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Standard Guide for Serving Protocol for Sensory Evaluation of Foods and Beverages[1]

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1. Scope

1.1 This guide describes suggested procedures for presenting samples to sensory assessors. The purpose of this guide is to provide general guidelines for conducting sensory evaluation on a variety of foods and beverages, excluding beverage alcohol.

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1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

E1627 Practice for Sensory Evaluation of Edible Oils and Fats

E1810 Practice for Evaluating Effects of Contaminants on Odor and Taste of Exposed Fish

2.2 *IEC Standard:*[3]

IEC 705 Guideline for Power Output Measurement of Consumer Microwave Ovens

3. Summary of Practice

3.1 Consistency must be maintained in all aspects of preparation and serving of samples to ensure reproducible data. Guidelines for consistency may change with the test objective.

4. Significance and Use

4.1 This guide provides general guidelines and recommendations for presenting samples to assessors for sensory evaluation. Specific situations may require variations to these guidelines.

5. Procedure

5.1 *General Guidelines*:

5.1.1 *Pretest*—A practice session may be conducted with a few staff members or assessors to determine if the selected procedures are appropriate for a specific test. Serving sizes and containers, carriers, number of samples, time between samples, number of questions, palate cleansers, sample temperature, lighting, etc., should be determined by pretesting and appropriately modified for the actual test.

5.1.2 *Product Variability*—Variability exists in all products. How product variability is handled depends on the objective of the test, the size of the effect one is attempting to detect, and the risks associated with decision making. Unless the test is designed to understand the extent of product variability, it should be minimized so that each assessor has the same stimuli.

5.1.2.1 Samples must be consistent and uniform regarding production lot, age, package size, and storage conditions, etc. All test conditions and serving procedures are determined by the test objective, test method, and test design. A descriptive test might have

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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.

[3] Available from International Microwave Power Institute, 13542 Union Village Circle, Clifton, VA 22024. Phone: (703) 830-5588.

different requirements than an acceptance or preference test. It is important that all sample preparation and serving procedures be pretested.

5.1.2.2 Consider product variability when preparing samples for a test. Based on the objective of the test, contents of all containers may be blended for a given product prior to portioning individual samples or samples may be portioned from individual containers. For example, if six bottles of a given brand of salad dressing are required for a test, it may be decided to blend the contents of the six bottles. While this option appears to provide the most uniform sampling, it masks any variation among the six bottles. This can impact the results if a positive or negative effect goes undetected.

5.1.2.3 Another consideration is the pouring sequence for products that layer, for example, blended beverages and salad dressings. Each sample should be taken from the same location within the container for all variables for a single assessor. Another consideration of product variability is the difference between exposed surfaces and interior surfaces. Some products, for example, peanut butter, mayonnaise, butter, jam, and frozen desserts, may require removal of exposed surfaces prior to evaluation. It may be important, however, to evaluate both exposed and interior surfaces.

5.1.3 *Serving Containers/Utensils*—The same type of containers and utensils should be used throughout the test. Consider the following when choosing the container/utensil:

(1) The test objective, for example, a lid may be needed for aroma evaluation,

(2) Maintaining sample characteristics, for example, size, shape, serving temperature, moisture, etc.,

(3) Product/container interaction,

(4) The amount of sample required to complete the evaluation,

(5) The amount of effort required by assessors to remove the product from the container for evaluation, and

(6) The containers/utensils should be neutral in color (unless tint is needed to mask color differences) and made of materials that are inert, nonreactive, and odor-free.

5.1.3.1 Some plastic materials are less inert, more susceptible to temperature changes, and less odor-free than others so they should be pretested prior to their use. Consider washing glassware with an unscented detergent, followed by baking at 93°C ~~(200°F)~~ for several hours, to eliminate any dusty smell. Assessors should not be able to draw conclusions about the identity of the samples due to extraneous variables not related to the test objective. It may be possible to mask color differences with light filters, subdued lighting, or tinted glassware, or combination thereof.

5.1.4 *Serving Size*—Consider the test objective when determining serving size. Provide enough of the sample to ensure the assessor evaluates the overall product, not just one or two components. The amount and size of the sample must be consistent for each assessor. Scoops, measuring cups, and top loading balances are effective for maintaining consistency.

5.1.4.1 Consider all of the test variables and product characteristics when determining sample preparation and serving protocol, for example, the top crust of bread is different from the bottom crust. Pretesting is helpful to accurately determine the amount needed, for example, the perceived spice level of a barbecue sauce may be markedly higher on the third or fourth bite than the first, so consider providing enough sauce for evaluation of both the first and third bites. It may be necessary to provide instructions to ensure that the samples are evaluated correctly, for example, "place entire sample in mouth," "be sure your bite includes the crust," etc.

5.1.4.2 It may be necessary for the assessors to eat an entire serving portion based on the test objective. Assessors should be informed of the quantity they will be required to consume prior to beginning the test. To ensure assessors comply, require them to finish the portion before completing the evaluation.

5.1.5 *Serving Temperature*—Consider the test objective in determining the sample serving temperature. The serving temperature of all samples must be consistent and within a predetermined range. The serving temperature, however, may be different than the evaluation temperature due to heat gain or loss. For example, a sample that is to be evaluated at 70°C may need to be served at 85°C. Since serving temperatures vary with product type, recommended ranges are provided in 5.4. If no range is provided, ambient temperature is recommended. Maintain the selected temperature range using hot trays, water baths, steam tables, crushed ice, or ice water. Ranges larger than those recommended may result in differences due to temperature rather than the test variables. The sample's temperature should not be so hot that the assessor cannot comfortably hold it in one's mouth. The temperature, however, should be selected to ensure the sample is microbiologically safe. It is important to monitor the temperature of the samples throughout serving and evaluation. Preheating serving containers will minimize heat loss. A new sample may need to be provided during a test period to maintain a consistent temperature. Also, consider the effect of temperature loss or gain on a product's moisture content, viscosity, and other characteristics.

5.1.6 *Palate Cleansers*—Palate cleansers should be used before evaluation and between samples. Different types of products require different palate cleansers. A palate cleanser needs to be as bland as possible and easily cleared from the mouth. Room temperature water, bottled, filtered, distilled, etc., is a commonly used cleanser. Saltine or oyster crackers, unsalted tops, are effective for many products. Other cleansers, such as warm water, a 50/50 blend of warm water and sodium-free carbonated water, or extended rest periods between samples also may be effective. For products that leave an oily residue in the mouth, consider carbonated or warm water. For flavors such as garlic and spices, milk or cream cheese may help neutralize the carryover flavor. Often, only extended rest periods will sufficiently eliminate the carryover effects of a product. Determine which cleanser or combination of cleansers is best for a product during pretesting.

5.1.7 *Carriers*—Consider the test objective and nature of the product when determining if a carrier is needed. Carriers most