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ABSTRACTS . . . . . Don Whyte, Editor

• Oils and Fats

R. A. Reiners, Abstractor

IMPROVEMENT OF THE CLASSICAL METHOD FOR DETERMINATION OF THE INDUSTRIAL OUTPUT OF OLIVE-OIL BY PRESSURE. P. M. Rousseau. *Industr. agr. alim.*, **67**, 52(1950). The pressure-juice is collected in a graduated tube of sufficient capacity. The oil is separated from the liquid in the tube by centrifugation. Measurement of the volume gives the results.

DERIVATIVES OF FATTY ACIDS. IDENTIFICATION BY X-RAY DIFFRACTION POWDER PATTERNS. F. W. Matthews, G. G. Warren, and J. H. Michell. *Anal. Chem.* **22**, 514(1950). Three types of derivatives of fatty acids, silver salts, amides, and anilides, were found suitable as a means of identification of the acid by the use of X-ray diffraction powder patterns. For ease of preparation and pattern differentiation the silver salts are preferred.

HEAT CAPACITY OF STABILIZED PEANUT BUTTER. T. L. Ward, W. S. Singleton, and A. F. Freeman (Southern Reg. Res. Lab.). *Food Research* **15**, 146(1950). An equation is derived for expressing the specific heat of stabilized peanut butter from 20 to 80°C. which is $C_p = 0.361 + 0.0012t$ where C_p is expressed in calories per g. and t is the temperature in °C.

KINETICS OF THE ESTERIFICATION OF OLEIC ACID BY PRIMARY ALCOHOLS AT ROOM TEMPERATURE. M. Loury and Janine Piquard. *Oleagineux* **4**, 505-9(1949). The extent of esterification of oleic acid with various primary alcohols was measured after reacting for 7 days at 18°C. in the presence of sulfuric acid. (*Chem. Abs.* **44**, 3885.)

FATS AND FATTY OILS AS LUBRICANTS. M. Singer. *Seifensieder-Ztg.* **73**, 133-5, 153-5, 173-5(1947). The properties and uses of a large number of animal and vegetable fats and oils and polymerized oils are discussed. (*Chem. Abs.* **44**, 3723.)

CHROMATOGRAPHIC ANALYSIS OF THE UNSAPONIFIABLE MATTER OF MARINE ANIMAL OILS. L. E. Swain. *Canadian Chem. and Process Indust.* **32** (6), 553-554(1948). A flowing chromatogram is used to separate the unsaponifiable matter into hydrocarbons (petroleum elution), mono-alcohols (methylene chloride elution), di-alcohols (diethyl ether elution), and an unidentified fraction (methanol elution). (*Biol. Abs.* Sect. G. **23** [3], 21.)

THE ISOLATION OF A CONJUGATED UNSATURATED ACID FROM THE OIL FROM *Ximenia caffra* KERNELS. S. P. Lighthelm and H. M. Schwartz. *J. Am. Chem. Soc.* **72**, 1868(1950). The acids from *X. caffra* oil were fractionated and a C_{18} acid was isolated which contained a double bond and a triple bond either in conjugation with one another or with one of them in conjugation with the carboxyl group. This acid, for which the name ximenynic acid is proposed, was present in about 25% concentration.

ABSORPTION SPECTRUM OF OLIVE OILS IN THE ULTRAVIOLET ZONE. F. Poggio and Maria M. Retortillo. *Bol. Inst. Espanol Oceanogr.* **14**, 1-11(1949). A study of the absorption spectra of 50 samples of olive oil of different qualities revealed that at the wavelength 255 mμ. the maximum extinction coefficient for the pressure oils was 87 and that the minimum extinction coefficient for refined extracted oils was 139. This difference can serve as a guide in distinguishing quality. (*Biol. Abs.* Sect. G. **24** [1], 20.)

UREA ADDITION OF ALIPHATIC COMPOUNDS. W. Schlenk Jr. (Ammonia Lab. Oppau, B.A.S.F., Ludwigshafen, Ger.). *Ann.* **565**, 204-40(1949). Urea forms with acids, esters, ethers, amines, nitriles, alcohols, halides, and aliphatic hydrocarbons a series of crystalline adducts which represent an entirely new type. Unless the "partner" in the adduct has an appreciable vapor pressure, they are stable at room temperature when dry but decompose when treated with water or suitable organic solvent. With monocarboxylic acids the tendency toward dissociation increases with a decreasing number of carbon atoms. The adducts of all n-monocarboxylic acids from C_4 to C_{12}, as well as C_{14}, C_{16}, and C_{18} were formed. Most of these were precipitated from a methyl alcohol solution of urea. (*Chem. Abs.* **44**, 3900.)

MICROMETHOD FOR FAT ANALYSIS BASED ON THE FORMATION OF MONOLAYER FILMS. K. K. Jones (Northwestern Univ. Med. School, Chicago). *Science* 111, 9-10(1950). The amount of fat in a petroleum ether solution may be estimated by placing an aliquot on a film of piston oil spread on the surface of a 0.3% sulfuric acid solution. After evaporation of the solvent the area of the fat film is measured. This method is claimed to be more sensitive and accurate than other methods. (*Chem. Abs.* **44**, 3843.)

LESPEDEZA SEED OIL. Anon. *Chem. Industries* **66**, 503(1950). The oil from lespedeza seed has been shown to be a semi-drying oil comparable to soybean oil.

OIL FROM THE SEEDS OF *Zizyphus sylopyra* (Willd.). J. W. Airan. *Current Sci.* **17** (5), 150(1948). Only three fatty acids were found on hydrolysis of the glycerides of this oil: myristic acid (28.1), oleic acid (47.3), and linoleic acid (24.6). (*Biol. Abs.* Sect. G. **23** [3], 19.)

RAPE SELECTION. P. Larroque. *Oleagineux* **5**, 292-295(1950). Discusses methods for scientific selection of rape.

STUDIES IN CO-SOLVENCY. PART IV. SOLUBILITY OF STEARATES OF LITHIUM, SODIUM, AND POTASSIUM IN GLYCOLIC MIXTURES. Shreepati Rao and Santi R. Palit. *J. Indian Chem. Soc.* **26**, 577-583(1949). The solubility of stearates of lithium, sodium, and potassium was determined at 35° in binary solvent mixtures where one component is propylene or diethylene glycol and the other is chloroform, ethylene dichloride, or benzene. A few measurements have been recorded using alcohols in place of glycols in the above binary mixtures. The glycolic mixtures improve to a great extent the solvent power of the individual solvents and the results are found to be in agreement with previous observations and the already postulated mechanism.

CLASSIFICATION OF SURFACE-ACTIVE AGENTS BY "HLB." C. Griffin. *J. Soc. Cosmetic Chemists* 1, 311-326(1949). The HLB system for the choice of emulsifiers based on their hydrophile-lipophile balance is described. The system, though it does not indicate the over-all efficiency of the emulsifier, does tell what kind of an emulsion or product to expect, and so enables us to compare various chemical types of emulsifiers at their optimum balance. Estimated HLB values for various types of emulsifiers and fats and oils are presented as well as a method for their determination.

EXPERIMENTAL FORMULATION OF EMULSIFIED CREAMS. S. Druce. *Mfg. Chemist*, 21, 159-160(1950). Emulsified cosmetic and dermatological creams, particularly of the o/w type, have become very popular during recent years and many medicaments have been incorporated into vanishing-cream type bases. In some cases it is necessary to formulate a base which will remain stable in an acid medium, and for this purpose a soap emulsifying agent cannot be used. The emulsifying properties of the sulphated alcohols and other emulsifying agents when used as separate entities were investigated.

WORLD PRODUCTION OF FAT SUBSTANCES IN 1949. Paul H. Mensier. *Oleagineux* **5**, 284-286(1950). The outlook for production of fat substances and their bearing on world trade is examined.

SELECTIVE HYDROGENATION. M. Loury. *Oleagineux*, **5**, 279-283(1950). Selective hydrogenation results from a particular heterogeneous catalysis which can be controlled by the reaction conditions.

CONDITIONS FOR STORING RAW AND RENDERED FAT. S. Liberman and E. Mirkin. *Myasnaya Industriya* 20 (5), 26-9(1949). The effects of temperature, light, and duration of storage on raw and rendered fats are pointed out with tables and charts showing the development of peroxide and acid values. Optimum storage conditions of 3 to 5°C. and relative humidity of

80% were recommended. For package material the use of parchment treated with a 2.5% citric acid solution in alcohol was mentioned. (*Chem. Abs.* **44**, 3723.)

MECHANISM OF AUTOXIDATION AND THE ACTION OF AN ANTIOXIDANT. L. Michaelis (Rockefeller Inst. for Med. Research, New York, N. Y.). *Biol. Antioxidants,* Trans. 3rd Conf. 1948, 11-23. It is suggested that the hydroperoxide of an unsaturated fatty acid can oxidize hydroquinone or tocopherol to its semiquinone radical. The hydroperoxide is reduced to a compound of a lower level of oxidation, which by an electronic rearrangement is converted into a compound which reduces the semiquinone back to the hydroquinone, itself being oxidized to the hydroperoxide again. Hereby a certain concentration of the hydroperoxide is maintained; however each single hydroperoxide molecule has too short a lifetime to induce the slower, successive irreversible reactions which result in the oxidation of the fatty acid. (*Chem. Abs.* **44**, 4053.)

PATENTS

PROCESS FOR PRESERVING ANIMAL FATS. M. E. Dunkley. *U. S. 2,504,507.* A gas consisting of products of combustion analyzing 8.2% carbon dioxide, 0.1 to 0.2% acetylene, 0.2 to 0.1% oxygen, 3.8% carbon monoxide, 2.2% methane, and 85.5% nitrogen was bubbled through the liquid fat.

PROCESS OF MANUFACTURING STABILIZED NUT BUTTERS. F. L. Avera. *U. S. 2,504,620.* A stabilized nut butter is prepared by addition of hydrogenated oil stabilizer containing an edible oil which has been hydrogenated only to the point of maximum trans-9, 10-octadecenoic formation.

SEPARATION OF FATTY ACIDS. H. T. Spannuth (Wilson and Company Inc.). *U. S. 2,505,012.* Fatty acids are fractionated by rapidly cooling the fatty acids to a temperature which is below the melting point of the mixture but above the melting point of one component and contacting this mixture with a solvent at a temperature so low that the higher melting fatty acid is insoluble therein.

SYSTEM AND APPARATUS FOR SOLVENT EXTRACTION. M. W. Pascal (Sherwin-Williams Company). *U. S. 2,505,139.* Apparatus is described for counter-current solvent extraction of oil-bearing seeds in which the miscella and the meal are separated by use of a centrifuge.

REFINING FATTY OILS. G. H. Palmer (M. W. Kellogg Company). *U. S. 2,505,338.* Liquid propane used as the solvent.

METHOD OF MANUFACTURING BUTTER. H. A. Toulmin Jr. (Commonwealth Engineering Company). *U. S. 2,505,654.* Butter is made by freezing an oil bearing substance, removing water therefrom while frozen, thawing the concentrated substance, and churning the thawed substance to coalesce the oil to make butter.

VEGETABLE OIL EXTRACTION. A. C. Beckel, P. A. Belter, and H. J. Deobald (U. S. A.). *U. S. 2,505,749.* Oil is extracted from dry vegetable seeds with hot ethanol and the resulting miscella cooled to below 20°C., causing separation of most of the alcohol from the oil. The oil layer is then heated slightly, causing precipitation of solids which are removed by filtration.

PRODUCTION OF THE HIGHER FATTY ACID ESTERS OF POLY-CHLORINATED PHENOLS. E. B. Higgins. *U. S. 2,506,361.* Fatty acid esters of poly-chlorinated phenols are produced by chlorinating in the presence of phosphorus oxychloride, a solution of phenol in the theoretical quantity of fatty acid.

ALKALI-REFINING OF FATTY GLYCERIDES IN THE PRESENCE OF AN INORGANIC PHOSPHATE COMPOUND. S. J. Rini (Lever Brothers Company.). *U. S. 2,507,184.* The addition of up to 0.75% of an inorganic phosphate compound in the normal alkali-refining process is claimed to reduce the refining losses.

• Biology and Nutrition

R. A. Reiners, Abstractor

FACTORS AFFECTING THE STABILITY OF THE VITAMIN A FROM COD LIVER OIL IN CEREAL FEEDS. A. W. Halverson and E. B. Hart (Univ. of Wisconsin). *J. Nutrition* **40**, 415(1950). Cod liver oil was added to ground white corn and to a mixed ration. Storage for 2.5 to 3 months at 33 to 36° in gas-tight containers resulted in destruction of 40% of the vitamin A. Rapid destruction was induced by adding minerals (Fe, Cu, Co, and Mn), but this could be prevented by adding them in a dried gelatin-mineral mixture.

THE EFFECT OF FAT LEVEL OF THE DIET ON GENERAL NUTRITION. V. THE RELATIONSHIP OF THE LINOLEIC ACID REQUIREMENT TO OPTIMUM FAT LEVEL. H. J. Deuel Jr., S. M. Greenberg, C. E. Calbert, Evelyn E. Savage, and T. Fukui (Univ. of S. Calif.). *J. Nutrition* **40**, 351(1950). Weanling rats fed a fat-free diet developed symptoms of fat deficiency in 12 weeks. When 20 mg. of linoleic acid was given as a supplement to the rats, a prompt response in growth resulted which was not further augmented when the level was increased to 60 mg. per day. The administration of a 10% cottonseed oil diet to rats receiving linoleate at an optimum level resulted in further acceleration of growth.

THE *in vitro* DIGESTIBILITY OF RAW AND HEAT-PROCESSED SOY PRODUCTS VARYING IN THE NUTRITIVE VALUE OF THE PROTEIN. M. Simon and D. Melnick (Quartermaster Food and Container Inst.). *Cereal Chem.* **27**, 114(1950). Dehulled soybeans, unheated defatted soy flakes, mildly heat-processed soy flour, optimally heat-processed soy flour, and over heat-processed soy flour were evaluated by *in vitro* enzymatic digestion techniques. Poor correlation was obtained between nutritive data and the *in vitro* digestibility values. Large increases in the efficiency with which the protein in soy products was utilized by test animals were associated with only small increases in *in vitro* digestibility. The nutritive value of the proteins in soy products can be markedly increased without appreciably affecting the antitryptic activity.

VITAMIN A UTILIZATION STUDIES. III. THE UTILIZATION OF VITAMIN A ALCOHOL, VITAMIN A ACETATE, AND VITAMIN A NATURAL ESTERS BY HUMANS. E. F. Week and F. J. Sevigne (Collett-Week-Nibecker Inc.). *J. Nutrition* **40**, 563(1950). The relative utilization of the three forms of vitamin A was judged by the blood serum levels after administration of 134,000 μg. of the vitamin in 50 g. of margarine. In males the order of biological efficacy was alcohol > acetate > natural esters. In females the alcohol and the natural esters were equally effective while the acetate was less effective. Vitamin A present in the blood serum was always present as the ester. The addition of tocopherols had no effect on vitamin A absorption.

STABILITY OF CAROTENE IN ALFALFA MEAL. EFFECT OF ANTIOXIDANTS. C. R. Thompson (Western Regional Res. Lab.). *Ind. and Eng. Chem.* **42**, 922(1950). *p*-Substituted phenylenediamines, 2,5-disubstituted hydroquinones, and derivatives of 2,2,4-trimethyl-1, 2-dihydroquinoline were the most active antioxidants for carotene in dehydrated alfalfa meal. Metal deactivators failed to give increased stability. Even with the best of the antioxidants at 0.125% concentration 30-35% of the carotene was destroyed after 7 months' storage at 25°.

VITAMIN E CONTENT OF FOODS. P. L. Harris, Mary L. Quaife, and W. J. Swanson (Distillation Products inc.). *J. Nutrition* **40**, 367(1950). The average per capita consumption of vitamin E in the U. S. has been estimated at 14 mg. of *d*, α-tocopherol (13 I. U.) per day. Vegetable oils, cereal products, and eggs are rich dietary sources of vitamin E while vegetables, fruit, and animal products are rather poor sources of vitamin E.

EFFECT OF TOCOPHEROLS ON VITALITY OF PIGS IN RELATION TO "BABY PIG DISEASE." L. E. Carpenter and W. O. Lundberg (Univ. of Minnesota, Austin). *Ann. N. Y. Acad. Sci.* **52**, 269-75(1949). Increasing the sow's intake of vitamin E did not affect the size or apparent health of pigs at birth but did affect favorably the livabillity and growth of nursing pigs under conditions in which "baby pig disease" was enzootic. (*Chem. Abs.* **44**, 3581.)

THE INFLUENCE OF CRACKED SOYBEANS AND OTHER FACTORS UPON FLAVOR OF MILK AND THE IODINE VALUE OF MILK FAT. J. B. Frye Jr., C. Y. Cannon, and E. W. Bird (Iowa State College, Ames). *J. Dairy Sci.* **33**, 205(1950). There was no indication that cracked soybeans produced an undesirable flavor in milk when constituting approximately 11% of the concentrate mixture. As the total milk and fat production increase, the tendency for the production of milk having a flat flavor decreases. A close relationship may exist between mean external temperature and the iodine value of the milk fat produced.

THE ALKALI REFINING OF OILS CONTAINING VITAMIN A. L. Hartman. *J. Soc. Chem. Ind.* **69**, 55(1950). Under the usual refining conditions the neutralization with alkali of fish liver oils results in increased vitamin A potency. The increase is approximately proportional to the free fatty acid content of the original oil.

FAT SOLUBLE VITAMINS A, E, AND K. H. R. Butt. *J. Am. Med. Assoc.* **143**, 236(1950). The physiological and clinical aspects of these vitamins are given.

PHYSICAL AND CHEMICAL INVESTIGATIONS OF FAT SPLITTING AND FAT SYNTHESIS BY LIPASE. H. Steudel (Univ., Berlin). *Forschungen u. Fortschr.* **25**, 65-7(1949). The hydrolysis of fats by lipase *in vitro* reaches equilibrium when one-third of

the fat has been hydrolyzed. Lipase therefore catalyzes the synthesis as well as the hydrolysis of fats. The failure of the reaction to reach equilibrium *in vivo* is attributed to the rapid absorption of the fatty acids and later the rapid removal of the newly synthesized fats through the chyle vessels. (*Chem. Abs.* **44**, 4051.)

MARGARINE IN THE NORTHERN COUNTRIES. Anon. *Oleagineux*, **5**, 287-291(1950). The countries of northern Europe, where the physiological requirements of the population in fat substances are especially high, traditionally are big producers and consumers of dairy products. The margarine production in those countries is reviving even though the oils and fats necessary to the manufacture have to be imported.

THE PHYSICAL STRUCTURE OF THE BIREFRINGENT LAYER OF THE FAT GLOBULES IN BUTTER. N. King. *Neth. Milk & Dairy J.* **4**, 30-40(1950). The birefringent layer of the fat globules in butter is a spherical layer-crystal ("shell-crystal") built up of radically orientated rodlike molecules of the higher melting butterfat fractions. This "shell-crystal" possesses plastic properties and is possibly related to the mesomorphic substances (liquid crystals). In cooled cream only a few fat globules with the birefringent layer are found, even after keeping the cream at the cooling temperature for a long time. If, however, an optimum pressure is exerted on the globules, the optically active peripheral layer is formed, owing to the orientation of the molecules of the higher melting fats. At higher pressures the fat globules are destroyed.

THE DETECTION AND DETERMINATION OF NEUTRALIZING AGENTS AND/OR LACTIC ACID IN LIQUID MILK AND DRIED MILK. J. Van der Burg, B. M. Krol, P. Tiersma, and J. T. N. Venekamp. *Neth. Milk & Dairy J.* **4**, 22-27(1950). Neutralizing agents are sometimes added to milk which has become slightly sour in order to mask this sourness, or to make this milk still processable (for pasteurization, or for manufacture of dried milk.) The determination of sodium bicarbonate in concentrations of less than 420 grams per 1000 litres of milk was investigated by the following methods: 1st—The determination of the alkalinity of the ash, according to Kolthoff's method. 2nd—The determination of the sodium content according to Barber and Kolthoff. 3rd—The method of Tillmans and Luckenbach, in which a possible neutralization is deducted from the relation between the titratable acidity of the milk and the buffering power of its serum. None of these methods appeared to be suitable.

FATTY ACID CHANGES IN EGG YOLK OF HENS ON A FAT-FREE AND COTTONSEED OIL RATION. R. Reiser (Texas Agr. Exp. Sta., College Station). *J. Nutrition* **40**, 429(1950). The data show that the hen cannot synthesize polyunsaturated fatty acids from non-fat precursors but that it can synthesize 3, 4, and 5, but not 6, double bond acids from linoleic acid.

ROUTINE DETERMINATIONS OF COPPER, IRON, AND MANGANESE IN BUTTER. P. C. den Herder and B. M. Krol. *Neth. Milk & Dairy J.* **4**, 42-53(1950). Methods given are suitable for routine work. The determination is carried out in the serum after its separation from the butterfat. For the determination of the copper and iron content the serum is treated with hot alcoholic hydrochloric acid and then cooled and filtered. In the filtrate copper is determined colorimetrically by means of sodium diethyl-dithiocarbamate and iron by means of ammonium thiocyanate. Manganese is determined according to Broek's method by preparing the sulphated ash from the dried serum and then oxidizing the ash thus treated by means of nitric acid and potassium periodate to obtain a violet-colored permanganate solution. The concentration of this solution of manganese is determined colorimetrically.

THE IMPORTANCE OF THE DIETARY LEVEL OF FATS ON THEIR NUTRITIONAL EVALUATION. V. H. Barki, R. A. Collins, C. A. Elvehjem, and E. B. Hart. *J. Nutrition* **40**, 383(1950). Butterfat, corn oil, soybean oil, and coconut oil were fed to rats at 3 different levels in the diet, 10, 28, and 35%. The rats gained most weight on a 35% butterfat diet and a 10% corn oil diet. Slower growth was observed on the diets containing higher levels of corn oil and lower levels of butterfat. Changes in the levels of coconut oil or soybean oil in the diet did not result in significant changes in growth although in general the gains on coconut oil diets were low.

VIABILITY OF FOOD-POISONING *Staphylococci* AND *Salmonellae* IN SALAD DRESSING AND MAYONNAISE. Mary C. Wethington and F. W. Fabian (Mich. State Coll.). *Food Research* **15**, 125 (1950). Owing to their acid content mayonnaise and salad dressing are not probable sources of *Staphylococci* or *Salmonellae* food-poisoning. Decreasing the amount of acetic acid increased the survival time of the organism studied.

NUTRITIONAL VALUE OF PLANT MATERIALS. I. GROWTH OF RATS ON PURIFIED RATIONS CONTAINING SOYBEAN PROTEIN. M. O. Schultze (U. of Minn.). *J. Nutrition* **41**, 103(1950). Rats fed purified rations containing 24% protein in the form of a soybean protein preparation and DL-methionine as the only source of amino acids made satisfactory post-weaning weight gains for four successive generations. Extensive purification of the soybean protein did not change the growth rate of the rats consuming it. The addition of crystalline vitamin B_{12} to the diet of rats fed on a ration containing highly purified soybean protein did not increase the early post-weaning weight gains or the efficiency of food utilization.

EFFECT OF THE DIETARY FAT ON THE COMPOSITION OF THE DEPOT FATS OF ANIMAL. F. B. Shorland (Dept. of Sci. and Ind. Res., Wellington, N. Z.). *Nature* **165**, 766(1950). The fatty acid composition of beef and mutton tallow is shown to be almost entirely unaffected by the nature of the dietary fat.

SOY PROTEIN IN POULTRY DIETS. H. R. Bird. *Soybean Digest* **10** (7), 20(1950). Good breeder diets can be devised without animal protein supplements when soybean oil meal is the major source of protein if the recommended allowances of known nutrients are provided and if vitamin B_{12} is provided.

THE EFFECT OF METHIONINE SUPPLEMENTATION OF A SOYBEAN OIL MEAL. PURIFIED RATION FOR GROWING PIGS. J. M. Bell, H. H. Williams, J. K. Loosli, and L. A. Maynard (Cornell Univ.). *J. Nutrition* **40**, 551(1950). The protein from soybean oil meal when fed at a 10% level of protein was less efficiently retained by growing pigs and had a significantly lower biological value than whole egg protein. The addition of methionine to equal the amount in the whole egg made the soybean oil meal protein equal to the egg protein.

FATTY ACIDS MAY BE IMPORTANT TO HEALTH. Anon. *Sci. News Letter* **57**, 344 (1950). The importance of fatty acids in the diet is discussed.

EFFECT OF FEEDING POLYOXYETHYLENE MONOSTEARATES ON THE GROWTH RATE AND GROSS PATHOLOGY OF WEANLING HAMSTERS. B. S. SCHWEIGERT, B. H. McBride, and A. J. Carlson (U. of Chicago). *Proc. Soc. Exptl. Biol. and Med.* **73**, 427 (1950). Data on rate of gain of weight, mortality, organ weights, and gross pathology indicate that the ingestion of polyoxyethylene monostearates was deleterious to hamsters.

STUDIES WITH RAPE-SEED OILCAKE MEAL. I. THE EFFECT OF VARIOUS LEVELS OF RAPE-SEED OILCAKE MEAL IN THE DIET ON THE WEIGHT OF THE THYROID GLANDS OF TURKEY POULTS. R. M. Blakely and R. W. Anderson. *Sci. Agric.* (Ottawa) **28** (9), 393-397(1948). Rape-seed oilcake meal was included in the diet of turkey poults for a 42-day period. Increases of 2, 3.2, and 4.8 times that of the thyroid weight of the controls were obtained on rations containing 4, 10, and 20% of rape-seed oilcake meal. II. THE EFFECT OF THE INCLUSION OF PROTAMONE IN THE DIET ON THE THYROID ENLARGEMENT INDUCED BY THE FEEDING OF RAPE-SEED OILCAKE MEAL TO TURKEY POULTS. *Ibid.* 398-402. The addition of 36 g. Protamone to 100 lb. of starter mash containing 20% rape-seed oil meal reduced the thyroid size of 30 turkey poults to about 10% of normal. Nevertheless growth was more nearly normal than in the group fed rape-seed oil meal mash without Protamone. The groups fed rape-seed oil meal mash had a lower incidence of perosis and dermatitis than the control group fed a meat meal diet. (*Biol. Abs. Sect. G.* **23** [3], 30.)

BIOLOGICAL FAT SYNTHESIS. W. Diemair and C. Boresch (Univ., Frankfurt a M., Ger.). *Z. Lebensm.-Untersuch. u. -Forsch.* **90**, 14-26(1950). A culture of *Mucor* was used in the production of fat biologically. The yield of protein varied with various sources of nitrogen, but the fat production was independent of the nitrogen source. Largest yield of mycelium occurred at 1.0% glucose content of the medium. High-fat mycelium was attained with use of low-nitrogen media. Mycelium of 8-12 g. and fat of 3-5 g. per l. of medium were obtained. (*Chem. Abs.* **44**, 4077.)

BACTERIAL AND CHEMICAL ANALYSIS OF MAYONNAISE, SALAD DRESSING, AND RELATED PRODUCTS. F. W. Fabian and Mary C. Wethington (Mich. State Coll.). *Food Research* **15**, 138(1950). Bacterial analysis of mayonnaise, salad, and French dressing and tartar sauce showed the absence of thermophiles, coliform, and lipolytic bacteria. A few yeast and molds were present. Mayonnaise was found to have the least and French dressing the greatest variation in chemical composition.

SPOILAGE IN SALAD AND FRENCH DRESSING DUE TO YEASTS. F. W. Fabian and Mary C. Wethington (Mich. State Coll.). *Food Research* **15**, 135(1950). Two samples of French dressing and two samples of salad dressing, of over 100 analyzed, were found to be spoiled due to yeast fermentation. In all cases yeast of the genus *Zygosaccharomyces* was proved to be the cause of the spoilage.

PATENTS

ANIMAL FEED AND METHOD OF IMPROVING SAME. P. A. Singer and H. J. Deobald (Allied Mills Inc.). *U. S. 2,504,159.* Pulverulent dehydrated forage, an edible oil, and an emulsifying agent are mixed in a ratio of 0.92 to 1.84 lb. of oil and emulsifrying agent to 100 lb. of forage to form an improved dry animal feed.

ANIMAL FEED. M. J. E. Ernsting and W. T. Nauta. *U. S. 2,504,401.* An animal feed containing an effective quantity of 4-methyl-2-thiouracil is claimed to increase the rate of gain in weight of animals.

• Waxes

E. H. McMullen, Abstractor

WATER-RESISTANT AND WEATHER-PROOF PROPERTIES OF FABRICS IMPREGNATED BY DIFFERENT METHODS. S. F. Burdin, M. N. Zusman, and O. A. Samsonova. *Tekst. prom.*, 1947, No. 9, 28-29. The effects of a wide range of impregnating agents are reported. Salts of copper and iron are as effective as is aluminum acetate in imparting water resistance in presence of paraffin wax emulsion. Ozokerite is an effective substitute for paraffin wax. Dyed fabrics are more water repellent than when undyed. Increased rot-resistance is produced by salts of copper but not of aluminum or iron. Paraffin wax-casein emulsion lowers the loss of fabric strength but does not impart sufficient water-resistance. (*Brit. Abs.* **BII**, 244, 1950.)

THE STEROLS OF LANOLIN. H. Jannistini. *Riv. ital. essenze profumi piante offic., olii vegetali, saponi* **29**, 404-6(1947); *Chimie et industrie* **60**, 252(1948). The sterols of lanolin are cholesterol and dihydrocholesterol. Isocholesterol (a mixture of lanosterol and agnosterol) is not an emulsifying agent. The esterified alcohols in lanolin have good emulsifying properties. Even after removal of free cholesterol lanolin has a good water-absorbing capacity. All the sterols precipitable by digitonin are emulsifiers provided they are soluble in fats or excipients. Cholesterol is a very good emulsifier; phytosterol is nearly equal to it. (*Chem. Abs.* **44**, 4695.)

A METHOD FOR IMPROVING THE KEEPING QUALITY OF BREAD. R. S. Alcock and J. King. *Jour. of Science of Food and Agriculture* 1, No. 1, 14-17(1950). A method developed to delay the usual manifestation of staleness brought about by the storage of the plain type of bread used by the British Army is described. The active ingredient employed was a mixture of paraffin and beeswax added to wheat flour before making the dough.

SUGAR CANE WAX. S. N. Gundurao, H. G. Kulkarni, and D. P. Kulkarni (Ravalgaon Sugar Farm, Ravalgaon, Narik, India). *Proc. Sugar Technol. Assoc. India* **18**, Pt. I. 62-7 (1949). Sun-dried press cake is ground and extracted with gasoline. The fatty components of the crude wax are best removed with acetone, which gives a product containing 60% of hard wax after the percolate is steam-distilled. Yield of crude wax is around 7% of filter cake. Attempts to get rid of the fats by allowing the press muds to ferment proved uneconomical. Fractionation of the hot, crude concentrated wax by cooling and extracting with cold solvent also failed. Partial decomposition of the fatty portion could be effected by heating for some time with high-pressure steam after distilling off the solvent. Destruction of the fatty material is best effected on a large scale by boiling the crude wax in a glass-lined vat with 10% nitric acid for two hours (avoiding overheating). The product is 85% crude wax and is hard, melting at 75-80°, light brown in color. Treatment with nitric and hydrochloric acids gives even better results, including better removal of ash. (*Chem. Abs.* **44**, 3728.)

RECOVERY OF WAX FROM SUGAR-FACTORY PRESS CAKE. M. Narasinga Rao and R. Subbiah (Andhra Univ., Waltair, India). *J. Sci. Ind. Research* (India) **6B**, No. 12, 178-80(1947). A froth-flotation method applied to steam-treated press cake extracted up to 62.9% captive cane wax. (*Chem Abs.* **44**, 3728.)

WOOL GREASE DISTILLATION PRODUCTS. E. S. Lower. *Oil Col. Tr. J.*, **115**, 27-32, 84-86(1949). Wool grease when distilled yields gas-oil 10-15%, distilled wool grease 55-70%, dark colored distillate 5-10%, and a residue (wool grease pitch) 10-25%. The main fraction is usually cut into wool grease olein and wool grease stearin. The composition is given for these fractions from wool wax acids and from wool grease. Formulae are given for the use of the oleins and stearins in polishes, leather dressing, soaps, and greases. (*Brit. Abs.* **BI**. 181, 1950.)

CONSTITUTION OF GLYCERIDES OF HYDROGENATED CASTOR OIL. S. Pietra. *Ann. Chim. appl.*, Roma, **39**, 234-236(1949). Opal wax obtained by hydrogenation of castor oil may contain glyceryl tris-(11-hydroxyheptadecane-1-carboxylate) II, melting point 88.2°, of low solubility in benzene toluene, or the internal ether (III), formed by loss of water between two of the OH-groups of II, or an ether formed by loss of water between two molecules of II. One sample of I, repeatedly recrystallized from benzene, gave almost pure II, and other fractions rich in II and III. Another sample consisted mainly of III. Tests for the quality of I should include the I value, the OH value and molecular weight; waxes of OH value 120-130 are of good quality; those of OH value 100-120 are also good, provided molecular weight is sufficiently high; waxes of OH value <100 are of inferior quality. (*Brit. Abs.* **BII**. 248, 1950.)

THE PAINT INDUSTRY IN GERMANY DURING THE PERIOD 1939-1945. (B.I.O.S. Surveys Report No. 22) C. WAXES. Neil R. Fisk and H. W. Bowron. *Paint Technology* **15**, no. 172, 170-172(1950). Hard paraffin wax was obtained in the Fischer-Tropsch synthesis of hydrocarbons. Montan wax extracted from lignite found many applications, as did the oxidation products of paraffin waxes. High-molecular waxy substances were prepared from octadecyl alcohol and ethylene oxide.

LIGNITE. NOTES ON THE CHARACTERISTICS OF DEVONSHIRE LIGNITE WITH PARTICULAR REFERENCE TO STEAM RAISING. John Fox. *Claycraft* 22, 125-30(1949). Devon lignite was extracted with benzine at its boiling point, giving a wax similar to the German montan wax in appearance, melting point, acid, and ester value. Higher yields of wax were obtained with other solvents, but the resulting waxes showed a considerable variation in quality. (*Chem. Abs.* **44**, 3697.)

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POLYTETRAFLUOROETHYLENE WAXES HAVING A SHARP MELTING POINT. Kenneth L. Berry (E. I. du Pont de Nemours and Company). *U. S. 2,496,978.* A fluorocarbon wax is prepared by heating $(C_2H_2F_4)x$ at 450 to 500° for three to 20 hours with the heating stopped before 40% is converted to volatile products. The product is a microcrystalline solid melting sharply in the range of 320 to 327° to a clear mobile liquid with low-melt viscosity. Friability can be decreased and toughness improved by addition of approximately 2% of glass fibers or 5% of an interpolymer consisting of 60% $C_2H_2F_4$ and 40% $C_2H_2F_3Cl$. These waxes are useful as nonflammable impregnants and coatings for ceramics, porous C articles, and metals because of their chemical, electrical, and water-repellent properties. (*Chem. Abs.* **44**, 4270.)

WAX EXTRACTION. Oscar J. Swenson (to Cuban-American Sugar Company and S. C. Johnson and Son Inc.). *U. S. 2,499,008.* Sugar cane wax is recovered from cachaza by countercurrent extraction at 75° with commercial heptane. The solid cachaza is fluidized by increasing the water content to 85%.

MOISTUREPROOFING COMPOSITION. Joe E. Moose (Monsanto Chemical Company). *U. S. 2,500,426.* Modifying materials for use in natural or synthetic wax substances are selected from the group consisting of terphenyls, mixture of terphenyls, hydrogenated terphenyls, and N-xenyl stearamides. The above compositions are excellent coating and impregnating materials for moistureproofing paper, cloth, regenerated cellulose, glassine, cellulose acetate, and artificial flowers. (*Chem. Abs.* **44**, 4608.)

WATER-REPELLENT FINISHES FOR TEXTILE. J. R. F. Jackson, A. H. Lord, and Imperial Chem. Industries Ltd. *B. P. 627,356.* In producing stiff water repellent finishes on textiles by use of starch and a wax emulsion, the materials are given a simultaneous or additional treatment with glyoxal. (*Brit. Abs.* **BII**, 246, 1950.)

• Drying Oils

Robert E. Beal, Abstractor

THE CONSTITUTION OF SOLVENT-SEGREGATED DRYING OILS. T. P. Hilditch and A. J. Seavell (The University, Liverpool, England). *J. Oil and Colour Chemists' Assoc.* **33**, No. 355, 49-58(1950). Extract and raffinate fractions obtained from liquid-liquid extraction of linseed and soybean oils with furfural on a commercial scale were analyzed for their component fatty acids. The composition of these fractions is similar to that of composites of certain fractions obtained by low temperature fractional crystallization of linseed and soybean oils

in acetone. The composition of fractions which might be obtained by liquid-liquid extraction of conophor, candlenut, rubber seed, and hempseed oils is deduced from their behavior in solvent crystallization. Oils high in linolenic or in linoleic acid probably can not be fractionated profitably since the fractions would be of little or no more value than the original oil. It should be possible to fractionate oils containing moderate amounts of both linoleic and linolenic acids economically.

FORMATION OF CYCLIC COMPOUNDS IN POLYMERIZATION OF METHYL ESTERS OF FATTY ACIDS FROM LINSEED OIL AND OTHER DRYING OILS. H. I. Waterman, J. P. Cordia, and B. Pennekamp (Tech. High School, Delft, Holland). *Research* (London) 2, 483-5(1949). Linseed oil was simultaneously transesterified and polymerized by heating at 300°-310° under CO_2 with methyl alcohol and KOH. The esters were freed of triglycerides by molecular distillation, fractionated into monomers and residual polymers by distillation at 20 mm., and the polymers were separated into two fractions by molecular distillation. The distillate from the latter step was hydrogenated and further treated to remove oxygenated groups, and examination by ultimate analysis, molecular weight determination, density, and refractive index after the method of Ulugter indicated the presence of 3 rings per molecule. By this method untreated linseed oil was found to have 0 rings, the monomer from polymerized linseed oil, 1 ring, tung oil polymers, 2.8, tung oil monomers, 1, and poppyseed oil polymers, 1.7. (*Chem. Abs.* **44**, 2766.)

ROLE OF METALLIC SOAPS IN FILM FORMATION. R. F. Bowles (B. Winstone and Sons Ltd., Harefield, Middlesex, England). *J. Oil and Colour Chemists' Assoc.* **33**, No. 356, 97-112(1950). Rheological measurements of linseed stand oil, TiO_2 points (1) and mineral oil, TiO_2 dispersions (2) to which 13 naphthenate salts were added, indicates that the salts are flocculating agents for (1) but that only a few are flocculating agents for (2) and some are dispersing agents. Zn, Pb, and Ca driers are believed to assist the drying of oils by acting as flocculating agents for the disperse phase polymers.

THE DRYING OILS FROM VARIETIES OF IMPATIENS. R. Kuhrke. *Seifen-Öle-Fette-Wachse* **75**, 239-41(1949). The seeds of *Impatiens glanduligera* contain 50% drying oil (I value Kaufmann 188, saponification number 198.2). (*Chem. Abs.* **44**, 1265.)

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MANUFACTURE OF INTERPOLYMERS OF AROMATIC VINYL HYDROCARBONS AND OILS. W. T. C. Hammond (The Sherwin-Williams Company). *U. S. 2,509,495.* A mixture of 10-70% drying oil, ½-5% by weight of the drying oil of sulfur, and the balance, an aromatic vinyl hydrocarbon, is heated at a polymerizing temperature to obtain an interpolymer.

TALL OIL TREATMENT. R. Rosher (Hercules Powder Company). *U. S. 2,509,884.* Tall oil is selectively esterified to form a mixture of fatty acid esters and resin acids, the mixture is dissolved in a hydrocarbon solvent, and the resin acids are separated by precipitation with cyclohexylamine.

DEHYDRATING CASTOR AND OTHER NONDRYING OILS. Etablissements Robbe Freres. *British 625,123.* Castor oil is heated at 140°-280° for about 3 hours while SO_2 is blown through it to produce a slightly colored drying oil. The SO_2 acts as a decolorizing, deoxidizing, and dehydrating agent. (*Chem. Abs.* **44**, 2257.)

PHENOL RESIN MODIFIED WITH DRYING OIL. T. Akahiva and M. Yanagita. *Japan 174,656.* A mixture of phenol (50), formaldehyde (40), butanol (17), and HCl (0.5) is heated for 100 minutes at 90°, tung oil (40) is added, and this mixture is heated at 105° until part of the butanol is vaporized. The oil soluble, semisolid resin has good drying properties. (*Chem. Abs.* **44**, 2794.)

• Detergents

Lenore Petchaft, Abstractor

PROTECTIVE COLLOID ACTION OF DETERGENTS. K. Lindner. *Melliand Textilber.* **31**, 58-61(1950). Interfacial activity and protective colloid action are the two chief characteristics of a useful detergent. A process is described for the quantitative determination of protective colloid action and consists in the production of dispersions of soot by means of two solutions of detergents of different strengths and measurement of their opacity by photoelectrical methods. It is shown that not all products with a strong interfacial action are good protective colloids and that substances with little or no interfacial action can be good protective colloids. (*J. Soc. Dyers Colourists* **66**, 296[1950].)

SAPAL FOR TEXTILE FINISHING. O. Hohmuth. *Kunsteide u. Zellwolle* **28**, 12-16(1950). These synthetic textile assistants have high wetting properties, are resistant to hard water, metallic salts, acids, and alkalies, and are good agents for dispersing, emulsifying, and dirt-loosening. Directions for their use are given and results obtained with them are described. (*Chem. Abs.* **44**, 4258.)

SYNTHETIC DETERGENTS AND SEWAGE PROCESSING. A. Lawrence Waddams. *Surveyor* **109**, 39-40(1950). An anionic detergent, Teepol, did not affect primary sedimentation, bacterial activity, sludge digestion, or methane production when tested in concentrations likely to be encountered in sewage treatment. A nonionic detergent, Lissapol N, behaved in a similar manner. Cationic detergents are bactericidal. (*Chem. Abs.* **44**, 4172.)

SYNTHETIC DETERGENTS IN THE BRITISH ISLES. J. M. Vallance. *Soap Sanit. Chemicals* **26**, No. 5, 37-9, 155, 157, 177 (1950). Review of the most important synthetic detergents made and used in the British Isles, such as secondary alkyl sulfates (Teepols), alkyl aryl sulfonates, and nonionics, such as the copolymer of ethylene oxide and a chlorinated phenol.

SYNTHETIC DETERGENTS IN THE WASHROOM. J. Riley. *Power Laundry,* **81**, 916-7(1949). Report on laundry successfully using synthetic detergents for all washing purposes. The main washing materials used were "Lensex" (a sulphated secondary alcohol) and sodium metasilicate as "builder," a combination giving a well-balanced detergent mixture. Salt can be safely added in washing of colored articles to set and brighten colours. The process for washing sheets is given. (*Textile Research J. Abstracts* **20**, 139[1950].)

BETTER DETERGENTS FORECAST. Anon. *Drug Trade News.* **25**, No. 11, 41(1950). Future detergent developments predicted include synthetic detergents efficient in cold water, pressure containers for the detergents, elimination of bleaching which is detrimental to fabrics, mothproofing woolens from synthetic detergents, selling of detergents in pellet form, increase in importance of non-ionic detergents, and development of entirely new inorganic type builders.

HOUSEHOLD SCOURING CLEANERS. Milton A. Lesser. *Soap Sanit. Chem.* **26**, No. 5, 40-3, 98(1950). Review article giving requirements of a good scouring powder, types of products made (powders, pastes, and bars), materials used in manufacture including types of abrasives, recent use of sodium carboxymethylcellulose in powders, and various types of soaps and synthetic detergents. Formulations are given. 29 references.

ART OF COLD PROCESS SOAP MAKING. S. N. Sethu Madhava Rao and A. N. Ghose. *Indian Soap J.* **15**, 188-91(1950). Review of cold process soap making, giving advantages and disadvantages of method, rules for selection of raw materials, and detailed manufacturing directions.

GLYCEROL RECOVERY USING DIRECT OR INDIRECT METHODS OF PROCESSING FATS IN SOAPMAKING. John Holmberg (Forskningslaboratoriet LKB, Appelviken, Sweden). *Acta Polytech., Chem. Met. Ser.* **1**, No. 10, 23 pp.(1949). Equations were derived for factors influencing glycerol recovery in kettle soapmaking, fat splitting, and alcoholysis of fats. The costs of glycerol recovery were determined; however the cost of the complete soap process must be considered. 32 references. (*Chem. Abs.* **44**, 4697.)

KNOW SOAP. Stanley Brechner (Lightfoot Schultz Company, Hoboken, N. J.). *Safety Eng.* **99**, No. 6, 15, 34-6(1950). General review article on soap and its use for industrial and cleansing purposes and skin protection.

PATENTS

SOAP BAR. Thomas J. Verbsky. *U. S. 2,505,444.* Pins or fingers of a material harder or less erodible than soap are projected from the soap bar to support it, to aid in drying the bar, and to lengthen its life.

COMPOUNDS HAVING HIGH WETTING ACTIVITY AND PROCESS FOR PREPARING THEM. Milton Kosmin (Monsanto Chemical Company). *U. S. 2,508,036.* Efficient wetting agents are prepared by the reaction of ethylene oxide with 2-n-propylheptanol so that at least five moles and less than 16 moles of ethylene oxide combine with each mole of the alcohol.

PROCESS FOR MANUFACTURING AND PURIFYING SOAP. L'Oreal. *British 636,945.* Neat phase soap prepared without the usual salting out and fitting steps is continuously washed with a brine solution of a concentration close to the critical concentration below which the neat soap would dissolve in order to remove glycerol and rancidity factors.