lation to foam resistance, the following compounds were tried out in percentages varying from 0.01% to 0.1%:

Tergitol
Alkanol
Nacconol NR
Cholesterol
Ursolic Acid
Sucrose Octaacetate
Surfasol
Impervium
Opalwax
Monolaurin
Monostearin
Ferric Stearate
Aluminum Stearate
Ferrous Stearate
Sodium Acetate
Sodium Sulfate
Calcium Propionate
Lanolin
Morpholine Stearate
Boric Acid
B-OH Ehtyl Palmitate

None of the materials used was outstanding in preventing foaming of oils or hydrogenated fats and oils. In the case of ferric soaps and monoglycerides there was a decrease in the time before foaming started. Ferric soaps were found to be worse for causing foam than ferrous soaps. It is possible that if any appreciable amount of iron soaps found their way into shortening materials, the tendency to foam would be increased.

According to the method which we have developed and used for studying the foaming tendencies of oil, it would seem that time and temperature are the main factors in the breakdown of an oil which causes it to foam. Hydrogenated oils have a greater resistance to foam than the original oils from which they were produced. Some mineral soaps have a tendency to retard foaming, and use of excess caustic in refining of oils is of some assistance in building up foam resistance. In general, it may be said that there is a fair correlation between the increase in the refractive index and viscosity of a shortening material and the tendency to foam. It was also noted that the shorter the time before foaming sets in, the greater the increase in free fatty acids. There was no tremendous difference found between any type of oil, as to resistance to foaming properties. Some animal fats which are not reported in this study were found to have a higher resistance to foaming than the vegetable oil materials. It would seem possible that in seasons when the fatty acid content of original oils is rather low, there may be a tendency for shortening materials produced therefrom to show a greater foaming tendency than in years when the use of larger amounts of caustic in refining is practiced.

Abstracts

Oils and Fats

Edited by
M. M. PISKUR

Synthetic fatty acids. F. Wittka. *Soap 16,* No. 8, 28-32, 73 (1940).

Mono- and di-glycerides—their use in the food manufacture. *Food Manufacture, 15,* 187-8 (1940). Mono-and di-glycerides of stearic and lauric acid are being used in ever-increasing amounts by many manufacturers of diverse food products. While triglycerides are plentiful in nature, the mono- and di-glycerides have never been found in natural products. These products, having a hydroxyl-containing group at one end and a fatty group at the other end, are thus compatible with polar and many non-polar materials. They are used in food products because they act as emulsifying agents, thickeners, stabilizers, surface tension reducing agents, texture improvers, homogenizers, binders and protective film-forming media. Some of the food products in which they are used are breads, cake, nut butters, margarine, shortenings, ice cream, frozen eggs, salad dressings and dairy feeds.

Determination of acetyl values *(of oils).* P. M. Bogatyrev, et al. *Org. Chim. Ind. (USSR) 6,* 558-9 (1939). One hundred g. of oil is heated at 75° with 3-5 g. of p-$C_6H_4Me.SO_3H$, 70 ml. of white spirit is added, and the soln. is heated in a Dean-Stark app. for 80 min. at 150-180°; the Ac value is given by 28 n, where n is the vol. of H_2O collected *(Chem. Abs.).*

Chemistry of the spoilage of fats. X. participation of catalase. K. Täufel and R. Müller. *Biochem. Z, 304,* 275-84 (1940). Catalase by decompg. H_2O_2, which aids the oxidation of unsatd. fats, acts as an antioxidant. The presence of catalase in all fat-contg. biol. materials suggests that it may possibly function to prevent undesirable oxidation. Addn. of a liver catalase prepn. to olive oil definitely inhibits the autoxidation, but the inhibitory effect is not parallel to the catalase activity, and may partly depend on some other factor present in the ext. This is actually corroborated by the observation that the antioxidant action of the ext. persists even after the removal of the catalase *(Chem. Abs.).*

Sterols from crude soybean oil. H. R. Kraybill et al. *Ind. & Eng. Chem. 32,* 1138-9 (1940). A combined adsorption and extraction method for the production of a phosphatide-free sterol concentrate from soybean oil, having 15 to 20 times the sterol content of crude oil, is described. From this concentrate without saponification a large portion of the mixed sterols crystallized readily and may be recovered by filtration. The remaining sterols, some of which are combined as esters, are readily recovered by the saponification of a relatively small volume of oil. This method results in the production of "nonbreak" soybean oil and also permits the recovery of the greater part of the sterol glucosides present in the crude oil. In one experiment 234 g. of sterol glucosides and 1,778 g. of mixed sterols were obtained. From 20 to 25% of stigmasterol was separated from different portions of these mixed sterols.

Sterol glucosides from expressed soybean oil. M. H. Thornton, et al. *J. Am. Chem. Soc. 62,* 2006-8 (1940). Sterol glucosides occur to an appreciable extent in com. expeller soybean oil. These glucosides were removed from the oil by adsorption methods and were obtained by acetone extraction of the adsorbed material. The sugar was obtained from the glucosides in almost theoretical yield by first forming the ethyl glucoside and subsequently hydrolyzing the easily soluble ethyl glucoside. The sugar was identified as d-glucose. The sterols obtained by hydrolysis of the glucosides are very similar to the uncombined sterols of the oil and consist of a mixt. of sterols in which stigmasterol occurs to the extent of approx. 24%.

Bodying of dehydrated castor oil. J. D. von Mikusch. *Ind. & Eng. Chem. 32,* 1061-9 (1940). The bodying of dehydrated castor oil proceeded 3 to 4 times as fast as that of linseed oil; for instance, 3.4 hrs. were required to obtain a 40-poise viscosity at 560°F. with raw dehydrated castor oil.

Abstracts

Oils and Fats

Edited by
M. M. PISKUR

Fat-deficiency disease of rats. The relative curative potencies of methyl linoleate and methyl arachidonate with a note on the action of the methyl esters of fatty acids from cod liver oil. Eleanor M. Hume, et al. *Biochem. J. 34,* 879-83 (1940). Methyl arachidonate was prepared from pig's liver and from ox suprarenal glands. The material was tested curatively on rats receiving the fat-free diet of Burr, et al. in simultaneous comparisons with methyl linoleate. In confirmation of the work of Turpeinen, methyl arachidonate was found to be more active than methyl linoleate in promoting wt. increase; its activity in curing skin lesions was, however, no greater than that of methyl linoleate. Methyl arachidonate, like methyl linoleate, unless given in very sm. doses, continued to exercise a beneficial effect for some time after dosage had been suspended. Methyl esters of cod liver oil fatty acids were given prophylactically to young rats on the fat-free diet. The activity in promoting wt. increase and in giving protection vs. skin lesions was very slight.

Fat deficiency disease of rats. The effect of doses of methyl arachidonate and linoleate on fat metabolism, with a note on the estimation of arachidonic acid. Ida Smedley-Maclean and L. C. Nunn. *Biochem. J. 34,* 884-902 (1940). The percentages of neutral fat and phospholipin calculated on the wet wt. of tissues in the liver, muscle and kidney of rats kept for 215 days on a fat-free diet showed no significant variation when compared with similar figures for rats which after 163 days of fat-free diet had received curative doses of linoleic and arachidonate for 5-7 wks. before being killed. In rats fed for 35 days with doses of arachidonate (1, 0.5 and 0.25 drop) and then returned to the fat-free diet, the liver lipoid substance contained less phospholipin than in those in which the 1 drop doses had been continued. The muscles of rats which had received daily 1 drop doses of arachidonate and linoleate and had then been again fat-starved contained more fat than the muscles of rats which had received similar doses up to the time when they were killed. The tissues, especially skin and carcass, of rats which had received 0.5 and 0.25 drop doses of arachidonate for 5 wks. and had then been again fat-starved were much more fattened than those of rats which had received 1 drop doses of arachidonate or linoleate under similar conditions. The carcases of the 0.5 drop and 0.25 drop rats were also richer in phospholipin. The conclusion was drawn that a min. intake of arachidonate acid is necessary in order that the cells of the fat depots may first be loaded up with fat. Subsequently there is a process of true growth which is accompanied by the disappearance of comparatively large quantities of arachidonic acid.

PATENTS

Process for artificial production of fats. K. Brandt. *Brit. 509,755.* Carbohydrates are brought into contact with fresh animal albuminous pulp in the presence of a quantity of water, the pH is maintained at the neutral point and the fat formed is sepd.

Emulsifying composition. R. Kapp (National Oil Products Co.). *U.S. 2,207,256-7.* Mono- and diglycerides are prepd. from oils and fats by partial sapon. in glycol solvent.

Process for manufacturing fatty esters. A. Edeler and A. S. Richardson (Proctor and Gamble Co.). *U.S. 2,206,167-8.* Mono- and di-glycerides are prepd. by heating oil and glycerine to 150°-200° in the presence of a small amt. of soap or alcoholates.

Process of removing materials containing phosphatides from vegetable oils. B. H. Thurman (Refining, Inc.). *U.S. 2,206,210.* Water is added to the oil and it is centrifuged to sep. the foots.

Preparation of aliphatic acid nitriles. R. Greenhalgh (Imperial Chemical Industries, Ltd.). *U.S. 2,206,351.* Fat acid amides are reacted with phosgene in the prepn. of fat acid nitriles.

Reactivation of spent hydrogenation catalysts. V. E. Wellman and W. L. Semon (B. F. Goodrich Co.). *U.S. 2,208,616.* The catalyst is anodically oxidized in strong alk. soln., then in mild alk. soln., washed and finally reduced with H_2 at elevated temps.

Process of sulphurizing oils. H. T. Bennett (Mid-Continent Petroleum Corp.). *U.S. 2,206,151-2.* Fatty and mineral oils are sulfurized without substantial thickening by heating with S in the presence of aromatic amino or thiourea compds.

High molecular weight substituted ethinyl carbinols. A. W. Ralston (Armour and Co.) *U. S. 2,203,363.* The compds. are prepd. by reacting high mol. wt. ketones with Na- or K-acetylides to give Na or K derivs. of substituted ethinyl carbonols which are then hydrolyzed to the corresponding carbinols.

Impregnating or fatting leather. Deutsche Hydrierwerke A.-G. *Ger. 683,977 Cl 28a Gr. 9.* Fat alcs. together with a sulfonated product of the same is used in the process.

Nitric acid oxidation of oleic and other fatty acids. E. K. Ellingboe (E. I. du Pont de Nemours). from unstd. fat acids by oxidation with nitric acid is improved in presence of ammonia vanadate.

Preparation of long-chain aliphatic mononitriles. C. C. Wortz (E. I. du Pont de Nemours). *U. S. 2,205,076.* Fat acids, their corresponding anhydrides, esters, NH_4 salt or amide are brought together with NH_3 in the vapor phase in contact with a dehydrating agent at a temp. 425-450° in a special app. to form nitriles.