

lipid organic material. At such a time, the present refining test procedure would be wholly inapplicable, and a suitable test would consist primarily of a determination of the neutral oil content, possibly with an evaluation and allowance for pigments or other undesired substances not amenable to the new treatment.

While it does not appear very probable that all the cottonseed oil produced in United States will ever be refined without some type of alkali treatment, this is not necessarily the case for peanut, soybean and other domestic oils of lower non-oil content. In European refineries it has long been customary to use steam distillation under vacuum, either alone or in conjunction with alkali treatment, to reduce the fatty acid content of edible oils. This system has been little used in the United States, partly because of the dominance in past years of cottonseed oil in the fat and oil trade, partly because of the relatively lesser need in this country for taking all possible steps to avoid loss of oil, and partly because of the relative degree of decentralization of the American refining industry and the consequent lack in most plants of the rather expensive and specialized equipment required for the process. An essential requirement for efficient steam distillation, and one that has been lacking in most refineries in the United States, is a means of heating large batches of oil to high temperatures. Temperatures of 450° to 475° F. are required; distillation of fatty acids from palm oil at a good rate has been found to occur at 460° F. (4). With the introduction of Dowtherm (diphenyl-diphenyl oxide) vapor heating systems, high temperature operations have become much more feasible than they were formerly, and it seems probable that the steam distillation method of refining will find increasing use in this country. Peanut oil appears to be particularly amenable to steam treatment; preliminary experiments by the authors have indicated the possibility of satisfactorily processing certain types of peanut oil with no alkali treatment whatsoever. Should such a method of refining be generally adopted, the oils so treated would properly be evaluated by a determination of their neutral oil content, rather than by refining tests.

The present practice of assessing penalties against the oil seller for Lovibond red color in the refined oil above 7.6 units would also appear to be open to some justifiable criticism. The color of the refined oil itself

is seldom of any consequence to the manufacturer of oil and fat products, since the refined oil is usually bleached before it is further processed. It would seem more logical to make bleach colors rather than refined oil colors the basis for settlement. While refined oils with a color of 7.6 red will generally bleach by the official laboratory method to the accepted standard of 2.5 red, there are significant variations from this average relationship, not only among individual lots of oil during a single season, but also among the average oils of different seasons or of different localities. However, the case for settlement by means of bleach colors is by no means clear cut, since the introduction of the bleach test would increase the number of operations involved, with consequent increased chance for error. Further complications arise because a large proportion of the oil handled by American refiners is now hydrogenated and this process also has a marked effect on color.

It seems evident that continued research on methods of grading oil for trading purposes will be necessary if the future interests of the industry are to be served to the best advantage.

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Report of the Referee Board

For the 1941-2 season the Referee Board issued twenty-nine Referee Certificates and arranged for the distribution of 5 crude cottonseed oil samples, 5 soybean oil samples, and 10 cottonseed samples for collaborative tests. Again the number of voluntary collaborators exceeded the number of Referee Chemists taking part in this work.

The tabulated reports on the cottonseed oil samples were prepared by Messrs. Klare S. Markley, Frank G. Dollear, and Alton E. Bailey, of the Regional Research Laboratory. The tabulated reports on the soybean oil samples were prepared by Dr. Donald H. Wheeler of

the Regional Soybean Laboratory. The tabulated reports on the seed samples were prepared by Mr. R. T. Doughtie of the U. S. Agricultural Marketing Service in Memphis. To all these men and organizations the Referee Board is deeply indebted for their skillful handling of the work.

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