

# Abstracts

## Oils and Fats

Edited by  
M. M. PISKUR

THE UNIQUE CHEMISTRY OF CASTOR OIL. E. E. Gilbert. *J. Chem. Ed.* 18, 338-41 (1941).

A SEMI-MICRO MODIFICATION FOR THE DETERMINATION OF REICHERT-MEISSL, POLENSKE AND KIRSCHNER VALUED IN BUTTER FAT. Bernard Dyer, et al. *Chem. & Industry*, 60, 403 (1941). The authors emphasize the need for a semi-micro method for the detn. of the Reichert-Meissl, Polenske and Kirschner values of butter fat which could be used on small quantities of fat where the standard quantity of 5 grammes of fat is not available. In the method described one g. of butter fat is employed, together with one-fifth of the standard quantities of reagents; the apparatus employed is approximately one-third the size of the standard apparatus and the resultant fatty acids are titrated with N/50 baryta. The results obtained for butter fat show good agreement between the values obtained by the semi-micro method and the standard method. The Kirschner values are, in general, slightly higher with the semi-micro apparatus. The need for obtaining more data with the semi-micro apparatus for fats with high Polenske values, such as coconut fat, is emphasized.

THE INFLUENCE OF SOLVENTS ON THE AUTO-OXIDATION OF METHYL LINOLEATE. T. R. Bolam and W. S. Sim. *J. Soc. Chem. Industry* 60, 50-6 (1941). In the auto-oxidation of Me linoleate at 75° in the absence of solvent, or in soln. in acetic acid or hydrocarbon solvent, a peroxide group is formed at one double linking, and a ketol group at the other. The peroxide undergoes change, probably as the result of polymerization, and the ketol group is enolized to an extent depending on the conditions. Both the initial rate of oxidation and the rate of change of peroxide are much higher in acetic acid than in hydrocarbons, or in the absence of solvent, the hydrocarbons acting simply as diluents. With Cl-substituted acetic acids, the initial rate of absorption is still further increased, the effect being the more marked the greater is the degree of substitution. The rate of absorption is not increased in alc. soln., so that factors other than the polar or non-polar nature of the solvent are involved. Since the max. rate of absorption occurs at an earlier stage in acetic acid than in hydrocarbons, it would appear that the rate of oxidation is detd. by the concn. of free peroxide. The formation of volatile oxidation products occurs to a very limited extent.

DIELECTRIC CONSTANT AND EFFECTIVE DIPOLE MOMENT OF DRYING OILS. B. P. Caldwell and H. F. Payne. *Ind. Eng. Chem.* 33, 954-60 (1941). Mixts. of tung with linseed or perilla may be identified by refractive index measurements, but this method of identification is not satisfactory for tung with oiticica. Mixts. of the latter may, however, be identified by density and also by dielectric constant measurements. The rapid resonance method was applicable for mixts. of tung and oiticica, and the variation in dielectric constant with compn. was found to be linear.

FISH LIVER AND BODY OILS—CHEMICAL CHARACTERISTICS, PHYSICAL PROPERTIES AND VITAMIN CONTENT. A. D. Holmes et al. *Ind. Eng. Chem.* 33, 944-9 (1941). The chem. and phys. characteristics and vita-

min potency of 39 fish liver and fish body oils have been detd. The vitamin potency of the swordfish liver oils increased with increase in the amt. of unsapon. material, but the relation was not entirely consistent. Of the other oils there seemed to be no consistent relation between any of the chem. or phys. characteristics and their vitamin potency. Thus, it is extremely difficult if not impossible to gain information concerning the vitamin potency of a fish liver or body oil by the detn. of its chem. and phys. characteristics.

INFLUENCE OF DIFFERENT AMOUNTS OF SOYBEANS AND THEIR PRODUCTS UPON THE QUALITY OF PORK AND THE CHARACTER AND KEEPING QUALITIES OF LARD. M. D. Helser et al. *Rept. on Agric. Research*, Part I, Iowa State, 1940, 118-9. The lard from hogs fed 10% soybeans and those fed 10% soybean oilmeal had almost the same peroxide value while that from the 20% groups was nearly twice as great in milli-equivalents of peroxide. In other groups the peroxide value increased as the soybeans in the ration increased. During the processing and storage period the bacons lost from 10.00 to 15.81% of their green wt. while the shrinkage in wt. of hams was from 10.28 to 12.78%. The greatest shrinkage occurred in bacons and hams from hogs in the 20% lot and the least from hogs which ate few or no soybeans. Although the wt. losses in meat from lots that received 5, 7.5 and 10% soybeans were less than those from the 20% lot and greater than that from the check lot the correlation between shrinkage and quantities of beans consumed was quite low.

NUTRITIVE PROPERTIES OF STEAM-RENDERED LARD AND HYDROGENATED COTTONSEED OIL. R. Hoagland and G. G. Snider. *J. Nutr.* 22, 65-76 (1941). The 2 fats had approx. the same growth-promoting value when the diets contd. 5% of fat, but lard was superior when the diets contd. the larger proportions of fat. The av. growth-promoting value of all diets contg. lard was superior to the av. value of all diets contg. hydrogenated cottonseed oil. Both lard and hydrogenated cottonseed oil induced max. growth when the diets contd. 30%, and min. growth when the diets contd. 5% of fat. Each fat was utilized least efficiently for growth when the diet contd. 5% of fat, but each was utilized with approx. equal efficiency whether the diet contd. 15, 30 or 54% of fat. Lard was superior in digestibility to hydrogenated cottonseed oil at each level of fat intake. The digestive coefficients for lard ranged from 95.9 to 97.4% with an av. of 96.4% whereas those for hydrogenated cottonseed oil ranged from 91.0 to 95% with an av. of 92.9%.

ABSENCE OF SUPPLEMENTARY RELATIONSHIPS IN REQUIREMENTS FOR PYRIDOXIN AND ESSENTIAL FATTY ACIDS. Gladys A. Emerson. *Proc. Soc. Exptl. Biol. & Med.* 47, 445-448 (1941). In an attempt to disclose the possibility of a "sparing action" of fatty acids on pyridoxin deficiency, varying levels of ethyl linoleate were fed in conjunction with a subnormal and an optimal level of pyridoxin; the "sparing action" was not observed.

THE ABSORPTION AND TRANSPORT OF FATTY ACIDS ACROSS THE INTESTINAL MUCOSA. Richard H. Barns,

Elmer S. Miller and George C. Burr. *J. Biol. Chem.* 140, 233-40 (1941). By means of the spectroscopically distinguishable conjugated fatty acids of corn oil, a study of the absorption and transport of the methyl esters of fatty acids across the intestinal mucosa has been made. The results show no apparent parallelism between the rate of fatty acid incorporation into mucosa phospholipids and transport.

THE QUESTION OF THE PORTAL ABSORPTION OF FATTY ACIDS. Irwin C. Winter and Lathan A. Crandall, Jr. *J. Biol. Chem.* 140, 97-104 (1941). By use of the angiotomy technique in normal unanesthetized dogs, simultaneous blood samples were drawn from the portal and hepatic veins and the femoral artery before and during fat absorption. In different series of experiments, plasma and whole blood from these samples were analyzed for fatty acids. With a titrimetric method for the determination of fatty acids, with which a majority of duplicate analyses check within 3 per cent, no significant arterio-portal or hepatic inflow-outflow differences in fatty acid content could be demonstrated during fat absorption. Calculation shows that if 10 per cent of the fed fat had been absorbed by way of the portal vein, it is highly probable that an arterio-portal difference would have been detected.

ACTIVITY OF ALPHA TOCOPHEROL IN PREVENTING ANTAGONISM BETWEEN LINOLEIC AND LINOLENIC ESTERS AND CAROTENE. W. C. Sherman. *Proc. Soc. Exptl. Biol. & Med.* 47, 199-200 (1941). It appears that in the absence of *a*-tocopherol there is a physiological antagonism between unsaturated fatty acids and carotene which results in the inefficient utilization of carotene.

STEROL METABOLISM IN YOUNG WHITE RATS—THE EFFECT OF HIGH AND LOW FAT DIETS ON THE CHOLESTEROL METABOLISM OF FOUR GENERATIONS OF WHITE RATS. C. R. Treadwell and H. C. Eckstein. *J. Biol. Chem.* 140, 35-42 (1941). The differences between the fecal and dietary sterols of four generations of rats were greater on an adequate diet containing 28 per cent fat than when the fat content of the diet was 6 per cent. The free and total cholesterol content of the fasting whole blood and serum of the four successive generations was not influenced by the level of fat in the diet. The neutral fat, phospholipid, and cholesterol contents of the livers of these rats were likewise not influenced significantly by the increase in dietary fat.

THE PRODUCTION OF DIFFUSE NODULAR CIRRHOSIS OF THE LIVER IN RATS ON HIGH FAT-LOW PROTEIN DIETS. Harold Blumberg and High G. Grady. *J. Biol. Chem.* 140, (Proc. 35), XV (1941). Diffuse nodular cirrhosis of the liver was produced in rats which were maintained for approximately 200 to 400 days on a stock diet supplemented with large amounts (3 to 5 cc. per rat per day) of ether-extracted wheat germ oil. Extensive fatty changes and cirrhosis were also observed in animals fed similarly with a commercial corn oil. The results were secured in three different strains of rats.

THE LIPOTROPIC ACTION OF SOME SULFUR-CONTAINING AMINO ACIDS AND RELATED SUBSTANCES. Sam A. Singal and H. C. Eckstein. *J. Biol. Chem.* 140, 27-33 (1941). Cystine betaine, methionine sulfoxide, and dithiodiglycolic acid exhibit lipotropic activities when added to the low protein-high fat diet of the white mouse. Cysteine loses its effect upon liver "fat" when alkylated with the methyl, ethyl, propyl, or isopropyl radical. These derivatives behave more like methionine than cysteine in their relation to the dietary production

of fatty livers. Cystine disulfoxide behaves like cysteine in its action upon liver "fat," whereas cysteic acid has no influence thereon. Pento-cystine, hexocystine, djenkolic acid, dl-valine, dl-leucine, and dl-isoleucine are likewise inert in this respect.

THE INTAKE AND OUTPUT OF FAT BY THE HEN ON LOW FAT AND NORMAL RATION. W. C. Russell et al. *Poultry Science* 20, 372-8 (1941). The fat balance of hens on a normal ration, contg. 4 to 5% fat, became less pos. as egg production increased, and in the case of certain individuals became neg. when eggs were laid at the 66% production level. Others remained in pos. fat balance at this production level. When the fat content of the ration was reduced to a very low level (0.08% or less) the hens showed a neg. fat balance even when eggs were not being produced. The neg. character of the balance became more marked with an increase in egg production. Evidence was obtained in the case of certain hens on the low fat ration that the greater part, if not all, of the egg fat was synthesized from other constituents of the ration. The digestibility of the fat of all mash ration, made up of constituents commonly used in poultry rations, is 88%. The fat of eggs produced on the low fat ration was more satd. than that formed on the normal ration. Although there was a tendency toward a lower and less sustained egg production on the low fat ration there was no abrupt cessation of egg production, as might be expected if an essential nutritional factor were absent.

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PURIFICATION OF OIL IN A CENTRIFUGAL SEPARATOR. P. van Riel (N. V. Machinefabrick "Reineveld"). *U. S.* 2,244,043.

REFINING OF FATTY OILS. A. U. Ayres (The Sharples Corp.). *U. S.* 2,245,846. An improved continuous system using centrifuges is described.

SHORTENING TREATMENT. D. F. Grettie. *U. S.* 2,236,569. The method of stabilizing shortening comprises adding thereto and incorporating therewith from .001% to .05% of lactic acid.

STABILIZING FATTY COMPOSITION. G. D. Martin (Monsanto Chemical Co.). *U. S.* 2,247,281. An oxidizable fatty material having incorporated therein a diphenyl amine in an amount sufficient to retard the development of color and rancidity to a substantial degree is described.

STABILIZING FATTY COMPOSITIONS. G. D. Martin (Monsanto Chemical Co.). *U. S.* 2,247,280. A fatty oil having incorporated therein a neutral phosphate of a polyhydric phenol in an amt. sufficient to preserve said fatty oil is described.

STABILIZATION OF ORGANIC SUBSTANCES. E. G. Bolton (duPont de Nemours & Co.). *U. S.* 2,230,371. The method of inhibiting the catalytic deterioration of an org. substance caused by a member of the group consisting of Cu and its compds. in the presence of O<sub>2</sub> comprises incorporating in said org. substance a small proportion of a P compd. selected from the class of org. monophosphonic acids and org. dihydroxyphosphines.

COMPOSITION OF MATTER. F. J. Cahn and B. R. Harris (Emulsol Corp.). *U. S.* 2,236,517. Mono and/or diglycerides are used as emulsifiers for essential oils, vitamins, etc.

FATTY ACID SALTS OF POLYHYDROXY AMINES. B. M. Vanderbilt (Purdue Research Foundation). *U. S.* 2,247,106. The new compds. suitable as emulsifiers are fat acids sats. of aminohydroxy compds.

PROCESS OF MAKING HIGHER FATTY ACID ANHYDRIDES. H. F. Oxley and E. B. Thomas (Celanese Corp. of America). *U. S. 2,246,599*. Process for the production of anhydrides of carboxylic acids which comprises causing a carboxylic acid to react with the anhydride of a lower fatty acid to produce the anhydride of the higher acid together with the lower acid, by introducing the vapors of the lower anhydride below the surface of a body of the higher acid maintained in the molten state above the boiling point of the lower

anhydride, and allowing the vapors of the lower acid produced to escape from the reaction zone.

PROCESS FOR THE RECOVERY OF GLYCEROL FROM STILL RESIDUES FROM FERMENTATION PROCESSES. R. A. Walmesley (Imperial Chem. Industries, Ltd.). *U. S. 2,235,056*. A process for the recovery of glycerol from still residues comprises the step of extg. the glycerol-contg. liquor with a solvent selected from the group consisting of aniline, the toluidines and quinoline and recovering the dissolved glycerol by treating with cold water.

## Abstracts

### Soaps

Edited by  
M. L. SHEELY

#### SOAP

PROPOSE P-S-626 REVISIONS. *Soap 17*, No. 7, 39 (1941). Revisions proposed for the Federal specification for powdered toilet soap (for dispensers). Specification P-S-626, make provisions for borax soap (Type II) in addition to straight soap, now known as Type I. A tentative draft of the proposed revisions, dated May 23, gives the following general requirements for Type II powdered toilet soap: "Borax Soap: Powdered toilet soap for use in dispensers (Type II) shall be a uniform mixture of a thoroughly saponified soap and borax ( $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10 \text{H}_2\text{O}$ ); shall be uncolored and mildly perfumed unless otherwise specified; shall be a uniform, free-flowing, non-caking powder; and shall lather freely when used with cold soft water." Detailed requirements add that the material shall be free-flowing and no-caking when used in a dispenser conforming to Type III or IV of Federal specification FF-D-396; that it shall contain not less than 23% and not more than 27% of anhydrous soap, and not less than 72% of borax; or more than 77%; that free alkali shall not exceed 0.1%; that matter insoluble in water shall not exceed 0.2%; that rosin, sugar, and foreign matter shall not be present; and that the material shall meet the following fineness requirements:

|                    | Min.<br>Per cent | Max.<br>Per cent |
|--------------------|------------------|------------------|
| Retained on        |                  |                  |
| No. 12 sieve.....  | ....             | 0                |
| No. 45 sieve.....  | 5                | ....             |
| No. 100 sieve..... | 45               | ....             |

Another requirement not included in the old specification is that the anhydrous soda soap content of the straight soap (Type I) shall be not less than 91%.

THE EFFECT OF SALTS ON DETERGENCE. R. C. Palmer. *J. Soc. Chem. Industry 60*, 56-60 (1941). The effect of added salts of different valency types on the detergent power (ability to remove olive oil from wool) of a few com. detergents of the sulphonated alc. type has been investigated. Mn, Ca and Ba salts increase the detergent power just as readily as Na salts but are effective in much lower concns. than Na salts. Too great a concn. of any salt decreases the detergent power. The view that micelles (of the detergent) play a part in detergency is criticized, and an explanation of the salt effect is put forward.

THE EFFECT OF pH ON DETERGENCE. R. C. Palmer. *J. Soc. Chem. Industry 60*, 60-2 (1941). The variation of detergent power (ability to remove olive oil from wool) of a few com. detergents and Na oleate has

been studied. An increase of pH has only a small effect on solns. of detergents of the sulphonated alc. type (except Igepon T), but a large effect on Na oleate solns. A decrease in pH results in poorer detergency however. These results are discussed in terms of adsorption of detergent at the wool/water interface.

AN ELECTRON MICROSCOPE STUDY OF CURD FIBERS OF SODIUM LAURATE. L. Marton, J. W. McBain and R. D. Vold. *J. Amer. Chem. Soc. 63*, 1990 (1941). Electron microscope photographs of a curd of sodium laurate show that it consists of a mass of fibers which are thin ribbons whose widths tend to be integral multiples of approximately twice the length of the sodium laurate molecules. The fibers branch to form a felt, which accounts for the rigidity of the curd. The fiber junctions also give rise to many capillary spaces of variable diameter in which water can be retained, even at a very low relative humidity. Some of the sodium laurate apparently is not a part of the fibrous structure but is present as granules 100-200 A. in diameter irregularly spaced along the fiber.

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PROCESS OF MAKING SOAP. Benjamin Thurman (Refining, Inc.). *U. S. 2,242,187*. The process of producing soap, which comprises, mixing substantially anhydrous powdered caustic alkali with a saponifiable material substantially free of uncombined fatty acids, and heating a flowing stream of said mixture in the absence of substantial quantities of water and in the presence of an inert viscosity-reducing liquid comprising kerosene to a temperature sufficiently high to cause said alkali to react with said saponifiable material to produce substantially anhydrous molten soap and pure glycerine. At the high temperatures used, the Varrentrapp reaction occurs, which results in a shift in the double bond, and a fission of the carbon chain. This is not necessarily undesirable, as it reduces the unsaturation of the fatty acid radicals in the soap. It can be avoided, however, by rapidly raising the temperature above the melting point of the powdered anhydrous caustic alkali and then immediately separating the volatiles from the resulting soap in the vapor separating chamber, and quickly cooling the soap thus formed. The caustic, also, is not present in excess to accelerate the reaction.

METHOD OF PREPARATION OF A SOAP. William De Laney (Hercules Powder Co.) *U. S. 2,242,289*. A method of preparing a soap solution which comprises dispersing in water a gasoline-insoluble pine wood resin, produced by extracting resinous wood with coal