ABSTRACTS

R.A. REINERS, Editor. ABSTRACTORS: N.E. Bednarcyk, J.E. Covey, J.G. Endres, Yoshio Hirano, J. Iavicoli, S. Kawamura, D.A. Leo, F.A. Kummerow, E.G. Perkins, and R.W. Walker

• Fats and Oils

ANALYSES OF PHOSPHOLIPIDS, CERAMIDES, AND CEREBROSIDES BY GAS CHROMATOGRAPHY AND GAS CHROMATOGRAPHY-MASS SPECTROMETRY. M. G. Horning, S. Murakami and E.C. Horning. *Am. J. Clin. Nutr.* 24, 1086–96 (1971). Through the development of gas chromatography (GC) and gas chromatography-mass spectrometry (GC-MS) for the study of phospholipids, it is possible to obtain structural information without prior enzymic hydrolysis. The identification and location of fatty acids on the glycerol chain of phospholipids, and the identification of the long-chain base moiety and acyl groups of sphingomyelins, ceramides and cerebrosides are provided by GC-MS analyses.

IDENTIFICATION OF NEW STERANES, TERPANES AND BRANCHED PARAFFINS IN GREEN RIVER SHALE BY COMBINED CAPILLARY GAS CHROMATOGRAPHY AND MASS SPECTROMETRY. E.J. Gallegos (Chevron Res. Co., Richmond, Calif. 94802). *Anal. Chem.* 43, 1151–60 (1971). Combined gas chromatography-mass spectrometry, GC-Ms, of the branched-cyclic hydrocarbon fraction of Green River shale is used in a provisional identification of the carbon skeletons of two perhydro-α-carotenes; five pentacyclic triterpanes, one of which is gammacerane; two tetracyclic tris-homoditerpanes; 11 tricyclic terpanes; seven tetrocyclic steranes, 5-α- and 5-β-cholestane, 5-α- and 5-β-ergostane, 5-α- and 5-β-stigmastane, and 5-α-pregnane, and finally nine branched paraffins. Twenty-two of these components are reported here for the first time. The analytical identification of 36 individual components in the saturate fraction of Green River shale further demonstrates the importance of combined GC-MS. The stereochemical importance of the ratio of intensities of the m/e 149 to m/e 151 fragment ions in the identification by mass spectra of 5-α and/or 5-β-steranes is discussed.

METAL CAPRATES AS ANALYTICAL STANDARDS FOR SPECTROMETRIC OILS ANALYSIS. W.E. Hearn, R.A. Mostyn and B. Bedford (Quality Assurance Directorate (Materials), Royal Arsenal, London, S.E.18, U.K.). *Anal. Chem.* 43, 1821–26 (1971). Metal salts of capric acid are proposed as standard materials for the spectrometric determination of metals in oils and other organic samples. Detailed procedures are given for the preparation of metal caprates and for the accurate determination of their metal content. These salts possess certain advantages over alternative organometallic standards. Experimental results are presented of the comparative spectrometric performance of metal caprates and the widely-used metal cyclohexanebutyrates; methods of solubilization and the stability of standard solutions in various media are discussed.

QUANTITATIVE ANALYSIS OF LIPID CLASSES. O.S. Privett, K.A. Dougherty and J.D. Castell (Hormel Inst., Univ. of Minnesota, Austin, Minn. 55912). *Am. J. Clin. Nutr.* 24, 1265–75 (1971). Common techniques of lipid class analysis are briefly reviewed and a general procedure for extraction, fractionation, and analysis of these compounds is described. The method entails extraction of the tissues with chloroform-methanol and fractionation of the lipid by acid-washed Florisil chromatography. Neutral and polar lipid fractions are analyzed separately. Important aspects of the use of the charring-densitometric technique for quantitative analysis are demonstrated. Methods involving application of specific analytical techniques to compounds isolated by a combination of column or thin-layer chromatography, or both, are also briefly reviewed. A procedure is described for the quantitative degradation of glycerophosphatides and gas chromatography of triacetin derived from the glycerol moiety of these compounds. The method is also applicable to glycolipids and sphingolipids and is suggested as a means for the quantitative analysis of these compounds as well as glycerophosphatides.

SWEDISH QUALITY REQUIREMENTS FOR PALM OIL USED FOR MARGARINE MANUFACTURE, AND SOME COMPARATIVE ANALYSES OF EDIBLE OILS. G. Johansson (Karlshamns Oljefabriker). *Oleagineux* 26, 387–402 (1971). From analyses of oil shipments, a close relationship was shown to exist between bleachability and oxidation values; an oil with a low oxidation value also bleached well. In measuring oxidation, peroxide value alone is not sufficient; benzidine value must also be determined. Producers need to determine the stages during processing and shipping at which oxidation occurs and take steps to minimize it. Palm oil factories need facilities for determining both P.V. and B.V. for quality control.

FRACTIONATION AND HYDROGENATION OF FATS AND FATTY ACIDS. G. Coppa-Zuccari. *Oleagineux* 26, 405–9 (1971). A process is described for hydrogenation followed by solvent fractionation of the hardened fats. Some results with various animal fats and vegetable oils are given.

SELECTIVE HYDROGENATION. E. Ucciani (ITERG, Marseille). *Rev. Franc. Corps Gras* 18, 373–9 (1971). The chemical reactions involved and the various factors which influence hydrogenation selectivity are discussed. Results of recent studies on heterogeneous and homogeneous catalysis as well as the advantages and disadvantages of each process are also covered.

FRACTIONATION, WINTERIZATION AND DEGUMMING OF EDIBLE FATS AND OILS. M. Bernardini and E. Bernardini (Bernardini Mechanical Contracting Co.). *Rev. Franc. Corps Gras* 18, 439–43 (1971). The practical application of these processes is discussed along with some examples involving palm oil, lard (neutral and interesterified) and some other vegetable oils. Brief mention is made of continuous crystallizers and filters.

INTERESTERIFICATION OF ANIMAL FATS AND VEGETABLE OILS. A. Jakubowski (Fat Industries Inst., Warsaw). *Rev. Franc.*

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Associate Editor Dies

Word has been received of the death of Robert F. Witter, '63, Chief, Clinical Chemistry Standardization Unit, National Communicable Disease Center, U.S. Public Health Service, Atlanta, Georgia. Dr. Witter had served as an Associate Editor for *Lipids* since 1965.

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Corps Gras 18, 429–37 (1971). Principles and practices of interesterification are discussed. An example involving hydrogenated tallow and sunflower or rapeseed oil is given.

CHEMICAL CHANGES OCCURRING DURING THE HEATING OF FATS. R. Guillaumin (ITERG, Paris). *Rev. Franc. Corps Gras* 18, 445–56 (1971). The changes which take place in fats as a result of the action of heat and oxygen are reviewed. Both volatile and nonvolatile products such as free acids and various types of polymers are included. Reaction mechanisms for the formation of polymers are given in detail.

CHARACTERIZATION AND DETERMINATION OF PROOXIDANTS. A.M. Siouffi (Provence Univ., Marseille). *Rev. Franc. Corps Gras* 18, 457–64 (1971). Prooxidant substances in fats for the most part contain trace metals occurring either naturally (*e.g.*, from chlorophyll, hemoglobin) or accidentally as from contamination from equipment. The mechanism of their action is explained by Waters' and Kochi's hypotheses. Methods of analysis for these substances are reviewed. Those methods most frequently used are thin-layer microchromatography, atomic absorption spectroscopy, including use of a graphite oven, atomic fluorescence spectroscopy, photocolorimetry and activation analysis. The limits of sensitivity of atomic absorption and activation for different metals are tabulated.

PRESERVATION, STORAGE AND CONDITIONING OF EDIBLE OILS. G. Dagron (Ste. Lesieur-Cotelle, Boulogne-sur-Seine). *Rev. Franc. Corps Gras* 18, 501–8 (1971). Deterioration processes, such as autoxidation, reversion, and migration of components from the storage container, which fluid edible oils can undergo are reviewed. Ways of minimizing these changes in consumer containers of oil are discussed. Glass bottles are compared with containers of rigid PVC and low and high density polyethylene in terms of physical (*e.g.*, oxygen permeability), mechanical and thermal properties. Advantages and disadvantages of each of these last three materials are summarized.

ADDITIVES FOR EDIBLE FATS: PRESENT AND FUTURE REGULATION OF THE E.E.C.; GOOD AND BAD POINTS. M. Fondu (Union S.A., Merksam, Belgium). *Rev. Franc. Corps Gras* 18, 509–15 (1971). Regulations are tabulated on colors, antioxidants and emulsifiers in effect in the individual countries of the E.E.C. The proposals of the Codex Alimentarius Commission and the Federation of Oil Processors of the E.E.C. on these same additives are tabulated for comparison. Adoption of the acceptable daily dosage (A.D.D.) concept may alter some of these proposals.

VOLATILE COMPOUNDS FORMED VIA AUTOXIDATION. A. Prevot (Inst. des Corps Gras, Paris). *Rev. Franc. Corps Gras* 18, 517–36 (1971). Present knowledge on the identity of oxidative breakdown products of edible oils is reviewed. Particular attention is paid to the thresholds of perception of some of the compounds present at very low levels. Methods for isolating and analyzing these volatile breakdown products are described in detail.

OXIDIZED ACIDS IN CRUDE FATS. II. SEPARATION OF OXIDIZED METHYL ESTERS FROM UNSAPONIFIABLE CONSITUENTS WITHOUT STRUCTURAL ALTERATION. J. Graille, F. Bedie and M. Naudet (ITERG, Provence Univ., Marseille). *Rev. Franc. Corps Gras* 18, 537–45 (1971). The steps in the separation scheme are the following: hydrolysis by a nonspecific lipase, extraction of the unsaponifiables from a neutral buffered solution of the soaps with 25% ethanol, concentration (if necessary) of the oxidized acids by liquid-liquid extraction, methylation at room temperature with methyl sulfate, and isolation of the oxidized esters by reversed-phase liquid partition chromatography. The esters can then be fractionated by thin-layer chromatography.

MACHINE FOR MOLDING AND WRAPPING BUTTER, MARGARINE, AND OTHER SUBSTANCES OF LIKE CONSISTENCY. P. Graf (Schweizerische Industrie-Gesellschaft). *U.S. 3,616,594.* The shafts of the molding and wrapping wheels are at right angles and are turned step-wise by a common gear unit consisting of a Maltese cross transmission and planetary gearing.

APPARATUS FOR THE REMOVAL OF SURFACE OIL FROM FRIED FOODS. A.R. Davidson and J.E. Haubner (Lamb Weston). *U.S. 3,627,535.* The fried food is subjected to a blast of air saturated with water vapor immediately after frying and before the food has cooled substantially.

CONTINUOUS PROCESS FOR PRODUCING FAT AND SOLIDS FROM WET BIOLOGIC SUBSTANCE. E. Levin (Viobin Corp.). *U.S. 3,627,796.* Particles of substance and a solvent capable of forming an azeotrope with water and removing fat from the substance are continuously introduced into a wet intake zone and heated together to distill off the azeotrope. The solvent plus particles are further dried in a second zone before being separated by filtration in a third zone. The fat can then be separated from the miscella and the particles desolventized.

DETERMINING THE FAT CONTENT OF MILK. H. Werner (N. Foss Electric A/S). *U.S. 3,628,916.* A batch of an oil-in-water emulsion, such as milk, is stabilized by addition of a viscosity-increasing agent. A portion of the batch is then analyzed for fat content. The remainder of the batch is then utilized as a reference standard for checking and calibrating the apparatus used to determine the fat content of such emulsions by light transmission.

REFINING PROCESS FOR CRUDE GLYCERIDE OIL. M.A. Marino, F.J. Birkhaug and G.E. Sadek (CPC International). *U.S. 3,629,307.* The improved process comprises mixing the crude oil with an aqueous solution of sodium hydroxide, reacting the mixture until the free fatty acids are converted into soaps, dehydrating the mixture, and then rehydrating it in a pressurized centrifuge. The foots are then separated from the refined oil by centrifugation. The process permits a single refining step without the need for a separate degumming step.

• Fatty Acid Derivatives

STUDIES ON THE SYNTHESES OF MERCAPTANS. IV. ON THE SIDE REACTIONS LAURYL CHLORIDE REACTION WITH SODIUM HYDROGENSULFIDE IN N-BUTANOL AND DIMETHYLFORMAMIDE. T. Arai, M. Koyama and M. Koide (Res. Lab., Nippon Oil & Fat Co., Ohama-cho, Amagasaki, Japan). *Yukagaku* 20, 155–60 (1971). Products of the lauryl chloride Na_2S reaction in n-BuOH or DMF were quantitatively analyzed. The following reactions occurred almost quantitatively in n-BuOH and to a lesser degree in DMF: $RCl + Na_2S \rightarrow RSNa + NaCl$; $RSH + NaOH \leftrightarrows RSNa + H_2O$; $RSNa + RCl \rightarrow RSR + NaCl$.

These differences are well explained in terms of the difference in solvation power of each solvent for Na^+. In DMF, a small amount of RSSR was produced and the occurence of the following reaction was confirmed: $(CH_3)_2NCHO + Na_2S + H_2O \rightarrow (CH_3)_2NH + NaSH + HCOONa$.

DIBASIC ACIDS CONTAINING ETHER LINKAGES. II. PLASTICIZING ACTIVITIES OF ESTERS AND N- SUBSTITUTED AMIDES OF DIBASIC ACIDS DERIVED FROM DI-, TETRA-, AND PENTA-ETHYLENE GLYCOLS. Y. Abe, T. Aoki and H. Miyagawa (Faculty of Eng., Keio Univ., Maehara, Koganei, Tokyo). *Yukagaku* 20, 149–54 (1971). Higher esters and N-substituted amides of di(carboxy)methyl ether, di(carboxymethoxy)ethyl ether and di(β-(carboxymethoxy)ethoxy) ethane, obtained from di-, tetra-, and pentaethyleneglycols by nitric acid oxidation, were prepared, and their characteristics as plasticizers for polyvinyl chloride were studied. The esters were generally excellent in low temperature performance and had good antistatic properties, but showed poor thermal stability. The N-substituted amides were not good plasticizers because of low compatibility with resin and poor thermal stability.

FLOUR MIXES AND BAKED PRODUCTS CONTAINING FATTY ALCOHOL-ENHANCED EMULSIFIERS. B.D. Buddemeyer, M.S. Fish, D.P. Leonard and H.H. Miers (Paniplus Co.). *U.S. 3,623,887.* The emulsifier mixture consists of a fatty alcohol with 12–24 carbon atoms and one or more of the following components: (a) an acyl lactylic type ester; (b) a fatty alcohol monoester of an aliphatic dicarboxylic acid; (c) a mixed polyoxyalkylene, succinylated, lactylated or acetylated ester. The proportion of alcohol can range from 1 to 100% of the weight of the ester.

STABLE LIQUID SHORTENING. E.J. Reid (Hunt-Wesson). *U.S. 3,623,888.* A liquid shortening which remains clear to about 60F is prepared from a liquid oil, a crystal inhibitor and an emulsifier mixture consisting of an acyl lactylic acid mixture, a monoglyceride, and a free saturated fatty acid containing 16–22 carbon atoms.

FATTY ACID AMIDO-METHIONINE PRODUCTS. J.V. Morelle. *U.S. 3,624,114.* The fatty acid portion may contain 5–29 carbon atoms, and the amides are useful in therapeutic and cosmetic preparations for finger nails and hair.

HEAT STABILIZED ANTISTATIC POLYAMIDES. L.W. Crovatt (Monsanto). *U.S. 3,624,245.* Tensile strength loss on heating is reduced in polycarbonamides containing 0.1–20% polyalkoxylated triglyceride of a fatty acid containing 10–30 carbon atoms, by adding 0.01–2% of a sterically hindered phenol.

SHORTENING AND MIXES CONTAINING GLYCOLIPID EMULSIFIERS. D.V. Myhre and J.E. Hunter (Procter and Gamble Co.). *U.S. 3,625,706.* Bakery compositions containing glycolipids, *e.g.*, sugar glycosides with long chain (C_{12}-C_{22}) fatty acids, are disclosed. The glycolipids are useful as oil-in-water emulsifiers.

WASH CYCLE FABRIC SOFTENERS. M.M. Waldman and A.E. Mariahazy (Armour Industrial Chem. Co.). *U.S. 3,625,891.* The softener comprises certain combinations of three types of quaternary ammonium compounds as, for example, the combination of 25% dimethyldiphenylstearyl ammonium chloride, 30–45% dimethyl hydrogenated tallow C_{11}-C_{15} *sec*-alkyl ammonium chloride, and 45–30% dimethyl dihydrogenated tallow ammonium chloride. It is compatible with anionic and nonionic detergents.

PREPARATION OF MONOHALOGENATED METHYLENEDIPHOSPHONATE ESTERS AND PHOSPHONOACETATE ESTERS. D.A. Nicholson (Procter and Gamble Co.). *U.S. 3,627,842.* The dihalo ester starting materials are reacted with a reducing agent such as sulfite or sulfide ion in base. The resulting monohalo esters are useful as intermediates in the preparation of detergent builders and as extreme pressure additives and antiwear additives in lubricant compositions.

SPRAY-DRIED WHIPPABLE FOOD COMPOSITION. P.P. Noznick and C.W. Tatter (Beatrice Foods). *U.S. 3,628,968.* The product consists of a polyglycerol partial ester of a higher fatty acid; a carbohydrate from the group of starch, dextrin, gums, and sugars and/or a fat; and acid whey.

• Biochemistry and Nutrition

ROLE OF VITAMIN E IN THE REGULATION OF RABBIT LIVER XANTHINE DEHYDROGENASE ACTIVITY. G.L. Catignani and J.S. Dinning (Div. Nutr., Dept. Biochem., Vanderbuilt Univ., Nashville, Tenn. 37203). *J. Nutr.* 101, 1327–30 (1971). Vitamin E deficiency in rabbits results in a large increase in liver xanthine dehydrogenase activity, suggesting that vitamin E regulates the synthesis of this enzyme. It is postulated that increased liver xanthine dehydrogenase activity may be responsible for the anemia observed in vitamin E-deficient animals.

EFFECT OF PHOSPHOLIPASES ON THE STRUCTURE AND FUNCTION OF MITOCHONDRIA. C. Burstein, A. Loyter and E. Racker (Section of Biochem. and Molecular Biol., Cornell Univ., Ithaca, N.Y. 14850). *J. Biol. Chem.* 246, 4075–82 (1971). Exposure of bovine heart mitochondria to purified preparations of phospholipase A or phospholipase C resulted in losses of phosphorylation capacity, whereas respiration was not impaired. The inhibitory effects of low concentrations of phospholipase A on phosphorylation were prevented or reversed by bovine serum albumin. At higher concentrations of phospholipase A neither bovine serum albumin nor lecithin were effective in restoring phosphorylation. Exposure of mitochondria to phospholipase C resulted in a loss of Ca^{++} translocation, a partial depression of oxidative phosphorylation, and a partial loss of organically bound phosphorus. Phospholipase C-treated mitochondria were resistant to the uncoupling action of Ca^{++} or K^+ plus valinomycin. Addition of nigericin together with valinomycin and K^+ was required to abolish phosphorylation associated with oxidation in phospholipase C-treated mitochondria. These responses resemble those of submitochondrial particles rather than those of mitochondria. In electron micrographs, phospholipase C-treated mitochondria looked like submitochondrial particles packaged in mitochondria. A partial restoration of Ca^{++} translocation after phospholipase C digestion was achieved by addition of either egg lecithin or of large amounts of bovine serum albumin.

VARIABILITY OF CHOLESTEROL CONCENTRATION IN PLASMA AND EGG YOLKS OF HENS AND EVALUATION OF THE EFFECT OF SOME DIETARY OILS. I. Bartov, S. Bornstein and P. Budowski (Div. Poultry Sci., Volcani Inst. Agr. Res., Bet Dagan, Israel). *Poultry Sci.* 50, 1357–64 (1971). Yolks of eggs produced by different hens, but of similar rates of egg production, vary significantly in their cholesterol concentration, whereas different eggs laid by the same hen have remarkably uniform yolk cholesterol levels. The total amount of cholesterol per whole yolk, as well as the cholesterol concentration per gram yolk, were significantly higher in eggs laid by hens having a low rate of production. Supplementing a laying diet with 20% coconut or safflower oil produced a significant (but not marked) increase in yolk cholesterol, whereas soybean oil was without effect. Yolk cholesterol was not affected by dietary supplements of soy sterols.

HEPARIN-INDUCED RELEASE OF LIPASE ACTIVITY FROM PERFUSED CANINE SUBCUTANEOUS ADIPOSE TISSUE. K. Ballard, B.B. Fredholm, H.C. Meng and S. Rosell (Dept. Pharmacol., Karolinska Inst., Stockholm 60, Sweden). *Proc. Soc. Exp. Biol. Med.* 137, 1490–4 (1971). The effects of heparin, histamine and Compound 48/80 on the release of free fatty acids (FFA), glycerol and venous plasma lipolytic activity (VPLA) from the isolated perfused canine subcutaneous adipose tissue in situ was studied. Intra-arterial administration of heparin with dosages between 5 to 500 μg produced an increase in VPLA release which was dose dependent. The VPLA release was decreased after repeated injection of heparin. Heparin administration did not alter the release of FFA and glycerol. Histamine and Compound 48/80 increased FFA and glycerol release, but produced no effect on VPLA release. The results

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AOAC Invites Award Nominations

Harvey W. Wiley Award for Analytical Contributions

The Association of Official Analytical Chemists invites nominations for the 16th AOAC Harvey W. Wiley Award for outstanding contributions to analytical chemistry. Nominees must be from North America but need not be AOAC members to be considered for the $750 annual award.

The Harvey W. Wiley Award for analytical contributions was established by the AOAC in 1956 in honor of the father of the original Pure Food and Drug Law. Wiley was also one of the founders of the Association. The purpose of the award is to recognize an outstanding scientist or scientific team for contributions and achievements made in analytical methodology in subject areas of interest to agriculture and public health. Subjects include drugs, foods, beverages, colors, cosmetics, feeds, fertilizers, pesticides, vitamins, water and air pollution, and general analytical chemistry.

Previous awards have been given to scientists who contributed to pesticide residue analysis, analysis of agricultural products, drug methodology, fertilizer chemistry, paper chromatographic techniques, analytical chemistry of food contaminants, entomology, and techniques for molecular structure. The 1971 award was presented to Charles W. Gehrke, University of Missouri, for his outstanding contributions to gas liquid chromatography and GLC-mass spectrographic methodology.

Nomination forms for the Wiley Award and further information may be obtained from Luther G. Ensminger, Association of Official Analytical Chemists, Box 540, Benjamin Franklin Station, Washington, D.C. 20044. Nominations *must be received by April 1, 1972,* to be considered for this year's award. Any nominations submitted may be held 4 years for judging before renewal is necessary.

1972-1973 AOAC Scholarship Award

Nominations for the seventh annual AOAC Scholarship Award are now invited by the Association of Official Analytical Chemists. The award, established in 1965 in honor of Harvey W. Wiley, consists of $500 for each of 2 years to an undergraduate college student majoring in a scientific area important to agriculture or public health which is of interest to the Association. Students taking chemistry, food technology, pharmacology, and related subject areas are eligible. Medical or premed students are excluded. Students at Oregon State, Rutgers, Clemson and Purdue Universities, and Carleton and St. Joseph Colleges have won the first scholarships in the 1966–1971 period.

A nominee must have at least a "B" average grade, must be ready for the last 2 years of undergraduate study, and should but not necessarily be planning graduate study in an area covered above. He must have good character and need financial assistance to complete his education.

Any interested person may nominate candidates. The nomination letter must include: (1) the name, age and home address of the student, name and address of the institution where he will study; (2) his educational record and occupational experience; (3) general statement on financial status of student and family; (4) field of major interest; (5) character reference by two individuals; and (6) an evaluation by the sponsor.

Six copies of the nominating material must be received by May 1, 1972, to be considered for this year's award. Please send nominations to: Luther G. Ensminger, Association of Official Analytical Chemists, Box 540, Benjamin Franklin Station, Washington, D.C. 20044.

• *Abstracts . . .*

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do not support the contention concerning a possible role of mast cell heparin in the regulation of lipid metabolism in canine subcutaneous adipose tissue but confirm the previous findings that mast cell histamine may exert some effect in the mobilization of FFA.

STEROL AND TRITERPENE SYNTHESIS IN THE DEVELOPING AND GERMINATING PEA SEED. D.J. Baisted (Dept. Biochem. Biophysics, Oregan State Univ., Corvallis, Oregon 97331). *Biochem. J.* 124, 375–83 (1971). Developing and germinating pea seeds were compared with respect to their capacity to incorporate mevalonate into sterols and triterpenes. The capacity for sterol synthesis is greatest in the least mature fruits and decreases during their development. Label is shown, by gas-liquid chromatography and counting the radioactivity of trapped fractions, to be associated with campesterol, β-sitosterol and isofucosterol. During early stages of germination sterol synthesis is insignificant. The triterpene fraction becomes heavily labelled during both development and germination. The label is associated almost exclusively with β-amyrin during germination but with cycloartenol and 24-methylenecycloartanol during development. It is only in the terminal stages of maturation that β-amyrin becomes significantly labelled. At the same time an unidentified radioactive polar compound appears. The possible significance of the appearance of this polar compound and the regulation of the synthesis of these higher terpenoids is discussed.

FAT UTILIZATION AND LIPOGENESIS IN THE YOUNG PIG. G.L. Allee, D.H. Baker and G.A. Leveille (Dept. of Animal Sci., U. Ill. at Champaign-Urbana, Urbana, Ill. 61801). *J. Nutr.* 101, 1415–22 (1971). The effect of dietary fat on weight gain and energy efficiency as well as on adipose tissue lipogenesis and the activity of related enzymes was evaluated in the young pig. By the use of diet formulation methods that maintained a constant ratio of each nutrient in the diet to the concentration of metabolizable energy, it was demonstrated in three experiments that the young pig was capable of utilizing fat calories as effectively as carbohydrate calories. Lipogenesis, as measured by the incorporation of glucose-U-^{14}C into fatty acids in adipose tissue slices, was markedly depressed as the level of dietary fat increased. Glucose-U-^{14}C conversion to glyceride-glycerol and $^{14}CO_2$ was also reduced as dietary fat level increased. The specific activity of malic enzyme and citrate cleavage enzyme paralleled the lipogenesis response. Elevated plasma free fatty acid and cholesterol levels were observed in pigs fed diets containing 13% corn oil compared with those fed diets with 1% corn oil.

TOXICOLOGICAL EXAMINATION BY CHICKEN EMBRYO OF RANCID OILS. T. Miura, M. Tsuchida and K. Takagi (Nat. Inst. Health, 2–10–35 Kamiosaki, Shibuya, Tokyo). *Yukagaku* 20, 335–40 (1971). Two-tenths ml of oil sample was injected into the yolk sac of fertile eggs (White Leghorn, 6 days old), which were incubated at 38C for 3 days. The toxicity of oils was determined by the mortality of embryo. All fresh oils were proved to be nontoxic, while rancid oils showed remarkable toxicity parallel with their rancidity expressed by POV, carbonyl value, acid value or IV. The results agreed with those of animal experiments with mice and were reproducible.

DETERMINATION OF SOYBEAN TRYPSIN INHIBITORS: PROBLEMS ENCOUNTERED WITH DETERMINING LOW LEVELS IN TOASTED SOYBEANS. R. Delobez and R. Duterte (Lab. of the Soc. Ind. des Oleagineux, 62-St. Laurent Clangy) and M. Rambaud. *Rev. Franc. Corps Gras* 18, 381–9 (1971). An improved method for determining residual trypsin inhibitors, at levels of 0.2% of the initial value, in toasted soybeans is described. The method consists of digesting the toasted material with different amounts of trypsin. When the amount of inhibitor is low, digestion occurs more rapidly with lower levels of trypsin. Curves determined on various types of toasted soybean are presented.

NEW KNOWLEDGE ON THE NUTRITIONAL VALUE OF DIFFERENT FATS IN ANIMAL NUTRITION. R. Ferrando (National Veterinary School, Alfort). *Rev. Franc. Corps Gras* 18, 353–72 (1971). The following subjects are discussed in this review: digestibility and energetic value of different fats and their fatty acids, low calorie lipids, essential fatty acids and their effects on the laying hen, essential fatty acids and vitamin E, and toxic

substances introduced into edible fats as a result of processing and/or oxidation. The possible presence of pesticide residues is also considered.

EDIBLE FATS, ESSENTIAL FATTY ACIDS AND PROSTAGLANDINS. R.O. Vles (Unilever Res. Lab., Vlaardingen). *Rev. Franc. Corps Gras* 18, 345–52 (1971). In this review article, the author discusses the biochemistry of essential fatty acids and prostaglandins. The relationship of these substances to heart disease and the effects of vitamin E on longevity are also covered.

VITAMIN A: CONCENTRATION IN THE RAT LIVER GOLGI APPARATUS. S.E. Nyquist, F.L. Crane and D.J. Moore (Depts. of Bio. Sciences, Botany and Plant Pathol., Purdue Univ., Lafayette, Indiana 47907). *Science* 173, 939–41 (1971). Vitamin A compounds (principally as retinyl esters) are concentrated in Golgi apparatus fractions from rat liver. The amounts vary with the vitamin A status of the liver and show an inverse relation to the concentration of ubiquinone. The results suggest a specific role of the Golgi apparatus in the mobilization or action, or both, of vitamin A compounds.

UTILIZATION OF MEDIUM- AND LONG-CHAIN FATTY ACIDS BY NORMAL RAT AORTA, AND THE EFFECT OF DL-CARNITINE ON THEIR UTILIZATION. S. Hashimoto and S. Dayton (Res. Service & Med. Service, Wadsworth Hosp., V.A. Center, Los Angeles, Cal. 90073). *Atherosclerosis* 13, 345–54 (1971). Utilization of medium- and long-chain fatty acids by normal rat aorta and the effect of carnitine on their utilization were examined in vitro. Total uptake of fatty acid, measured as the sum of incorporation of ^{14}C into CO_2, lipid and water-soluble products, was maximal with octanoate and decreased steadily with increasing chain length up to palmitate. Further increase in chain length and the degree of unsaturation had no effect on total uptake of fatty acid. Octanoate, decanoate and laurate were most completely oxidized to CO_2, the fraction oxidized amounting to 99, 97 and 85% of the total uptake of fatty acids; stearate was lowest with 33%. Extent of oxidation of myristate, palmitate, oleate and linoleate, expressed in the same terms, was approximately 54%. Added carnitine stimulated the oxidation of palmitate, stearate and oleate only slightly. Even with carnitine added the completeness of oxidation of these acids did not approach that of the shorter chain fatty acids. Incorporation of ^{14}C from radioactive palmitate, oleate and linoleate into the aortic lipids was investigated. Order of incorporation of palmitate and linoleate into aortic lipid was: phosphatide > triglyceride > cholesteryl ester. With oleate, ^{14}C was distributed evenly between phosphatide and triglyceride. Incorporation into cholesteryl ester was the greatest with oleate and lowest with lineoleate. Radioactivity in aortic free fatty acid was lowest with lineoleate.

ULTRASTRUCTURAL ASPECTS OF LIPID ABSORPTION BY BOVINE INTESTINAL MUCOSA. P.R. Sterzing, A.D. McGilliard and R.S. Allen (Dept. Animal Sci., and Dept. Biochem. and Biophysics, Iowa State Univ., Ames, Ia. 50010). *J. Dairy Sci.* 54, 1436–48 (1971). Ultrastructural aspects of lipid absorption by the small intestinal mucosa of the ruminating and nonruminating bovine were investigated. Jejunal biopsies were obtained with a hydraulically-operated suction biopsy tube passed internally via a duodenal cannula. Biopsies excised from fasted animals were controls or were incubated in vitro for different time periods. In vivo absorption was studied after introduction of emulsified lipid directly into the small intestine. During in vivo absorption, epithelial cells contained circular profiles (lipid droplets) individually in the apical cytoplasm and as aggregates in the Golgi apparatus and intercellular spaces. A similar pattern was observed after exposure of biopsies in vitro to micellar solutions of oleic acid, monoolein and sodium taurodeoxycholate, except that aggregates were not distinct in the Golgi region and were absent intercellularly. These results suggest that the integrity of the small intestine is a requisite for transport but not for movement into the cell.

THE STRUCTURAL LOCALIZATION OF CHOLESTEROL DURING FAT ABSORPTION BY BOVINE INTESTINAL MUCOSA. *Ibid.*, 1449–56. Digitonin was incorporated into tissue fixation to localize free cholesterol during fat absorption by the bovine small intestine. Reaction products were associated with lipid droplets in the apical part of epithelial cells and, to a limited extent, with lipid-containing regions of the Golgi apparatus and intercellular spaces. These observations suggest that cholesterol is associated with lipid droplets early in the transport phase and that such an association may be the result of the process of chylomicron formation.

THE SPECIFICITY OF PORCINE ELASTASE AND α-CHYMOTRYPSIN. T.H. Marshall and A. Akgun (Dept. of Chem., Northern Illinois Univ., DeKalb, Ill. 60115). *J. Biol. Chem.* 246, 6019–23 (1971). The *p*-nitrophenyl esters of a homologous series of straight chain fatty acids were used as substrates for elastase and chymotrypsin. The net second order catalytic constants for enzymatic hydrolysis were divided by the saponification rate constants to correct for the inherent reactivity of each substrate. Enzyme specificity is discussed in terms of these "corrected" specificity constants. As the straight chain length increases, the specificity constants for both enzymes increase regularly to a maximum and then decline. The respective optimum chain length for each enzyme is consistent with known reactivities with other substrates and inhibitors as well as with the structure of the enzyme active site as revealed by x-ray crystallography.

THE RELATIONSHIP BETWEEN THE INSULIN-BINDING CAPACITY OF CELLS AND THE CELLULAR RESPONSE TO INSULIN. T. Kono and Frances W. Barham (Dept. of Physiol., School of Med., Vanderbilt Univ., Nashville, Tenn. 37203). *J. Biol. Chem.* 246, 6210–16 (1971). The effects of trypsin on the insulin-binding capacity of fat cells were studied with ^{125}I-iodoinsulin, which was shown to be a valid tracer of native insulin. The binding of insulin to isolated fat cells was approximately 5 microunits/100 mg when the concentration of the hormone in the incubation medium was 100 microunits per ml. The initial step of the insulin receptor interaction followed the law of mass action. When the cells were exposed to trypsin (1 mg per ml) for 15 sec and for 15 min, the binding capacity was reduced by more than 80 and 98%, respectively. Upon subsequent incubation of trypsin-treated cells for 2 hours after inactivation of the enzyme, the binding capacity was partly restored. However, the maximum binding capacity of "recovered" cells was only 9 and 4 microunits/100 mg (depending upon the length of the initial trypsin treatment) while that of untreated cells was 62 microunits/100 mg. The apparent dissociation constant of the insulin receptor system (approximately 1 milliunit per ml or 7nM) was not significantly altered by the above treatment.

THE REGULATION OF KETOGENESIS FROM OLEIC ACID AND THE INFLUENCE OF ANTIKETOGENIC AGENTS. J.D. McGarry and D.W. Foster (Dept. of Internal Med. and Biochem., Univ. of Texas SW Med. School at Dallas, Dallas, Texas 75235). *J. Biol. Chem.* 246, 6247–53 (1971). The regulation of ketogenesis in the isolated perfused rat liver has been studied with oleic acid as substrate. The date obtained established that the enhanced ketogenesis characteristic of livers from fasted animals could not be accounted for by depressed Krebs cycle activity. On the other hand, diminished incorporation of fatty acids into triglycerides and phospholipids was quantitatively sufficient to explain the elevated rates of ketone body synthesis. Several antiketogenic agents (fructose, glycerol, lactate and ethanol) were shown to inhibit ketone formation from oleic acid. In every case the major effect appeared to be a diminution in acetyl-coenzyme A generation secondary to accelerated triglyceride synthesis. In general, however, rates of triglyceride formation were not a simple function of *sn*-glycero-3-phosphate concentration. Taken together with an earlier study of octanote metabolism in isolated perfused livers, the findings serve to emphasize that the control of ketogenesis is not invested in a single regulatory step and that factors affecting both the generation of acetyl-CoA and its disposal in nonketogenic pathways play important roles.

THE MECHANISM OF INTRODUCTION OF ALKYL GROUPS AT C-24 OF STEROLS. IV. INHIBITION BY TRIPARANOL. H.C. Malhotra and W.R. Nes (Dept. of Biol. Sci., Drexel Univ., Philadelphia, Pa. 19104). *J. Biol. Chem.* 246, 4934–8 (1971). C_1 transfer

to the Δ^{24} bond of 8,24-lanostadien-3β-ol (lanosterol) or of 9,19-cyclo-24-lanosten-3β-ol (cycloartenol) was inhibited by triparanol when either of the two steroids was incubated with methionine as the C_1 source in a cell-free system from germinating peas. Specificity was demonstrated by the failure of triparanol to inhibit any of the steps between mevalonate and squalene. The mechanism of inhibition is probably through coordination of the lone electron pair of the nitrogen atom of triparanol with the electrophilic center of the enzyme which then interferes with binding of the Δ^{24} substrate to the enzyme.

THE INFLUENCE OF MYOCARDIAL BRIDGES ON THE WALL OF THE CORONARY ARTERIES DURING CHOLESTEROL-INDUCED ATHEROSCLEROSIS IN DOGS. A. Zechmeister (Dept. of Anatomy, J.E. Purkynje School of Medicine, Univ. of Brno, Brno, Czechoslovakia). *Atherosclerosis* 13, 305–17 (1971). In dogs, the influence of myocardial bridges of the coronary arteries on the development of coronary atherosclerosis was investigated under experimental conditions of early (6 months) and advanced (13 months) atherosclerosis. The adverse effect of myocardial bridges was shown in cholesterol-induced coronary atherosclerosis in dogs. In both early and advanced phases of coronary atherosclerosis the bridges caused unequal development of the sclerotic changes in the arterial wall which were most apparent in the subepicardial segments. In the early phases the atherosclerosis lesions occur mostly in the intima, in the advanced degree of atherosclerosis they occur throughout the arterial wall. In the subepicardial arterial portions of the anterior descending branch, mainly proximal to the bridge, the intima becomes thickened with advancing atherosclerosis; in the small branches ramifying before the bridge, even leads to complete occlusion. In contrast, in the intramyocardial portion below the bridge, the intima is thinnest. Evaluation of the estimated differences in area (evoked by the atherosclerosis) between individual layers of the arterial wall in the subepicardial and those in intramyocardial segments, shows a statistically significant relation between the presence of myocardial bridges and certain structural changes in the arterial wall.

THE FATE OF THE 6α-HYDROGEN OF 5α-CHOLEST-7-EN-3β-OL IN THE CONVERSION TO 7-DEHYDROCHOLESTEROL BY RAT LIVER MICROSOMES. D.J. Aberhart and E. Caspi (Worcester Found. for Expt. Biol., Shrewsbury, Mass. 01545). *J. Biol. Chem.* 246, 1387–92 (1971). 2-^{14}C-Mevalonic acid has been incubated with a rat liver homogenate in the presence of the inhibitor trans-1,4-bis(2-chlorobenzylaminoethyl)-cyclohexanedihydrochloride yielding 1,7,15,22,26-$^{14}C_5$-cholesta-5,7-dien-3β-ol which was reduced with lithium and ammonia to $^{14}C_5$-5α-cholest-7-en-3β-ol(Δ^7-cholestanol). Separation from endogenous cholesterol was achieved by oxidation with chromic acid, and subsequent borohydride reduction of the isolated Δ^7-3-ketone. 6β-^{3}H-5α-Cholest-7-en-3β-ol has been converted in 3% yield to 6-^{3}H-cholesta-5,7-dien-3β-ol by a rat liver microsomal preparation containing (trans-1,4-bis (2-chlorobenzylaminoethyl)-cyclohexane dihydrochloride. 6α-^{3}H-$^{14}C_5$-5α-Cholest-7-en-3β-ol has been incubated with a rat liver microsomal preparation, being converted in 5.5% yield into $^{14}C_5$-cholesta-5,7-dien-3β-ol with loss of tritium. Less than 1% of the liberated tritium was found in isolated NADH, the remainder being isolated as ^3H_2O. In a control experiment, synthetic NADH-4-$^3H_2$ was incubated with a microsomal preparation as before. The resulting NADH, isolated in 30% yield, contained 70% of the ^{3}H (corrected to 100% isolation), the remainder of the radioactivity was isolated as ^3H_2O. Clearly then in conversion of 5α-cholest-7-en-3β-ol into 7-dehydrocholesterol, the 6α-hydrogen is removed as a proton, and is not directly transferred to NAD$^+$. Had NADH-^{3}H been formed, not more than a 30% loss of ^{3}H would have been expected during the isolation of the NADH.

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COMPLETE PROGRAM AND ABSTRACTS
for the JOCS-AOCS 1972 Joint Meeting
Los Angeles Hilton Hotel
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April 23-26

THE FATTY ACID COMPOSITION OF INDIVIDUAL PHOSPHOLIPIDS FROM RAT LIVER NUCLEAR MEMBRANE AND NUCLEI. A.S. Khandwala and C.B. Kasper (McArdle Lab. for Cancer Res., Univ. of Wisconsin, Madison, Wisc. 53706). *J. Biol. Chem.* 246, 6242–46 (1971). The phospholipid distribution and the fatty acid composition of the individual phospholipids were determined for the nucleus and the bileaflet nuclear membrane. The phospholipid to protein ratio for the nuclear membrane was 0.45 and lipid phosphorus comprised 65% of the total membrane phosphorus. No significant differences were noted in the phospholipid composition of the nucleus and the nuclear membrane. The values of the nuclear membrane were phosphatidyl ethanolamine, 18.3%; phosphatidyl serine plus inositol, 13.8%; phosphatidyl choline 61.8%; sphingomyelin, 2.5%; lysophosphatidyl choline, 1.4%; cardiolipin plus phosphatidic acid, 1.4%. A comparison of the fatty acid composition of the nuclear membrane phospholipids to the corresponding literature values for plasma membrane, golgi apparatus and endoplasmic reticulum revealed major differences.

THE EFFECT OF DIETARY FATS ON THE SERUM LIPOPROTEINS OF NORMAL DOGS. A.W. Lindall, F. Grande and A. Schultz (Dept. of Med., Hennepin Co. Gen. Hosp., Minn. Med. Res. Foundation, Jay Phillips Lab., Mount Sinai Hosp., Univ. of Minn. Med. School, Minn., Minn. 55415). *Proc. Soc. Exp. Biol. Med.* 136, 1032–7 (1971). The serum lipoproteins of normal dogs were studied while on different dietary regimens including low fat and various high fat diets containing coconut, olive, safflower or menhaden oil. The serum low density (beta lipoprotein) fraction was increased nearly three fold by feeding coconut oil in contrast to the other diets which, except for a small increase with olive oil, showed little effect on the lipoproteins. High density lipoproteins, while constituting the major fraction in dogs, did not respond to the diets. Reasonably good separation into *alpha* and *beta* lipoprotein by ultracentrifugation was demonstrated by electrophoresis of the fractions on polyacrylamide gels.

THE DEPOSITION OF LIPIDS FROM SERUM INTO CELLS CULTURED IN VITRO. P.J. Bailey and D. Keller (Merck Inst. Therapeutic Res., Rahway, N.J. 07065). *Atherosclerosis* 13, 333–43 (1971). The deposition of lipid into a line of fibroblasts cultured in vitro was studied. When cells were transferred from a low lipid serum to high lipid serum prepared from a cholesterol-fed rabbit, an increased amount of lipid was deposited within the cells. An increase in all major classes of lipid was observed. Particularly striking, however, was the increase in the amount of cholesterol esters relative to cholesterol during growth in lipemic serum. The source of the major part of this lipid was the serum of the medium, less than 6% arising from de novo synthesis. In normal serum 80% of the radioactivity incorporated into neutral cell lipids from 1-^{14}C-acetate was recovered in cholesterol, only 7% in cholesterol esters and 8% in triglycerides. In lipemic serum only 3% was recovered in cholesterol whereas 65% was recovered in cholesterol esters and 25% in triglycerides.

STUDIES ON THE MECHANISM OF ACTION OF ALDOSTERONE: HORMONE-INDUCED CHANGES IN LIPID METABOLISM. D.B.P. Goodman, J.E. Allen and H. Rasmussen (Dept. of Biochem., Univ. of Pennsylvania Med. School, Philadelphia, Penn. 19104). *Biochemistry* 10, 3825–31 (1971). Studies to elucidate the mode of action of aldosterone in the amphibian urinary bladder have been carried out. Within 20 min after its addition, aldosterone causes increased decarboxylation of glucose-1-^{14}C and an alteration in the pattern of conversion of uniformly labeled ^{14}C-glucose into lipid, suggesting stimulation of the hexose monophosphate shunt and increased lipid synthesis. After 6 hr, phospholipid fatty acids from hormone treated tissue show an increase in the weight percentage and specific activity of several long-chain polyunsaturated fatty acids. These results suggest that a fundamental action of aldosterone in the toad urinary bladder is to alter the fatty acid metabolism of membrane phospholipids.

STUDIES ON THE MECHANISM OF FATTY ACID SYNTHESIS. H. Schulz and S.J. Wakil (Dept. of Biochem., Duke Univ. Med. Center, Durham, N.C. 27706). *J. Biol. Chem.* 246, 1895–1901 (1971). Although highly purified preparations of β-ketoacyl acyl carrier protein (ACP) reductase are obtained from extracts of *Escherichia coli*, purification is hampered by the enzyme's instability in dilute solution. An investigation of this phenomenon revealed that concentrations of TPNH and

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TPN^+ below 1mM and those of multivalent anions between 0.2 M and 1 M could protect the active form of the enzyme by binding to the protein and thereby stabilizing its active form. Enzyme inactivation occurred in two stages, the first being reversible by TPNH, TPN^+, and multivalent anions, and the second being irreversible by these agents. The fact that acetoacetyl-ACP in its enolate form would apparently not bind to the enzyme suggests that the keto form of the substrate is directly reduced in this reaction.

STUDIES ON THE CONVERSION OF PYRUVATE INTO FATTY ACIDS IN WHITE ADIPOSE TISSUE. M.L. Halperin (Univ. of Toronto School of Med., Dept. of Med., Med. Sci. Bldg., Room 7363, Toronto 181, Ont., Canada). *Biochem. J.* 124, 615–21 (1971). The effect of insulin on the conversion of pyruvate into fatty acids in the presence and in the absence of glucose was studied in epididymal adipose tissue of the rat. In adipose tissue from the normal rat, conversion of pyruvate into fatty acids is directly related to its concentration, the maximal rates occurring with 40mM- and the half-maximal rates with approx. 4mM-pyruvate. Insulin treatment did not greatly influence the maximal rates, but the half-maximal rates were at much lower pyruvate concentrations. This effect of insulin could be seen with physiological concentrations of this hormone (50–100 μunits/ml). In adipose tissue from acute-alloxan-diabetic and 36 hr-starved rats the conversion of pyruvate into fatty acids was almost zero until its concentration exceeded 3mM and then increased markedly as the concentration of pyruvate was increased. The lag phase of this S-shaped curve was decreased but not eliminated when insulin was present. This could account for the very low rates of glucose conversion into fatty acids in these metabolic states. Maximum rates of fatty acid synthesis were similar in the presence and in the absence of insulin, but only when 30–40mM-pyruvate was employed. Refeeding of the starved rats or insulin treatment of the diabetic rats in vivo for several days restored these patterns to normal.

STUDIES CONCERNING THE PATHOGENESIS OF NEUROGENIC HYPERCHOLESTEROLEMIA; I. INDEPENDENCE OF HYPERCHOLESTEROLEMIA AND BILIARY EXCRETION. M. Friedman and S.O. Byers (Harold Brunn Inst., Mount Zion Hosp. and Med. Center, San Francisco, Cal. 94115). *Proc. Soc. Exp. Biol. Med.* 138, 258–62 (1971). The possible role of the biliary system in the pathogenesis of hypercholesterolemia observed in rats following bilateral hypothalamic injury involving the ventral medial nuclei, the fornices and the medial portions of the lateral hypothalamus was investigated. The hypercholesterolemia was found not to be mediated by any abnormality in the flow of bile.

STRUCTURAL CHANGES IN THE PHOSPHOLIPID REGIONS OF THE AXONAL MEMBRANE PRODUCED BY PHOSPHOLIPASE C ACTION. H. Simpkins, Elaine Panko and S. Tay (Lady Davis Inst. for Med. Res. of the Jewish Gen. Hosp., Montreal, Quebec). *Biochemistry* 10, 3851–5 (1971). Phospholipase C cleaves most of the phospholipids in plasma membranes, rendering the fatty acid chains more mobile. We used spin labels to study the effect of phospholipase C action on the molecular motion of the phospholipids in nerve membranes. A substantial amount of bilayer character survives phospholipase C treatment, suggesting that membrane lipids can maintain their ordered structure in the absence of ionic interactions involving the phospholipid head group.

SERUM TRIGLYCERIDES AND FATTY ACIDS IN KWASHIORKOR. Grace O. Taylor (Dept. of Chem. Pathol., Univ. of Ibadan, Ibadan, Nigeria). *Am. J. Clin. Nutr.* 24, 1212–15 (1971). The levels of serum total cholesterol, cholesterol esters, phospholipids and total fatty acids in kwashiorkor children were found to be significantly lower than the levels in the control children, but there was no significant difference in the serum triglyceride levels. The levels of the serum triglycerides and total fatty acids of the eight admitted kwashiorkor children showed a marked rise during the first 20 days of treatment and a fall to the control level on the 30th day, whereas the levels of serum total cholesterol, cholesterol esters, and phospholipids still remained elevated on the 30th day. The main abnormality observed in the serum total fatty acids composition of the kwashiorkor children when compared with those of the control children was a marked decrease in the percentages and concentrations of linoleic and arachidonic acids.

REGULATION OF THE RATE OF STEROL SYNTHESIS AND THE LEVEL OF β-HYDROXY-β-METHYLGLUTARYL COENZYME A REDUCTASE ACTIVITY IN MOUSE LIVER AND HEPATOMAS. A.A. Kandutsch and R.L. Hancock (Div. of Med. Biochem., Faculty of Med., Univ. of Calgary, Calgary, Alberta, Canada). *Cancer Res.* 31, 1396–1401 (1971). Studies were carried out to determine whether feedback regulation of sterol synthesis is altered in the livers of mice with a high incidence of spontaneous hepatomas, to compare some properties of β-hydroxy-β-methylglutaryl-CoA (HMG-CoA) reductase from liver and hepatomas and to determine the extent to which this enzyme activity is altered in hepatomas by a variety of dietary steroids and other factors. The rate of hepatic sterol synthesis from acetate and the level of HMG-CoA reductase activity were depressed by the addition of cholesterol to the diets of mice genetically disposed to a high incidence of hepatomas (CE X DBA/2WyDi F_1 and C3H-A^{vy} mice); this is a normal regulatory response to the sterol. The level of HMG-CoA reductase activity was high in spontaneous hepatomas and in 2 transplanted hepatomas and was relatively unaffected by dietary cholesterol, food deprivation or injected Triton WR 1339. Rates of sterol synthesis from both mevalonate and acetate were elevated in spontaneous hepatomas indicating that the rate was also elevated over that portion of the pathway subsequent to HMG-CoA reductase. The rate of sterol synthesis from acetate in hepatoma BW-7756 was unaffected by several steroids other than cholesterol that altered the rate in liver. Analyses of K_m values and heat liability for HMG-CoA reductase from liver and hepatomas did not indicate any variation in these properties.

REGULATION OF MICROSOMAL ENZYMES BY PHOSPHOLIPIDS. D.A. Vessey and D. Zakim (Div. of Molecular Biol., V.A. Hosp., San Francisco, Cal. 94121). *J. Biol. Chem.* 246, 4649–56 (1971). Treatment of bovine liver microsomes with a partially purified preparation of phospholipase A from *Naja naja* venom leads to activation of UDP-glucuronyltransferase with *p*-nitrophenol as glucuronyl acceptor. This stimulation of activity is due to a 6-fold increase in activity at V_{max}. As activity at V_{max} increases, there is a progressive decrease in binding affinity of the enzyme for both substrates, and although the enzyme remains stable at 23C, it becomes unstable at 37C. This unstable form of UDP-glucuronyltransferase decays to another stable form with a maximum activity 2.5-fold greater than that of untreated enzyme. As with phospholipase A, treatment with phospholipase C also activates UDP-glucuronyltransferase, but to a lesser extent. In addition to phospholipases other agents which can alter microsomal lipids also activate UDP-glucuronyltransferase. Triton X-100, sonication and exposure to pH 9.8 increased activity at V_{max} and had variable effects on the binding constants for UDP-glucuronic acid and *p*-nitrophenol. Maximal activation by these treatments was less than that obtained with phospholipase A; no two treatments had similar effects on all kinetic parameters of the enzyme. Nevertheless, additive effects could not be demonstrated. Although Triton stimulated glucuronidation of *p*-nitrophenol by the enzyme, it was without effect on the reverse reaction. This fact plus the other data indicate that the activation of UDP-glucuronyltransferase in these experiments cannot be attributed to compartmentation of the enzyme but is due to phospholipid-induced alterations of enzyme conformation.

PRESQUALENE ALCOHOL. J. Edmond, G. Popjak, S. Wong and V.P. Williams (Dept. Biol. Chem. and Neuropsychiatric Inst., Mental Retardation Center, UCLA School of Med., Los Angeles, Cal. 90024). *J. Biol. Chem.* 246, 6254–71 (1971). An optically active (+) C_{30} alcohol has been isolated after hydrolysis of presqualene pyrophosphate by yeast microsomes. This alcohol can be prepared on a relatively large scale directly from farnesyl pyrophosphate on incubations with yeast microsomes from which inhibitors of phosphatase are

AOCS To Sponsor Short Courses On Human Hyperlipemias

AOCS will sponsor four short courses on "Human Hyperlipemias" to be held this year in Philadelphia (July 10–11), Houston (July 13–14), Chicago (July 16–17) and Los Angeles (July 20–21). The morning sessions of each two-day course will be devoted to theory, while practical demonstrations will be given during the afternoons. For further details, contact Dr. Nicholas Pelick, President, Supelco, Inc., Supelco Park, Bellefonte, Pa. 16823; telephone (814) 359–2732.

omitted. The alcohol is named presqualene alcohol as its pyrophosphorylated form appears to be identical with natural presqualene pyrophosphate and is converted into squalene by microsomes in the presence of NADPH. The elemental compositions of presqualene alcohols biosynthesized from protiofarnesyl pyrophosphate and from farnesyl-1-D_2 pyrophosphate were found by high resolution mass spectrometry to be $C_{30}H_{49}OH$ and $C_{30}H_{46}D_3OH$, respectively.

SPECIFIC INHIBITION OF CHOLESTEROL ABSORPTION IN SULFAGUANIDINE-FED RATS. J.F. Van Den Bosch, G.A. Janssen, H. Eyssen and H. Vanderhaeghe. (Univ. of Leuven, The Rega Inst. for Med. Res., 10 Minderbroedersstraat, B-3000 Leuven, Belgium). *J. Nutr.* 101, 1515–24 (1971). The influence of sulfaguanidine on the absorption of cholesterol was studied in the rat. In rats fed a diet without added cholesterol, feeding of 1% sulfaguanidine for 2 weeks did not significantly affect the cholesterol concentrations in the serum and the liver. Conversely, sulfaguanidine inhibited the rise of cholesterol levels in serum and liver of rats fed a 1% cholesterol diet. In rats with a thoracic duct fistula, feeding of 1% sulfaguanidine had no influence on lymphatic output of endogenous cholesterol but markedly inhibited the uptake of exogenous cholesterol. These experiments demonstrated that sulfaguanidine primarily inhibited the absorption of cholesterol from the intestine. The inhibitory effect on cholesterol absorption did not seem to be mediated via an effect on bile salts since sulfaguanidine did not promote fecal bile salt excretion, did not disturb micelle formation and did not displace cholesterol from preformed mixed micelles. Esterification of cholesterol by pancreatic esterase in vitro was not inhibited by concentrations of up to 10 mg of sulfaguanidine per milliliter. The effect of sulfaguanidine on cholesterol was highly specific, and minor modifications of the molecule resulted in almost complete loss of the inhibitory effect on cholesterol absorption.

PLASMA PHOSPHATIDYLETHANOLAMINE—A BETTER INDICATOR IN THE PREDICTABILITY OF ATHEROSCLEROTIC COMPLICATIONS? F. Kunz and W. Stummvoll (Dept. of Internal Med, Univ. of Innsbruck, Innsbruck, Austria). *Atherosclerosis* 13, 413–25 (1971). The percentage of phosphatidylethanolamine was found to be significantly elevated in the plasma of untreated patients with peripheral occlusive arterial disease compared with normal and hypercholesterolaemic healthy persons. Compared with the normal group phosphatidylserine and lecithin were found to be augmented, whereas the percentage of lysolecithin was diminished in patients with peripheral occlusive arterial disease. Apart from triglycerides, cholesterol and total phospholipids, free fatty acids were also augmented in the sclerothrombotic patients compared to normal, but not to hypercholesterolaemic persons. The significance of the data obtained is discussed with particular regard to the thromboplastic and platelet aggregating properties of phosphatidylethanolamine, phosphatidylserine and free fatty acids. Elevated proportions of phosphatidylethanolamine were found to be more closely connected with the occurrence of peripheral occlusive arterial disease than any other of the plasma lipid and phospholipid parameters investigated.

PROSTAGLANDINS: THE INHIBITION OF HEPATIC CHOLESTEROL ESTER SYNTHETASE IN THE RAT. J.S. Schweppe and R.A. Jungmann (Dept. of Res., Chicago Wesley Mem. Hosp. and Dept. of Biochem. and Med., Northwestern Univ. Med. School, Chicago, Ill. 60611). *Proc. Soc. Exp. Biol. Med.* 133, 1307–9 (1970). The effects of the prostaglandins E_1 and $F_{1\alpha}$ on the in vitro biosynthesis of cholesteryl palmitate, oleate, and linoleate by rat liver microsomes from cholesterol and free fatty acids was studied. Both prostaglandins exerted an inhibitory action on the enzymatic esterification of cholesterol. The degree of inhibition increased with increasing concentration of PGE_1 and $PGF_{1\alpha}$ in the incubation medium. At the lowest concentration used (4.6×10^{-8} M) cholesteryl linoleate synthesis showed the least inhibition (about 15%) while cholesteryl palmitate formation was inhibited by about 25%. At the higher concentrations of PGE_1 and $PGF_{1\alpha}$ used, no difference in the degree of inhibition of the individual esters was observed.

ON THE MECHANISM OF INHIBITION OF FATTY ACID OXIDATION BY 4-PENTENOIC ACID IN RAT LIVER MITOCHONDRIA. Mariam H. Fukami and J.R. Williamson (Johnson Res. Found., Univ. Pennsylvania, Philadelphia, Penn. 19104). *J. Biol. Chem.* 246, 1206–12 (1971). The effects of 4-pentenoic acid on substrate oxidations and on the distribution of coenzyme A and its derivatives were studied in isolated rat liver mitochondria. In a CoA-linked substrate, long and short chain fatty acid, pyruvate and α-ketoglutarate oxidations were inhibited 60 to 80% by 0.1 mM 4-pentenoic acid. The failure of 4-pentenoic acid to inhibit fatty acid oxidation in uncoupled mitochondria indicated that it was necessary for 4-pentenoic acid to be activated to its CoA ester to become inhibitory. Oxidation-reduction changes of mitochondrial pyridine nucleotides and flavoproteins following 4-pentenoic acid addition showed that the inhibitor itself could undergo β-oxidation. The addition of 4-pentenoic acid caused CoA and acetyl-CoA levels to decrease while acid-soluble and acid-insoluble acyl-CoA levels increased. The observed changes were interpreted as indicating that free CoA was being incorporated into a product of 4-pentenoic acid metabolism, and inhibition of fatty acid oxidation was caused by CoA depletion. These conclusions were supported by the reversal of 4-pentenoic acid inhibition of palmitylcarnitine oxidation in ultrasonically disrupted mitochondria by the addition of CoA, while oxidation of palmityl-CoA was not inhibited in this preparation.

ON THE IDENTIFICATION OF LAMELLAR AND HEXAGONAL PHASES IN NEGATIVELY STAINED PHOSPHOLIPID-WATER SYSTEMS. D.O. Tinker and L. Pinteric (Dept. Biochem., Univ. Toronto, Toronto 5, Canada). *Biochemistry* 10, 860–65 (1971). The principles of projective geometry are used to predict the features of electron micrographs of negatively stained liquid crystals composed of lamellar and two hexagonal phases. A well-characterized phosphatidylethanolamine from pig erythrocytes was hydrated and the resulting liquid crystals negatively stained with phosphotungstic acid and examined at high magnification in the electron microscope. Three types of liquid crystals were identified in these preparations: lamellar (bimolecular lipid leaflets spaced at 46 A units), H_I (lipid cylinders, diameter 40 A units, hexagonally packed in an aqueous matrix with a spacing of 61 A units), and H_{II} (aqueous cylinders, diameter 26 A units, hexagonally packed in a lipid matrix with a spacing of 56 A units). All the theoretically predicted features were evident in the micrographs. In the early stages of hydration, tubules of irregular diameter were seen to grow out of the unstructured lipid particles, later attaining a more uniform diameter and aligning regularly. These tubules evidently give rise to the H_I phase.

METABOLISM AND PLASMA PROTEIN TRANSPORT OF VITAMIN D_3 IN THE BABOON. S.J. Rosenstreich, W. Volwiler and C. Rich (Primate Inform. Center, Regional Primate Res. Center, I-421 Health Sci. Bldg., Univ. Washington, Seattle, Wash. 98105). *Am. J. Clin. Nutr.* 24, 897–905 (1971). Plasma protein transport of vitamin D_3 was investigated in baboons whose bodily vitamin D_3 has been labeled with ^{14}C-ring-labeled vitamin D_3. Plasma proteins were separated and identified by ultracentrifugation, gel filtration, DEAE cellulose chromatography, polyacrylamide gel and starch zone electrophoresis, and microimmunoelectrophoresis. More than 60% of the plasma vitamin D_3 was associated with a nonlipid containing α_1-globulin and most of the remainder with albumin. Transport by lipoproteins was quantitatively greater during the early phase of repletion, only trace quantities thus attached being detected in subsequent weeks. Thus, plasma transport of vitamin D_3 in nonhuman primates is very similar to that which has been described previously for other species. In addition, several aspects of baboon vitamin D metabolism were investigated and were found to be similar to those of man.

LOWERED CHOLESTEROL CATABOLISM IN GUINEA PIGS WITH CHRONIC ASCORBIC ACID DEFICIENCY. E. Ginter, J. Cerven, R. Nemec and L. Mikus (Inst. of Human Nutr. Res., Bratislava, Czechoslovakia). *Am. J. Clin. Nutr.* 24, 1238–45 (1971). Hypovitaminosis C caused a substantial decrease in vitamin C levels in tissues of guinea pigs and accumulation of total cholesterol in the liver. Hypovitaminosis C did not affect fecal excretion of ^{14}C in the fraction of neutral sterols in guinea pigs injected intraperitoneally with cholesterol-4-^{14}C, and it

slightly decreased fecal excretion of ^{14}C bile acids (during 20 days following administration of labeled cholesterol). Twenty days after application of cholesterol-4-^{14}C more ^{14}C was found in the blood serum and thoracic aorta of hypovitaminotic guinea pigs than in the control group. A working hypothesis is postulated that ascorbic acid is required for cholesterol hydroxylation during its transformation to bile acids.

LIPID METABOLISM BY RAT LUNG IN VITRO. R.W. Scholz and R.A. Rhoades (Dept. Vet. Science, Lab. for Human Performance Res., Penn. State Univ., University Park, Pa. 16802). *Biochem. J.* 124, 257–64 (1971). The incorporation of glucose-U-^{14}C into several lipid components of lung and liver slices, and the activities of glucose 6-phosphate dehydrogenase, 6-phosphogluconate dehydrogenase, 'malic' enzyme and NADP-isocitrate dehydrogenase of the cell cytosol were examined in normal, starved and re-fed rats. Lipogenesis and the activities of these enzymes in liver were decreased markedly in rats starved for 72 hr. Re-feeding starved rats on a fat-free diet for 72 hr resulted in the well documented hyperlipogenic response in liver, particularly in its ability to convert glucose into neutral lipid, and increased activities of glucose 6-phosphate dehydrogenase, 'malic' enzyme and 6-phosphogluconate dehydrogenase to values approx. 700, 470 and 250% of controls, respectively.

ISOLATION, IDENTIFICATION AND SPECIFIC LOCALIZATION OF DI-2-ETHYLPHTHALATE IN BOVINE HEART MUSCLE MITOCHONDRIA. D.J. Nazir, Aurora P. Alcaraz, Barbara A. Bierl, M. Beroza and P.P. Nair (Biochem. Res. Div., Dept. Med., Sinai Hosp. of Baltimore, Inc., Baltimore, Md. 21215). *Biochemistry* 10, 4228–32 (1971). A component associated with the triglycerides of beef heart mitochondria has been shown to be identical with di-2-ethylhexylphthalate. Studies on the intracellular distribution of di-2-ethylhexylphthalate in heart muscle show that this compound is associated with mitochondrial fractions.

INSULIN-LIKE EFFECT OF CLOSTRIDIAL PHOSPHOLIPASE C, NEURAMINIDASE AND OTHER BACTERIAL FACTORS ON BROWN FAT CELLS. Judith W. Rosenthal and J.N. Fain (Div. Biol. and Med. Sci., Brown Univ., Providence, R.I. 02912). *J. Biol. Chem.* 246, 5888–95 (1971). Incubation of brown fat cells with a preparation of neuraminidase from *Clostridium perfringens* at a concentration of 50 μg per ml stimulated basal glucose oxidation and abolished any further response of the cells to insulin and cysteine. A partially purified preparation of *C. perfringens* phospholipase C stimulated basal glucose metabolism at a concentration of 1 μg per ml in brown fat cells and inhibited the response to insulin and cysteine at a concentration of 5 μg per ml. Insulin-like activity was similarly observed with 10 μg per ml of a purified preparation of clostridial phospholipase C.

INSULIN-LIKE EFFECTS OF TRYPSIN ON FAT CELLS. T. Kono and Frances W. Barham (Dept. of Physiol., School of Med., Vanderbilt Univ., Nashville, Tenn. 37203). *J. Biol. Chem.* 246, 6204–9 (1971). The mechanism of the insulin-like action of trypsin was studied. When fat cells were exposed to trypsin (1 mg per ml) for 15 sec, glucose metabolism in the cells was stimulated. These data were consistent with an assumption that trypsin (a) interacts initially with the insulin receptor site of fat cells, (b) activates the receptor to produce the metabolic responses characteristic of insulin, and (c) eventually modifies the receptor to render the cells less sensitive than normal to both insulin and trypsin.

INFLUENCE OF ALPHA-TOCOPHEROL ON THE INHIBITION OF BETA-GLUCURONIDASE BY PEROXIDIZED LINOLEIC ACID. Linda H. Chen and L.V. Packett (Dept. Nutr. Food Sci., Univ. Kentucky, Lexington, Ky. 40506). *Am. J. Clin. Nutr.* 24, 1232–37 (1971). The in vitro effect of peroxidized linoleic acid on β-glucuronidase was studied. Rat liver cell preparation with the nucleus and cell membrane removed served as a source of β-glucuronidase. It was incubated at 25C with peroxidized linoleic acid or its potassium salt, then β-glucuronidase activity was determined. Peroxidized linoleic acid or its potassium salt lowered this enzyme activity, but this reduction in activity was partially reversed with time of incubation. The inhibition of β-glucuronidase was prevented by α-tocopherol or glutathione. Two synthetic antioxidants (butyl hydroxytoluene, butyl hydroxyanisole) had less effect in preventing it. Ascorbic acid had no effect. Cysteine inhibited β-glucuronidase. Tocopherol-deficient rat liver preparation tended to have lower β-glucuronidase activity ($P < 0.10$) and higher thiobarbituric acid values ($P < 0.01$) than that of the control group. The same amount of peroxide inhibited β-glucuronidase of the tocopherol-deficient rat liver preparation more than that of the control ($P < 0.01$). Addition of α-tocopherol in vitro to tocopherol deficient rat liver preparation prevented this further inhibition of β-glucuronidase caused by α-tocopherol deficiency. The results suggest that α-tocopherol reverses the inhibition of β-glucuronidase activity by reacting with the peroxide or an enzyme-peroxide complex.

HYDROLYSIS OF PHOSPHOGLYCERIDES BY PURIFIED LIPASE PREPARATIONS. I. SUBSTRATE-, POSITIONAL- AND STEREOSPECIFICITY. A.J. Slotboom, G.H. DeHaas, P.P.M. Bonsen, G.J. Burbach-Westerhuis and L.L.M. VanDeenen (Lab. of Biochem., State Univ. of Utrecht, Utrecht, The Netherlands). *Chem. Phys. Lipids* 4, 15–29 (1970). Purified lipase preparations (EC 3.1.1.3) from porcine pancrease and from the mold *Rhizopus arrhizus* hydrolyze exclusively the fatty acid ester bond at the 1-position of all common types of phosphoglycerides, regardless of the nature and distribution of the fatty acid constituents. Both enantiomeric forms of phosphatidylcholine are hydrolyzed at a similar rate by these enzymes, indicating that the latter lack stereo-specificity. The

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NOTICE: Clip and attach to your 1970 JAOCS Index

Erratum to the JAOCS 1970 Index, Volume 47

Owing to a duplication of page numbers (p. 224–234, June and July issues of JAOCS, Volume 47) several entries in the 1970 JAOCS Index are confusing. Please note the following:

"Extraction of Lipids From Cottonseed Tissue: II. Ultrastructural Effects of Lipid Extraction" by T.P. Hensarling, L.Y. Yatsu and T.J. Jacks appears on p. 224–225 in *June* JAOCS.

"Determination of Aflatoxins in Peanut and Cottonseed Soapstocks" by Alva F. Cuculla, Louise S. Lee, W.A. Pons, Jr., and L.A. Goldblatt appears on p. 226–228 in *June* JAOCS.

"Oil Stability: A DSC Alternative for the Active Oxygen Method" by C.K. Cross appears on p. 229–230 in *June* JAOCS.

"Determination of Residual Solvent in Oilseed Meals and Flours: II. Volatilization Procedure" by H.P. Dupuy and S.P. Fore appears on p. 231–233 in *June* JAOCS.

"The Determination of Fish Oil in Vegetable Oils" by M.F. Lauro appears on p. 234 in *June* JAOCS.

"Suspension Stability of Solid Particles in the Presence of Various Types of Electrolytes" by A.M. Mankowich appears on p. 234 in *June* JAOCS.

"The Analysis of 1,2-Epoxyalkanes by Gas Liquid Chromatography" by C.R. Glowacki, P.J. Menardi and W.E. Link appears on p. 225–228 in *July* JAOCS.

"Sulfation of Synthetic Linear Primary Alcohols With Chlorosulfonic Acid" by P. Sosis and L.J. Dringoli appears on p. 229–232 in *July* JAOCS.

"Correlation of Solubility Data: IV. Prediction of Solubilities of Homologous and Analogous Long Chain Compounds in Related Solvents" by Evald L. Skau appears on p. 233–236 in *July* JAOCS.

susceptibility of several synthetic analogues of choline phosphoglycerides, modified in the nature and type of bond at the 1- and 2-positions, as well as of phosphotriester derivatives to lipase was compared to that of phosphatidylcholine. It could be tentatively concluded that the susceptibility of the 1-acyl ester bond to lipase is influenced by the type of bond present at the 2-position.

INHIBITORY ACTION OF α-(4-CHLOROPHENOXY)-α-METHYLPROPIONIC ACID ANALOGS ON CHOLESTEROL BIOSYNTHESIS AND LIPOLYSIS IN VITRO. D.T. Witiak, D.R. Feller, E.S. Stratford, R.E. Hackney, R. Nazareth and Gwen Wagner (Div. of Med. Chem. and Biochem. Pharm., College of Pharmacy, Ohio State Univ., Columbus, Ohio 43210). *J. Med. Chem.* 14, 754–7 (1971). The antagonist activity of the title compound and some open chain and cyclic analogs on glycerol release from adipose tissue and incorporation of mevalonate-2-^{14}C into nonsaponifiable products of rat liver homogenate in vitro is discussed. Greater structural specificity was observed for the inhibition of cholesterol biosynthesis than for inhibition of lipolysis. A proposed mechanism for the antilipolytic effect of these compounds is described.

GLYCERINATED MUSCLE FIBERS: RELATION BETWEEN ISOMETRIC TENSION AND ADENOSINE TRIPHOSPHATE HYDROLYSIS. W.J. Bowen, and L. Mandelkern (Nat. Inst. of Arthr. and Metab. Diseases, Bethesda, Md. 20014). *Science* 173, 239–40 (1971). The isometric tension of glycerinated muscle fibers and the adenosine triphosphatase activity of homogenates were determined as a function of the concentration of adenosine triphosphate without the addition of divalent cations. These two phenomena are not parallel; large tensions can be developed with negligible hydrolysis of adenosine triphosphate. It is concluded that the large negative free energy change of the hydrolysis is not required for shortening or development of tension.

GAS CHROMATOGRAPHIC DETERMINATION OF GANGLIOSIDES IN MOUSE CELL LINES AND IN VIRALLY TRANSFORMED DERIVATIVE LINES. I. Dijong, P.T. Mora and R.O. Brady (Macromolecular Biology Sect., Lab. Cell Biol., National Cancer Inst., National Inst. of Health, Bethesda, Md. 20014). *Biochemistry* 10, 4039–44 (1971). The distribution of gangliosides in established mouse cell lines in tissue culture was investigated, before and after transformation of the cells with SV40, a tumorigenic DNA virus. A suitable chemical derivatization and gas-liquid chromatography procedure was developed for the carbohydrate residues of the gangliosides. Epithelial-like cell lines from A AL/N strain mouse and highly contact-inhibited fibroblastic 3T3 cell lines from both Swiss and Balb c strain mouse had drastically reduced content of the disialotetrasacharide ganglioside (G_{D1a}) after the SV40 virus induced transformation in culture. This finding is in complete agreement with our previous observation on these and similar cell lines employing thin-layer chromatography and colorimetric techniques. The method of derivatization and of gas-liquid chromatography for the carbohydrate residues of the gangliosides allowed definitive identification of the mouse gangliosides, and represents an accurate and internally consistent method suitable for the quantitation of the small amount of various gangliosides present in cell lines.

FOCAL ^{3}H-CHOLESTEROL UPTAKE IN THE PIG AORTA. J.B. Somer and C.J. Schwartz (Dept. Pathol., Faculty of Med., McMaster Univ., Hamilton, Ontario, Canada). *Atherosclerosis* 13, 293–304 (1971). The focal nature of aortic uptake of injected ^{3}H-cholesterol in vivo in the young pig has been described. Areas showing an increased ^{3}H-cholesterol uptake were identified by the focal accumulation of the protein-binding azo dye, Evans Blue. In areas of Evans Blue accumulation, free cholesterol activity and free cholesterol specific activity were greater than in adjoining areas where dye did not accumulate. Cholesterol ester activity did not differ. Areas showing Evans Blue accumulation had significantly lower phospholipid levels than areas of no dye accumulation. Free cholesterol and triglyceride levels were similar, and only trace amounts of cholesterol ester were present. In both areas of dye accumulation, and in areas of no dye accumulation, 90% or more of the label taken up was in the form of free cholesterol. Neither free cholesterol activity nor free cholesterol specific activity changed significantly from 1 to 21 days after the injection of label. The remaining 10% or less of the aortic label was in the form of cholesterol ester. Cholesterol ester activity decreased significantly from 1 to 21 days after the injection of label in both areas of dye and no dye accumulation. These studies show that as early as 8–12 weeks after birth, focal areas can be identified in the grossly normal pig aorta which show an increased uptake of cholesterol. The possible relationship of these foci to haemodynamically-induced endothelial injury and to the early stages of atherogenesis are discussed.

FATTY ACID OXIDATION IN YOUNG PIGS. G.M. Miller, J.H. Conrad, T.W. Keenan and W.R. Featherston (Dept. Animal Sci. Purdue Univ., Lafayette, Ind. 47907). *J. Nutr.* 101, 1343–50 (1971). Lipid metabolism in the very young pig previously has been investigated largely through studies of digestibility of intact fats. The present experiments were conducted to determine the ability of the young pig to utilize individual fatty acids when differences due to digestion and absorption were eliminated. Relative rates of oxidation of intramuscularly injected 1-^{14}C-lauric, palmitic, oleic and linoleic acids to $^{14}CO_2$ and the incorporation of these fatty acids into tissue lipids were studied with 48 pigs, 1 or 7 days of age. Laurate was oxidized to $^{14}CO_2$ more rapidly than any of the other administered acids. Oleate was oxidized slightly more rapidly than was linoleate. Liver phospholipids from pigs of both age groups contained the largest amount of radioactivity when linoleate was administered. There was very little accumulation of radioactivity in tissue lipid fractions when laurate was administered. No significant differences in oxidation rates of fatty acids were observed when 1- and 7-day-old pigs were compared. In a second experiment, the distribution of radioactivity from injected palmitate, oleate and linoleate in serum and tissue lipid fractions of 1-day-old pigs was determined. Serum phospholipid and diglyceride as well as serum, liver and carcass free cholesterol fractions contained the greatest amount of radioactivity when linoleate was administered. The highest level of radioactivity in the cholesterol ester fraction was observed when oleate was administered. These studies suggest that the oxidation of fatty acids was not a limiting factor in lipid utilization in very young pigs.

ETHANOL-INDUCED FATTY LIVER IN RATS: EFFECTS OF PYRAZOLE AND GLUCOSE. R. Domanski, D. Rifenberick, F. Stearns, R.M. Scorpio and S.A. Narrod (Dept. Biochem., Med. College of Pennsylvania, Philadelphia, Penn. 19129). *Proc. Soc. Exp. Biol. Med.* 138, 18–21 (1971). The acute administration of ethanol causes the accumulation of hepatic triglycerides in male rats and to a greater extent in female rats. Pyrazole, injected prior to ethanol administration, completely prevents accumulation of hepatic triglycerides in male rats, whereas in female rats the same treatment with pyrazole only partially lowers accumulation of hepatic triglycerides. Glucose administration simultaneously with ethanol decreases the concentration of hepatic triglycerides equally in both sexes.

• *World Congress . . .*

(Continued from page 63A)

Tuesday, June 20	
9:00–10:00 a.m.	Plenary lecture.
10:20–12:00 Noon	Sections and symposia.
1:30– 5:00 p.m.	Sections and symposia.
6:30 p.m.	Boat tour to Marstrand with supper.
Wednesday, June 21	
9:00–10:00 a.m.	Plenary lecture.
10:20–12:00 Noon	Sections and symposia.
1:30– 5:00 p.m.	Sections and symposia.
7:00 p.m.	Banquet.
Thursday, June 22	
8:00 a.m.–6:00 p.m.	Technical visits.
Friday, June 23	
Saturday, June 24	Midnight sun tour to Kiruna.
Monday, June 26	
Short course in Stockholm:	Surface chemistry with special regard to liquid crystals.