

detection of caramel coloring in milk by means of its insolubility in ether, or rather its separation in this way from other coloring-matters (annatto and aniline orange), its identification by "any of the usual tests" to follow.

We have found the method inapplicable to vinegars colored with caramel, genuine apple vinegar giving no color when shaken with ether.

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A RAPID METHOD FOR THE DETECTION OF "ANILINE ORANGE" IN MILK.

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DURING the year ending September 30, 1900, there have been examined by the Department of Food and Drug Inspection of the Massachusetts State Board of Health 6137 samples of milk, of which number 45, or 0.7 per cent., contained foreign coloring-matter. Of these colored samples, 20 contained annatto, 3 contained caramel and 22, or 48 per cent., contained "aniline orange" which generic term is used to describe those azo colors used for this purpose. The statistics of the previous five years show that 0.6 per cent. of the total samples of milk were artificially colored, of which 10 per cent. contained aniline orange. The statistics of 1900 show a decided increase in the use of aniline orange as a milk "improver."

In view of the facts that if a sample is carefully colored with a view of not getting in too much, that many samples containing color are above the legal standard and that it is very difficult to tell at a casual glance whether or not a sample is colored, a rapid method for the detection of foreign coloring-matter in milk would be invaluable to the milk analyst.

In testing a sample of milk for formic aldehyde by the well-known method of boiling with an equal volume of strong hydrochloric acid containing ferric chloride,¹ the writer found upon

¹ See Twenty-ninth Annual Report of the Massachusetts State Board of Health, 1897, p. 558.

mixing the cold acid with the milk that the resulting curd was of an intense pink color. Upon further examination by the method of A. E. Leach¹ the sample was found to contain aniline orange. As a result of this, the following method is offered for the detection of aniline orange in milk.

Place about 15 cc. of milk in a porcelain casserole and add about the same quantity of hydrochloric acid (sp. gr. 1.20) gently shaking the casserole to cause thorough mixing and to break up the curd into rather coarse lumps. If the milk contains aniline orange the curd will be colored pink while if it be free from the color, the curd will be white or yellowish, according to the natural color of the milk.

If it is desired to test the milk for formic aldehyde, this same solution may be boiled after the usual addition of a drop of ferric chloride solution and if it be present the usual purple color will appear. The presence of both substances has no effect upon either test.

Commercial hydrochloric acid to which ferric chloride has been added may be used provided that the solution is not too yellow. It has been the custom in this department to add 5 cc. of a 10 per cent. solution of ferric chloride to 2 liters of commercial hydrochloric acid, and to use this solution in testing for aniline orange and formic aldehyde in milk. Sulphuric acid cannot be employed for this purpose.

This test has been in use in this department during the past year and has given satisfactory results.

It is unfortunate that this test does not detect annatto and caramel for the analyst frequently labors in vain upon suspicious looking samples, but by applying this simple method, all the samples colored with aniline orange will be pointed out at the same time that the analyst makes the test for formic aldehyde, without the loss of time, reagent, or sample.

¹ A. E. Leach : *This Journal*, 20, 207 (1900).