

5. Report of the Color Committee, R.C. Stillman, chairman

The editorial changes in the method for the determination of Lovibond color of oils were accepted.

It is recommended that the revision be adopted and made ready for the 1960 edition of the methods.

A letter was read from Mrs. Lucy R. Hawkins, executive secretary, indicating a need for more complete information on special equipment or other supplies that are not normally available from chemical supply houses. Discussion led to the recommendation that, when such supplies are not available, sufficient information be incorporated in methods so that the user may obtain them even if he has to manufacture his own. Committee chairmen are to be asked to review their respective methods to make sure that the necessary descriptions of drawings for such supplies are given for the methods.

When ethyl alcohol is specified in the form of Formula 30 or 3A in the methods, it sometimes works a hardship on laboratories where the quantity used is very limited since government supervision has to be maintained on these items. It is requested that committee chairmen study their respective methods

with the thought of substituting other materials where these are specified. Perhaps isopropyl or methyl alcohol could be given consideration.

It is recommended by the Uniform Methods Committee set-up be made to diversify the load on committee chairmen where advisable. It is felt that some chairmen have responsibilities over and above the amount that could be expected of them. Their work is certainly appreciated, and it will be hard to find other means to get it done so well, but something must be done to relieve them. If one of these chairmen with a great load wishes to retire, it will be difficult to find a replacement. The Uniform Methods Committee recommends that a committee be set up for this study.

UNIFORM METHODS COMMITTEE

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ABSTRACTS R. A. REINERS, Editor

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• Fats and Oils

A MANUFACTURING METHOD FOR IMPROVING THE PHYSICAL CHARACTERISTICS OF WINTER BUTTER. E.A. Zottola, G.H. Wilster, and R.W. Stein (Dept. of Food and Dairy Tech., Oregon State College, Corvallis). *J. Dairy Sci.* **44**, 41-46 (1961). Two methods of manufacturing butter were studied. One, the control procedure, consisted of cooling the cream after pasteurization to 46°F. The cream was held at that temperature overnight (15 hr.) and churned the next morning. The other method, the cream-temperature treatment or experimental method, consisted of cooling the cream after pasteurization to 46°F. and holding it at that temperature for 2 hr. Then it was heated slowly to 66°F. (heating time 1 hr.) with water in the jacket of the vat at 79°F. This temperature was maintained for 6 hr. The cream was then cooled to 61°F., held overnight (15 hr.), and churned next morning. Examination of the butter made by the two methods, when at a temperature of 48°F., showed that the cream-temperature treatment resulted in butter that was relatively soft and waxy and possessed smooth spreading properties. The butter made by the control procedure was generally hard, crumbly, and sticky and had poor spreading properties. Chilled wash water (40°F. or lower) and low-temperature storage (below 0°F.) were also found to be beneficial in the attainment and maintenance of desirable body characteristics in butter.

LIPIDS OF ANKISTRODESMUS BRAUNII. Virginia Williams and Rosamond McMillan (Dept. of Agri. Chem. and Biochem., Louisiana State Univ., Baton Rouge). *Science* **133**, 459-60 (1961). *Ankistrodesmus braunii* was grown to stationary phase on a chemically defined medium and its cellular lipids were analyzed. The lipid content was found to vary from 18 to 73% of dry weight for cultures of different age and method of analysis. The pigments of the nonsaponifiable fraction were separated by adsorption chromatography and counter-current extraction and tentatively identified. The fatty acid fraction was converted to the corresponding methyl esters and analyzed by gas chromatography. The principal fatty acids present were: palmitic, oleic, and linolenic acids. Traces were detected of caprylic, capric, lauric, and palmitoleic acids.

VOLATILE CARBONYL COMPOUNDS IN STORED DRY WHOLE MILK. O.W. Parks and S. Patton (Dept. of Dairy Science, The Penn. Agricultural Exper. Station, Univ. Park). *J. Dairy Sci.* **44**, 1-9 (1961). Flavor constituents in the low-temperature vacuum distillate of reconstituted dry whole milks were largely carbonyl in nature. The 2,4-dinitrophenylhydrazone derivatives identified by paper and column chromatography, ultraviolet studies, and melting points revealed qualitative differences in the milks studied. The relative amounts of individual carbonyls in four additional dry whole milks manufactured and stored under various conditions were determined. The results suggest that the complex problem of organoleptically characterizing stale and oxidized flavor deterioration in dry whole milk stems in part from the large numbers and variable quantitative relationships of the carbonyl compounds involved.

DETERMINATION OF CHOLESTEROL AND SQUALENE BY GAS CHROMATOGRAPHY. H.J. O'Neill (Armour Research Foundation of Ill. Inst. of Tech., Chicago, Ill.) and L.L. Gershbein (Dept. of Biology, Ill. Instit. of Tech., Chicago, Ill.). *Anal. Chem.* **33**, 182-85 (1961). Procedures are advanced for the determination of cholesterol and squalene in various biological mixtures; notably, scalp sebum. The cholesterol determination can be performed either on the unsaponifiable fraction of sebum or on a sterol-enriched fraction (10 to 20% cholesterol) obtained by a liquid phase chromatograph of the unsaponifiable material. The squalene content can be analyzed directly in the original sebum or on the unsaponifiable fraction. The total time required for the analysis of both components is approximately 10 minutes and covers the range of 2 to 24% with an accuracy of $\pm 0.7\%$. The procedures have also been applied to ovarian dermoid cysts, placental lipides, basking shark liver oil, tall oil, and synthetic mixtures containing perhydro-squalene ($C_{30}H_{52}$), among others.

COMPARISON OF ACID AND NONACID VOLUMETRIC METHODS FOR DETERMINING THE PERCENTAGE OF BUTTERFAT IN RAW MILK. W.T. O'Dell (Dept. of Dairy Science, Penn. Agric. Exp. Station, University Park). *J. Dairy Sci.* **44**, 47-57 (1961). Raw milk of varied fat content was comparatively analyzed by the Gerber, Dairy Products Section (DPS) TeSa, Schain, Babcock, and Mojonier procedures. The Babcock, Gerber, and

DPS averaged higher than the Mojonnier: .054, .077, and .003% butterfat, respectively, whereas the TeSa and Schain were lower, .064 and .053%. All of the above differences, except that for the DPS, were statistically significant ($P < 0.01$). When compared with the Babcock, the Gerber test was slightly higher (.023%), while DPS, TeSa, and Schain tests were lower: .038, .082, and .044%, respectively. Only the TeSa and Schain differences were statistically significant. The Gerber, DPS, TeSa, and Schain tests were more closely correlated with the Babcock than they were with the Mojonnier.

THE PLANT SULFOLIPID. II. ISOLATION AND PROPERTIES OF SULFOGLYCOSYL GLYCEROL. M. Lepage, H. Daniel, and A.A. Benson (Dept. of Agri. and Biol. Chem., The Pennsylvania State Univ., Univ. Park, Penn.). *J. Am. Chem. Soc.* 83, 157-159 (1961). The sulfolipid found in photosynthetic tissues is readily deacylated to give a sulfodeoxyhexopyranosyl glycerol. This sulfo glycoside has been isolated from the deacylation products of alfalfa leaf lipids by anion exchange resin chromatography. Elution of the product was followed by assay of the radioactivity of added sulfoglycoside-S³⁵ and the major anionic deacylation products of glycerol phosphatides-P³². The infrared spectrum and physical properties of the sulfoglycosyl glycerol cyclohexylammonium salt are reported.

INFLUENCE OF COLUMN SUPPORT ON SEPARATION OF FATTY ACID METHYL ESTERS BY GAS CHROMATOGRAPHY. I. Hornstein and P.F. Crowe (Meat Lab., Eastern Utilization Research and Development Division, U.S. Dept. of Agriculture, Beltsville, Md.). *Anal. Chem.* 33, 310-11 (1961). In a letter to the editor, the authors reported separation factors, retention volumes, and theoretical plates for fatty acid methyl esters using different column supports.

LOW TEMPERATURE EXTRACTION OF WHEAT FLOUR LIPIDS AND GRADIENT ELUTION FROM SILICIC ACID. J.J. Wren and S.C. Elliston (Lyons Labs., Hammersmith Rd., London). *Chem. & Ind.* 1961, 80-1. To minimize formation of artifacts by enzymic and other reactions, the lipids of wheat flour were extracted and washed to remove nonlipids at -23°. At least 90% of the total lipids were thus obtained. The washed lipids were eluted from silicic acid with a continuous, concave gradient of methanol in chloroform. By this procedure sterol ester and triglycerides, phosphatidylethanolamines, lecithins, lysolecithins, and ethanolamine-containing lipids different from phosphatidylethanolamines were separated.

ACETONE-SOLUBLE LIPIDS OF GRASSES AND OTHER FORAGE PLANTS. I. GALACTOLIPIDS OF RED CLOVER (*TRIFOLIUM PRATENSE*) LEAVES. R.O. Weenink (Fats Res. Lab., Dept. of Sci. & Ind. Res., Wellington, New Zealand). *J. Sci. Food Agr.* 12, 34-38 (1961). The acetone-soluble lipids of red clover were found to consist largely of the galactolipids, galactosyl-1-glycerol and digalactosyl-1-glycerol linolenate. The fatty acids from the galactolipids, expressed in moles, were shown by gas-liquid chromatography to consist of 95.8% linolenic, 1.9% linoleic, and 2.3% palmitic acid. Oleic, stearic, and palmitoleic acids were not detected. No indication was obtained of the presence of triglycerides in the acetone-soluble lipids.

ACETONE-SOLUBLE LIPIDS OF GRASSES AND OTHER PLANTS. II. GENERAL OBSERVATIONS ON THE PROPERTIES OF THE LIPIDS WITH SPECIAL REFERENCE TO THE YIELD OF FATTY ACIDS. F.B. Shorland (Fats Res. Lab., Dept. Sci. & Ind. Res., Wellington, New Zealand). *J. Sci. Food Agr.* 12, 39-42 (1961). Examination of the lipids soluble in acetone at 0° from the leaves of rye-grass, cocksfoot, white clover, and rape showed that the yield of fatty acids when corrected for unsaponifiable matter ranged from 70.5 to 76.5% as compared with 95.6% required for a pure triglyceride calculated as trilinolenin. Further investigation of the lipids of rye-grass by diffusion in light petroleum through a rubber membrane showed that most of the fatty acids were combined in a nondialyzable form as galactolipids. These results support the view that glycerides do not occur to any appreciable extent in leaves but are replaced by galactolipids. Fatty acid analysis showed that the dialyzable lipids contained palmitic, stearic, C₂₀ and higher saturated acids, oleic, linoleic, and linolenic acids while the nondialyzable lipids contained mostly linolenic with small amounts of palmitic and linoleic acids.

TRIGLYCERIDE SHORTENING COMPOSITION AND METHODS FOR PREPARING THE SAME. J.J. Gleason (Rath Packing Co.). *U.S.* 2,970,055. An improved edible shortening composition is prepared by molecularly rearranging a triglyceride fat substantially free of mono- and diglycerides in the presence of an interesterification catalyst at a temperature at which at least some of the fat remains in the liquid phase. From 0.1 to 3%

by weight of a hydroxycarboxylic acid (lactic, gluconic, tartaric, malic, glyceric, or glycollic) is added and the reaction continued under the same conditions to cause substitution of the hydroxy acid for some of the fatty acid radicals originally present in the triglyceride fat.

PROCESS FOR PRODUCING LECITHIN PRODUCTS FROM SOAPSTOCKS. B.H. Thurman (Refining, Unincorporated). *U.S.* 2,970,910. A crude glyceride oil containing nutritive phosphatides is mixed with a nonsaponifying alkali, and the mixture is separated into a refined oil and a soapstock containing the phosphatides. The soapstock is then treated with a mineral acid at a temperature and pressure insufficient to split or char the phosphatides. Enough acid is added to bring the pH of the soapstock to 5 to 8. The acid-treated soapstock separates into an aqueous material and a lecithin product consisting of free oil, fatty acids, and hydrated phosphatides still in nutritive state.

WHIPPED MARGARINE AND PROCESS FOR MAKING THE SAME. D. Melnick (Corn Products Co.). *U.S.* 2,970,917. The described product consists of about 15 to 40% inert gas by volume uniformly and finely dispersed in the margarine. The entire oil composition of the margarine has a melting point of 90-105°F. and setting point of 71-82°F.

• Fatty Acid Derivatives

METHOD FOR IMPROVING YIELD OF SODIUM BASE GREASES. J.R. Roach, J.F. Lyons, and J.P. Dilworth (Texaco, Inc.). *U.S.* 2,969,325. A process is described for improving the yield of sodium base greases derived from fatty acids containing 6 to 24 carbon atoms, their glycerides and monoesters, or mixtures of the acids and glycerides. From 0.5 to 3% by weight of an estolide of a hydroxy fatty acid containing 10 to 24 carbon atoms is added to the finished grease composition and the mixture is heated to a temperature above 300°F. The estolide-grease mixture is then cooled with the resulting formation of a harder grease composition.

CHLORINATED TRIGLYCERIDES OF FATTY ACIDS AS SECONDARY PLASTICIZERS FOR POLYVINYL CHLORIDE. M. Dohr and H.J. Krause (Dehydag, Deutsche Hydrierwerke G.m.b.H.). *U.S.* 2,969,339. The described composition consists of 60 parts by weight polyvinyl chloride, 20 parts by weight dioctyl phthalate, and 20 parts of a triglyceride of a chlorinated high-molecular weight fatty acid derived from refined coconut oil having a chlorine content of about 34.7%.

CHOLINE-FAT COMPOSITION. E. Lorz (Hoffman-Taff, Inc.). *U.S.* 2,970,911. A high-energy feed supplement is produced by mixing a choline compound with fat containing free fatty acids, heating, and then cooling the reaction mass to obtain a stable, homogeneous mixture of fat and choline salts of fatty acids. Sufficient choline compound is added to provide about 1% by weight of choline in the mixture.

POLYMERIC COMPOSITION CONTAINING FATTY ACID DERIVATIVE OF MORPHOLINE. H.P. Dupuy, L.A. Goldblatt, and F.C. Magne (U.S.A., Sec'y of Agr.). *U.S.* 2,971,855. A plastic composition which is stable against exudation of plasticizer is a mixture containing a polymer such as cellulose acetate, polyvinylchloride, or a vinyl chloride-vinyl acetate copolymer and a plasticizer selected from a group consisting of 1,12-di-β-cyanoethoxy-9-octadecene, 4-ricinoleoylmorpholine, 4-(12-hydroxystearoyl)-morpholine, 4-ricinoleidoylmorpholine, 4-(12-acetoxyoleoyl)-morpholine, 4-(12-β-cyanoethoxystearoyl)-morpholine, and 4-(12-acetoxyoleoyl)-morpholine. The plasticizer should be present in 10 to 80 parts per 100 parts of the vinyl chloride polymer.

• Biology and Nutrition

PLASMA FREE FATTY ACIDS AND THE RARE-EARTH FATTY LIVER. F. Snyder and N. Stephens (Med. Div., Oak Ridge Inst. of Nuclear Studies). *Proc. Soc. Exp. Biol. Med.* 106, 202-204 (1961). Cerium (2 mg./kg.) causes an early decrease in serum glucose and a later significant increase in plasma free fatty acids followed by fatty degeneration of the liver. Conditions that prevent the free fatty acid and fatty liver responses are (a) administration of the cerium as a bound complex or particle, and (b) use of hypophysectomized, diabetic, or male rats.

INHIBITORY EFFECT OF HUMAN BLOOD COMPONENTS ON A LIPASE OF MICROBIOLOGICAL ORIGIN. G.B. Phillips (Depts. of Biochem. and Med., College of Physicians and Surgeons, Columbia Univ.

and Presbyterian Hospital, N.Y., N.Y.). *Proc. Soc. Exp. Biol. Med.* 106, 192-194 (1961). Human plasma, red blood cells, plasma protein fractions and a hemoglobin preparation were found to inhibit lipolytic activity of a microbiological lipase preparation when an olive oil emulsion was used as substrate. Human serum albumin, which was inhibitory in proportion to its concentration, was not inhibitory when triacetin was used as substrate. Hydrolysis of the olive oil emulsion by pork pancreatic extract was not inhibited by human plasma, red blood cells or albumin.

CHOLESTEROL-4-C¹⁴ AND BILE ACIDS IN THE GUINEA PIG. L. Peric-Golia and R.S. Jones (Dept. of Pathology, Univ. of Utah College of Med., Salt Lake City). *Proc. Soc. Exp. Biol. Med.* 106, 177-80 (1961). In adult guinea pigs with biliary tract fistulae and stable enterohepatic bile acid pool, cholesterol-4-C¹⁴ was converted into 3 labeled bile acids (3 α ,7 α ,12 α -trihydroxycholic, 3 α ,7 α -dihydroxycholic and 3 α -hydroxy, 7-ketocholic acid). This conversion occurred independently of enteric passage, 3 α ,7 α ,12 α -trihydroxycholic (cholic) acid appearing in relatively low but gradually increasing concentration during the first 9 hours of free flow and of continuous cycling. After one or more days of continuous enterohepatic cycling, 3 α ,7 α ,12 α -trihydroxycholic acid was the predominant labeled bile acid, maintaining a relatively high level until termination of the experiment 18 days after injection of cholesterol-4-C¹⁴.

THE CONVERSION OF RADIOACTIVE β -CAROTENE INTO VITAMIN A BY THE RAT INTESTINE IN VIVO. J.A. Olson (Dept. of Biochem., College of Med., Univ. of Fla., Gainesville, Fla.). *J. Biol. Chem.* 236, 349-56 (1961). In the present investigation, small physiological doses of β -carotene were employed, and the rate of absorption, requirement for bile salts, and formation of various products were examined in detail.

ALTERATIONS IN AORTA LIPIDS WITH ADVANCING ATHEROSCLEROSIS. J.F. Mead and M.L. Gouze (Dept. of Physiological Chem., Univ. of Calif. Med. Center, Los Angeles). *Proc. Soc. Exp. Biol. Med.* 106, 4-7 (1961). Analysis of lipids of the intima and media of aortas with progressive stages of atherosclerosis reveals an increase in sterol and sterol ester fractions and a decrease in phospholipids. It is proposed that these changes reveal a very low rate of lipid turnover in this tissue. The fatty acid composition of the cholesterol esters did not change with advancing atherosclerosis.

DISPOSAL OF INTRAVENOUSLY ADMINISTERED FAT IN SUBJECTS WITH ATHEROSCLEROSIS AND IN NORMAL CONTROLS. M.L. Mashford and P.J. Nestel (Univ. of Melbourne Dept. of Med., Royal Melbourne Hosp., Melbourne, Australia). *Circulation Res.* 9, 7-11 (1961). A series of experiments has been performed in which a standard dose of an artificial oil emulsion (Lipomul I.V.) was given to 5 groups of subjects and the disappearance of fat from their blood was observed by plasma optical density measurements. The groups were age-matched and consisted of a control group; 3 groups who had suffered a myocardial infarction and were respectively untreated, receiving heparin and receiving phenprocoumon after recovery from the acute stage of the illness; and the last group which consisted of patients who suffered from intermittent claudication. The control, untreated infarct and peripheral vascular disease groups exhibited similar curves of optical density on time.

SEX DIFFERENCES IN EFFECT OF RESTRICTION OF TIME OF ACCESS TO FOOD ON THE PLASMA LIPID COMPONENTS IN RATS. Elaine Lis and Ruth Okey (Dept. of Nutrition, Univ. Calif., Berkeley, Calif.). *J. Nutrition* 73, 117-125 (1961). An investigation of plasma lipid components in young adult rats of both sexes is reported. Cottonseed and coconut oils were chosen as examples of unsaturated and saturated fats. Cholesterol feeding resulted, for both sexes, in significant lowering of the percentage of arachidonic acid in plasma cholesterol ester. The change was greatest in the female rats with high cholesterol values and restricted access to food. When linoleic acid was available from the diet, it took the place of arachidonic acid in the cholesterol ester. Without it, i.e., when fed the coconut oil diet, the percentage of oleic acid was increased.

BIOCHEMICAL STUDIES IN FULL-BLOODED NAVAJO INDIANS. R.J. Kositzek, M. Wurm, and R. Straus (Dept. of Med. Res., Div. of Labs., Saint Joseph Hospital, Burbank, Cal.). *Circulation* 23, 219-224 (1961). The beta/alpha lipoprotein ratio and other serum lipid components have been studied in a population of full blooded Navajo Indians. The findings offer a basis for assessing the low degree of atherogenesis and are consistent with evidence for the low incidence of coronary heart disease in this ethnic group.

EFFECT OF CONDITIONED ANXIETY UPON THE BEHAVIOR, BLOOD LIPID LEVEL, AND ATHEROSCLEROSIS OF CHOLESTEROL-FED COCKERELS. C.R. Joyner, D.H. Bullock, H.M. Rawnsley, and M.Y. Brunt (Dept. of Med., Univ. of Penn., Philadelphia, Penn.). *Circulation Res.* 9, 69-74 (1961). Cholesterol-fed cockerels were subjected five days of each week to repetitive unavoidable shocks preceded by warning signals. The birds rapidly developed the intended conditioned emotional reaction. Comparison of these chicks with nonstressed cholesterol-fed cockerels over several months gave no indication that this type of stress influenced weight gain, blood lipid level, or the development of atherosclerosis.

EXPERIMENTAL STEATORRHEA INDUCED IN MAN BY BILE ACID SEQUESTERANT. S.A. Hashim, S.S. Bergen, Jr., and T.B. Van Itallie (Dept. of Med., St. Luke's Hospital and Inst. of Nutrition Sciences, Columbia Univ., N.Y., N.Y.). *Proc. Soc. Exp. Biol. Med.* 106, 173-75 (1961). Gross steatorrhea has been induced experimentally in healthy human subjects by administration of a resin capable of sequestering bile acids in the intestinal lumen. This agent (MK-135) inhibited absorption of I³¹-labeled triolein but not I³¹-labeled oleic acid. In contrast to certain other forms of experimental malabsorption, MD-135-induced steatorrhea appears to be predictable and innocuous.

DRESSING AND COOKING LOSSES, JUICINESS AND FAT CONTENT OF POULTRY FED CEREAL GRAINS. PART I, BELTSVILLE WHITE TURKEYS. Grayce Goertz, Anna Hooper, P.E. Sanford, and R.E. Clegg (Depts. of Home Ec., Poultry Husb., and Chem., Kansas State Univ., Manhattan). *Poultry Sci.*, 40, 39-45 (1961). Dressing, thawing, and cooking losses were determined for Beltsville White turkey hens and toms fed corn, sorghum grain, oats, or wheat. For fresh frozen turkeys, total and dripping cooking losses were significantly ($P < .05$) higher for turkeys fed corn or wheat than for those fed sorghum grain or oats. However, no differences attributable to grain were noted for total cooking losses following 6 months' storage.

THE MECHANISM OF KIDNEY TRANSAMINASE REDUCTION IN VITAMIN E-DEFICIENT RABBITS. C.D. Fitch, Cecilia Hsu, and J.S. Dinning (Dept. of Biochem., School of Med., Univ. of Arkansas, Little Rock, Arkansas). *J. Biol. Chem.* 236, 490-92 (1961). The mechanism of kidney transaminase depression by vitamin E deficiency was investigated. The evidence obtained supports the hypothesis that the depression is secondary to excessive creatine excretion. A direct effect of vitamin E on transaminase could not be demonstrated.

INFLUENCE OF FATTY ACIDS AND STEROLS ON ATHEROSCLEROSIS IN THE AVIAN ABDOMINAL AORTA. H. Fisher, H.S. Weiss, and P. Griminger (Dept. of Poultry Science, Rutgers, The State University, New Brunswick, N.J.). *Proc. Soc. Exp. Biol. Med.* 106, 61-63 (1961). Male chickens were fed for 6 months on rations containing (a) no supplement, (b) cholesterol plus corn oil, (c) cholesterol plus corn oil sterol and (d) cholesterol plus fatty acids rich in linoleic acid. Atherosclerotic severity tended to be greatest in the group given fatty acids and least on the sterol-containing diet. Since sterol excretion indicated a similar rate of cholesterol absorption on the cholesterol-supplemented diets, it appears that the principle in corn oil which retards avian aortic atherogenesis is present in the sterol fraction.

ENDOGENOUS HYPERCHOLESTEROSIS IN RABBITS FED A FAT-FREE PURIFIED DIET AND THE EFFECT OF UNSATURATED LIPID. E.R. Diller, M. Korzenovsky, and O.A. Harvey (Biochem. Res. Div., Lilly Res. Lab., Indianapolis, Ind.). *J. Nutrition* 73, 14-16 (1961). Serum and hepatic cholesterol levels of male, adult rabbits were determined at the end of a 12-week period of *ad libitum* maintenance with cholesterol-free purified diets. The purified diets contained either no lipid or 5, 10, or 20% of corn oil. The total cholesterol concentration of the serum increased in all groups. The group receiving no lipid exhibited a greater cholesterol rise in the serum than the groups receiving corn oil. The increase in serum cholesterol of rabbits fed corn oil did not appear to be a function of the lipid content of the diet.

EFFECT OF INTRA-ARTERIAL INSULIN ON TISSUE CHOLESTEROL AND FATTY ACIDS IN ALLOXAN-DIABETIC DOGS. A.B. Cruz, Jr., D.S. Amatuzio, F. Grande, and L.J. Hay (Jay Phillips Res. Lab., Mt. Sinai Hosp., Univ. of Minnesota, Minneapolis, Minn.). *Circulation Res.* 9, 39-43 (1961). Insulin and saline were injected into the right and left femoral arteries, respectively, of 19 alloxan-diabetes-mellitus dogs for 1 to 28 weeks. A significant increase of artery tissue cholesterol and total fatty acids was found on comparing the insulin-administered right

leg with the saline-administered left leg. Similarly, a significant increase of total fatty acids in muscle was found on comparing the right with the left leg of the alloxan-diabetes-mellitus dogs. No significant differences were observed in the normal animals when the insulin-injected side was compared with the noninjected.

INFLUENCE OF AGE ON LIVER PHOSPHOLIPIDE METABOLISM OF MICE. W.E. Cornatzer and J.H. Reiter (Dept. of Biochem., Univ. of N. Dakota School of Med., Grand Forks). *Proc. Soc. Exp. Biol. Med.* 106, 194-96 (1961). The influence of age upon radioactive turnover and chromatographic separation of the individual phospholipides was studied in female mice. There was an increase in the proportion of μg . phospholipide P/mg. liver N for the 8- to 60-day old mice after which the concentration remained unchanged with age. There was little change in percentage of total lipid phosphorus for the various phospholipide fractions with respect to age. However, the relative specific activities of each phospholipide fraction were greater in the younger mice.

CONJOINT EFFECTS OF DIETARY VEGETABLE FATS AND CHOLESTEROL IN RABBITS. Joyce Beare, H.C. Grice, and C.Y. Hopkins (Food and Drug Lab., Nat. Res. Council, Ottawa, Canada). *J. Nutrition* 73, 17-22 (1961). Rabbits were given a commercial diet with added fats such that the total fat contained 20, 39, 60, and 80% of saturated acids (as glycerides) and the linoleic acid content was approximately 12%. The level of fat in the diet was 10%. The 20% saturated fat produced the highest weight gain. There was no significant differences in serum cholesterol but the concentration of liver cholesterol varied inversely with the saturation of the fat, as determined by a ferric chloride method. Addition of 0.5% of cholesterol to the above diets gave the expected high levels of serum cholesterol and formation of aortic plaques, but the degree of saturation of the dietary fat did not alter the magnitude of these effects significantly, within the limits studied.

THE EFFECT IN VIVO AND IN VITRO OF ESTROGENS ON LIPID SYNTHESIS IN THE RAT UTERUS. Y. Aizawa and G.C. Mueller (McArdle Memorial Lab., Univ. of Wis. Med. School, Madison 6, Wisc.). *J. Biol. Chem.* 236, 381-86 (1961). During the first 6 hours of estrogen treatment *in vivo*, the levels of ethanamine, choline, and inositol phospholipids in the rat uterus increased as much as 150%. Surviving segments from rats killed 6 hours after a single injection of estradiol incorporated inorganic orthophosphate- P^{32} into the individual phospholipid fractions as much as 200% faster than the uterine segments from control rats. The pathways for the incorporation of acetate- 1-C^{14} into fatty acid, cholesterol, and nonsaponifiable fractions of surviving uterine segments were also stimulated by early estrogen action, but reflected a different time course than that observed for the phospholipid labeling. The addition of low levels of estradiol, estrone, or estril to the incubation medium *in vitro* caused an acceleration of inorganic orthophosphate- P^{32} incorporation into the phospholipids of uterine segments from control rats.

A REQUIREMENT FOR REDUCED TRIPHOSPHOPYRIDINE NUCLEOTIDE FOR CHOLESTEROL SIDE-CHAIN CLEAVAGE BY MITOCHONDRIAL FRACTIONS OF BOVINE ADRENAL CORTEX. I.D.K. Halkerston, J. Eichhorn, and O. Hechter (Worcester Foundation for Exp. Biol., Shrewsbury, Mass.). *J. Biol. Chem.* 236, 374-80 (1961). Results demonstrate that the transformation of cholesterol to pregnenolone in bovine adrenal cortex occurs in the mitochondrial fraction and has an absolute requirement for TPNH.

• Drying Oils and Paints

URETHANE MODIFIED DRYING OIL. H.M. Hauge and J.A. Pawlak (Spencer Kellogg & Sons, Inc.). *U.S. 2,970,062*. An ethylenically unsaturated vegetable drying or semidrying oil is heated at a temperature in the range of 420 to 550°F. with 7-25% by weight of an aliphatic alcohol which is at least trifunctional until alcoholysis has occurred and ester interchange to form a diol ester is completed. The reaction product is then reacted with a polyisocyanate in an amount approximately equivalent to the hydroxyl of the oil diol ester at a temperature below 130°F. until there is less than 20% of the polyisocyanate unreacted. The mixture is then heated to above 130°F. until there is less than 1% unreacted polyisocyanate present.

PROCESS FOR PREPARING DRYING OILS FROM SUCROSE AND RAFFINOSE. H.B. Hass (Sugar Res. Foundation, Inc.). *U.S. 2,970,142*. Sucrose or raffinose is reacted with an ester of a drying

oil fatty acid and a volatile lower alcohol (at least 6 moles ester/mole saccharide) in the presence of an alkaline catalyst at a temperature between 20° and 120° until the saccharide contains at least 4 of the acid groups per molecule of saccharide.

• Detergents

AN INVESTIGATION OF THE RELATIONSHIP BETWEEN SURFACE ACTIVITY, EMULSIFIER STABILITY, AND THE HLB VALUE OF NON-IONIC EMULSIFIERS. W. Wachs, and W. Reusche (Inst. Food Chemistry, University of Berlin). *Fette Seifen Anstrichmittel* 62, 803-810 (1960). The authors have reviewed the different methods and problems associated with classifying emulsifiers according to the HLB system. They have attempted to improve and expand the measurement of emulsifier characteristics. A number of nonionic emulsifier mixtures having known HLB values were used in this study. A modified centrifugation procedure was used to measure the stability of emulsions prepared with known emulsifier mixtures. In all cases maximum stability was attained when the emulsifier combination had an HLB value of approximately 9.5. Interfacial tension measurements were made with a duNuoy tensiometer. In most cases the interfacial tension decreased rapidly up to a concentration of 0.001% emulsifier in the lipophilic phase, above which it remained fairly constant. A number of cases were observed where the interfacial tension reached a minimum when the proportion of two emulsifiers were varied. This minimum occurred at an HLB value of 9.5. Other cases were observed where the interfacial tension continually decreased as the HLB value of the emulsifier mixture was increased. Theories are put forth to explain the phenomena reported.

NEW SURFACTANTS LISTED. J.W. McCutcheon (475 Fifth Ave., New York 17, N.Y.). *Soap Chem. Spec.* 36 (11), 54-62; 36 (12), 64-72 (1960); 37 (1), 51-58 (1961). Parts II, III, and IV of the latest revision.

ANTISEPTIC DETERGENT COMPOSITIONS. D.J. Beaver and P.J. Stoffel (Monsanto Chemical Co.). *U.S. 2,965,575*. The described composition consists of an anionic or nonionic organic detergent containing 0.1 to 50% (by weight on detergent) of a chlorine or bromine substituted benzamide.

DETERGENT COMPOSITIONS. S.A. Heininger (Monsanto Chemical Co.). *U.S. 2,969,329*. The described composition consists of a sulfated or sulfonated anionic or nonionic detergent in combination with a small amount of benzimidazol sufficient to inhibit tarnishing of a copper base alloy.

DIOCTYL SULFOSUCCINATE COMPOSITIONS CONTAINING ANTIFOAMING AGENTS. E.B. Lawler and K.D. Ballou (American Cyanamid Co.). *U.S. 2,969,332*. A wetting composition consists of from 50 to 90 parts by weight of an alkali metal or ammonium dioctyl sulfosuccinate and from 10 to 50 parts of a mixture of a fatty acid containing 16 to 22 carbon atoms and a diethylene glycol monoester of a fatty acid containing 16 to 22 carbon atoms. The weight ratio of the diethylene glycol monoester to fatty acid should be about 1:1.

SURFACE-ACTIVE MONOESTERS. W.D. Niederhauser (Rohm & Haas Co.). *U.S. 2,969,388*. The surface-active monoester is the reaction product at 110° to 220° of ethylene oxide and a mixture of at least 80% of the viscous residue containing long-chained polycarboxylic acids, having an acid number between 140 and 165, an iodine number between 30 and 60 and no more than 20% of a higher aliphatic monocarboxylic acid. The viscous residue is the non-volatile material remaining from vacuum-distilling the by-product acids from sebacic acid manufacture from castor oil by treatment with alkali. The finished product contains from 5 to 25 ethylenoxy groups per carboxy group and an acid number of zero.

PROCESS FOR MAKING AMPHOTERIC SURFACE ACTIVE AGENTS. R.A. Walker (Johnson & Johnson). *U.S. 2,970,160*. A C_{10} to C_{18} carbon atom fatty acid is reacted with a hydroxylalkyl substituted alkylene diamine until between 1.5 and 2 moles of water for each mole of fatty acid are volatilized off. The resulting molten fatty amine condensate is rapidly added to a dilute aqueous solution of sodium chloroacetate (at least a 30% molar excess over the fatty amine condensate) that has been derived from the neutralization of one mole of chloroacetic acid with at least 1.3 moles of sodium hydroxide. The temperature of the mixture is kept at 0-15° during the mixing and is then gradually raised to about 95°. At least 0.4 mole of sodium hydroxide per mole of sodium chloroacetate is added and the mixture heated at 95° for 1-5 hours.