Technical Papers Summarized for Convenient Reference

At the 22nd Fall Meeting of the American Oil Chemists' Society held in New York, November 15-17, 1948, a total of 39 scientific papers was presented. These will be, for the greater part, published in coming issues of the Journal of the American Oil Chemists' Society. By holding two sessions simultaneously, the papers were all presented within the usual three days.

In this brief review the papers are discussed in the following order:

a) Nutrition of Fats
b) Preservation of Fats
1. Reversion
2. Antioxidants
3. Oxidation Phenomena
d) Detergents—Soap and Synthetics
d) Drying Oils
e) Industrial
f) Analytical

A. Nutrition of Fats

Swift and Black studied the efficiency of the utilization by rats of diets containing amounts of fat varying from 2 to 30% on an equicaloric diet with the same amounts of protein, vitamins, and minerals. It was found that the energy expense of utilization (heat increment) for the 2 to 30% fat diet varied from 36 to 16%, respectively, of the gross energy of the diet. The fat conferred economy of utilization of food energy. The fat content had little effect on nitrogen utilization. In experiments in which the nitrogen level was reduced from 22 to 7%, from 36 to 16%, respectively, of the gross energy of the diet.

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Tall oil exhibits form a large display at convention, which is being admired by H. D. Fincher (right), Anderson, Clayton, Houston, as he chats with G. J. Thomas, representative for National Southern Products Corporation. The famous Penn-Top of the Hotel Pennsylvania served as exhibit hall for 40 firms.

In a mellow mood as the 22nd annual fall meeting climbs to a record attendance are the following members of the Governing Board: (seated) J. R. Mays, Jr., Barrow-Agee Laboratories, Memphis; V. C. Mehlenbacher, Swift and Company, Chicago; C. P. Long, Procter and Gamble, Cincinnati, president; L. B. Parsons, Lever Bros., Cambridge, Mass.; (standing) G. A. Crapple, Wilson and Company, Chicago; R. T. Milner, Northern Regional Research Laboratory, Peoria; S. O. Sorensen, Archer-Daniels-Midland Company, Minneapolis; and K. S. Markley, Southern Regional Research Laboratory, New Orleans. (Other members of the board, absent at the time, are R. R. King, H. L. Roschen, and J. J. Vollertsen.)

This was interpreted as meaning that in oxidizing the oil no additional ethylene bond is produced but an additional one is formed on heating. Nichols, Reimenschneider, and Herb presented a theory of alkali isomerization of polyunsaturates using linoleic, linolenic, and arachidonic acids as examples. Mathematical expressions for the amount of conjugated diene, triene, and tetraene, as a function of time and concentration, were given for these three acids. Correlation of the limited experimental data available was attempted. Dugan, Beadle, and Henclick studied the infrared absorption spectra of autoxidized oleate in a series having a peroxide value of 1 to 940 me/kg. Principal changes occur in the frequency range of 3400-3550 cm\(^{-1}\) where bonded OOH groups absorb, and at 1650-1775 cm\(^{-1}\) where the \(\text{C} = \text{O}\) group absorbs. Two maxima were obtained in the oxidized sample. One was sharp and distinct at 3467-70 cm\(^{-1}\) and increased with peroxide value until it resolved into a true maximum at 3430 cm\(^{-1}\). The latter was attributed to state of association due to hydrogen bridging between \(\text{OOH}\) groups in hydroperoxides. Reduction of typical oxidized samples with KI reagent resulted in the disappearance of the 3430 cm\(^{-1}\) bond and appearance of a new bond about 3500 cm\(^{-1}\). Lundberg, Chipault, and Hendrickson have attempted to elucidate a number of apparently contradictory observations by various workers on the oxidation of esters of linoleic acid. A specific case is that the unexpectedly low spectral absorption of oxidized methyl oleate in the region of 2300 \(\AA\) has never been reconciled with the data obtained by Borgstrom and others. Lundberg showed that methyl linolene peroxides could be reduced by potassium iodide without change in spectral absorption in the region of 2300 \(\AA\). The chemical analysis of the reduced peroxide clarifies the autoxidation of methyl linoleate.

Knight and Swern described techniques for the accurate determination of conventional groups, such as those resulting from oxidation of fatty materials with oxygen, when peroxide and oxirane groups are present. Previous available methods do not permit this. Data by conventional analytical procedures for a series of pure compounds, synthetic mixtures, and methyl oleate hydroperoxides of 70% purity were presented. A modified procedure for determination of carbonyl oxide was reported. Swift, O’Connor, Brown, and Dellear submitted spectrophotometric evidence that delta 2:3 and delta 2:3;4:5 unsaturated aldehydes are produced during autoxidation of cottonseed oil. The semi-carbazones and the 2-4 dinitrophenylhydrazones which were prepared from the carbonyl products of oxidation indicate 2-octenal, hexenal, and probably 2,4-decadienal were produced. It is speculated these are formed by the decomposition of the isomeric hydroperoxide of linoleic acid.

C. Detergents—Soap and Synthetics

Snell reviewed the present situation and made predictions for the future. One pound of synthetics will be used for each five pounds of soap in 1948. The trend in synthetics has shown no signs of slackening. The synthetics of largest production

Merck and Company’s J. T. Owen (center) cracks a joke with F. A. Collatz of General Mills, Minneapolis, and A. E. Bailey of Girdler Corporation, Louisville.

Open house at the Sharples Corporation booth shows J. F. Bourner of Capital City Products, Columbus, in the corner, flanked on the left by W. H. Craig, Cleveland, Leo D. Jones, Philadelphia, and on the right by L. H. LaMent, Philadelphia, and W. R. Froesch, Chicago.