240°F. for 3 hours. These results were obtained with flakes from prime cottonseed with a moisture content of 6.9% and a free fatty acid of 1.2%. Flakes from seed that have been stored under unfavorable conditions and that are not prime or have a high moisture content will in all probabilities give different results.

On the basis of these experiments and on those of a previous study on the effect of heat on cottonseed oil miscellas (5) it can be concluded that dark oils produced from prime seed of low moisture content by solvent extraction methods are due to conditions other than flake drying temperatures; for example, improper treatment of seeds and flakes, tempering of meats, or high temperatures during miscella concentration. Data also show that prime flakes can be dried at relatively high temperatures without affecting the protein solubility of the meal which is desirable. Proper drying of flakes will aid in obtaining optimum solvent extraction conditions, such as percolation rate, extractability of flakes, and minimum fines.

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ABSTRACTS . . . . Don Whyte, Editor

• Oils and Fats

R. A. Reiners, Abstractor

POLYMORPHISM OF UNSATURATED C_{18} FAT ACIDS. G. B. Ravich, V. A. Vol'nova, and T. N. Kuz'mina (Inst. Gen. and Inorg. Chem., Acad. Sci. U.S.S.R.). *Izvest. Sektora Fiz.-Khim. Anal., Inst. Obshchei i Neorg. Khim., Akad. Nauk S.S.S.R.* **15**, 47-57 (1947). Crystallization and melting curves were obtained for oleic acid under conditions of very slow cooling and heating. The thermograms were recorded with a recording pyrometer and a differential thermocouple. The results seem to indicate the existence of a modification m. 20-20.5°C. (*Chem. Abs.* **44**, 6250)

FATTY ACID ANALYSIS BY PARTITION CHROMATOGRAPHY. J. Boldingh (Unilever Research Lab., Zwijndrecht, Netherlands). *Rec. Trav. Chim.* **69**, 247-61(1950). Natural and synthetic elastomers can be used as carriers for the immobile solvent in partition chromatography. With systems containing benzene absorbed in vulcanized *Hevea* rubber and with a strong polar solvent as the mobile phase, a straight quantitative micro determination of the saturated n-fatty acids from C_6 to C_{18} can be made. Hydroxy fatty acids also are readily separated from their mixtures with n-fatty acids. As organic solvent a mixture of methanol and acetone 3:1 was used, the amount of water saturated with benzene added being dependent on the acid being extracted. With solvent to water ratios of 40:60, caproic acid is eluted; 60:40 caprylic and capric; 65:35 lauric and myristic; 70:30 palmitic; and 74:26 stearic. Complete details of the separation are given. (*Chem. Abs.* **44**, 6348)

COMPOSITION OF THE FRUITS OF TURKISH PISTACIA VARIETIES AND THE PROPERTIES OF THEIR SEED OILS. T. Yazicioglu (Univ. Ankara, Turkey). *Fette u. Seifen* **52**, 6-9(1950). The fruit of *Pistacia vera* contained an average of H_2O 4.0%, fat 58.9%, protein 21.5%, N-free extract 10.8%, crude fiber 2.9%, and ash 2.4%. *Pistacia vera* oil contained saturated acids 20.3, oleic acid 62.8, and linoleic acid 17.0%, saponification no. 194.3, I no. 83.7, thiocyanogen no. 68.9, unsaponifiable 0.8%. *P. terebinthus* fruits contained an average of H_2O 5.9, fat 42.0, protein 9.7, N-free extract 14.2, crude fiber 23.7, and ash 2.1%. *P. terebinthus* oil contained saturated acids 20.6, oleic acid 58.4, and linoleic acid 21.1%, saponification no. 190-4, I no. 86-9, thiocyanogen no. 68.6, unsaponifiable 0.98%. *P. khinjuk* fruits contained an average of H_2O 4.6, fat 57.6, protein 20.3, N-free extract 10.0, crude fiber 4.7, and ash 2.8%. *P. khinjuk* oil contained saturated acids 14.7, oleic acid 56.4, and linoleic acid 28.9%, saponification no. 194.5, I no. 98.8, thiocyanogen no. 73.7, unsaponifiable 0.54%. (*Chem. Abs.* **44**, 6659)

FATTY OIL OF CHELIDONIUM MAIUS. E. Funck (Arzneiwerke Jena G.m.b.H., Jena, Germany). *Apoth.-Ztg.* **61**, 88(1950). The seeds of *Chelidonium maius* contain 32% of an oil, d = 0.9158, acid no. 3.10, Hehner no. 93.70, saponification no. 180.10, I no. 131.90, unsaponifiable 0.41%, acetyl no. 0.40. (*Chem. Abs.* **44**, 6659)

THE 1948 AND 1949 REPORTS OF THE OIL COLOR COMMITTEE OF THE AMERICAN OIL CHEMISTS' SOCIETY. W. Ciusa and G. Nebbia (Univ. Bologna, Italy). *Olearia* **4**, 108-14(1950). Since the relation between the results of the spectrophotometric method of the A.O.C.S. and the Lovibond red nos. obtained by subsequent calculation is only empirical, i.e., the nos. are only approximate, it is proposed that the spectrophotometric data be converted into trichromatic expressions recommended by the International Commission on Illumination. These trichromatic expressions can be more easily related to the Lovibond red nos. experimentally obtained. (*Chem. Abs.* **44**, 7073)

MICROTITRATION OF FATTY ACIDS BY PH METER. J. Gracian and A. Vioque. *Anales fis. y quim.* (Madrid) **46(B)**, 105-110 (1950). Discusses methods for determining acid equivalents and the analysis of binary mixtures by indirect analysis with sample weights of 5 mg.

MICRODETERMINATION OF THE LOWER FATTY ACIDS ON THE REFRACTOMETER. J. Gracian and A. Vioque. *Anales fis. y quim.* (Madrid) **46(B)**, 111-118(1950). Measures the specific dispersions of refractive indexes for lines E and G of mercury. The dispersion is a function of the concentration of the acids in mg. per gram of solution whether a single acid or a mixture.

ANALYSIS AND TESTING OF THE ACTIVITY OF FAT SPLITTING AGENTS. A. Doadrio and R. Montequi. *Anales fis. y quim.* (Madrid) **46(B)**, 233-244(1950). Twitchell and the alkylarylsulfonic acid derivatives compared as to their splitting power; chemical determinations such as free and total sulfuric acid, absolute fat, humidity, volatility, iodine value, and physical-chemical constants such as solubility, boiling stability, surface tension, foaming agent, emulsion stability, and humidity power being run on each type.

REFINING OF EDIBLE OILS. II. H. P. Kaufmann (Munster i. W., Germany). *Olearia* **4**, 101-7(1950). The methods of refining crude vegetable oils which do not lead to losses of their valuable components are reviewed, and a plant-scale experiment with colza-seed oil is cited. Chromatography and molecular distillation are critically examined as possible methods for the technical separation of the valuable accessory substances in vegetable oils. (*Chem. Abs.* **44**, 7073)

DETERMINATION OF RAW FAT IN SEEDS. H. Hansen. *Tids. Planteavl* **53**, 354-8(1950). A method is given for the extraction of fat from seeds with ether in a Soxhlet-like apparatus in which the seeds are weighed before and after complete (24-36 hrs.) extraction. The method is unsuited for poppy and flaxseeds since their quantitative extraction is difficult. (*Chem. Abs.* **44**, 6659)

SOME CAUSES OF VARIATION IN THE COMPOSITION OF FISH OILS. J. A. Lovern (Torry Research Sta., Aberdeen, Scotland). *J. Soc. Leather Trades' Chemists* **34**, 7-21(1950). An address dealing with effects of species, diet, temperature, salinity, selective mobilization, and selective distribution of the fat-acid components of the fats of fish and marine mammals. (*Chem. Abs.* **44**, 6660)

THE REGENERATION OF CATALYSTS USED FOR HYDROGENATING FATS. P. L. Casaus and G. S. Marco (Univ., Zaragoza, Spain). *Rev. acad. cienc. exact, fis.-quim. y nat. Zaragoza, Ser. 2A.* 3, No. 2, 65-72(1948). The preparation of catalysts by the decomposition of Ni formate is described. The analysis of catalyst residues for Ni (by the dimethylglyoxime method) is outlined, and the question of Ni soaps that are soluble in the fat is discussed. (*Chem. Abs.* 44, 6657)

Fumaric acid as an antioxidant for fats. E. Glimm and M. Rozdilskyj. *Fette u. Seifen* 51, 389-91(1944). Fumaric acid and maleic acid were tried as antioxidants for fats and oils, but neither was sufficiently effective to warrant practical use. (*Chem. Abs.* 44, 6657)

A comparison of the composition of proteins in peanut and palm-kernel oil cake. N. Baudoin. *Oleagineux* 5, 241-242(1950). The amino acid composition of palm kernel oil cake proteins and peanut oil proteins were compared. Both oil cakes were good sources of protein although the peanut protein was relatively poor in methionine.

Home oil seeds. 1949 crop and 1950 outlook. J. Choppin de Janvry. *Oleagineux* 5, 220-226(1950). Oil seed production in France is summarized by seed types and geographical regions. The 1949 crop amounted to about 150,000 tons.

Flax selection. G. Grillot. *Oleagineux* 5, 213-219(1950). The selection of flax suitable for oil production in Morocco is discussed particularly from the historical point of the development.

Branched-chain fatty acids. J. Baltes (Chem. Landesuntersuchungsamt Nordrhein-Westfalen, Munster i. W., Germany). *Fette u. Seifen* 52, 41-5(1950). A review with 33 references. (*Chem. Abs.* 44, 6659)

Pharmacology of skin fats and ointments. III. A method for determining the unsaponifiable matter in lipid samples of less than one milligram. S. A. Kvorning (Univ. Copenhagen). *Acta Pharmacol. et Toxicol.* 5, 375-82(1949). The sample is placed in an ampul of 2-cc. capacity, 0.4 cc. of 10% KOH in methanol is added, and the ampul is sealed and heated 30 min. at 80°C. The ampul is opened, the methanol is evaporated, 1 cc. of water and exactly 1 cc. of petroleum ether are added, the ampul is sealed and heated to 80° C. for 30 min. with shaking, the ampul is placed in a centrifuge and spun 30 min. It is then carefully opened and exactly 0.5 or 0.75 cc. of the clear petroleum ether solution is taken out and evaporated. The residue from this evaporation is weighed, or the C is determined by the gasometric method of Van Slyke, *et al.*

IV. Composition of lipids on the skin of normal individuals. *Ibid.* 383-96. Lipids washed from the skin of 19 subjects with ether contained about 50% of triglycerides and probably 10-20% of esters of higher alcohols. Very small amounts of phosphatides and cholesterol were present. (*Chem. Abs.* 44, 6462)

New apparatus for determination of solidifying point of oils. O. A. Hutzel (Karlsruhe-Badenwerk, Germany). *Brennstoff-Chem.* 31, 125(1950). An improved apparatus is described in which the individual sample tubes have a conical bottom; the thermometer is provided with a glass extension below the bulb, so that the bulb is at the approximate center of the oil. The tubes are immersed in an alcohol bath, cooled, and stirred by a rotating cylinder containing solid CO_2. The apparatus is claimed to give more accurate results than older methods. (Chem. Abs. 44, 6203)

Micro method for the determination of fat in yeast. K. Schilde and E. Schilde. *Fette u. Seifen* 51, 257-8(1944). For use in following the progress of the biological synthesis of fat by microorganisms, a method using a sample equivalent to 100 mg. dry yeast has been worked out. The method is based on 13% HCl hydrolysis and petroleum ether extraction. (*Chem. Abs.* 44, 6918)

The olive oil mill. P. Moitrel. *Oleagineux* 5, 243-247 (1950). Olive oil can be obtained by two processes. The older way involved crushing the whole olives and pressing. The Acapulco process stoned the olives and then extracted the pulp. The equipment, processes, and yields are compared.

The fishing industry in Morocco and its effect on the market of fats. C. Brezillon. *Oleagineux* 5, 415-419(1950). Morocco has lately begun to market large amounts of sardines which required 9,000 tons of olive or peanut oil in 1949.

Value and utilization of by-products in the oil industry. P. Murat. *Oleagineux* 5, 407-414(1950). The utilization of by-products such as the lecithins separated in oil demucilagenation, the fatty acids separated in neutralization, the carotene-acids, and the sterols are described. The uses of oil cakes are outlined.

Studies on the rapid estimation of industrial yields in olive oil industry. P. M. Rousseau. *Industr. agr. alim.* 47, 145-147(1950). Direct centrifugation in a graduated tube of a known quantity of olive cake, which has been treated before by boiling was carried out. The proportion of the separated oil-volume is evaluated and then transposed into weight values. Precautions are necessary for the sampling of olives.

The urea complexes of unsaturated fatty acids. H. Schlink and R. T. Holman (Agr. and Mech. Coll. of Texas). *Science* 112, 19(1950). The ability of urea to form adducts preferentially with saturated fatty acids was used to fractionate soybean fatty acids, Chinese tallow fatty acids, and olive oil fatty acids.

First results of inorganic fertilizer tests on oil-palm trees at Dabou. M. Ferrand and M. Ollagnier. *Oleagineux* 5, 227-233(1950). A number of fertilizer combinations were tried on the palm trees. The fertilizer which contained 1 kilo of KCL per palm tree gave increases of 95% in 1948 and 70% in 1949 in the weight of the clusters. Nitrogen has only a very slight effect while phosphates have no effect on the yield. Apparently there was a major deficiency in potassium which prevented the tree from using the other fertilizers.

Autoxidation of the fatty acids. III. The oily products from elaidic and oleic acids. The formation to monoacyl derivatives of dehydroxystearic acid and of α,β-unsaturated keto acids. G. W. Ellis (St. Mary's Hospital Medical School, London). *Biochem. J.* 46, 129(1950). Elaidic and oleic acids were oxidized in the presence of the corresponding cobalt salt by exposure of thin films to O_2 at relatively low temperatures (48-100°) for long periods of time (8 hrs. to 19 days). At all temperatures β-ketonic acids are formed and considerable volumes of carbon dioxide and water are evolved. This chain oxidation and degradation is regarded as being brought about by peroxides present in small amounts and formed from the unsaturated keto acids which are the initial products. At 100° colored resinous polymers of the α,β-unsaturated keto acids are formed to a considerable extent as are isomeric dimerides of α,β-unsaturated keto acids. Autoxidation at lower temperatures produces smaller amounts of the resinous polymer, and more α,β-unsaturated keto acids and dimerides.

The Rotocel extractor. G. Karnofsky (Blaw-Knox Co.). *Chem. Eng.* 57, 108(1950). It is claimed that the Rotocel extractor is superior to the basket extractor in that drainage is more complete, operation is more flexible and solvent requirements are less.

X-ray diffraction and melting point-composition studies on 9,10-epoxy- and dihydroxystearic acids and 9,10-epoxyoctadecanols. L. P. Witnauer and W. Swern. *J. Am. Chem. Soc.* 72, 3364(1950). The low melting isomer (48.0-48.8°C.) of 9,10-epoxyoctadecanol possesses the *trans* configuration and the high melting isomer (52.6-53.5°C.), the *cis* configuration. The 9,10-epoxystearic acid of m.p. 54.1-55°C. has the *trans* configuration, the one melting at 58.8-58.7°C. has the *cis* configuration. Melting point-composition data can be employed to determine the composition of binary mixtures of the isomeric 9,10-epoxyoctadecanols and the 9,10-epoxystearic acids to ± 1%.

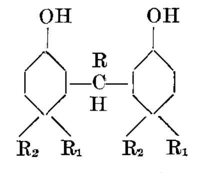
PATENTS

Process for producing an antioxidant concentrate. L. O. Buxton (Nopco Chemical Co.). *U. S. 2,515,858.* A process for producing an antioxidant concentrate is claimed which consists of contacting a crude vegetable oil with ammonia, contacting the ammonia treated oil with a solvent miscible with the oil at room temperature but only partially miscible at temperatures somewhat below room temperature and separating a solvent solution containing a highly active antioxidant extract from the oil at a temperature below room temperature.

Ibid. U. S. 2,515,859. The process disclosed above in which the solvent is methanol or ethanol.

Ibid. U. S. 2,515,860. The process disclosed above in which the solvent may be isopropyl alcohol, n-propyl alcohol, acetone, diacetone alcohol, ethyl acetate, methyl acetate, and methyl ethyl ketone, said solvents containing at least 10% water.

Antioxidants for oils and oil compositions containing the same. D. R. Stevens and A. C. Dubbs (Gulf Research and Development Co.). *U. S. 2,515,908.* A compound of the following formula is claimed as an antioxidant:



wherein R is a furyl or alkyl substituted furyl group, R_1 is a tertiary alkyl radical containing at least 4 C atoms and R_2 is a member of the group consisting of hydrogen and alkyl radicals containing no more than 8 C atoms.

Rendering fats. C. Pavia (Pavia Process, Inc.). *U. S. 2,516,071.* A process is described for rendering fat by bringing comminuted fatty tissue in contact with a surface heated above 300°F. for a period of time sufficient to rupture the cells of the fat tissue without chemically disintegrating the cellular tissue substantially, whereby the fat is released from the cells and the ruptured tissue retains its normal water absorbent characteristics. The ruptured cells absorb water from the released fat and float to the surface of the fat, permitting easy separation.

SOYBEAN OIL REFINING PROCESS. H. M. Unschuld. U. S. *2,516,733*. Soybean oil is heated at reduced pressure to 100-520°F. and is passed between electrodes immersed in the oil. Current of a voltage of 500-2000 and of a frequency of 500-4000 is applied in order to pass from 100-700 milliamperes through the oil for a period of 30-60 sec. This treatment permits the phosphatides and fatty acids to be removed from the oil leaving a deodorized and decolorized oil.

PROCESS FOR THE PRODUCTION OF STEROLS FROM OILS, FATS, AND FATTY ACIDS. O. Böhm (Severoceske tukove zavody, narodni podnik, Utsi nad Labem, Czechoslovakia). *U. S. 2,516,834*. A process is disclosed for recovery of sterols from oils, fats, fatty acids, and fatty mixtures by esterifying with methyl or ethyl alcohol, separating most of the esters from the non-esterified portions by vacuum distillation, and isolating sterols from the residue by means of saponification, further esterification, extraction, crystallization, and recrystallization.

APPARATUS FOR SOLVENT EXTRACTION OF OIL FROM OIL-BEARING SEEDS. H. R. Straight. *U. S. 2,517,143*. A continuous countercurrent extractor is described.

• Biology and Nutrition

R. A. Reiners, Abstractor

THE EFFECT OF FAT LEVEL OF THE DIET ON GENERAL NUTRITION. VI. THE INTERRELATION OF LINOLEATE AND LINOLENATE IN SUPPLYING THE ESSENTIAL FATTY ACID REQUIREMENT IN THE RAT. S. M. Greenberg, C. E. Calbert, Evelyn E. Savage, and H. J. Deyel, Jr. (Univ. of Southern California, Los Angeles). *J. Nutrition* **41**, 473(1950). Linolenic acid had only slight growth-promoting action when fed alone to fat-depleted rats at the level indicated. When fed with suboptimum doses of linoleic acid, the resultant activity of the additional linolenate equaled that of linoleate. The optimum dosage of linoleic acid (methyl ester) for male rats exceeds 50 mg. daily (probably about 100 mg. daily) while that for female rats has been found to be between 10 and 20 mg. per day. However, greater growth was found in the female rats on 30% cottonseed oil diets than could be obtained on a fat-low regime where the animals were supplemented with an optimum quantity of methyl linoleate.

PROGRESS IN PEDIATRIC NUTRITION. I. ENERGY AND PROTEIN REQUIREMENT IN THE PREMATURE INFANT. Ruth Woods. *Borden's Review of Nutrition Research* **11**, 51(1950). Premature babies do not utilize fat as well as full term babies. A low fat, high protein, and carbohydrate diet is suggested.

THE NATURE OF THE VITAMIN B_1-SPARING ACTION OF FAT. M. Gruber (Lab. V. Physiologische Chemie Der Rijksuneversiteit, Utrecht). *Nature* **166**, 78(1950). It was concluded on the basis of results obtained by feeding pigeons carefully controlled diets that the larger consumption of carbohydrate caused quicker depletion of the tissue vitamin B_1. Thus the sparing action of fats is due to reduced use of vitamin B_1.

UTILIZATION OF VITAMIN A BY TURKEY POULTS. I. CRYSTALLINE CAROTENE, CRYSTALLINE VITAMIN A ACETATE, AND "BLACK COD" LIVER OIL. R. Gurcay, R. V. Boucher, and E. W. Callenbach (Penn. State College). *J. Nutrition* **41**, 565(1950). On the basis of International Units of vitamin A activity "Black Cod" liver oil was found to be twice as efficient in supporting normal growth as the corresponding levels of crystalline carotene. Crystalline vitamin A acetate was approximately four times as efficient as carotene.

THE STABILITY OF ADDED CAROTENE IN VANASPATI UNDER DIFFERENT CONDITIONS OF STORAGE. J. C. Sadana and B. Ahmad (Sci. Ind. Research Council, Delhi). *Indian J. Med. Research* **37**, 203-12(1949). Dehydrated carrots were added to hot hydrogenated vegetable oil (Vanaspati), followed by decantation and filtration. Samples of this treated vegetable oil were stored in sealed glass bottles and tins. Storage at room temperature and under refrigeration for 20 weeks showed losses of 30.6% and 27%, respectively, of the β-carotene content which originally was 8.47 γ per g. (*Chem. Abs.* **44**, 6987)

CAROTENE AS A PIGMENT AND PROVITAMIN FOR BUTTER. F. Kieferle, A. Seuss, and H. Kiendl (Chem. Inst. Suddeutschen Versuch- u. Forschunganstalt Milchw., Weihenstephan, Germany). *Proc. 12th Intern. Dairy Congr.* (Stockholm) **1**, 69-82 (1949). The addition of 10 kg. of carrots per day to the dry fodder fed cows increased the vitamin A content of the butter by 24% and the carotene content by 25%. (*Chem. Abs.* **44**, 6983)

THE CONVERSION OF β-CAROTENE TO VITAMIN A IN THE INTESTINE. S. Y. Thompson, J. Ganguly, and S. K. Kon (U. Reading). *Brit. J. Nutrition* **3** (1), 50-78(1949). Evidence was obtained that the small intestine is the site of conversion of β-carotene to vitamin A in rats and in pigs and that the lymphatic system is the route of transport for the vitamin. Most of the vitamin A in the contents of the small intestine was in the alcohol form but the wall contained about equal amounts of both alcohol and ester. (*Biol. Abs. Sect. G.* **24** (6), 8)

HYPERVITAMINOSIS A IN THE RAT. K. Rodahl (Oslo Univ., Norway). *J. Nutrition* **41**, 399(1950). Prolonged administration of an excess of vitamin A over a period of several days was necessary to produce the changes characteristic of hypervitaminosis A. Gross doses of over 50-100 I. U. vitamin A/gram of body weight daily resulted in appreciable toxic manifestations. Daily doses over 800 I. U./gram of body weight proved lethal in all cases at the end of periods varying from 9-30 days.

PREVENTION OF LOSS OF BODY FAT BY CORTISONE. H. C. Stoerk and C. C. Porter (Merck Inst. for Therapeutic Res.). *Proc. Soc. Exp. Biol. and Med.* **74**, 65(1950). Adrenalectomized rats, partially starved for 5 days, lost approximately 4 times as much adipose tissue as similar animals injected with 2 mg. of compound E daily and twice as much as the controls. Desoxycorticosterone acetate was ineffective.

SPHINGOMYELIN AND THE ETHER-INSOLUBLE GLYCEROPHOSPHATIDE OF THE BRAIN. F. Rennkamp (Univ. Cologne, Germany). *Z. physiol. Chem.* **284**, 215-28(1949). Pure glycerol-free sphingomyelin with the correct P:N ratio from brain was hydrolyzed with alcoholic HCl. Among the hydrolytic products, fatty acids occurred in the theoretical amount while free H_3PO_4 and free choline were not found. The principal fatty acids were stearic acid (46%) and nervonic and lignoceric acids (34% together). Other acids found were: palmitic 2%, arachidic 2%, behenic 6%, and hexacosenic 10%. Palmitic acid cannot be an essential component of the brain sphingomyelin. In the glycerophosphatide it accounted for 81% of the entire fatty acids. The investigation confirms the structural formula for sphingomyelin proposed by Levene. (*Chem. Abs.* **44**, 6900)

CONTRIBUTION TO THE STUDY OF SHEA-BUTTER. J. Pansard. *Oleagineux* **5**, 234-240(1950). A bibliography on Shea-butter is given. The presence of unsaponifiable material such as resinous alcohols, phytosterols, and carotene has prevented its industrial use. Separation methods for these materials were investigated in order to produce a better product.

PHOSPHATIDE CONTENT OF MILK, CREAM, BUTTER, AND BUTTERMILK. W. Mohr (Phys. Inst. Versuchs- u. Forschungsanstalt Milchwissenschaft, Kiel, Germany). *Milchwissenschaft* **5**, 121-4 (1950). Butters show variations in phospholipid content with variations in manufacture. Alfa continuous process butter contains 0.460% phospholipid soluble in an ethanol-benzene mixture and 0.398% soluble in an isopropyl alcohol-benzene mixture. Corresponding values for Fritz continuous process butter are 0.384 and 0.278%; for sweet cream washed butter 0.296 and 0.260%; for acid cream washed butter 0.310 and 0.288%. (*Chem. Abs.* **44**, 6539)

FAT DETERMINATION IN ICE CREAM. V. Zakharova (Ivanovsk Milk Plant). *Molochnaya Prom.* **11**, No. 1, 41(1950). A 5-g. sample and 10 ml. H_2SO_4 (d. 1.5) is heated on steam bath until all protein is dissolved and is transferred to a butyrometer, with 7-8 ml. wash H_2SO_4. After addition of 1 ml. amyl alcohol and centrifuging 3 times, with intermediate 5-min. heating to 65°C., the fat indicator is read, and the value is multiplied by 2.2, when the usual milk butyrometer is used. (*Chem. Abs.* **44**, 6983)

MODIFIED METHOD FOR DETERMINING MOISTURE, AND VOLUMETRIC METHOD FOR FAT, IN CHICKEN MEAT. A. L. Moxon, R. S. Hutton, and M. Rhian. *Proc. S. Dakota Acad. Sci.* **26**, 34-8(1946-47). The finely-ground meat sample (0.5-2 g.) is forced through the nozzle of a syringe to be deposited as a thin filament in the milk-test bottle; in this form it is dried in vacuum at 28°C. for 12 hrs. The sample is then treated successively with 1.75% aq. NH_3 (10 ml.), concentrated H_2SO_4 (10 ml.), and water (15 ml., at 80-90°C.). After heating at 100°C. for 5 min., hot water is added to fill the bottles, which are heated at 100°C. for a further 5 min. and then centrifuged and filled to the mark; the volume of fat is read from the marks on the bottle. Comparative figures are given for chicken, pork, and beef meat samples dried by different methods. (*Chem. Abs.* 44, 6985)

Chronic essential fatty acid deficiency in mice. A. B. Decker, Dorothy L. Fillerup, and J. F. Mead (Univ. of California at Los Angeles). *J. Nutrition* 41, 507(1950). A state of chronic essential fatty acid deficiency may be produced in mature mice. In this state the external appearance is normal but typical acute essential fatty acid deficiency symptoms and possibly death may be produced by minor injuries, pregnancy and irradiation by x-rays. It is apparent that the essential fatty acids are intimately associated with the formation of new cells.

The intravenous administration of combined fat emulsion with surgical patients. B. G. P. Shafiroff, J. H. Mulholland, C. Tui, E. Roth, and H. C. Baron (New York Univ. Coll. Med.). *Surg. Gynecol. and Obstet.* 89, 398-404(1949). A 10% combined fat emulsion was given intravenously to a series of 22 surgical patients. The incidence of toxic effects was sufficiently low to recommend its use. (*Biol. Abs. Sect. G.* 24 [6], 4)

Intermediate fat metabolism. K. Lang (Johannes-Gutenberg Univ., Mainz, Germany). *Fette u. Seifen* 52, 158-61 (1950). A lecture. (*Chem. Abs.* 44, 6929)

Lipid metabolism. H. J. Deuel, Jr. (Univ. Southern California, Los Angeles). *Calif. Med.* 72, 197-200(1950). An address with 18 references. (*Chem. Abs.* 44, 6935)

Newer knowledge in the field of the biology of fats. E. Klenk. (Univ., Köln, Germany). *Fette u. Seifen* 52, 86-9 (1950). A lecture. (*Chem. Abs.* 44, 6900)

PATENTS

Separation of saponified and unsaponifiable portions of fats and oils. M. Freiman (Vitamins, Inc.). *U. S. 2,516,112.* The vitamin bearing unsaponifiable material is separated from a saponified oil by mixing the saponified oil with a finely divided stable inert solid in proportions to reduce the entire mass to percolatable consistency, and percolating a solvent for the unsaponified material through said mass.

Treating castor press cake. E. LeBreton and P. Gregory ("Societe Organico," Paris, France). *U. S. 2,516,128*). Castor oil press cake is treated with a proteolytic enzyme until a major portion of the poisonous body has been rendered nontoxic and thereafter treated with an agent selected from the group consisting of autolyzed yeast and autolyzed azotobacter.

• Waxes

E. H. McMullen, Abstractor

Wax wear resistance. Bernice Cummings (U. S. Testing Co.). *Soap and Sanitary Chemicals* 26, No. 8, 114-115(1950). The wear resistance of flood wax is tested by means of radioisotopic techniques.

Non-glossy oils and lacquers. *Farbe u. Lack* 56, No. 3, 111-112. (*Paint and Varnish Production*, July, 1950, 32-33). Matt drying oils and lacquers are produced, partly by the addition of non-waxy matt-producing media. They may be oil-wax or copal varnish-wax blends. The amount of the wax added should be limited to about 3-6%. Carnauba, montan, or beeswax are most suitable, but paraffin, ceresine, and some of the synthetic waxes may be used. A formulation for a typical wax varnish is given.

New processes for the removal by distillation of unsaponifiable matter from saponification products of paraffin oxidation. H. Pardun. *Fette u. Seifen* 51, 434-9(1944). A review. (*Chem. Abs.* 44, 6660)

High-rosin paraffin size. E. M. Berkman. *Bumazh. Prom.* 24, No. 5, 15-18(1949). An increasing degree of sizing for the same amount of size was obtained in the order—"white" rosin size, rosin-paraffin size, high-rosin size, high-rosin-paraffin size. The optimum rosin: paraffin ratio was found to be about 60:40. Optimum fold properties were obtained from high-rosin-paraffin-sized paper when the paraffin content of the size was 60%; optimum breaking length was obtained at 50% paraffin content. (*Chem. Abs.* 44, 6623)

Sizing paper with paraffin. A. I. Perelygina. *Bumazh. Prom.* 24, No. 4, 16-19(1949). In view of the adverse effects of rosin on paper properties and because of the shortages of rosin, a process for sizing with paraffin was developed. A typical emulsion formula included 100 kg. paraffin, 20 kg. stearin emulsifier, 10 kg. gelatin stabilizer, and 8 kg. $Na_2B_4O_7$ as a saponifying agent for the stearin. A final emulsion concentration of 25-30 grams per liter was obtained along with a pH of 8.5-9.5. Stability of the emulsion increased at higher pH values and coagulation occurred at lower pH values. Care had to be taken during emulsification to have the solutions of borax and gelatin at the same temperature as the paraffin-stearin mixture or coagulation would occur. Paraffin size can be used in conjunction with rosin size (0.5% paraffin based on bone-dry fiber weight) and a 4-fold reduction in rosin size required (from 2.0 to 0.5%) can be achieved in this way. (*Chem. Abs.* 44, 6623)

The use of tar in the manufacture of paper and board. A. S. Sergeeva. *Bumazh. Prom.* 24, No. 1, 41-3(1949). Bitumen emulsions are prepared by heating 200 kg. of bitumen and 30 kg. of mineral wax to 105-110°, simultaneously heating 30 kg. crude sulfated soap and 15 liters of water to 70-80°, mixing the two liquids and, finally, adding 100-150 liters of water to give the final emulsion for the sizing process. (*Chem. Abs.* 44, 6623)

PATENTS

Obtaining fatty alcohols from their esters. S. Steinberger (The Richards Chemical Works). *U. S. 2,506,473.* Esters, e.g. spermaceti, of fatty alcohols containing 8-20 carbon atoms are saponified in the presence of high boiling water-miscible solvents, such as triethylene glycol. Distillation gives a mixture from which the alcohol is separated by controlled dilution with water. (*Chem. Abs.* 44, 6876)

Wax compositions. John R. Bowman and Wm. P. Ridenour (Gulf Research & Development Co.). *U. S. 2,506,059.* A solid paraffin wax composition of increased tensile strength is prepared by mixing 0.1-0.5% by weight of a wax-soluble aluminum soap in paraffin wax. The highest tensile strength is obtained with a highly refined paraffin wax with an ASTM m.p. of 132°F. (*Chem. Abs.* 44, 6619)

• Drying Oils

Stuart Harrison, Abstractor

Drying oils as starting materials for new varnish compositions. J. Baltes. *Fette u. Seifen* 52, No. 1, 19(1950). The use of phenolic resin in conjunction with drying oils as well as semidrying oils to give valuable varnish materials is reviewed. Today the most important coating materials are made through the oil modified alkyds. Two important recent developments are (1) The reaction of diisocyanates with hydroxy esters of drying fatty acids. (2) The styrenation of drying oils. The structures of the modified oils made by the two procedures are given. Tables of the properties of a number of examples of the modified oils are given.

Oxidation of linseed oil. P. S. Hess and G. A. O'Hare. *Ind. Eng. Chem.* 42, 1424(1950). Raw linseed oil was air blown under controlled conditions. The air flow and agitation were kept constant and runs were made at different temperatures from 80° to 200°. Samples were withdrawn periodically and examined. The iodine value, peroxide value, ultraviolet absorption spectra, refractive index, and viscosity of each sample were determined. Results showed that a definite induction period exists which is an exponential function of temperature in the range 80°-130°, as the temperature is lowered the length of the induction period increases logarithmically. Above 130° the induction period is practically negligible. The refractive index and viscosity climb rapidly after the induction period. The peroxide value climbs rapidly then passes through a maximum and falls off. The iodine value falls off rapidly after the induction period. The theories of oxidation and oxidative polymerization are discussed.

Pentaerythritol-tall oil esters. S. Gourley. *J. Oil & Colour Chemists Assoc.* 33, No. 358, 175(1950). A review. The variability in composition of tall oil according to its source is shown. A comparison of tall oil esters of glycerol and P. E. showed a great superiority of the latter in durability and drying rate. Though the durability of P.E.-tall oil esters is in general inferior to linseed oil, the esters do furnish a useful substitute for conventional drying oils.

Study of the polyhydroxy esters of certain non- or semi-drying fatty acids and their utilization in varnishes. Raymond Skiencar (Master's thesis, Marquette University, 1947). OTS PB 99172. Good drying oils made using cottonseed and soya fatty acids in conjunction with various polyhydric alcohols; i.e. mannitol, sorbitol, and di-tri-poly pentaerithritols. The soya oils dried well whereas the cottonseed oils dried poorly. Soya varnishes were superior in most respects to cottonseed varnishes.

POROSITY OF PAINT FILMS. I. Wolock and B. L. Harris. *Ind. Eng. Chem.* 42, 1347(1950). The surface area of unsupported linseed oil films was measured by a Krypton adsorption method to determine whether the permeability to water vapor is due to porosity. Conclusions from data show that there is no appreciable quantity of fine pores in the film large enough to allow physical transmission of water vapor.

DRYING CHARACTERISTICS OF PAINT FILMS. D. D. Laiderman and R. R. Bruhn. *Paint, Oil & Chemical Review* 113, No. 13, 12(1950). The Reichhold Drying Recorder for testing the drying rate of films has been modified to facilitate the detection of certain stages of drying. The modified instrument consists essentially of a constant speed motor which pulls a doctor blade through the film. The tear point on the film recorder correlates well with the manual set to-touch point. Photographs of the recorders and test films are shown.

PATENTS

EXTRACTION OF PLASTICS FROM LINOLEUM CEMENT. H. A. Reehling (Armstrong Cork Co.). *U. S. 2,515,265.* A linoleum cement prepared by oxidizing a mixture of linseed oil and rosin in a mechanical oxidizer for 30 hours at a temperature of 200°F. is mixed with wood flour to make a product containing 40% wood flour and 60% cement. This mixture is first extracted with petroleum ether followed by ethyl ether to give an extracted residue of polymeric material and wood flour, which can be compressed into strong plastic objects.

PRODUCTION OF DEHYDRATED CASTOR OIL. C. A. Coffey and W. T. Walton (Sherwin-Williams). *U. S. 2,517,765.* A dehydrated castor oil with a color not darker than 4 (Hellige-Klett scale) is produced by heating raw castor oil at atmospheric pressure and at temperatures of 210-550°F. and adding H_2SO_4 in increments to the oil. The proportion of H_2SO_4 used is in the range .025% to 0.3%. A diluent which is a common solvent for oil and H_2SO_4 is used as well as an antioxidant.

DRYING OIL. R. A. Carleton. *U. S. 2,517,838.* Oils having a large proportion of unconjugated diene unsaturation are conjugated without appreciable thermal polymerization by first hydroxylating in a tower by passing air and steam through the oil at 130-150°F. The hydroxylated oil is then given a flash dehydration by subjecting a thin film to temperature of 610°F. for 5 seconds under a pressure of 3-5 mm. then cooled immediately to 300°F.

• Detergents

Lenore Petchaft, Abstractor

FOAM MEASUREMENT. Joseph G. Sinsheimer (Fuld Bros. Inc., Baltimore, Md.). *Soap Sanit. Chemicals* 26, No. 8, 38-41, 157 (1950). Review of theory of foam formation, methods of producing and measuring foams, and applications of foam measurement in evaluating detergents.

BASIC WASHING MATERIALS. I. SURFACE ACTIVITY AND DETERGENCY. K. Lindner. *Melliand Textilber* 20, 203-9(1948). Surface and interfacial (paraffin oil-H_2O) tensions of aqueous solutions of 27 natural and synthetic detergents have been determined. Conclusions regarding the physicochemical basis of the washing process derived from the results agree with those of Adam and in particular it is observed that although the surface- and interfacial-tension characteristics of a compound do not give a complete evaluation of its detergent power one of the most important requirements of a washing material is fulfilled if its dilute solution (less than 0.2%) possesses strong surface and interfacial tension-lowering properties. (*Chem. Abs.* 44, 6661)

COLLOIDAL ELECTROLYTES. Reynold C. Merrill (Philadelphia Quartz Co., Philadelphia, Pa.). *J. Chem. Education* 27, 312-28 (1950). A review with 95 references. (*Chem. Abs.* 44, 6237).

SOLUBILIZATION. H. B. Klevens (University of Minnesota, St. Paul, Minn.). *Chem. Revs.* 47, 1-74(1950). Extensive review article on the solubilization phenomena associated with surface-active agents. Phases covered include methods of observing solubilization, types and mechanisms of solubilization, effect of structure of solubilizer, effect of structure of solubilizate, temperature effects, effect of various additives, structure and organization in soap solutions, and applications of solubilization in biological and chemical processes. 258 references.

QUATERNARY AMMONIUM PRODUCTS IN THE FOOD INDUSTRY. J. P. Sisley and M. Loncin. *Oleagineux* 5, 420-424(1950). The detergency and bactericidal action of these compounds are particularly important for food industries. General directions for their use are given.

THE BALANCE SHEET OF OXYGEN, SULFUR, NITROGEN, AND ALKALI—AN IMPORTANT AID IN DETERGENT ANALYSIS. B. Wurzschmitt. *Chem.-Ztg.* 74, 16-20(1950). The original, dried product is analyzed for C, H, O, S, N, halogen, and alkali content. Special groups and constants are determined, split portions are estimated, and a balance sheet is set up. This method yields results much faster and eliminates errors due to determination of only the well-purified sections, which may not be the sole active ingredient. Thus, only a few separations with petroleum ether from neutral, AcOH, or HCl solutions, extraction with petroleum ether after boiling or heating under pressure with HCl and some volumetric analysis for functional groups (acid saponification, Ac values, I No., NH_2-group determination, titratable N, total Na, inorganic and organic Cl and S) in connection with molecular weight determination, and a quantitative balance sheet for Cl, S, O, and N will identify the detergent sufficiently in a very short time. Examples are given in detail for the analysis of condensates of ethylene oxide and fatty alcohol, fatty acid with protein-degradation products, sulfonated compounds, fatty acid amides, and amine compounds. (*Chem. Abs.* 44, 7074)

STRUCTURE AND ACIDIMETRY OF HEAVY METAL SOAPS. J. P. Wolff. *Oleagineux* 5, 20-3(1950). Heavy metal soaps, like Cu oleates, are associated in organic solutions. The degree of association depends on the solvent and diminishes rapidly in the presence of polar molecules. Being slightly soluble in alcohol, heavy metal soaps hydrolyze into free acids and metal hydroxide. This behavior makes impossible the determination of free acidity by usual methods. (*Chem. Abs.* 44, 7073)

IDENTIFICATION OF RELATIN AND TYLOSE. A. Hintermaier. *Fette u. Seifen* 51, 367-8(1944). The color reaction with α-naphtholsulfonic acid is given only by carbohydrate-like compounds but cannot be used to distinguish between them. Microscopic examination in 10% NaOH medium containing methylene blue is suggested. Photomicrographs are given. (*Chem. Abs.* 44, 6661)

AN HISTORICAL SURVEY OF SODIUM CARBOXYMETHYLCELLULOSE AS A DETERGENT AID. F. J. Pollok (Imperial Chemical Industries, Ltd., Stevenston, Ayrshire). *Soap, Perfumery, Cosmetics* 23, 811-17(1950). A review of the history of the use of sodium carboxymethylcellulose in detergents as revealed by German and Dutch, American and Canadian, and British publications. The publications and patents are reviewed in detail. 25 references.

CELLULOSE DERIVATIVES IN SOAP. Milton A. Lesser. *Soap Sanit. Chemicals* 26, No. 8, 29-32, 82(1950). Review of the development and use of cellulose derivatives such as methyl cellulose and sodium carboxymethyl cellulose in soap and detergents to improve detergency and appearance. 34 references.

PERFUMING OF LIQUID SOAPS. Andrew Treffler. *Soap Sanit. Chemicals* 26, No. 8, 33-5, 157-8(1950). Methods of solubilizing perfumes and some fatty substances such as lanolin into concentrated stock solutions of liquid soaps are described. The theory of solubilization, based on orientation of aromatic and alkyl substances by means of their polar groups and residual forces resulting in adherence of like molecules with no change in refractive index or clarity is explained. On this basis, low molecular weight fatty acids and unsaturated higher fatty acids may be useful as solubilizing agents, but resin acids, tall oil and petroleum sulfonates containing both alkyl and aryl groups are more successful as solubilizers for perfumes which may also contain both alkyl and aryl groups.

PATENTS

PROCESS FOR THE MANUFACTURE OF A DETERGENT PRODUCT AS A SUBSTITUTE FOR SOAP. Joaquin de la Vega Samper. *British 634,179.* A detergent product useful as a soap substitute is manufactured by treating sea-weed mucilage with steam or boiling water and then saponifying with caustic lye.

PROCESS AND APPARATUS FOR DRYING, COOLING, AND DEODORIZING SOAP. Giuseppe Mazzoni. *British 640,908.* A process for drying, cooling, and deodorizing soap under vacuum, which consists in spraying a hot soap paste in an evaporating chamber maintained under vacuum, while maintaining a relative movement inside the evaporating chamber between the spray and a surface which receives the spray, and scraping the receiving surface to remove the soap deposited thereon.

GERMICIDAL DETERGENT COMPOSITIONS. Joseph M. Lambert (General Aniline & Film Corp.). *British 641,297.* A high level of germicidal efficiency as well as detergency is shown by a mixture of an organic anionic detergent (alkyl aryl sulfonate), a cationic germicide (quaternary ammonium compound), and a nonionic detergent containing a polyglycol ether group, said nonionic agent being added to overcome incompatibilities of anionic and cationic detergents.