; *List of Accessions, Roy. Inst. Technology Library, Stockholm*, 1963(147), 13. (Rev. Current Lit. Paint Allied Ind.)

EXHAUSTIVE CHLORINATION OF OLEIC AND STEARIC ACIDS AND SUITABILITY OF THE REACTION PRODUCTS FOR THE MANUFACTURE OF FIRE-RETARDANT PAINTS. P. S. Cheng. *Thesis, Karlsruhe*, 1962, 47 pp.; *List of Accessions, Roy. Inst. Technology Library, Stockholm*, 1963(147), 11. (Rev. Current Lit. Paint Allied Ind.)

CONFECTIONERS' MOLDING STARCH. J. W. Evans (American Maize-Products Co.). *U.S.* 3,130,060. A starch molding composition for use in the manufacture of confectionery products consists of an edible non-toxic admixture of starch and an ester of an aliphatic monohydric alcohol having from 1 to 12 carbon atoms and a saturated fatty acid having from 8 to 18 carbon atoms. The amount of the ester is from 0.05% to 0.5% by weight based on the weight of the starch.

• Biology and Nutrition

SHORTENING OF DEVELOPMENT TIME IN THIN-LAYER ADSORPTION CHROMATOGRAPHY. APPLICATION TO THE SEPARATION OF STEROIDS. J. Vaedtke, Anna Gajewska and Anna Czarnocka (Lab. of Hormones and Vitamins, Instytut Farmaceutyczny, Poland). *J. Chromatog.* 12, 208-211 (1963). It was found that by adding Celite to Silica Gel, R_f values increased but had no influence on the selectivity of the steroid mixture. A mixture (1:1) of silica gel and Celite 545 shortened the development time of thin layer plates 2.5 to 3.5 times as compared to chromatograms obtained when using pure absorbents.

BRAIN LIPIDS: I. QUANTIFICATION AND FATTY ACID COMPOSITION OF CEREBROSIDE SULFATE IN HUMAN CEREBRAL GRAY AND WHITE MATTER. J. S. O'Brien, D. L. Fillerup and J. F. Mead (Univ. of California School of Medicine, Los Angeles, Calif.). *J. Lipid Res.* 5, 109-116 (1964). Cerebroside sulfate was isolated by column chromatography from infant whole brains and adult human cerebral grey and white matter. Fatty acid analysis performed by gas-liquid chromatography of normal and α -hydroxy fatty acids obtained after hydrolysis revealed that cerebroside sulfate contains long-chain fatty acids ranging from 14-26 carbons both in the normal and hydroxy series. In mature brains, 24:0 and 24:1 were the major fatty acids in both series. Odd-chain fatty acids were present, as well as monounsaturates of both odd- and even-chain fatty acids, but no polyenes were detected. The fatty acid compositions of cerebroside sulfate from grey and white matter were similar. Comparison of cerebroside and cerebroside sulfate isolated from the same source revealed a similar fatty acid composition.

ANALYSIS OF LOW-DENSITY LIPOPROTEINS BY PREPARATIVE ULTRACENTRIFUGATION AND REFRACTOMETRY. F. T. Lindgren, A. V. Nichols, N. K. Freeman, R. D. Wills, L. Wing and J. E. Gullberg (Donner Laboratory of Medical Physics, Lawrence Radiation Laboratory and Laboratory of Optics and Metrology, Dept. of Zoology, Univ. of California, Berkeley, Calif.). *J. Lipid Res.* 5, 68-74 (1964). A simplified method for the analysis of both the glyceride-rich S_r $20 \cdot 10^5$ and the cholesterol-rich S_r 0-20 low-density lipoproteins is presented. It consists of serum lipoprotein fractionation by preparative ultracentrifugation and subsequent quantitative analysis by refractometry. Comparison of this technique with the technically more difficult analytic ultracentrifugal methodology reveals comparable results for these two principal low-density lipoprotein groups. One of the advantages of this procedure is that it provides a reliable and reproducible means for quantifying the principal glyceride-bearing lipoprotein group.

METABOLISM OF CHYLOMICRONS OF DIFFERING TRIGLYCERIDE COMPOSITION. P. J. Nestel and R. O. Scow (Laboratory of Metabolism, Natl. Heart Inst., Natl. Inst. of Health, Bethesda 14, Md.). *J. Lipid Res.* 5, 46-51 (1964). Lymph chylomicrons of

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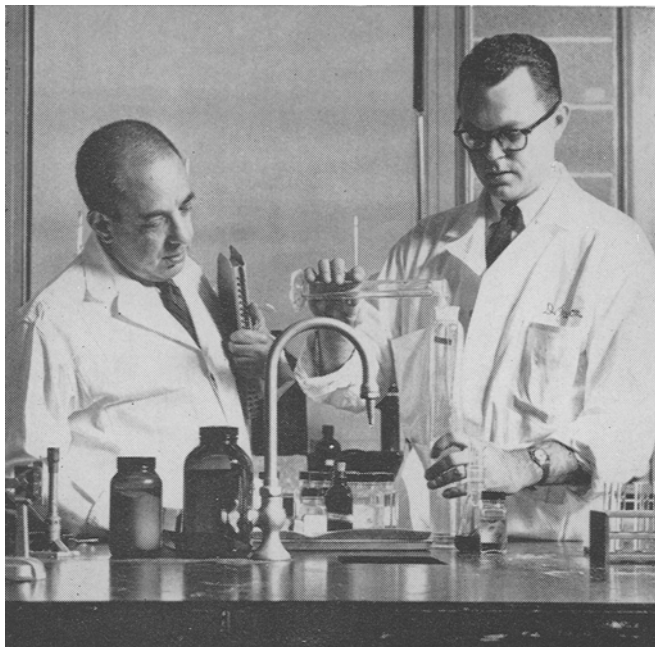
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widely different fatty acid composition were obtained from donor animals fed either cream and palmitic acid-9,10- H^3 or corn oil and linoleic acid-1- C^{14} . In intact dogs and rats, the removal of cream chylomicrons was the more rapid. In dogs the H^3/C^{14} ratio in hepatic venous blood was lower than that in femoral venous blood. In livers of rats, there was a greater percentage uptake of radioactivity associated with cream chylomicrons than of that associated with corn oil chylomicrons, but similar amounts were recovered from adipose tissue. When livers of rats were perfused with the two types of chylomicrons, the rate of removal of cream chylomicrons from the perfusate was greater. Cream and corn oil chylomicrons were removed in similar amounts when adipose tissue of rats was perfused.

METABOLISM OF GLYCERLIPIDS: V. METABOLISM OF PHOSPHATIDIC ACID. W. E. M. Lands and P. Hart (Dept. of Biological Chem., Univ. Michigan, Ann Arbor, Mich.). *J. Lipid Res.* 5, 81-7 (1964). Monoacyl glycerol phosphate is acylated more rapidly than glycerol-3-phosphate by microsomal preparations from rat or guinea pig liver. Specifically labeled diacyl glycerol phosphate derivatives were prepared. Only the 2-labeled derivative produced radioactive fatty acids when treated with *Crotalus adamanteus* venom, indicating that the phospholipase can hydrolyze diacyl glycerol phosphate and that the reaction is specific for the 2-ester. When glycerol phosphate was acylated, linoleate and stearate were incorporated at both the 1- and 2-positions. The results suggest that the specificities of the acyl transferase reactions leading to diacyl glycerol phosphate are not adequate to provide the pattern of fatty acids that is known to occur in glycerolipids in nature.

THE STRUCTURE OF PLASMALOGENS: VII. ANALYSIS OF MAMMALIAN LIVER LIPIDS AND THE INTERFERENCE OF VITAMIN A IN THE ANALYSIS. G. Camejo, M. M. Rapport and G. A. Morrill (Dept. of Biochem., Albert Einstein College of Medicine, Yeshiva Univ., N. Y.). *J. Lipid Res.* 5, 75-80 (1964). Low values of the molar ratio of α,β -unsaturated ether to aldehydogenic lipid found with lipid extracts of mouse and rat liver are shown to result solely from the presence in these extracts of vitamin A rather than of long-chain aldehydes or mixed acetals. Vitamin A interferes in the spectrophotometric determination of specific iodination of α,β -unsaturated ethers because it absorbs some light at 355 $m\mu$. Vitamin A interferes much more seriously with the estimation of aldehydogenic lipids as *p*-nitrophenylhydrazones because of its transformation under the reaction conditions to anhydro vitamin A.

EMPLOYMENT OF ETHANOL AS A SOLVENT IN SMALL SCALE CATALYTIC HYDROGENATIONS OF METHYL ESTERS. R. G. Ackman and R. D. Burgher (Fisheries Research Board of Canada, Technological Research Laboratory, Halifax, Nova Scotia). *J. Lipid Res.* 5, 130-2 (1964). Platinum oxide on silicic acid, prepared by the procedure of F. A. Vandenhuevel (*Anal. Chem.* 28, 362, 1956) does not lead to transesterification when employed with 95% ethanol in the catalytic hydrogenation of fatty acid esters. The influence of recovery procedure on the proportion of esters of various chain lengths was investigated. Disproportionate losses of methyl palmitate and myristate, relative to methyl stearate, are low during solvent removal, even when temperatures of 65-75C are employed to speed up vacuum stripping. By any recovery procedure, however, losses of methyl laurate may be appreciable.

IN VITRO UPTAKE AND HYDROLYSIS, BY RAT TISSUES, OF CHOLESTEROL ESTERS OF A VERY LOW DENSITY, CHYLE LIPOPROTEIN FRACTION. N. Brot, W. J. Lossow and I. L. Chaikoff (Dept. of Physiology, Univ. of California, Berkeley). *J. Lipid Res.* 5, 63-7 (1964). A very low density, lipoprotein fraction of chyle containing cholesterol- C^{14} (of which about 70% or more was in the esterified form) was incubated with various rat tissues. Adipose tissue, adrenal gland, mucosa of the small intestine, liver, kidney and muscle incorporated the cholesterol- C^{14} of the chylomicrons and hydrolyzed the esters. Adipose tissue, adrenal gland and mucosa of the small intestine showed the greatest hydrolytic activity. On the basis of these and other, *in vivo*, observations, the conclusion is drawn that, while the liver removes the bulk of the cholesterol esters of very low density chyle lipoproteins from the circulation, all tissues that incorporate them hydrolyze them.

BLOOD CHOLESTEROL AND CHOLESTEROL-ESTER LEVEL IN ETHIOPIANS. A. S. Loginov (Soviet Red Cross Hospital in Addis Ababa). *Federation Proc.* 23, T145-46 (1964). (*Kardiologiya* 2(1), 84, 1962). A low blood cholesterol level (166.3 ± 5

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mg%) is found in natives of Ethiopia whose diet is low in fat content; and the cholesterol-ester titer is often depressed. X-ray findings show that aortic atherosclerosis is widespread among Ethiopians and electrocardiographic findings reveal a high incidence of diffuse cardiosclerosis. Of diseases predisposing to atherosclerosis, hypertension and diabetes mellitus are most prevalent in Ethiopia.

ATHEROSCLEROSIS IN CHRONIC NONSPECIFIC LUNG DISEASES. M. A. Shalevich and G. E. Sarankin (Dept. of Pathological Anatomy, Moscow Clinical Hospital No. 4 and Chair of Propedeutics of Internal Diseases of the Pediatric Faculty, Pirogov Second Moscow Institute of Medicine). *Federation Proc.* 22, T857-860 (1963). (*Terapevticheskiy Arkhiv* 34(9), 38, 1962). The general pattern of the spread of atherosclerosis in different vascular beds of the aorta and the arteries of the heart and brain, as well as the general age and sex characteristics of atherosclerosis, applies in the case of patients with chronic nonspecific lung diseases. The reasons for the unusual development and course of atherosclerosis in patients with nonspecific lung diseases may well be the hypochlosteremia arising as a result of intensified lipid metabolism in the lungs and the hypotension frequently observed in these patients. Chronic hypoxia probably inhibits the development of atherosclerosis.

ARTERIOVENOUS DIFFERENCE IN BLOOD CHOLESTEROL LEVELS IN DIFFERENT FUNCTIONAL STATES OF THE CEREBRAL CORTEX. K. G. Karagezyan and M. G. Urgandzhyan (Inst. of Biochem., Armenian SSR Academy of Sciences). *Federation Proc.* 22, T973-975 (1963). (*Fiziologicheskii Zhurnal SSSR imeni I. M. Sechenova*, 48(11), 1377, 1962). Under normal conditions the brain releases free cholesterol into the peripheral blood. Electrocutaneous ("pain") excitation causes a marked increase in the free cholesterol level of the blood flowing out of the brain and somewhat lowers the cholesterol level of the blood flowing into the brain. There is a positive arteriovenous difference in the free cholesterol level after deep conditioned inhibition, i.e., the level increases in the arterial blood and decreased in the venous blood. Hence, during deep inhibition the brain absorbs free cholesterol from the peripheral blood instead of releasing it.

PHOSPHOLIPID AND PLASMALOGEN CHANGES DURING FUNCTIONAL DIFFERENTIATION OF ADIPOSE TISSUE IN THE NEWBORN RAT. G. A. Morrill and M. M. Rapport (Depts. of Physiol. and Biochem., The Albert Einstein College of Med., Yeshiva Univ., N. Y. 61, N. Y.). *J. Biol. Chem.* 239, 740-42 (1964). The changes in the aldehyde hydrogenic lipid, phospholipid, total lipid, nucleic acid and water content (expressed per mg of tissue DNA phosphorus) of developing adipose tissue of newborn rats have been followed during the first 8 days of life. The results indicate that the rate of deposition of total lipid referred to the DNA content of the tissue rises rapidly in the first 2 days post-natally, whereas the water content per cell does not decrease until the 3rd day. As the adipose tissue fills with lipid, the concentration of both plasmalogen and phospholipid increase with respect to DNA content, suggesting a net synthesis of phospholipid per cell during the period of accelerated lipid deposition. Plasmalogen, however, accumulates less rapidly than the total phospholipid, indicating a differential accumulation of nonaldehyde hydrogenic phospholipids. A characteristic of developing adipose tissue is the constant value for the RNA:DNA ratio.

THE EFFECT OF A PHTHALANILIDE DERIVATIVE ON LIPIDE METABOLISM IN L1210 LEUKEMIA CELLS. A. Gellhorn, M. Wagner, M. Rechler, Z. Koren and W. Benjamin (Dept. of Med. and Inst. of Cancer Res., College of Physicians and Surgeons, Columbia Univ., New York, N. Y.). *Cancer Res.* 24, 400-8 (1964). An active anti-leukemic phthalanilide, 2-chloro-4'-4"-di-2-imidazolyl-2-ylterephthalanilide (NSC-60339) markedly inhibited the *in vitro* incorporation of acetate into lipides of L1210 cells after *in vivo* administration. The depression of lipide biosynthesis is considered to be the primary mechanism of anti-leukemic action of this class of compounds because a) it is not found when an inactive congener is injected into tumor-bearing mice, b) there is only partial inhibition of lipide metabolism in the phthalanilide-resistant L1210 tumor following treatment, c) the drug inhibits fatty acid and cholesterol synthesis to a significantly greater extent than protein synthesis, d) methotrexate, 6-mercaptopurine, 5-fluorouracil, cyclophosphamide, and a nitrosourea derivative, all therapeutically effective against L1210, fail to depress lipide biosynthesis significantly and e) the effect of the phthalanilide on fatty acid synthesis in normal adipose tissue is an irregular inhibition in contrast to a regular and profound depression of lipide metabolism in L1210 cells.

BIOSYNTHESIS OF SKIN STEROLS. VI. ENZYMATIC DEMETHYLATION OF LANOSTEROL AND LANOSTA-7,24-DIEN-3 β -OL BY HOMOGENATES OF RAT LIVER. J. L. Gaylor (Graduate School of Nutrition, Cornell Univ., Ithaca, N. Y.). *J. Biol. Chem.* 239, 756-61 (1964). Bucher homogenates of rat liver convert (demethylate) lanosterol and lanosta-7,24-dien-3 β -ol to C₂₇-sterols. The maxi-

New Orleans Highlights

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LADIES' ACTIVITIES



Tuesday was a big day for the ladies as well. They began with a Continental Breakfast at the Roosevelt Hotel, boarded busses for a tour of the Ponchartrain Lakefront, parks, fountains and outstanding residential areas. Luncheon at Vista Shores Country Club (Bayou St. John) was followed by shopping and preparation for the Annual Banquet that evening. The New Orleans Ladies' Committee (left photo) is to be congratulated for the fine program that awaited the record number of ladies who attended the 55th Annual Meeting. They are (left to right): Mrs. J. P. Hughes; Mrs. J. J. Ganucheau; Mrs. R. O. Feuge; Mrs. L. E. Brown; Mrs. Joseph Pominski; Mrs. N. B. Knoephler; Mrs. H. L. E. Vix, Chairman; Mrs. S. D. Jones; Mrs. J. J. Shadaro; Mrs. H. K. Gardner; and Mrs. R. T. O'Connor.

Among the Committees convening on Tuesday to shape the year ahead were the National Program and Planning



SYMPOSIA COMMITTEES



Committee, whose formidable task it is to coordinate nationwide efforts to plan major portions of the AOCS Technical Programs presented each year. Center photo (clockwise from extreme left): R. J. Buswell; S. C. Miksta; R. T. O'Connor; R. A. Reiners (only hand showing); L. O. Leenerts, Chairman; Raymond Reiser; H. P. Dupuy; N. H. Moore; D. C. Porter; and T. P. Matson.

A highlight of both Monday and Tuesday Technical Programs was the Biodegradable Detergents Symposium. Many of the authors who participated in this major presentation are to be found in the above right photo, left to right: L. J. Garrison; W. A. Sweeney; J. Rubenfeld; F. J. Coughlin; Eric Jungermann, Chairman; R. D. Swisher; C. A. Brunner; E. S. Pattison; R. L. Huddleston; E. C. Steinle; and J. H. McFarland. Papers of this Symposium will be published in a later issue. (Continued on page 43)