

## • Fats and Oils

CONSTANTS AND GLYCERIDE COMPOSITION OF NEATS FOOT OIL AND FOOT BONE OIL OF BEEF RACES. Z.E. Shoeb, H.M. El-Khalafy and F.S. Taha (Fats and Oil Lab., NRC, Cairo UAR). *Seifen-Öle-Fette-Wachse* 98, 365-9 (1972). Reported are constants and glyceride compositions of Egyptian domestic animals. Oils analyzed were obtained from neats and foot bones of horned cattle, buffaloes and sheep.

PHYSICO-CHEMICAL PROPERTIES OF TALL OIL PRODUCTS. V.V. Zavodchikova and G.A. Uzlov. *Gidroliz. Lesokhim. Prom.* 24 No. 3, 13-5 (1971). Determinations were made of density, viscosity, surface tension and heat conductivity in the 293-353K range, and of specific heats in the 293-393K range, of tall oil from the Kotlass kraft mill and of products of its processing, including distillates from the distillation vat and from the first and second columns, distilled tall oil, light oils and fatty acids. The data obtained are tabulated and empirical formulae are given for calculating the density and viscosity, within the temp. range studied, as functions of temp. and fatty acid content. The experimental data were also used to calculate the temp. coefficients of density and volume expansion of tall oil and its products. (World Surface Coatings Abs. No. 359)

HEXAFLUOROACETONE KETALS AS DERIVATIVES FOR POSITIONAL AND GEOMETRICAL CHARACTERIZATION OF DOUBLE BONDS. B.M. Johnson and J.W. Taylor (Dept. of Chem., Univ. of Wis., Madison, Wis. 53706). *Anal. Chem.* 44, 1438-44 (1972). The characterization of double bond position and geometry has been improved through conversion of n-alkenes to hexafluoroacetone ketals. Derivatives are synthesized by stereospecifically forming bromohydrins from the alkenes and converting them to ketals *via* base-promoted reaction with hexafluoroacetone in sealed glass reaction tubes. The addition of hexafluoroacetone proceeds with at least 97% *trans* specificity. Mass spectral fragmentations which indicate the original double bond position are discussed as are the stereochemical effects. The uses of GLC, NMR and IR for derivative characterization are also examined. The combination of GC and MS on the derivative provides complete characterization of the original olefin.

PRODUCTION OF HIGH STABILITY LIQUID VEGETABLE OILS. C.M. Gooding (CPC International). *U.S.* 3,674,821. The process comprises partially hydrogenating a winterized vegetable oil of 100-120 I.V. to an I.V. of 70-90, cooling the oil, and separating the solid components.

CERTAIN LINOLEIC AND LINOLENIC ACID ESTER FRACTIONS OF VEGETABLE OILS AND DERIVATIVES THEREOF. F.W. Zilliken and H. Egge (American Home Products Corp.). *U.S.* 3,676,472. This invention is concerned with prophylactically effective substances which are useful in protecting mammals against staphylococcal infection. These substances comprise the linoleic and linolenic acid ester fractions of vegetable oils and derivatives thereof.

METHOD OF STABILIZING NIACINAMIDE AGAINST CAKING. E. De Ritter and J.E. Raymond (Hoffmann-La Roche). *U.S.* 3,676,556. Mixtures of fatty acid mono- and diglycerides are used as the anti-caking component.

DEODORIZATION OF FATS. A. Renold (Colgate-Palmolive Co.). *U.S.* 3,678,034. A composition and process for the purification of fats and oils employing a mixture of a fat soluble strong acid, an acidic clay and a carbohydrate are disclosed.

## • Biochemistry and Nutrition

PROTECTIVE EFFECT OF VITAMIN E ON PLASMA LIPID DIENES IN MAN. N.R. Di Luzio (Dept. of Physiol., Tulane Univ. Schl. of Med., New Orleans, La. 70112). *J. Agr. Food. Chem.* 20, 486-90 (1972). Since previous studies indicated that lipid peroxidation may be the molecular basis of experimental ethanol-induced hepatic injury, studies were undertaken to determine if diene conjugation could be detected in plasma lipids in conditions of acute and chronic alcoholism. Plasma lipids of human subjects, both normal and diseased, revealed the presence of conjugated diene absorption patterns. The presence of conjugated dienes in plasma lipids, particularly

in the phospholipid fraction, may well result from *in vivo* peroxidative events since the administration of lipid antioxidant, as mixed tocopherols, was associated with a significant reduction in plasma lipid conjugated diene levels. This reduction was associated with a significant enhancement in plasma lipid soluble antioxidant activity. Conversely, removal of supplemental vitamin E was associated with a fall in plasma lipid antioxidant activity and a rise in conjugated diene levels, suggesting that the presence of the abnormal conjugated dienes in plasma lipids might be due to a relative antioxidant deficient state or antioxidant imbalance related to excessive polyunsaturated fat intake.

EFFECT OF 2-ACETOAMIDOETHYL (P-CHLOROPHENYL) (M-TRIFLUOROMETHYLPHENOXY) ACETATE (HALOFENATE) ON CHOLESTEROL OXIDATION BY RAT LIVER MITOCHONDRIA. D. Kritchevsky and Shirley A. Tepper (Wistar Inst. of Anatomy and Biol., Philadelphia, Pa. 19104). *Proc. Soc. Exp. Biol. Med.* 139, 1284-7 (1972). We have compared the effects of halofenate [2-acetoamidoethyl (p-chlorophenyl) (m-trifluoromethylphenoxy) acetate] and clofibrate (ethyl p-chlorophenoxyisobutyrate) on rat serum and liver lipids and on oxidation of cholesterol by suitably fortified preparations of rat liver mitochondria. The halofenate was fed as 0.05% of the diet and the clofibrate as 0.3%. Both compounds caused increases in liver size and liver lipids. In the 3-week feeding experiment, both test compounds showed a significant hypocholesteremic effect. When complete incubation mixtures were used, the oxidation of 26-<sup>14</sup>C-cholesterol to <sup>14</sup>CO<sub>2</sub> was no different for liver mitochondrial preparations from halofenate, clofibrate or control rats. However, in the absence of boiled supernatant factor (cytosol), oxidation of cholesterol was significantly higher with liver mitochondrial preparations from the drug-treated rats.

A KINETIC STUDY OF THE PHOSPHOLIPASE A<sub>2</sub> (CROTALUS ADAMANTEUS) CATALYZED HYDROLYSIS OF 1,2-DIBUTYRYL-SN-GLYCERO-3-PHOSPHORYLCHOLINE. M.A. Wells (Dept. of Biochem., Arizona Med. Center, Univ. of Arizona, Tucson, Ariz. 85724). *Biochemistry* 11, 1030-41 (1972). A detailed kinetic analysis of the *Crotalus adamanteus* phospholipase A<sub>2</sub>-catalyzed hydrolysis of dibutyryllecithin has been carried out. Product inhibition studies and dead-end inhibition studies with butyramide are consistent with an ordered release of products. The fatty acid is released first from the enzyme and the lysolecithin is released second.

## De Laval promotes Ed Bahret

AOCS member Edward G. Bahret of the De Laval Separator Co. has been appointed Eastern Regional Sales Manager for the company's Industrial Division in East Orange, N.J., effective September 1. In his new position he will be responsible for field sales development for De Laval's Industrial Division line of separation and thermal equipment in the Eastern United States.



Since joining De Laval in 1954, Bahret has held positions of increasing responsibility in the Engineering and Industrial Sales Divisions in the development and marketing of De Laval products and processes. In his most recent position as Manager, Process Sales, he directed the development of customer process applications for De Laval equipment in milk plant, food equipment and industrial markets.

A native of Poughkeepsie, Bahret holds a Bachelor's Degree from the University of Miami. He has been professionally active in the American Society of Testing Materials, the American Oil Chemists' Society, and Sales and Marketing Executive's International. ■

THE METABOLISM OF VITAMIN D<sub>3</sub> IN THE CHICK. M.R. Haussler and H. Rasmussen (Dept. of Biochem., Univ. of Pa., Philadelphia, Pa. 19104). *J. Biol. Chem.* 247, 2328-35 (1972). Physiological doses of radioactive vitamin D<sub>3</sub> are administered to vitamin D-deficient chicks 16 hours prior to the preparation of lipid extracts of small intestine, plasma, kidney and bone. Analysis of the vitamin D metabolite pattern is carried out via column chromatography on silicic acid, Sephadex LH-20 and Celite (liquid-liquid partition), countercurrent distribution and treatment with periodic acid. The major metabolite present in plasma, kidney and bone is 25-hydroxy-vitamin D<sub>3</sub>, but significant amounts of 1,25-dihydroxy-vitamin D<sub>3</sub> are detected in all three sites. The association of 1,25-dihydroxy-vitamin D<sub>3</sub> with bone and its considerable activity in promoting skeletal dissolution, raises the question as to whether 25-hydroxy-vitamin D<sub>3</sub> or the 1,25-dihydroxy-sterol represents the active form directing bone resorption.

5,6-TRANS ISOMERS OF CHOLECALCIFEROL AND 25-HYDROXY-CHOLECALCIFEROL. SUBSTITUTES FOR 1,25-DIHYDROXYCHOLECALCIFEROL IN ANEPHRIC ANIMALS. M.F. Holick, M. Garabedian and H.F. DeLuca (Dept. of Biochem., College of Agr. and Life Sci., Univ. of Wisc., Madison, Wisc. 53706). *Biochemistry* 11, 2715-9 (1972). Two analogs of vitamin D, 5,6-trans-cholecalciferol and 5,6-trans-25-hydroxycholecalciferol, have been synthesized and tested for their biological activity. The 5,6-trans-cholecalciferol elicits an intestinal calcium-transport response as well as a bone calcium mobilization response in anephric rats while its 25-hydroxy derivative only stimulates intestinal calcium transport in these animals. By way of contrast, the 5,6-cis compounds (cholecalciferol and 25-hydroxycholecalciferol) are inactive in nephrectomized animals. An explanation for this unexpected biological activity of the trans isomers has been provided based on the fact that the 3-hydroxyl is geometrically located in the position normally occupied by the 1 hydroxyl of 1,25-dihydroxycholecalciferol, the probable metabolically active form of vitamin D<sub>3</sub> in the stimulation of intestinal calcium transport and calcium mobilization from bone.

ETHER-LIPIDS,  $\alpha$ -GLYCEROL PHOSPHATE DEHYDROGENASE, AND GROWTH RATE IN TUMORS AND CULTURED CELLS. Barbara V. Howard, H.P. Morris and J.M. Bailey (Dept. of Biochem., George Washington Univ. Med. Schl., Washington, D.C. 20005). *Cancer Res.* 32, 1533-8 (1972). Ether-lipid levels and  $\alpha$ -glycerol phosphate dehydrogenase activity have been measured in a number of transplantable hepatomas and cell cultures in order to investigate a possible correlation between the two. The levels of ether-lipids were highest in the most rapidly growing hepatomas and were progressively lower in

the less rapidly growing and more highly differentiated tumors. This increase in ether-lipid level was generally associated with an inverse relationship in  $\alpha$ -glycerol phosphate dehydrogenase levels so that the slowest growing, more differentiated tumors contained the highest amounts of the enzyme. In all the cell cultures, the levels of ether-lipids were elevated as compared to normal tissues, and the cellular glycerol phosphate dehydrogenase activities were as low as in the fastest growing tumors *in vivo*. Among the cell cultures were those derived from both normal and neoplastic tissues as well as a line derived by oncogenic virus transformation. The results indicate a correlation between increase in glyceryl-ether content and decrease in glycerol phosphate dehydrogenase levels. The relationship of these results to previous studies on aerobic glycolysis and the significance of these parameters to the neoplastic process is discussed.

CHOLESTEROL 7 $\alpha$ -HYDROXYLASE IN RAT LIVER MICROSOMAL PREPARATIONS. K.A. Mitropoulos and S. Balasubramaniam (Med. Res. Council Lipid Metab. Unit, Hammersmith Hosp., London W12 0HS, U.K.). *Biochem J.* 128, 1-9 (1972). Subcellular fractions containing microsomes prepared from rat livers homogenized in the absence of EDTA, catalysed the oxidation of cholesterol to 7 $\alpha$ -hydroxycholesterol, 7-oxocholesterol, 7 $\beta$ -hydroxycholesterol and 5 $\alpha$ -cholestane-3 $\beta$ ,5,6 $\beta$ -triol. These reactions required native protein, molecular oxygen and NADPH. It is suggested that these compounds are formed by a peroxidation analogous to the peroxidation of fatty acids catalysed by liver microsomal preparations. Incubations of [4-<sup>14</sup>C] cholesterol with microsomal preparations from rat liver homogenized in the presence of EDTA gave 7 $\alpha$ -hydroxy[<sup>14</sup>C]-cholesterol as the main product. This reaction required molecular oxygen and NADPH, and was inhibited by CO. The mass of 7 $\alpha$ -hydroxycholesterol formed during the incubation was measured by a double-isotope-derivative dilution procedure. This procedure was used to assay the activity of cholesterol 7 $\alpha$ -hydroxylase and to measure low concentrations of endogenous 7 $\alpha$ -hydroxycholesterol in liver.

VITAMIN E: THE BIOLOGICAL AND ENVIRONMENTAL ANTIOXIDANT. D.B. Menzel, J.N. Roehm and S.D. Lee (Duke Univ. Med. Center, Durham, N.C. 27706). *J. Agr. Food Chem.* 20, 481-6 (1972). Trace amounts (ppm) of the air pollutants O<sub>3</sub> and NO<sub>2</sub> rapidly oxidize polyunsaturated fatty acids. Phenolic antioxidants retard this oxidation. Vitamin E decreases the acute toxicity of both O<sub>3</sub> and NO<sub>2</sub>. On continuous exposure to 1.5 ppm of O<sub>3</sub> the LT<sub>50</sub> for vitamin E-depleted rats was 8.2 days, compared to 18.5 days for continuously supplemented rats. Similarly the LT<sub>50</sub> for depleted rats exposed to 33 ppm of NO<sub>2</sub> was 11.1 days *vs.* 17 days. Exposure to 0.5 ppm of O<sub>3</sub> also accelerated the depletion of vitamin E from erythrocytes of exposed animals in 23 days *vs.* 36 days for unexposed animals. The polyunsaturated fatty acid content of lung tissue significantly declined in rats fed a constant fatty acid composition diet free of vitamin E and/or exposed to NO<sub>2</sub>. O<sub>3</sub> exposure decreased the oleic and linoleic acid content but increased the arachidonic acid content. These changes may be complex responses of the lung to increased oxidant stress, as shown by depression of serum reduced glutathione and tissue sulfhydryl compound content, or may be related to other metabolic roles of vitamin E in the biosynthesis of polyunsaturated fatty acids.

BIOSYNTHESIS OF A MYCOBACTERIAL LIPOPOLYSACCHARIDE. EVIDENCE FOR AN ACYLPOLYSACCHARIDE METHYLTRANSFERASE. E. Grellert and C.E. Ballou (Dept. of Biochem., Univ. of Cal., Berkeley, Cal. 94720). *J. Biol. Chem.* 247, 3236-41 (1972). The structural similarity between the methylated octasaccharide and the mycobacterial lipopolysaccharide suggests that the 6-O-methyltransferase is specific for the methylation of a partially acylated or otherwise lipophilic precursor of the lipopolysaccharide. ■

## George Kreutzer earns promotion at Swift

George M. Kreutzer has been named Vice-President of Manufacturing for the Swift Edible Oil Co., with responsibility for directing the production planning and manufacturing of all SEOCO products, which include those of the Refinery, Oil Mill and Vegetable Protein Products Divisions.

Kreutzer joined Swift in 1966 as Director of Manufacturing, Refinery Division, and most recently was Director of Operations for that division. He has had 25 years of experience in the processing, refining and food industries.

Kreutzer was graduated from the University of Cincinnati in 1941 with a B.S. degree in mechanical engineering and from the U.S. Merchant Marine Academy in 1943 with a B.S. degree in marine engineering. A native of Chicago, he has been an AOCS member since 1952 and is very active in Society committee work. ■



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