ABSTRACTS

R. A. REINERS, Editor. ABSTRACTORS: J. G. Endres, J. Iavicoli, K. Kitsuta, F. A. Kummerow, C. C. Litchfield, Louise R. Morrow, E. G. Perkins, and T. H. Smouse

• Fats and Oils

INSECTICIDE RESIDUES IN FAT, A SCREENING METHOD FOR CHLORINATED PESTICIDE RESIDUES IN FAT WITHOUT CLEANUP. L. F. Krzeminski and W. A. Landmann (Div. of Analytical and Physical Chem., American Meat Institute Foundation, Chicago, Ill.). *J. Agr. Food Chem.* 11, 81–83 (1963). A screening method for the estimation of total chlorinated hydrocarbon residues in fat has been developed. The method can be used on fat samples without the isolation of the pesticide residue. Fat samples, from which water-soluble inorganic chloride ion has been removed by heat rendering adipose tissue through filter paper, are treated with sodium in anhydrous liquid ammonia to reduce organically bound chlorine to chloride ion. Reduction is complete in a few minutes and gives better than 90% recovery for a 10-gram fat sample containing 10 ppm DDT. Chloride ion concentration is measured potentiometrically and converted to ppm insecticide by referring to a standard calibration curve.

INSECTICIDE RESIDUES IN MILK AND MEAT, RESIDUES IN BUTTERFAT AND BODY FAT OF DAIRY COWS FED AT TWO LEVELS KELTHANE (1.0 and 2.0 P.P.M.). G. Zweig, E. L. Pye, and S. A. Peoples (Pesticide Residue Res., Lab. and Dept. of Physiological Sciences, Univ. of Calif., Davis, Calif.). *J. Agr. Food Chem.* 11, 72–74 (1963). A microanalytical method for analysis of Kelthane in butterfat or body fat of dairy cows, without the removal of the substrate material, was developed. Five cows were fed daily rations containing 2.0 ppm Kelthane for 71 days and 1.0 ppm for 39 days. Milk and body fat were analyzed for residues of Kelthane. A feeding level of 2.0 ppm Kelthane in the daily feed produced an average of 0.23 to 0.40 ppm Kelthane in the butterfat, while 1.0 ppm Kelthane added to the cows' daily feed produced insignificant residues of Kelthane in the milk. Body fat, analyzed during the latter part of the experiment, contained 1.07 to 2.70 ppm Kelthane.

HERITABILITY OF VARIATION IN OIL CONTENT OF INDIVIDUAL CORN KERNELS. L. F. Bauman (Dept. of Botany and Plant Pathology. Purdue Univ., Lafayette, Indiana). T. F. Conway and S. A. Watson. *Science* 139, 498–499 (1963). Nuclear magnetic resonance spectroscopy was used to determine oil content of individual corn kernels in order to evaluate this technique as an aid in the development of strains having greater oil content. This method is rapid and does not impair viability. Individual kernels from a selfed single-cross ear ranged from 2.7 to 5.4 percent oil and were significantly correlated ($r = +0.75$) with the oil content of their progeny. This indicates that the single-kernel differences in oil content were heritable, and this method may greatly increase selection efficiency in breeding for higher oil content in corn.

FLOUR LIPIDS AND BREADMAKING. R. L. Glass (Inst. of Agric., Univ. of Minn., St. Paul, Minn.). *Baker's Dig.* 36(6), 40–42 (1962). This is a review of flour lipids and their involvement in the baking process taken from literature appearing from 1932–1962.

THE DEVELOPMENT AND USES OF FLUID SHORTENINGS. R. H. Ellinger (Durkee Famous Foods, Chicago, Ill.). *Baker's Dig.* 36(6), 65–69 (1962). Through improved shortening and emulsifier technology, it is now possible to use fluid shortenings for nearly every baking use. Fluid shortenings have been developed which have superior functioning properties to those of plastic shortenings. Many of their advantages over plastic shortenings are presented.

BRANCHED CHAIN FATTY ACIDS. PART II. SYNTHESIS AND STUDY OF PHYSICAL PROPERTIES. R. Haque and A. N. Saha (Dept. of Applied Chem., Univ. Colleges of Sci. and Technol., Calcutta 6, India). *J. Indian Chem. Soc.* 39(7), 485–489 (1962). Five branched chain fatty acids have been synthesized from myristic acid. They are α-ethyl-, α-*n*-butyl-, α-isobutyl-, α-*tert*-butyl-, and α-phenyl-myristic acids. Their conductance, surface tension, and solubilizing power was studied and presented. The melting points were all lower than their corresponding straight chain isomers.

THE ANALYSIS OF MIXTURES OF ANIMAL AND VEGETABLE FATS. III. SEPARATION OF SOME STEROLS AND STEROL ACETATES BY THIN-LAYER CHROMATOGRAPHY. J. W. C. Peereboom and H. W. Beekes (Gov. Dairy Sta., Leiden, The Netherlands). *J. Chromatog.* 9(11), 316–320 (1962). The separation of the following sterols was achieved using kieselgur G as the adsorbent and cyclohexane-ethyl acetate mixture (99.5 : 0.5) as the solvent: ergosterol-cholesterol, cholesterol-lanosterol, and cholesterol-vitamin D_2. In reverse-phase systems (undecane/acid-water), cholesterol acetates could be separated from the acetates of the major phytosterols i.e. β-sitosterol and stigasterol. This permits the analyysis of mixtures of animal and vegetable fats.

SEPARATION OF OXYGENATED FATTY COMPOUNDS BY THIN-LAYER CHROMATOGRAPHY. R. Subbarao, M. W. Roomi, M. R. Subbaram, and K. T. Achaya (Regional Res. Lab., Hyderabad, India). *J. Chromatog.* 9(11), 295–299 (1962). Thin-layer chromatography was applied to the separation of various types of fatty compounds using mixtures of ether and petroleum ether as the solvent systems. It was found that the following could be separated: (1) Compounds of same chain length but different hydroxyl numbers, (2) Compounds differing in chain length by four carbon atoms, (3) Compounds with an epoxy group from those containing hydroxy group, and (4) *cis* and *trans* isomers. Compounds which could not be separated are given.

THE RELATIONSHIP BETWEEN SOLID SUPPORT, COLUMN EFFICIENCY, AND STEROL QUANTITATION BY GAS CHROMATOGRAPHY. D. K. Bloomfield (Western Reserve Univ., Cleveland, Ohio). *J. Chromatog.* 9(12), 411–418 (1962). This paper shows that the argon ionization detector is not a truly linear instrument for the quantitative analysis of sterols. Various effects which change the molar response are described and a method is given for the quantitation of complex sterol mixtures. Standardization of detector response is necessary.

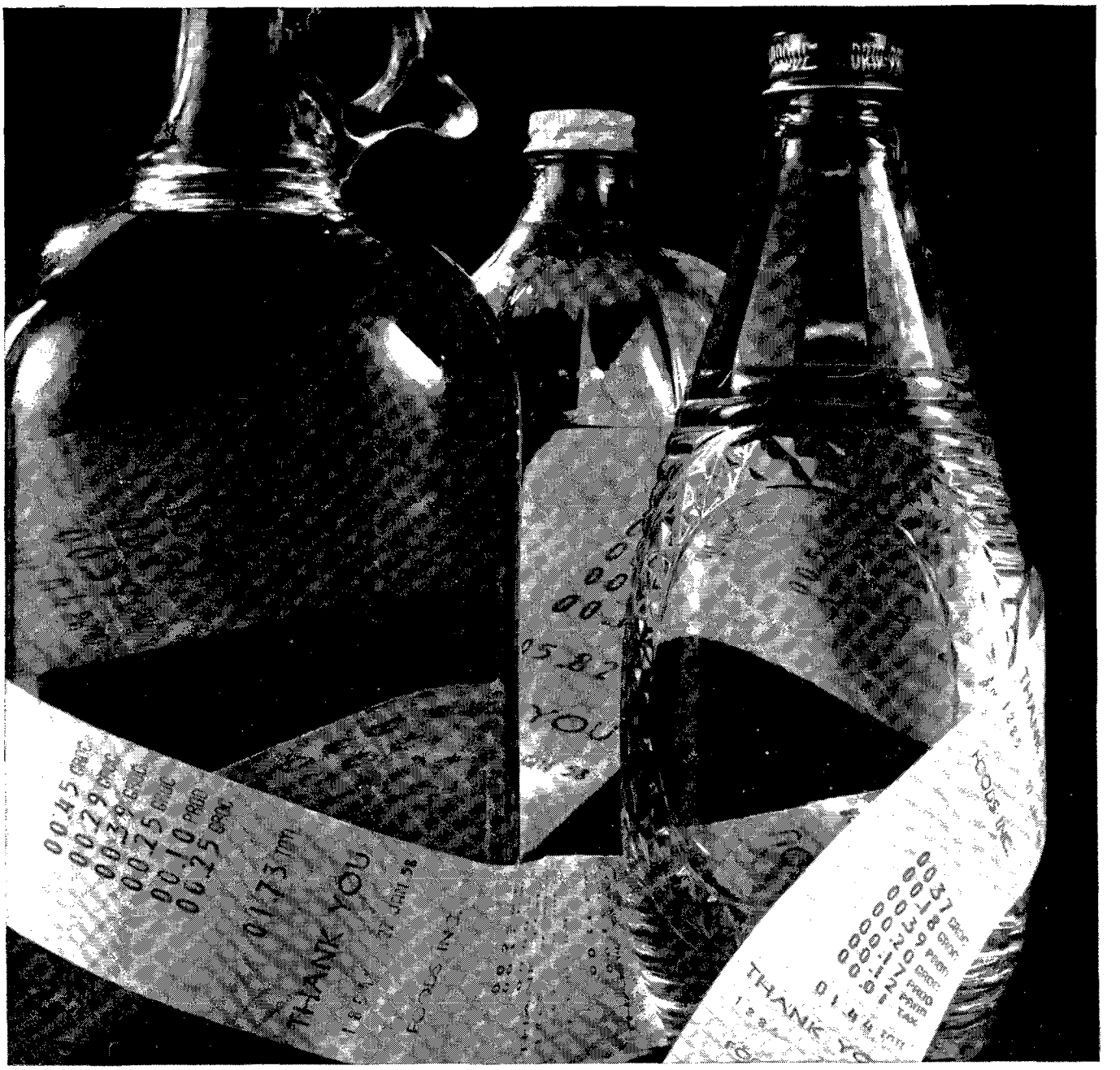
SUGAR CANE PHOSPHOLIPIDS, THE ISOLATION, SEPARATION, AND IDENTIFICATION OF PRINCIPAL PHOSPHOLIPIDS OF SUGAR CANE JUICE. J. J. Friloux and N. A. Cashen (Sugarcane Prod. Lab., Houma, La.). *J. Agr. Food Chem.* 10(6), 509–12 (1962). By utilizing a combination of solvent fractionation and silicic acid column chromatography, the principal phospholipides were isolated from lyophilized fresh sugar cane juice. They corresponded chromatographically to phosphatidyl ethanolamine and lecithin on silicated glass paper.

PEROXIDE VALUE-FLAVOR SCORE RELATIONSHIPS IN STORED FOAM-DRIED WHOLE MILK. Phyllis G. Kilman, A. Tamsma, and M. L. Pallansch (Dairy Prod. Lab., U.S.D.A., Wash., D.C.). *J. Agr. Food Chem.* 10(6), 496-99 (1962). The possibility of relating peroxide value with the flavor score of stored, vacuum-foam dried, whole milk powders was studied. No useful correlation was found between P. V. and flavor score.

ANTIOXIDANT MEASUREMENT, DETERMINATION OF 2,6-DI-*tert*-BUTYL-4-HYDROXYTOLUENE (BHT) : APPLICATION TO EDIBLE FATS AND OILS. C. R. Szalkowski and J. B. Garber (Merck Chem. Div., Merck and Co. Inc., Rahway, N. J.). *J. Agr. Food Chem.* 10(6), 490–95 (1962). The method presented is based upon the steam distillation of BHT from the fat and oil and colorimetric determination with a dianisidine-nitrous acid reagent. The method is capable of determining 10 to 200 ppm BHT in the presence of other allowable antioxidants.

TOTAL ORGANIC CHLORIDE CONTENT IN BUTTERFAT BY A RAPID METHOD OF NEUTRON ACTIVATION ANALYSIS. R. A. Schmitt, G. Zweig (General Atomic Div. of General Dynamics, San Diego, Calif.). *J. Agr. Food Chem.* 10(6), 481–84 (1962). A rapid neutron activation method is given for the determination of total organic chloride content in milk products. It consists of irradiating butterfat and a chlorine reference standard in a nuclear reactor for a short time and then measuring and comparing the induced Cl^{38} radioactivity.

MEASURING THE OIL-BINDING CHARACTERISTICS OF FLOUR. W. C. Shuey, O. S. Rask and P. E. Ramstad (U.S.D.A. Hard Red Spring and Durum Wheat Qual. Lab., Crops Res. Div., Cereal Technol. Dept., North Dakota State Univ., Fargo, N. D.). *Cereal Chem.* 40(1), 71–78 (1963). Two methods for measuring oil-binding characteristics of flour are described. With increased protein content, the oil-binding capacity increases. However, it is shown that this is not entirely explained by an interaction between protein and oil in that the oil-binding capacity of wheat starch increases by a chlorine bleaching treatment. It is also shown that the oil-binding characteristics are physical rather than chemical by comparing oil-binding measurements when a comparatively unsaturated triglyceride, a saturated triglyceride, and a hydrocarbon (mineral) oil are incorporated with the wheat flour.



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JOHNS-MANVILLE

THE CHROMATOGRAPHY OF LIPIDS IN TEST TUBES COATED WITH A THIN LAYER OF SILICIC ACID. K. B. Lie and J. F. Nyc (Dept. of Physiol. Chem., Sch. of Medicine, Univ. of Calif. Med. Ctr., Los Angeles, Calif.). *J. Chromatog.* **8**, 75–81 (1962). Test tubes, coated on the inner surface with a thin film of silicic acid, were used as the stationary phase for the ascending chromatography of various lipids. The behavior of several purified lipids was determined with the mobile phase being mixtures of chloroform with methyl alcohol and *n*-hexane with ethyl ether.

APPLICATION OF REVERSED PHASE CIRCULAR PAPER CHROMATOGRAPHY TO THE ANALYSIS OF HIGHER FATTY ACIDS. C. V. Viswanathan and B. M. Bai (Dept. Biochem., Indian Inst. of Sci., Bangalore, India). *J. Chromatog.* **7**, 507–15 (1962). A detailed study of various reversed phase systems for the qualitative analysis of fatty acids was performed. It was found that a liquid paraffin-aqueous methanol system is the most convenient one. Details of a simple and rapid method for the quantitative estimation of oleic, linoleic, linolenic, lauric, myristic, palmitic, and stearic acids are discussed.

METHOD FOR THE REGENERATION OF BLEACHING EARTHS. C. Thomopoulas and C. Liapis (Lab. Nut. Chem. and Tech. of The Nat. Tech. Univ., Athens, Greece). *Rev. Franc. Corps Gras* **9**, 611–615 (1962). A unique method for the regeneration of bleaching earths is described. The cake is washed with detergent to remove adsorbed oil, and then washed with water. Fifty grams of washed earth is suspended in 200 milliliters of water containing 10 milliliters of sulfuric acid. The suspension is boiled and five grams of potassium permanganate added, just enough to give a stable red color. The earth is then filtered and dried at 70C. Potassium dichromate is equally effective. Ninety eight percent efficiency is obtained.

OBTAINING LIGHT-COLORED OIL AND SOAPSTOCK IN REFINING COTTONSEED OIL. I. EXPERIMENTAL DATA ON OIL REFINING AND ACID OIL DISTILLATION. P. L. Narayana Rao and K. T. Achaya (Reg. Res. Lab., Hyderabad, India). *Indian Oilseeds J.*, **6**, 43–52 (1961). Monoethanolamine (2%), as an additive, can replace the excess alkali used during refining of crude cottonseed oil. Used in conjunction with excess alkali, monoethanolamine yields a bleached oil of considerably reduced color, but has no effect on soapstock color. Use of 2% of 30% hydrogen peroxide as a refining additive decreases bleach color by a factor of 1.7, decreases soapstock color by a factor of 2 to 4 and increases oil yield by about 1.5%. In certain instances, use of 2% of hydrogen peroxide as an additive can dispense with the need for re-refining. Conducting both refining and re-refining using hydrogen peroxide is advantageous for highly color-fixed oils. Oils derived by hydrogen peroxide refining and straight refining have the same storage quality. Fatty acids distilled from hydrogen peroxide derived soapstocks are 1.5 to 2.0 times as light as acids distilled from normal soapstocks. The cost of 2% of the additive is nullified when an extra 3% yield of oil is obtained.

THE FATTY ACID COMPOSITION OF HYDROGENATED RAPESEED OIL. A. Jakubowski, I. Sobierajska and K. Modzelewska (Inst. for Ind. Fatty Acids, Warsaw, Poland). *Rev. Franc. Corps Gras* **9**, 678–680 (1962). Fourteen samples of hydrogenated rapeseed oil suitable for use in margarine were studied. The iodine value of the members of the group ranged from 82.1 to 64.3. The fatty acid composition was studied by gas liquid chromatography. It was observed that the type of hydrogenation used (not stated) was highly selective for linolenic and linoleic. Little erucic or eicosenoic acid was hydrogenated

TALLOW AND ITS MARKETS. M. Moulin (Dir. of Society S.I.P.O.R.). *Rev. Franc. Corps Gras* **9**, 601–610 (1962). The source, use, production and distribution of tallow throughout the world is reviewed.

THE CHEMISTRY OF FATTY ACIDS. G. Cusinberche (Dir. of Ets Cusinberche, Clichy (Seine), Fr.). *Rev. Franc. Corps Gras* **9**, 671–677 (1962). A review.

PREPARATION AND PROPERTIES OF SYNTHETIC FATTY ACIDS OBTAINED BY THE OXIDATION OF PARAFFINS. B. Solomon (ITERG). *Rev. Franc. Corps Gras* **9**, 626–635 (1962). A review of the Russian methods for preparing fatty acids from paraffins. There are 60 references.

A LABORATORY DEODORIZER. J. Heide-Jensen (Aarkus Oliefabrik A/S, Denmark). *Oleagineux* **17**, 879–82 (1962). A compact, portable laboratory deodorizer is described. Capacity is 5 liters. A schematic diagram is supplied.

PROTON MAGNETIC RESONANCE AND THE POLYMORPHISM OF TRIGLYCERIDES. N. Nakajima. *J. Phys. Soc. Japan* **16**, 1778 (1961). The nuclear magnetic resonance spectra of the α- and β-forms of tristearin and tripalmitin are obtained as a function of temperature from −125C to +50C. The data support the hexagonal structure for the α-form as suggested by X-ray and infrared studies. (Rev. Current Lit. Paint Allied Ind.)

FIXATION OF NITROGEN BY VEGETABLE OILS. S. A. Saletore and V. N. Gavai. *J. Sci. Ind. Res.* **21D**(3), 86–8 (1962). Raw, refined and bleached samples of ground nut oil, when exposed to the air for long periods under laboratory conditions, have been found to show an increase in their N content. Accelerated tests carried out by bubbling air at 95C through groundnut oil and its fatty acid esters, coconut oil and linseed oil also result in an increase, though more rapid, in N content. It is suggested that this increase in N contents is due to fixation of atmospheric N_2 by the oils; this phenomenon does not appear to have been reported before. In aerated oils the development of organoleptic rancidity appears to be more closely related to the N contents of the oils than to their peroxide values. (Rev. Current Lit. Paint Allied Ind.)

FUNDAMENTAL STUDIES ON AUTOXIDATION. Hyderabad Regional Res. Lab. *Annual Report*, **1960–61**, 10–12. During studies on autoxidation, it was noted that an increase in N content also occurred. A standard Kjeldahl digestive technique was adopted for determining N in samples of methyl palmitate, oleate and linoleate on ageing at 63C. The N content of methyl palmitate increased in 41 days from 27 to 49 mg. per 100 g. ester, from 31 to 83 for the oleate and from 36 to 84 for the linoleate. N content of oleic acid rose from 51 mg. to 144 mg. per 100 g. on ageing for 48 days at 63C. (Rev. Current Lit. Paint Allied Ind.)

BLEACHING EARTHS. Hyderabad Regional Res. Lab. *Annual Report*, **1960–61**, 57–9, 71. Korvi and Mudh earths were activated with HCl and H_2SO_4 prior to testing. Mudh earth was comparable to Tonsil Optimum in bleaching efficiency, oil retention and bulk density. Preliminary experiments with a fluidization technique for activating earths are briefly described. Work on a standard earth for evaluation of bleaching earths is also described and various heats of wetting are reported. Work on the quality of water suitable for washing acid-activated bleaching earths included a study of the effect of cations present in the water on the activity of the earths. The decolorizing capacity of some of the acid-activated earths was almost 20% more when distilled water was used for washing instead of well water. The results indicate that different earths adsorbed ions in different proportions and that the adsorbed ions reduced the bleaching capacity of these earths to a considerable extent. (Rev. Current Lit. Paint Allied Ind.)

TALL OIL FATTY ACIDS. Anon. *Paint Tech.* **26**(5), 26–7 (1962). A brief history of tall oil fatty acid production is given. Because of the decrease of 30% in the price of tall oil fatty acids during the last 3 years, there is now a high demand for them. (Rev. Current Lit. Paint Allied Ind.)

NON-GLYCERIDE CONSTITUENTS OF OILS AND FATS. I–III. *British Oil & Cake Mills Tech. Notes* **1962**, Nos. 42–4, 3 pp. The occurrence of minor non-glyceride constituents, such as free fatty acids, coloring matter, phosphatides and waxes, in glyceride oils is briefly reviewed. (Rev. Current Lit. Paint Allied Ind.)

• Fatty Acid Derivatives

PREPARATION OF MONOGLYCERIDES FROM CASTOR OIL. III. EFFECT OF GLYCEROL AND WATER. S. K. Dey, P. K. Kochhar and P. K. Bhatnagar (Shir Ram Inst. for Ind. Res., Delhi, India). *Indian Oilseeds J.* **6**, 215–225 (1962). During glycerolysis of oils the ratio of glycerol to oil present at any time in the reaction mixture determines the composition of the final product to a great extent. The higher this ratio is, the greater will be the percentage of monoglycerides in the final product. Small amounts of water (4–5% on weight of anhydrous glycerol) is optimum for high mono preparation. Without water, the reaction rate is extremely slow, but large amounts leads to excessive generation of fatty acids.

ASSOCIATION OF α-MONOGLYCERIDES IN NON-AQUEOUS SOLVENTS P. Debye and H. Coll. *J. Coll. Sci.* **17**, 220–30 (1962). Number average mol. wts. of monocaprin are determined as a function of its concentration in C_6H_{12}, CCl_4, C_6H_6 and $CHCl_3$ by measurement of vapor pressure lowering (thermoelectric method). Variations of dipole moment with concn. are measured using a heterodyne beat frequency apparatus. Change in the proportion of free to H-bonded −OH with concn. is deduced from infrared spectra. Some unsatisfactory light-scattering results are reported. It is concluded that some association of α-monoglycerides takes place in non-aqueous

solvents; clustering increases with decreasing cohesive energy density of the solvents. (Rev. Current Lit. Paint Allied Ind.)

ELECTRON-DIFFRACTION STUDIES OF FATTY-ACID MONOLAYERS. B. R. Banerjee, B. Ostrofsky, and H. E. Ries, Jr. *Nature* **193**, 873–4 (1962). (Rev. Current Lit. Paint Allied Ind.)

SEPARATION OF THE METHYL ESTERS OF FATTY ACIDS BY THIN LAYER CHROMATOGRAPHY. S. Ruggieri. *Nature* **193**, 1282–3 (1962). (Rev. Current Lit. Paint Allied Ind.)

• Biology and Nutrition

CONVERSION OF LECITHIN TO LYSOLECITHIN AS A SOURCE OF FATTY ACIDS IN INCUBATED PLASMA OR SERUM. W. C. Vogel and L. Zieve (*Radioisotope Service and Dept. of Med., Minneapolis Veterans Hospital, Univ. of Minnesota*). *Proc. Soc. Exp. Biol. Med.* **111**, 538–540 (1962). Incubation of human serum or plasma at 38C for 4 hours results in conversion of approximately 10% of the lecithin to lysolecithin. Serum from patients with acute pancreatitis and postheparin plasma was no different than normal serum or plasma in this respect.

GAMMA IRRADIATION AND INTERRELATION OF DIETARY VITAMIN A AND COPPER AND THEIR DEPOSITION IN THE LIVER OF SWINE. R. L. Shirley, T. N. Meacham, A. C. Warnick, H. D. Wallace, J. F. Easley, G. K. Davis, and T. J. Cunha (Animal Science Dept., Agr. Expt. Sta., Univ. of Florida, Gainesville). *J. Nutrition* **78**, 454–460 (1962). A study was made to determine (1) whether dietary vitamin A had an effect on the level of copper deposition in the liver; (2) whether dietary copper had an effect on the deposition of vitamin A in the liver; and (3) whether whole body gamma irradiation had an effect on the deposition of vitamin A and copper in the liver of swine. Vitamin A supplementation decreased the deposition of copper in the liver. Copper supplementation increased the level of vitamin A in the liver. Gamma irradiation increased the deposition of copper in the liver.

EFFECTS OF ETHIONINE AND METHIONINE ON SERUM LIPIDS AND LIPOPROTEINS. J. C. Seidel and A. E. Harper (Dept. of Biochem., Univ. of Wisconsin, Madison). *Proc. Soc. Exp. Biol. Med.* **111**, 579–582 (1962). Prolonged feeding of ethionine to rats receiving a diet containing cholesterol, cholic acid and hydrogenated coconut oil leads to about a 10-fold rise in serum triglyceride concentration which is primarily confined to triglycerides bound to low-density lipoproteins. This increase is prevented if an equal amount of methionine is included in the diet. Serum cholesterol concentrations of rats fed ethionine are lower than those of unsupplemented rats. Addition of methionine with ethionine further lowers the cholesterol concentration. Methionine lowers the concentrations of serum triglycerides and phospholipids only slightly but substantially lowers serum cholesterol concentration.

EFFECT OF UNEQUAL MILKING INTERVALS ON LACTATION MILK, MILK FAT, AND TOTAL SOLIDS PRODUCTION OF COWS. G. H. Schmidt and G. W. Trimberger (Dept. of Animal Husbandry, Cornell Univ., Ithaca, N. Y.). *J. Dairy Science* **46**, 19–21 (1963). Cows of three breeds were milked at 12- and 12-hr, 14- and 10-hr, and 16- and 8-hr daily intervals for complete locations, to determine the effect of milking intervals on the milk, milk fat, and total solids production. Thirty-five trios were used over a 2-yr period in the experiment. The mature equivalent milk records of cows milked at 14- and 10-hr intervals were 0.3% lower, and those of cows milked at 16- and 8-hr intervals were 1.3% lower, than the records of cows milked at equal intervals. The mature equivalent milk production records of all cows averaged over 13,500 lb milk. No significant differences occurred between any two groups in the milk fat and total solids percentages or yields. There was some indication that the 16- and 8-hr intervals had a greater adverse effect on higher-producing cows in comparison to lower-producing cows, and on first-calf heifers in comparison to older cows; however, the evidence was not conclusive. Unequal intervals had no effect on udder health or the incidence of ketosis.

GLYCEROL INTAKE, BLOOD CHOLESTEROL LEVEL AND ANEMIA IN THE GUINEA PIG AND RABBIT. R. Ostwald (Dept. of Nutritional Sciences, Univ. of California, Berkeley). *Proc. Soc. Exp. Biol. Med.* **111**, 632–634 (1962). A solution of either glycerol in saline or saline alone was administered by stomach tube to groups of guinea pigs and rabbits. Their plasma and cell cholesterol levels and their red blood cell count were compared over periods of 30 to 50 days. Guinea pigs given more than 5 ml of a 50% glycerol solution daily died with acutely toxic symptoms. Rabbits tolerated at least 10 ml daily. In neither species of animals did the level of the plasma or cell cholesterol show consistent changes attributable to the intake of glycerol. It appears probable that in the guinea pig the intake of glycerol is accompanied by an anemia.

IMPAIRED PIGMENTATION IN CHINOOK SALMON FED DIETS DEFICIENT IN ESSENTIAL FATTY ACIDS. N. Nicolaides and A. N. Woodall (Dept. of Biochem. and Div. of Dermatology, Univ. of Oregon Med. School, Portland). *J. Nutrition* **78**, 431–437 (1962). A marked depigmentation was observed in the skin of Chinook salmon fry-fed a fat-free diet since hatching. A similar depigmentation was observed when triolein or linolenic acid was included in the diet, but depigmentation was largely prevented by the inclusion of trilinolein. Depigmentation became apparent after 16 weeks of feeding and reached a maximum in about 24 weeks. General repigmentation occurred during a recovery experiment and appeared to be more pronounced and more rapid in subgroups fed a diet containing 3% of trilinolein than in the subgroups continued with their original diet. Histochemical tests suggest that the depigmentation process involves melanin. Trilinolein or linolenic acid, or both, elicited a positive growth response in Chinook salmon fry when substituted isocalorically for sucrose in a fat-free ration, but triolein did not.

DISTRIBUTION OF ALPHA GLYCERYL ETHERS IN ANIMAL TISSUES. S. Nakagawa and J. M. McKibbin (Dept. of Biochem., State Univ. of New York, College of Med., Syracuse, N. Y.). *Proc. Soc. Exp. Biol. Med.* **111**, 634–636 (1962). A method is described for determination of lipid alpha glyceryl ethers in animal tissues. Purified tissue lipid extracts are hydrolyzed and the lipid soluble fraction of the hydrolysate is fractionated on a silicic acid column. The glyceryl ether fraction is oxidized with periodic acid and the formaldehyde formed is determined colorimetrically. The alpha glyceryl ethers are a minor component of all of the tissues examined except bone marrow. The tissues other than bone marrow range in content from 0.20 to 1.35 micromoles per gram of dry lipid-free tissue and from 0.002 to 0.010 molar ratio to lipid phosphorus.

EFFECT OF AGE ON THE RESPONSE OF CHICKENS TO DIETARY PROTEIN AND FAT. J. E. Marion and H. M. Edwards, Jr. (Poultry Dept., Univ. of Georgia, Athens). *J. Nutrition* **79**, 53–61 (1963). A high level of protein and the presence of corn oil in the diet of growing female chickens each increased body weights, decreased the size and lipid content of the liver, and decreased the incorporation of sodium acetate-1-C^{14} into liver lipids. The changes in liver lipid content were largely a reflection of changes in the level of glycerides and cholesterol esters in this organ. Generally, these measures were not significantly affected by diet after the birds reached sexual maturity. The analysis of eggs, plasma, heart, liver, and depot fat from mature birds showed that the fatty acid content of these sites was altered little by protein level. Adding corn oil to the diet increased the level of linoleic acid in these sites and decreased the palmitoleic and oleic acid content. Egg weights and egg production were not significantly influenced by dietary protein level. However, higher values for these measurements were noted when corn oil was added to the diet.

PHENETHYLBIGUANIDE AND TRIGLYCERIDE SYNTHESIS. C. Longcope and R. H. Williams (Dept. of Med., Univ. of Washington School of Med., Seattle). *Proc. Soc. Exp. Biol. Med.* **111**, 775–777 (1962). The effect of PEBG on triglyceride synthesis has been studied *in vitro*. In intact tissue PEBG interferes with the conversion of diglyceride to triglyceride. In homogenates, PEBG increases the incorporation of labeled fatty acids into triglyceride. It thus differs from insulin in its effect on triglyceride synthesis. An explanation for this is presented.

THE ACTION OF CARBON TETRACHLORIDE ON THE TRANSPORT AND METABOLISM OF TRIGLYCERIDES AND FATTY ACIDS BY THE ISOLATED PERFUSED RAT LIVER AND ITS RELATIONSHIP TO THE ETIOLOGY OF FATTY LIVER. M. Heimberg, I. Weinstein, G. Dishmon, and A. Dunkerley (Dept. of Pharmacology, School of Med., Vanderbilt Univ., Nashville 5, Tenn.). *J. Biol. Chem.* **237**, 3623–3627 (1962). A major metabolic defect induced by CCl_4 administration to the rat appears to be inhibition of the outward transport of hepatic triglycerides. This inhibition of outward triglyceride transport may be the etiology of the fatty liver associated with CCl_4 poisoning.

EFFECTS OF VITAMIN K-ACTIVE COMPOUNDS AND INTESTINAL MICROORGANISMS IN VITAMIN K-DEFICIENT GERM-FREE RATS. B. E. Gustafsson, F. S. Daft, E. G. McDaniel, J. C. Smith, and R. J. Fitzgerald (Nat'l Inst. of Arthritis and Metabolic Diseases, Nat'l Inst. of Dental Research, Nat'l Insts. of Health, Bethesda, Md.). *J. Nutrition* **78**, 461–468 (1962). Vitamin K deficiency was readily induced in two different strains of germ-free rats raised with a vitamin K-deficient

(Continued on page 31)

• *Names in the News*

G. Y. Brokaw

T. H. McGuine

O. W. Johnson

Daniel Swern (1942) was recently named "Federal Civil Servant of the Year" at a luncheon meeting of the Federal Business Association. Dr. Swern was honored for his outstanding contributions to the fundamental chemistry of fats, and for products and processes widely used throughout the plastics industry which have stemmed from his research. Other awards Dr. Swern has received include the John Scott Award of the City of Philadelphia (1956), the Arthur S. Flemming Award (1955), and the Distinguished Service Award (1955).

G. Y. Brokaw (1948) has been named to head the new Development Laboratories recently formed at Distillation Products Industries, Division of Eastman Kodak Company. Dr. Brokaw joined the organic research group at DPI in 1947.

R. W. Lehman (1950) will work with Dr. Brokaw in the new laboratories at Distillation Products Industries as head of a new Technical Service Department. Mr. Lehman joined DPI in the organic research department in 1940.

Ingenuin Hechenbleikner (1952) has been appointed Vice President of Carlisle Chemical Works, Inc., Reading, Ohio. Dr. Hechenbleikner's duties include all technical activities of both the Carlisle Division and the Advance Division in New Brunswick, N. J.

T. H. McGuine (1954) has been transferred to the Industrial Chemicals Department of Archer-Daniels-Midland Co. as a product supervisor. Mr. McGuine joined ADM in January of 1962.

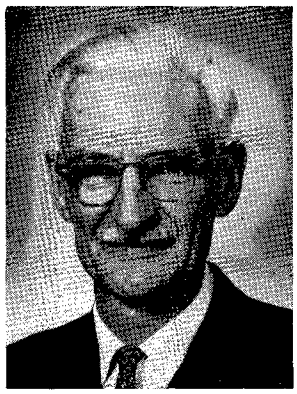
W. N. B. Armstrong (1957) was recently appointed Director of Materials Chemical Research of Ontario Research Foundation. Mr. Armstrong has been with ORF since 1946.

O. W. Johnson (1948) has been named Manager of the recently expanded Distribution Sales Division of Dorr-Oliver, Inc., Stamford, Conn. Mr. Johnson joined Dorr-Oliver as Staff Assistant to the General Sales Manager.

M. J. Hein (1958) was recently appointed Sales Manager of the Sterotex and Stearate Department of The Capital City Products Co. This appointment is an addition to Mr. Hein's present position as Manager of the New Products Department.

E. S. Pattison (1951) has been named Manager and Secretary of the Soap and Detergent Association. Mr. Pattison has been Divisional Manager of the SDA, heading up the Glycerine Producers' Association and the Fatty Acid Producers' Council.

Ingenuin Hechenbleikner



W. N. B. Armstrong

E. S. Pattison

• *New Literature*

Glycerine Producers Association has issued a new booklet entitled "Physical Properties of Glycerine and Its Solutions." This 28 page booklet is a compilation of the available data on glycerine, covering thirty-four subjects from adiabatic expansion to viscosity. (295 Madison Ave., New York 17, N. Y.)

Cahn Instrument Co. is offering a four page reprint (in German) of the article "Apparatus for the Measurement of Sorption Kinetics and Micro Method for the Measurement of Sorption Isotherms." (15505 Minnesota Ave., Paramount, Calif.)

Research Specialties Co. has released a 12 page bibliography on Gas Chromatography of Steroids, covering significant publications from 1960 through 1962. Listing is in alphabetical order by author. (200 South Garrard Boulevard, Richmond, Calif.)

Beckman Instruments, Inc., Scientific and Process Instruments Division, announced publication of a 50 page literature packet describing accessories for Beckman Infrared Spectrophotometers. (2500 Harbor Boulevard, Fullerton, Calif.)

Delmar Scientific Laboratories, Inc., has prepared an eight page booklet entitled "Delmar Biological Glassware," which describes five specialized glassware units for biological research. (317 Madison St., Maywood, Ill.)

Will Scientific, Inc., are distributing a new issue of "Lablog," a periodic 16 page supplement to Will's Apparatus Catalog 8. (Box 1050, Rochester 3, N. Y.)

Blaw-Knox Co. has issued Flakers Catalog 396 which presents Buflovak's advanced information of the design, construction, application, and operation of Flakers for continuously chilling and flaking many chemical and food products. (Buflovak Equipment Division, P. O. Box 2041, Buffalo 5, N. Y.)

Geigy Industrial Chemicals, Division of Geigy Chemical Corp., announced the availability of their new 15 page bulletin entitled "Sequestrene Food Grade EDTA Products." The bulletin tells how to overcome the deteriorative effects encountered in 15 food and beverage categories. A complete list of literature references is keyed to the text. (P. O. Box 430, Yonkers, N. Y.)

(Continued from page 29)

diet. Conventional animals fed the same diet showed no deficiency symptoms. The addition of 25% of lard to the basal diet accelerated the appearance of vitamin K deficiency symptoms, whereas 10% of peanut oil in the diet exerted a sparing effect.

EFFECTS OF DIET HIGH IN POLYUNSATURATED FAT ON THE PLASMA LIPIDS OF NORMAL YOUNG FEMALES. B. Gunning, G. Michaels, L. Neumann, S. Splitter, and L. Kinsell (Inst. Metabolic Res., Highland-Alameda County Hosp., Oakland, Calif.). *J. Nutrition* **79**, 85–92 (1963). Substitution of a palatable mixed diet containing 45% of the calories as fat, 50% of this derived from polyunsaturated fatty acids, for an average American diet, produced a significant decrease in the level of plasma cholesterol and phospholipids in normal young women, as tested by *t* values less than the critical level of 15%. (All figures with respect to fat composition are approximate.) No significant change occurred in the plasma glycerides. The increase in cholesterol linoleate which occurred in all subjects can be used as an index of short-term diet adherence.

ATHEROSCLEROSIS IN THE RAT. EFFECT OF X-RAY AND A HIGH FAT DIET. H. Gold (L. D. Beaumont Memorial Res. Lab., Mt. Sinai Hosp., Cleveland, Ohio). *Proc. Soc. Exp. Biol. Med.* **111**, 593–595 (1962). Forty-two albino Wistar rats, average weight 133 g, fed on a supplemented high-fat diet, were divided into 2 groups. One group was treated with 2500 r (X-rays) to the thorax, and the other kept on the high fat diet, but not irradiated. The rats were killed 20 to 28 weeks after completion of irradiation. Marked atherosclerotic lesions were observed in the coronary arteries of 38.8% of the irradiated group and in 22.7% in the group on the high fat diet alone. In the pulmonary arteries similar changes were noted in 25% of the irradiated group and none in the unirradiated group. Previous studies showed that in 8–15 weeks after irradiation, marked coronary lesions were present in 26.6% of the irradiated group and none in the unirradiated. It is suggested that X-irradiation accelerates the process that ordinarily develops slowly.

VITAMIN E DEFICIENCY IN THE MONKEY. V. ESTIMATED REQUIREMENTS AND THE INFLUENCE OF FAT DEFICIENCY AND ANTIOXIDANTS ON THE SYNDROME. C. D. Fitch and J. S. Dinning (Dept. of Biochem., School of Med., Univ. of Arkansas, Little Rock). *J. Nutrition* **79**, 69–78 (1963). The influence of a fat-deficient diet and N,N′-diphenyl-p-phenylenediamine (DPPD) on vitamin E deficiency was studied in the rhesus monkey. Fat deficiency did not prevent the monkeys from developing the full syndrome of vitamin E deficiency including the anemia, but it appeared to reduce the requirement for vitamin E. The estimated requirement for monkeys receiving the diet containing fat was 2 to 3 mg of DL-α-tocopherol per kg body weight per day, whereas a single estimate of the requirement in a monkey supplied with the fat-deficient diet was 0.7 mg per kg of body weight per day. Also the average length of time required to develop vitamin E deficiency was longer in the fat-deficient monkeys. The DPPD had a beneficial effect in the vitamin E-deficient monkeys but the response was not complete. Several electrocardiograms were obtained for each of the monkeys in these experiments and a relatively high incidence of abnormalities due to pericarditis was noted. No abnormalities were present in the electrocardiograms that could be attributed either to vitamin E deficiency or fat deficiency.

EFFECT OF OVARIECTOMY ON BLOOD CONCENTRATION OF ORALLY ADMINISTRATED TRIOLEIN I^{131} IN BITCHES ON LOW AND MODERATE FAT INTAKE. E. N. Dost and W. M. Dickson (College of Veterinary Med., Washington State Univ., Pullman). *Proc. Soc. Exp. Biol. Med.* **111**, 674–676 (1962). Triolein I^{131} was administered to castrate and intact female beagles maintained on 2 levels of dietary fat. Castrate bitches were found to have a greater maximum percentage of administered radioactivity in circulation than intact females. Curves representing blood radioactivity plotted against time were similar after castration to those of some conditions in the human in which deranged lipid metabolism is implicated. Curves produced under conditions of low availability of dietary fat became erratic and presented only slightly different mean peak values when intact and castrate animals were compared.

EFFECT OF DIET UPON THE IN VITRO METABOLISM OF RAT EPIDIDYMAL ADIPOSE TISSUE. J. Di Giorgio, R. A. Bonanno, and D. M. Hegsted (Dept. Nutrition, Harvard School of Public Health, Boston, Mass.). *J. Nutrition* **78**, 384–392 (1962). Rats were fed crude and purified diets for several weeks in order to study their effects on the *in vitro* release of fatty acids from rat epididymal tissue. The purified diets were isocaloric and differed only in the kind and amount of dietary fat. It was found that the total quantities of fatty acids released during a 4-hour incubation period of epididymal adipose tissue from the various groups of rats were not significantly different. However, the adipose tissue fatty acids were released in proportions different from those initially present in the parent tissue.

THE HYDROLYSIS OF LONG-CHAIN FATTY ACID ESTERS OF CHOLESTEROL WITH RAT LIVER ENZYMES. D. Deykin and D. S. Goodman (Lab. Cellular Physiol. and Metabolism, Nat'l Heart Inst., Nat'l Insts. of Health, Bethesda, Md.). *J. Biol. Chem.* **237**, 3649–3656 (1962). The hydrolysis of long-chain fatty acid esters of cholesterol with rat liver homogenates has been shown. The bulk of hydrolytic activity was associated with the soluble protein fraction, although the microsomes contributed between 11 and 32% of the observed total hydrolysis. The soluble enzyme was partially purified by ammonium sulfate precipitation and calcium phosphate gel absorption. The enzyme was unstable and lost activity after freezing, dialysis, or lyophilization. The soluble cholesterol esterase was separable from the major esterase activities involved in the hydrolysis of *p*-nitrophenylacetate and *p*-nitrophenylphosphate.

SYNTHESIS OF SOME 3β-HYDROXYLATED BILE ACIDS AND THE ISOLATION OF 3β,12α-DIHYDROXY-5β-CHOLANIC ACID FROM FECES. H. Danielsson, P. Eneroth, K. Hellström, and J. Sjövall (Dept. of Chem., Karolinska Inst., Stockholm, Sweden). *J. Biol. Chem.* **237**, 3657–3659 (1962). The synthesis of 3β,7α-dihydroxy, 3β,12α-dihydroxy, and 3β,7α,12α-trihydroxy-5β-cholanic acids is described. 3β,12α-Dihydroxy-5β-cholanic acid has been isolated from rabbit feces and was found to be a metabolite of deoxycholic acid.

CARNITINE IN INTERMEDIARY METABOLISM. THE METABOLISM OF FATTY ACID ESTERS OF CARNITINE BY MITOCHONDRIA. J. Bremer (Inst. of Clinical Biochem., Rikshospitalet, Univ. of Oslo, Oslo, Norway). *J. Biol. Chem.* **237**, 3628–3632 (1962). A simple method for the preparation of DL-palmityl-, DL-octanoyl-, and DL-butyrylcarnitine is reported. These compounds have been incubated in the presence of catalytic amounts of succinate with mitochondria isolated from several tissues of the rat. Under these conditions, oxygen uptake corresponding to a complete oxidation to carbon dioxide and water of the acyl group of one of the optical isomers, presumably the L isomer, is observed.

IDENTIFICATION OF LIPIDS IN BLOOD THROMBOPLASTIN. H. P. Bentley, Jr. (Dept. of Pediatrics, Univ. of Alabama Medical Center, Birmingham). *Proc. Soc. Exp. Biol. Med.* **111**, 757–759 (1962). Lipids from blood thromboplastin were identified by column chromatography and paper chromatography as inositol phosphatide, lecithin, sphingomyelin, phosphatidyl serine, phosphatidyl ethanolamine, and cholesterol. Despite wide variations in thromboplastic acitvity in 70 samples of blood thromboplastin, there was no change in the presence of any of the lipids.

ERYTHROCYTE PHOSPHOLIPIDS IN THE NEWBORN INFANT. H. P. Bentley, Jr. (Dept. of Pediatrics, Univ. of Alabama Medical Center, Birmingham). *Proc. Soc. Exp. Biol. Med.* **111**, 591–592 (1962). The total phospholipids from both the entire erythrocyte and the erythrocyte stroma of the newborn infant have been shown to be equal to the adult. The individual phospholipids from the entire red cell have been shown to be identical to the adult.

EFFECTS OF OIL INGESTION ON LIPOPROTEIN FATTY ACIDS IN MAN. A. V. Nichols, C. S. Rehnborg, F. T. Lindgren, and R. D. Wills (Div. of Med. Physics, Donner Lab. of Med. Physics, Lawrence Radiation Lab., Univ. of Calif., Berkeley). *J. Lipid Res.* **3**, 320–26 (1962). This report describes preliminary clinical investigations on the influence of safflower and olive oil ingestion on (a) the lipid composition of the major serum lipoprotein classes, (b) the fatty acid composition of the lipoprotein lipids, and (c) the fatty acid composition of the ultracentrifugal protein residue fraction. Significant glyceride increases occurred in the S_f 20–10^5 and the high-density lipoproteins (HDL). Fatty acid composition changes occurred in the glyceride moieties of the S_f 20–10^5, S_f 0–20, and HDL fractions. Marked alterations in the composition of the fatty acids associated with the ultracentrifugal protein residue fraction occurred following oil ingestion. The origin of the HDL lipid following oil ingestion is discussed in relation to the metabolism of the S_f 20–10^5 lipoproteins.

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