Several Canadian refineries are equipped with centrifugals for caustic refining, but a majority of the plants use kettles.

Bleaching kettles and filter presses are of the usual type, but due to the variety of oils handled, some with very dark colors, the bleaching agents used include a relatively large proportion of activated earths, and special mixtures of fullers earths and bleaching carbons.

High temperature and high vacuum batch deodorizers are used with vacuum cooling tanks. As far as I am able to determine, no continuous deodorizer installations have been made in Canada.

Several enclosed type chilling machines are in use, but most shortening plants use direct expansion ammonia or brine chilled rolls for chilling shortenings.

High pressure homogenizing and automatic or semiautomatic measuring and packaging equipment is generally used in Canadian plants.

Salad oil is produced by chilling in several types of vertical or horizontal tanks, and by filtration through plate and frame presses.

In the hydrogenation plants, hydrogen gas is produced by both the electrolytic and the steam iron methods.

Finished Products

The chief product made from edible oils in Canada is shortening.

The greater portion of this product is the compound type made from hydrogenated vegetable oil stearine mixed with vegetable oils. This is the shortening generally used in the households throughout the country.

Hydrogenated shortenings are made for use in biscuit and cake bakeries, and special shortenings containing emulsifying agents are also made.

Palm oil has been the cheapest edible vegetable oil obtainable in world markets for several years, and Canadian refiners have developed shortening formulae including rather large percentages of this oil blended with peanut, cottonseed, and coconut oils.

The problem presented by palm oil is that of color. This has been met with more or less success by using high temperatures, special bleaching agents, and other special processes developed by individual refiners.

Palm oil also presents a problem in the texture of shortening containing it. Too much palm oil makes a shortening too brittle, but the correct amount adds to the water-absorbing and mixing qualities of the finished product.

The cottonseed oil (from African and South American seed) used in Canada is usually inferior in quality compared to cottonseed oil from the United States, and special refining methods have been developed for processing this oil.

The peanut oil varies in quality but the average oil is satisfactory.

The coconut oil imported from the Malay States and adjoining areas is usually excellent in quality as it is made from sun-dried copra. This oil is used to some extent in shortenings, but relatively large quantities are used in special plastic substitutes for cocoa butter in coatings and fillings for sweet biscuits.

Palm kernel oil is used in Canada for the production of plastic fats by hydrogenation.

Cottonseed, corn, and soybean oils are used as salad and cooking oils with success. The salad oil business in Canada has increased greatly during the last ten years.

Sesame, kapok, and sunflower seed oils are used when they are available.

I have tried to outline the situation on edible oils in Canada during peace times and the early period of the present war in which that country is an active belligerent. What the future holds is a matter of conjecture.

With supplies of crude oils cut off from many parts of the far-flung British empire, and with increasing restrictions on exports and imports in many neutral countries, changes in raw materials for the Canadian edible oil industry will almost certain take place.

The problem of obtaining edible fats and oils will no doubt be solved by finding new sources of supply, and by utilizing more of the oils and fats produced in Canada.

Abstracts

Oils and Fats

Edited by
M. M. PISKUR

Stabilization of fats, oils and soaps. H. I. Henk. *Fette u. Seifen 48,* 90-1 (1941). A review.

Hydrolysis and oxidation of spoiling fats. E. Glimm and A. Ellert. *Fette u. Seifen 48,* 60-2 (1941). Data on butter fat, lard and triolein are presented and include change in acid, sapon. and Lea values. Peroxides were unstable above 60°. The dependence of peroxide formation on light rays was affirmed.

Deacidifying by adsorption. H. A. Boekenoogen. *Fette u. Seifen 48,* 59-60 (1941). Al_2O_3 will remove most or all the phosphatides, sterols and chlorophyll and it removes part of the carotinoid and quinoid compds.

Official grain standards of the United States for soybeans. U. S. D. A. Agr. Marketing Ser. *Fed. Register. 6,* 2675-6 (1941).

Solvent extraction of soybean oil. Editorial. *Chem. & Met. Eng. 48,* 148 (1941). Use of selective solvents to obtain from soybean oil a highly unsaturated fraction was investigated on laboratory scale and reported before the Am. Institute of Chem. Eng. in Chicago by R. E. Ruthruff and D. F. Wilcock of the Sherwin-Williams Co. The method found to offer greatest possibilities consists of extg. raw soybean oil with furfural to obtain a highly unsaturated constituent and then further extg. with a hydrocarbon solvent to eliminate materials which retard drying by acting as antioxidants.

Index of refraction of unsaponifiable. L. Kifler and R. Opfer-Schaum. *Fette u. Seifen 48,* 49-51 (1941). The optical refraction on 10 oils was investigated. It was more variable than that of the original oil. This was particularly important with olive oil which can be distinguished from other oils with this criterion. Data using a 1.4840 glass at 0° were olive 56-63, peanut 78-94, sesame 114-137, almond 106-107, linseed 94-96, grape seed 91-92, cottonseed 84, soybean 98-99 and sunflower oil 95-96.

Application of molecular distillation in the fat field. II. The distillation of glycerides. H. P.

Kaufmann and W. Wolf. *Fette u. Seifen 47,* 51-3 (1941). Experience and data on the distn. of triolein, trimyristrin, coco fat, palm kernel fat, palm oil, butter fat linseed oil and soybean oil is presented. The information on the separated fractions include temp. of distn. and acid, sapon., I and (SCN) values.

Report of the "international commission for the study of fat materials" for the year 1938/39. 1. Determination of fat in oil seeds, oil cake and other materials. H. P. Kaufmann. *Fette u. Seifen 48,* 114-22 (1941). Collaborative work is reported.

Distribution and characteristics of beef plasma fatty acids. F. E. Kelsey and H. E. Longenecker. *J. Biol. Chem. 139,* 727-40 (1941). Ester distn. analyses of these acids showed the presence in the total acetone-sol. lipids of 42% linoleic acid 21% palmitic acid and 18% oleic acid with lesser amts. of stearic, arachidic, palmitoleic, linolenic and arachidonic acids.

Lipids of the fasting mouse. H. C. Hodge et al. *J. Biol. Chem. 139,* 897-915 (1941). Mortality rate was 70% in 4 days. The utilizable carcass lipids are mobilized and disappear in 2 days; roughly ½ of the total originally present is lost each day. There is a linear relation between the logarithm of the amt. of total carcass lipids and their I no. On the assumption that the I no. of the utilizable carcass lipid is about 80 and of the essential lipid about 100 to 110, it can be shown that there is no evidence of a selective utilization of the more unsatd. fatty acids. The liver loses about ½ its wt. in 2 days, after which there is no further loss. In contrast, the body loses only 20% of its wt. in 2 days and thereafter loses an addnl. 10%.

The fat content of feed. A. E. Sandelin. *Maataloustieteellinen Aikakauskirja 11,* 86-96 (1939). It was demonstrated that the cow often receives considerable more raw fat acids in the feed than the fat produced in the milk. Therefore, it is assumed that the fat content of the feed can be a factor limiting production in the milk if the feed has a low initial fat content or if the fat in the feed becomes oxidized during drying and storage. In detg. the food value of a given feed more consideration than has been customary should be given to its fat content and to the influence of the fat of the feed on the properties of the milk fat (*Chem. Abs.*).

Pancreas and liver fat. B. Shapiro and E. Wertheimer. *Arch. Intern. pharmacodynamic 64,* 265-72 (1940). If rats are fed on a high-fat diet contg. some choline, added choline has little effect on the fatty infiltration of the liver, but pancreatic ext. is very active. Liver and brain exts. are inactive. Injections of ultrafiltered pancreatic exts., cured fatty livers and the active agent could be destroyed by boiling for 4 hrs. which has no effect on the choline in the prepn. (*Chem. Abs.*).

Influence of thyroidectomy on fat deposition in the rat. Eaton M. MacKay and James W. Sherrill. *Endocrinology 28,* 518 (1941). Ten months after thyroidectomy, adult male albino rats show a marked reduction in the amt. of body fat in comparison with unoperated controls of the same age. The av. amt. of fat is: thyroidectomized 6.4, controls 31.1 and thyroid-fed 14.2%. In spite of the low fat content the thyroidectomized rats do not appear less plump nor do they weigh appreciably less than the controls (*Chem. Abs.*).

Role of the external secretion of the pancreas in the prevention of fatty infiltration of the liver. M. L. Montgomery and I. L. Chaikoff. *Am. J. Physiol. 133,* P391 (1941). It was demonstrated by gross specimens, photomicrographs and chem. analyses that the daily ingestion of adequate amts. of pancreatic juice can replace the raw glandular tissue in the prevention of fatty livers in duct-ligated and in completely depancreatized dogs kept alive with insulin.

The relation of the vitamin b complex and liver and parcreas extracts to fat synthesis. H. E. Longenecker et al. *J. Biol. Chem. 139,* 611-20 (1941). It has previously been reported that the administration of a beef liver fraction to rats fed a fat-free diet causes intensely fatty livers, preventable by feeding lipocaic but not by choline; these livers contain large amts. of cholesterol, which is less when lipocaic is also given. There is also an increase quantity of lipids in the carcasses. The fatty acids synthesized when thiamine, riboflavin, pyridoxine and choline are given are largely C_{16} and C_{18} acids, the C_{16} acids being 54% of the total. Further supplementing the diet with the liver fraction causes a greater increase of C_{18} acids than of C_{16} acids and also augments the quantity of unsatd. acids. The fatty livers caused by the liver fraction contain large amts. of acetone-sol. fat which is kept at a normal level by simultaneously feeding lipocaic.

The prevention by choline of liver cirrhosis in rats on high fat low protein diets. Harold Blumberg and E. V. McCollum. *Science, 94,* 598-9 (1941). Cirrhosis of the liver has been produced in more than 30 rats fed high fat, low protein diets, whereas the development of cirrhosis has been prevented in a like number of animals by the addn. of choline.

PATENTS

Recovery of higher fatty alcohols. Benj. H. Thurman (Refining, Inc.). *U.S. 2,245,538.* This invention relates to a process by which oils or fats containing fatty acid radicals in combination with higher fatty alcohols are treated to form soap from the fatty acids and to recover the higher fatty alcohols substantially free from impurities.

Higher aliphatic alcohols. Wilhelm Norman. *U. S. 2,241,416-7.* In a method for prepn. of fat alcs., fats or alc. esters of fat acids are hydrogenated at 200 to 400°.

Recovery of phosphatides. Benj. H. Thurman (Refining Inc.). *U.S. 2,245,537.* In a method for recovering phosphatides from oil the gummy material is first pptd. and removed with an ag. medium having a pH of 7.

Refining of vegetable oils. Benj. H. Thurman. (Refining, Inc.). *U.S. 2,242,188.* The process is described of partially refining vegetable oils contg. gums, which comprises, mixing an aq. soln. of water soluble salt other than alkali metal halides and strongly alkaline salts with said oil to precipitate gums and reducing the viscosity thereof, and thereafter centrifugally sepg. the pptd. gums from said oil, whereby the oil entrained with said gums is reduced.

Process for refining oils. Benjamin Clayton and Walter B. Kerrick. Henry M. Stadt (Refining, Inc.), *U.S. 2,239,701.*

Process of refining oil. Benj. H. Thurman (Refining, Inc.). *U.S. 2,239,747.* Improvement in a continuous system is described.

Yarn treating composition and process. Forrest D. Pilgrim and Edwin A. Robinson (Eastman Kodak Co.). *U.S. 2,245,412.* The textile lubricant contains sulfonated olive oil, mineral oil, blown neats-foot oil, oleic acid and triethanolamine.

Prevention of autoxidation of fats and oils. Theodor Sabalitschka. *Hung. 124,996.* Esters of gallic acid are added to the fats and oils. (*Chem. Abs.*)

Mixed lauric-myristic esters and method of making same. E. F. Drew. *U. S. 2,238,441-2.* The soap and oil removed from coconut oil in refining are split, the fat acids are distilled and these are reconstructed to an edible fat.

Soap stock purification. B. H. Thurman (Refining, Inc.). *U. S. 2,239,131.* The foots from refining is

Hydraulic pressure transmitting fluid. Robt. R. Fulton (Puritan Company, Inc.). *U. S. 2,238,045.* The fluid contains castor oil, glycerin, glycols, alcohol, soap and water.

Production of lubricants for textiles. I. M. Colbeth (The Baker Castor Oil Co.). *U. S. 2,225,552.* A lubricant for textiles and the like comprising dehydrated castor oil having one of the double bonds of each acid group saturated.

Grease and the method of preparing the same. L. C. Brunstrum and R. A. Swanson (Standard Oil Company). *U. S. 2,229,368.* A heat resistant grease comprising a lubricating oil, soda rosin soap and soda soap of hydrogenated fish oil fatty acid pitch.

Manufacture of an improved tall oil. H. R. Murdock (The Champion Paper and Fibre Co.). *U. S. 2,235,462.* Tall oil is improved in relation to color and made capable to prolong standing without crystn. by heating the dry oil at 250-350° until about 5% is lost.

Hydrocarbon drying oil. Charles A. Thomas (Monsanto Chemical Co.). *U. S. 2,240,081.* The method of making a drying oil comprising heating at a temp. between 100° and 300° C. and in the presence of H_3PO_4, a resin obtained by the polymerization of an unsatd. liquid hydrocarbon in the presence of a metallic halide, and separating therefrom a liquid distillate having an I no. of at least 100.

Continuous process of treating oils. Otho M. Behr. *U. S. 2,239,692.* An app. for separating polymerized from unpolymerized by pptn. from soln. in a solvent is described.

Factice. Yosio Nanasato and Teisi Ito. *Japan 137, 731.* To natural oils contg. esters of unsatd. acids, such as soybean oil, fish oil, linseed oil or castor oil, S_2Cl_2 is added, and the mixt. is treated with ultrasonic waves, without CCl_4, to shorten the time of reaction and to obtain homogenous factice. (*Chem. Abs.*)

Ink. R. E. Coleman (The Zein Corp.). *U. S. 2,236,-521.* A printing ink comprising zein, a solvent for the zein, linseed fatty acids, and a coloring agent is described.

Abstracts

Soaps

Edited by
M. L. SHEELY

Properties of detergent solutions. pH studies on modified soda-soap solutions. Leslie Bacon, James Hensley and Thomas Vaughn. *Ind. Eng. Chem. 33,* 723 (1941). This paper is the first of a series concerned with the properties of detergent solutions and the measurement of detergent effects. There is presented here detailed pH data at 25°, 40°, 60° and 80° C. for commercial modified soda-water solutions over a wide concentration range, with and without soap. Methods and apparatus for determining pH are discussed in detail. Concentrations from 0.01-10.0 were used. Modified soda solutions are characterized by remarkably flat pH maxima at concentrations between 0.5 and 1.0 gram per liter in a pH range of 0.3 unit. Dilution buffering capacity diminishes regularly with rise in temperature at all concentrations. The low maximum pH of 10.02 at 25° reflects the physiological mildness of modified soda solutions.

The presence of soap in modified soda solutions produces interesting effects. At very low modified soda concentrations, the pH values closely approximate those of the soap solutions. At high concentrations the behavior is practically that of the builder alone. Intermediate concentrations show transitional values. At 25° C. the pH of soap is reduced by modified soda at all concentrations, the reduction increasing with concentration. At 40° C. the behavior is similar but less marked. At 60° C. reduction no longer occurs but all concentrations of modified soda increase the pH of the soap solution, while at 80° C. a still greater increase occurs. At a soap concentration of 0.1% the practical laundry builder range of modified soda concentration can be taken as approximately 0.03 to 0.3%. For this range, it is shown that the entire pH difference would be 0.04 at 40° and 0.10 unit at 60° C. yet great differences in effective washing capacity result from the use of various compositions within this range.

Reclamation of Stoddard dry cleaning solvent. Charles Lowe and Adrian Smith. *Ind. Eng. Chem. 33, 762* (1941). The adsorptive properties of activated carbon, magnesium silicate and activated fuller's earths toward fatty acids and substances associated with rancidity in dry cleaning solvents have been studied in laboratory and plant tests. Alkali absorption and mineral acid theories of dry cleaning soap decomposition are presented to account for excessive accumulation of fatty acids in Stoddard dry cleaning solvent above that derived from the garments themselves. The effect of soap on the adsorptive capacity of a powder is pointed out.

Super-fatting of soaps. *Am. Perfumer 42,* 5, 65 (1941). Among modern super-fatting agents for which recent patents have been granted are decylphenol, decylcresol, dodecyl- (b-y-dioxypropyl)-amine, nonyl-, undecyl-, tridecyl- and pentadecylketone, monodecyl- to hexadecylphenol, etc. Further recommended as super-fatting agents are sodium protalbinate, particularly for increasing the lathering capacity, lamepones, casein, preferably in a borax solution, sodium cholate and the addition of sulphonated oils, especially sulphonated fatty alcohols.

For the stabilization of soap, additions of borax, sodium thiosulphate, salicylic acid, benzoic acid and their sodium salts have been recommended. Additions of 0.1% stannous chloride as well as additions of 0.1-0.2% methyl-p-oxybenzoate or -p-phenylphenolate are also said to be very effective. According to Brit. 440,910, octylphenols and their derivates are to be used as antioxidants for soaps and vegetable oils. For the same purpose the use of p-tertiaryamyl- and butylphenol has been protected in this country.

A patented process (*Ger. 653,217*) for the production of soaps, shaving creams, etc., uses ketones contg. a