Abstracts

• Fats and Oils

GEL TO LIQUID-CRYSTALLINE PHASE TRANSITIONS IN WATER DISPERSIONS OF SATURATED MIXED-ACID PHOSPHATIDYLCHOLINES. K.M.W. Keough, and P.J. Davis (From the Dept. of Biochem., Memorial Univ. of Newfoundland, St. John's, Newfoundland, A1b 3X9, Canada) *Biochemistry* 18, 1453–8 (1979). Mixed-acid saturated lecithins containing myristate, palmitate, and stearate chains have been synthesized by phospholipase A_2 digestion of the appropriate single-acid lecithin, followed by reacylation of the lysolecithin with the desired fatty acid anhydride. Variable amounts of acyl migration were found to occur during the syntheses. A model which proposes slight differences in chain packing in the bilayer in the gel state is presented as a possible explanation for the observed differences in the thermotropic behavior of the positional isomers.

BUTYLDIMETHYLSILYL ETHERS OF IODINE-CATALYSED SOLVOLYSIS PRODUCTS OF LONG-CHAIN EPOXIDES. D.E. Minnikin and D.V. Patel (Dept. of Organic Chem., Univ. of Newcastle upon Tyne, Newcastle upon Tyne NE1 7RU, UK) *Chem. Phys. Lipids* 23, 173–8 (1979). Epoxides of methyl esters of elaidic and oleic acids were allowed to react with methanol, ethanol, *n*-propanol, *iso*-propanol and *n*-butanol, in the presence of iodine, to give the corresponding alkoxyhydroxy methyl esters. Ethyl elaidate epoxide gave a hydroxymethoxy methyl ester when treated with boron trifluoride in methanol but the ethyl ester group was not attacked with iodine as catalyst. Mass spectra of the alkoxyhydroxy esters contained strong peaks which demonstrated the location in the chain of the original epoxide ring. Mass spectra of all the *t*-butyldimethylsilyl ether derivatives contained intense fragments allowing the molecular weights and the positions of the ether functions to be easily determined.

ISOLATION OF TRANS, TRANS-2,4-DECADIENAL AND INTERMEDEOL FROM COLD-PRESSED CITRUS OILS. M.G. Moshonas and P.E. Shaw (U.S. Citrus and Subtropical Prod. Lab., U.S. Dept. of Agr., Sci. and Ed. Admin., Fed. Res., Winter Haven, Florida 33880) *J. Agric. Food Chem.* 27, 210–1 (1979). *Trans,trans*-2,4-decadienal has been isolated and identified as a citrus constituent for the first time from cold-pressed orange and tangerine oils. The sesquiterpene alcohol intermedeol has been identified as an orange oil constituent.

HYDROXY ACIDS AND ESTOLIDE TRIGLYCERIDES OF HELIOPHILA AMPLEXICAULIS L.F. SEED OIL. R.D. Plattner, K. Payne-Wahl, L.W. Tjarks and R. Kleiman (Northern Regional Res. Center, Agr. Res., Sci. and Education Admin., U.S. Dept. of Agr., Peoria, Illinois 61604) *Lipids.* 14, 576–9 (1979). Thirty percent of the fatty acids from *Heliophila amplexicaulis* seed oil are hydroxy acids, primarily lesquerolic acid (14-hydroxy-*cis*-11-eicosenoic acid) with a trace of a new fatty acid, 16-hydroxy-*cis*-13-docosenoic acid. The hydroxy acids in the oil are found exclusively in the 1 and/or 3 positions of the triglycerides and are completely acylated with C-20 or C-22 saturated or monoenoic acids.

IDENTIFICATION OF NOVEL OCTADECADIENOIC FATTY ACIDS IN THE SEAWEED CLADOPHORA RUPESTRIS THROUGH OXIDATIVE OZONOLYSIS OF THE ALCOHOLS PREPARED FROM THE ACIDS. W.N. Ratnayake and R.G. Ackman (Chem. Dept. Dalhousie Univ. Halifax, N.S. B3H 4J3, Canada) *Lipids.* 14, 580–4 (1979). The BF3-MeOH reagent for ozonolysis of ethylenic unsaturation does not oxidize alcohols. It is therefore feasible to determine the position of ethylenic unsaturation in long chain fatty alcohols of synthetic or natural origin by recovering the methyl ester products intact and silylating the alcohol function of half-ester, half-alcohol, products prior to gas liquid chromatographic analysis. The C_3 fragment from methylene-interrupted alkyl chains is not recovered, but, by first reducing carboxyl ester groups to alcohols, the terminal difunctional products can be identified in nonmethylene-interrupted dienoic fatty acids. The seaweed *Cladophora rupestris* is shown to contain Δ5,Δ11-, Δ8,Δ11-, and Δ11,Δ14- as well as Δ9,Δ12-octadecadienoic acid.

NOVEL FURALDEHYDES FROM OXIDIZED SOY PHOSPHOLIPIDS. D.J. Sessa and R.D. Plattner (Northern Regional Res. Center, Agr. Res., Sci. and Ed. Admin., U.S. Dept. of Agr., Peoria, Illinois 61604) *J. Agric. Food Chem.* 27, 209–10 (1979). A novel lipid oxidation product was isolated after HCl gas treatment of bitter-tasting soy phospholipids. It was identified by ultraviolet, infrared, proton nuclear magnetic resonance, and mass spectra as a 5-(pentenyl)-2-furaldehyde. Another furaldehyde, probably arising from decomposition of the pentenylfuraldehyde and subsequent reaction with HCl gas, was identified as chloromethylfuraldehyde. Although these furaldehydes possess a licorice odor, their contribution to flavor in soy has yet to be determined.

ALCOXYHALOGENATION D'ACIDES GRAS ETHYLENIQUES. IV: CAS DES OCTADECADIENOATES DE METHYLE 9C,12C ET 9T,11T ET DE COMPOSES APPARENTES. A.M. Siouffi, M. Tassel and M. Naudet (Laboratoire de Chimie des Corps Gras, Faculte des Sciences et Techniques, Universite d'Aix-Marseille 3, Place Victor Hugo, 13331 Marseille Cedex 3 (France)) *Chem. Phys. Lipids.* 23, 355–753 (1979). Methoxybromination, with HBBT, of long chain methylene interrupted dienes led to simultaneous formation of methoxybromides and dimethoxydibromides. Formation of dimethoxydibromides in which methoxy groups are both internal is limited by steric hindrance. Methoxybromination of long chain conjugated dienes forms, in nearly equal quantities, methoxybromides resulting from a 1,4 addition and methoxybromides from 1,2 addition in which the methoxy group is adjacent to the double bond.

ESTERS OF TREHALOSE FROM CORYNEBACTERIUM DIPHTHERIAE: A MODIFIED PURIFICATION PROCEDURE AND STUDIES ON THE STRUCTURE OF THEIR CONSTITUENT HYDROXYLATED FATTY ACIDS. D.W. Thomas, A.K. Matida, C.L. Silva and T. Ioneda (SRI International, Menlo Park, CA. (U.S.A.)) *Chem. Phys. Lipids.* 23, 267–82 (1979). The purification procedure of 6,6′-diesters of trehalose from *Corynebacterium diphtheriae* was modified and the isolated substance was analysed by mass spectrometry as its permethylated derivative. The fatty acid moiety released from the glycolipid after alkaline hydrolysis was studied by mass spectral analysis of the O-methylated and O-acetylated methyl ester derivatives. By argentation thin-layer chromatography, three species of O-acetylated methyl esters were recognized, corresponding to saturated, mono-unsaturated and di-saturated α-branched-β-hydroxylated fatty acids.

MASS SPECTROMETRIC LOCATION OF TRIPLE BONDS IN FATTY ACIDS AND FRAGMENTATION MECHANISMS OF N-ACYLPYRROLIDINES. A.J. Valicenti, W.H. Heimermann, and R.T. Holman (The Hormel Inst., Univ. of Minnesota, Austin, MN 55912) *J. Org. Chem.* 44, 1068–73 (1979). Mass spectra of the pyrrolidide derivatives of isomeric octadecynoic acids are characterized by simple fragmentation patterns. Examination of the spectra indicates that if the triple bond in acetylenic fatty acids occurs between Δ5 and ω2, the unsaturation may be located by observing the most intense peak in each 14-amu cluster of fragments. Simple spectra are obtained in which the position of the substituent group may be deduced directly without necessitating a library search.

FLOW PROCESS FOR CONJUGATING UNCONJUGATED UNSATURATION OF FATTY ACIDS. K.E. Krajca (Sylvachem Corporation, Jacksonville, Fla.) *US* 4,164,505. A flow process for conjugating unconjugated unsaturation of fatty acids in the presence of alkali metal hydroxide under at least autogenic pressure at elevated temperature with control of the cis/trans to trans/trans ratio of the conjugated fatty acid product.

PROCESS FOR THE HYDROGENATION OF A VEGETABLE OIL. A.J. Bird, T.M. Priestley, and J.M. Winterbottom (Johnson,

Matthey & Co., Limited, London, England) *US* 4,163,750. This invention relates to the catalytic hydrogenation of edible oils of animal and vegetable origin. Catalytic hydrogenation according to the invention improves the keeping qualities of such edible oils without impairing their nutritional value or edibility. This is achieved by selectively hydrogenating the triply unsaturated forms of the fatty acids contained in the oil to doubly unsaturated forms using a supported catalyst. The catalyst used contains one or more of the metals Fe, Co, Ni and the platinum group metals and the support may be of extended surface or particulate form, for example, C, stainless steel, ceramics and Fe—Cr—Al—Y alloys.

AUTOMATION IN THE REFINING OF EDIBLE OILS. A.J. Duff and C.B.v. Klösterlein, *Fette, Seifen, Anstrichm.* 81, 257–71 (1979). Automatic process control and regulation are now indispensable items in production plants and auxiliary equipment for the refining of edible oils. Their application is primarily aimed towards reduction of cost of wages, energy and raw materials as well as auxiliary materials, and towards maintenance of constant conditions of processing which ensures uniform and high quality product. In addition to classical instrumentation in individual production sections having independent regulating systems, emphasis is laid these days on centralization and coupling of the various unit operations. Recent developments in the area of programmed control, microprocessors and minicomputers permit suitable and elegant solution of such tasks. Technically sophisticated signal processing shows distinctly that specific receivers of actual processing data are available to a rather limited extent. A few special developments in this area are discussed. In other cases, suitable combination of easily measurable data can be used for comparison.

STUDIES IN THE SOLVENT INTERESTERIFICATION OF ACIDOLYSED COTTONSEED OIL. M.M. Chakrabarty, A.K. Gayen and M.K. Chakrabarty (Department of Applied Chemistry, Calcutta University, India) *Fette, Seifen, Anstrichm.* 81, 271–3 (1979). The directed rearrangement reaction of an acidolysed cottonseed oil (acidolysed with palmitic acid) in solvent has been studied to find out the mode of distribution of the acyl radicals in the triglyceride moiety and also the changes in glyceride pattern and configuration of the oil after such reaction using pancreatic lipase hydrolysis. The glyceride compositions as calculated by the application of 1,3-random 2-random distribution hypothesis of M.H. Coleman and W.C. Fulton of acidolysed cottonseed oil before and after directed interesterification reaction point out remarkable changes in the pattern of glycerides namely a notable increase of trisaturated glycerides with the diminution in the content of triunsaturated glycerides. Solid fat indices as determined by measuring the dilatation of fat, content of trisaturated glycerides and moderate slip points of the order of 37°C denote the suitability of using the modified fat thus produced as a good margarine base fat as the said fat has been shown to have a fairly long and extended plastic range as evidenced by low slopes in dilatometric charts compared to other conventional plastic fats.

TOMATO SEED OIL I: FATTY ACID COMPOSITION, STABILITY AND HYDROGENATION OF THE OIL. A.H. El-Tamimi, M.M. Morad, M.S. Raof and A.H. Rady, *Fette, Seifen, Anstrichm.* 81, 281–4 (1979). Tomato seed oil was investigated to study their components of fatty acids, stability and hydrogenation conditions. The estimation of the fatty acids of tomato seed oil from Ace variety and tomato seed oil extracted from local waste in comparison with cotton seed oil (the most familiar edible oil in Egypt)—Giza 69 variety—extracted by n-hexane and oil obtained by pressing shows that more than 50% of the total fatty acids are linoleic. Palmitic acid was found in a range between 20% to 29% and oleic acid was in a range between 13% to 18%. Other fatty acids like stearic, arachidic, and linolenic acid were less than 3%. The induction periods (at 100°C) for oils of fresh, roasted and stored tomato seeds were found to be 7, 10, and 5 hours respectively. The hydrogenation conditions of crude tomato seed oil were 180°C, 3 kg/cm^2 and 0.2% nickel catalyst for three hours of hydrogenation to reach a melting point of 50.7°C and an iodine value of 42.

INACTIVATION OF THE ENZYMES OF THE CASTOR MEAL BEFORE COOKING. U.M. Kopeykovski et al. *Maslo-zhir. Promst.* 1978(10), 15–17. In the process of hydrothermal treatment of the castor meal, the lipase loses its activity at a heating temperature of 80–90C and a humidity of 8–9%. Such a short duration of heating results in a thermal inactivation of the enzymic system and in decrease of 0.7 in the acid value of the pre-pressing cator oil. The oil is better separated in the presses and its content of the particles in suspension diminishes. (Rev. Fr. Corps Gras)

DETERIORATION OF SUNFLOWER SEEDS DURING CLEANING, TRANSPORT, AND STORAGE. M.I. Igoltchenko et al. *Maslo-zhir. Promst.* 1978(11), 18–20. The sunflower seeds were damaged in all technological operations of their treatment before storage. The seeds had the greatest deterioration during collision at the bottom of silo. The degree of deterioration of sunflower seeds during storage can be lowered by creating a verticle air current. The quantity of air brought at the beginning of storage for ventillation apparatus must not exceed 5,000 m^3/h. Beyond this quantity, an increase in the degree of deterioration of the seeds occurs. (Rev. Fr. Corps Gras)

FRACTIONAL COMPOSITION OF THE COTTON KERNEL IN THE HYDROCYCLONE PROCESS. T.V. Tchernenko et al. *Maslo-zhir. Promst.* 1978(11), 23–5. The fractional composition of the fractions without and with gossypol which are formed during the separation of the kernel from the cotton in hydrocyclone was determined. The kernel was dried to 2–3% moisture at 80C, before being reduced to meal. This is agitated for 7 min with hexane to obtain a suspension of 45% which is then diluted to a concentration of 20%. The hydrocyclone has a diameter of 75 nm and a height of 200 mm. In this way, 27% of a fraction which contains only 0.02% of free gossypol was obtained. (Rev. Fr. Corps Gras)

CONCENTRATION OF SOAPSTOCKS BY EVAPORATION. S.N. Volotovskaya et al. *Maslo-zhir. Promst.* 1978(11), 29–31. The diluted soapstocks can be concentrated by evaporation in vacuum on a thin film. Such a concentration reduces the formation of residual waters, eliminates the use of sulfuric acid and salt. Evaporation of alkaline soap solutions can be realized in the apparatus with horizontal films elaborated by VNIIZH for the drying of phosphatides. (Rev. Fr. Corps Gras)

ARTIFICIAL DRYING OF SUNFLOWER SEEDS BEFORE HARVEST. M.F. Bozhko. *Maslo-zhir. Promst.* 1978(12), 9–12. A Treatment by aeroplane which consists of spraying the plants with different chemical solutions (magnesium chlorate, derivatives of dipyridyl, etc.) was elaborated. This treatment produces the following effects: it accelerates considerably the drying of plants and seeds, minimizes the seed losses during harvest and improves the quality of seeds, oil, and protein. (Rev. Fr. Corps Gras)

INFLUENCE OF STORAGE OF SUNFLOWER SEEDS ON CHLOROGENIC ACID. P.S. Popov et al. *Maslo-zhir. Promst.* 1979(1), 11–13. The variation of chlorogenic acid in sunflower seeds rich and poor in oil was studied during a prolonged storage (16 months) under normal conditions. The content of chlorogenic acid and other phenolic compounds increases a little in the first 8 months and then gradually decreases. (Rev. Fr. Corps Gras)

ABOUT THE ALKALINITY OF GLYCERINE UNDERGOING DISTILLATION. M.V. Irodov et al. *Maslo-zhir. Promst.* 1979(1), 22–5. The causes of foaming of crude glycerine were studied. The rate of formation of the foam is determined, not only by the content of surface-active substances of glycerine, but also by its alkalinity. The quantity of alkali in crude glycerine influences at the same time the foaming power of the surface-active substances and the formation of ester complexes of the distillate. (Rev. Fr. Corps Gras)

FORMATION OF STEROLS IN SUNFLOWER SEEDS. P.S. Popov. *Maslo-zhir. Promst.* 1979(2), 6–7. In sunflower seeds, the sterols are principally found in the form of free alcohols and in esterified state. An intensive accumulation of sterols is observed before maturation of the seeds. In the process of selection for obtaining seeds rich in oil, the ratio between the forms of sterols remains unchanged, but the total quantity of sterols increases. (Rev. Fr. Corps Gras)

SAPONIFICATION OF THE FATS IN AN APPARATUS WITH A TOURBILLON LAYER. N.P. Ikhno et al. *Maslo-zhir. Promst.* 1979(3), 24–5. The hydrogenated neutral fat can be saponified with a water solution of caustic soda in 5 seconds, and the fatty acids of animal fat with the sodium carbonate in 10 seconds. The possibility of obtaining soap with 67.5–79.5% of fatty acids was established. The apparatus used, type VA-100, is constructed in series by the factory of chemical construction of Poltava. (Rev. Fr. Corps Gras)

EVALUATION OF SOME EGYPTIAN ANIMAL FATS AND THEIR USE

IN SHORTENINGS. S.B. El-Magoli, et al. *Fette, Seifen, Anstrichm.* 81(6), 244–5 (1979). Physical and chemical constants of some Egyptian animal fats, ie from camel hump and buffalo caul in comparison with imported beef tallow were investigated. Camel hump fat revealed different characteristics from buffalo caul and imported beef tallow in melting point, iodine value, saponification value and unsaponifiable matter. Fatty acid composition by GLC for the three extracted fats indicated the presence of large amount of saturated fatty acids in comparison with unsaturated acids.

STUDIES IN THE GLYCERIDE COMPOSITION OF PARTIALLY HYDROGENATED REARRANGED GLYCERIDES OF COTTONSEED OIL. M.M. Chakrabarty, et al. *Fette, Seifen, Anstrichm.* 81(6), 233–6 (1979). The directed rearrangement reaction in solvent of partially hydrogenated cottonseed oil was investigated with special reference to the influence of polarity of solvents and amount of trisaturated glycerides formed. The results were obtained by selective enzymatic hydrolysis, gas liquid chromatography and infrared spectrophotometry of the whole fat triglycerides and of the corresponding monoglycerides of cottonseed oil and partially hydrogenated cottonseed oil, before and after directed interesterification.

A NEW CONTINUOUS PLANT FOR SOAPSTOCK SPLITTING. F. Steinwallner. *Fette, Seifen, Anstrichm.* 81(7), 286–90 (1979). A plant recently developed by VEB Schwermaschinenbaukombinat "Ernst Thalmann," Magdeburg, for the splitting of soapstock obtained during the refining of vegetable oils and animal fats, is described. In comparison to conventional discontinuous process carried out in vats, the continuous plant offers several technical and economical advantages. These advantages are achieved by automatic processing in combination with a self-discharging separator and the use of mild conditions of reaction. Low cost of operation and high quality of the fatty acids produced ensure such a significant economic advantage, that the cost of investment is returned within a few years.

TOMATO SEED OIL I. FATTY ACID COMPOSITION, STABILITY AND HYDROGENATION OF THE OIL. A.H. El-Tamimi et al. *Fette, Seifen, Anstrichm.* 81(7), 281–4 (1979). Tomato seed oil was investigated to study their fatty acid components, stability and hydrogenation conditions: The variety and tomato seed oil extracted from local waste in comparison with cottonseed oil (the most familiar edible oil in Egypt).

FACTORS INFLUENCING THE USE OF FATS IN CHOCOLATE. M.H. Gordon et al. *Fette, Seifen, Anstrichm.* 81(3), 116–21 (1979). The phase behavior of binary mixtures of cocoa butter with three types of confectionery fat are described. The information allows prediction of the levels at which different types of fat can be mixed with cocoa butter to provide satisfactory chocolate products.

STUDIES ON RANCIDITY OF OILS AND FATS ON THE EFFECT OF PHOSPHOLIPIDS ON THE AUTOXIDATION OF FATS IN NON-AQUEOUS MEDIUM. M.F.M. El-Tarras, E.M. Abdel Moety, A.K.S. Ahmad and M.M. Amer, *Olèagineux*, 34, 139–44 (1979). The effect of different concentrations (0.1–2.0 p. 100 w/w) of fresh egg yolk phospholipids on the autoxidation of fresh fatty substrate is studied in the presence and absence of traces of Cu (II) (0.1 ppm). The effects of addition of either fresh or autoxidised phospholipids (0.5–2 p. 100 w/w) on the autoxidation of fresh and highly autoxidised fatty substrate with and without 0.1 ppm Cu (II) are also investigated. The course of autoxidation is monitored by physical means, e.g. organoleptic detection of off-flavors and colour changes as well as the chemical methods as the determination of total and labile forms of peroxides, carbonyl value by 2,4-dinitrophenylhydrazine (2,4-DNPH), benzidine value and the thiobarbituric acid value.

ENERGY SAVING IN DEODORISATION. D.W. Foster, *Olèagineux*, 34, 199–204 (1979). Rosedowns has perfected a system of heat recovery on the continuous and semi-continuous deodorisation apparatus. The hot, deodorized oil is used to preheat the crude oil before itself being cooled. It is considered that the investment can be written off in about a year thanks to the energy saved alone. Furthermore, water consumption for oil cooling is reduced.

REMOVAL OF FREE FATTY ACIDS AND SUGARS FROM PETROLEUM MISCELLA OF VEGETABLE OILS BY WASHING WITH A SOLUTION OF SODIUM CARBONATE. K. Stefanov and M.G. Marinov, *Rev. Fr. Corps Gras*, 26, 269–72 (1979). Five samples of sunflower and soybean oil petroleum miscella, obtained from two Bulgarian processors have been tested. The results indicate that the miscella washed with saturated (40°C) aqueous solution of sodium carbonate removes practically all free fatty acids. The carbonate solution extracts more than half of free sugars in miscella. Only 10–15% of the phospholipids are removed by washing—mainly on account of their carrying away by the formed soaps. Oils and lecithins, obtained from the washed miscella are lighter coloured in comparison with oils and lecithins, obtained from the initial miscella. Miscella washing with sodium carbonate saturated solution does not lead to miscella emulsification.

DETERMINATION OF GLYCERIDE STRUCTURE. J.P. Wathelet, *Rev. Fr. Corps Gras*, 26, 263–8 (1979). The method for calculating the glyceride structure proposed by Wathelet in 1977 has been improved. Van Der Wal hypotheses have been adjusted not only with the results obtained by silver nitrate thin layer chromatography, gas liquid chromatography and lipolysis, but also with the fatty acid percentages in external position. It has been tested by determining the composition of synthetic mixtures, hypothetic mixtures and palm-oil.

TREATMENT OF WASTE WATERS FROM CONTINUOUS RENDERING FOR THEIR DEPOLLUTION. A.J. Mangon, *Rev. Fr. Corps Gras*, 26, 279–80 (1979). A novel method for depolluting waste waters from continuous rendering of animal fats has been developed. It produces directly useful fats and proteins, uses waters from rendering as industrial steam and suppresses pollution. Its yield is satisfactory.

THE PLACE OF PALM OIL ON WORLD FATS MARKET. HISTORICAL BACKGROUND AND PROSPECTS. D. Colon and Ch. Surre, *Olèagineux*, 34, 163–73 (1979). Before the war palm oil, mainly produced by the African wild palm groves, was mostly consumed locally, the part exported then going to the European and North American markets, which were dominated at the time by concrete oils. In the '50s, the fats requirements of the industrialized countries rose spectacularly, and were satisfied by soya oil, production of which was accelerated by the growing demand for press-cake. It was necessary to wait for the '60s and the arrival of new, selected varieties of oil palm for plantations to develop across the world, and palm oil gradually gained a predominant place on the market. Thus, the years from 1968 to 1978 saw production developing massively, chiefly due to Malaysia and Indonesia which, at the expense of Africa, moved to the head of the exporting countries. The mid-term prospects confirm the determining role which palm oil will play on the international fats market, and the increased share it will take in exports as regards Malaysia and Indonesia and in imports as far as other Asiatic countries are concerned.

ANTIOXIDANT ACTIVITY OF T-BUTYL HYDROQUINONE. A BRIEF STUDY. C. Paquot and P. Cuvier, *Rev. Fr. Corps Gras*, 26, 275–7 (1979). The antioxidant properties of TBHQ have been studied for the oil sunflower, lard and tallow at 50°C. TBHQ is above BHA, BHT and gallates.

FATTY ACID COMPOSITION OF DIFFERENT PARTS OF THE OLIVE KERNEL (OLEA EUROPEA L.). A. Drira and A. Cherif, *Rev. Fr. Corps Gras*, 26, 273–4 (1979). The fatty acids of the whole kernel, embryo and albumen are identical, but the proportions in different acids vary from one part to another part. The albumen is higher in linoleic acid than the embryo. Lipids of albumen and embryo are especially neutral lipids. The fatty acid composition of different molecular categories is also different.

DETERMINATION OF AFLATOXINS BY LIQUID COLUMN CHROMATOGRAPHY AND SPECTROPHOTOMETRIC AND SPECTROFLUOROMETRIC DETECTIONS. F. Guyon, M. Caude and R. Rosset, *Rev. Fr. Corps Gras*, 26, 217–23 (1979). Adsorption and partition chromatography (normal and reversed phase) have been used for the separation of aflatoxins B1, B2, G1 and G2. Best results have been obtained by adsorption chromatography mode associated with spectrofluorometric detection using a packed silicagel flow cell. The minimum detectable amount of aflatoxins ranges from 0.15 up to 0.03 10^{-12} mole injected according the nature of aflatoxin.

KINETIC STUDY ON THE CRYSTALLIZATION OF PLASTIC FATS. IV. EFFECT OF TEMPERATURE OF THE START OF COOLING. E. Sambuc, G. Reymond, Z. Dirik and M. Naudet, *Rev. Fr. Corps Gras*, 26, 231–7 (1979). In order to obtain solidification curves by low resolution broad band NMR, a simple method for calculating SFI has been developped without using the kinetic curves of temperature. The influence of an incomplete melting has been

studied for different samples of plastic fats. This effect is null or little marked for normal or fast solidification fats.

THE SELECTIVE HOMOGENEOUS CATALYTIC HYDROGENATION. V. MECHANISM OF THE REDUCTION OF METHYL LINOLEATE USING DICOBALT OCTACARBONYL AS CATALYTIC PRECURSOR. E.J. Ucciani, G. Cecchi and G. Mallet, *Rev. Fr. Corps Gras*, 26, 225–30 (1979). Hydrogenating methyl linoleate by molecular hydrogen and dicobaltoctacarbonyl as catalytic precursor, exhibits a) no stearic formation, b) high conversion into monoenes, c) low conjugation. The monoenes show extensive double bond migration, as well as cis-trans isomerization. The mechanism of selective reduction was investigated. It can be postulated that it involves three steps: first conjugation by a hydrido-species leading to cis-trans and trans-trans complexed dienes, then reduction into monoenes, and finally double bond migration of the resulting monoenes by metal-olefin interactions.

• Biochemistry and Nutrition

PURIFICATION AND PROPERTIES OF RAT LIVER 3-HYDROXY-3-METHYLGLUTARYL COENZYME A REDUCTASE. P.A. Edwards, D. Lemongello and A.M. Fogelman (Div. of Cardiology, Dept. of Med., Univ. of California Los Angeles, Los Angeles, CA) *Biochem. Biophys. Acta* 574, 123–35 (1979). 3-Hydroxy-3-methylglutaryl coenzyme A reductase has been purified from rat liver microsomes with a recovery of approx. 25%. The enzyme was homogeneous on gel electrophoresis and enzyme activity comigrated with the single protein band. The molecular weight of the reductase determined by gel filtration on Sephadex G-200 was 200,000. SDS-polyacrylamide gel electrophoresis gave a sub-unit molecule weight of 52,000 ± 2,000, suggesting that the enzyme was a tetramer. Antibodies prepared against purified reductase inactivated 100% of the soluble and at least 91% of the microsomal enzyme activity.

THE EFFECT OF A PUTATIVE ANTI-ATHEROSCLEROTIC AGENT (S 1204) ON LIPID METABOLISM IN RABBIT AORTA. G. Marquie (Laboratoire de Physiologie Metabolique et de la Nutr., Institut de Biologie, Universite des Sciences et de la Technologie, P.O. Box 9, Dar-el-Beida, Alger) *Atherosclerosis* 32, 253–7 (1979). The effects of the novel fenfluramine derivative, S 1204 (meta-trifluoro-methyl phenyl-1 [β(sulfamyl-3′-chloro-4′-benzoyloxycethyl)]amino-2-propane) were studied on lipid metabolism in rabbit aorta and other tissues. Pretreatment of rabbits with S 1204 (50 mg/kg orally) for 10 days strongly inhibited the aortic incorporation of an intravenous 20 μCi tracer-dose of [4-^{14}C]-cholesterol given 24 hr earlier. The results indicate that S 1204 may have anti-atherogenic properties, which could be valuable in the clinical treatment of atherosclerosis.

CORRELATION IN THE HUMAN AORTA OF APO B FRACTIONS WITH TISSUE CHOLESTEROL AND COLLAGEN CONTENT. H.F. Hoff, M. Karagas, C.L. Heideman, J.W. Gaubatz and A.M. Gotto, Jr. (Dept. of Med., Baylor College of Med., Houston, TX) *Atherosclerosis* 32, 259–68 (1979). The amounts of buffer- and Triton-extracted apo B (LDL-protein), as well as the sum of these two fractions, were correlated with the total tissue cholesterol and hydroxyproline content (as a measure of collagen) in grossly normal intima, fatty streaks, and fibrous plaques of human aortas obtained at autopsy. The positive correlation between Triton-extracted apo B and cholesterol in plaques suggests one or both of the following: the extracellular pool of cholesterol or some material increasing concurrently with cholesterol interacts with apo B or another part of the LDL particle; or the apo B containing lipoprotein is trapped in the hydrophobic environment of extracellular lipid.

HIGH DENSITY LIPOPROTEIN CHOLESTEROL IN MALE RELATIVES OF PATIENTS WITH CORONARY HEART DISEASE. H. Micheli, D. Pometta, C. Jornot and J.-R. Scherrer (Div. de Diabetologie et d'Informatique, Dept. of Med. of the Univ. of Geneva, Geneva, Switzerland) *Atherosclerosis* 32, 269–76 (1979). To study factors that play a role in the familial occurrence of coronary heart disease, very low density lipoprotein (VLDL) triglycerides, low density lipoprotein (LDL) cholesterol and high density lipoprotein (HDL) cholesterol were measured after preparative ultracentrifugation in first degree male relatives of coronary patients and in control subjects. The HDL cholesterol concentration was significantly lower in relatives of 20–71 years old than in controls. No increase of serum and LDL cholesterol was found. A low HDL cholesterol level appears to be a marker of relatives of coronary patients.

MODULATION BY SODIUM ASCORBATE OF THE EFFECT OF CHLOROQUINE ON LOW DENSITY LIPOPROTEIN RETENTION AND DEGRADATION IN CULTURED HUMAN SKIN FIBROBLASTS. G.A. Coetzee, Olga Stein and Y. Stein (Dept. of Exp. Med. and Cancer Res., Hebrew Univ.-Hadassah Med. Schl., Jerusalem, Isreal) *Atherosclerosis* 32, 277–87 (1979). Human skin fibroblasts in culture were incubated for 48 hr with ^{125}I-labelled low density lipoprotein and chloroquine in the presence and absence of sodium ascorbate. Pretreatment of the cells for 3 days with sodium ascorbate and addition of the vitamin during incubation resulted in a decrease in cellular retention and an increase in degradation of the labelled low density lipoprotein. It is proposed that sodium ascorbate by virtue of its reducing properties provides some protection to the intralysosomal hydrolases against the inhibitory action of chloroquine. If cholesterol accumulation in human and experimental atheroma is caused by partial inhibition of lysosomal enzymes, sodium ascorbate could play a role in the alleviation of such an inhibition.

EFFECTS OF CALORIC RESTRICTION ON LIPID METABOLISM IN MAN. CHANGES OF TISSUE LIPOPROTEIN ACTIVITIES AND OF SERUM LIPOPROTEINS. M. Taskinen and E.A. Nikkila (Third Dept. of Med., Univ. of Helsinki, Helsinki, Finland) *Atherosclerosis* 32, 289–99 (1979). Heparin-releasable lipoprotein lipase (LPL) activity was measured in biopsy samples of adipose tissue and skeletal muscle of 8 normal healthy females, first during an isocaloric diet and then after 2 and 7 days on a 400-kcal diet. In adipose tissue the LPL activity expressed per tissue weight fell to 38% and to 22% of the initial level after 2 and 7 days' caloric restriction, respectively. It is concluded that substantial restriction of calorie intake results in a decrease of over-all triglyceride removal capacity but in an increase of the fraction removed by skeletal muscle. The decrease of HDL cholesterol is probably a consequence of the low turnover of exogenous and engogenous triglyceride-rich lipoproteins.

HYPOLIPIDEMIC EFFECTS IN DOGS OF ML-236B, A COMPETITIVE INHIBITOR OF 3-HYDROXY-3-METHYLGLUTARYL COENZYME A REDUCTASE. Y. Tsujita, M. Kuroda, K. Tanzawa, N. Kitano and A. Endo (Fermentation Res. Lab., Sankyo Co., Ltd., 1-2-58 Hiromachi, Shinagawa-ku, Tokyo, 140 Japan) *Atherosclerosis* 32, 307–13 (1979). ML-236B, a competitive inhibitor of 3-hydroxy-3-methylglutaryl-CoA reductase, significantly reduced both serum cholesterol and phospholipid levels in dogs, when used at a dosage higher than 10 mg/kg per day. Triglyceride levels were not consistently changed, but β- and pre-β-lipoproteins were preferentially reduced. Fecal excretion of neutral sterols was unaffected but that of bile acids was markedly elevated by the drug. Under these conditions, hepatic cholesterol 7α-hydroxylase, the rate-limiting enzyme in bile acid biosynthesis, showed no detectable changes.

METABOLISM OF APOLIPOPROTEIN B-CONTAINING LIPOPROTEINS IN FAMILIAL HYPERCHOLESTEROLAEMIA. EFFECTS OF PLASMA EXCHANGE. A.K. Soutar, N.B. Myant and G.R. Thompson (Med. Res. Council Lipid Metabolism Unit, Hammersmith Hosp., London, W12 OHS Great Britain) *Atherosclerosis* 32, 315–25 (1979). The turnover of apolipoprotein B (apo B) in very low density lipoprotein (VLDL), intermediate density lipoprotein (IDL) and low density lipoprotein (LDL) was investigated in 2 homozygous and 3 heterozygous patients with familial hypercholesterolaemia. The effects of a marked reduction in plasma LDL concentration, brought about by plasma exchange, upon apo B turnover were studied in 4 patients. These findings provide no support for the hypothesis that apo B synthesis is controlled by the plasma LDL.

BINDING OF IMMUNOGLOBULIN G TO PHOSPHOLIPID VESICLES BY SONICATION. L. Huang and S.J. Kennel (Dept. of Biochem., Univ. of Tennessee, Knoxville, TN) *Biochemistry* 18, 1702–7 (1979). Purified goat immunoglobulin G (IgG) does not bind to sonicated phospholipid vesicles. However, when IgG is sonicated together with phospholipids, 4–40% of the IgG can be bound to the vesicles, depending on the experimental conditions. The extent of bonding depends on the period and power of sonication, the IgG to lipid ratio, and the lipid composition. Antigen binding capacity of bound IgG is not increased when vesicles are lysed by 1.5% NP-40, suggesting all of the bound IgG is exposed on the outer surface of the vesicles.

STUDIES ON MOLECULAR SPECIES OF CHOLINE GLYCEROPHOSPHOLIPIDS OF DEVELOPING RAT BRAIN. H. Ogino, T. Matsumura, K. Satouchi and K. Saito (Dept. of Pediatrics, Kansai Med.

Univ., Moriguchi, Osaka 570, Japan) *Biochim. Biophys. Acta* **574**, 57–63 (1979). The chronological changes in molecular species of choline glycerophospholipids were studied for cerebra of 17-, 19-, and 21-day old rat fetuses, and 3-, 6-, 12-, 24- and 90-day old rats. The molecular species found by gas chromatography mass spectrometry and selected ion retrieval technique were phosphatidylcholines of '30:0, 32:0, 32:1, 34:0, 34:1, 34:2, 36:0, 36:1, 36:2, 36:3, and 36:4' where the larger number indicates the sum of chain lengths on positions C-1 and C-2; the smaller number is the total number of double bonds.

CHOLINE AND ETHANOLAMINE GLYCEROPHOSPHOLIPID SYNTHESIS IN ISOLATED SYNAPTOSOMES OF RAT BRAIN. J. Strosznajder, A. Radominska-Pyrek and L.A. Horrocks (Exp. and Clin. Med. Res. Centre, Polish Academy of Sci., ul., Dworkowa 3, Warsaw 00–784, Poland) *Biochim. Biophys. Acta* **574**, 48–56 (1979). Substantial activities of cholinephosphotransferase (EC 2.7.8.2) and ethanolaminephosphotransferase (EC 2.7.8.1) were found with lysed synaptosomes but not with intact synaptosomes isolated from adult rat brains. Synaptosomal and non-synaptosomal microsomal transferases were similar in kinetic properties. The relative synthesis of different glycerophospholipid classes and the relative proportion of alkylacyl type (plasmalogen precursors) and diacyl type of glycerophospholipids may be influenced by the levels of adenine nucleotides and/or biogenic amines. Elevated cyclic AMP levels will decrease the synthesis of plasmalogen precursors.

ORIGIN OF THE ARACHIDONIC ACID RELEASED POST-MORTEM IN RAT FOREBRAIN. J. Marion and L.S. Wolfe (Donner Lab. of Exp. Neurochem., Montreal Neurological Inst., McGill Univ., 3801 Univ. St., Montreal, Quebec, H3A 2B4, Canada) *Biochim. Biophys. Acta* **574**, 25–32 (1979). To determine the origins of the arachidonic acid released post-mortem in brain tissue, [^{3}H]arachidonic acid was injected by the intracerebroventricular route and radioactivity monitored in complex lipids and free arachidonic acid at various times after decapitation. The specific activity of the released arachidonic acid was close to that in the total phospholipid fraction and much lower than that of the neutral lipids. In the microsomal fraction, the specific activity of the free arachidonic acid was very close to that in phosphatidylinositol.

FACTORS REGULATING THE ELONGATION OF PALMITIC AND STEARIC ACID BY RAT LIVER MICROSOMES. J.T. Bernert, Jr. and H. Sprecher (Dept. of Physiol. Chem., College of Med., Ohio State Univ., 333 W. 10th Ave., Columbus, OH) *Biochim. Biophys. Acta* **574**, 18–24 (1979). Analysis of the rates of overall chain elongation and condensation of malonyl-CoA with palmitoyl-CoA and stearoyl-CoA as primers demonstrated that for each primer, the rate of the overall metabolic process was similar to the initial condensation. Both substrates were incorporated into phospholipids at low rates and there was a time-dependent hydrolytic cleavage of the acyl-CoA primers which was partially prevented by bovine serum albumin. These findings demonstrate that there was no selective removal of either primer which could result in specific substrate depletion and an apparent reduction in the rate of condensation.

POSITIONAL DISTRIBUTION OF EXOGENOUS AND ENDOGENOUS FATTY ACIDS IN TRIACYLGLYCEROLS FORMED BY RAT ADIPOCYTES IN VITRO. R.J. Henderson, W.W. Christie and J.H. Moore (Hannah Res. Inst., Dept. of Biochem., Ayr, KA6 5HL, UK) *Biochim. Biophys. Acta* **574**, 8–17 (1979). Rat adipocytes were used to compare the positional distributions of fatty acids of intra- and extra-cellular origin in triacyl-*sn*-glycerols. Fatty acids of extracellular origin were esterified to each position in similar, but not identical, proportions to the natural distributions. The results are discussed in terms of esterification of the fatty acids from the two sources in different compartments of the cell.

PLASMA MEMBRANE LIPIDS OF HUMAN DIPLOID FIBROBLASTS FROM NORMAL INDIVIDUALS AND PATIENTS WITH CYSTIC FIBROSIS. J.R. Riordan, N. Alon and M. Buchwald (Res. Inst., The Hosp. for Sick Children, Toronto M5G 1X8, Canada) *Biochim. Biophys. Acta* **574**, 39–47 (1979). The lipid composition of isolated plasma membranes of human skin fibroblasts is described for the first time. Plasma membranes from a number of strains of fibroblasts from patients with cystic fibrosis and matched normals were isolated by a recently described procedure and analysed for major phospholipid classes, cholesterol and fatty acids. No differences in the quantities of these compounds were detected between cells of the two different origins. Consistent with this lack of chemical change in the lipids of membranes of cystic fibrosis cells, the degree of fluorescence polarization of diphenylhexatriene, an index of fluidity, was also unchanged.

EFFECT OF CCl_4-INDUCED CIRRHOSIS ON THE PATHOPHYSIOLOGIC COURSE OF ACUTE MYOCARDIAL INFARCTION IN NONARTERIOSCLEROTIC VS ARTERIOSCLEROTIC MALE RATS. B.C. Wexler and B.P. Greenberg (May Inst. for Med. Res., 421 Ridgeway Ave., Cincinnati, OH) *Atherosclerosis* **32**, 231–51 (1979). Arteriosclerotic and nonarteriosclerotic rats were treated with carbon tetrachloride (CCl_4) to induce cirrhosis of the liver. Massive myocardial infarction was then induced in intact and CCl_4-treated animals. The cirrhotic animals manifested poor myocardial repair with persistent foci of necrosis, calcification, and a high incidence of large, occlusisve, atrial thrombi. It is suggested that cirrhosis interferes with lipid metabolism and adrenal steroid conjugation leading to abnormal levels of mineralocorticoids which favor congestive heart failure, poor myocardial repair, and atrial thrombosis.

DIGESTION AND ABSORPTION OF TRIOLEOYL-THIOGLYCEROL IN THE RAT. B. Akesson, S. Gronowitz and P. Michelsen (Dept. of Physiol. Chem., Chem. Center, Univ. of Lund, P.O. Box 750, S-220 07 Lund 7, Sweden) *Chem. Phys. Lipids* **23**, 93–9 (1979). A triacylglycerol analogue, *rac*-1,2-di-O-oleoyl-3-S-thioglycerol, was fed to rats and chyle acylglycerols were analyzed. Triacylglycerol was the dominating chyle lipid but X-triacyl-1-thioglycerol constituted approx. 6% of total chyle lipids. Its identity was verified by ultraviolet and mass spectra and its stereochemical structure by ORD and CD. Possible reasons for this stereospecificity are discussed. The study shows that the stereochemical configuration of lipids isolated from biological material can be assessed by ORD and CD.

A CONVENIENT MICROFILTRATION PROCEDURE FOR PURIFICATION OF BOVINE AND OVINE SUBCUTANEOUS TISSUE LIPID EXTRACTS. G.J. Miller, M.L. Riley, and R.A. Field (Div. of Animal Sci., Univ. of Wyoming, Univ. Station Box 3354, Laramie, Wyoming 82071). *J. Agric. Food Chem.* **27**, 206–7 (1979). A convenient and rapid microfiltration procedure for the extraction and purification of lipids in bovine and ovine subcutaneous tissues is described. The procedure is as efficient in the extraction of total lipid, free fatty acids, total sterols, and phosphorus-containing lipid as an extraction procedure employing an aqueous wash for purification. Using lipid calcium as a measure of nonlipid contamination, the microfiltration procedure is as effective as aqueous washing. Due to the avoidance of separatory funnel washing and lengthy phase separations, the microfiltration procedure is preferred if numerous samples are extracted.

THE CONVERSION OF PHOSPHATIDYLETHANOLAMINE INTO PHOSPHATIDYLCHOLINE LABELED IN THE CHOLINE GROUP USING METHYL IODIDE, 18-CROWN-6 AND POTASSIUM CARBONATE. K.M. Patel, J.D. Morrisett and J.T. Sparrow (Dept. of Med. Baylor College of Med. and The Methodist Hosp. Houston, Texas 77030) *Lipids* **14**, 596–7 (1979). A chemical method for the conversion of phosphatidylethanolamine into phosphatidylcholine is described. Methyl iodide in the presence 18-crown-6 (1,4,7,10,13,16-hexaoxacyclooctadecane) and potassium carbonate in benzene is used to alkylate phosphatidylethanolamine in 2.5 hr at 37 C to give an isotopically enriched phosphatidylcholine. The product is purified conventionally and is obtained in 75% yield.

EFFECT OF MILK CONSTITUENTS ON HEPATIC CHOLESTEROLGENESIS. A.A. Ahmed, R.D. McCarthy, and G.A. Porter (Dept. of Food Sci., The Pennsylvania State Univ., Univ. Park, PA 16802 (U.S.A.)) *Atherosclerosis* **32**, 347–57 (1979). Two preparations active in reducing hepatic cholesterol biosynthesis were isolated from bovine skim milk. One of the inhibitors was in the dialysate and was identified as orotic acid (OA). The other inhibitor, present in the retentate, was not identified. Orotic acid appears to act by inhibiting cholesterol biosynthesis before the formation of mevalonate, whereas the retentate inhibitor exerts its effect beyond the formation of mevalonate in the biosynthetic pathway. Human milk also inhibited the incorporation of both labeled acetate and mevalonate into cholesterol by rat liver. Orotic acid was not detectable in human milk samples employed in this study. Administration of {6-^{14}C}orotate to rats revealed its conversion to uracil in the liver. Subsequent work demonstrated that uracil had in-

hibitory activity on hepatic cholesterol biosynthesis similar to that of orotate when incubated with rat liver slices.

STUDIES ON THE BIOSYNTHESIS OF SULFOLIPIDS IN THE DIATOM NITZSCHIA ALBA. R. Anderson, M. Kates, and B.E. Volcani (Dept. of Microbiology and Immunology, Univ. of Western Ontario, London, Ontario N6A 5C1) *Biochim. Biophys. Acta.* 573, 557–61 (1979). Labeling of sulfolipids in *Nitzschia alba* was studied after growth of the cells in media containing L-{^{35}S}cystine, L-{^{35}S}cysteine, L-{^{35}S}-methionine or a mixture of L-{*Me*-^{3}H}methionine and L-{^{35}S}methionine. {^{35}S}cysteine or {^{35}S}cystine labeled the deoxyceramide sulfonate and the sulfonium analog, phosphatidylsulfocholine (and its lyso derivative) but not the sterol sulfate nor the sulfoquinovosyl diglyceride; {^{35}S}methionine labeled only the phosphatidylsulfocholine and its lyso derivative. With the {^{35}S}- and {*Me*-^{3}H}methionine mixture (^{3}H/^{35}S ratio 1.0) the phosphatidyl sulfocholine had a ^{3}H/^{35}S ratio of 1.5 indicating that both sulfonium methyl groups were derived from methionine. Probable biosynthetic pathways for these novel sulfolipids are discussed.

POST-TRANSLATIONAL REGULATION OF LIPOPROTEIN LIPASE ACTIVITY IN ADIPOSE TISSUE. P. Ashby, D.P. Bennett, I.M. Spencer and D.S. Robinson (Dept. of Biochem., Univ. of Leeds, Leeds LS2 9LS, U.K.) *Biochem. J.* 176, 865–72 (1978). Changes in adipose-tissue lipoprotein lipase activity that are independent of protein synthesis were investigated in an incubation system *in vitro*. Under appropriate conditions at 25°C a progressive increase in the enzyme activity occurs that is energy-dependent. Part of the enzyme is rapidly inactivated when the tissue is incubated with adrenaline or adrenaline plus theophylline. The mechanism of this inactivation appears to be distinct from, and to follow, the activation of the enzyme. A hypothesis is presented to account for the results in terms of an activation of the enzyme during obligatory post-translational processing and a catecholamine-regulated inactivation of the enzyme as an alternative to secretion from the adipocyte.

THE PHYSICAL PROPERTIES OF AN EFFECTIVE LUNG SURFACTANT. A.D. Bangham, C.J. Morley, and M.C. Phillips (Biophysics Unit, A.R.C. Inst. of Animal Physiology, Babraham, Cambridge, Dept. of Child Health, Med. Schl., Cambridge (U.K.)) *Biochim. Biophys. Acta.* 573, 552–6 (1979). It is suggested that the phospholipids at the alveolar/air interface exhibit both thermodynamic (equilibrium) and kinetic forces during the course of a respiratory cycle. The alveolae are kept open at full expiration by a residue of nearly pure dipalmitoyl phosphatidylcholine which is condensed and therefore, incompressible at 37°C.

SPECIES DIFFERENCES IN THE ACTIVITY OF A SERUM TRIGLYCERIDE TRANSFERRING FACTOR. P.J. Barter, J.M. Gooden and O.V. Rajaram (Clin. Biochem. Unit, Schl. of Med., The Flinders Univ. of South Australia, Bedford Park 5042, South Australia (Australia)) *Atherosclerosis* 33, 165–9 (1979). Low density lipoproteins (LDL), endogenously labelled with ^{3}H in the triglyceride moiety, were isolated from rabbit serum and subsequently incubated in vitro at 37°C with unlabelled preparations of rabbit high density lipoproteins (HDL) or very low density lipoproteins (VLDL). In direct contrast to the rabbit studies, rat serum failed to show a comparable process of triglyceride transfer. In subsequent experiments, mixtures of labelled LDL and unlabelled VLDL isolated either from rabbits or from rats were incubated with lipoprotein-free rabbit, rat or human serum. The lipoprotein-free serum of both the rabbit and man was effective in promoting transfer of 30 = 50% of LDL {^{3}H}triglyceride into VLDL, regardless of the species origin of the lipoproteins. By contrast the lipoprotein-free serum of rats was only slightly more effective than buffer alone in promoting such transfers. It has been concluded that rabbit and human serum contains a triglyceride transferring factor of far greater activity than that in rat serum.

ACCUMULATION AND LOSS OF CHOLESTEROL ESTERS IN MONKEY ARTERIAL SMOOTH MUSCLE CELLS EXPOSED TO NORMAL AND HYPERLIPEMIC SERUM LIPOPROTEINS. S.R. Bates (Dept. of Pathology and Specialized Center of Res. in Atherosclerosis, The Univ. of Chicago, Chicago, Illinois 60637 (U.S.A.)) *Atherosclerosis* 32, 165–76 (1979). The effects of high, low and very low density lipoprotein fractions from normal or hyperlipemic rhesus monkey serum on the accumulation or removal of cholesterol esters from rhesus monkey smooth muscle cells in tissue culture were determined. Serum or serum lipoproteins were labeled with {^{14}C}free cholesterol and adjusted to the same free cholesterol level in the incubation medium. The cells incubated in normal or hyperlipemic HDL or lipoprotein-deficient serum had the lowest cholesterol ester content. Thus, the lipoprotein fractions which caused the lowest levels of cholesterol esterification were also the most efficient in the removal of cellular cholesterol esters.

EFFECTS OF CONTINUOUS AND INTERMITTENT FEEDING ON BILIARY LIPID OUTPUTS IN MAN: APPLICATION FOR MEASUREMENTS OF INTESTINAL ABSORPTION OF CHOLESTEROL AND BILE ACIDS. H.Y.I. Mok, K. von Bergmann, and S.M. Grundy (Veterans Administration Hospital, San Diego, CA 92161) *J. Lipid Res.* 20, 389–98 (1979). Hepatic outputs of biliary lipids can be measured by intestinal perfusion techniques, either during constant infusion of liquid formula into the duodenum or throughout a 24-hour period during which time three meals are given along with an overnight fast. The purpose of this study was to compare these two methods for estimating secretion of biliary lipids. By combining the intestinal perfusion technique with measurements of fecal excretion of neutral steroids and bile acids, this method may be used to estimate absorption of cholesterol and bile acids from the intestine. Thus, these measurements allow quantification of a number of parameters of the enterohepatic circulation.

THE ISOLATION OF ACYL-CoA DERIVATIVES AS PRODUCTS OF PARTIAL REACTIONS IN THE MICROSOMAL CHAIN ELONGATION OF FATTY ACIDS. J.T. Bernert Jr., and H. Sprecher (The Dept. of Physiological Chem., College of Med., 333 West 10th Avenue, Ohio State Univ., Columbus, OH 43210 (U.S.A.)) *Biochim. Biophys. Acta.* 573, 436–42 (1979). An analysis of overall chain elongation, condensation, β-hydroxyacyl-CoA dehydrase and 2-*trans* enoyl-CoA reductase reactions, using the appropriate CoA derivatives as substrates which are required in the microsomal chain elongation of both palmitoyl-CoA and 6,9-octadecadienoyl-CoA, demonstrated that in each instance, the products of these reactions were the CoA derivatives. Reverse dehydrase reactions run with 2-*trans* enoyl-CoA derivatives as substrates, in the absence of NADPH, revealed that the product was the β-hydroxyacyl-CoA. In the presence of NADPH, incubations with β-hydroxyacyl-CoA demonstrated that both the 2-*trans* derivatives and the α,β-saturated product were recovered as their CoA derivatives. These latter findings are more consistent with the involvement of discrete dehydrase and 2-*trans*-enoyl-CoA reductase enzymes rather than a single protein catalyzing two reactions.

THE INFLUENCE OF STARVATION ON THE REMOVAL MECHANISMS OF PLASMA TRIGLYCERIDES IN MAN. K. Bolzano, F. Haslauer and F. Krempler (First Dept. of Med., Landeskrankenanstalten, Salzburg (Austria)) *Atherosclerosis* 33, 171–80 (1979). In 14 obese male subjects (whose plasma triglyceride (TG) levels lay between 72 and 491 mg/dl), total plasma cholesterol, plasma TG, "hepatic" TG lipase (HTGL) and ("extra-hepatic") lipoprotein lipase (LPL) activity in post-heparin plasma, and the k_2 of the intravenous fat tolerance test (IVFTT) were measured when on a normal isocaloric diet and after one and two weeks of total starvation. The results of this study are compatible with the following hypothesis concerning the regulation of plasma TG concentration. Both on a normal diet and during prolonged starvation, a reduced fractional removal rate of plasma TG is responsible for an increase in plasma TG concentration. Independent of the nutritional state, k_2 seems to be a reliable estimate for the fractional removal rate of endogenous plasma TG. In the fed state, the extent of hypertriglyceridaemia is also influenced by the influx rate of plasma TG.

THE GLUTATHIONE CONJUGATE OF PROSTAGLANDIN A_1 IS A BETTER SUBSTRATE THAN PROSTAGLANDIN E FOR PARTIALLY PURIFIED AVIAN PROSTAGLANDIN E 9-KETOREDUCTASE. L.M. Cagen, and J.J. Pisano (Sec. on Physiological Chem., Lab. of Chem., Nat'l Heart, Lung and Blood Inst., Nat'l Inst. of Health, Bethesda, MD 20014 (U.S.A.)) *Biochim. Biophys. Acta.* 573, 547–51 (1979). The reduction of the glutathione conjugate of prostaglandin A_1 by avian prostaglandin E 9-ketoreductase occurs at a faster rate than reduction of its presumed natural substrates, prostaglandin E_1 or E_2.

REGULATION OF ENZYMES BY FATTY ACYL COENZYME A. SITE-SPECIFIC BINDING OF FATTY ACYL COENZYME A BY CITRATE SYNTHASE-A SPIN-LABELING STUDY. A.V. Caggiano and G.L. Powell (Dept. of Biochem., Clemson Univ., Clemson, South Carolina 29631) *J. Biol. Chem.* 254, 2800–6 (1979). The

spin-labeled fatty acyl-CoA analogues, 6-doxylstearoyl-CoA and 16-doxylstearoyl-CoA were prepared from CoA and the mixed carbonate anhydrides of 2-(5-carboxybutyl)-2-dodecyl-4,4-dimethyl-3-oxazolidinyl-*N*-oxyl and 2-(14-carboxytetradecyl)-2-ethyl, 4,4-dimethyl-3-oxazolidinyl-*N*-oxyl, respectively. Competitive binding studies show acetyl-CoA and ATP to displace 6- and 16-doxylstearoyl-CoA from citrate synthase but little while oxalacetate and NADPH compete very effectively. These studies may suggest binding by fatty acyl-CoA at sites apart from the acetyl-CoA binding site. Site-specific binding of fatty acyl-CoA by citrate synthase provides strong support for a physiological role for fatty acyl-CoA in the regulation of citrate synthase and by analogy for other related enzymes of lipid metabolism.

MOLECULAR CONFORMATIONAL CHANGES IN THE TRIGLYCERIDE AND METHYL ESTER OF STEARIC ACID AS STUDIED BY TEMPERATURE DEPENDENT CARBON-13 CHEMICAL SHIFTS. P.T. Callaghan and K.W. Jolley (Dept. of Chem., Biochem., and Biophys., Massey Univ., Palmerston North, New Zealand) *Chem. Phys. Lipids* 23, 133–42 (1979). The temperature dependence of the ^{13}C chemical shifts in tristearin and methyl stearate has been investigated in both the melt and solution phases. Intramolecular conformational changes dominate the observed behaviour and there is little evidence for intermolecular interactions even in the melt phase of tristearin. In the absence of an acceptable mechanism for the chemical shifts of ^{13}C nuclei in hydrocarbon chains it is not possible to use this data to investigate conformational changes along the hydrocarbon chain.

INTERACTION OF SMALL MOLECULES WITH PHOSPHOLIPID BILAYER MEMBRANES: A SPIN LABEL STUDY. F.T. Chaykowski, J.K.S. Wan, and M.A. Singer (Dept. of Med., Queen's Univ., Kingston, Ontario, Canada) *Chem. Phys. Lipids* 23, 111–23 (1979). Multilamellar spin labelled liposomes were prepared from dipalmitoyl or dimyristoyl phosphatidylcholine, dicetyl phosphate, and the spin probe 12-doxyl stearate methyl ester. The effects of a series of benzene and adamantane derivatives, on fatty acyl chain motion was measured through changes in the electron spin resonance spectra of these liposomes. All the compounds tested, increased lipid chain motion to a variable degree. These observations are consistent with the hypothesis that the location of the additive within the bilayer is the main determinant of its effectiveness in increasing fatty acyl chain motion.

A DUAL, CONCENTRATION-DEPENDENT ABSORPTION MECHANISM OF LINOLEIC ACID BY RAT JEJUNUM IN VITRO. S.L. Chow and D. Hollander (Div. of Gastroenterology, Wayne State Univ., Detroit, MI 48202) *J. Lipid Res.* 20, 349–56 (1979). Linoleic acid absorption was studied using everted rat jejunal sacs. At low concentrations (42–1260μM), the relationship between linoleic acid concentration and its absorption rate fitted best to a rectangular hyperbola. At high concentrations (2.5–4.2 mM) the relationship between the two parameters was linear. Facilitated diffusion is the predominant mechanism of absorption at low concentrations, while at high concentrations, simple diffusion is predominant. At low concentrations, the absorption rate of linoleic acid is influenced by the pH, surfactant type and concentration, the simultaneous presence of other polyunsaturated fatty acids, and the thickness of the unstirred water layer.

VERY LOW DENSITY LIPOPROTEIN SYNTHESIS AND SECRETION BY CULTURED RAT HEPATOCYTES. R.A. Davis, S.C. Engelhorn, S.H. Pangburn, D.B. Weinstein, and D. Steinberg (Div. of Metabolic Disease, Dept. of Med., M-013D, Univ. of California San Diego Med. Schl., La Jolla, California 92093) *J. Biol. Chem.* 254, 2010–6 (1979). Hepatocytes were obtained by collagenase perfusion of adult rat liver *in situ* and plated as monolayers in plastic culture dishes. (^3H)Glycerol was actively incorporated into cellular triglycerides and phospholipids which were rapidly secreted into the culture medium. The incorporation of (^3H)leucine into the low density lipoprotein (LDL) fraction (d = 1.02 to 1.07) was measured to evaluate the possibility that the liver directly synthesizes LDL. These results demonstrate for the first time that orotic acid can act directly on the hepatocyte to inhibit VLDL secretion.

INCORPORATION OF LABEL FROM (9,10-METHYLENE-14C) STERCULIC ACID IN RAINBOW TROUT, SALMO GAIRDNERI. T.A. Eisele, R.S. Parker, J.K. Yoss, J.E. Nixon, N.E. Pawlowski and R.O. Sinnhuber (Dept. of Food Sci. and Tech. Oregon State Univ. Corvallis, Oregon 97331) *Lipids* 14, 523–8 (1979). The distribution of radioactivity from sterculic acid, labeled on the 9,10-methylene carbon of the cyclopropene ring, was investigated in trout, *Salmo gairdneri*. Fifty percent of the administered dose was excreted in feces and urine by 168 hr, but less than 1% of the dose was expired as carbon dioxide during the same time period. Incorporation of radioactivity into most organs peaked at 119 hr, and the majority of the label in the liver was in the fatty acid portion of the lipid fraction. Total lipid radioactivity in liver was higher in trout conditioned to cyclopropene lipids, and a substantial amount of label was found in phosphatidylcholine and ethanolamine phospholipids as well as neutral lipid. The data demonstrate that rainbow trout readily absorb, transport and incorporate sterculic acid into tissue lipid, including membrane lipid, but cannot oxidize the methylene carbon of the cyclopropene ring to carbon dioxide.

CRITICAL MICELLE CONCENTRATIONS OF GANGLIOSIDES. S. Formisano, M.L. Johnson, G.L. Salvatore, M. Aloj, and H. Edelhoch (Clin. Endocrinology Branch and the Lab. of Biochem. Pharmacology, Nat'l Inst. of Arthritis, Metabolism, and Digestive Diseases, Nat'l Inst. of Health, Bethesda, Maryland 20014) *Biochemistry* 18, 1119–24 (1979). The micellar properties of mixed, bovine gangliosides and purified galactosyl-N-acetylgalactosaminyl(N-acetylneuraminyl) galactosylglucosylceramide were studied by gel filtration, equilbrium dialysis, and band and boundary centrifugation in sucrose gradients. The dissociation of micelles is very slow (days) in water and required us to approach equilibrium by association of monomers rather than by the dissociation of micelles. The critical micelle concentration of the mixed gangliosides was found to be approximately 10^{-8} M by gel filtration, equilibrium dialysis, and band centrifugation.

THE EFFECTS OF CORTISOL, CORTICOTROPIN AND THYROXINE ON THE SYNTHESIS OF GLYCEROLIPIDS AND ON THE PHOSPHATIDATE PHOSPHOHYDROLASE ACTIVITY IN RAT LIVER. H.P. Glenny and D.N. Brindley (Dept. of Biochem., Univ. of Nottingham Med. Schl., Queen's Med. Centre, Nottingham NG7 2UH, U.K.) *Biochem. J.* 176, 777–84 (1978). Male rats were injected daily for 5 days with 0.15m-NaCl, corticotropin, cortisol or L-thyroxine and the rates of glycerolipid synthesis were measured in the livers after intraportal injection of {^{14}C}palmitate and {^3H}glycerol. 2. Injection of all three hormones decreased the rates of body-weight gain.3. Cortisol treatment increased the weight of the liver relative to body weight. It is proposed that cortisol could be directly or indirectly involved in increasing the activity of hepatic phosphatidate phosphohydrolase in starvation, diabetes, laparotomy, subtotal hepatectomy, liver damage, ethanol feeding and in obesity. This enzyme adaptation could contribute to the potential of the liver to increase its synthesis and accumulation of triacylglycerols or to secrete very-low-density lipoproteins.

TRANSLATION IN VIVO AND IN VITRO OF PROTEINS RESEMBLING APOPROTEINS OF RAT PLASMA VERY LOW DENSITY LIPOPROTEIN. R. Hay and G.S. Getz (Dept. of Pathology and Biochem., The Univ. of Chicago and The Pritzker Schl. of Med., Chicago, IL 60637) *J. Lipid Res.* 20, 334–48 (1979). Antibodies raised against rat plasma apoVLDL and a purified fraction of arginine-rich peptides (ARP) were labeled with $Na^{125}I$ and were shown to bind to polyribosomes isolated from rat liver. Antibody fractions enriched by selective affinity chromatography exhibited increased levels of binding to polysomes. Anti-apoVLDL immunoreactivity was further resolved into anti-ARP and anti-apoB components, each reactive with a distinct polysome population. Most of the in vitro translation products precipitated by purified anti-ARP migrated identically on polyacrylamide gel electrophoresis with unlabeled purified ARP.

REGULATION OF THE HYDROXYLATION OF 25-HYDROXYVITAMIN D_3 IN VIVO AND IN PRIMARY CULTURES OF CHICK KIDNEY CELLS. H.L. Henry (Dept. of Biochem., Univ. of California, Riverside, California 92521) *J. Biol. Chem.* 254, 2722–9 (1979). Primary cultures of chick kidney cells which reach confluency in 4 to 5 days have been prepared. When incubated with 5×10^{-8} M 25-hydroxyl(^3H) vitamin D_3 (25-OH-(^3H)D_3), the cultures converted 1 to 16% (5 to 80 pmol/75 cm^2 flask) to 1,25-dihydroxyl(^3H) vitamin D_3 (1,25(OH)$_2$-(^3H)D_3) in 30 min. 1,25(OH)$_2$-(^3H)D_3 production was maximal (50 to 80 pmol/flask) when cultures were in serum-free medium for 24 h prior to the assay of metabolism of 25-hydroxyl(^3H)vitamin D_3. The primary cultures of chick kidney cells described not only carry out the metabolism of 25-OH-(^3H)D_3 in a manner

similar to that observed *in vivo* but are capable of modulating this metabolism. The effects of vitamin D metabolites on renal 25-hydroxyvitamin D_3 metabolism observed *in vivo* are apparently exerted directly on the kidney cell.

THE FORMATION OF PHOSPHATIDYLINOSITOL BY ACYLATION OF 2-ACYL-SN-GLYCERO-3-PHOSPHORYLINOSITOL IN RAT LIVER MICROSOMES. B.J. Holub and J. Piekarski (Dept. of Nutr. College of Biol. Sci. Univ. of Guelph, Guelph, Ontario, Canada N1G 2W1) *Lipids* 14, 529–32 (1979). The conversion of 2-acyl-*sn*-glycero-3-phosphorylinositol into phosphatidylinositol via acyl-CoA: 2-acyl-*sn*-glycero-3-phosphorylinositol acyltransferase activity was found to occur in rat liver microsomes. Over a wide range of conditions, stearic acid was preferred over palmitate by the acyltransferase when these acids were presented in mixtures as acyl-CoA derivatives. The potential importance of this enzyme activity for the entry of stearic acid into the 1-position of hepatic phosphatidylinositol is further supported by its greater preference for stearate relative to the acyl-CoA: 2-acyl-*sn*-glycero-3-phosphorylcholine acyltransferase under certain assay conditions.

DISSOCIATION BETWEEN DIETARY EFFECTS ON PLASMA LIPID CONCENTRATION AND ON PLASMA LIPOPROTEIN DISTRIBUTION IN SELECTED RATS. A.T. Hostmark, E.W. Rasmussen and R. Askevold (Inst. of Hygiene, Gydas vei 8, Oslo 3, Norway) *J. Nutr.* 108, 1823–9 (1978). The influence of two types of diet on plasma total cholesterol and triglyceride concentration, and on the lipoprotein distribution was studied in rats with genetically different levels of spontaneous running activity. Genetically active and passive rats of both sexes were fed an open formula cereal based stock diet or a purified diet containing sucrose (47% of calories), coconut fat (35% of calories), and casein (18% of calories) from the age of 3 to 8 months, during which time blood samples were taken three times. In groups fed the purified diet a slight decrease in percentage of the pre-beta and beta fractions, a pronounced increase in a diffuse "pre-alpha" fraction and a decrease in the alpha fraction was observed as compared with groups fed stock diet. The data for passive rats suggest that a given diet may have an appreciable influence on the lipoprotein distribution without affecting the concentration of total cholesterol and triglycerides in plasma.

DIETARY FIBER AND CHOLESTEROL METABOLISM IN RATS FED A HIGH CHOLESTEROL DIET. N. Jayakumari and P.A. Kurup (Dept. of Biochem., Univ. of Kerala, Trivandrum 695001 (India)) *Atherosclerosis* 33, 41–7 (1979). The effect of administering blackgram *(Phaseolus mungo)* fiber (isolated as neutral detergent residue) at the 30% dietary level has been studied with regard to lipid concentration in the tissues and that of biliary and fecal bile acids and sterols. Rats were fed a high fat-cholesterol diet and compared with those fed a cellulose diet. The results indicate that blackgram fiber significantly lowers cholesterol in both serum and aorta (11). There was an increased concentration of biliary sterols and bile acids and increased fecal excretion of sterols and bile acids, each of these effects being significantly greater than those observed in the rats fed cellulose.

UPTAKE OF (14 C) CHOLINE AND INCORPORATION INTO LUNG PHOSPHOLIPID BY THE ISOLATED PERFUSED RAT LUNG. R.G. Johnson, M.A. Lugg and T.E. Nicholas (Dept. of Human Physiology, Schl. of Med., The Flinders Univ. of South Australia, Bedford Park, S.A. 5042) *Lipids* 14, 555–8 (1979). We have used the isolated perfused lung (IPL) preparation from the rat to determine whether uptake of choline from the vascular compartment could limit the rate of synthesis of phosphatidylcholine (PC). The uptake of choline was rapid and did not saturate at a concentration of 10 mM. The rate of incorporation of choline into phospholipid was saturated above 0.1 mM choline. Whereas, uptake and incorporation were depressed at 4 C, uptake was neither dependent on the extracellular sodium concentration nor inhibited by equimolar concentrations of hemicholinium-3 (HC-3). We could find no evidence that uptake might limit synthesis of lung lecithin and conclude that uptake is either by free diffusion, or by a carrier-mediated process with a very high Km.

OBESITY, LIPIDS AND GLUCOSE INTOLERANCE. THE FRAMINGHAM STUDY. W.B. Kannel, T. Gordon and W.P. Castelli (Framingham Heart Disease, Epidemiology Study, Framingham, Mass. 01701) *Am. J. Clin. Nutr.* 32, 1238–45 (1979). Some lipid and lipoprotein accompaniments of obesity and its association with glucose intolerance are examined in the Framingham cohort of 5209 men and women ages 30 to 59 examined biennially over 18 years. While *B* and pre-*B* lipoproteins were positively correlated with relative weight, high density lipoprotein cholesterol, was inversely correlated. The association was strongest for high density lipoprotein cholesterol, varying little by age and sex. Triglyceride was a close second, but unlike high density lipoproteins, it and other lipids were more closely associated with obesity in men than women and in younger than older persons. Obese persons tended to have a greater likelihood of glycosuria and an increasing prevalence of diabetes. Relative weight in the Framingham cohort rose in both sexes to age 54, remained essentially unchanged until 62 and then began to decline. Despite such changes body weights even 18 years apart had a correlation of 0.8. Men from each succeeding birth cohort were heavier, women were lighter, but even women from the most recent birth cohort were much more frequently above "desirable" weight than below it.

THE HYDROLYSIS OF CHOLESTEROL ESTERS IN PLASMA LIPOPROTEINS BY HORMONE-SENSITIVE CHOLESTEROL ESTERASE FROM ADIPOSE TISSUE. J.C. Khoo, C.A. Drevon, and D. Steinberg (Div. of Metabolic disease, Dept. of Med., Univ. of California, San Diego, La Jolla, California 92093) *J. Biol. Chem.* 254, 1785–7 (1979). Adipose tissue contains a high level of neutral esterase active against emulsions of cholesteryl oleate. The present studies show that this enzyme can also effectively hydrolyze the cholesterol esters in native rat plasma high density lipoproteins (HDL) and low density lipoproteins (LDL). Rat adipose tissue homogenates were also very active against lipoprotein cholesterol esters, hydrolyzing as much as 60% of the total labeled cholesterol ester in HDL or LDL in 1 h. The results show that hormone-sensitive cholesterol esterase of adipose tissue has ready access to the neutral lipid core of plasma lipoproteins, either because the enzyme penetrates the polar shell or because the cholesterol ester in the core is exposed, at least intermittently, to allow enzyme · substrate complex formation.

INTESTINAL ABSORPTION AND RETENTION OF ^{109}CD: EFFECTS OF CHOLECALCIFEROL, CALCIUM STATUS AND OTHER VARIABLES. S.I. Koo, C.S. Fullmer and R.H. Wasserman (Dept. of Physical Biol., New York State College of Veterinary Med., Cornell Univ., Ithaca, New York 14853) *J. Nutr.* 108, 1812–22 (1978). The intestinal absorption of ^{109}Cd by chicks was investigated as a function of the site of absorption, absorption period, concentration of stable cadmium, or calcium in the dose, and nutritional status with respect to dietary cholecalciferol, calcium, and phosphorus. All absorption studies utilized the in situ ligated loop technique, and the following observations were made; (a) duodenal absorption of ^{109}Cd was approximately 3-fold greater than that in the jejunum or the ileum, with no difference between the latter two. (b) cadmium absorption in the duodenum occurred in two phases, at an initial rapid rate during the first 20 minutes of absorption, followed by a slow phase thereafter.

AORTIC CHOLESTEROL ESTERASE. INFLUENCE ON BILE SALTS. H.V. Kothari and D. Kritchevsky (Harrison Dept. of Surgical Res., Univ. of Pennsylvania, Philadelphia, PA) *Atherosclerosis* 31, 371–5 (1978). The in vitro activity of cholesteryl ester hydrolase preparations of rat and rabbit aortas was assayed in the presence of the taurine and glycine conjugates of cholic, chenodeoxycholic, deoxycholic and lithocholic acids or in the presence of Triton X-100 and Tween-20. Maximum activity was obtained with tauro- or glycocholic acids. As in the case of pancreatic cholesteryl esterase, trihydroxycholanoic acid derivatives may serve an obligatory function.

SELECTIVE MEASUREMENT OF TRIACYLGLYCEROL LIPASE ACTIVITIES IN PIG POST-HEPARIN PLASMA. T. Kuusi, T. Schroder, B. Bang, M. Lempinen and C. Ehnholm (Third Dept. of Med. and Sec. Dept. of Surgery, Univ. of Helsinki and Central Public Health Lab., Helsinki (Finland)). *Biochim. Biophys. Acta.* 573, 443–50 (1979). Immunochemical methods for the selective measurement of pig post-heparin plasma lipoprotein lipase and hepatic lipase are described and validated. A simple two step purification method for porcine hepatic lipase from hepatic perfusate based on affinity chromatography and gel filtration is reported. The activity of the post-heparin plasma lipoprotein lipase and hepatic lipase in swine is reported. It is demonstrated that fasting decreases the activity of post-heparin plasma lipoprotein lipase activity more than two-fold while it does not affect the hepatic lipase activity significantly.

THE INFLUENCE OF PHTHALATE ESTERS ON HUMAN PLASMA LECITHIN/CHOLESTEROL ACYLTRANSFERASE. M. Lagente, F. de La Farge and P. Valdiguie (Laboratoire de Biochimie, Faculte' de Medecine de Rangueil, chemin du Vallon, 31054 Toulouse Cedex, France) *Lipids* 14, 533–4 (1979). The effect of various phthalate esters on the lecithin/cholesterol acyltransferase activity in man was studied in vitro. The enzymatic activity was strongly reduced with all phthalates except for the dimethyl phthalate. The inhibition rate depends on the phthalate concentration and also on the carbon number of the alkyl groups of phthalates.

CHARACTERIZATION OF FATTY ALCOHOL: NAD^+ OXIDOREDUCTASE FROM RAT LIVER. T.C. Lee (Med. and Health Sci. Div., Oak Ridge Associated Univ., Oak Ridge, Tennessee 37830) *J. Biol. Chem.* 254, 2892–6 (1979). Long chain fatty alcohols are known to be rapidly oxidized to the corresponding fatty acids in normal mammalian tissues *in vivo*. We have demonstrated the conversion of (1-^{14}C) hexadecanol to (1-^{14}C) hexadecanoic acid using a cell-free system from rat liver. The subcellular distribution of this enzyme system parallels that of microsomal marker enzymes. Fatty aldehyde was also isolated and identified from the reaction mixture. Addition of semicarbazide, a trapping agent for aldehydes, to the incubation system increased the amount of fatty aldehyde produced with concomitant decrease in the formation of fatty acid. This documents that aldehyde is an intermediate in the reaction. This oxidoreductase is found in most tissues but has the highest activity in liver.

LONG-TERM EFFECT OF THE COMBINATION OF CALCIUM CLOFIBRATE AND CALCIUM CARBONATE ON SERUM TOTAL CHOLESTEROL, TRIGLYCERIDE AND HIGH DENSITY LIPOPROTEIN-CHOLESTEROL CONCENTRATIONS IN HYPERLIPOPROTEINAEMIA. A COMPARATIVE STUDY WITH CLOFIBRATE. A. Lehtonen and J. Viikari (Dept. of Med., Univ. Central Hosp. of Turku, 20520 Turku 52 (Finland)) *Atherosclerosis* 33, 49–58 (1979). Thirty hyperlipidaemic patients (19 with type IIA, 4 with IIB and 7 with type IV hyperlipoproteinaemia) were subjected to therapy with calcium clofibrate and calcium carbonate (4C, 2 +2 g/day for 6 months) and the effect was compared with clofibrate (1C, 2 g/day) which was given for 6 months as well, in a single-blind placebo-controlled study. 4C and 1C decreased total serum cholesterol levels especially in subgroups IIA and IIB. 4C was somewhat more effective than 1C in decreasing (VLDL + LDL)-cholesterol in subgroup IIA. The HDL-cholesterol and total cholesterol increased during treatment with both 1C and 4C. The HDL-cholesterol increase (vs. Placebo) was 18%. The concentrations of serum triglycerides decreased by 33% during both treatment periods and there was no significant difference between 1C and 4C.

BIOSYNTHESIS OF LIPID-LINKED OLIGOSACCHARIDES. ISOLATION AND STRUCTURE OF A SECOND LIPID-LINKED OLIGOSACCHARIDE IN CHINESE HAMSTER OVARY CELLS. E. Li, and S. Kornfield (Dept. of Med. and Biochem., Washington Univ. Schl. of Med., St. Louis, MO 63110) *J. Biol. Chem.* 254, 2754–8 (1979). Previous work has shown that vesicular stomatitis virus-infected chinese hamster ovary cells contain a major high molecular weight lipid-linked oligosaccharide which is transferred *en bloc* to protein during the formation of the asparagine-linked complex-type oligosaccharides of the vesicular stomatitis virus G protein (Tabas, I., Schlesinger, S., and Kornfield, S. (1978) *J. Biol. Chem.* 253, 716–722). Several lines of evidence are presented which indicate that this lipid-linked oligosaccharide is primarily involved in the assembly of the major lipid-linked oligosaccharide rather than in the direct glycosylation of proteins.

FATTY ACID SYNTHESIS IN RUMINATING AND NONRUMINATING GOATS. G.U. Liepa, D.C. Beitz, and J.R. Linder (Dept. of Animal Sci. Iowa State Univ. Ames, Iowa 50011) *J. Nutr.* 108, 1733–9 (1978). Fatty acid synthetic rates were determined in several tissues of ruminating (R) and nonruminating (NR) goats. The R goats were fed goat milk for 1 month and then a hay and grain diet for the next 3 months. The NR goats were fed goat milk for 4 months. Rates of fatty acid synthesis from acetate and glucose were determined in perirenal adipose tissue, small intestine, brain, and liver. With either acetate or glucose as a precursor, rates of lipogenesis were greatest in perirenal adipose tissue and least in liver. When acetate was used as a precursor, no dietary effects were noted for any of the four major tissues except liver in which fatty acids were synthesized more readily in R goats than in NR goats. Therefore, adipose tissue is the principal anatomical site of lipogenesis in either R or NR goats, and acetate is used as a precursor at much higher rates than is glucose.