Completely mix the ground sample with the fingers.

Proceed with the extraction exactly as directed under Whole Nuts except that 1-2 grams of sand is added to the partially extracted material before regrinding.

Ammonia*

As directed above under whole nuts.

2nd Moisture*

As directed above under whole nuts.

Calculation—Partially Dry to Original Moisture Basis

$$\frac{\%\ \text{Oil or}\ \%\ \text{Ammonia} \times (100-\%\ \text{Original Moisture})}{100-\%\ \text{2nd Moisture}} = \%\ \text{Oil or}\ \%\ \text{Ammonia (Original Basis)}.$$

Notes % Foreign Matter may be added to the % Original Moisture in the above calculation if it is desired to report on an As Received Basis.

FFA in Oil in Peanuts

Preparation of Sample Whole Nuts

Accumulate, as directed under Preparation of Sample, approximately 200 grams of nuts.

Separate the kernels and hulls by hand.

Grind these kernels through the food grinder, using the peanut butter blade. This grinding, need not be as thorough as is required for the oil determination.

Shelled Stock

Accumulate, as directed under preparation of Sample, 150 grams of kernels.

Grind these kernels as directed above under whole nuts.

Extraction and Determination

After thoroughly mixing the ground samples extract sufficient oil for a titration, by percolation, as directed in the official Method for Cottonseed. Weigh, titrate and calculate the % FFA in oil as directed in the Cottonseed Method.

Calculation of Crushing Yields from Analytical Data on Whole Peanuts

In the calculations given below the following assumptions are used:

1. Working Loss—Material	5%—100 lbs. per ton
2. Oil lost in hulls	6 lbs. per ton
3. Factor—Available ammonia	92%
4. Cake ammonia	8.76%—45% Protein
5. Oil—Ammonia ratio	.80 (Standard)
6. Factor (Invisible Loss)	97%

% Oil (Original Moisture Basis) × 1900 = Lbs. total oil per ton — 5% loss basis

% Ammonia (Original Moisture Basis) × .92)1900 = Lbs. available ammonia per ton — 5% loss basis

$$\frac{\text{Lbs. Available Ammonia per ton}}{.0876} = \text{Lbs. 45\% protein cake per ton}$$

Lbs. 45% Protein Cake × .0701 = Lbs. Oil lost in pressing per ton

Lbs. Oil lost in pressing — 6 = Total oil lost — visible

(Lbs. Total Oil — Lbs. Total lost) .97 = Lbs. available oil per ton — 5% loss basis.

* The weighings of prepared samples for moisture, oil and ammonia should take place at as nearly the same time as possible. This partially dry material may change rapidly under some conditions.

Abstracts

Oils and Fats

Edited by
M. M. PISKUR

Soybean flour as an emulsifying agent in preparation of salad dressings. B. M. Watts and L. Morse. *Food Res. 5,* 197-203 (1940). Benzine extracted, undenatured, soybean flour, heated with water, was successfully used as an emulsifying agent in the preparation of salad dressings. The emulsions obtained were less finely dispersed than those prepared from an equal proportion of yolk solids, but were practically identical in droplet size to egg-white emulsions made over the same formula. The relative viscosity of the soybean dressings was much greater than those from either yolk or white, making possible the preparation of inexpensive salad dressings, containing a low amount of oil with the soybean flour as the sole emulsifying and thickening agent. The fat-free soybean flour was also used to replace egg white in combination with egg yolk as an emulsifying agent but the characteristic high viscosity of the cooked soybean flour was lost on addition of yolk.

Storage of margarine in the atmosphere of combustion gases. M. Ravich and E. Schmidt. *Masloboinc Zhirovoe Delo 15,* No. 4, 20-3 (1939). Comparative tests on the effect of storage of margarine in air and in a current of combustion gases ($CO_2$85.8, N 14.1 and O 0.1+) at room temperature are described. After storage for 100 days in the atmosphere of combustion gases, the margarine samples showed no changes in their physical appearance. The samples held in the air atmosphere became moldy after 13 days of storage and were thoroughly infected with green and brown molds, after 2 days (*Chem. Abs.*)

The composition of commercial palm oils. V. Partial separation of palm oils by crystallization as an aid to the determination of the component glycerides. T. P. Hilditch and L. Maddison. *J. Soc. Chem. Ind. 59,* 67-71 (1940). The chief components are "oleo"-dipalmitin and palmitodi-"olein," in amts. which vary according to the proportions of palmitic, oleic, and linoleic acids in the whole fats; together, these glycerides amt. to 70-75% of the palm oil, "oleo"-dipalmitin preponderating in oils with high palmitic acid content, and conversely. The other (minor) components are, in addn. to "oleo"-palmitostearin (10-15%), tri-unsaturated glycerides (linoleodiolein and/or triolein, 6-15%, according to the united oleic and linoleic acid content of the palm oil) and fully-saturated glycerides (tripalmitin and dipalmitostearin) 3-9%, according to the palmitic acid content of the palm oil. The linoleic acid of palm oils probably occurs mainly in the form of linoleo-oleopalmitins, with minor amts. of linoleodipalmitin and linoleodiolein.

Observations on fat synthesis and metabolism. E. W. McHenry and G. Gavin. *J. Biol. Chem. 133,* lxvi (1940). In rats given an alcohol-soluble fraction of beef liver, fat synthesis is greatly augmented and fatty livers, different from those caused by thiamine, are produced. These fatty livers are highly resistant to the lipotropic action of choline but readily respond to lipocaic. A procedure for the rapid assay of lipocaic is thus available. The administration of the liver fraction causes a marked increase in liver cholesterol, although no cholesterol is furnished by the basal diet or supplements. Lipocaic diminishes the amt. of liver chol-

Abstracts

Oils and Fats

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M. M. PISKUR

esterol. It is suggested that lipocaic affects the transport of cholesterol, while choline is mainly concerned with the transport of neutral fat.

THE INERTIA OF HIGHLY UNSATURATED FATTY ACIDS IN THE ANIMAL, INVESTIGATED WITH DEUTERIUM. K. Bernhard and R. Schoenheimer. *J. Biol. Chem. 133,* 707-12 (1940). The finding is new confirmation that hydrogen of $—CH_3$, $—CH_2—$, and $= CH—$ groups in fatty acids is not exchangeable with the hydrogen of the water of the body fluids in which they are dissolved or suspended. Introduction of hydrogen from body fluids occurs only in the course of chemical reactions.

THE BIOLOGICAL RELATIONS OF THE HIGHER ALIPHATIC ALCOHOLS TO FATTY ACIDS. D. Steeten and R. Schoenheimer. *J. Biol. Chem. 133,* 347-57 (1940). Cetyl and octadecyl alcohols containing deuterium were prepared from the corresponding fatty acids. The acetates of these alcohols were fed, in small amts., to normal rats. Both substances were readily absorbed and rapidly converted into saturated fatty acids of the same chain length. In addn., a portion of the cetyl alcohol was converted into stearic acid and a part of the octadecyl alcohol into palmitic acid. The reverse reaction, the conversion of fatty acids into higher alcohols, has been studied in rats fed deuteropalmitic acid. The fraction of higher aliphatic alcohols obtained from the feces had a deuterium content indicative of its origin from palmitic acid. The results are taken to mean that these alcohols are normal intermediates in fat metabolism, and their possible role in the process of elongation of the carbon skeleton has been discussed.

THE CONVERSION OF PALMITIC ACID INTO STEARIC AND PALMITOLEIC ACIDS IN RATS. D. Stetten and R. Schoenheimer. *J. Biol. Chem. 133,* 329-45 (1940). Deuteropalmitic acid in the form of its ethyl ester was added as a quantitatively minor component to a diet otherwise generously supplied with a variety of normal fatty acids and this diet was fed to rats. After 8 days, the animals were killed, and various fractions of body fat, including several individual carcass fatty acids, were isolated and analyzed for deuterium. Part of the palmitic acid was degraded to acids of shorter chain length; another part was desaturated to palmitoleic acid. A novel reaction was the finding the conversion of palmitic acid into stearic acid, representing a direct elongation of the carbon chain of palmitic acid by 2 carbon atoms. The new fatty acids were formed despite the fact that the animals were ingesting, during the course of the experiment, an abundance of the same fatty acids, supplied as butter in the diet. These conclusions are coordinated with the previous reports of studies in the metabolism of fatty acids, and a scheme is proposed to indicate certain interconversions of fatty acids that are normally and continuously taking place in the animal body.

COMPARISON OF NUTRITIVE VALUE OF REFINED COCONUT OIL AND BUTTERFAT. R. S. Harris and L. M. Mosher. *Food Res. 5,* 177-84 (1940). Animals on the butterfat diet consumed a slightly larger, but possibly insignificant, amt. of diet but increased in wt. much less rapidly than the animals on the coconut-oil diet. The superior wt. increase of the rats on the coco-nut-oil diet was not adipose tissue, for the body and liver tissues of the groups contained essentially the same amt. of fat (alcohol-ether extract) and true lipid (petroleum-ether extract of the alcohol-ether extract). These results indicate that butterfat and coconut oil, even when fed at rather high levels in a complete diet, are equally harmless to rats and presumably to man.

PATENTS

REMOVAL AND RECOVERY OF SOLVENT. D. McDonald (Engineering, Inc.). *U. S. 2,198,412-3.* App. is described.

ANTIOXIDANT FOR FATS AND OILS. A. Guillaudeu (Industrial Patents Corp.). *U. S. 2,197,269.* Reaction products of castor oil and an aliphatic acid having at least 2 reactive groups are used as stabilizers for oils.

ANTIOXIDANTS. *S. Musher* (Musher Foundation, Inc.). *U. S. 2,198,197-222.* The antioxidants include cereal seeds, raw coffee, raw nuts, their extracts, combinations of phospholipids and sugar and skim milk.

PROCESS OF REFINING ANIMAL AND VEGETABLE OILS. B. Clayton (Refining, Inc.) *U. S. 2,199,041.* Equipment for a continuous method is described.

TREATMENT OF GLYCERIDE OIL. S. Musher (Musher Foundation, Inc.). *U. S. 2,199,364.* A refined cottonseed oil, having novel flavor and odor is prepd. by adding a small amt. of oil derived from macerated olive paste.

COOLING DEVICE FOR FATS. J. Brix-Hansen. *U. S. 2,199,038.* App. is described.

MARGARINE AND METHOD OF MAKING. E. E. Werk and H. M. Zekind (Churngold Corp.). *U. S. 2,197,457.* Emulsifying and cooling app. is described.

PREPARATION OF FATTY ACID ESTERS OF POLYHYDROXY ALCOHOLS. C. M. Gooding and H. W. Vahlteich (Best Foods). *U. S. 2,197339-40.* In the prepn. of mono and diglycerides the soap is removed from the reaction mixture by extn. with diethyl sulfate and glycerol chlorohydrin.

PROCESS OF INTRODUCING DOUBLE BONDS INTO ALIPHATIC COMPOUNDS. K. A. Pelikan et al. (Woburn Degreasing Co.). *U. S. 2,198,884.* The hydroxy fat acids are reacted with H_2SO_4, neutralized with an alkali and then heated at 150-300° whereby mono alkali sulfate is split off.

SYNTHETIC DRYING OIL AND METHOD OF MAKING SAME. F. A. Strauss (Wecoline Products, Inc.). *U. S. 2,197,813.* Alcohols (polyglycerols) having unesterified hydroxy groups are reacted with fatty acids of drying and semi-drying oils to yield oils with improved drying properties.

YARN CONDITIONING PROCESS. J. B. Dickey and J. B. Normington (Eastman Kodak Co.). *U. S. 2,197,998-2,198,000.* Tritetrahydrofurfuryl amine salts, esters of tetrahydrofuroic acid and salts of dioxane are added to textile oils as antistatic components.

RECOVERY OF FATTY ACIDS. T. F. McCormick and A. Lazar (Tide Water Associated Oil Co.). *U. S. 2,196,421.* Aliphatic acids are removed from petroleum oils by washing with alkali solns. at 300°F.

STABILIZED GREASE LUBRICANT. W. A. Lutz. (Gulf Research and Development Co.). *U. S. 2,197,433.* The lubricant contains 15 to 25% Ca stearate.

Abstracts

Oils and Fats

Edited by
M. M. PISKUR

Lube oil addition agents. R. Rosen (Standard Oil Development Co.). *U. S. 2,199,187.* Reaction products of fatty alcs. and cyclic carboxylic acids are used to depress the pour pt. of waxy lubricating oils.

Method of making sulphurized cutting oils. A. Pollak and R. Hastings (West Va. Pulp and Paper Co.). *U. S. 2,198,562.* Cutting oil is prepd. by agitating an oil at 300-400°F, with 30% by wt. of S for 2-4 hrs.

Resin and method of making same. C. Ellis (Ellis-Foster Co.). *U. S. 2,197,855.* The resins are reaction products of glycerol phthalic acid, fat acid, and boric acid.

Abstracts

Soaps

Edited by M. L. SHEELY

Significance of suspending power in detergent processes. J. Powney and R. W. Noad, *J. Textile Inst. 30, T* 157-71 (1939). The influence of various alkalies and long chain detergents on the degree of deposition of suspended ilmenite particles on to cotton fabric was studied under various conditions. Simple alkalies such as sodium carbonate and sodium hydroxide cause an increase of deposition which can be attributed to a sodium ion effect rather than to a pH effect. In contrast, certain sodium silicates and phosphates exhibit a very considerable protective action, which is attributed to selective adsorption of the anion. With sodium hexametaphosphate and sodium pyrophosphate the protective action was still appreciable at concentrations as low as 5-10 pts./mil. With sodium laurate, sodium stearate and sodium oleate, the optimum protective action is reached at concentrations which decrease rapidly with increasing chain length. The effect of added alkalies on the behavior of soap solutions was considered. Detergents of the long-chain alkyl sulfate type possess relatively low protective action. (*Chem. Abs.*)

Soap. F. W. Gibbs, *Ann. Sci. 4,* 169-90 (1939). A history of the manufacture of soap.

Soap solutions. Kurt Hess. *Fette u. Seifen 46,* 572-5 (1939). In further developing ideas as to the structure of soap micelles, it is postulated that the micelles are built up of sheets of oriented soap mols. with —COONa groups forming one surface of the sheet and the terminal CN_3— groups of the parallel alkyl groups forming the other surface. In the micelles, the sheets are so arranged that pairs of —COONa surfaces face each other as do also pairs of CN_3-surfaces. On increasing the C chain length of the soap from C_4 to C_{10}, the amount of water held between the —COONa surfaces of the adjacent sheets increases from 1 to 6 mols. per mol of soap.

When clear dispersions of benzene are produced by addition of limited amounts to a soap solution containing micelles, changes in the x-ray diagram showed that the benzene is taken up between the CH_3— surfaces of the sheets of soap mols. (*Chem. Abs.*)

Control of soap rancidity. Paul I. Smith. *Am. Perfumer 40,* No. 3, 59-61 (1940). A review.

Making powdered soap with gas. Victor Alexieff. *Gas 16,* No. 3, 17 (1940). A light, fluffy, powdered soap is made by spray-drying in a current of air mixed with products of combustion of gas at 255°F. Soap made in the usual way, but without additions other than preservatives to prevent rancidity, is conditioned at the desired temperature by the use of steam coils. It is then passed through a low-pressure pump, and then a high-pressure hydraulic pump to give a spraying pressure of 1000 to 3000 lb. per sq. in., then through a "saponifying valve" and finally through the spray nozzle having a 0.036" opening. The spray chamber is shaped very much like a centrifugal collector of cyclone type. The liquid soap is dried almost instantly, and is sucked by a fan into cooling and storing collectors. About 1.5 cu. ft. of natural gas was required per lb. of finished soap. (*Chem. Abs.*)

PATENTS

Method of forming floating milled soap. Thomas Eagen (Procter and Gamble Co.). *U. S. 2,195,399.* The process of forming a bar of milled toilet soap having floating properties which comprises forcibly inserting displacing means only part way through a blank, unperforated bar of soap and simultaneously stamping same, thereby giving the soap bar substantially its final form with a cavity extending inward from only one face of the bar, withdrawing the displacing means and with stamping dies in stamping position to prevent deformation of the bar, stamping the face of the bar contg. the opening of said cavity thereby closing said opening and forming within the bar a hollow space of sufficient size to reduce the apparent specific gravity of the bar to less than that of water.

Liquid antiseptic soap. Louis Figg (Eastman Kodak Co.). *U. S. 2,196,763.* A liquid antiseptic toilet soap comprising soap, water, from 0.5% to 33% by volume of hardwood oil whose boiling range is between 180°C. and 240°C. and a blending agent for the soap and the hardwood oil.

Detergent. Emil Dreger and John Boss (Colgate-Palmolive-Peet Co.). *U. S. 2,195,512.* A process for preparing a material suitable for use as a detergent that comprises reacting a material of the class consisting of fatty oils and fatty acids with a polyhydric alcohol, a sulphonating agent, and an aromatic compound of the class consisting of compounds of the benzene, naphthalene series, and thereafter neutralizing the reaction product by bringing the concentrated reaction product into confluence with a relatively concentrated solution of a neutralizing agent in the presence of a considerable quantity of already substantially neutralized material.

Detergent. Colgate-Palmolive-Peet Co.). *Canadian 387,238.* A detergent obtained by reacting a fatty material such as fatty oils or fatty acids, with an isobutylene derivative of the class consisting of beta-methyl glycerine and beta-methyl glycidol *which has been subsequently reacted with sulfuric acid.*