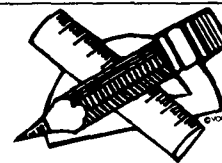


Abstracts



EDITOR: S. KORITALA • ABSTRACTORS: J.C. Harris, M.G. Kokatnur, F.A. Kummerow, G. List, B. Matijasevic, K.D. Mukherjee, D.B.S. Min, R.A. Reiners, and P.Y. Vigneron

• Fats and Oils

CONTRIBUTION TO THE STUDY OF THE DEGRADATIONS EXPERIMENTED BY OILS DURING THE FRYING PROCESS I. OLIVE OIL. A.L. Díaz Alonso, E.T.S.I.A. de Córdoba, *Grasas Aceites (Seville)* 28, 235 (1977). Determinations of the changes experimented by the chemical and physico-chemical index during five consecutive frying with olive oil in hermetic system and at two temperatures (150 and 180° C) have been carried out for this study. Such determinations have also been done in the oil penetrated in the food used in the frying, which has been in every case sliced potatoes of thickness 2 mm and diameter 50 mm. It has also been studied the correlation among the different index attaining functional mathematical expressions among several of them.

PERCENTAGE DETERMINATION OF NEUTRAL OIL BY ADSORPTION COLUMN CHROMATOGRAPHY. CONTRIBUTION TO THE METHOD. E. Molina Grima, L. Martínez Nieto and J. Pereda Marín, *Grasas Aceites (Seville)* 28, 345 (1977). The determination of neutral oil percentage in several kind of vegetable oils, is made by Norma UNE 55 106. Concluding, the method is suitable for any kind of oils in case that the alumine oxide has the fourth degrees activity. This activity degree can be obtained by heating at 600° C and adjusting the moisture to 4.44%. The alumine oxide recuperated can be utilized depending on free acid, impurities and oil sorts.

CONTRIBUTION TO THE STUDY OF DEGRADATIONS EXPERIENCED BY OILS IN THE FRYING PROCESS. II. SOYBEAN OIL AND ITS COMPARISON WITH THE RESULTS OBTAINED WITH OLIVE OIL. A.L. Díaz Alonso, *Grasas Aceites (Seville)* 28, 319 (1977). The variations experimented by the physicochemical and chemical index of the soybean oil, during 5 consecutive fries in hermetical system at two temperatures (150 and 180° C), are studied. The evolutions of the fried oil and those of the oil inside the food (potato) are observed. The correlation between the index variations is also studied, and mathematical equations of functionality between, expressed in relation to the acidity index, are found. According to the study realized with olive oil, some comparative conclusions between both oils are determined.

DIRECTED TRANSESTERIFICATION OF FATS. IV. CALCULATION OF THE FINAL COMPOSITION OF GLYCERIDES IN PROCESSES BY STAGES WITH DIFFERENT THERMIC PROGRAMS AND OPTIMISATION OF THE PROCESS. F.J. Nieto Rodríguez-Brochero and A. Madarro, *Grasas Aceites (Seville)* 28, 409 (1978). The realization of directed transesterification process in different equilibrium stages at descending temperatures permits that the composition of glycerides of the final system results nearer to the minimum distribution law than in the case of single equilibrium, increasing the percentage in triglycerides S₃ and I₃ and lowering of the S₂I and S₁I₂. We arrive to this conclusion by applying to a mathematical model the results of processes in a simple stage in what were obtained relations for the percentage in saturated fatty acids of the liquid phase in the equilibrium ($x_L = f_1(t)$) and the solid phase composition or selectivity factor ($r = f_2(t)$), both in function of temperature. The obtained results with the model have been experimentally confirmed. Also, this method permits the optimisation of number of stages or reactors for the continuous realization of the process and the thermal program to follow.

THE ANTIOXIDANT EFFECT OF NATURALLY OCCURRING UNSAPONIFIABLE MATTER IN LINOLEIC ACID AND SOME VEGETABLE OILS. F. El-Wakeil *et al.*, *Grasas Aceites (Seville)* 29, 9 (1978). The addition of the total purified unsaponifiable matter extracted from crude sesame seed oil and soybean seed oil to both linoleic acid and refined cotton seed oil raised their stability towards oxidative rancidity. However, the unsaponifiable extracted from crude soybean seed oil was found to be more efficient as naturally occurring antioxidants for

linoleic acid and refined cotton seed oil than those extracted from crude sesame seed oil. An attempt has been done to mix crude sesame seed oil and crude soybean seed oil in various proportions with refined cotton seed oil and an apparent increase in the stability of the mixture against oxidation and deterioration than any oil alone was observed. Once again, the mixing of crude sesame seed oil with refined cotton seed oil has more efficient antioxidants effect than the mixing of crude soybean seed oil with refined cotton seed oil.

NEUTRALIZATION OF FOOT-CAKE OILS IN SOLUTION: I. BATCH METHOD. L. Martínez Nieto and J. Pereda Marín, *Grasas Aceites (Seville)* 29, 17 (1978). The alkaline neutralization of foot-cake oils are compared by method A.O.C.S., and using hexane solvent. The influence of the initial free fatty acid, the NaOH concentration and the oil concentration in hexane are studied. Concluding, the neutral oil percentage obtained is always better by the solvent process than the A.O.C.S. method, while the residual fatty acid does not depend from the employed method.

TRANS-ISOMERIC FATTY ACIDS PRESENT IN WEST GERMAN MARGARINES, SHORTENINGS, FRYING AND COOKING FATS. H. Heckers and F.W. Melcher, *Am. J. Clin. Nutr.* 31, 1041-9 (1978). Fatty acid patterns were determined in 83 brands of margarine, 9 brands of low-calorie margarine and 18 brands of shortening, frying and cooking fat purchased at random from the retail market in the Federal Republic of Germany in 1973-1974, and a second time in 1976. As a result of gas-liquid chromatographic analyses on a Silar 10 C coated packed column, complemented in some cases by the values recorded on a highly selective SP 2340 capillary column, *trans*-octadecenoic acids ranging from 53.2 to 0.1% were measured. None of the products examined was completely free of *trans*-fatty acids. Following partial hydrogenation, *trans*-hexadecenoate, 0.1 to 0.2%, was detected in some of the edible fats.

INFLUENCE OF SAMPLING ON FATTY ACID COMPOSITION OF HUMAN MILK. W.B. Emery III *et al.*, *Am. J. Clin. Nutr.* 31, 1127-30 (1978). To study effects of sampling on the fat and fatty acid composition of human milk, three subjects each obtained four complete expressions of milk in sequential fractions from each breast. Two subjects collected partial expressions of about 5 ml of milk from each breast frequently over a 2-month period. Milk samples were analyzed gravimetrically for fat and by gas chromatography for the fatty acids 10:0, 12:0, 14:0, 14:1, 16:0, 16:1, 18:0, 18:1, and 18:2. Fatty acid composition from pairs of left and right breast samples collected at the same nursing did not differ.

¹³C NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY OF CYANOLIPIDS AND CYANOLIPID-CONTAINING SEED OILS. K.L. Mikolajczak and D. Weisleder, *Lipids* 13, 514-6 (1978). ¹³C nuclear magnetic resonance (NMR) signals of all carbon atoms of the hydroxynitrile moieties on which cyanolipids are based have been assigned. The four known types of cyanolipids can be conveniently distinguished and identified by ¹³C-NMR whether they are in pure form or in unfractionated seed oils from which they are derived.

SYNTHESIS AND PROPERTIES OF A HIGHLY FLUORESCENT DERIVATIVE OF PHOSPHATIDYLETHANOLAMINE. J.A. Monti, S.T. Christian, and W.A. Shaw, *J. Lipid Res.* 19, 222-8 (1978). Properties of *N*-4-nitrobenzo-2-oxa-1,3-diazole-phosphatidylethanolamine (NBD-PE), prepared by alkylation of the free amino group of phosphatidylethanolamine with 4-chloro-7-nitrobenzofurazan (NBD-Cl) are described. The alkylated product containing this fluorochromic group was purified by silicic acid chromatography and had a nitrogen/phosphorus ratio of 3.96 (4.0 theoretical). The NBD-PE was sparingly soluble in distilled water but freely soluble in organic solvents. These data indicate that NBD-PE might be a unique and effective probe for the phospholipid regions of membranes.

ANALYSIS OF FATTY ACID METHYL ESTERS BY A GAS-LIQUID CHROMATOGRAPHY-CHEMICAL IONIZATION MASS SPECTROMETRY COMPUTER SYSTEM. T. Murata, *J. Lipid Res.* 19, 166-71 (1978). The technique of gas-liquid chromatography-chemical ionization mass spectrometry can easily identify trace peaks and unresolved peaks on gas-liquid chromatography, utilizing MH^+ ions of chemical ionization mass spectra. In polyunsaturated fatty acid methyl esters such as C22:5 and C22:6, the determination of molecular weights that are difficult to determine by electron impact mass spectrometry could be easily identified by chemical ionization mass spectrometry. The identification could be performed even more easily from a mass chromatogram obtained by means of a gas-liquid chromatography-chemical ionization mass spectrometry-computer system.

THERMAL DECOMPOSITION OF METHYL OLEATE HYDROPEROXIDES AND IDENTIFICATION OF VOLATILE COMPONENTS BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY. E. Selke, E.N. Frankel and W.E. Neff, *Lipids* 13, 511-3 (1978). The role of methyl oleate hydroperoxides as precursors of volatile compounds was investigated by thermal decomposition in the injector port of a gas chromatograph attached to a computerized mass spectrometer. The major volatile compounds identified correspond to those formed from triolein heated in air at 192 C.

CHANGES IN THE LIPID COMPOSITION OF RIPENING BANANA FRUITS AND EVIDENCE FOR AN ASSOCIATED INCREASE IN CELL MEMBRANE PERMEABILITY. N.L. Wade and D.G. Bishop, *Biochim. Biophys. Acta* 529, 454-64 (1978). The content of total lipid in banana fruit pulp tissue remained constant during the climacteric rise induced by applied ethylene. The relative proportions of neutral lipid, glycolipid and phospholipid did not change during ripening. This change was confined largely to the phospholipid fraction, in which there was an increase in the proportion of linolenic acid and a decrease in the proportion of linoleic acid. The net result was an increase in total unsaturation of the fatty acids in the phospholipid fraction.

GENERATION OF PHOSPHOLIPID ARTEFACTS DURING EXTRACTION OF DEVELOPING SOYBEAN SEEDS WITH METHANOLIC SOLVENTS. P.G. Roughan, C.R. Slack, and R. Holland, *Lipids* 13, 497-503 (1978). The major phospholipids of soybean cotyledons during development were phosphatidylcholine (45-55%), phosphatidylethanolamine (24-28%), and phosphatidylinositol (15-18%) when the tissue was steam-killed prior to extraction of the lipids. The only other phospholipids of any significance (4-6%) was identified as phosphatidylglycerol. Phosphatidic acid was a minor constituent (<1%), and neither N-acyl phosphatidylethanolamine nor bis-phosphatidic acid were detected in appreciable (>0.1%) of the total lipid phosphorus quantities. Phosphatidymethanol was formed by the phospholipase D-catalyzed transphosphatidylolation of phosphatidylcholine and phosphatidylethanolamine during extraction.

HYDROCARBON AND MULTIBRANCHED ESTER WAXES FROM THE UROPYGIAL GLAND SECRETION OF GREBES (PODICIPEDIFORMES). J. Jacob (Biochem. Inst. für Umweltcarcinogene, D-2070 Ahrensburg/Holst, West Germany) *J. Lipid Res.* 19, 148-53 (1978). The uropygial gland secretion of some grebes (*Podicipediformes*) has been shown to contain saturated and unsaturated aliphatic hydrocarbons and monoester waxes. While ester waxes are common constituents of preen gland secretions, nonisoprenoid hydrocarbons have not been detected hitherto. The wax constituents are very complex, belonging to several multibranch homologous series, including unusual acids with ethyl branches. The waxes were identified by gas-liquid chromatography-mass spectrometry and equivalent chain length comparisons. A method for the prediction of equivalent chain length values of unknown methyl esters is offered. The results are discussed from a chemotaxonomic viewpoint.

COMPARATIVE STUDY ON TOXICITY OF PHENOLIC ANTIOXYDANTS AUTHORIZED IN FOODS. G. Pascal, *Rev. Franc. Corps Gras.* 25(5), 239-44 (1978). The author compares the effects of 5 dietary phenolic antioxidants (BHT, BHA and propyl, octyl and dodecyl gallates) to re-evaluate the potential toxic risks involved in their use. BHT and BHA, affecting many metabolic processes, seem to present the most problems.

SYNTHESIS AND CATALYSIS IN LIPID CHEMISTRY. E.J. Ucciani, *Rev. Franc. Corps Gras.* 25(5), 219-26 (1978). Catalysis and synthesis are important in new molecular chemistry.

They naturally took place in lipid chemistry. Various examples on fatty acids are given: stereochemistry, positional isomery, unusual structures. Synthesis and catalysis are very usefull for studying the physical, analytical, biochemical and physico-pathological properties of lipids.

TOCOPHEROLS AND TOCOTRIENOLS IN PALM OIL. CONSIDERATIONS ON THEIR ROLE AS ANTI-OXIDANTS AND PRACTICAL DETERMINATIONS. B. Jacobsberg, P. Deldime and Abdul Gapor, *Oleagineux*, 33(5), 239-47 (1978). The mechanism of oxidation and the role of tocopherols in fats in relation to structure, temperature, substrate and concentration is examined. The individual tocopherols in palm oil were identified and their stability was related to heat resistance, and to the effect of industrial refining. It is remarkable that palm oil contains over 60 p. 100 of tocotrienols, which are not normally present in other edible oils. Though their antioxidant properties are very close to the corresponding tocopherols they present specific analytical problems. For rapid assessment, differential pulse voltammetry is applicable provided a correcting factor is used for the tocotrienol response and carotene influence is reduced by heat bleaching.

ON THE SYNTHESIS OF CYCLIC FATTY ACIDS. J. Graille, *Rev. Franc. Corps Gras*, 25(6), 309-13 (1978). One of the effects of thermal treatments or U.V. irradiation is the induction of peri-cyclic reactions at the expense of polyunsaturated systems. Products of such reactions are transposed compounds such as components having been submitted to either a π system migration or cyclisations, or components issued to cycloadditions such as bi-cyclic compounds (indanic) or Diels-Alder's dimerides. In order to study the toxicity of these compounds, which are formed in particular in edible oils during heating, synthesis of cyclic compounds became necessary. Various syntheses of 6-membered ring compounds are described or proposed.

CONTINUOUS SOLVENT FRACTIONATION OF PALM OIL. M. Bernardini, *Oleagineux*, 33(6), 297-305 (1978). The author describes the C. M. B. process for the fractionation of crude palm by continuous crystallization using hexane as the solvent. He details the materials used and the processing cycle: fractionation, continuous thermic bleaching of the fractionated palm oil; filtration of the oil/bleaching earth suspension through special filters assuring total recovery of oil from the earths; combined neutralization and deodorization of the bleached oil in a single operation.

SOME PRODUCTS OF THE THERMAL TRANSFORMATION OF THE METHYL-OLEATE HYDROPEROXIDES. G. Lercker, et al. *Rev. Franc. Corps Gras*, 25(5), 227-37 (1978). The methyl-oleate oxidation has been studied at various temperatures and at various times. After the initial hydroperoxides formation, there is a progressive increase in the formation of compounds series, as shown by TLC. On a methyl-oleate sample oxidised in the presence of air at 80° C up to a peroxide value 1900, those compounds were isolated and identified and they appeared as products of direct or indirect transformation of methyl-oleate hydroperoxides. Among the identified compounds are to be found methyl erythro- and threo-epoxy-stearate, a blend of unsaturated ceto-esters, the corresponding hydroxy-esters and their epoxidation products.

DETERMINATION OF TOCOPHEROLS BY GLASS CAPILLARY COLUMN CHROMATOGRAPHY. F. Mordret and A.M. Laurent, *Rev. Franc. Corps Gras*, 25(5), 245-50 (1978). The new french standard NF T 60.239 for determination of tocopherols is reviewed. The different steps of the method unsaponifiable preparation, thin-layer chromatography fractionation, tocopherol gas-liquid chromatography must be carefully carried out. Glass capillary column use is always valuable and sometimes necessary (for β and γ tocopherol separation). The 8 natural tocopherols have been separated with capillary columns and retention times on SE 30 and OV 17 phases are given. Tocopherols compositions of some vegetable oils have been determined. This method is interesting for detecting some mixtures: 2 examples are given (specially small additions of soybean oil in the sunflower oil).

• Biochemistry and Nutrition

LINOLEIC ACID OXIDATION BY LIPOXYGENASE. I. THE INFLUENCE OF SOME VARIABLES ON THE FINAL PRODUCTS OBTAINED. E.

Vioque and M.P. Maza, *Grasas Aceites (Seville)* 29, 107 (1978). The influence of several variables (pH, presence of alcohols), in connection with the oxidation of linoleic acid by the enzyme lipoxygenase has been studied. It has been shown that the presence of ethanol or methanol among the final products leads to the formation of alkoxyderivatives in a high acid medium.

TRANS FATTY ACIDS AND CELL MEMBRANES. B. Entressangles, *Rev. Franc. Corps Gras*, 25(6), 297-301 (1978). The influence of trans fatty acids presence in membrane lipids is shown by trials carried out on membranous models. Then results obtained «in vivo» in the membranes of intestine brush border of rats, fed with trans isomers are described: incorporation of these acids in the membrane; repercussions of this incorporation on fatty acid composition of membrane phospholipids and on cholesterol amount; phenomenon reversibility. These results are discussed in relation to biological function of intestinal brush border.

BIOLOGICAL ROLE OF LINOLENIC ACID. P. Lemarchal, *Rev. Franc. Corps Gras*, 25(6), 303-8 (1978). Dietary linolenic acid is rapidly converted into high unsaturated fatty acids (C20 and C22) in animal cell. These acids have specific functions in some neural cells. An important dietary apportion of linolenic acid does not seem to present unfavourable physiological effects on superior animal. The present researchers conclude to a necessary equilibrium between dietary fatty acids according to species and point out the importance of the relation existing between the two series of polyenic fatty acids $\omega 3$ and $\omega 6$.

EFFECT OF FATS AND OILS ON MYOCARDIUM. R.O. Vles, *Rev. Franc. Corps Gras*, 25(6), 289-95 (1978). Detailed morphometric studies on the myocardium of Wistar rats, mice, pigs and rabbits show the harmlessness of rapeseed oils with low erucic acid contents. The great sensitivity of the male rat of the Sprague-Dawley strain to cardiac necrosis is confirmed. The linolenic/linoleic acid ratio and the relative excess of monounsaturated fatty acids which characterize the oils of the new varieties of rapeseed explain the phenomena observed in this particular experimental model. The existence of a specific, non-triglyceride antinutritional factor in cruciferous oils is improbable.

SOLUBILIZATION AND PARTIAL PURIFICATION OF PROSTAGLANDIN ENDOPEROXIDE SYNTHETASE OF RABBIT KIDNEY MEDULLA. S.G. Bhat *et al.*, *Biochim. Biophys. Acta* 529, 398-408 (1978). The microsomes of rabbit kidney medulla converted arachidonic acid into prostaglandin E_2 in the presence of hemoglobin, tryptophan and glutathione as activators. When the microsomal suspension was treated with 1% Tween 20, a solubilized enzyme was obtained which catalyzed the conversion of arachidonic acid to prostaglandins G_2 and H_2 . The solubilized enzyme was adsorbed to and then eluted from an ω -aminooctyl Sepharose 4B column, resulting in about 10-fold purification over the microsomes.

EVIDENCE FOR STEREOSPECIFIC PHOSPHOLIPID-CHOLESTEROL INTERACTION IN LIPID BILAYERS. N. Chatterjee and H. Brockerhoff, *Biochim. Biophys. Acta* 511, 116-9 (1978). The CH_2 proton NMR linewidths of *sn*-3 and *sn*-1 dipalmitoyl phosphatidylcholine respond differently to the addition of cholesterol to the lipid vesicles. This result points to a stereospecific phospholipid-cholesterol interaction in the "hydrogen belt" region.

EXCITATION OF INDOLE-3-ACETIC ACID (AN AUXIN) IN A LINEOLEATE-LIPOXYGENASE SYSTEM. M. Nakano and K. Sugioka, *Biochim. Biophys. Acta* 529, 387-97 (1978). The weak luminescence that accompanies the linoleate-lipoxygenase reaction was greatly enhanced by the addition of indole analogues, and especially indole acetic acid. The main emitting species in the indole acetic acid-linoleate-lipoxygenase system was analysed spectrophotometrically in the visible region and ascribed to the transition of excited indole acetate in triplet state to its ground state.

IDENTIFICATION OF VASOPRESSOR PHOSPHOLIPID IN CRUDE SOYBEAN LECITHIN. A. Tokumura *et al.*, *Lipids* 13, 468-72 (1978). The vasopressor phospholipid in crude soybean lecithin was isolated by column chromatography on Sephadex LH-20. It represented 0.1% of crude soybean lecithin. The isolated phospholipid was identified to be lysophosphatidic acid by gas chromatography-mass spectrometry analysis of

TMS-deacylated product and acetolysis product. Nuclear magnetic resonance analysis favored the 1-monoacyl isomer over the 2-isomer. The activity of isolated lysophosphatidic acid was slightly less than that of synthetic 1-linoleoyl-L-3-glycerophosphate.

STEADY-STATE KINETICS OF THE ANAEROBIC REACTION OF SOYBEAN LIPOXYGENASE-1 WITH LINOLEIC ACID AND 13-L-HYDROPEROXYLINOLEIC ACID. J. Verhagen, *et al.*, *Biochim. Biophys. Acta* 529, 369-79 (1978). The steady-state kinetics of the anaerobic reaction of soybean lipoxygenase-1 with linoleic acid and 13-L-hydroperoxylinoleic acid were studied. Initial rates of the formation of oxodienoic acids, absorbing at 285 nm, were measured at pH 10. About 50% of the consumed 13-L-hydroperoxylinoleic acid was converted into oxodienoic acids regardless of the initial ratio of the two substrates. Values for the kinetic constants were calculated by fitting simultaneously the complete set of data to the appropriate rate equation.

ACTIVATION OF LIPOLYSIS. I. DISTRIBUTION OF LIPASE ACTIVITY IN TEMPERATURE ACTIVATED MILK. L. Wang and H.E. Randolph, *J. Dairy Sci.* 61, 874-80 (1978). Temperature activation did not affect lipase activity of whole milk but altered the distribution of lipase in skim milk and cream fractions. Cooling milk to 4 C caused migration of lipase activity to the cream fraction. Maximum redistribution of lipase activity was achieved by the normal temperature activation treatment of warming milk from 4 C to 30 C and recooling. Repeated temperature activation treatments failed to increase the amount of lipase adsorbed to the cream fraction. Storage of milk at 4 C for 24 h or at 22 C for 2 h prior to temperature activation decreased lipase activity of the cream.

INCORPORATION OF ($1-^{14}C$)ACETATE INTO LIPIDS OF SOYBEAN CELL SUSPENSIONS. A.C. Wilson, M. Kates and A.I. de la Roche, *Lipids* 13, 504-10 (1978). Suspension cultures of soybean cells incorporated ($1-^{14}C$)acetate very rapidly into the fatty acid moieties of phospholipids and glycolipids when incubated at 26 C for up to 22 hr. The most rapidly labeled lipid was 3-*sn*-phosphatidylcholine, which contained 58% of the total fatty acid radioactivity after 16 min; more than 75% of this label was found to be in the oleic acid of the phosphatidylcholine. Most of the labeled linolenic acid at 22 hr was found in the unidentified phospholipid, di- and triacylglycerols, and the glycolipid fraction.

LIPID ADAPTATION IN LIVER MITOCHONDRIAL MEMBRANES OF CARP ACCLIMATED TO DIFFERENT ENVIRONMENTAL TEMPERATURES. PHOSPHOLIPID COMPOSITION, FATTY ACID PATTERN AND CHOLESTEROL CONTENT. E. Wodtke, *Biochim. Biophys. Acta* 529, 280-91 (1978). The lipid fraction of liver mitochondria has been studied in carp acclimated to high and low environmental temperatures. Evidence is provided for a temperature-induced lipid adaptation which might control membrane fluidity. This supports suggestions made in a recent communication on temperature-induced changes in the Arrhenius functions of mitochondrial oxidase systems from carp liver.

SELECTIVE SOLUBILIZATION OF MARKER ENZYMES OF BUFFALO MILK FAT GLOBULE MEMBRANE BY DETERGENTS. M.K. Bhavadan and N.C. Ganguli, *J. Dairy Sci.* 61, 697-700 (1978). Activities of alkaline phosphomonoesterase, xanthine oxidase, 5'-nucleotidase, and adenosine triphosphatase associated with buffalo milk fat globule membrane were assessed in the presence of detergents Triton X-100, Tween-20, and deoxycholate. All detergents enhanced the enzyme activities, except adenosine triphosphatase, which was inhibited. Deoxycholate treatment of the membrane material resulted in maximum recovery of these enzymes in the supernatant, but sodium dodecyl sulphate at 2 mM inhibited all the enzymes.

CALCIUM-DEPENDENT LIPOLYTIC ACYL-HYDROLASE ACTIVITY IN PURIFIED PLANT MITOCHONDRIA. R. Bligny and R. Douce, *Biochim. Biophys. Acta* 529, 419-28 (1978). Ageing of isolated potato mitochondria induced by $CaCl_2$ resulted in rapid enzymatic hydrolysis of the membrane phospholipids with the liberation of free fatty acids. The enzyme responsible for this effect was identified as a membrane bound lipolytic acyl-hydrolase which was unmasked by $CaCl_2$. The presence of this lipolytic acyl-hydrolase induced severe functional impairments in the mitochondrial oxidative and phosphorylative properties.

REGULATORY ROLE OF INSULIN IN THE DEGRADATION OF LOW DENSITY LIPOPROTEIN BY CULTURED HUMAN SKIN FIBROBLASTS. A. Chait, E.L. Bierman, and J.J. Albers, *Biochim. Biophys. Acta* 529, 292-9 (1978). The degradation of ^{125}I -labeled low density lipoprotein by cultured human skin fibroblasts was enhanced 25% by preincubation of cells with insulin. This effect of insulin appeared to be mediated via stimulation of low density lipoprotein binding to its cell surface receptor, since binding and subsequent internalization of low density lipoprotein were stimulated to a similar extent as was degradation. In addition, insulin enhanced binding of low density lipoprotein at 4° C, at which temperature internalization of the lipoprotein does not occur. Thus, insulin may play a role in the regulation of low density lipoprotein and very low density lipoprotein degradation by peripheral cells by influencing the receptor-mediated transport of these lipoproteins.

LIPOPROTEIN LIPASE OF CULTURED MESENCHYMAL RAT HEART CELLS. I. SYNTHESIS, SECRETION AND RELEASABILITY BY HEPARIN. T. Chajek, O. Stein and Y. Stein, *Biochim. Biophys. Acta* 528, 456-65 (1978). Cell suspensions prepared from rat hearts were separated by replating into F₁, F₂ and M cultures and cultured for 3-11 days. Lipoprotein lipase activity was highest in the F₁ cultures which consisted mainly of non-beating mesenchymal cells. The enzyme activity was released into the medium only after addition of heparin. The release occurred by an initial rapid phase and a continuous slow phase. Both the rapid and the slow release of enzyme activity by heparin were inhibited by about 70% after a 4 h pretreatment with colchicine. These data indicate that the culture system can be used to study regulation of new enzyme synthesis and its turnover.

THE EFFECTS OF CLOFIBRATE FEEDING ON THE METABOLISM OF PALMITATE AND ERUCATE IN ISOLATED HEPATOCYTES. R.Z. Christiansen *et al.*, *Lipids* 13, 487-91 (1978). The metabolism of palmitate and erucate has been investigated in hepatocytes isolated from control rats and from rats fed 0.3% clofibrate. Clofibrate increased the oxidation of (1- ^{14}C) palmitate 1.5 to 2-fold while the esterification was decreased. At a high concentration of palmitate (1.5 mM), the total rate of fatty acid metabolism was stimulated. Clofibrate stimulated both the oxidation (3.5 to 5-fold) and the esterification (1.7-fold) of (14- ^{14}C) erucate. It is suggested that erucate is shortened by the recently detected β -oxidation system of peroxisomes.

THE PLASMA LIPIDS, LIPOPROTEINS, AND DIET OF THE TARAHUMARA INDIANS OF MEXICO. W.E. Connor *et al.*, *Am. J. Clin. Nutr.* 31, 1131-42 (1978). The Tarahumaras are unacculturated Indians of the Sierra Madre Occidental Mountains renowned for their running in competitive races. Over a 4-year period at different locations, 523 healthy Tarahumaras (ages 5 to 70 years) were surveyed for plasma lipids and lipoproteins. We determined also the nutrient intakes of a subsample (174 adults). The total plasma cholesterol correlated positively with dietary cholesterol intake ($r=0.874$), the first time in man such a correlation has been found. Particularly notable was the virtual absence of the hypertension, obesity, and the usual age rise of the serum cholesterol in adults. Thus, the customary diet of the Tarahumaras is adequate in all nutrients, is hypolipidemic, and is presumably antiatherogenic.

CHANGES IN THE LIPOPROTEIN LIPASE (CLEARING-FACTOR LIPASE) ACTIVITY OF WHITE ADIPOSE TISSUE DURING DEVELOPMENT OF THE RAT. A. Cryer and H.M. Jones, *Biochem. J.* 172, 319-25 (1978). The lipoprotein lipase (clearing-factor lipase) activity of the white adipose tissue from rats aged between 1 and 145 days was determined. Five adipose-tissue sites (epididymal, uterine, subcutaneous, perirenal and intramuscular) together with serum concentrations of triacylglycerol, cholesterol and glucose were studied. The pattern of enzyme-activity change was remarkably similar in all the sites studied, although the growth of the tissues proceeded non-uniformly. The changes in enzyme activity were related to other metabolic changes in adipose tissue and with the known changes in plasma insulin concentrations occurring during development.

EFFECTS OF COLD STRESS ON RATS FED DIFFERENT LEVELS OF DOCOSENOIC ACIDS. P.O. Darnerud, M. Olsen and B. Wahlstrom, *Lipids* 13, 459-63 (1978). Male Sprague-Dawley rats,

4 weeks old, were subjected to an ambient temperature of 4 C for periods up to 24 days and fed a synthetic diet containing one of the following oils: peanut oil (PO), rapeseed oil (RO), low erucic acid rapeseed oil (LO), and partially hydrogenated marine oil (HO), each at 20% w/w. A parallel experiment using the same oils was performed at room temperature (23 C). The fatty acid composition of the cardiac triglycerides reflected that of the diet, while the composition of the cardiac lecithin was only marginally modified.

EFFECTS OF AN ESSENTIAL FATTY ACID DEFICIENCY, PAIR-FEEDING AND LEVEL OF DIETARY CORN OIL ON THE HYPOTHALAMIC-PITUITARY-GONADAL AXIS AND OTHER PHYSIOLOGICAL PARAMETERS IN THE MALE CHICKEN. H.M. Engster *et al.*, *J. Nutr.* 108, 889-900 (1978). Two studies were conducted to observe the effects of an essential fatty acid (EFA) deficiency, added dietary corn oil and pair-feeding on growth, reproduction and other physiological parameters in the mature cockerel. A purified linoleic acid (LA)-deficient diet (0.01% LA), or additions of 5% (3.01% LA) or 15% (9.04% LA) corn oil, were fed ad libitum from hatching through 24 weeks of age. The degenerate testicular histology of the 20-week old deficient cockerels, while responding fully to the ad libitum intake of the diets containing corn oil, showed only partial rehabilitation of spermatogenesis when diets with either 5% or 15% corn oil were pair-fed. In general, increasing the level of dietary fat from 5% to 15% did not cause many physiological changes.

PURIFICATION AND PROPERTIES OF THE POLYMERIC FATTY ACID SYNTHETASE FROM A FILAMENTOUS FUNGUS. P. Giompres and N.M. Packter, *Biochim. Biophys. Acta* 529, 189-200 (1978). Fatty acid synthetase was purified from the filamentous fungus, *Aspergillus fumigatus* to a specific activity of 4,000-5,000 munits/mg protein. Its purity was established by its appearance in electron micrographs, on sodium dodecyl sulphate polyacrylamide gels and by analytical ultracentrifugation, and also by its behaviour upon sucrose gradient centrifugation. This enzyme comprises two large polypeptides with molecular weights of 190,000 and 186,000. Synthetase activity present in crude extracts has been identified as a very heavy component with sedimentation coefficient greater than 100 S.

STUDIES ON THE SITES OF THE ANTILIPOLYTIC ACTION OF INSULIN IN ADIPOSE TISSUE. B. Lambert, C. Godard and C. Jacquemin, *Biochim. Biophys. Acta* 529, 465-74 (1978). The purpose of this work was to localize, with the aid of pharmacological tools, the site(s) of the antilipolytic action of insulin in rat fat pads. When lipolysis is maximally stimulated by 1-methyl-3-isobutyl xanthine ($1 \cdot 10^{-8}$ M) or by 4-(3,4-dimethoxybenzyl)-2-imidazolidine (RO 7-2956) ($1 \cdot 10^{-8}$ M), and the antilipolytic insulin action disappears. This suggests that at the basal reaction rate of adenylate cyclase, functional phosphodiesterases are needed to allow the expression of insulin action.

15-HYDROXYPROSTAGLANDIN DEHYDROGENASE ACTIVITY IN VITRO IN LUNG AND KIDNEY OF ESSENTIAL FATTY ACID-DEFICIENT RATS. H.S. Hansen and B.S. Toft, *Biochim. Biophys. Acta* 529, 230-6 (1978). Weanling rats were fed for 6 months on a diet deficient in essential fatty acids: either fat-free, or with 28% (w/w) partially hydrogenated fish oil. Control rats were fed a diet with 28% (w/w) arachis oil for 6 months. 15-Hydroxyprostaglandin dehydrogenase activity was determined as initial rates of formation of ^3H -labelled 15-keto-dihydro-prostaglandin E₁ plus 15-keto-prostaglandin E₁ in high speed supernatants of lung and kidney from each of the groups of rats.

CHOLESTEROL ESTERIFICATION BY ACYL-CoA:CHOLESTEROL ACYLTRANSFERASE IN AORTAS OF RATS FED A DIET HIGH IN COCOA BUTTER, OLEIC-RICH SAFFLOWER OIL, OF LINOLEIC-RICH SAFFLOWER OIL. S. Hashimoto and S. Dayton, *Artery* 4(3), 224-30 (1978). Cholesterol esterification rate by acyl-CoA:cholesterol Acyltransferase (ACCAT) was examined in microsomes of the aortas of rats fed a diet containing 19.9% by weight of either cocoa butter, oleic-rich safflower oil, or linoleic-rich safflower oil. The animals were maintained on the diets for six weeks. Relative to the cocoa butter, oleic-rich safflower oil stimulated ACCAT activity moderately but highly significantly. Conclusions on the linoleic-rich safflower oil were equivocal because of poor weight gain in one of the two sub-groups.