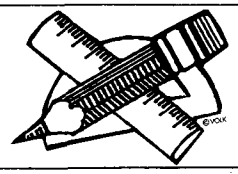
Abstracts



• Fats and Oils

STUDIES ON AN ALLEGED TOXIC HAZARD OF HEAT-BLEACHED PALM OIL. J.B. Davis, J.M. Robinson, N.K. Silva and A. Barranco, *J. Food Technol.* 14, 253–64 (1979). It has recently been suggested that the high-temperature heat-bleaching procedure sometimes used to decolorize palm oil for use in margarine and similar products could lead to the oil becoming contaminated with (unspecified) toxic substances, these being derived by thermal degradation of the orange-red carotenoids originally present. Several of the non-glyceride constituents of such an oil have been identified (as squalene, hentriacontane, and various known sterols and triterpenes: all common food constituents) while degradation products of the type said to be present have been sought without success. In addition, the degree to which one of the known carotenoid thermal-degradation products is removed from the oil during the usual refining procedure has been measured and the oil's toxicology has been briefly examined. Neither the results obtained here, nor the allied data reported by others and noted herein, appear to provide any evidence in support of the above suggestion.

IMPROVED SYNTHESIS OF CHOLINE PHOSPHOLIPIDS. H. Brockerhoff and N.K.N. Ayengar (New York State Inst. for Basic Res. in Mental Retardation, Staten Island, NY) *Lipids* 14, 88–9 (1979). Choline phospholipids (diether and dialkyl analogs of phosphatidyl choline, cholesteryl phosphocholine) were prepared, in yields of 72–83%, by condensation of the diglyceride analogs (or cholesterol) with phosphorusoxychloride and choline toluene-sulfonate.

CHEMISTRY OF SINGLET OXYGEN. 30. THE UNSTABLE PRIMARY PRODUCT OF TOCOPHEROL PHOTOOXIDATION. R.L. Clough, B.G. Yee and C.S. Foote (Dept. of Chem., Univ. of California, Los Angeles, California 90024) *J. Am. Chem. Soc.* 101, 683–5 (1979). α-tocopherol (vitamin E) reacts with singlet molecular oxygen both by a quenching process and by irreversible reaction to give products, and this scavenging action may be one mode of its biological antioxidant function. We have investigated the photooxidation of α-tocopherol at low temperature and identified the primary product as the modestly stable *hydroperoxydienone* (6). The structure of 6 has been characterized by Ir, UV, ^1H and ^{13}C NMR, and mass spectroscopy.

LIPIDS OF HIGHER FUNGI. V: THE OCCURRENCE OF LONG-CHAIN ERYTHRO-2,3-DIHYDROXY FATTY ACIDS IN POLYPORUS OFFICINALIS. Cv. Cosvić and M. Prostenik (Inst. of Chem. and Biochem., Faculty of Med., Univ. of Zagreb, Croatia (Yugoslavia) *Chem. Phys. Lipids* 23, 349–53 (1979). *erythro*-2,3-dihydroxytetracosanoic, -pentacosanoic, and -hexacosanoic acids in a 5.4: 2.6:1 ratio, were found in the most polar ceramide fractions of *Polyporus officinalis*. The structure was deduced from gas chromatographic data, mobility on chromatoplates impregnated with boric acid, and from data obtained by periodate-permanganate oxidation.

THE CRYSTAL STRUCTURE OF CHOLESTERYL DODECANOATE: COPACKING OF STEROID SKELETA AND HYDROCARBON CHAINS. B. Dahlen (Dept. Structural Chem., Faculty Med., Univ. Goteborg, Fack S-400 33 Goteborg (Sweden)) *Chem. Phys. Lipids* 23, 179–88 (1979). The crystal structure of cholesteryl dodecanoate has been determined. The compound shows a copacking of cholesterol skeleta and hydrocarbon chains. There are two molecules in the asymmetric unit both almost fully extended. The hydrocarbon chain axes are however somewhat bent in order to get a good close-packing side by side with the rigid cholesterol skeleta. The two non-symmetry related skeleta show different packing surroundings. One skeleton packs with both hydrocarbon chains and other skeleta while the other skeleton is completely surrounded by hydrocarbon chains. The latter packing is of particular interest as it is considered to indicate important packing principles in biological lipid bilayers.

SYNTHESIS AND PROPERTIES OF ALKYLGLUCOSIDES WITH MILD DETERGENT ACTION: IMPROVED SYNTHESIS AND PURIFICATION OF β-1-OCTYL-, NONYL-, AND DECYL-GLUCOSE. SYNTHESIS OF β-1-UNDECYLGLUCOSE AND β-1-DODECYLMALTOSE. W.J. De Grip and P.H.M. Bovee-Geurts (Dept. of Biochem., Univ. of Nijmegen, P.O. Box 9101, 6500HB Nijmegen (The Netherlands)) *Chem. Phys. Lipids* 23, 321–5 (1979). Medium chain β-1-alkylglycosides show interesting mild detergent properties. Therefore, their synthesis and purification have been investigated and improved so as to permit preparation of 50–100 g amounts. Preparatory methods are presented for the already known compounds β-1-octyl-, β-1-nonyl and β-1-decyl-glucose and for the new compounds β-1-undecylglucose and β-1-dodecylmaltose. Some relevant properties such as melting point, optical rotation, critical micelle concentration and NMR-spectra have been determined. They illustrate the suitability of this class of detergents for membrane research.

AMPEROMETRIC ENZYMATIC DETERMINATION OF TOTAL CHOLESTEROL IN HUMAN SERUM WITH TUBULAR CARBON ELECTRODES. Y. Hahn, and C.L. Olson (College of Pharmacy, 500 West 12th Avenue, The Ohio State University, Columbus, Ohio 43210) *Anal. Chem.* 51, 444–9 (1979). An amperometric enzymatic assay for total cholesterol in human serum has been developed. The assay utilizes cholesterol esterase, cholesterol oxidase, and peroxidase. H_2O_2 produced by the oxidase is coupled via peroxidase to produce $K_3Fe(CN)_6$ which is measured at a tubular carbon electrode. The reactions go all the way to completion and the $K_3Fe(CN)_6$ formed can be stoichiometrically related to total cholesterol concentration. The method shows very good reproducibility, accuracy, and sensitivity. Results obtained by the amperometric method show excellent agreement (correlation coefficient =0.995) with those obtained by the Leffler method.

IDENTIFICATION OF THE DIOL ASSOCIATED WITH VARIATIONS IN WAX ULTRASTRUCTURE ON RHUS COTINUS LEAVES. G.M. Hunt, and E.A. Baker (Long Ashton Res. Station, Univ. of Bristol, Bristol, BS18 9AF (United Kingdom)) *Chem. Phys. Lipids* 23, 213–21 (1979). The diol constituent of *Rhus continus* leaf epicuticular wax has been identified as nonacosane-5,10-diol from chemical investigations of the free compound, the TMSi ether and the nonacosane-5,10-dione prepared from the diol by oxidation. The form and distribution of the crystalline waxes changed as the leaves expanded, dense clusters of short tubes covering the thin ribbons formed during the initial stages of growth. The diol content of the wax decreased by more than 50% over the same period.

SATURATED AND UNSATURATED LIPID SPIN LABELS WITH TERMINALLY LOCATED NITROXIDE GROUPS. J.F.W. Keana, and L.E. LaFleur (Dept. of Chem., Univ. of Oregon, Eugene, OR 97403, (U S A.) *Chem. Phys. Lipids* 23, 253–65 (1979). Synthetic routes are described to a new series of nitroxide lipid spin labels useful for studying the effects of unsaturation and chain length on motion experienced by nitroxide spin labels in biological membrane systems. The labels incorporate a terminally-located proxyl nitroxide group on a saturated or unsaturated fatty acid chain. Syntheses utilize as the key step either an alkylation of an acetylide anion with a nitroxide iodide or else a Wittig coupling between a nitroxide ylid and an aldehyde. Spin labels described include 17-proxylstearolic acid, 17-peroxylstearic acid, 17-proxyloleic acid, 16-proxylheptadecanoic acid, 9-proxyldecanoic acid and two phosphatidyl choline derivatives.

SPHINGOLIPID BASE METABOLISM. CHEMICAL SYNTHESIS AND PROPERTIES OF N-ACETYLDERIVATIVES OF 4R-, 4S-, 5R-, AND 5S-HYDROXYSPHINGANINE. R.J. Kulmacz, Alemka Kisic, and G.J. Schroepfer, Jr. (Dept. of Chem. and Biochem., Rice Univ., Houston, TX 77001 (USA)) *Chem. Phys. Lipids* 23, 291–319 (1979). The following compounds were prepared by chemical synthesis from tribenzoylsphingosine: (2S,3S,4S)-2-acetamido-1,3,5-trihydroxyoctadecane, (2S,3S,4R)-2-acetamido-1,3,4-trihydroxyoctadecane, (2S,3S,5S)-2-acetamido-1,3,5-trihydroxyoctade-

cane, and (2S,3S,5R)-2-acetamido-1,3,5-trihydroxyoctadecane. These compounds were characterized by melting point determination, low and high resolution mass spectra, infrared, optical rotation, chromatographic, and chemical degradation studies. In addition, each of the compounds was converted to the corresponding free base and *N*-benzoyl derivative. (2S, 3S,4R)-2-benzylamino-1,3,4-trihydroxyoctadecane was prepared from the *N*-benzoyl derivative of authentic phytosphingosine.

LIPID OXIDATION IN BOLOGNA CONTAINING MECHANICALLY DEBONED BEEF. J.P. Mosoek, J.E. Kunsman and R.A. Field (The Animal Sci. Div., Univ. of Wyoming, Laramie, WY 82071) *J. Food Sci.* **44**, 151–3 (1979). Control bologna and bologna in which 20% of the lean beef was replaced with mechanically deboned meat (MDM) were manufactured. Bologna was evaluated for palatability characteristics and monitored for decreases in the fatty acids of the polar and nonpolar lipid fractions and for the production of monocarbonyls. The addition of MDM to bologna had no effect on fatty acid loss during storage and the production of monocarbonyls in MDM-containing bologna was similar to that of the control bologna. Control bologna and bologna with MDM included had similar flavor scores during storage at 1°C. Both control and MDM bologna showed a slight decrease in flavor scores with increases in storage up to 60 days.

SEPARATION AND PURIFICATION OF LECITHINS BY HIGH PRESSURE LIQUID CHROMATOGRAPHY. N.A. Porter, R.A. Wolf and J.R. Nixon (Paul M. Gross Chem. Lab., Duke Univ., Durham, N.C.) *Lipids* **14**, 20–4 (1979). Ten different synthetic lecithins have been analyzed by reverse-phase high pressure liquid chromatography. An empirical lecithin "carbon number" that depends on the total number of carbons and double bonds in the fatty acyl chains is a useful index in predicting retention volumes of lecithins on a nonpolar octadecyl fatty acid column. Commercial egg lecithin is separated into its components by this technique.

IDENTIFICATION OF CYCLOPENTENYL FATTY ACIDS BY GAS LIQUID CHROMATOGRAPHY AND MASS SPECTROMETRY. V.K.S. Shukla, E.M. Abdel-Moety, E. Larsen and H. Egsgaard (Bundesanstalt fur Fettforschung D-4400 Munster, West Germany) *Chem. Phys. Lipids* **23**, 285–90 (1979). The straight chain fatty acids and the cyclopentenyl fatty acids present in the lipids of *Hydnocarpus wightiana* seeds were separated as their pyrrolidides by means of gas chromatography. A gas chromatography-mass spectrometry system confirmed the complete separation and permitted the identification of the individual components in the sample.

OCCURRENCE OF PLANT STEROLS IN AQUATIC VERTEBRATES. T. Takagi, A. Sakai, K. Hayashi and Y. Itabashi, (Dept. of Chem., Faculty of Fisheries, Hokkaido Univ., Hakodate, Japan) *Lipids* **14**, 5-8 (1979). Plant sterols were found by gas liquid chromatography in the sterols of five species of aquatic vertebrates; mackerel *(Scomber japonicus)*, rainbow trout *(Salmo gairdnerii)*, smelt *(Osmerus dentex)*, sardine *(Sardinops melanosticta)* and chimera *(Chimera phantasma)*. Sperm whale *(Physeter catodon)* sterols consisted of more than 99% cholesterol with only traces of 22-dehydrocholesterol.

DEUTERIUM MAGNETIC RESONANCE STUDY OF CHOLESTERYL ESTERS IN MEMBRANES. M.I. Valic, H. Gorrissen, R.J. Cushley, and M. Bloom (From the Dept. of Chem., Simon Fraser Univ., Burnaby, British Columbia, V5A 1S6 Canada) *Biochemistry* **18**, 854–9 (1979). The ternary systems EYL:H_2O (50:50 wt %) containing 1 and 5 mol % cholesteryl palmitate-d_{31} or 1 and 5 mol % cholesteryl palmitate-*16,16,16-*d_3 have been studied. Cholesteryl palmitate-d_{31} gave a unique deuterium magnetic resonance spectrum corresponding to a homogeneous ($\Delta\nu_Q = 3$ and 12 kHz) and a solid phase ($\Delta\nu_Q = 38$ and 118 kHz). From the characteristic spectra and spin-lattice relaxation times. A procedure for calculating the amount of each phase present in the ternary mixture is given resulting in a maximum value of homogeneously dissolved cholesteryl palmitate of 0.2 ± 0.1 mol % and a solid fraction above 0.2 mol %. The most probable order parameter for the $(-CD_2)\eta$ portion of the homogeneous fraction of cholesteryl palmitate-d_{31} was determined from the quadrupolar splittings to be $S = 0.1$ which is less than one-half that of the order parameter found for the lecithin chains. Possible explanations for the diminution of the order parameter for cholesteryl ester in bilayers are discussed.

COMPARATIVE STUDIES OF THE SOYBEAN AND SUNFLOWER MEALS AS COMPONENTS IN THE MIXTURES FOR FATTENING PIGS. L. Anguelova et al. *Maslo-sapbenea Prom.* **1977**(4), 549–60. (Rev. Fr. Corps Gras)

STUDY OF THE INTERFACIAL TENSION OF THE FATS USED IN THE PRODUCTION OF A FULL MILK SUBSTITUTE. P.P. Zapevalov et al. *Pishch. Tekhnol.* **1979**(1), 131–2. (Rev. Fr. Corps Gras)

POTENTIOMETRIC MEASURING OF THE SALT IN THE MARGARINE. N.I. Mironova et al. *Pishch. Tekhnol.* **1978**(5), 147–9. (Rev. Fr. Corps Gras)

EXTRACTION OF PROTEINS FROM THE VEGETABLE RAW MATERIALS OF SECONDARY IMPORTANCE. A.T. Markh et al. *Pishch. Tekhnol.* **1978**(5), 86–7. (Rev. Fr. Corps Gras)

INFLUENCE OF LIPIDIC PRODUCTS ON THE THERMOPHYSICAL CHARACTERISTICS OF THE BREAD DOUGH DURING BAKING. L.I. Poutchkova et al. *Pishch. Tekhnol.* **1978(5)**, 83–6. (Rev. Fr. Corps Gras)

VARIATION OF THE PROTEID COMPOSITION OF COTTONSEEDS DURING THE DIFFERENT PROCESSES OF THEIR TREATMENT. R. Mirzakarimov et al. *Pishch. Tekhnol.* **1978**(5), 55–8. (Rev. Fr. Corps Gras)

COMPARATIVE EVALUATION OF THE ANTIOXIDANT POWER OF AMINO ACIDS. M.M. Merzametov et al. *Pishch. Tekhnol.* **1978**(2), 49–52. (Rev. Fr. Corps Gras)

VARIATION OF THE PHYSICO-CHEMICAL VALUES OF THE FRYING OIL AT DIFFERENT STORAGE REGIMES. N.S. Alekaev et al. *Pishch. Tekhnol.* **1978**(5), 42–3. (Rev. Fr. Corps Gras)

DETERMINATION OF THE PHOSPHORIC ACID IN VEGETABLE OILS DURING NONALKALINE REFINING. B. Ya. Sterlin et al. *Troudy VNIIZha* **33**, 96–104 (1977). (Rev. Fr. Corps Gras)

STORAGE OF UNRIPE SOYBEANS. V.V. Klioutchkine et al. *Troudy VNIIZha* **33**, 67–71 (1977). (Rev. Fr. Corps Gras)

• Biochemistry and Nutrition

THE BINDING OF ORGANIC IONS TO PHOSPHOLIPID BILAYERS. B.A. Levine, J. Sackett and R.J.P. Williams, *Biochim. Biophys. Acta* **550**, 201–11 (1979). The binding of organic anions and cations, mainly tetraphenylboride and tetraphenylarsonium, to phospholipid membranes has been studied using an NMR method. Binding is appreciable and is affected by cholesterol in the membrane and counterions in solution. The passage of the organic anions through the membrane has also been followed. These measurements indicate that it is naive to use organic anions to measure membrane potentials in a simple manner.

THE STRUCTURAL SPECIFICITY OF LECITHIN FOR ACTIVATION OF PURIFIED D-β-HYDROXYBUTYRATE APODEHYDROGENASE. Y.A. Isaacson, P.W. Deroo, A.F. Rosenthal, R. Bittman, J.O. McIntyre, H.-G. Bock, P. Gazzotti and S. Fleischer, *J. Biol. Chem.* **254**, 117–26 (1979). We have studied the activation of the purified apodehydrogenase by a number of lecithin analogues with modifications in either the hydrophobic or polar regions of the molecule in order to map the structural specificity for the lecithin molecule. From these studies, we conclude that although D-β-hydroxybutyrate apodehydrogenase does not exhibit specificity for the hydrophobic domain, there is a high degree of specificity for the choline moiety. The quaternary ammonium group seems to be essential. The polar region can be varied within limits of steric and structural constraints.

ESR STUDIES ON THE ORIENTATION OF CHOLESTERYL ESTER IN PHOSPHATIDYLCHOLINE MULTILAYERS. A.K. Grover, B.J. Forrest, R.K. Buchinski and R.J. Cushley, *Biochim. Biophys. Acta* **550**, 212–21 (1979). The alignment of cholesteryl esters in multilayer phosphatidylcholine membranes was investigated using two spin-labelled cholesteryl esters: 10:3 ester (I) and 1:14 ester (II). The data supports a 'horseshoe' configuration for the cholesteryl ester in the bilayer, with both the fatty acid chain and the cholesteryl moiety extending deep into the hydrophobic region of the membrane and with the ester linkage near the surface.

IMPROVED METHODS FOR THE SOLUBILIZATION AND ASSAY OF HEPATIC 3-HYDROXY-3-METHYLGLUTARYL COENZYME A REDUCTASE. P.A. Edwards, Donna Lemongello and A.M. Fogelman, *J. Lipid Res.* **20**, 40–6 (1979). A method for solubilizing HMG-CoA reductase is described that reproducibly yielded ap-

proximately 190% of the activity assayed in rat liver microsomes. A rapid spectrophotometric assay of the reductase has been developed and the optimal conditions defined. Using this assay, the kinetics were determined for HMG-CoA reductase purified to a specific activity of 17,400 nmol NADPH oxidized per minute per mg protein.

SYNTHESIS OF (24,25-^{3}H)CHOLESTEROL: A NEW SUBSTRATE FOR DETERMINING THE RATE OF CHOLESTEROL SIDE CHAIN OXIDATION. C.L. Bentzen and K. Brendel, *J. Lipid Res.* 20, 134–9 (1979). A procedure for the synthesis of (24,25-^{3}H)cholesterol from the nonradioactive precursor desmosterol is described. The intermediate, isodesmosterol, which was purified by column chromatography, was formed to protect the original double bond (Δ 5–6) from hydrogenation. Applications of this method to in vivo, isolated perfused liver, and isolated hepatocyte preparations of the rat are discussed.

IONIC CHARGE ON PHOSPHOLIPIDS AND THEIR INTERACTION WITH THE MITOCHONDRIAL ADENOSINE TRIPHOSPHATASE. C.C. Cunningham and G. Sinthusek, *Biochim. Biophys. Acta* 550, 150–3 (1979). The activity of the lipid-depleted, oligomycin-sensitive mitochondrial ATPase has been measured in the presence of liposomes prepared from mixtures of phosphatidylglycerol and phosphatidylglycerol lysine. These observations demonstrate that the activity of the ATPase is directly proportional to the ionic charge on phospholipid activators if the acyl chain composition of the phosphoglycerides is relatively constant.

LIPID REORGANIZATION IN BIOLOGICAL MEMBRANES. A STUDY BY FOURIER TRANSFORM INFRARED DIFFERENCE SPECTROSCOPY. H.L. Casal, I.C.P. Smith, D.G. Cameron and H.H. Mantsch, *Biochim. Biophys. Acta* 550, 145–9 (1979). The first application of infrared difference spectroscopy to the study of a natural biological membrane is described. Perdeuterated palmitic acid was incorporated biosynthetically into the lipids of the plasma membrane of *Acholeplasma laidlawii* and the temperature-induced structural rearrangement of the endogenous lipids monitored via their C-^{2}H vibrational modes.

RANDOM CLOSE-PACKED ARRAYS OF MEMBRANE COMPONENTS. B.A. Cornell, D. Chapman and W.E. Peel, *Chem. Phys. Lipids* 23, 223–37 (1979). Consideration is given to random close-packed arrangements of membrane components in two-dimensional bilayer structures. Such arrangements are simulated by studying two-dimensional close-packed random arrangements of different sized discs (or plates). One disc is used to simulate a lipid hydrocarbon chain whilst the other disc (or plate) simulates either a cholesterol molecule or the stem of an intrinsic protein. It is assumed that the sole interaction between the components is the steric repulsion which prevents the molecules from overlapping. The arrays provide a useful visual representation which enables the consequences of such random arrangements of membrane components to be examined and enables the contacts which can occur between the two components to be counted. The approach, whilst crude, appears to provide some insight into arrangements of membrane components and points to questions which require further consideration.

STRUCTURAL STABILIZATION OF ISOLATED ACETYLCHOLINE RECEPTOR: SPECIFIC INTERACTION WITH PHOSPHOLIPIDS. H.W. Chang and E. Bock, *Biochemistry* 18, 172–9 (1979). In this report we demonstrate that specific interaction between phospholipids and acetylcholine receptor appears to exist even in 1% nonionic detergent solutions, and we find a definite relationship between the amount of endogenous phospholipid remaining in the purified receptor and its retention of high affinity acetylcholine sites. These results suggest that acetylcholine receptor protein requires a highly specific hydrophobic environment, perhaps defined by certain phospholipids, in order to retain native structure.

MODULATION OF ERYTHROCYTE MEMBRANE PROTEINS BY MEMBRANE CHOLESTEROL AND LIPID FLUIDITY. H. Borochov, R.E. Abbott, D. Schachter and M. Shinitzky, *Biochemistry* 18, 251–5 (1979). Human erythrocyte membranes were enriched or depleted of cholesterol and effects on membrane proteins assessed with a membrane-impermeant sulfhydryl reagent, (^{35}S)glutathione-maleimide. Cholesterol enrichment enhanced the surface labeling of Coomassie brilliant blue stained bands 1, 2, 3, and 5, decreased the labeling of band 6, and did not change significantly that of band 4. The results demonstrate that changes in membrane cholesterol which influence lipid fluidity can alter the surface labeling of both intrinsic and extrinsic membrane proteins.

STRUCTURE AND THERMODYNAMIC PROPERTIES OF THE COMPLEXES BETWEEN PHOSPHOLIPASE A_2 AND LIPID MICELLES. P.S. de Araujo, M.Y. Rosseneu, J.M.H. Kremer, E.J.J. van Zoelen and G.H. de Haas, *Biochemistry* 18, 580–6 (1979). The interaction between porcine pancreatic phospholipase A_2 and a homogeneous population of micelles of the substrate analogue *n*-hexadecylphosphorylcholine containing 155 lipid monomers was studied by light scattering, equilibrium gel filtration, and isothermal calorimetry. The affinity constants and complex composition have been determined at different temperatures, allowing calculation of thermodynamic parameters of the binding process. It is concluded that the interaction of phospholipase A_2 with micellar lipids is predominantly hydrophobic.

HEPATIC CHOLESTEROL METABOLISM IN NORMO- AND HYPERLIPIDEMIC PATIENTS WITH CHOLESTEROL GALLSTONES. J. Ahlberg, B. Angelin, I. Bjorkhem, K. Einarsson and B. Leijd, *J. Lipid Res.* 20, 107–15 (1979). The aim of the present investigation was to determine if the increased production of cholesterol in HLP type IV can be attributed to a correspondingly high level of the hepatic 3-hydroxy-3-methylglutaryl (HMG) CoA reductase activity and if the low cholic acid: chenodeoxycholic acid synthesis ratio in HLP type II is due to some hydroxylase deficiency. The HMG CoA reductase activity was normal in HLP type IIa and type IIb and was increased about twice in HLP type IV ($P < 0.001$).

EFFECT OF DIETARY LOW-ERUCIC ACID RAPESEED-OIL ON PLATELET AGGREGATION. B. Jacotot, *Rev. Fr. Corps Gras*, 26, 171–4 (1979). Effect of low-erucic acid rapeseed oils (Primor and Canbra) on platelet aggregation has been studied in vitro in rat, rabbit and man. In rats maintained for one year on a normolipidic diet constituted by Primor, sunflower or peanut oil, significant differences in platelet aggregation have been evidenced. This aggregation has been the lowest with sunflower and the highest with peanut. In rabbits fed a sequential hyperlipidic and atherogenic diet constituted by olive oil, Primor oil or butter, the platelet aggregation has been the highest with butter. In man, Canbra oil, olive oil and butter have been compared after a normolipidic diet for 7 days; Canbra oil caused the lowest platelet aggregation and butter the highest. These studies show the favourable effect of low-erucic acid rapeseed oil probably owed to linoleic and linolenic acids of this oil.

EFFECTS OF COOKING AND OF FROZEN STORAGE ON THE CHOLESTEROL CONTENT OF SELECTED SHELLFISH. R.V. Krishnamoorthy, A. Venkataramiah, G.J. Lakshmi and P. Biesiot (Gulf Coast Res. Lab., Ocean Springs, MS 39564) *J. Food Sci.* 44, 314–5 (1979). The effects of heat (cooking) and of frozen storage on the cholesterol content of oyster, blue crab, and shrimp meats was determined. Cooking decreased the cholesterol content of crab meat but brought about no significant change in shrimp or oyster meat levels ($p > 0.05$). Freezing and thawing of raw tissue increased the cholesterol content of oyster and shrimp meat but did not affect the level in crab meat.

BIOSYNTHESIS OF UNSATURATED FATTY ACIDS IN THE DIATOM PHAIODACTYLUM TRICORNUTUM. V.J. Moreno, J.E.A. de Moreno and R.R. Brenner (Catedra de Quimica Biologica, Dpto. de Biologia, Univ. Nacional de Mar del Plata, Mar del Plata, Argentina) *Lipids* 14, 15–9 (1979). The biosynthesis of fatty acids in the diatom *Phaeodactylum tricornutum* was studied. The diatom was incubated with sodium (1-^{14}C)acetate and the acids (1-^{14}C)palmitic, (1-^{14}C)stearic, (1-^{14}C)linoleic and (1-^{14}C)-α-linolenic. The distribution of radioactivity in the products was determined by gas liquid radiochromatography. When labeled acetate, stearic, α-linolenic or even linoleic acid were incubated with the diatom, the polyunsaturated C_{20} fatty acids synthesized belonged predominantly to the ω3 family. The existence of Δ9, Δ6, Δ5, Δ4, ω6 and possibly ω3 desaturases in *P. tricornutum* is suggested.

1,25-DIHYDROXYVITAMIN D_3 INCREASES THE ACTIVITY OF THE INTESTINAL PHOSPHATIDYLCHOLINE DEACYLATION-REACYLATION CYCLE. P.J.A. O'Doherty (G.F. Strong Lab. for Med. Res., Dept. of Med., Univ. of British Columbia, Vancouver, B.C., Canada V5Z 1M9) *Lipids* 14, 75–7 (1979). The activity of the intestinal phosphatidylcholine deacylation-reacylation cycle has been found to be stimulated by 1,25-dihydroxy-vitamin D_3. The stimulation of this cycle thus provides a possible mechanism for the reported retailoring of the fatty acid composition of phosphatidylcholine in intestinal cell membranes by 1,25-dihydroxy-vitamin D_3 and its analogue, 1α-hydroxy-vitamin D_3.

A COMPARISON OF THE GANGLIOSIDE DISTRIBUTIONS OF FAT TISSUES IN VARIOUS ANIMALS BY TWO-DIMENSIONAL THIN LAYER CHROMATOGRAPHY. M. Ohashi (Res. Inst. of Food Chem., Ochanomizu Univ., 2-1-1, Otsuka, Bunkyo-ku, Tokyo 112, Japan) *Lipids* 14, 52–7 (1979). The ganglioside distributions of various fat tissues from human, rabbit, rat, mouse, chicken and frog were compared with pig adipose gangliosides by two-dimensional thin layer chromatography. It was found that there is a remarkable species variation in ganglioside distribution, especially in the composition and relative concentration of complex gangliosides. In other respects, a substantial amount of disialosylgangliosides was commonly found in all animal fat tissues.

FATTY ACID BIOSYNTHESIS IN THE DEVELOPING ENDOSPERM OF COCOS NUCIFERA. K.C. OO and P.K. Stumpf (Dept. of Biochem. and Biophys. Univ. of California, Davis, CA 95616) *Lipids* 14, 132–43 (1979). Endosperm tissue of developing coconut endosperm incorporated {^{14}C} acetate and {^{14}C}-malonate into {^{14}C}C_8–C_{18} fatty acids. The distribution of {^{14}C} label into the various fatty acids mimicked the distribution of endogenous fatty acids at early and middle stages of endosperm development. Although {^{14}C}C_8–C_{18} fatty acids were taken up rapidly by endosperm tissue slices, no elongation occurred; {^{14}C} stearic acid was not desaturated to oleic. Cell free preparations have also been obtained from this tissue that readily incorporated {^{14}C} malonyl-CoA into a range of {^{14}C} fatty acids in the presence of ACP and NADH at pH 7.0. Employing this system, a number of experiments were designed to determine the mechanism of chain length termination. In contrast to intact tissue slice experiments, cell-free extracts yielded as principal products palmitic acid and stearic acid, although up to 20% were shorter chain acids. A number of possible mechanisms for chain length termination were proposed and tested.

A COMPARISON OF DELIPIDATED SERA USED IN STUDIES OF STEROL SYNTHESIS BY HUMAN MONONUCLEAR LEUKOCYTES. H.R. Slater, and F.W. Robertson (Dept. of Genetics, Univ. of Aberdeen, Aberdeen, Scotland) *J. Lipid Res.* 20, 413–6 (1979). Sterol synthesis in human mononuclear leukocytes is stimulated by delipidated serum. Synthesis in media containing serum delipidated by three different methods is compared. Significant differences between subjects are shown and these differences are maximized by measuring synthesis in serum delipidated by extraction with butanol-diisopropyl ether 40:60 and diethyl ether. A comparison of delipidated sera used in studies of sterol synthesis by human mononuclear leukocytes.

SERUM HIGH DENSITY LIPOPROTEIN AND ITS RELATIONSHIP TO CARDIOVASCULAR DISEASE RISK FACTOR VARIABLES IN CHILDREN—THE BOGALUSA HEART STUDY. G.S. Berenson, S.R. Srinivasan, R.R. Frerichs and L.S. Webber (Dept. of Med., Louisiana State Univ. Med. Center, New Orleans, LA) *Lipids* 14, 91–8 (1979). The distribution and interrelationship of serum lipids, lipoproteins, anthropometric measurements and blood pressures were determined in some 5,000 children. Children had mean ± S.D. α-lipoprotein cholesterol levels (mg/100 ml) of 36 ± 15 at birth, 51 ± 22 at 6 mo, 53 ± 18 at 1 yr, 60 ± 19 at preschool age (2½–5½ yr) and 68 ± 22 at school age (5–14 yr), reflecting a sharp increase in α-lipoprotein between birth and school-age years, when these levels remained relatively stable through age 14.

WORK-INDUCED MUSCLE HYPERTROPHY IN VITAMIN D-DEFICIENT RATS. D.D. Bikle, L. Hagler, L.O. Lollini, S.F. Hull, and R.H. Herman (Dept. of Med., Letterman Army Inst. of Res., Presidio of San Francisco, San Francisco, California 94129) *J. Clin. Nutr.* 32, 515–6 (1979). To determine if vitamin D deficiency would retard the ability of muscle to hypertrophy in response to mechanical stress, we severed the gastrocnemius tendon on one leg of rats in each of three groups, the treatment of which differed only in the amount of vitamin D in the diet. After 1 week the increased size of the soleus and plantaris in the leg in which the gastrocnemius was severed relative to that of the sham operated leg, was determined for each rat. Despite differences in body weight and serum calcium among the groups, we found no difference in the percent of muscle hypertrophy. We conclude that muscle hypertrophy can occur in response to local mechanical forces despite a deficient hormonal environment that otherwise retards growth.

TRANSFORMATION OF ARACHIDONIC ACID BY RABBIT POLYMORPHONUCLEAR LEUKOCYTES. P. Borgeat, and B. Samuelsson (From the Dept. of Chem., Karolinska Institutet, S-104 01 Stockholm, Sweden) *J. Biol. Chem.* 254, 2643–6 (1979). A new metabolite of arachidonic acid, 5-D-(S), 12-D-(R)-dihydroxy-6,8,10,14-eicosatetraenoic acid, was found upon incubation of the fatty acid with a suspension of rabbit peritoneal polymorphonuclear leukocytes collected 4 h after injection of glycogen into the peritoneal cavity. The yield of the dihydroxy acid was 0.5 to 2%. The compound possesses three conjugated double bonds and was found to be stereochemically pure at C-5 and C-12. Incubation of the cells with 8,11,14-eicosatrienoic acid did not lead to the formation of the analogous triunsaturated dihydroxy acid.

FATTY ACID POSITIONAL SPECIFICITY IN PHOSPHOLIPIDS OF L1210 LEUKEMIA AND NORMAL MOUSE LYMPHOCYTES. C.P. Burns, S.-P.L. Wei, D.G. Luttenegger, and A.A. Spence (Dept. of Med. and Biochem. Univ. of Iowa College of Med. Iowa City, Iowa 52242) *Lipids* 14, 144–7 (1979). The positional distribution of fatty acids in the choline and ethanolamine phosphoglycerides of the L1210 murine leukemia cells was determined and compared to that of normal mouse lymphocytes. The major phospholipids of both cell types had appreciable degrees of positional specificity as evident from the higher percentage of saturated fatty acids in position 1 and of polyunsaturated fatty acids in position 2. The L1210 cells had less arachidonate and more linoleate in position 2 of choline and ethanolamine phosphoglycerides as compared to the normal lymphocytes. However, there were similar proportions of saturated, monoenoic and polyenoic fatty acids in positions 1 and 2 of the phospholipids of the L1210 leukemia cells and the lymphocytes. These data demonstrate that fatty acid positional specificity is retained in the major phospholipids of this rapidly growing tumor.

DIETARY POLYUNSATURATED FAT VERSUS SATURATED FAT IN RELATION TO MAMMARY CARCINOGENESIS. K.K. Carroll and G.J. Hopkins (Dept. of Biochem. Univ. of Western Ontario, London, Ontario, Canada N6A 5C1) *Lipids* 14, 155–8 (1979). High levels of dietary fat have been shown to promote the development of mammary tumors induced in rats by 7,12-dimethylbenz (α) anthracene, and polyunsaturated fats were found to be more effective than saturated fats. In further studies it was found that diets containing 3% sunflowerseed oil (polyunsaturated fat) and 17% beef tallow or coconut oil (saturated fats) enhance tumorigenesis as much as a diet containing 20% sunflowerseed oil. Rats on these diets developed at least twice as many tumors as those fed diets containing either 3% sunflowerseed oil or 20% of the saturated fats alone. These results are in accord with human epidemiological data which show that breast cancer mortality in different countries is positively correlated with total fat intake but not with intake of polyunsaturated fat. Total fat intake varies greatly in different countries, but most human diets probably contain levels of polyunsaturated fat at least equivalent to 3% sunflowerseed oil.

MUCOSAL COENZYME A-DEPENDENT CHOLESTEROL ESTERIFICATION AFTER INTESTINAL PERFUSION OF LIPIDS IN RATS. S.B. Clark (Gastroenterology Div., Columbia Univ. St. Luke's Hosp. Center, New York, New York 10025) *J. Biol. Chem.* 254, 1534–6 (1979). Coenzyme A-dependent esterification of cholesterol was determined in intestinal mucosal homogenates prepared after duodenal perfusion of cholesterol-free lipid emulsions for 5 h unanesthetized rats. Cholesterol esterification rates were lowest and the mucosal cholesterol pool was greatly reduced after the same lipid infusions that, lymph fistula rats, had produced chylomicrons deficient in cholesterol esters. During triglyceride secretion by the gut, unesterified cholesterol for chylomicron membranes may be maintained both by suppressing mucosal CoA-dependent cholesterol ester formation and from a mobilizable unesterified cholesterol pool within the mucosa.

EVIDENCE FOR A ROLE OF PHOSPHATIDYLINOSITOL TURNOVER IN STIMULUS-SECRETION COUPLING. S. Cockcroft, and B.D. Gomperts (Dept. of Experimental Pathology, Univ. College Hosp. Med. Schl., Univ. Street, London WC1E 6JJ, U.K.) *Biochem. J.* 178, 681–7 (1979). Histamine secretion and phosphatidylinositol turnover were compared in antigen-sensitized rat peritoneal mast cells stimulated with a number of different ligands. A small and variable increase in the incorporation of (^{32}P)P_i and of (^{3}H)inositol into phosphatidylinositol was observed then the cells were treated with immunoglobulin E-directed ligands (antigens and concanavalin$_A$), and this was accompanied by a low amount of secretion (10% of total cell histamine). These results support the proposition that metabolic events involving phosphatidylinositol play a necessary

intermediate role in the regulation of Ca^{2+} channels by ligand-activated receptors.

ATHEROSCLEROSIS IN LEMMINGS AND VOLES FED A HIGH FAT, HIGH CHOLESTEROL DIET. R.A. Dieterich and D.J. Preston, (Inst. of Arctic Biol. Univ. of Alaska, Fairbanks AK 99701 USA) *Atherosclerosis* 33, 181–9 (1979). Two species of lemmings and two species of voles were fed a high fat, high cholesterol diet for several months. *Clethrionmys rutilus* had a moderate (2X) rise in serum cholesterol while *Microtus oeconomus* had a marked increase (5X); *Dicrostonyx stevensoni* and *Dicrostonyx rubricatus* had extreme increases (8X and 11X, respectively). Typical lesions of atherosclerosis were observed in all species, but *D. rubricatus* had significantly more severe lesions. Hepatic fatty infiltration was the principal pathologic lesion found besides atherosclerosis in those test rodents which died spontaneously.

LIPOGENESIS IN THE DEVELOPING BRAIN: UTILIZATION OF RADIOACTIVE LEUCINE, ISOLEUCINE, OCTANOIC ACID AND β-HYDROXYBUTYRIC ACID. G.A. Dhopeshwarkar and C. Subramanian (Lab. of Nuclear Med. and Radiation Biol., Univ. of California, 900 Veteran Ave., Los Angeles, CA) *Lipids* 14, 47–51 (1979). Incorporation of radioactivity from intracranially injected radioactive leucine, isoleucine (ketogenic amino acids), octanoic acid and β-hydroxybutyric acid into the brain lipids of 15 to 16 day-old rats was examined. The results showed that radioactivity from all the above precursors was incorporated into brain lipids. Utilization of these compounds for providing carbon for lipogenesis during development under unstressed normal conditions is discussed.

HIGH DENSITY LIPOPROTEIN CHOLESTEROL AND MYOCARDIAL INFARCTION OR SUDDEN CORONARY DEATH: A PROSPECTIVE CASE-CONTROL STUDY IN MIDDLE-AGED MEN OF THE OSLO STUDY. S.C. Enger, I. Hjermann, O.P. Foss, A. Helgeland, I. Holme, P. Leren and K.R. Norum (Sentral Lab., Drammen sykehus, N-3000 Drammen, Norway) *Artery* 5, 170–81 (1979). The high density lipoprotein (HDL) cholesterol concentrations of frozen specimens obtained in 1972–73 are reported from 93 men aged 40–49 years who later developed coronary heart disease (CHD), and for 186 controls. Mean HDL cholesterol of CHD-patients was 7.9% lower than that of controls matched for smoking habits and serum concentrations of triglycerides and total cholesterol (p 0.05 for 82 men who had myocardial infarction, n.s. difference for 11 with sudden coronary death), and 10.2% lower (p 0.05) than that of controls who were not matched for the parameters mentioned. The present prospective study confirms that HDL cholesterol is inversely associated with the risk of developing CHD in middle-aged men.

EFFECT OF INTRAVENOUS INJECTION OF CDP-CHOLINE, S-ADENOSYL-METHIONINE AND CITIOLONE IN SUBJECTS WITH HYPERLIPEMIA. F. Galeone, F. Salvadorini, M. Guarguaglini and P. Saba, (Dept. of Med., Psychiatric Hosp. of Volterra, Pisa, Italy) *Artery* 5, 157–69 (1979). The effect of some drugs (CDP-choline, S-adenosyl-methionine and acetyl-homocysteinethiolactone) stimulating a number of liver enzymatic activities was studied in hyperlipemic patients to explore the role of liver function in hyperlipidemia. The data suggest that the hypolipidemic effect of the three compounds is due to a common mode of action, i.e., the stimulation of hepatic phospholipid biosynthesis, though in a different way.

HYPOCHOLESTEROLEMIC EFFECT OF YOGURT AND MILK. G. Hepner, R. Fried, S. St. Jeor, L. Fusetti, and R. Morin, (Dept. of Med. and Pathology, Harbor/UCLA Gen. Hosp., Torrance, California 90509). *Amer. J. Clin. Nutr.* 32, 19–24 (1979). In order to determine the effect of milk products on serum cholesterol, triglycerides, and diet, 54 volunteers were studied for varying periods with dietary supplementation of non-pasteurized yogurt, pasteurized yogurt and 2% butterfat milk. Serum cholesterol was significantly reduced by 5 to 10% after 1 week of supplementation with either nonpasteurized or pasteurized yogurt; 2% butterfat milk reduced serum cholesterol to a smaller and less significant effect. Serum triglycerides were unaffected by the diet and dietary intake studies confirmed that intake of other nutrients remained relatively stable throughout the study. Supplementation of diet with yogurt may have a helpful hypocholesterolemic effect.

THE EFFECT OF ESSENTIAL FATTY ACID-DEFICIENT DIET ON THE LEVELS OF PROSTAGLANDINS AND THEIR FATTY ACID PRECURSORS IN THE RABBIT BRAIN. A.G. Hassam, A.L. Willis, J.P. Denton, P. Stevens and M.A. Crawford, (Dept. of Biochem., Nuffield Lab. of Comparative Med., Zoological Society of London, Regent's Park, London MW1 4RY, England) *Lipids* 14, 78–80 (1979). Rabbits were maintained on an EFA-deficient diet. After eight weeks on this diet, lipid analysis showed no major alterations in the levels of brain dihomo-gamma-linolenic and arachidonic acids when compared with animals maintained on the standard laboratory diet. However, there were substantial reductions in the brain prostaglandin contents. It is suggested that the dihomo-gamma-linolenic acid and arachidonic acid utilized for prostaglandin production may be more directly related to the dietary essential fatty acid input rather than to the size of the precursor pool in the principal phospholipids.

VITAMIN D DEFICIENCY AND REPRODUCTION IN RATS. B.P. Halloran, and H.F. DeLuca, (Dept. of Biochem., College of Agr. and Life Sci., Univ. of Wisconsin-Madison, Madison, 53706) *Science* 204, 73–4 (1979). Female weanling rats from a colony maintained on a diet low in vitamin D were raised on a diet that was deficient in vitamin D but was otherwise adequate. Vitamin D deficiency was confirmed in the rats by hypocalcemia and the absence of vitamin D metabolites in blood. These females gave birth to litters that were slightly smaller than control litters from females maintained on a vitamin D-containing diet. The pups from the vitamin D deficient mothers appeared normal throughout lactation, and at weaning had normal concentrations of calcium and phosphate in the plasma. These results indicate that vitamin D and its metabolites are not necessary for reproduction and fetal development in the rat.

COMPOSITION OF LIPIDS BOUND TO PURE CYTOCHROME P-450 OF CHOLESTEROL SIDE-CHAIN CLEAVAGE ENZYME FROM BOVINE ADRENOCORTICAL MITOCHONDRIA. P.F. Hall, M. Watanuki, J. DeGroot and G. Rouser, (Dept. of Physiology, College of Med. Univ. of Calif. Irvine, Irvine, CA 92717) *Lipids* 14, 148–51 (1979). Phospholipids bound to highly purified cytochrome P-450 from bovine adrenocortical mitochondria, part of the enzyme complex responsible for catalyzing the conversion of cholesterol to pregnenolone, have been examined for comparison with the bulk phospholipids of the mitochondria from the same tissue. In both cases, the major phospholipids are phosphatidylcholine (PC) (37%) and phosphatidylethanolamine (PE) (56%), as well as smaller amounts of sphingomyelin and diphosphatidylglycerol. The fatty acid compositions of the four classes of phospholipids and of the neutral lipids bound to the pure enzyme are indistinguishable from those of the respective mitochondrial lipids. They are also similar to those of mitochondria from other organs except for high levels of arachidonate and low levels of diphosphatidylglycerol.

ANALYSIS OF SUBCELLULAR PHOSPHATIDYL CHOLINE IN DEVELOPING RABBIT LUNG. G.R. Gutcher, R.D. Zachman and F.H.C. Tsao, (Dept. of Pediatrics, Univ. of Wisconsin, Madison, WI) *Lipids* 14, 25–9 (1979). Phosphatidyl choline is a major lung surfactant. Insufficient development of the surfactant in neonates is often associated with the Respiratory Distress Syndrome. This study has investigated the development of the concentration and fatty acid composition of phosphatidyl choline in subcellular fractions of 28-day and 30-day fetal and maternal New Zealand rabbit lungs. Changes of several unsaturated fatty acid components were observed in both lamellar bodies and microsomes in the developing lungs. Maturational development of phosphatidyl choline is reflected in an increase in the concentration of this surfactant, particularly in lamellar bodies, and possibly in remodeling of fatty acid composition in both lamellar bodies and microsomes.

DEXTRAN SULFATE PRECIPITABLE (LIGHT) PLASMA LIPOPROTEINS IN GENETICALLY ACTIVE AND PASSIVE RATS FED TWO TYPES OF DIET. O. Gronnerod and A.T. Hostmark, (Work Res. Inst., Univ. of Oslo, Gydas vei 8, Oslo 3, Norway) *Artery* 5, 144–56 (1979). Genetically active and passive female rats were fed a purified sucrose/fat diet or a stock diet from the age of 11 to 27 weeks. The age-related increase in plasma total cholesterol concentration was much more pronounced in active rats fed the purified diet than in active rats fed the stock diet. The results confirm our earlier observation that there might be a dissociation between the dietary effect on the plasma total cholesterol level and on the lipoprotein distribution. The data also suggest that the hyperlipemic sucrose/fat diet causes a shift from the prebeta and beta lipoproteins to the "light prealpha" fractions.

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LIPOPROTEIN LIPASE ACTIVITY IN HUMAN ADIPOSE TISSUE DURING INDUCED HYPERTRIGLYCERIDAEMIA. G. Holdsworth, K.G. Taylor and D.J. Galton, (Diabetes and Lipid Res. Lab., St. Bartholomew's Hosp. London EC1A 7Be Great Britain) *Atherosclerosis* 33, 253–8 (1979). Needle biopsies of adipose tissue and blood samples were obtained before and at short intervals after a "bolus" injection of 10% intralipid. Lipoprotein lipase activities were measured in acetone-ether extracts of the tissue samples. Levels of serum triglyceride began to fall less than 5 min after the injection of the intralipid with a half-life of 20 min. During this time interval, no significant changes were observed in the activities of lipoprotein lipase in adipose tissue. A patient with a severe hypertriglyceridaemia (type V) underwent plasma exchange with a reduction in serum triglyceride levels from 11 to 4 mm/l. There was a parallel fall in adipose tissue lipoprotein lipase activity. We conclude that lipoprotein activity in adipose tissue is unaltered during experimental hypertriglyceridaemia and that the activity of the enzyme in adipose tissue is probably not reduced as a secondary feature of an elevated plasma triglyceride level.

ISOLATION AND IDENTIFICATION OF PREVITAMIN D_3 FROM THE SKIN OF RATS EXPOSED TO ULTRAVIOLET IRRADIATION. M.F. Holick, N.M. Richtand, S.C. McNeill, Sally A. Holick, Jane E. Frommer, J.W. Henley, and J.T. Potts, Jr., (Massachusetts General Hosp., and the Dept. of Med., Harvard Med. Schl., Boston, Massachusetts 02114) *Biochemistry* 18, 1003–7 (1979). The process of the photolytic activation of vitamin D precursor (s) in the skin has been elucidated by a detailed analysis of the products formed after ultraviolet light exposure. The photolytic product isolated from the skin of rats exposed to ultraviolet irradiation was identified as previtamin D_3 by several criteria including its (a) characteristic ultraviolet absorption spectrum, (b) mass spectrum, and (c) thermal isomerization to vitamin D_3, which itself was identified also by mass spectroscopy. Vitamin D_3, which itself was identified also by mass spectroscopy. Vitamin D_3 per se was not formed by ultraviolet irradiation-vitamin D_3 arises exclusively from the thermal conversion of previtamin D_3. Detectable amounts of lumisterol$_3$ or tachysterol$_3$ were not seen.

HDL-CHOLESTEROL LEVELS IN THE MULTIPLE RISK FACTOR INTERVENTION TRIAL (MRFIT) BY THE MRFIT RESEARCH GROUP. S. Hulley, P. Ashman, L. Kuller, N. Lasser and R. Sherwin, (Dept. of Med., Schl. of Med., Stanford Univ., Stanford, CA) *Lipids* 14, 119–25 (1979). Preliminary data from the Multiple Risk Factor Intervention Trial (MRFIT) have been examined for evidence that the program has an influence on plasma HDL-cholesterol. The overall mean level of this lipoprotein in the initial cohort of 1,084 men was not altered by two years of participation in this risk factor reduction project. We conclude that conventional risk reduction programs are not likely to lower circulating HDL-cholesterol, and that program components such as weight reduction and smoking cessation may increase the levels.

DIETARY FIBER AND BLOOD LIPIDS: REDUCTION OF SERUM CHOLESTEROL IN TYPE LL HYPERLIPIDEMIA BY GUAR GUM. D.J.A. Jenkins, A.R. Leeds, B. Slavin, J. Mann, and E.M. Jepson, (Central Middlesex Hosp., London, NW10 7NS, England.) *Amer. J. Clin. Nutr.* 32, 16–8 (1979). Guar gum, a storage polysaccharide galactomannan and a form of dietary fiber, was administered to 10 patients with type II a or b hyperlipidemia for 2 weeks. Five grams of gum was given before each of three meals daily, either in a specially prepared soup or mixed with fruit juice or milk. No other deliberate change of diet was made. Three patients had been taking 12 to 16 g/day of cholestyramine for more than 2 years and one had been taking 1,000 mg of clofibrate daily. These drugs were continued throughout the trial. Serum cholesterol levels of all 10 patients had been stable for 6 to 18 months before the trial at the start of which the mean level was 345 ± 15 mg/dl. After 2 weeks of guar gum the mean was 308 ± 16 mg/dl, a fall of 10.6% ($P < 0.01$). Serum triglyceride was not changed significantly. Guar gum, which can be incorporated into foods, merits further study as a potential hypocholesterolemic agent.

ISOLATION AND IDENTIFICATION OF 24,25-DIHYDROXYVITAMIN D_2 USING THE PERFUSED RAT KIDNEY. G. Jones, A. Rosenthal, D. Segev, Y. Mazur, F. Frolow, Y. Halfon, D. Rabinovich, and Z. Shakked, (The Hosp. for Sick Children, Toronto, Canada) *Biochemistry* 18, 1094–101 (1979). 24,25-dihydroxyvitamin D_2 was biologically generated from synthetic 25-hydroxyvitamin D_2 using an isolated perfused rat kidney incubated under normocalcemic and normophosphatemic conditions. 24(R),25-dihydroxyvitamin D_2 and 24(S),25-dihydroxyvitamin D_2 were chemically synthesized starting with stigmasterol and their configurations determined by X-ray diffraction analysis. The biosynthetic metabolite proved to be identical with the synthetic 24(R) epimer in its chromatographic mobility, mass spectrometry, and derivative synthesis. Significant quantities of (3α-^{3}H)-24(R),25-dihydroxyvitamin D_2 were found to be present in the plasma of vitamin D replete rats 24 h after receiving a physiological dose of (3α-^{3}H) vitamin D_2.

BODY WEIGHT AND DEPOT FAT CHANGES AS INFLUENCED BY EXERCISE AND DIETARY FAT SOURCES IN ADULT BHE RATS. H.C. Lau, E. Flaim, and S.J. Ritchey, (Dept. of Human Nutr. and Foods, Virgina Polytechnic Inst. and State Univ., Blacksburg, Virginia 24061) *J. Nutr.* 109, 495–500 (1979). Adult male BHE rats were fed diets containing 15% of either corn oil (CO) or medium chain triglycerides (MCT) as the dietary source of fat. Further, rats were allowed to remain sedentary or were forced to exercise by swimming for 1 hour daily, for 3 weeks, followed by swimming for 2 hours daily for 3 weeks. The exercise for 3 weeks caused significant reductions in average body weight gains. After 6 weeks of exercise the lipid content of the adipose cells was reduced by about 50%. Fat cell numbers were not changed by either fat source or exercise, but fat cell size was significantly reduced after swimming daily for 6 weeks.

ISOLATION AND PARTIAL CHARACTERIZATION OF THE NEUTRAL GLYCOSPHINGOLIPIDS AND GANGLIOSIDES OF THE HUMAN HEART. G.M. Levis, J.N. Karli and S.D. Moulopoulos, (Dept. of Clin. Therapeutics, Schl. of Med., Univ. of Athens, Alexandra Hosp., Vass. Sophias and K. Lourou St., Athens 611, Greece) *Lipids* 14, 9–14 (1979). The glycosphingolipids (GSL) of the human heart muscle have been isolated from total lipids by column and thin layer chromatography and their sugars and fatty acids analyzed by gas liquid chromatography. The neutral GSL content for those parts of the hearts of two males aged 22 and one female aged 14 ranged from about 90 to 160 nmoles/g wet weight. Differences in the content and composition of neutral GSL and gangliosides between the heart and other human tissues are discussed. It is concluded that the patterns of these two GSL fractions of the heart are more complex than those of most of the extraneural human tissues.

CORRELATION IN THE PROPORTION OF OLEIC TO VACCENIC ACID OF PLASMA PHOSPHOLIPIDS WITH THE EARLY STAGES OF HEPATOMA 7288CTC GROWTH. J.P. Mapes and R. Wood, (Dept. of Biochem. and Biophys., Texas Agr. Exp. Sta., Texas A&M Univ. System, College Station, TX) *Lipids* 14, 70–1 (1979). The major octadecenoate isomers, oleate ($\Delta 9$) and vaccenate ($\Delta 11$), were measured in the plasma phospholipids of rats bearing hepatoma 7288CTC as the tumor developed. The percentage of vaccenate continued to decrease as a function of time until day 15, after which it remained constant. Detection of alterations in plasma phospholipids at an early stage of tumor development in rats suggests that experiments should be carried out to determine if the same effects occur in humans.

PLASMA LIPOPROTEINS AND CORONARY ARTERIOGRAPHY IN SUBJECTS IN THE PROGRAM ON THE SURGICAL CONTROL OF THE HYPERLIPIDEMIAS. PRELIMINARY REPORT. R.B. Moore, J.M. Long, J.P. Matts, K. Amplatz, R.L. Varco, H. Buchwald and The Posch Group, (Univ. of Minn. Med. Schl. Minn, MN (U.S.A.)) *Atherosclerosis* 32, 101–19 (1979). Coronary arteriographic findings, plasma lipid and lipoprotein levels, and cigarette smoking history are reported for the first 101 male post myocardial infarction survivors who have been entered into the POSCH clinical trial. Estimates of the extent of stenosis in the major coronary arteries were made using 4 models ranging from a simple determination of the number of the 3 major vessels having significant (i.e. 50% or greater stenosis) disease to more complex methods of determining overall extent of disease in 14 major segments of the coronary arteries. Age was shown to be an important factor in the extent of vessel disease. When controlling for age, plasma cholesterol and LDL-cholesterol levels were shown to be related to the extent of disease, especially in Type II hyperlipoproteinemia subjects. Multiple linear regression analysis demonstrated that age and LDL-cholesterol had positive associations and HDL-cholesterol had an inverse association with the coronary artery disease indices.

EFFECTS OF ESTROGENS AND PROGESTINS ON HIGH DENSITY LIPOPROTEINS. R.M. Krauss, F.T. Lindgren, J. Wingerd, D.D. Bradley and S. Ramcharan, (Donner Lab., Lawrence Berkeley Lab. Univ. of California, Berkeley, CA) *Lipids* 14, 113–8 (1979). High density lipoprotein (HDL) levels are known to be higher in women than in men, and to increase with esotrogen use. To assess the effects of estrogens on HDL subspecies, analytic ultracentrifuge measurements of HDL were compared in 11 menopausal estrogen users and 16 controls. An increase in HDL of higest flotation rate ($F°_{1.20}$ 5–9) was seen, which corresponded with the time of ovulation, raising the possibility of pituitary as well as gonadal hormone effects on HDL. ●

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