abstracts
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ABSTRACTORS: N.E. Bednarcyk, J.E. Covey, J.C. Harris, F.A. Kummerow, T. Mares, B. Matijasevic, J.C. Means, D.B.S. Min, and E.G. Perkins

• Fats and Oils

CHIRALITY OF 3-HYDROXYOCTADECANOIC ACID FROM STEAROYL-CoA BY RAT LIVER SOLUBLE ENZYMES. M.G. Kienle, G. Cighetti and E. Santaniello (Instituto di chimica, Facolta di Medicina e Chirugia, Universita di Milano, 20133 Milano, Italia) *Bioorg. Chem.* **4**, 64–71 (1975). One of the transformation products formed from Stearoyl-CoA by the soluble enzymes of rat liver homogenate has been identified as 3-hydroxyoctadecanoic acid. The chirality of this acid obtained from incubation of (1-^{14}C) stearoyl-CoA with the 105000g soluble enzymes of rat liver has been determined. After 10 and 20 min of incubation 70% of the L(+) and 30% of the D(−) enantiomer are formed, whereas racemic 3-hydroxyoctadecanoic acid is isolated after 90 min of incubation. These results suggest either that an epimerizing enzyme is present in the soluble fraction or that two enzymes each specifically forming one of the two enantiomers are present.

LIPID EXTRACTION PROCEDURE FOR IN VITRO STUDIES OF GLYCERIDE SYNTHESIS WITH LABELED FATTY ACID. K. Christiansen (Dept. Biochem. C, The Parrum Inst., Univ. of Copenhagen, Blegdamsvej 3, DK-2200 Copenhagen, Denmark) *Anal. Biochem.* **66**, 93–9 (1975). Loss of radioactivity to the aqueous phase of conventional extraction procedures has been observed in studies of glyceride synthesis with labeled fatty acids. A method is presented which does not involve washing procedures and by which all added radioactivity is recovered and all labeled compounds identified.

VOLATILE MEDIUM CHAIN FATTY ACIDS AND MUTTON FLAVOR. E. Wong, L.N. Nixon and C.B. Johnson (Applied Biochem. Div., Dept. of Scientific and Industrial Res., Palmerston North, New Zealand) *J. Agric. Food Chem.* 23, 495–8 (1975). Mutton fat, cooked with or without meat added, produced a host of steam volatile fatty acids in trace amounts. These have been identified by GC-MS as medium chain normal, branched, unsaturated, oxygenated, and aromatic acids belonging to 11 homologous series. Odor properties of these acids have been evaluated and results indicate that the branched chain and unsaturated acids having 8 to 10 carbon atoms contribute to the undesirable flavor of cooked mutton. The 4-methyl branched C_9 and C_{10} acids in particular are considered primarily responsible for the sweaty odor note described in Chinese as "SOO."

INFLUENCE OF ELEVATED POLYUNSATURATED FATTY ACIDS ON PROCESSING AND PHYSICAL PROPERTIES OF BUTTER. F.W. Wood, M.F. Murphy and W.L. Dunkley (Dept. of Food Sci. and Technology, Univ. of Calif., Davis, Calif. 95616) *J. Dairy Sci.* **58**, 839–45 (1975). Milk fat containing varied percents of linoleic acid (from 1.8 to 28.0% of the fatty acids) from feeding cows a protected lipid supplement and by blending conventional and polyunsaturated milk fats was used to make experimental butters by churning and by the continuous Votator system. Measurements were made of the hardness of the butters by disk and cone penetrometers, of melting characteristics of the milk fats by dilatometry, of butters by nuclear magnetic resonance, and of oiling off properties at 10 and 20 C. The higher the linoleic content of the milk fat, the softer the butter. Comparison at similar linoleic percents of butters made from milk fat as produced and those from blends of conventional and polyunsaturated milk fat showed that products from blends were harder, had a wider temperature range at which they were plastic, and were less susceptible to oiling off at 20C. Below 12 C butter made by the contiuous Votator system was appreciably harder than that by churning, but at higher temperatures hardness of the two butters was similar. The results indicate possiblities for improving the spreadability of butter by manipulating the composition and physical properties of milk fat by feeding cows protected lipid supplement.

REACTION OF MALEIC ANHYDRIDE WITH LINOLEIC ACID IN THE PRESENCE OF ACTIVATED CLAY. M. Nagakura, Y. Kai and K. Yoshitomi (The Nisshin Oil Mills Ltd., Research Laboratory, 1–3, Chiwaka-cho, Kanagawa-ku, Yokohama). *Yukagaku* **24**, 149–55 (1975). The addition reactions of maleic anhydride to linoleic acid were carried out in the presence of activated clay at 180C. The methyl ester of reaction products was fractionated and characterized. The activated clay acts as a catalyst for the maleic anhydride addition reaction to linoleic acid giving monomaleinized compounds with the structure of cyclohexenic type in more than 50% yield. In the absence of activated clay the reaction products include compounds of various type containing monomaleinized compounds of succinic anhydride type.

ISOMERIZATION OF SAFFLOWER OIL IN THE PRESENCE OF IODIDES OF ALKALI AND ALKALINE EARTH METALS. H. Shina and T. Hashimoto (National Chemical Laboratory, 1-1-5 Honmach, Shibuya-ku, Tokyo). *Yukagaku* **24**, 161–5 (1975). The isomerization of safflower oil in the presence of 5% alkali and alkaline earth metals such as LiI, NaI, KI, MgI_2, CaI_2, SrI_2 and BaI_2, at 200 and 220°C was studied. The results show that LiI, MgI_2, CaI_2 and SrI_2 promote the isomerization. In the case of MgI_2 and LiI catalysts which having the strong isomerization activity, it is found that much octadecenoic acid forms and on the other hand, the content of saturated acids does not increase during the reaction. Also, the formation of small amounts of dimers and some compounds having lower molecular weight are observed.

LIGHT-INDUCED REACTIONS OF UNSATURATED FATTY ACID METHYL ESTERS. III. PHOTO-DIMERIZATION REACTIONS OF CONJUGATED FATTY ACID METHYL ESTERS. O. Suzuki and T. Hashimoto (National Chemical Laboratory for Industry, Honmachi, Shibuya-ku, Tokyo). *Yukagaku* **24**, 216–22 (1975). The photochemical reactions of conjugated fatty acid methyl esters, that is, methyl α-eleostearate, methyl *cis*-9, *trans*-11- and *trans*-9, *trans*-11-octadecadienoates, under various conditions were studied. The formation of dimers was rapid from these conjugated fatty esters in either CCl_4 or $CHCl_3$. However, the dimers produced were found to be chlorinated. Accordingly, the photo-dimerization in halomethanes was recognized to be a kind of telomerization, where the holomethane itself took part in the reaction. In the greater part of the photochemical reactions in organic solvents other than halomethanes, the *cis-trans* isomerization reaction was observed. Especially, the *cis,trans*-conjugated fatty ester was converted into only *trans,trans*-conjugated isomer in heptane without forming the dimer. Then, both the photo-dimerization and the isomerization of the conjugated fatty esters in heptane were suggested to be carried out by the conversion of the conjugated fatty esters into their electronically excited molecules by irradiation. Furthermore, the effective wave length of light on the phothchemical reactions of the conjugated esters was also examined by monochromatic radiation.

HIGH PRESSURE INJECTION OF A FAT IN AN AQUEOUS PHASE. H.G. Schmidt, K.G. Strauss and J. Tennikat (Lever Bros. Co.). *U.S. 3,889,004.* In the process for preparing an aqueous fatty emulsion a first liquid is injected through a nozzle into a stream of a second liquid flowing at 2–50 cm/sec through a pipe. Immediately before injection there is a pressure difference between the first and the second liquid of at least 100 atmospheres. The pressure in the second liquid is at least 0.3 atmospheres. The first and second liquids consist of a fatty and an aqueous phase, respectively.

EMULSIFIER SYSTEM. K. R. Brammer and T. Wieske (Lever Bros. Co.). *U.S. 3,889,005.* An improved edible emulsion, which is a low calorie fat spread of the water-in-oil type, having improved microbiological stability and organoleptic properties, consists of 30–60% fatty phase, an aqueous phase, and an improved emulsifier system. The emulsifier system consists of saturated fatty acid partial glycerides and unsaturated fatty acid partial glycerides in weight ratios of 1:1.5 to 1:10. The saturated fatty acid partial glycerides contain a dominant portion of stearic acid.

PROCESS FOR RECOVERING FATTY ACIDS AND/OR ROSIN ACIDS. T. Harada and T. Yumoto (Japan Synthetic Rubber Co.). *U.S. 3,887,537.* A process for recovering fatty acids and/or rosin acids comprises the steps of (a) saponifying a tall oil head and/or pitch, (b) introducing the saponified material into a thin film evaporator equipped with a rake, (c) evaporating and removing the low boiling material, including unsaponifiables, at a temperature not lower than the melting