

# Abstracts

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## Fats and oils

**AUTOXIDATION OF METHYL ESTERS OF CYCLOPENTENYL FATTY ACIDS.** E.M. Abdel-Moety and W.O. Lundberg (Fed. Center for Lipid Res., Inst. for Biochem. and Technology, H.P. Kaufmann-Institute, D-4400 Münster (Westf.), Germany) *Lipids* 15(5), 298-305 (1980). The early stages of the autoxidation of methyl hydnocarbate, chaumoograte and gorlate in air have been examined at 40, 60 and 80 C, and the initial products have been compared by several methods with those derived from methyl oleate and linoleate autoxidized at 60 C. The kinetic and other data presented in this study strongly support the conclusion that the methyl esters of cyclopentenyl fatty acids yield initial autoxidation products that, although they are primarily peroxides, differ in some ways (as expected) in the kinetics of their formation and their chemical nature, compared to those of oleate and linoleate. Nevertheless, all the data obtained strongly support the surmise that the peroxides are formed autocatalytically by a chain mechanism, and that secondary products not derived from peroxide decomposition, are formed *pari passu* in lesser, but increasing amounts with increasing temperature, probably from free radical intermediates. The autoxidation of esters of cyclopentenyl fatty acids has potential importance in several ways, 3 of which are mentioned briefly.

**INFLUENCE OF CONFIGURATION ON THE SELF-CATALYTIC DECOMPOSITION OF HYDROPEROXIDES IN THE AUTOXIDATION OF METHYL OLEATE AND METHYL ELAIDATE.** J. Sliwiok and W.J. Kowalski. *Rev. Roumaine Chim.* 24, 681-9 (1979). Autoxidation of methyl oleate and methyl elaidate leads to a mixture of unsaturated hydroperoxides. The *trans* hydroperoxides are more favorable for hydrogen bonding which leads to greater thermal stability than the *cis* hydroperoxides, formed only in the methyl oleate autoxidation. (In German). (World Surface Coatings Abs. No. 451)

**STUDIES ON DEEP FAT FRYING—CHANGES DURING HEATING OF OIL.** S.N. Sulthana and D.P. Sen (Central Food Technological Research Institute, Mysore) *J. Food Sci. Technol.* 16, 208, (1979). In order to find out the deteriorative changes during heating of groundnut oil, vanaspati (partially hydrogenated vegetable oils) and safflower oil, model experiments were conducted. Results indicated considerable damage of test oils through the formation of oxirane-oxygen, conjugated double bonds, oxidised and non-urea adduct forming fatty acids during heating. Associated with these, there were continuous deteriorative physical and chemical changes as reflected in increase in Lovibond color units, viscosity, foaming property, free fatty acids, refractive index and decrease in smoke point and iodine value. In presence of added dimethyl polysiloxane (silicone), the above changes were substantially retarded.

**PALM OIL QUALITY AND USE OF END PRODUCTS.** K.G. Berger, *Oléagineux*, 35(4), 213 (1980). A certain number of specifications for the definition of fully refined, bleached and deodorized palm oil quality are presented. They concern appearance, colour, slip melting point, iodine, Reichert and Polenske values, flavour and odour, free fatty acids, moisture, foreign matter, ash, lead content and stability to oxidation. The food uses of palm oil are reviewed; it is widely used in shortenings, margarines, vanaspati, for frying or cooking; it is not suitable as salad oil or for coatings, but can be used, depending on the legislation of the country concerned, for making ice creams. In any case, its properties can be modified by different processes (hydrogenation, refining, fractionation, inter-esterification), which increases its uses. The technical aspects of palm use in foodstuffs are completed by an examination of the various aspects of fats which give them an important role to play as foods.

**ISOMERISATION OF LINOLENIC ACID DURING THE DEODORIZATION OF RAPESEED AND SOYBEAN OILS.** G. Devinat, L. Scamaroni and M. Naudet. *Rev. Fr. Corps Gras*, 57(6)p. 283 (1980). The linolenic acid of soybean and "new" rapeseed oils is able to undergo a partial geometrical isomerisation under the influence of temperature and heating. The more drastic deodoriza-

tion conditions are, the higher isomerisation rate is; it depends on the kind of oil, its quality, the apparatus and process. Because low content of linolenic acid in these oils, this isomerisation even high generates a very little "trans" acids. Besides, this isomerisation does not affect significantly the formation of polymers and cyclic acids during the frying operations.

**MASTERY AND CONTROL OF SENSORIAL PROPERTIES: SPREADABILITY, TASTE, STABILITY AND RHEOLOGICAL PROPERTIES AND PERFORMANCES OF MARGARINES.** L. Faur. *Rev. Fr. Corps Gras*, 27(7) 319-25 (1980). The sensorial characteristics and rheological performances of margarines are mastered at several stages of the manufacture: preparation of fatty phase defined by solid curve and glyceride distribution; control of aqueous phase by evaluating the milk-ripening and determining different components; control of emulsifiers; control of processes leading to crystallization and kneading various degrees, therefore to different hardness and plasticity levels. The quality of obtained products is studied by particular methods: evaluation of splashes during the cooking, quantification of development in puff paste for pastry and so on.

**REGULATORY ASPECTS CONCERNING MARGARINE IN FRANCE AND EEC.** R. Marchal. *Rev. Fr. Corps Gras*, 27, (7), 327-31 (1980). Manufacture and trade of margarine in France are regulated by a law dating from 1897 which aimed to protect butter. This basic principle has been completed, but non modified later. Since the establishment of Common Market, the regulations must be harmonized with EEC, At present, an adjustment of regulation to publicity, economical, technical, nutritional facts looks necessary.

**ON THE REFINABILITY OF OILS. I. GENERAL CONSIDERATIONS; TECHNOLOGICAL AND ANALYTICAL ASPECTS.** G. Devinat, S. Biasini, M. Naudet, R. Guillaumin and M. Jauniaux, *Rev. Fr. Corps Gras*, 27, (7) 333-9 (1980). A general study has been carried out in a first step to investigate the relations between the tasting mark for an oil fresh or stored for more or less a long time, and physicochemical characteristics of the oil after its deodorization; in a second step, to try to relate these data to physicochemical characteristics of the raw starting oil. Therefore, some thirty soybean and rapeseed oils have been refined in a laboratory pilot plant in strictly defined conditions. The raw, during refining, fully refined oils have been analysed; the obtained results will be explained later by statistical methods.

**ADVANCES IN THE MANUFACTURE OF MARGARINES: EQUIPMENT, PROCESSES, AUTOMATIZATION. INFLUENCE ON THE PRODUCT COMPOSITION.** C. Bouffard, *Rev. Fr. Corps Gras*, 27,(6) 269-74 (1980). The production of margarines advanced toward a deep mechanization of the manufacture and packaging. The development of continuous operations entailed an automated control. The currently used processes for the preparation of mixtures, the proper manufacture, the packing of margarines, the palletization of obtained loadings are reviewed. The qualitative and quantitative improvements owed to these processes are shown.

**MODERN PACKING OF MARGARINES. INFLUENCE ON THE PRODUCT QUALITY.** R. Iffenecker, *Rev. Fr. Corps Gras*, 27,(6), 275-8 (1980). Launching of spreadable margarine a few years ago, involved the development of rigid and tight containers since this type of product pours as a liquid from nozzles of the filling machines. To meet technical, commercial and financial constraints was possible with the use of different plastic materials, either alone or combined in multi-layers. Harmlessness of these materials, and of possible adjuvants, in contact with food products is strongly controlled in the respect of the French legislation and in the expectation of future European regulation. Migrations measured, or supposed when they are under the lowest detection limit of recent analytic methods however extremely sensitive, are very low and far under the official acceptable figures. It is obvious that the modern packaging of margarines comes up to consumers' requests for the best quality/cost ratio.