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Standard Practice for Sensory Evaluation of Edible Oils and Fats¹

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1. Scope

1.1 This practice covers the recommended procedures for the sensory evaluation of edible oils and fats.

1.2 This practice covers techniques for evaluating appearance, odor, and flavor in fats and oils, for determining overall odor and flavor intensity, and the intensity of individual odors or flavors.

1.3 The techniques used in this practice are applicable to oils (liquid at room temperature) and liquified fats (solid at room temperature).

1.4 The values in SI units are to be regarded as the standard.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

[E1346 Practice for Bulk Sampling, Handling, and Preparing Edible Vegetable Oils for Sensory Evaluation](#)

[E1871 Guide for Serving Protocol for Sensory Evaluation of Foods and Beverages](#)

2.2 *Other ASTM Publications:*²

[ASTM STP 758 Guidelines for Selection and Training of Sensory Panel Members](#)

[ASTM Manual 26 Manual on Sensory Testing Methods](#)

¹ This practice is under the jurisdiction of ASTM Committee E18 on Sensory Evaluation and is the direct responsibility of Subcommittee E18.06 on Food and Beverage Evaluation.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[ASTM Manual 60 Physical Requirement Guidelines for Sensory Evaluation Laboratories](#)

3. Terminology

3.1 A lexicon specific for descriptors of odors and flavors in oils and fats is included in [Appendix X2](#).

4. Summary of Practice

4.1 This practice addresses the procedures and considerations for selection and training of oil assessors; and sample handling, preparation, and evaluation.

5. Significance and Use

5.1 The application of this practice will help ensure consistency in procedures used for the sensory evaluation of edible oils and fats.

6. Apparatus

6.1 The following equipment should be used during sample preparation and evaluation to ensure consistent sample presentation, including temperature. (See Practice [E1346](#).)

6.2 *Glass Sample Container*; use colored glass for odor/flavor evaluations to mask any color difference among samples; use clear glass for visual examination. Containers should provide a uniform sample surface area, and adequate headspace, and be lidded to retain volatiles.

6.3 *Hard Plastic Threaded Caps with Liners*, liners should be food-grade, heat-resistant, and water-tolerant.

6.4 *Circulating Water Bath*, with automatic timer, thermostat, and rack.

6.5 *Water Bath Thermometer*, with range from 20 to 100 °C in 1 °C divisions.

7. Pre-Testing for Palate Cleansing

7.1 The sensory professional should conduct pre-testing to determine the length of time required between samples to overcome sensory adaptation (fatigue). This pre-testing should include any substances used to “zero” the assessor’s nasal and oral cavities (for example, clear the nose and mouth of residual aromas and flavors), and a definition of clearing procedures – amount of clearing agent(s), length of use, number of times to clear, and so forth. (See Guide [E1871](#).)

7.1.1 For example, in odor evaluations, smelling an unscented substance and/or smelling a unused, empty sample container may be used to zero the nasal passages.

7.1.2 In flavor evaluations, an example clearing procedure could read “Rinse the mouth well with 50 ml warm water (50 ± 1) for 60 seconds between samples to clear mouth of residual flavors. Wait 2 minutes before tasting the next sample to prevent taste fatigue.” Additional substances used to clear the mouth of residual flavors of oils could include unsalted soda crackers, or a 50:50 blend of warm water and sodium-free carbonated water (50 ± 1).

8. Procedures for Selecting and Training Oil Assessors

8.1 Present prospective assessors with a series of samples and a list of applicable oil descriptors specific for the type of oil to be tested (see [Appendix X1](#) and [Appendix X2](#)). Test prospective assessors for general discrimination and the ability to describe samples and demonstrate familiarity with terms. (See STP 758.)

8.1.1 [Appendix X1](#) presents examples of odors, flavors, and tastes predominately characteristic of various oil types. Attributes are identified as typical of an unprocessed or partially processed oil (U), freshly processed oil (F), deteriorated oil (D), or origin unknown (X). The appendix is a general guideline based on the attributes typically identified for each oil type; however, other attributes may be noted.

8.1.2 [Appendix X2](#) contains definitions and examples of each descriptor.

8.2 Determine assessor training based upon the chosen test method, which may include intensity ranking, attribute recognition, or difference tests, or a combination thereof (see ASTM Manual 26). Training should familiarize assessors with the relevant products, tasks, procedures, scales, attributes, references, and so forth. (See STP 758.)

8.3 Assessors and sample servers should avoid introducing extraneous odors during testing by use of products, such as scented hand soap, hand creams, perfume, etc., or odorous writing instruments or inks.

8.4 Assessors should avoid exhaling into sample vials.

8.5 Prepare training samples characteristic of various odors or flavors and various intensity levels. Use [Appendix X1](#) and [Appendix X2](#) as guides.

8.6 Evaluate a series of concentrations starting with easily distinguished samples and proceed to more difficult discriminations.

8.7 Evaluate assessors’ consistency on repeated tests as recommended in STP 758.

9. Procedures for Oil Sample Handling, Preparation, and Presentation

9.1 For information on preparation methods for liquid oils, serving containers, sample size, heating methods for liquid samples, sample temperature, hold time, and presentation methods, see Practice [E1346](#).

9.2 If samples are not liquid at room temperature, pre-test for the times and temperatures needed to melt the sample, and at which to hold the sample without sensory changes.

9.3 If samples are presented in pairs or other multiples, it is recommended that a method be used to maintain uniform sample temperature of the oils during testing. (See Practice [E1346](#).)

9.4 Evaluations should be conducted using best practices that minimize respondent bias and distraction. (See ASTM Manuals 26 and 60.)

10. Considerations for Appearance Evaluations

10.1 Examine the color, clarity, and thickness of the sample visually. These attributes can be evaluated against the expected appearance of the oil, based on the knowledge and experience the assessor has of that oil. If the oil is an unusual color, is not clear, or is not similar in thickness/consistency compared to the previous samples, these deviations from expected visual attributes should be noted on the assessor’s ballot.

11. Considerations for Odor Evaluations

11.1 Follow prescribed palate-cleansing procedures before and between samples, including wait time between samples.

11.2 Pick up the vial containing the oil; hold the vial as close to base as possible.

11.3 Swirl the covered vial; lift to nose; remove the cover; sniff the headspace above the oil (use short, “bunny” sniffs); replace the cover quickly.

11.4 Sniff in the same manner—distance from nose, number of times, length of time, and so forth—for each sample.

12. Considerations for Flavor Evaluations

12.1 Follow prescribed palatecleansing procedures before and between samples, including wait time between samples.

12.2 Take enough sample into the mouth to enable thorough evaluations. Be consistent with amount taken for each sample.

12.3 Swish through the mouth thoroughly; cup mouth and draw air in through mouth and exhale through nose to enhance perception of aromatics.

12.4 Expectorate the sample; do not swallow the oil.

13. Keywords

13.1 appearance; aroma; flavor; odor; sample; sensory evaluation; taste; visual