

ABSTRACTS

R. A. REINERS, Editor. ABSTRACTORS: N. E. Bednarczyk, J. E. Covey, J. G. Endres, J. Iavicoli, F. A. Kummerow, E. G. Perkins, T. H. Smouse, J. A. Thompson and R. W. Walker

• Fats and Oils

VITAMIN E, VITAMIN A AND CAROTENE CONTENTS OF ALBERTA BUTTER. S. K. Searles and J. G. Armstrong (Dept. Food Science, Univ. Alberta, Edmonton, Canada). *J. Dairy Sci.* 53, 150-54 (1970). The vitamin E, vitamin A and carotene contents and the total vitamin A potencies of milk fat have been determined for 498 samples of butter representative of Alberta production for 15 months. Carotene was measured colorimetrically, glycerol dichlorohydrin reagent was used to determine vitamin A, and vitamin E was measured using a modified Emmerie-Engel procedure. Vitamin A, carotene, and total vitamin A potency had maximum values in late spring when fresh pasture became available; they showed minimum values during late winter and early spring. Vitamin E had a maximum value in early fall and a minimum value in early spring. The mean summer, winter, and yearly values observed were, for vitamin A: 916, 679, 797 $\mu\text{g}/100$ fat; carotene: 915, 307, 616 $\mu\text{g}/100$ g fat; total vitamin A potency: 4570, 2770, 3670 IU/100 g fat; vitamin E: 3630, 2390, 3010 $\mu\text{g}/100$ g fat.

MASS SPECTROMETRY OF SOME DEUTERATED 1,3-DISTEARINS. A. Morrison, M. D. Barratt and R. Aneja (Unilever Res. Lab. Colworth/Welwyn, the Frythe, Welwyn, Herts., U.K.). *Chem. Phys. Lipids* 4, 47-59 (1970). The mass spectra of 1,3-distearins -d₁, -d₂ and -d₃ with the deuterium incorporated into the glyceryl moiety, have been investigated in order to clarify the electron-impact induced fragmentation of 1,3-distearin itself. High resolution mass spectrometry has been utilized to give accurate masses of fragment ions and consequently molecular formulae. Where applicable, metastable peaks have been correlated with proposed mechanisms. It has been found that the loss of water from the molecular ion is electron-impact induced and that the hydrogen atoms eliminated arise from the hydroxyl group and the stearyl chains. There is no appreciable scrambling of deuterium between the chains and the glyceryl head. Many of the fragment ions with molecular weights greater than 200 a.m.u. probably have cyclic structures and most retain the glyceryl residue intact.

GAS CHROMATOGRAPHIC DETERMINATION OF THE CIS-TRANS ISOMER CONTENT OF OLEFINS. L. M. McDonough and D. A. George (U.S. Dept. of Agr., Agr. Res. Service, Entom. Res. Div., 3706 W. Nob Hill Blvd., Yakima, Wash. 98902). *J. Chromat. Sci.* 8, 158-161 (1970). Stereospecific epoxidation of olefins produced oxiranes for which the gas chromatographic retention times were greater for the cis than for the trans isomer. The difference in retention times increased with increasing polarity of the liquid phase, and was made the basis of a method of analyzing for the cis-trans isomers of the synthetic sex attractant (cis-7-dodecen-7-ol acetate) of the cabbage looper moth, *Trichoplusia ni* (Hubner). The method was usable for the analysis of cis-trans isomers of methyl 9,10 hexadecenoate, and thus, it considerably extends the range of molecular weights for which the cis-trans isomer content may be determined by gas chromatography with packed columns.

SIMPLE TEST FOR LIPOLYTIC RANCIDITY IN MILK. S. Nakai, J. J. Perrin and V. Wright (Dept. of Food Sci., Univ. of British Columbia, Vancouver 8, Can.). *J. Dairy Sci.* 53, 537-40 (1970). The Rhodamine B method of MacKenzie *et al.* was simplified for determining lipolytic rancidity in milk. This may facilitate detection of rancid milk and prevent intermixing with normal milk. Lipids extracted from 2 ml of milk with petroleum ether were dried, dissolved in toluene and color produced by shaking with Rhodamine B was compared with a color disc in a portable comparator. This method compared with acid degree values revealed a highly significant correlation coefficient of 0.924 for 23 milks, acid degree value of from 0.6 to 2.0, out of 40 different milks; the other 17

milks were so rancid they exceeded the comparator's color range.

TAXONOMIC PATTERNS IN THE FAT CONTENT, FATTY ACID COMPOSITION AND TRIGLYCERIDE COMPOSITION OF PALMAE SEEDS. C. Litchfield (Dept. Biochem., and Biophys., Texas Agr. Exp. Station, College Station, Texas 77843). *Chem. Phys. Lipids* 4, 96-103 (1970). Twelve species of Palmae seeds have been examined for (a) fat content, (b) fatty acid composition of the triglycerides and (c) positional distribution of the fatty acids within the triglycerides. There is a direct correlation between the values of these parameters and the botanical sub-families within the Palmae. Coccoideae species have a high fat content (44-72%), a high level of 12:0 (38-56 mole %), a low level of unsaturated acids (6-19 mole %), and appreciable esterification of 12:0 and 14:0 at the 2-position of the triglycerides. Coryphoideae and Phoenicoideae species exhibit a low fat content (3-14%), an intermediate level of 12:0 (15-29 mole %), a high level of unsaturated acids (45-61 mole %), and preferential esterification of 12:0 and 14:0 at the 1, 3 positions of the triglycerides. Arecoideae species show a wide variation in the values of these parameters. Two hypotheses on the possible causes of these relationships are presented.

CUTICULAR LEAF WAXES PART II. CHENOPODIUM ALBUM AND LOTULUM PERENNE L. Jennifer E. Allebone, R. F. Hamilton, S. A. Knights, B. S. Middleditch and D. M. Power (Dept. Chem. and Biol., College of Tech., Byrom Street, Liverpool 3). *Chem. Phys. Lipids* 4, 37-46 (1970). Several constituents of the cuticular leaf waxes of *C. album* and *L. perenne* L. have been examined by gas chromatography and mass spectrometry. The hydrocarbon fraction from *C. album* contained n-alkanes C₂₂-C₃₁ with n-nonacosane as the principal component. A more polar fraction from *C. album* was found to contain thirteen aldehydes, nC₁₅ to nC₃₂, with n-octacosanal as the major component, and six acetates of alcohol, nC₂₀, nC₂₂, nC₂₄, nC₂₆, nC₂₈, nC₃₀ with octacosanyl acetate as the major component. A similar fraction from *L. perenne* was found to contain nine aldehydes with chain lengths nC₂₅ to nC₃₆, with n-hexacosanal as the major constituent.

THE SYNTHESIS OF TEN OCTADECADIENOIC ACIDS AND OF THE RELATED CIS,CIS- AND TRANS,TRANS-OCTADECADIENOIC ACIDS. F. D. Gunstone and M. Lie Ken Jie (Dept. of Chem., The Purdie Bldg., The Univ. of St. Andrews, Scotland). *Chem. Phys. Lipids* 4, 1-14 (1970). The following C₁₈ diynoic, cis,cis-dienoic and trans,trans-dienoic acids have been prepared: 5,12; 6,12; 7,12; 8,12; 9,12; 10,12; 6,8; 6,9; 6,10 and 6,11.

THE USE OF PYROLYSIS AND HYDROGENATION IN THE GAS CHROMATOGRAPHY OF ALIPHATIC HYDROCARBONS. T. A. Gough and E. A. Walker (Ministry of Tech., Lab. of Gov. Chem., Stamford St., London S.E. 1, Eng.). *J. Chromat. Sci.* 8, 134-38 (1970). An investigation has been carried out into the effects of pyrolysis and hydrogenation in the examination by gas-liquid chromatography of normal and branched hydrocarbons. The formation of the breakdown products is discussed and a method for the identification of a number of methyl branched hydrocarbons is suggested using the ratios of peak heights of C₄ and C₅ isomers.

PREPARATION OF CRYSTALLINE L-OX-GLYCEROPHOSPHORYL-CHOLINE-CADMIUM CHLORIDE ADDUCT FROM COMMERCIAL EGG LECITHIN. Jaswinder Singh Chadha (Unilever Res. Lab. Colworth/Welwyn, Herts., England). *Chem. Phys. Lipids* 4, 104-108 (1970). Preparation of crystalline L-ox-GPC/CdCl₂ complex from an average sample of commercial egg lecithin containing phosphatidylethanolamine (P.E.), sphingomyelin and other lipids is described. The method has been used for preparing up to 250 g of the L-ox-GPC/CdCl₂ complex. Commercial egg lecithin is methanolized in ether/methanol, when crude GPC containing GPE and two other impurities are precipitated. Crystalline L-ox-GPC/CdCl₂ is obtained from the crude GPC by a combination of solvent extractions and fractional crystallization stages.

PARTITION COEFFICIENTS OF SOME ANTIOXIDANTS IN BUTTEROIL-WATER SYSTEMS. D. G. Cornell, E. D. DeVilbiss and M. J. Pallansch (Dairy Products Lab., Eastern Utilization Res. and Dev. Div., Washington, D.C. 20250). *J. Dairy Sci.* 53, 529-32 (1970). The butteroil/water partition coefficients of the esters

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