Manila Cocoanut Oil: Color and Fluorescence

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WHEN the tariff of 1922 went into effect cocoanut oil importations of the types commonly known as Tahiti, Java and Japanese, automatically ceased and the so-called Manila oil became our only outside supply. Before that time, these four grades were well known market products differing widely in their color ranges, though not greatly in their acid contents.

The difference then was more directly due to copra grades[1] from which the oil was derived and was little affected by factory controlled methods. The environments, climatic conditions and customs of native handling still predominate over all else in giving the copra from any locality its distinctive character, but improved conditions of manufacture have brought a change in the oil.

Manila oil prior to 1921 was produced by numerous mills, small and large and of greater or less efficiency, and in consequence the output was variable, particularly as to the color[2]. At present, however, there are about seven mills producing, all more up to date in their methods of handling the oil. The color is better and more uniform as a result of blending operations and occasional decolorizing. While in the past it was not uncommon to receive shipments of very dark oil, this is no longer encountered. This change for the better is most strikingly illustrated by the following survey of shipments entering the port of San Francisco since the beginning of 1919; those during 1919 were largely case and barrel goods, and also during the early part of 1920 considerable was received in packages, but from then on practically all shipments have arrived in bulk.

An extreme example of the manner in which oil is characterized by the copra from which it is derived, may be cited in the following record of a shipment from a locality ordinarily yielding dark colored oil. The oil from this copra was highly fluorescent with a color of 150 yellow and 35 red before refining, 100 yellow and 10 red after refining and 30 yellow and 4.7 red after bleaching, yet it was pressed from material wholly free from any contamination and only reflects a condition inherent to

COLOR & ACID COMPARISONS OF EIGHT YEARS
SHIPMENTS OF MANILA COCOANUT OIL

		1919	1920	1921	1922	1923	1924	1925	1926
Lovibond Color Readings:									
Minimum...	Yellow...	35	35	50	20	20	30	30	30
	Red.....	4.6	6.2	5.4	3.2	3.4	5.0	4.2	4.2
Maximum...	Yellow...	120	130	130	120	50	50	50	50
	Red.....	21.7	21.0	50.0	21.5	8.1	9.0	8.4	8.7
Average.....	Yellow...	60	60	90	55	40	40	30	35
	Red.....	10.7	10.2	15.1	7.9	6.4	6.5	5.8	5.9
Per Cent Free Fatty Acids (As Oleic)									
	Minimum.	2.62	2.32	1.85	1.83	1.65	1.30	2.08	2.48
	Maximum.	6.99	6.48	4.70	4.65	3.95	3.95	5.70	5.65
	Average..	4.98	4.11	3.14	3.12	3.12	2.54	3.22	3.74

the product and influenced by its curing, age and exposure. The character of the oil could easily have been mistaken as a condition brought about by marked fuel oil contamination.

A natural inference is to be drawn from the above example, namely, that when very dark oils in their crude state are decolorized (not refined), it may reduce the color to the desired point for shipment, but at the same time be found unsatisfactory when the oil is later subjected to the customary refining and bleaching process here. In such cases the oil does not respond to refining as expected and the color in consequence is but slightly changed, as the original bleaching has lowered the color about as far as it will go, and the oil in its final treatment here, does not reach the low point desired.

It therefore follows that some few crude oils while received with satisfactory color, due to more modern methods, may sometimes not be any more desirable as a result of it, as they will not much further reduce in color, or at least not to the desired point. However, such cases as these are very rare and the majority of Manila oils now received are a great improvement over the older shipments.

Fluorescence

With dark colored oils, the consideration of the cause of fluorescence arises and the possibility of fuel oil contamination. Of the large number of copra shipments examined, sundried, smokedried and mixed, and from numerous points of origin, we have yet to find a single shipment which does not show fluorescence in the pressed oil, persisting even after refining and bleaching, although considerably diminished after bleaching but sometimes even more pronounced after refining.

When this phenomenon is observed under proper and uniform conditions and with a full knowledge of the copra situation, it affords a fairly reliable means of establishing abnormal fluorescence due to fuel oil contamination. The essential factor in making deductions, with reasonable assurance however, lies in the fundamental knowledge of the type cocoanut oil under consideration, and the effect fuel oil has on the particular refined and bleached oil.

By carefully controlled observation, it is possible to reach correct and equitable decision when the extent of fuel oil contamination is of practical significance, but not when only a trace is present, as an indefinite margin overlaps between the normal and abnormal fluorescence, and in such cases no decision can be reached.

Details of this subject are referred to in previous articles[3], also the phenomenon as it applies to Chinese Cottonseed oil[4]. A further article by L. E. Fisher of Shanghai treats fluorescence as it relates to both Chinese and Indian Cottonseed Oil[5].

Reference to the subject of natural fluorescence in vegetable oils would not be complete without quoting in part references to the subject found in Bureau of Chemistry, circular 84, U. S. Department of Agriculture, by Walker & Broughton, published in 1911, in substance as follows:

"Fluorescence in an oil does not, however, prove the presence of mineral or rosin oil. A number of samples of other fatty oils (other than linseed oil), of known purity, some of which were cold-pressed from the seed in the Bureau of Chemistry, showed marked fluorescence, in some cases as marked as that of many pure mineral oils. It appears, therefore, that while it is interesting to know that the enclosed arc

is a very convenient means of strongly magnifying fluorescence, this fluorescence is not proof of the presence of mineral or rosin oil."

[1] Cotton Oil Press, Feb., 1920—"Cocoanut Oil and It's Ally," Vol. 3, No. 10, P. 40. Also Journal of the Oil & Fat Industries, Jan., 1927, Vol. 4, No. 1, P. 23.

[2] Cotton Oil Press, Nov., 1922—"Variations in Color Readings of Cocoanut Oil," Vol. 6, No. 7, P. 30.

[3] Cotton Oil Press, March, 1924—"Detection of Small Amounts of Fuel Oil in Cocoanut Oil," Vol. 7, No. 2, P. 33.

[4] Cotton Oil Press, June, 1921—"Fluorescence in Chinese Cottonseed Oil," Vol. 5, No. 2, P. 123.

[5] Cotton Oil Press, April, 1922—"Fluorescence in Chinese Cottonseed Oil," Vol. 5, No. 12, P. 36.

Pilchard Oil from Canada

The motorship *Dinteldyk* recently left Vancouver with a cargo of 625 tons of pilchard oil destined for Europe and thus inaugurated the shipping of a new British Columbia product to European markets. Converting fish into oil and meal has become an important industry on the west coast of Vancouver Island, British Columbia. This year fifteen plants are operating, ten more than last year. Two million dollars have been invested in the business and during the last few months $700,000 have been invested for new machinery for the older plants. The aggregate capacity of these plants is more than six times as great as last season, which was the first year of the industry. The first run of the pilchards commenced in June and lasted until about the end of October. If the run of these fish comes up to expectations, the value of the year's production should be in the neighborhood of $2,000,000.

Joins Staff of Arthur D. Little

C. L. McArthur, formerly Chief Technologist for the F. X. Baumert Co. Inc., cheese manufacturers, has joined the staff of Arthur D. Little, Inc., chemists, engineers and managers of Cambridge, Mass. Mr. McArthur spent several years in the capacity of research bacteriologist for the government and was at one time head of the Department of Bacteriology of the University of Akansas.

Cottonseed Crushings Increase In Seven Months' Period

Cottonseed crushed in the seven-month period, August 1 to February 28, totaled 4,951,671 tons, compared with 4,478,441 tons for the same period a year ago, and cottonseed on hand at mills February 28 totaled 818,528 tons, compared with 744,246 tons a year ago, the census bureau announced to-day.

Cottonseed products manufactured in the period and on hand February 28 were:

Crude oil produced, 1,471,752,045 pounds, compared with 1,288,592,633, and on hand, 155,680,433 pounds, compared with 121,579,275.

Refined oil produced 1,180,701,015 pounds, compared with 1,000,507,205, and on hand 460,721,631 pounds, compared with 260,451,744.

Cake and meal produced 2,218,245 tons, compared with 2,081,965, and on hand 153,639 tons, compared with 357,495.

Linters produced 806,087 bales compared with 839,708, and on hand, 194,336 bales, compared with 200,105.

Exports of linters in the period totaled 134,518 bales, compared with 59,569.

Final 1926 Ginnings Show Big Decline

The report of the U. S. Census Bureau on cotton ginnings for 1926, issued on March 21, surprised everyone by showing a decline of some 700,000 bales below the government December estimate.