Olive Oil Analytical Method*

The Use of the Ultra-Violet Ray in the Detection of Refined in "Virgin" Olive Oil

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IT becomes a matter of considerable concern to manufacturers of food products of high quality when they are forced into competition with cheaper adulterated or misbranded articles for which no distinct test is acknowledged.

The unparalleled use of renovated olive oil labeled as "virgin" olive oil results, perhaps, from the recognition of some merchants that there is in this country practically no effort devoted to the investigation of physical or chemical tests for the examination of olive oils along these lines.

Attached to this report is a list of articles concerning the use of the ultra-violet lamp for detecting the presence of refined olive oils in "virgin" olive oil.

From the beginning of the experimental work in 1925 to the present time, we consider that there has been practically no disagreement as to the advisability of accepting this test as definite and accurate, just as today the oil merchants of Nice and Marseilles are permitted the use of the lamp by the government in accepting or rejecting shipments of oil which do not approach the standard.

The practicability of the test is further deemed acceptable because in no less than ten experimental laboratories where this work has been carried on, its conclusions have distinctly shown the test accurate in every case.

We are responsible for bringing this test to the attention of Dr. K. S. Gibson of the Bureau of Standards—a report of whose experimental work was given at one of the previous meetings of this Society; but to all practical purposes there was no further research done, in spite of the apparent importance of the use of the ultra-violet lamp, both in the examination of refined and "virgin" olive oils and in the detection of admixtures of other refined vegetable oils with "virgin" olive oil.

Our own experimental work has been confined to clearing the few doubtful points which have arisen in the minds of the researchers over the past few years. For instance, Marcille in the Annales des Falsifications, Volume 21, page 189, reports that he believes the change of fluorescence of olive oils is due to the oxidation fixation properties of the unsaturated fats.

In the course of our experimental work we compared "virgin" olive oil which had remained in a tin from 1913 to the present time, whose free fatty acid was 3.74 per cent and which was distinctly rancid, with other oils. It was found that the fluorescence of this oil was absolutely the same as that of a fresh "virgin" oil sample of this year's crushing. It was also determined that the "virgin" olive oils of different origin showed no change in fluorescence; that is, the Tunisian, French, Spanish, and Italian oils acted in a practically identical manner. We likewise found that the procedure was greatly facilitated by the white background before the lamp.

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We might further mention that the sample of olive oil taken to the Bureau of Standards on October 3, 1927 (crushed during the preceding December), when viewed at the Bureau around October 15, 1928 (or close to two years from the date of its original pressing) showed no change from the original fluorescence, despite the fact that it had suffered distinct deterioration in quality.

Mixtures of refined and virgin oils placed at the disposal of the Bureau by ourselves likewise showed no change in fluorescence, and enabled us to distinguish between the samples of pure "virgin" and mixtures of "virgin" with refined olive oils.

We merely want to offer our suggestion that we believe Marcille has been misled in assuming that oxidation plays a distinct role in the blue fluorescence of a refined oil. After all, we are concerned only with the edible olive oils—"virgin" or renovated—and this experimental work did not take us into the influence of oxidation of oils beyond the time it required to render them rancid or unpalatable.

We therefore are suggesting to the American Oil Chemists' Society that they undertake the work of substantiating the reports of the ten chemists under whose direction this test has been given a place of importance in the Mediterranean countries—where far more considerable quantities of olive oil are used and merchandised, than anywhere else—and especially inasmuch as olive oil is one of the vital industries of those countries.

We are at the present time engaging in further research to more thoroughly substantiate the results already obtained although this lapse of time should not indicate any doubt as to the practicability of the test.

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