

TABLE 3  
Per Cent Variation in the Iodine Number of Crude Tall Oil  
With Excess Iodine

Excess Iodine Range	Iodine No.	Per Cent Variation $\pm$
125 $\pm$ 25	170-186	4.5
175 $\pm$ 25	186-194	2.1
225 $\pm$ 25	194-198	1.0
275 $\pm$ 25	198-201	0.75
325 $\pm$ 25	201-203	0.5
125 $\pm$ 10	176-182	1.0
175 $\pm$ 10	189-192	0.75
225 $\pm$ 10	195-197	0.5
275 $\pm$ 10	199-200.5	0.4
300 $\pm$ 10	200.5-201.5	0.25
325 $\pm$ 10	201.5-202.5	0.25

The Wijs method as adopted by the American Oil Chemists' Society calls for a 30-minute reaction time for most oils and fats, and for one hour with linseed, tung, and perilla oils. Data taken from figure 6 for crude tall oil with 300% excess iodine shows a variation in the iodine number of 11 points for a 30-minute change in the reaction time. For a variation of  $\pm 0.25\%$  or  $\pm 0.5$  points this corresponds to a reaction time varying by  $\pm 1.5$  minutes.

The Wijs method as adopted by the American Oil Chemists' Society and the Association of Official Agricultural Chemists does not mention a temperature of absorption for most oils, but a temperature of 20-25°C. is given for tung, linseed, and perilla oils. The American Society for Testing Materials procedure specifies that 25  $\pm$  2°C. be used. For crude tall oil and 250% excess iodine, figure 3, the iodine number increased from 186 to 208 at 21.1 and 32.2°C., respectively. This corresponds to a change of  $\pm 2\%$  for 25  $\pm$  2°C. A variation in the temperature of  $\pm 0.5^\circ\text{C}$ . would cause  $\pm 0.5\%$  change in the iodine number.

The maximum variation then totals 1% as shown below:

Condition	Iodine No. % Variation
30 $\pm$ 1 minute time . . . . .	$\pm 0.25$
25 $\pm$ 0.5°C. temperature . . . . .	$\pm 0.50$
300 $\pm$ 10% excess iodine . . . . .	$\pm 0.25$
Total . . . . .	$\pm 1.0$

Where less precision is permissible, some control may be reduced but in no case could the present broad standard conditions be applied to tall oil or rosin for useful results.

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## Abstracts

### Oils and Fats

Edited by

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PHOTOMETRIC DETERMINATION OF ACETONE-INSOLUBLE MATERIAL IN SOYBEAN OIL. C. A. Murray and E. B. Oberg. *Ind. & Eng. Chem., Anal. Ed.* 14, 785-7 (1942). A photometric procedure has been described for the detn. of acetone-insol. material and break in solvent-extd. soybean oil. The photometric method is rapid, possesses an av. precision of approx. 0.005 break % and is relatively free of errors introduced by differences in technique. A direct empirical relation has been found between acetone-insol. material and break in solvent-extd. soybean oils.

THE VITAMIN D CONTENT OF ENGLISH BUTTER FAT THROUGHOUT THE YEAR. K. M. Henry and S. K. Kon. *Biochem. J.* 36, 456-9 (1942). The vitamin D potencies of the fat of butters churned at approx. monthly

intervals from the milk of the Shinfield herd have been measured between March 1940 and March 1941. The assay was done by the prophylactic bone ash method against the international standard on groups of 11 or 12 rats, all comparisons being between littermates. The values of the non-saponifiable residue varied from less than 0.1 i.u./g. fat in the months of Nov.-March to 0.55 i.u./g. in July and 0.97 i.u./g. in August. The latter figure may be too high. The values for untreated fat were invariably higher than those measured after sapon., the difference being much more marked in winter than in summer.

THE APPLICATION OF LABELING AGENTS TO THE STUDY OF PHOSPHOLIPID METABOLISM. I. L. Chaikoff. *Physiol. Revs.* 22, 291-317 (1942).

THE COMPARATIVE RATES OF ABSORPTION OF EGG OIL AND COD LIVER OIL. Ruth Reder. *Poultry Sci.* 21, 528-31 (1942). The percentage of egg oil and cod liver oil absorbed from the gastro-intestinal tract of rats, following the administration by stomach tube of approx. 1.5 ml. of each oil, was detd. at the end of 2-, 4-, 6-, and 10-hour absorption periods. At the end of a 2-hour absorption period, 25.9% of egg oil and 30.7% of cod liver oil had been absorbed. At the end of a 10-hour absorption period, 97.7% of egg oil and 87.2% of the cod liver oil had been absorbed. From these results it appears that egg oil is more readily absorbed than cod liver oil.

A COMPARISON OF RATS FED AN EVAPORATED MILK WITH THOSE FED A "MILK" IN WHICH THE NATURALLY OCCURRING FAT HAS BEEN REPLACED BY COCONUT OIL. S. Freeman and A. C. Ivy. *J. Dairy Sci.* 25, 877-81 (1942). The growth of rats fed an evapd. milk was greater over a 97-day period than for a similar group of rats maintained on a "filled milk" in which the butterfat had been replaced by coconut oil. The percentage of bone ash and of liver fat is quite similar for the 2 groups of rats, both after 49 and 97 days on the diets. There were more volatile fatty acids deposited in the storage fat of the coconut oil group.

HATCHABILITY IN RELATION TO THE FAT CONTENT OF THE DIET. B. W. Heywang. *Poultry Sci.* 21, 521-4 (1942). No statistically significant differences in hatchability that could be attributed to the differences in fat content of the diets were observed. It is concluded that the hatchability of the eggs of pullets is not significantly affected by feeding a diet of low fat content or modifications of such a diet in which as much as 8% corn oil is included as a source of addnl. fat. It also is concluded that the fat content of the 4 diets used in this study had no effect on the time of occurrence of embryo mortality.

THE FAT CONTENT OF MILK AND ITS INCREASE BY ADDITION OF VITAMINS. W. v. Lucadou. *Klin. Wochenschr.* 20, 115-119 (1941). When a group of milch cows received daily 5 g. live baker's yeast in their drink, the fat content of the milk, which remained unaltered in amount, rose from 4.1 to from 5.1 to 5.3 per cent. and remained at the higher level as long as the yeast was given. In order to discover the active agent in the yeast, 50 mg. pure vitamin B<sub>1</sub> or 6 mg. riboflavin were given daily, but there was no effect on the milk fat. When, however, both were given together there was definite rise. The author calculates that by giving vitamin B<sub>1</sub> and riboflavin to cows, the total available butterfat in Germany could be increased by at least 10 per cent, an amount covering the present deficiency and equal to the extra butterfat imported in the year 1936 to 1937. (*Nutr. Abs. & Revs.*)

THE VITAMIN-B<sub>1</sub> SPARING ACTION OF FAT AND PROTEIN. 3. THE OXIDATION OF PYRUVATE BY THE TISSUES OF SYMPTON-FREE FATS ON DIETS DEFICIENT IN VITAMIN B<sub>1</sub>. G. G. Banerji and J. Yudkin. *Biochem. J.* 36, 530-41 (1942). Earlier work has shown that rats can thrive on a diet free from vitamin B<sub>1</sub> if it contains a large proportion of fat or of protein. Expts. have now been carried out to det. whether the absence of the more obvious signs of deficiency, such as loss of wt., polyneuritis and bradycardia, extends to the defect in carbohydrate metabolism studied by the Peters

school. The respiration of kidney slices from rats on different diets was detd. in the presence and absence of pyruvate and the effect observed of the addn. in vitro of vitamin B<sub>1</sub>. It was found that the "specific metabolic defect," that is the defective oxidation of pyruvate which is restored by the addn. of vitamin B<sub>1</sub> to the respiring tissue, could be demonstrated in all animals deprived of the vitamin, whatever the compn. of the diet and irrespective of the presence or absence of other signs of deficiency.

A STUDY OF THE ANTIRACHITIC EFFECT OF FAT ON RATS RECEIVING HIGH CALCIUM-LOW PHOSPHORUS RACHITOGENIC DIETS. R. G. Booth, K. M. Henry, and S. K. Kon. *Biochem. J.* 36, 445-55 (1942). Several independent expts. have shown that vegetable fats devoid of vitamin D and triglycerides resynthesized from the fatty acids of butter or peanut oil from which the non-saponifiable residue had been carefully removed exerted a definite antirachitic effect on rats receiving high Ca-low P rachitogenic diets, as compared with littermate rats receiving similar diets in which the fat was isocalorically replaced by starch. A similar effect was observed when a synthetic high Ca-low P diet contg. 25% peanut oil in which all the P was present as inorg. phosphate was compared with a similar diet contg. only 5% of the oil but supplying in equicaloric amts. the same quantities of Ca and P. The calcifying effect of the resynthesized triglycerides of lard and of coconut, olive, linseed and soya bean oils was also demonstrated. Fat exerted no calcifying effect when added to high P-low Ca diets. A metabolic expt. showed that the addn. of fat as compared with an equicaloric addn. of starch lowers the faecal excretion of P and the urinary excretion of Ca. It is concluded that the fat effect is qual. different from that of vitamin D but that it req. further elucidation.

THE EFFECT OF VARIOUS DIETS ON THE LIVER DAMAGE CAUSED BY EXCESS CYSTINE. D. P. Earle and J. Victor. *J. Exp. Med.* 75, 179-189 (1942). The liver lesion in rats caused by excess dietary cystine (5 to 10 per cent) could be modified by diet, haemorrhage being least severe with low fat diets, necrosis most severe with synthetic diets, and fatty infiltration consistently present only with a diet low in protein and high in fat. Cirrhosis was delayed by a diet contg. 20 per cent lard and 5 per cent cod liver oil but not by a diet contg. 25 per cent butter. Addn. of 1 per cent choline inhibited fatty infiltration but did not protect the liver against damage by cystine at a level of 5 per cent in a diet low in protein and high in fat. There was no apparent correlation between the degree of fatty infiltration of the liver and the incidence or degree of cirrhosis. (*Nutr. Abs. & Revs.*)

PANCREAS AND LIVER FAT. B. Shapiro and E. Wertheimer. *Arch. Internat. Pharmacodyn.*, 64, 265-272 (1940). An alc. ext. of pancreas, purified by removal of proteins with lead acetate or by ultra-filtration, when fed or when injected intraperitoneally, prevented fatty infiltration of the livers of rats on a high fat diet. A similar effect was not observed with choline chloride fed in an amount greater than that present in the pancreatic ext. Differences between the lipotropic principle of pancreatic ext. and choline were found in their behaviour towards adsorbents and precipitants and in their resistance to boiling. A similar effect was not detected in exts. of liver and brain. (*Nutr. Abs. & Revs.*)

**INFLUENCE OF pH, TYPE OF FAT AND PANCREATIC EXTRACT UPON LIPOLYSIS IN HOMOGENIZED MILK.** I. A. Gould. *J. Dairy Sci.* 25, 869-76 (1942). Opt. pH for lipase action in a-homogenized rennet whey-fat emulsion was within the range of pH 8 to pH 9. Low pH values adversely and permanently affect lipase activity. Milk lipase is a nonspecific fat splitting enzyme capable of producing lipolysis upon a wide variety of fatty substrates under favorable conditions. Homogenization creates a condition which greatly enhances lipolysis as produced by pancreatic ext.

#### PATENTS

**CHEMICAL TREATMENT OF BLACK LIQUOR AND TALL OIL.** J. Ross and J. H. Percy (Colgate-Palmolive-Peet Co.). *U. S.* 2,296,952. The process of recovering by-products of black liquor comprises partially acidifying and extg. the black liquor with tall oil to obtain a tall oil ext. and an improved black liquor raffinate, and salting out the tall oil soaps from the black liquor raffinate in the presence of excess caustic alkali under non-oxidizing conditions.

**ACIDIFIED DIATOMACEOUS EARTH FILTER AID.** M. A. Harrison (Dicalite Co.). *U. S.* 2,296,850. In the clarification of a fatty substance the color of which is darkened by contact with diatomaceous earth, there is the step of adding to said fat a diatomaceous earth filter-aid and a quantity of a free acid only sufficient to offset said darkening effect and thereafter removing from said fat said filter-aid and substances entrained therein.

**WATER-DISPERSIBLE LECITHIN.** S. Jordan. *U. S.* 2,296,933. A water-dispersible lecithin comprises com. lecithin free of oil or fatty material dissolved in 20-25% by wt. of the lecithin in a mixt. of 75% monoethyl ether of diethylene glycol and 25% diethyl ether of diethylene glycol.

**PHOSPHATIDIC COMPOSITION.** Benjamin H. Thurman (Refining Inc.). *U. S.* 2,280,427. The process of prepg. a non-foaming high ratio shortening contg. modified phosphatidic material, comprises, addg. a small amt. of phosphatidic material to said shortening, heating the same in the presence of an adsorbent to a temp. and for a time sufficient to destroy the foaming characteristics but insufficient to destroy the high ratio properties of said phosphatidic material, and filtering the resulting mixt. in the presence of an adsorbent.

**GELATINOUS SHEETS, FILMS, AND PLASTIC MASSES.** A. W. Ralston (Armour and Co.). *U. S.* 2,298,162. A

hardened gelatin film contains a monoglyceride of a fat acid as a softening agent.

**METHOD OF SEPARATING FATTY ACIDS.** L. D. Myers and V. J. Muckerheide (Emery Industries, Inc.). *U. S.* 2,298,501. The method of conditioning a fatty acid stock to promote the formation of crystals having good filtering characteristics in solvent soln. of the stock cooled to a predetd. temp. comprises adding neutral fat to the stock in such amt. that the total fat content of the stock resides within the range of from approx. .2% to approx. 3½%.

**PROTECTIVE COATING.** H. E. Rogers (Teletype Corp.). *U. S.* 2,298,513. The anticorrosive dip soln. is a 12-20% soln. of wool fat in trichloroethylene which is used at a temp. of 150-90°F.

**MANUFACTURE OF MODIFIED ORGANIC ISOCOLLOIDS.** L. Auer. *U. S.* 2,298,270-1. Oils are bodied by heating in the presence of polar org. compds.

**MODIFICATION OF FATTY OILS.** L. Auer. *U. S.* 2,298,914-9. In bodying, the oils are heated with a small amt. of org. halogen, nitrosulfonic or cyclic compds., or org. or inorg. acid.

**PLASTIC MASSES SIMILAR TO FACTICE AND LINOXYN.** W. Wolff (General Aniline & Film Corp.). *U. S.* 2,298,078. Plastic masses similar to factice and linoxyn comprises interpolymerization products of glycol divinyl ethers and of esters of satd. ales. with tall oil.

**METHOD OF PRODUCING ALKYD RESINS.** R. H. Potts and J. E. McKee (Armour and Co.). *U. S.* 2,297,716. A synthetic alkyd resin comprises the reaction product of glycerol, phthalic anhydride and a special cottonseed oil fatty acid compn. having the lower boiling constituents of normal cottonseed oil fatty acids eliminated.

**SYNTHETIC PROTEIN RESIN AND METHOD OF MAKING THE SAME.** F. C. Atwood (Atlantic Research Associates, Inc.). *U. S.* 2,298,269. The product is a stable, water-dispersible hydrated casein straight chain alkyl amine higher fat acid soap resin.

**PROCESS OF FLOTATION SEPARATION OF ORE.** H. M. Corley, A. W. Ralston, and E. W. Segebrecht (Armour and Co.). *U. S.* 2,298,281. The process of sepg. ores comprises subjecting the ore to flotation sepn. in the presence of a flotation agent comprising a mixt. of at least 1 primary aliphatic amine and at least 1 aliphatic nitrile, each contg. at least 6 C atoms, the amt. of nitrile being about 20% to about 65% of the combined quantity of amine and nitrile.

## Abstracts

### Soaps

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**ROSIN AND TALL OIL: APPLICATION IN THE SOAP INDUSTRY.** Anon. *Soap, Perfumery and Essential Oil Record* 33, 260-62 (1942). Characteristics of rosin and of tall oil, and methods of using these in soap products are given.

Notes from Germany describe the following: (1) A potash paste soap is prepd. using caustic potash, 8 parts; water, 10 parts; tall oil, 20 parts. KCl, or linseed and soybean fatty acids reduce the viscosity. (2)

For a curd soap, use 50 parts of hard fat, 20 parts tall oil, 20 parts coco fatty acids, and 10 parts peanut oil fatty acids; 2% bleach (Blankit) makes a light yellow, odorless soap. (3) For a toilet soap there has been used a blend using: hard fat, 53.7%; tallow, 29%; and purified tall oil, 12.1%.

**THE MEXICAN SOAP MARKET.** Alic. R. Gerstell. *Soap* 18, No. 10, 25-27 (1942). Consumption was 5 lbs. per capita 10 yrs. ago, is now 10 lbs. Brown laundry soap