ABSTRACTS

R. A. REINERS, Editor. ABSTRACTORS: N. E. Bednarcyk, J. E. Covey, J. G. Endres, J. Iavicoli, S. Kawamura, D. A. Leo, F. A. Kummerow, E. G. Perkins, and R. W. Walker

• Fats and Oils

NEW FATS PRODUCED BY GENETICS. J. Morice (Station de Genetique et d'Amelioration des Plantes, Versailles). *Rev. Franc. Corps Gras* 18, 135–42 (1971). Through selective breeding, plant geneticists have been able to alter the fatty acid composition of various oilseeds. The author describes in detail work in France on reducing the erucic acid content of rapeseed oil. It has also been possible to reduce the linolenic acid content of this oil to 2–3%.

CHANGES IN THE PHYSICO-CHEMICAL CHARACTERISTICS OF TALLOW DURING REFINING. F. Mordret (Inst. des Corps Gras, Paris). *Rev. Franc. Corps Gras* 18, 157–61 (1971). Samples of tallow were analyzed at various stages of the refining process for moisture, impurities, free fatty acids, soap and peroxide value. Among samples of different origin, these values were all very similar. The specific extinctions at 232 and 270 nm changed only slightly during refining, but they increased during deodorization. Also during this stage, the value ($E_{280} - E_{277}$) always decreased, independently of the raw material. The AOM value of the finished products was generally satisfacotry. Bleaching improved the AOM stability.

NEW STUDIES ON THE IMPROVEMENT OF RAPESEED PRESSCAKE; VARIABILITY OF THERMAL DEBITTERING IN THE PRESENCE OF SULFURIC ACID. J. Zgainski *et al. Tluszcze Jadalne* 15(1), 25–30 (1971). In 1969, Nadwyczawski *et al.* proposed a method of debittering rapeseed presscake in the presence of 15% sulfuric acid, heating for 6 hours at 96–98C, cooling, neutralizing with powdered chalk, then drying to 8% moisture. The authors obtained a material with the VTO content reduced from 0.89 to 0.11% and the ITC content from 0.38% to 0. In the work reported here, the authors were not able to confirm these previous results. (Rev. Franc. Corps Gras)

DECOMPOSITION OF CHLOROPHYLL IN AN OIL WITH A HIGH FREE FATTY ACID CONTENT. I. Bratkowska *et al. Roczniki Technol. Chem. Zywnosci* 20, 5–14 (1971). An increased percentage of free fatty acids in rapeseed oil undergoing autoxidation accelerates the decomposition of chlorophyll to pheophytin. This decomposition occurs even at low levels of hydroperoxides in the oil. The free acids do not affect the pheophytin. (Rev. Franc. Corps Gras)

ANALYSIS OF PESTICIDE RESIDUES IN EDIBLE FATS AND OILS. B. Solomon (ITERG). *Rev. Franc. Corps Gras* 18, 89–95 (1971). The author discusses methods published since the last complete review in July, 1968. The complete method worked out by the IUPAC, involving GLC analysis using an electron capture detector, is included. Finally, there is a discussion of an analytical method for organophosphorus pesticides by wet digestion, oxidation and colorimetric determination of the orthophosphate derivative.

TRITERPENIC ALCOHOLS IN RAPESEED OIL. J. Sawicki (Faculte des Sciences, Marseille). *Rev. Franc. Corps Gras* 18, 83–7 (1971). The total triterpenic alcohols from rapeseed oil were separated from the other unsaponifiable components by preparative column chromatography. Following acetylation and epoxidation, they were fractionated further by thin-layer chromatography. The following compounds were found: cycloartenol, 24-methyl-cycloartanol, α- and β-amyrine, butyrospermol and lupeol. These compounds occur in both free and esterified forms. All were found in deodorizer residues.

PALM OIL: PRODUCTION, PROPERTIES, REFINING AND USES. M. Lonein, B. Jacobasberg and G. Evrard (Congopalm S.C., Brussels). *Rev. Franc. Corps Gras* 18, 69–82 (1971). This paper was originally presented at the AOCS-ISF Congress in Chicago, 1970. It contains a review of the chemistry and technology of palm oil. The supply of high quality, bleachable palm oil is expected to increase in the future so that this oil will become an increasingly important factor in the world supply of edible fats and oils.

INHIBITION OF YEAST DEVELOPMENT ON THE SURFACE OF EDIBLE FATS BY WRAPPERS IMPREGNATED WITH SORBATES. D. Fotouhi and R. Buttiaux (Pasteur Inst., Lille). *Rev. Franc. Corps Gras* 18, 63–8 (1971). Margarine and butter samples were wrapped in papers impregnated with potassium or calcium sorbate at levels of 4–6 g/m². Untreated wrappers were used as controls. Samples were stored at 16 and 25C. After 30 days, there was no yeast or mold growth on any of the samples, including those innoculated with *S. cerevisiae* and *Candida lipolytica*. It was concluded that the impregnated papers were effective in controlling mold and yeast growth.

STUDIES ON THE PHOSPHATIDES OF INDIAN VEGETABLE OILS AND CAKES. III. THE PHOSPHATIDE CONTENTS AND THEIR RECOVERY FROM INDIAN VEGETABLE OILS. K.V. Rao, A. Jogi Pantulu, M.M. Paulose, and K.S. Murti (Oil Technological Res. Inst., Anantapur). *Oils and Oilseeds J.* 23(7), 13–8 (1971). The phosphatide contents of and their recovery as acetone insoluble matter from different Indian vegetable oils are reported. Cottonseed oils contained the greatest quantity of phosphatides (1.32–2.74%) of which 0.70–2.36% (based on the weight of oil) could be easily recovered. Other oils yielding lesser but still commercially important quantities of phosphatides were groundnut, rice bran and sesame, in decreasing order. Rape, mustard, linseed, and mahua oils yielded very small quantities. The method of extraction of the oil, *i.e.*, expeller or solvent extraction, did not affect the yield of phosphatides from the oils very much.

COPPER AND IRON CONTENT OF INDIAN GROUNDNUT OIL. D.N. Sharma (Indian Agric. Res. Inst., New Delhi). *Oils and Oilseeds J.* 23(7), 11–2 (1971). Copper was found at levels of 0.1 ppm or less in 83% of the samples analyzed. Iron contents varied from 2 ppm to 4 ppm in 75% of the samples and averaged 3.60 ppm.

SOLVENT RECOVERY IN EXTRACTION UNITS. A.S. Konstas and S.A. Konstas. *Oleagineux* 26, 113–5 (1971). The sources of solvent losses are described with emphasis on those losses in the non-condensable gases. Various methods have been devised for trapping the solvent, and the one proposed here employs an absorption column containing some of the vegetable oil from the same plant. About 12% of the oil is recirculated, and it contains about 15% hexane as it leaves the column. The oil plus solvent is added to the miscella for subsequent stripping. Satisfactory performance of this system has been achieved at a number of installations.

EFFECT OF PRESS CONSTRUCTION AND WORKING PRESSURE ON THE STABILITY OF HELIANTHUS ANNUS SUNFLOWER OIL. R. Baruffaldi and E. Aquarone (Sao Paulo Univ.). *Oleagineux* 26, 107–12 (1971). Following grinding of the seeds, the oil was expressed in a press of Ni/Cr, 18/8 stainless steel or one of plain carbon steel. Working pressures of 180 kgf/cm² or 390 kgf/cm² were maintained on the seeds over a 24 hour period. Stabilities were determined by the Schaal oven test at 60C and the Active Oxygen Method. Samples from the stainless steel press were more stable than those from the plain steel press. In both cases, the sample obtained at the lower pressure was more stable than the other.

METHOD FOR PREPARING DANISH PASTRY. J.F. Schaible and S.S. Jackel (Baker Res. Dev. Service, Inc.). *U.S. 3,585,046.* A plurality of discrete, hard particles comprising shortening with a melting point of not greater than about 108F and having a particle size of not greater than about 500 mm³, such that one pound of the shortening contains at least 1000 particles, is incorporated into developed, leavened, Danish pastry dough and distributed throughout it. The dough can then directly be processed into Danish pastry, without the necessity of performing any roll-and-fold steps.

COSMETIC PREPARATIONS CONTAINING ISOPROPYL ESTER OF METHYL HEPTADECANOIC ACID. C.F. Moculeski (Clintwood Chem. Co.). *U.S. 3,536,810.* Cosmetic preparations incorporating an isopropyl alcohol ester of a branched chain octadecanoic acid, especially a methyl-substituted heptadecanoic acid, whereby, among other things, markedly improved emolliency properties are imparted to the preparation.

WATER-IN-OIL EMULSION. H.J. Kellner (Atlas Chem. Ind., Inc.). *U.S.3,536,816.* A water-in-oil emulsion vehicle for cosmetics and pharmaceuticals comprising a partial ester of glycerol and oleic acid, sorbitol and water in suitable proportions to form gels, creams, ointments and the like.

FAT PRESERVATION. W. Kuster. *U.S. 3,544,607.* Fatty animal products are preserved at room temperatures in aqueous suspension by incorporating an inorganic acid to achieve a pH of 1–4.

(Continued on page 400A)

• *Abstracts* . . .

(Continued from page 392A)

• Fatty Acid Derivatives

STABILITY OF OIL-IN-WATER EMULSIONS. 1. EFFECTS OF SURFACE TENSION, LEVEL OF OIL, VISCOSITY AND TYPE OF MEAT PROTEIN. J. C. Acton and R. L. Saffle (Dept. of Food Sci., Univ. of Georgia Exp. Sta., College Station, Athens, Ga. 30601). *J. Food Sci.* **35**, 852–5 (1970). Surface tension responses for solutions of salt-soluble protein from five different meat sources followed the Type III curve typical of surface-active agents. Stability of the emulsions increased when either the concentration of the protein or oil were increased. Highly significant correlation was found between protein surface activity and emulsion stability. Little change in emulsion viscosity was found except at the upper protein and oil levels tested.

CHEMICAL COMPOSITION OF *Anona squanosa, Hyoscyamus niger* AND *Hibiscus sabdariffa* SEED OILS. Z. E. Shoeb (National Res. Centre, U.A.R.). *Grasas Aceites (Seville, Spain)* **5**, 270–1 (1970). The proximate analysis of *A. squanosa, H. niger* and *H. sabdariffa* seeds and the characteristic of their oils were determined. Gas-liquid chromatography was utilized for the elucidation of fatty acid composition. A conclusion of this study is that the seed oils of *H. niger* and *H. sabdariffa* may be used as a source of linoleic acid and that the seed oil of *A. squanosa* is a good source of oleic acid.

DETERMINATION OF SOLVENT RESIDUES IN EXTRACTED OILS. M. Nosti Vega, F. Gutiérrez Rosales and R. Gutiérrez Gonsález-Quijano (Inst. de la Grasa y sus Derivados, Dept. Chem. and Microbiol., Seville, Spain.). *Grasas Aceites (Seville, Spain)* **5**, 276–81 (1970). A simple, rapid and fully automated GLC method for the determination of hexane in extracted oils is proposed in this paper. The method makes use of a hydrogen flame ionization detector. The influence of temperature, sample size and calibration was evaluated. Commercial samples of extracted soya and cottonseed oils were analyzed and reported. The solvent content of multiple samples from five producers of soybean oil varied from a low of 0.11% by weight to a high of 1.60%. The arithmetic means of multiple samples between producers ranged from 0.22% to 1.44% with an estimated standard deviation of 0.03% to 0.31%. Multiple samples from two sources of cottonseed oil were reported. Solvent content ranged from 0.25% to 1.16%. The means were 0.53% and 0.66% with s of 0.21% and 0.22%. The work emphasizes the desirability of strict control during the manufacturing process in order to obtain low solvent content oils and to avoid risks and unnecessary losses.

ANALYSIS OF MONO-, DI-, AND TRIGLYCERIDES MIXTURES BY GAS CHROMATOGRAPHY USING PROGRAMMED TEMPERATURE. D. Prada, C. F. Carracedo, L. Montenegro and A. Prieto (La Toja, S. A., La Coruña, Spain). *Grasas Aceites (Seville, Spain)* **5**, 261–69 (1970). The separation of mono, di, and triglycerides and fatty acids was studied using programmed temperature gas chromatography. The difficulties of analyzing samples without derivatization are described. These difficulties are eliminated by forming the trimethylsilyl derivates. Better resolution and quantitative interpretation are possible when the silyl derivates are chromatographed. Shorter columns are also possible with improved separation over usual analytical techniques. Commercial oils and mixtures of oils, mono, diglycerides and free fatty acids may be analyzed with this simple and general technique.

• Biochemistry and Nutrition

PHOSPHOLIPID METABOLISM IN VITAMIN A-DEFICIENT RATS. R. F. Krause, Kathryn C. Beamer and Jane H. Plow (Dept. of Biochem., West Virginia Univ. Med. Cent., Morgantown, W. V. 26506). *J. Nutr.* **101**, 161–68 (1971). The effect of vitamin A deficiency on the *in vivo* uptake of ^{32}P-phosphoric acid, ^{14}C-choline, ^{14}C-oleic acid, ^{14}C-palmitic acid and ^{14}C-glycerol by phospholipids from subcellular fractions of rat liver and their mitochondrial membrane fractions was examined. Vitamin A deficiency resulted in an increased incorporation of ^{14}C-choline, ^{14}C-oleic and ^{14}C-palmitic acids into phospholipids from various subcellular fractions. The majority of this increase was found in the phosphatidyl choline component of all subcellular fractions. The uptake of ^{14}C-glycerol into the respective subcellular phospholipids from deficient and control animals was similar. In all instances the specific activity of the mitochondrial phospholipids was highest in the outer membrane fraction. The specific activity of the mitochondrial phospholipids labeled with ^{32}P, ^{14}C-choline, ^{14}C-palmitic and ^{14}C-oleic acids was highest in the outer membrane from deficient animals. The uptake of ^{14}C-glycerol into the respective mitochondrial membrane fractions from control and deficient groups was approximately the same. No significant difference was noted in the fatty acid composition of total phospholipids from control and deficient groups.

ENTRY OF ESTERIFIED CHOLESTEROL INTO FOAM CELLS. C. W. M. Adams, Y. H. Abdulla and O. B. Bayliss (Dept. of Pathol., Guy's Hosp. Med. Schl., London, S.E.1 (Great Britain)). *J. Atheroscler. Res.* **13**, 111–19 (1971). A mixture of doubly labelled cholesterol linolenate and non-radioactive cholesterol-linoleate was injected subcutaneously in rats. The lipid implants were separated into predominantly extracellular and intracellular phases by progressive solvent extractions. Chromatography and scintillation counting of the fractions showed that little esterified cholesterol had been hydrolysed in the intracellular phase and little randomization of fatty acids had occurred between radioactive and non-radioactive cholesterol. It is concluded that foam cells (macrophages) can take up cholesterol in esterified form and that preliminary hydrolysis to free cholesterol is not obligatory for uptake by these cells.

• Drying Oils and Paints

NEW FAST-DRYING POLYISOCYANATES FOR THE SURFACE COATINGS INDUSTRY. Anon. *Paintindia* **21**(1), 21–30 (1971). Products discussed in this review include the toluene diisocyanate adduct made from 3 moles of TDI and 1 mole of trimethylol propane; the hexamethylene diisocyanate biuret made from 3 moles of HDI and 1 mole of water; the TDI isocyanate; and the TDI/HDI isocyanate.

MALAWI TUNG OIL IN WATER-SOLUBLE MEDIA. H. W. Chatfield. *Paint, Oil Col. J.* **158** No. 3757, 709–10 (1970). Most progress has been made in the field of media suitable for electrophoretic coatings. Reaction of tung oil with maleic anhydride, and copolymerisation of tung oil with various acrylic monomers, are described. Tough coatings with good adhesion were obtained by the latter method. (World Surface Coatings Abs. No. 347)

STUDIES ON PAINTS BASED ON CASHEW NUT SHELL LIQUID AND ITS DERIVATIVES. I. V. Madhusudhan, M. S. Ramaiah, B. G. K. Murthy and M. A. Sivasamban (Regional Res. Lab., Hyderabad-9). *Paintindia* **21**(3), 7–11 (1971). Paints were formulated from CNSL and cardanol and from resins derived from them, and they were compared with similar paints based on oleoresinous and alkali media. Conclusions from the study follow: Cardanol-based paints can be used on a par with other phenolic resin-based paints. Where the color of the paint is not so important, Polydol can replace cardanol and other phenolic resins since it is cheaper and imparts better weathering properties. Styrenated CNSL/cardanol paints are harder and are recommended mainly for interior coatings. CNSL and cardanol paints can be used in exterior coatings after blending with alkali resins.

• Detergents

THE USE OF NN-DIMETHYLCASEIN IN THE DETERMINATION OF PROTEOLYTIC ENZYMES IN WASHING PRODUCTS AND AIRBORNE DUST SAMPLES. E. Dunn and R. Brotherton (Procter and Gamble Ltd., Newcastle Tech. Centre, Newcastle upon Tyne). *Analyst* **96**, 159–63 (1971). NN-Dimethylcasein is used as substrate in an automatic method for the determination of proteolytic enzymes in washing products and airborne dust samples. Amino-acids formed by reaction with the enzyme are caused to react with 2,4,6-trinitrobenzenesulphonic acid to form stable, colored Meisenheimer complexes. As NN-dimethylcasein does not react with trinitrobenzenesulphonic acid there is no need to remove excess of substrate before color development, and the enzyme digestion and color reactions can be conducted simultaneously. This leads to high sensitivity, which is of particular value in dust analysis and allows the use of a simple trouble-free manifold.

PHYSICO-CHEMICAL STUDIES OF EMULSIONS WITH SURFACTANTS AS EMULSIFYING AGENTS: PART I. K. D. Jain and M. K. Sharma (Dept. of Chem., D.A.V. (Post-Graduate) College, Dehra Dun, India). *J. Indian Chem. Soc.* **47**, 989–95 (1970). Oil-in-water emulsions with water and kerosene oil as external and internal phases and sodium dioctyl sulphosuccinate (anionic surfactant), cetyl pyridinium bromide (cationic surfactant) and poly-oxyethylene sorbitan monosterate (nonionic surfactant) as emulsifying agents have been prepared. Properties like emulsion type, specific gravity, interfacial tension, viscosity, conductivity, pH and particle size of these emulsions have been measured. Low interfacial tension and specific gravity, high viscosity, conductivity and particle size favour emulsification and increase stability of emulsions.