Abstracts

Biochemistry and nutrition

COMPLETE EXCHANGE OF VIRAL CHOLESTEROL. B.M. Sefton and B.J. Gaffney (Tumor Virology Lab., The Salk Inst., San Diego, CA 92112 (B.M.S.). *Biochemistry 18*,436-41 (1979). The exchange of the cholesterol in the membranes of two enveloped viruses, Sindbis virus and vesicular stomatitis virus, with cholesterol present in lipid vesicles and in serum was measured. Biosynthetically labeled viral cholesterol underwent spontaneous and complete transfer to both lipid vesicles and to serum. The rate with which and the extent to which this process occurred were very similar for these two viruses. During incubation with lipid vesicles in excess, half of the viral cholesterol underwent transfer in approximately 4 h and more than 90% underwent transfer in 24 h at 37 C. Similar rates and extents of movement of viral cholesterol were observed when incubations were carried out with vesicles which contained cholesterol and phospholipid in the same molar ratio as in the virus or with egg lecithin vesicles which contained no cholesterol. When labeled cholesterol was present initially in the lipid vesicles, movement of cholesterol from the vesicles to the virus was observed. One implication of the fact that viral cholesterol undergoes extensive exchange with serum cholesterol is that cellular cholesterol is in equilibrium with that in the extracellular fluid.

THE EFFECTIVENESS OF THE VITAMIN D ANALOG 1 α-OH-D_3 IN PROMOTING FERTILITY AND HATCHABILITY IN THE LAYING HEN. J.H. Soares, Jr., M.R. Swerdel and M.A. Ottinger (Dept. of Poultry Sci. Univ. of Maryland, College Park, Maryland 20742) *Poult. Sci. 58*,1004-6 (1979). Single Comb White Leghorn hens were fed either 20 μg vitamin D_3 or 5 μg 1 α-OH-D_3 per kilogram diet for 20 weeks and then artificially inseminated. All eggs laid during the twenty-first week of feeding were collected and incubated. There were no differences in egg production or fertility between the two groups. However, the hens fed 1 α-OH-D_3 had significantly lower hatchability and a markedly higher incidence of embryonic abnormalities, indicative of a vitamin D deficiency. These data indicate that 1 α-OH-D_3, a synthetic analogue of the hormone form of vitamin D_3, may be poorly transported into the egg.

METABOLISM OF APOLIPOPROTEIN B-CONTAINING LIPOPROTEINS IN FAMILIAL HYPERCHOLESTEROLAEMIA. A.K. Soutar, N.B. Myant and G.R. Thompson (Medical Research Council Lipid Metabolism Unit, Hammersmith Hospital, London, W12 OHS Great Britain) *Atherosclerosis 32*(3), 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.

ARTERIAL ENTRANCE AND METABOLISM OF FREE AND ESTERIFIED PLASMA CHOLESTEROL MEASURED *IN VIVO* IN EXPERIMENTAL ANIMALS BY A DUAL ISOTOPE METHOD. S. Stender (Dept. of Clinical Chem. CL, Rigshospitalet, Univ. Hospital, Blegdamsvej 9, Dk-2100 Copenhagen, Denmark) *Atherosclerosis 32*(2),129-39 (1979). The arterial walls of 3 cholesterol-fed rabbits were exposed for 3-4 hours *in vivo* to homologous cholesterol-labelled plasma with a 20-fold higher [^{3}H/^{14}C] ratio in esterified cholesterol (EC) than in free cholesterol (FC). The [^{3}H/^{14}C] ratio in total cholesterol (TC) in the thoracic aorta was 0.6-0.9 times the ratio prevailing in TC in plasma. The arterial influx of FC without EC (influx by exchange) accounted for 10-25% of the total influx of cholesterol in the rabbits and 40-70% in the cockerels.

THE METABOLISM OF DIHOMO-γ-LINOLENIC ACID IN MAN. K.J. Stone, A.L. Willis, M. Hart, S.J. Kirtland, P.B.A. Kernoff, and G.P. McNicol (Roche Products Ltd., Hertfordshire, United Kingdom) *Lipids 14*(2),174-80 (1979). Orally administered dihomo-γ-linolenic acid (DHLA) is well absorbed in man; it appears in blood after ca. 4 hr first as triglyceride ester and later as phospholipid. After sustained-dosing, DHLA penetrated membrane pools and all phospholipid components but, depending on the dosage, reached a metabolic equilibrium in 4-16 days. Intact platelets do not accumulate arachidonate following DHLA administration, and species differences occur in the capacity of animals to metabolize DHLA to arachidonic acid (AA). Concomitant increases in PGE_2 synthesis do not apparently result from an increased production of AA and suggest that DHLA, or a DHLA metabolite, interferes with the metabolism of AA. Effects on thromboxane and prostacyclin synthesis are being studied.

ENZYMIC REGULATION OF ARACHIDONATE METABOLISM IN BRAIN MEMBRANE PHOSPHOGLYCERIDES. G.Y. Sun, K.L. Su, O.M. Der, and W. Tang (Sinclair Comparative Med. Res. Farm and Biochem. Dept., Univ. of Missouri, Columbia, MO 65211). *Lipids 14*(2),229-35 (1979). The metabolism of arachidonate in brain membrane phosphoglycerides was investigated *in vivo* by intracerebral injection of labeled arachidonate and by *in vitro* assay of enzymic systems associated with the metabolism. Some evidence of a metabolic relationship between diacyl-*sn*-glycerophosphoinositols (diacyl-GPI) and diacylglycerols was observed. Three types of enzymic systems related to metabolism of the polyunsaturated fatty acids in brain were investigated. In general, the results of in vitro studies are in good agreement with those observed in vivo and the information yielded has contributed towards understanding the metabolism of polyunsaturated fatty acids in brain subcellular membranes.

LINOLENIC ACID DEFICIENCY. J. Tinoco, R. Babcock, I. Hincenbergs, B. Medwadowski, P. Miljanich and M.A. Williams (Dept. of Nutr. Sci. Univ. of California, Berkeley, CA 94720) *Lipids 14*,166-73 (1979). Linolenic acid deficiency has not been demonstrated clearly in warm blooded animals, yet circumstantial evidence suggests that n-3 fatty acids may have functions in these animals. The fact that several species of fish definitely require dietary n-3 fatty acids indicates that n-3 fatty acids have important and specific functions in these animals and suggests that such functions may also be present in warm blooded animals. It is also true that n-3 fatty acid distribution in tissues of birds and mammals appears to be under strict metabolic control, and that this complex metabolic control mechanism apparently has survived evolutionary pressure for a very long time. So far, attempts to produce linolenic acid deficiency in mammals have not revealed an absolute requirement for n-3 fatty acids. If functions for n-3 fatty acids do exist in warm blooded animals, it seems probable that they may be located in the cerebral cortex or in the retina, because these tissues normally contain high concentrations of n-3 fatty acids.

SYNTHESIS OF CERAMIDES AND CEREBROSIDES CONTAINING BOTH α-HYDROXY AND NONHYDROXY FATTY ACIDS FROM LIGNOCEROYL-COA BY RAT BRAIN MICROSOMES. H. Akanuma and Y. Kishimoto (John F. Kennedy Inst. for Handicapped Children and the Dept. of Neurology, John Hopkins Univ. School of Med., Baltimore, MD 21205) *J. Biol. Chem. 254*(4),1050-6 (1979). The conversion of [1-^{14}C] lignoceroyl-CoA to nonhydroxy- and α-hydroxyceramides and cerebrosides by brain microsomes of developing rat in the presence of NADPH was investigated. A new technique of thin layer chromatography for the separation of these lipids and unreacted substrate was developed for this assay. The synthesis of nonhydroxy- and hydroxyceramides was significantly stimulated by the addition of heat stable factor, a facotr which is essential in the α-hydroxylation of free lignoceric acid. However, lignoceroyl-CoA, like free lignoceric acid, does not appear to be the immediate substrate of the α-hydroxylation.

STUDIES ON LACRIMAL GLAND LIPIDS IN ESSENTIAL FATTY ACID DEFICIENCY. B.S. Alam and S.Q. Alam (Dept. of Biochem. Louisiana State Univ. Med. Center, New Orleans, LA 70119) *Proc. Soc. Exp. Biol. Med. 161*(2),199-203 (1979). Extraorbital lacrimal glands, like the salivary glands, perform secretory function and are very similar ultrastructurally (1). Although there are a few studies on the lipid composition of Harderian gland, another exocrine eye gland, in rabbits (2,3) and rats (4), there is a paucity of similar information on extraorbital lacrimal glands.

THE METABOLISM OF ESTERIFIED CHOLESTEROL IN RABBIT PLASMA LOW DENSITY LIPOPROTEINS. P.J. Barter and J.I. Lally (Clin. Biochem. Unit, Schl. of Med., The Flinders Univ. of South Australia, Bedford Park, South Australia 5042, Australia) *Biochim. Biophys. Acta 572*,510-8 (1979). The metabolism of esterifed cholesterol in plasma low density lipoproteins (LDL) has been studied in rabbits. LDL labelled with ^{3}H in the esterified and free cholesterol moieties was isolated from the serum of donar rabbits which has been injected with [^{3}H] mevalonic acid, and subsequently either incubated at 37°C *in vitro* with unlabelled rabbit

serum or unlabelled rabbit lipoprotein fractions, or reinjected into other rabbits. It has been concluded that *in vitro* the esterified cholesterol in LDL exchanges with that in both the VLDL and HDL, and that *in vivo* the esterified cholesterol pools in LDL and HDL may represent parts of a progressively equilibrating plasma pool.

INTERACTIONS OF SMALL MOLECULES WITH PHOSPHOLIPID BILAYERS. E. Tipping, B. Ketterer and L. Christodoulides (Courtauld Inst. of Biochem., Middlesex Hosp. Med. School, London W1P7PN, U.K.) *Biochem. J. 180*(2),327-37 (1979). To assess the possible involvement of ligandin and aminoazo-dye-binding protein A in intracellular transport it is necessary to know how their ligands, most of which are molecules with hydrophobic moieties, interact with cellular membranes. To obtain such information we examined the interactions of bromosulphothalein, oestrone sulphate, haem and bilirubin with aqueous dispersions of egg phosphatidylcholine and egg phosphatidylcholine/cholesterol (1:1, molar ratio) by equilibrium dialysis and spectrophotometry. By assuming that the interactions with egg phosphatidylcholine resemble those with the phospholipid components of mammalian intracellular membranes the binding data for phosphatidylcholine, together with data for binding to the intracellular proteins ligandin and aminoazo-dye-binding protein A, enable the subcellular distributions of the four compounds to be estimated. For the rat hepatocyte up to 92, 51, 98 and 47% of the total bromosulphophthalein, oestrone sulphate, haem and bilirubin respectively may be membrane-bound.

THE EFFECT OF 5,8,11,14-EICOSATETRAYNOIC ACID ON LIPID METABOLISM. L.D. Tobias and J.G. Hamilton (Roche Res. Center, Hoffmann-La Roche, Nutley, New Jersey 07110) *Lipids 14*,181-93 (1979). The purpose of this presentation is to review the current state of knowledge regarding 5,8,11,14-eicosatetraynoic acid (ETYA, Ro 3-1428) and its effects on lipid metabolism. Accordingly, the topics discussed include hypocholesterolemic and dermatological studies involving ETYA in both animals and man, as well as the effects of ETYA on desaturase enzymes. Metabolic studies involving ETYA are also noted. Primary interest is focused on the effects of ETYA on selected processes of arachidonate metabolism, and the effect of ETYA on inflammation, platelet aggregation and tumor growth are discussed, keeping in mind the relevance of arachidonate metabolism to these processes.

EFFECT OF CHOLESTEROL-FEEDING ON TISSUE GLUCOSE UPTAKE, INSULIN-DEGRADATION, SERUM LIPIDS AND SERUM LIPOPEROXIDE LEVELS IN RABBITS. A.C. Tsai and N.S.C. Chen (The Univ. of Michigan, M5170 Human Nutrition Program, School of Public Health, Ann Arbor, MI 48109) *J. Nutr. 109*(4),606-12 (1979). The experiment was conducted to study the effect of cholesterol-feeding on tissue glucose uptake, serum insulin concentration and other metabolic parameters in rabbits. Cholesterol-feeding markedly increased total serum cholesterol, but decreased serum high density lipoprotein (HDL) cholesterol levels. Cholesterol-feeding also increased serum unesterified fatty acid and lipid peroxide concentrations. The concentration of serum insulin in cholesterol-fed rabbits was not significantly changed. Results of this study indicate that cholesterol-feeding can increase vascular permeability to glucose, decrease serum HDL-cholesterol, and increase serum unesterified fatty acid and lipoperoxide levels. These metabolic alterations may play an important role in the pathogenesis of atherosclerosis.

EFFECTS OF VITAMIN D_3 AND D_3 METABOLITES ON PRODUCTION PARAMETERS AND HATCHABILITY OF EGGS. S.M. Abdulrahm, M.B. Patel, and J. McGinnis (Dept. of Animal Sci., Washington State Univ., Pullman, WA) *Poult. Sci. 58*(4),858-63 (1979). A two phase experiment was conducted with Leghorn pullets to study the effect of graded levels (0 to 18 μg/kg feed) of vitamin D_3, 25-OH-D_3, and 1α-OH-D_3 on production parameters and hatchability of eggs. Phase 1 was conducted with 21-week-old pullets for a period of 13 weeks. Eggs were incubated weekly for period of 8 weeks beginning when the hens were 26 weeks of age. During the recovery phase (phase 2), egg production and hatchability of eggs from pullets previously fed the vitamin D_3 deficient diet recovered to normal after 8 and 10 days, respectively. Hatchability of eggs from pullets previously fed 1,25-(OH)-D_3 and 1α-OH-D_3 was normal after 3 and 4 days on the vitamin D_3 supplemented diet.

EFFECT OF UNSATURATED FATS AND CHOLESTEROL ON SERUM AND FECAL LIPIDS. P. Hill, B.S. Reddy, and E.L. Wynder (American Health Foundation, Naylor Dana Institute, Valhalla, New York) *J. Am. Diet. Assoc. 75*, 414-20 (1979). Despite many studies of the effects of cholesterol-lowering diets, evidence is conflicting as to whether such diets produce a negative cholesterol balance in free-living people. Using a low-cholesterol (250 mg. per day), high-polyunsaturated fat (33 per cent fat calories, P:S ratio of 1.2) diet composed of customary foods, a lower plasma cholesterol concentration and a higher fecal neutral but not acidic sterol content were found in middle-aged men. In this study, when caloric balance was maintained, a "prudent diet" with a high P:S ratio produced a negative balance of body cholesterol.

BIOHYDROGENATION OF UNSATURATED FATTY ACIDS: PRESENCE OF DITHIONITE AND AN ENDOGENOUS ELECTRON DONOR IN *BUTYRIVIBRIO FIBRISOLVENS*. S. Yamazaki and S.B. Tove (Dept. of Biochem., North Carolina State Univ., Raleigh, NC 27650) *J. Biol. Chem. 254*(10), 3812-7 (1979). Two oxygen-consuming substances were isolated from cell-free extracts of the rumen anaerobe, *Butyrivibrio fibrisolvens*. The major fraction comprising 97% of the total activity was characterized as a three-component mixture of glucose, maltose, and dithionite. The minor activity fraction contained an electron donor for the reduction of *cis-9,trans*-11-octadecadienoate to *trans*-11-octadecenoate. After oxidation, the electron donor could be reduced by the dithionite, thereby accounting for the previously observed capacity of cell-free extracts of the bacterium to carry out the biohydrogenation of the conjugated dienoic fatty acid.

PROPERTIES OF SALT-RESISTANT LIPASE AND LIPOPROTEIN LIPASE PURIFIED FROM HUMAN POST-HEPARIN PLASMA. A.M. Östlund-Lindqvist (Dept. of Medical and Physiological Chemistry, Biomedical Centre, Univ. of Uppsala, Uppsala, Sweden) *Biochem. J. 179*(3), 555-9 (1979). Lipoprotein lipase and salt-resistant lipase were isolated from human post-heparin plasma. The proteins of human post-heparin plasma lipoprotein lipase and salt-resistant lipase were identified and demonstrated to be immunologically different. Significant differences between the two enzymes in their relative amino acid composition were demonstrated, which indicated that the two enzymes are different proteins. When analyzed by sodium dodecyl sulphate/polyacrylamide-gel electrophoresis, the enzymes seemed to have monomer molecular weights similar to that of lipoprotein lipase purified from bovine milk.

INTERACTION OF NEUTRAL POLYSACCHARIDES WITH PHOSPHATIDYLCHOLINE MULTILAMELLAR LIPOSOMES. PHASE TRANSITIONS STUDIED BY THE BINDING OF FLUORESCEIN-CONJUGATED DEXTRANS. M. Minetti, P. Aducci, and V. Viti (Dept. of Cell Biology and Immunology, Instituto Superiore di Sanita, V. Regina Elena 299, Rome, Italy) *Biochemistry 18*(12), 2541-8 (1979). The interaction of neutral polysaccharides with membrane models was studied by determining the binding of fluoresceinylthiocarbamoyl-dextran (FITC-D) to phosphatidylcholine multilamellar liposomes. The amount of FITC-D bound to liposomes increased with temperature and showed two sharp changes at temperatures around the phase transitions of synthetic phosphatidylcholine multilamellar liposomes. The increased disorder of the bilayer, necessary for the formation of vesicles, may also be induced by cholesterol even at low temperature.

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, UK) *Biochim. Biophys. Acta 573*(3), 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.

MIXED MICELLES OF SPHINGOMYELIN AND PHOSPHATIDYLCHOLINE WITH NONIONIC SURFACTANTS. EFFECT OF TEMPERATURE AND SURFACTANT POLYDISPERSITY. R.J. Robson and E.A. Dennis (Dept. of Chem., Univ. of Calif. at San Diego, La Jolla, CA 92093) *Biochim. Biophys. Acta 573*(3), 489-500 (1979). Mixed micelle formation of the polydisperse nonionic surfactant Triton X-100 as well as its homogeneous analogue, p-(1,1,3,3-tetramethylbutyl)-Phenoxynonaoxyethylene glycol (OPE-9), with bovine brain sphingomyelin or dipalmitoyl phosphatidylcholine has been characterized by column chromatography on 6% agarose. These results show that surfactant polydispersity and temperature are important determinants in the solubilization of lipids by nonionic surfactants. It is also shown that pure surfactant micelles and lipid/surfactant mixed micelles do not co-exist in the same solution.

LIPID LATERAL DIFFUSION BY PULSED NUCLEAR MAGNETIC RESONANCE. A. Kuo and C.G. Wade (Dept. of Chem., Univ. of Texas, Austin, TX 78712) *Biochemistry 18*(11), 2300-8 (1979). The temperature and hydration dependences of lipid lateral diffusion in model membrane-D_2O multilayers of dipalmitoyl (DPL), dimyristoyl (DML), dilauryl (DLL), and egg yolk (EYPC)

lecithins were measured by using pulsed gradient proton NMR spin-echo techniques. Oriented samples were used to minimize anisotropic dipolar interactions and permit formation of a spin-echo. A general discussion of the technique and of the possible errors is included. The results agree with recent photo-spin-label measurements. Cholesterol in small amounts (less than 10 mol %) in DPL *increases* lipid diffusion; its presence in larger concentrations decreases diffusion.

EFFECTS OF WHOLE WHEAT FLOUR AND MILL-FRACTIONS ON LIPID METABOLISM IN RATS (40395). M-L. W. Chang, M.A. Johnson, and D. Baker (Nutr. Inst., Sci. and Educ. Admin., U.S. Dept. of Agric., Beltsville, MD 20705) *Proc. Soc. Exp. Biol. Med. 160*(1), 88-93 (1979). Effects on lipid metabolism in rats were studied of (1) commercially available whole wheat flour (WW) and (2) hardred winter (HRW) whole wheat and mill-fractions in cholesterol-free diets. For similar food intake, dietary WW as compared with white flour (WF) increased bile acid excretion, fecal dry weight, pellet number and size. The results suggest that a factor in wheat affected the levels of cholesterol in serum and liver and was concentrated in the low-grade flour fraction and also that dietary fiber from wheat did not alter cholesterol levels in serum and liver.

INFLUENCE OF SAPOGENINS ON CHOLESTEROL METABOLISM IN RATS (40403). D. Kritchevsky, S.A. Tepper, and J.A. Story (The Wistar Inst. of Anatomy and Biology, Philadelphia, PA 19104) *Proc. Soc. Exp. Biol. Med. 160*(1), 126-9 (1979). Rats were fed for four weeks on a basal fiber-free diet (B) or the same diet augmented with 1% cholesterol (BC). Diosgenin, tigogenin, hecogenin, β-sitosterol and their acetates (1%) were added to diet BC. Liver cholesterol and triglyceride levels of rats fed BC were significantly elevated compared to rats fed diet B (472 and 165%, respectively). The acetates of hecogenin, togogenin and β-sitosterol were more effective than the unesterified steroids in inhibiting cholesterol accumulation in liver.

BIOCHEMICAL ASPECTS OF LIPID-DERIVED FLAVORS IN LEGUMES. D.J. Sessa (Northern Reg. Res. Center, Agr. Res., Sci. and Educ. Admin., U.S. Dept. of Agric., Peoria, IL 61604) *J. Agric. Food Chem. 27*(2), 234-9 (1979). Lipoxygenase-mediated conversion of polyunsaturated fatty acids to aldehydes and alcohols is a major contributor of the off-flavors in legume protein products. Numerous volatile compounds produced by action of either purified pea or soybean lipoxygenases on linoleic aicd and linolenic acids include 2-*n*-pentylfuran and 3-*cis*-hexenal, both of which reportedly contribute to the green-beany flavor of soybeans. Higher alka-2,4-dienals, described as tasting oxidized, cardboardlike, oily, and painty, have also been generated by enzymic oxidations. A novel 5-substituted-2-furaldehyde from linolenic acid decomposition is released from bitter tasting soy phospholipids. Nonvolatile oxygenated fatty acids are also generated in model systems with soybean lipoxygenase and linoleic acid or its hydroperoxide in the presence of electron donors. Similar fatty acids can also arise from action of cysteine-Fe^{3+} on linoleic acid hydroperoxides, are found on bitter-tasting soy phosphatidylcholines (SPC), and are produced by soy lipoxygenases acting on purified SPC substrates. Development of off-flavors can be controlled by inactivation of lipoxygenase with heat, acid, alcohol, or antioxidants.

REGULATION OF THE SURFACE PROPERTIES OF THE VERY LOW DENSITY LIPOPROTEIN. F. Schroeder, E.H. Goh, and M. Heimberg (Dept. of Pharmacology, Univ. of Missouri, School of Medicine, Columbia, MO 65212) *J. Biol. Chem. 254*(7), 2456-63 (1979). The surface physical properties of very low density lipoproteins (VLDL) secreted by isolated perfused rat livers were investigated with fluorescence probes. The livers were perfused *in vitro* with a medium of defined composition containing either palmitic or oleic acid bound to purified lipid-free bovine serum albumin. The VLDL triglyceride and cholesteryl ester acyl groups were enriched with the respective fatty acid infused. Smaller alterations in phospholipid acyl group composition were noted. The spectral behavior of fluorescence molecules β-parinaric acid and cholestatrienol, which were incorporated into the VLDL surface, was studied and the locations of the probes were investigated by solvent quench studies. No differences in fluorescence properties of the two types of VLDL were detected with the cholestatrienol nor were characteristic break temperatures revealed by the fluorescent sterol. Some of the cholestatrienol molecules were in close proximity to tryptophan groups of VLDL surface apoproteins. The results are consistent with a structure for the VLDL of a "monolayer surrounding a lipid core" in which phase alterations may occur in the VLDL surface phospholipids but not in the surface sterols.

REGULATION OF VERY LOW DENSITY LIPOPROTEIN INTERIOR CORE LIPID PHYSICOCHEMICAL PROPERTIES. F. Schroeder and E.H. Goh (Dept. of Pharmacology, Univ. of Missouri, School of Medicine, Columbia, MO 65212) *J. Biol. Chem. 254*(7), 2462-70 (1979). The fluorescent molecules 1,6-diphenyl-1,3,5-hexatriene and *N*-phenyl-1-naphthylamine were used to probe the interior core structure of the very low density lipoprotein (VLDL). The fluorescence behavior of *N*-phenyl-1-naphthylamine in the VLDL was strikingly dissimilar from that obtained with 1,6-diphenyl-1,3,5-hexatriene. *N*-Phenyl-1-naphthylamine was partially accessible to the chemical quencher, trinitrophenylglycine; however, about 40% of the probe fluorescence was not quenched. Thus, *N*-phenyl-1-naphthylamine appeared to be associated with the surface as well as with the interior core of the VLDL. The polarization and emission anisotropy also indicated that *N*-phenyl-1-naphthylamine was in a more fluid domain than 1,6-diphenyl-1,3,5-hexatriene and was unaffected by the type of fatty acid enrichment in the VLDL. The results were consistent with the possibility that the physicochemical properties of VLDL core lipids could be regulated by the structure of the fatty acids ingested.

THE HYPOCHOLESTEROLEMIC EFFECT OF TERBUFIBROL AND OTHER DRUGS IN NORMAL AND HYPERCHOLESTEROLEMIC BABOONS. A.N. Howard, R. Zscholcke, R. Loser and G. Hofrichter (Dept. of Medicine, Univ. of Cambridge, Cambridge (Great Britain) and Res. Lab., Klinge Pharma, Munich (FRG)). *Atherosclerosis 32*(4), 367-80 (1979). Hypercholesterolemia was produced in young baboons by feeding either a high protein and fat diet (HPF) or 2% cholesterol (HC). Compared with animals fed a normal monkey diet (N), the main effect of the HPF diet was to increase both LDL and HDL by 35%; total cholesterol (TC) in LDL but not HDL was increased. With the HC diet LDL was increased 3-fold and HDL by 40%, both LDL-TC and HDL-TC being increased. It is concluded that the baboon is a useful species for the investigation of potential hypolipemic compounds but effects on human lipoproteins cannot be predicted with any certainty.

THE BINDING OF TOTAL LOW DENSITY LIPOPROTEINS IN HUMAN ARTERIAL INTIMA AFFECTED AND UNAFFECTED BY ATHEROSCLEROSIS. G.H.V. Bradby, K.W. Walton and R. Watts (Dept. of Exp. Pathology, Univ. of Birmingham, Birmingham, Great Britain) *Atherosclerosis 32*(4), 403-22 (1979). Using polyspecific antiserum to whole human serum and two-dimensional electro-immunodiffusion, it has been established that a wide range of serum proteins present in arterial intima can be mobilised just as effectively from intact as from minced intima samples. Using monospecific antiserum to total low density lipoproteins (TLDL) reactive with apolipoprotein B, or antiserum to albumin, and single-dimensional (rocket) electroimmunodiffusion, it has been shown that quantitation of TLDL or albumin respectively can be carried out on the extractable fractions of these proteins from intact intima from the aorta, coronary and pulmonary arteries.

SERUM LIPID AND LIPOPROTEIN LEVELS IN JAPANESE PATIENTS WITH FAMILIAL HYPERCHOLESTEROLEMIA. H. Mabuchi, R. Tatami, K. Ueda, R. Ueda, T. Haba, T. Kametani, A. Watanabe, T. Wakasugi, S. Ito, J. Koizumi, M. Ohta, S. Miy Amoto and R. Takeda (Second Dept. of Internal Medicine, School of Medicine, Kanazawa Univ., Kanazawa, Japan) *Atherosclerosis 32*(4), 435-44 (1979). Serum lipid and lipoprotein levels were studied in 17 normal subjects, and in 40 heterozygous and 4 homozygous patients with familial hypercholesterolemia (FH) in Japan. The serum cholesterol (Chol) levels (mean ± SD) in normal subjects, heterozygotes were 173 ± 22, 358 ± 70 and 532 ± 44 mg/dl, respectively. LDL-Chol levels in heterozygotes (254 ± 59 mg/dl) were significantly higher than in normal subjects (94 ± 21 mg/dl) and lower than in homozygotes (432 ± 66 mg/dl). LDL-Chol levels in heterozygotes and homozygotes were significantly higher than normal; serum triglyceride (TG) levels in heterozygotes were significantly higher than normal, as were serum phospholipid (PL) levels. LDL-PL levels in heterozygotes were significantly higher than in normal subjects ($P < 0.001$) and lower than in homozygotes ($P < 0.001$). LDL-PL levels in patients with FH were significantly higher than normal.

ISOLATION OF A SPECIFIC ARACHIDONOYL COENZYME A: CYTIDINE DIPHOSPHATE MONOACYLGLYCEROL ACYLTRANSFERASE. W. Thompson and G. MacDonald (Dept. of Biochem., Univ. of Toronto, Toronto, Ontario, Canada M5S 1A8) *J. Biol. Chem. 254*(9), 3311-4 (1979). An enzyme has been isolated from rat liver microsomes that specifically catalyzes the acylation of CDP-monoacylglycerol utilizing arachidonoyl-CoA. The enzyme was purified to near homogeneity and was recovered in 10 to 27% yield correspondingly to 0.01 to 0.03% of original microsomal protein with a purification of over 900-fold. High acylation rates with the product were recorded (> 70 μmol/min/mg of protein). Acylation of the liponucleotide was catalyzed by microsomes and by crude enzyme with any of a number of saturated and unsaturated acyl-CoA thioesters. However, after the final step of affinity chromatography only arachidonoyl-CoA could serve as fatty acid donor. The isolated enzyme thus exhibits strict specificity both with respect to

lysolipid acceptor and acyl group donor.

INHIBITION OF FATTY ACID OXIDATION BY 2-BROMOOCTANOATE: INCLUDING EFFECTS OF BROMOOCTANOATE ON KETOGENESIS AND GLUCONEOGENESIS. B.M. Raaka and J.M. Lowenstein (Grad. Dept. of Biochem., Brandeis Univ., Waltham, Mass. 02154) *J. Biol. Chem. 254*(9), 3303-10 (1979). DL-2-Bromooctanoate inhibits fatty acid oxidation in perfused rat liver and in mitochondria isolated from rat liver. Perfusion of livers for 12 min with 0.6 mM bromooctanoate causes complete and irreversible inhibition of ketogenesis from octanoate or oleate. Bromooctanoate also inhibits gluconeogenesis from lactate plus pyruvate but not from dihydroxyacetone. In isolated mitochondria, bromooctanoate irreversibly inhibits the oxidation of medium and long chain fatty acids and their L-carnitine esters. The extent of inhibition depends on the concentration of inhibitor and on the concentration of mitochondria. The results support the conclusion that an activated derivative of 2-bromooctanoic acid inhibits one or more of the enzymes of β-oxidation.

CHARACTERIZATION OF LIPID-PROTEIN INTERACTIONS IN ACETYLCHOLINESTERASE LIPOPROTEIN EXTRACTED FROM BOVINE ERYTHROCYTES. G. Beauregard and B.D. Roufogalis (Lab. of Molecular Pharmacology, Faculty of Pharmaceutical Sciences, Univ. of British Columbia, Vancouver, B.C. V6T 1W5, Canada) *Biochem. J. 179*(1), 109-17 (1979). Acetylcholinesterase was released from bovine erythrocytes in hypo-osmotic sodium phosphate buffer. Solubilization of the acetylcholinesterase in the particulate fraction with Lubrol WX (2 mg/ml) resulted in the loss of all lipids except cardiolipin. Addition of a mixture of erythrocyte phospholipids to the soluble forms and to the Lubrol WX-solubilized enzyme resulted in the formation of particulate forms of the enzyme with increased partial specific volume and Stokes radius, and a break in the Arrhenius plot of the enzyme activity around 20°C. The break in the Arrhenius plot was abolished by treatment of a soluble enzyme preparation with 1.8M salt (NaCl) in phosphate buffer, conditions that allowed the extraction of cardiolipin from the enzyme by chloroform/methanol. Failure of the high-salt treatment to decrease the Stokes radius made it unlikely that the bound cardiolipin formed a boundary layer or annulus around the protein. It is suggested that cardiolipin is bound to the core of the dimeric protein structure, thereby controlling the acetylcholinesterase activity.

QUANTITATIVE STUDIES OF THE INTERACTION OF CHOLECALCIFEROL (VITAMIN D_3) AND ITS METABOLITES WITH DIFFERENT GENETIC VARIANTS OF THE SERUM BINDING PROTEIN FOR THESE STEROLS. M. Kawakami, M. Imawari and D.S. Goodman (Dept. of Medicine, Columbia Univ. College of Physicians and Surgeons, New York, NY 10032) *Biochem. J. 179*(2), 413-23 (1979). Cholecalciferol (vitamin D_3) and its 25-hydroxy metabolite are transported in plasma bound to a specific protein, the binding protein for cholecalciferol and its metabolites (DBP). DBP is identical with the group-specific component (Gc) proteins, which are known to display genetic polymorphism. Studies were conducted to explore whether or not major differences in the transport of cholecalciferol and its biological metabolites might exist among persons with different Gc phenotypes. Detailed quantitative studies were first carried out on the interaction of 25(OH)D_3 with DBP in 21 different samples of serum, representing eight different Gc phenotypes. The studies used a filter disc assay method that provided highly reproducible quantitative results with cholecalciferol-related sterols. The common genetic variants of DBP/Gc protein, and the uncommon genetic variants studied here, all appear to have similar binding properties for cholecalciferol and its several metabolites.

25-AZAVITAMIN D_3, AN INHIBITOR OF VITAMIN D METABOLISM AND ACTION. B.L. Onisko, H.K. Schnoes, and H.F. DeLuca (Dept. of Biochem., College of Agricultural and Life Sciences, Univ. of Wisconsin-Madison, WI 53706) *J. Biol. Chem. 254*(9), 3493-6 (1979). 25-Azavitamin D_3 inhibited both the bone calcium mobilization and intestinal calcium transport responses of rats to vitamin D_3 but not to 25-hydroxyvitamin D_3. Although 25-azavitamin D_3 had no effect on the response of bone to 1α,25-dihydroxyvitamin D_3, it did diminish the response of the intestine to that metabolite. 25-Azavitamin D_3 increased liver vitamin D content and reduced the concentration of 25-hydroxyvitamin D_3 in the serum. The doses of 25-azavitamin D_3 required to inhibit the metabolism of vitamin D_3 (75 and 200 μg) were similar to the doses of 25-azavitamin D_3 required to inhibit the action of vitamin D_3 *in vivo* (500 and 100 μg). 25-Azavitamin D_3 is thus a vitamin D antagonist, acting for the most part via inhibition of the liver 25-hydroxylation of vitamin D_3.

EFFECTS OF ETHYNYLOESTRADIOL ON THE METABOLISM OF [1-^{14}C]OLEATE BY PERFUSED LIVERS AND HEPATOCYTES FROM FEMALE RATS. I. Weinstein, C. Soler-Argilaga, H.V. Werner, M. Heimberg (Departments of Pharmacology and Medicine, University of Missouri School of Medicine, Columbia, MO 65212), *Biochem. J. 180,* 265-71 (1979). Normal female rats were given 15 μg of ethynyloestradiol/kg body wt. for 14 days and were killed on day 15 after starvation for 12-14h. The livers were isolated and were perfused with a medium containing washed bovine erythrocytes, bovine serum albumin, glucose and [1-^{14}C]-oleic acid; 414 μmol of oleate were infused/h during a 3h experimental period. It is pertinent that hepatocytes prepared from livers of fed rats that had been treated with ethynyloestradiol produced fewer ketone bodies and secreted more triacylglycerol than did hepatocytes prepared from control animals. In these respects, the effects of the steroid were similar in livers from fed or starved (12-14h) rats. Oestrogens may possibly inhibit hepatic oxidation of fatty acid, making more fatty acid available for the synthesis of triacylglycerol, or may stimulate the biosynthesis of triacylglycerol, or may be active on both metabolic pathways.

THE ROLE OF INSULIN IN THE REGULATION OF STEARIC ACID DESATURASE ACTIVITY IN LIVER AND ADIPOSE TISSUE FROM OBESE-HYPERGLYCAEMIC (*OB/OB*) AND LEAN MICE. M. Enser (Agr. Res. Council, Meat Res. Inst., Langford, Bristol BS18 7 D Y, U.K.) *Biochem. J. 180*(3), 551-8 (1979). The relationship between the hyperinsulinaemia of obese-hyperglycaemic (*ob/ob*) mice and their high activity of stearic and Δ^9-desaturase compared with lean mice has been investigated. After treatment the hepatic desaturase activities were 24, 68 and 19% less respectively on a cell basis than in livers from untreated obese mice, and the total epididymal fat-pad activities were lower by 16, 62 and 57%. These results suggest that hyperinsulinaemia is not essential for the increased hepatic desaturase, but may be important in adipose tissue. Food intake appears to be a significant factor controlling the hepatic desaturase activity, but even this may be subject to overriding regulation by the concentration of esterified linoleic acid in the liver lipids, which was negatively correlated (r=0.91, P<0.001) with desaturase activity.

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 Ave., Ohio State University, Columbus, OH 43210) *Biochim. Biophys. Acta 573*(3), 436-42 (1979). An analysis of overall chain elongation, condensation, β-hydroxyacyl-CoA dehydrase and 2-*trans* enoyl-CoA reducatase 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 CoA derivatives. Reverse dehydrase reactions run with 2-*trans* enoyl-CoA derivatives as substrates, in the absence of NADPH, revealed taht 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.

DISSOCIATION OF APOLIPOPROTEIN A-I FROM PORCINE AND BOVINE HIGH DENSITY LIPOPROTEINS BY GUANIDINE HYDROCHLORIDE. T.M. Forte, R.W. Nordhausen, A.V. Nichols, G. Endemann, P. Miljanich and J.J. Bell-Quint (Donner Lab., Lawrence Berkeley Lab., Univ. of California, Berkely, CA 94720) *Biochim. Biophys. Acta 573*(3), 451-63 (1979). Dissociation of apolipoprotein A-I from pig and steer high density lipoproteins (HDL) deficient in apoA-II was determined by exposing native HDL fractions to a 6 M guanidine hydrochloride (Gdn-HCl) at 37°C for periods from 5 min to 18 h. Bovine high density lipoprotein (HDL-B) wss isolated at d 1.063-1.100 g/ml while procine high density lipoprotein (HDL-P) was isolated at d 1.25-1.21 g/ml. The difference in behavior of HDL-B and HDL-P to Gdn-HCl exposure is discussed in terms of differences in apolipoprotein A-I amino acid composition, interaction of apolipoprotein A-I with phospholipids and the possible involvement of the cholesteryl ester core.

26-HYDROXYLATION OF C_{27}-STEROIDS BY SOLUBLE LIVER MITOCHONDRIAL CYTOCHROME P-450. J.I. Pedersen, I. Bjorkhem, and J. Gustafsson (Inst. for Nutr. Res., School of Medicine, Univ. of Oslo, Oslo 3, Norway) *J. Biol. Chem. 254*(4), 6464-9 (1979). A study of the enzymatic properties of a cytochrome P-450 preparation previously isolated from rat liver mitochondria has been undertaken. Treatment of rats with phenobarbital was found to increase both the amount and the specific content of cytochrome P-450 isolated from the liver mitochondria. With a reconstituted system consisting of the cytochrome P-450 prepara-

tion, adrenodoxin, adrenodoxin reductase, and a NADPH-generating system, several C_{27}-steroids considered to be intermediates in the formation of bile acids were found to be hydroxylated in the 26-position. The mitochondrial cytochrome P-450 has much higher potential for 26-hydroxylation than microsomal cytochrome P-450.

ISOLATION AND CHARACTERIZATION OF HIGH DENSITY LIPOPROTEIN APOPROTEINS IN THE NONHUMAN-PRIMATE (VERVET). J.S. Parks and L.L. Rudel (Dept. of Comparative Medicine, Bowman Gray School of Medicine, Wake Forest Univ., Winston-Salem, NC 27103) *J. Biol. Chem. 254*(14), 6716-23 (1979). Six different apoproteins have been isolated and characterized from vervet high density lipoprotein (HDL). The apoproteins were isolated and purified by a combinatin of gel and ion exchange chromatography along with preparative isoelectric focusing. Measured properties of the apoproteins included: relative mobility on urea-polyacrylamide gel electrophoresis (PAGE), isoelectric point, molecular weight, amino acid composition, sialic acid content, ability to activate purified lipoprotein lipase, and relative content in HDL. Based on these characteristics, several analogies were seen between human and vervet HDL apoproteins. It was concluded that: 1) vervet and human HDL apoproteins are similar based on chemical, physical, and functional characteristics, and 2) the relative amounts of the threonine-poor apoproteins in vervet HDL are greater and more variable than in normal human HDL.

HIGH DENSITY LIPOPROTEIN LEVELS IN CHILDREN OF YOUNG MEN WITH ISCHAEMIC HEART DISEASE. M.S. Nupuf and W.H.F. Sutherland (Dept. of Medicine, P.O. Box 913, Dunedin, New Zealand) *Atherosclerosis 33*(3), 365-70 (1979). This study was designed to assess HDL levels in children of young men with IHD, compared with children of asymptomatic men. Like their fathers, sons of patients with heart disease, had significantly lower HDL cholesterols than controls. This difference was independent of fasting triglycerides, obesity, diet or physical activity, and was the only "coronary risk factor" in this young age group.

SEPARATE MECHANISMS FOR THE UPTAKE OF HIGH AND LOW DENSITY LIPOPROTEINS BY MOUSE ADRENAL GLAND *IN VIVO*. P.T. Kovanen, W.J. Schneider, G.M. Hillman, J.L. Goldstein, and M.S. Brown (Dept. of Molecular Genetics and Internal Med., Univ. of Texas Health Science Center, Dallas, TX 75235) *J. Biol. Chem. 254*(12), 5498-505 (1979). The adrenal gland of the mouse exhibits uptake mechanisms of plasma high density lipoprotein (HDL) and low density lipoprotein (LDL). To study this uptake, we lowered the endogenous plasma lipoprotein level in mice by administering 4-aminopyrazolopyrimidine and then injected the animals with tracer amounts of human ^{125}I-HDL or ^{125}I-LDL intravenously. In cross-competition experiments, unlabeled LDL competed more effectively than unlabeled HDL for ^{125}I-LDL uptake; conversely, unlabeled HDL competed more effectively than unlabeled LDL for ^{125}I-HDL uptake. These data suggest that two different lipoprotein uptake systems supply cholesterol to the adrenal gland of the mouse, one using LDL and another using HDL.

THE FATTY ACID PATTERN OF TRIGLYCERIDES AND FFA IN SERUM OF SPONTANEOUSLY HYPERTENSIVE RATS (SHR). P. Singer, S. Voigt, V. Moritz and R. Baumann (Central Inst. of Cardiovascular Regulation Res., Academy of Sci. of G.D.R., 1115 Berlin-Buch (G.D.R.)) *Atherosclerosis 33*, 227-38 (1979). The fatty acid patterns of serum triglycerides and FFA in SHR and in normotensive controls aged 4, 8 and 26 weeks were estimated by gas-liquid chromatography. In serum triglycerides of SHR, the percentage of linoleic acid ($C_{18:2}$) was lower and the content of arachidonic acid ($C_{20:4}$) higher than in age-matched control animals. A continous increase in palmitic (C_{16}) and linoleic acids as well as a decrease in arachidonic acid has been found with advancing age, the most striking differences existing between 4- and 8-week-old animals, i.e. before onset of arterial hypertension in SHR. The results are discussed in connection with the hypotensive effect of a linoleic acid-rich diet recently reported in hypertensive rats.

FACTORS AFFECTING THE ACTIVITY AND STABILITY OF THE PALMITOYL-COENZYME A HYDROLASE OF RAT BRAIN. T.E. Knauer (Dept. of Med., Medical College of Virginia, Richmond, VA 23298) *Biochem. J. 179*(3), 515-23 (1979). Palmitoyl-CoA hydrolase (EC 3.1.2.2) catalyses the irreversible hydrolysis of long-chain acyl-CoA thioesters. This enzyme is found primarily in the postmicrosomal supernatant fraction prepared from homogenates of rat brain. Either of two forms of the hydrolase, a lower-molecular-weight species of approx. 70,000 or a higher-molecular-weight species of approx. 130,000 can be isolated by gel filtration. The two forms differ in the availability or reactivity of certain external thiol groups, as determined by covalent chromatography with activated thiol Sepharose. The evidence supports the conclusion that the substrate palmitoyl-CoA promotes the formation of a relatively stable dimer from two unstable subunits. This process may not be reversible, since the removal of palmitoyl-CoA or glycerol from solutions of the higher-molecular-weight form does not result in the appearance of the lower-molecular-weight form of the hydrolase.

ENZYMES OF *MYO*-INOSITOL AND INOSITOL LIPID METABOLISM IN RATS WITH STREPTOZOTOCIN-INDUCED DIABETES. P.H. Whiting, K.P. Palmano, and J.H. Hawthorne (Dept. of Biochem., Univ. of Nottingham Medical School, Queen's Medical Centre, Nottingham NG7 2UH, U.K.) *Biochem. J. 179*(3), 549-53 (1979). Diabetes, with only mild ketosis, was induced in male rats by a single injection of streptozotocin. After 12 weeks the specific activities of enzymes concerned with the metabolism of inositol and of inositol lipids were measured in various tissues. Inositol 1-phosphate synthase (EC 5.5.1.4) was most active in testis and the activity was significantly less in diabetic rats than in controls on a similar diet. Inositol oxygenase (EC 1.13.99.1), which converts *myo*-inositol into glucuronic acid, was also less active in kidney from diabetic animals. CDP-diacylglycerol-inositol phosphatidyltransferase (EC 2.7.8.11) and phosphatidylinositol 4-phosphate kinase (EC 2.7.1.68) showed decreased specific activities in brain and sciatic nerve of diabetic rats. By contrast the diabetic state did not affect the specific activities of phosphatidylinositol kinase (EC 2.7.1.67) or phosphatidylinositol 4,5-bisphosphate phosphatase (EC 3.1.3.36) in these tissues. The results are discussed in relation to diabetic neuropathy.

IN VITRO METABOLISM OF LINOLEATE-ENRICHED LOW DENSITY LIPOPROTEINS. P.J. Nestel and J. Ma (Baker Medical Res. Inst., Melbourne, 3181, Australia) *Artery Leonides (Mich.) 6*(1), 20-7 (1979). Low density lipoproteins (LDL) were isolated from subjects before and after a linoleate-rich diet, radioiodinated and incubated with human fibroblasts. The uptake and degradation of both species of LDL were similar and the cholesterol content of the cells rose comparably. Fibroblasts that were enriched in oleate or linoleate content through the addition of the fatty acids to the culture medium metabolized LDL at similar rates. The data suggest that linoleate-rich diets lower the plasma LDL concentration by mechanisms other than enhanced LDL removal in extra-hepatic cells.

REGULATION OF PHOSPHATIDYLCHOLINE METABOLISM BY CYCLIC AMP IN A MODEL ALVEOLAR TYPE 2 CELL LINE. R.M. Niles and J.S. Makarski (Div. of Surgery and Dept. of Biochem., Boston Univ. School of Medicine, Boston, Mass.) *J. Biol. Chem. 254*(11), 4324-6 (1979). The influence of cyclic AMP on the metabolism of phosphatidylcholine, the major component of pulmonary surfactant was examined in a cell line (A 549) with type 2 pneumonocyte characteristics. It was found that cyclic AMP increased both the total amount of phosphatidylcholine and disaturated phosphatidylcholine as well as the incorporation of [^{3}H]-choline into these fractions. The effect was specific for cyclic AMP since 5'-AMP, adenosine, and cyclic GMP did not alter phosphatidylcholine of disaturated phosphatidylcholine in levels. Since the ability of various cyclic AMP analogs to increase phosphatidylcholine and disaturated phosphatidylcholine levels was correlated with their ability to activate protein kinase, it seems likely that a protein phosphorylation mechanism is involved in controlling phosphatidylcholine metabolism

STEREOCHEMICAL SPECIFICITY OF THE BIOSYNTHESIS OF THE ALKYL ETHER BOND IN ALKYL ETHER LIPIDS. P.A. Davis and A.K. Hajra (Dept. of Bio. Chem. and Mental Res. Inst., Univ. of Michigan, Ann Arbor, MI 48109) *J. Biol. Chem. 254*(11), 4760-3 (1979). The stereochemical course of the formation of the alkyl ether bond in alkyl ether lipids was investigated through the synthesis of stereospecifically labeled acyl *R*- of *S*-[1-^{13}H] dihydroxyacetone 3-phosphate (DHAP) starting from L-glyceraldehyde. It was demonstrated directly that the formation of the alkyl ether bond results in the stereospecific exchange of the *pro-R* C-1 hydrogen of DHAP with a proton of water. The configuration of the hydrogen that is retained on C-1 after formation of the alkyl ether bond was also investigated. The results demonstrated that the retained hydrogen on C-1, which was *pro-S* in the starting substrate, was *pro-S* in the product alkyl ether.

LIPOPROTEIN LIPASE OF CULTURED MESENCHYMAL RAT HEART CELLS. IV. MODULATION OF ENZYME ACTIVITY BY VLDL ADDED TO THE CULTURE MEDIUM. G. Friedman, O. Stein and Y. Stein (Lipid Res. Lab., Dept. of Medicine B, Hadassah Univ. Hospital, Jerusalem, Israel) *Biochim. Biophys. Acta 573*(3), 521-34 (1979). Lipoprotein lipase activity was studied in rat heart cell cultures grown in the presence of 20% fetal calf and horse serum and a medium concentration of triacylglycerol of 0.03 mg/ml. After 6-8 days, when the enzyme activity had reached high levels, the cells were incubated for 24 h in a medium containing 20% serum derived from fasted or fed rats. The present results obtained with cultured

rat hearts cells suggest that in vivo plasma levels of triacylglycerol-rich lipoproteins could modulate the lipoprotein lipase activity of the heart.

ACTIVATION OF LIPOPROTEIN LIPASE BY NATIVE AND ACYLATED PEPTIDES OF APOLIPOPROTEIN C-II. T.A. Musliner, P.N. Herbert, and E.C. Church (Div. of Clinical and Exp. Atherosclerosis, The Miriam Hospital, 164 Summit Ave., Providence, RI 02906) *Biochim. Biophys. Acta 573*(3), 501-9 (1979). Apolipoprotein C-II, a protein found associated with all major classes of plasma lipoproteins, is a potent activator of the enzyme lipoprotein lipase. We have prepared the malenyl, citraconyl and succinyl derivatives of apolipoprotein C-II, and compared the capacities of the intact and tryptically cleaved proteins to activate lipoprotein lipase. The NH_2-terminal 50 residue peptide proved virtually inactive, even after removal of the masking groups from the citraconyl derivative. The COOH-terminal 29 residue peptides of maleyl and citraconyl apolipoprotein C-II were more active than the corresponding succinylated peptide. After deacylation of the citraconyl derivative, the COOH-terminal peptide had maximal activity as great as apolipoprotein C-II, although the profile of activation remained dissimilar at low activator concentrations.

EFFECT OF SPHINGOSINE AND OTHER AMPHIPHILIC AMINES ON THE BIOSYNTHESIS OF PHOSPHATIDYLETHANOLAMINE AND OTHER GLYCEROLIPIDS IN ISOLATED RAT HEPTOCYTES. B. Akesson (Dept. of Physiological Chem., Univ. of Lund, Lund, Sweden) *Biochim. Biophys. Acta 573*(3), 481-8 (1979). The importance of ethanolamine and sphingosine as percursors of phosphoethanolamine was investigated by incubating them with [^{3}H]glycerol and isolated rat heptocytes. Sphingosine (0.1-0.5 mM) stimulated the synthesis of phosphatidylethanolamine from [^{3}H]glycerol, but the stimulation by ethanolamine was more pronounced. Furthermore, more phosphoethanolamine accumulated in the hepatocytes after incubation with ethanolamine than after incubation with sphingosine. It is concluded that ethanolamine is the most important phosphoethanolamine precursor in rat liver.

CO-ORDINATE REGULATION OF ETHANOLAMINE KINASE AND PHOSPHOETHANOLAMINE CYTIDYLYLTRANSFERASE IN THE BIOSYNTHESIS OF PHOSPHATIDYLETHANOLAMINE IN RAT LIVER. EVIDENCE FROM ESSENTIAL-FATTY ACID-DEFICIENT ANIMALS. J.P. Infante and J.E. Kinsella (College of Agr. and Life Sciences, Dept. of Food Sci., Stocking Hall, Cornell Univ., Ithaca, NY 14853) *Biochem. J. 179*(3), 723-5 (1979). Essential-fatty acid deficiency produces a 52% increase in the rate of phosphatidylethanolamine synthesis in rat liver as calculated from results obtained *in vivo* (Trwhella & Collins (1973) *Biochim. Biophys. Acta* 296, 34-50). This flux change was used to test the possible regulatory roles of ethanolamine kinase and of phosphoethanolamine cytidylyltransferase, which are rate-limiting enzymes of the cytidine pathway for the synthesis of phosphatidylethanolamine (Infante (1977) *Biochem. J.* 167, 847-849). The results show that essential-fatty acid deficiency produces 50% and 53% increases respectively in the specific activity of these enzymes, accounting for the increased rate of phosphatidylethanolamine synthesis produced by this dietary insufficiency. This evidence leads to the conclusion that ethanolamine kinase and phosphoethanolamine cytidylyltransferase have co-ordinated regulatory roles in the flux control of the cytidine pathway, and its sphinganine 1-phosphate lyase branch reaction, for the synthesis of phosphatidylethanolamine.

CORRELATION BETWEEN SKELETAL MUSCLE FREE FATTY ACID EXTRACTION AND VASCULAR DECOMPENSATION DURING HEMORRHAGIC HYPOTENSION. R.F. Bond, A. Zepp, L.C. Peissner, and E.S. Manning (Department of Physiology, Kirksville College of Osteopathic Medicine, Kirksville, Missouri 63501) *Lipids 14*(10), 842-7 (1979). The objective of this study was to determine whether or not a relationship exists between free fatty acid (FFA) extraction by skeletal muscle and onset of irreversible shock. Hind limb skeletal muscle vasculature of anesthetized dogs was surgically isolated from cutaneous tissue and subjected to a modified Wigger's hemorrhage shock protocol which was divided into five stages (I-V). Since the first signs of irreversibility began in Stage II, this stage of hypovolemic hypotension was subdivided into IIa, IIb and IIc. Arterial and venous blood samples were taken during each stage for subsequent blood gas and FFA analysis. The data indicated that the onset of severe tissue ischemia and metabolic acidosis occurs concurrently with increased uptake of FFA and skeletal muscle vasodilation (decompensation). A possible physiological explanation for these observations could be related to an increased synthesis and release of PGE_1. This agent has been shown by others to inhibit adrenergic neurotransmitter release causing loss of vascular tone.

pH GRADIENT ELECTROPHORESIS AND ISOELECTRIC FOCUSING OF LIPOPROTEINS ON AGAROSE BEAD THIN LAYERS. A. Vost, D.M-E. Pocock, and S. Pleet (McGill University Medical Clinic, Montreal General Hospital, Montreal, Quebec, Canada H3G 1A4) *Lipids 14*(10), 864-71 (1979). A new method of isoelectric focusing (IEF) and pH gradient electrophoresis, using thin layers of agarose gel beads, was devised to investigate chylomicrons and very low density lipoproteins (VLDL). pH gradient stability and cathodal gradient drift were similar to those of polyacrylamide gel IEF, and linearity of gradients was maintained for 23 hr. Chylomicrons and VLDL were detectable without staining. Chylomicrons from human serum and from rat lymph migrated in this system. Rat lymph chylomicrons, obtained by ultracentrifugation, migrated in several discrete bands, and this heterogeneity of rat chylomicrons was confirmed by electron microscopic demonstration of chylomicrons in each band. This new technique has permitted the first measurement of isoelectric points of some lipoproteins in the ultracentrifuged fraction of human serum chylomicrons and the first separation of multiple discrete fractions of ultracentrifuged lymph chylomicrons.

POTENTIAL USE OF 1,25-DIHYDROXYCHOLECALCIFEROL FOR PREVENTION OF PARTURIENT PARESIS. D.R. Gast, R.L. Horst, N.A. Jorgensen, and H.F. DeLuca (Depts. of Dairy Science and Biochem., Univ. of Wisconsin, Madison, WI 53706) *J. Dairy Sci. 62*(6), 1009-13 (1979). Twelve cows, at least third parity, were assigned randomly to either a control or treatment group. Treated cows received .4 mg of the vitamin D metabolite, 1,25-dihydroxycholecalciferol intramusculary in 5 ml corn oil. Intramuscular injections were started 5 days before predicted calving with reinjections every 5 days until calving. Incidence of parturient paresis was 0 and 33% (2 of 6) in the treated and control groups. Response to treatment was rapid with elevated calcium in serum approximately 12 hr postinjection. Based on these observations 1,25-dihydroxycholecalciferol holds promise as a preventative of parturient paresis; however, further studies are needed on application and safety.

ALTERATIONS IN THE RATE OF LIPOGENESIS *IN VIVO* IN MATERNAL LIVER AND ADIPOSE TISSUE ON PREMATURE WEANING OF LACTATING RATS. A POSSIBLE REGULATORY ROLE OF PROLACTIN. L. Agius, A.M. Robinson, J.R. Girard, and D.H. Williamson (Metabolic Res. Lab., Nuffield Dept. of Clin. Med., Radcliffe Infirmary, Oxford OX2, 6HE, United Kingdom) *Biochem. J. 180*(3), 689-92 (1979). Removal of pups for 24 h from rats at peak lactation decreased ^3H_2O incorporation into lipid *in vivo* in mammary gland by 95%, whereas it was increased in liver (77%) and adipose tissue (330%). These increases were prevented by administration of prolactin. Plasma insulin increased 3-fold on weaning and this was partially prevented by prolactin.

STUDIES ON THE BIOSYNTHESIS OF SULFOLIPIDS IN THE DIATOM *NITZSCHIA ALBA*. R. Anderson, M. Kates and B.E. Volcani (Dept. of Microbio. and Immunology, Univ. of Western Ontario, London, Ontario N6A 5C1, Canada) *Biochim. Biophys. Acta 573*(3), 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 phosphatidylsulfocholine 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.

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., National Heart, Lung and Blood Inst., National Institutes of Health, Bethesda, MD 20014) *Biochim. Biophys. Acta 573*(3), 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.

Fats and oils

VARIATION OF THE QUALITY OF LIPIDS DURING THE BAKING OF PASTRY. A.I. Danilova et al. *Pishch. Tekhnol.* 1979(3), 123-5. (Rev. Fr. Corps Gras).

INFLUENCE OF THE DEGREE OF EXTRACTION ON THE REFINING OF COTTONSEED OIL IN THE MIDDLE OF MISCELLA. S.K. Ibraguimov et al. *Pishch. Tekhnol.* 1979(3), 70-3. (Rev. Fr. Corps Gras).

ABOUT THE STABILITY TO OXIDATION OF FISH OIL. L.S. Sedova et al. *Pishch. Tekhnol.* 1979(3), 64-6. (Rev. Fr. Corps Gras).

DILATOMETRIC STUDIES OF MIXTURES RICH IN LIPIDS FOR ICE CREAM. V.A. Ousatcheva et al. *Pishch. Tekhnol.* 1979(3), 57-60. (Rev. Fr. Corps Gras).

STRUCTURE OF THE USED NICKEL CATALYSTS FOR THE HYDROGENATION OF FATS. K. Kh. Mazhidov et al. *Pishch. Tekhnol.* 1979(3), 37-9. (Rev. Fr. Corps Gras).

FATTY ACID COMPOSITION OF TRITICALE LIPIDS. G.G. Romaniuk et al. *Pishch. Tekhnol.* 1979(3), 25-6. (Rev. Fr. Corps Gras).

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BEHAVIOR OF PROTEIN MATERIALS AND OF GOSSYPOL DURING THE DIRECT EXTRACTION OF COTTONSEEDS. A.K. Esik et al. *Maslo-zhir. Promst.* 1979(7), 19-21. (Rev. Fr. Corps Gras).

INFLUENCE OF THE WORK CONDITIONS OF THE SEPARATORS ON THE COMPOSITION OF THE SOAPSTOCKS. G. Ya. Swirnov et al. *Maslo-zhir. Promst.* 1979(5), 26-8. (Rev. Fr. Corps Gras).

DETERMINATION OF THE TARTARIC ACID IN THE MONOGLYCERIDE AND DIGLYCERIDE ESTERS WITH DIACETYLTARTARIC ACID. A.A. Shmidt et al. *Maslo-zhir. Promst.* 1979(5), 23-4. (Rev. Fr. Corps Gras).

OBTAINMENT OF FIRST QUALITY CRUDE GLYCERINE FROM TECHNICAL FAT WITH HIGH ACIDITY. M.V. Irodov. *Maslo-zhir. Promst.* 1979(4), 42. (Rev. Fr. Corps Gras).

ECONOMIC EVALUATION OF THE WAYS OF DISCHARGING OF THE SUNFLOWER SEEDS. I.I. Belokhvostikov et al. *Maslo-zhir. Promst.* 1979(4), 31-3. (Rev. Fr. Corps Gras).

TREATMENT OF SUNFLOWER AND SOYBEAN MEALS OF EXTRACTION WITH THE SOAPSTOCKS. A.K. Mosiane et al. *Maslo-zhir. Promst.* 1979(6), 21-3. The addition of soapstocks to the sunflower and soybean meals of extraction doesn't change their quality even during prolonged storage (50-80 days). It is recommended to introduce the soapstocks into the meal of extraction before its entrance in the evaporator. The compositions of fatty acids of the oil separated from the meal before and after the addition of the soapstocks are analogous; they are characterized by an important content of essential fatty acids. (Rev. Fr. Corps Gras).

METHODS OF CALCULATION OF THE CONTENT OF INDIVIDUAL FATTY ACIDS IN FOOD PRODUCTS. D.I. Konznetsov et al. *Voprosy Pitania* 1979(3), 56-66. Two methods are proposed for calculation of the individual fatty acids composition in a food product on the basis of the data obtained with gas chromatography and thin-layer chromatography or only with gas chromatography (method of the added standard). The first one is used for the calculation of the individual fatty acid composition in the food products for the second volume of "Tables of the chemical composition of food products". A variant of the acid-alkaline methanolysis of a lipid and of the esterification of free fatty acids in a closed system was proposed. (Rev. Fr. Corps Gras).

PREPARATION AND PURIFICATION OF ARACHIDONIC ACID HYDROPEROXIDES OF BIOLOGICAL IMPORTANCE. N.A. Porter, J. Logan, and V. Kontoyiannidou (Paul M. Gross Chem. Lab., Duke Univ., Durham, NC 27706) *J. Org. Chem. 44*(18), 3177-81 (1979). Singlet oxygen oxidation of arachidonic acid (5,8,11,14-eicosatetraenoic acid) leads to eight hydroperoxides that may be separated by high-pressure liquid chromatography. The hydroperoxides result from allylic oxidation of one of the double bonds of the polyene fatty acid, a trans double bond being formed in the process. 12-(Hydroperoxy)eicosatetraenoic acid, 12-HPETE, a biologically important hydroperoxide formed from arachidonic acid and a lipoxygenase enzyme present in blood platelets, may be prepared by this approach.

FATTY AND AMINO ACID COMPOSITION OF SALTED MULLET ROE. J.Y. Lu, Y.M. Ma, C. Williams and R.A. Chung (Food Science Lab., Tuskegee Inst., Tuskegee, AL 36088) *J. Food Sci. 44*(3):676-7 (1979). Salted mullet roe was prepared by soaking in brine, pressing and air drying. The prepared roe product was high in protein (35.5%) and lipids (25.7%). The GLC analysis showed that the major saturated fatty acid was 16:0 and the major unsaturated fatty acids were 16:1 and 18:1 in the roe lipids. The analysis of the roe protein indicated that the major amino acids were glutamic acid, proline and lysine. The roe protein is well balanced with essential amino acids, and appears to be a high quality protein.

SYNTHESIS OF PHOSPHOLIPID ANALOGUES. VARIATION OF THE P-N DISTANCE. W. Diembeck and H. Eibl (Max-Planck-Institut für biophysikalische Chemie, D-3400 Göttingen-Nikolausberg, F.R.G.) *Chem. Phys. Lipids 24*(3), 237-44 (1979). Phosphatidyl choline analogues with increased phosphate-trimethylammonium distance and phosphatidyl ethanolamine analogues with increased phosphate-ammonium distance were synthesized. The distance was varied by the incorporation of additional methylene groups, from 2 (natural) to 11 CH_2-units. The synthesis of the analogues was possible by phosphorylation of 1,2-dipalmitoyl-*sn*-glycerol with bromoalkylphosphoric acid dichlorides which were obtained from the respective bromoalkanols and phosphorus oxychloride. The resulting bromoalkylesters of 1,2-dipalmitoyl-*sn*-glycerol were subjected to direct amination with trimethylamine. dimethylamine, methylamine and ammonia to yield to respective phosphatidyl choline and ethanolamine analogues. Chromatographically pure products were obtained in yields of 50 to 70% of the 1,2-diacyl glycerol.

PRELIMINARY IDENTIFICATION OF VOLATILE FLAVOR COMPOUNDS IN THE NEUTRAL FRACTION OF ROAST BEEF. D.B.S. Min, K. Ina, R.T. Peterson and S.S. Chang (Dept. of Food Sci., Dook College, Rutgers, The State Univ., New Brunswick, NJ 08903) *J. Food Sci. 44*(3), 639-42 (1979). The volatile flavor compounds (VFC) in the neutral fraction of roast beef flavor isolate were identified in this study. The VFC from 150 lb of eye round roast beef were isolated and separated into acidic, basic and neutral fractions. Since the latter fraction was the only one to have a pleasant roast beef-like aroma, it was the only fraction further analyzed. The components of the neutral fractions. The components of the neutral VFC fraction were separated into relatively pure subfractions by repetitive gas chromatography and collection in "Hairpin" cold traps. The relatively pure subfractions were then analyzed by GC-MS combination. More than 120 compounds were identified including a number of lactones, substituted aromatic compounds, furan compounds, and sulfur-containing compounds. The aforementioned classes of compounds may play significant roles in the roast beef flavor.

EFFECTS OF OILSEED PROTEINS, AT TWO REPLACEMENT LEVELS, ON CHEMICAL, SENSORY AND PHYSICAL PROPERTIES OF FRANKFURTERS. R.N. Terrell, J.A. Brown, Z.L. Carpenter, K.F. Mattil and C.W. Monagle (Meats & Muscle Biology Section, Dept. of Animal Science, Texas A&M Univ., TX 77843). *J. Food Sci. 44*(3):867-8 (1979). Frankfurters (all meat) and frankfurter-like products (oilseed proteins replaced 30% of the meat) were prepared. Oilseed proteins were hydrated to a protein content of 13% during batter preparation. There were no significant differences among finished products in protein content; however, frankfurter-like products containing 10% oilseed proteins has ($P < 0.05$) higher moisture, fat and ash percentages than did frankfurters or frankfurter-like products containing 30% oilseed proteins. Differences in sensory panel ratings for overall satisfaction and texture desirability were more apparent among frankfurter-like products when 30%, rather than 10%, of the meat was replaced with oilseed proteins. None of the frankfurter-like products containing 30% oilseed proteins was as desirable in overall satisfaction or texture desirability as the all-meat frankfurter.

AFRICAN BAOBAB OIL: ADANSONIA DIGITATA L. FATTY ACID AND STEROL COMPOSITION. E.M. Gaydou, J.-P. Bianchini and A. Ralaimanarivo. Rev. Fr. Corps Gras, *26* 447-8 (1979). The oil from seeds of Adansonia digitata L (Baobab) can be used as an edible fat. It contains important enough proportions of palmitic (27%), oleic (42%) and linoleic (21%) acids. The sterol fraction is analyzed; it is rich in cholesterol and β-sitosterol.

ADDITIVES AND EDIBLE OILS. INFLUENCE ON QUALITY. E. Zwobada. Rev. Fr. Corps Gras, *26* 435-40 (1979). Many additives are proposed to increase resistance to oxydative and thermal deterioration of vegetable oils. These are: antioxidants, synergetics for antioxidants, sequestering agents for metal traces, antifoams. Their use involves the observation of: a legal matter, rules vary from country to country and are sometimes very compelling; a consumerism matter, the use of specific additives may be unfavorable for the selling or trading; to forecast such an effect is difficult; a technical matter, it is difficult to correlate laboratory tests set up for quantifying the additive efficiency and the feeling of the consumers about the oil quality.

EXTRACTION OF RAPESEED OIL AND PROTEINS, BY WATER. T. Staron and R. Guillaumin. Rev. Fr. Corps Gras, *26* 441-6 (1979). Rapeseed contains excellent proteins, but its high content of fiber and toxic compounds restricts the use of meals in animal feed. The processes for detoxifying the meals are of little efficient or too expansive. The meals of varieties without thioglucosides contain still isoflavones which have antinutritional properties. The processing described in this paper removed the fiber and toxic compounds from seeds. It provides, with good yields, an edible oil of quality, easily refinable and not affected by the reversion. The proteins have a high nutrition value for monogastric animals and would be able to be used for human nutrition.

KINETIC STUDY ON THE CRYSTALLIZATION OF PLASTIC FATS. V. SOLIDIFICATION IN PRESENCE OF WATER. E. Sambuc, Z. Dirik and M. Naudet. Rev. Fr. Corps Gras, *26* 399-407 (1979). Because of the reciprocal insolubility of water and fats the kinetics of fat solidification in presence of water can be studied only with shaking in order to keep the homogeneous medium, at least as long as this is fluid or pasty. A device allowing, with shaking, to plot the cooling and solidification curves is described. The solid content is determined discontinuously by wide pulsed band NMR.

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The obtained curves for fats, just as they are, are comparable with these obtained in purely static conditions. The introduction of water leads to decreased cooling speed and apparently decreased solidification speed. However, if the results are related not to fat water mixture but to pure fat, it is found the water accelerates lightly crystallization and decreases intensity of surfusion.

CATALYSIS BY PRECIOUS METALS IN LIPID CHEMISTRY. I. HYDROGENATION OF SOYBEAN OIL CATALYZED BY SUPPORTED PRECIOUS METALS. G. Cecchi, J. Castano, and E. Ucciani. Rev. Fr. Corps Gras, *26* 391-7 (1979). Supported precious metals (Ru, Rh, Pd, Pt on alumina or carbon) were used to catalyze the partial hydrogenation of soybean oil in comparison with a nickel catalyst. The specific activity was found to be under the influence of the support, carbon being better than alumina. Precious metals exhibit an activity higher than that of nickel, as exemplified by the ordering: Pd> Rh> Pt> Ru> Ni. The S3,2 selectivity remains in every case at a low level (1,7 <S3,2 <2,5) but is always better than that of Ni. So it is with the S3,1 selectivity which is kept unchanged whatever the support: Rh> Pd> Pt> Ru> Ni. The tendency to induce cis-trans isomerization is established as follows: Rh> Pd> Ru> Ni> Pt. In the case of rhodium hydrogenated products, double bond migration is restricted to a slight extent, the content of unchanged oleic – and linoleic acids being important. The ability of Rh/Al_2O_3 catalyst to be reused was investigated. The specific activity was kept constant for 50 runs, but not the selectivity which failed at last. Many advantages seem to be offered by supported rhodium catalysts in the conversion of soybean oil into plastic fats.

RAPE AND MUSTARD IN INDIA. E. Chone. Rev. Fr. Corps Gras, *26*, 331-4, (1979). During the first international congress on fats and oilseeds in Dehli, information has been given about oilseeds in India and research concerning the culture of crucifers. The different lectures of this meeting and visits to research centers are reviewed.

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