Appendix D

International Olive Council (IOC)
Olive Oil Sensory Evaluation Methodology

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Taste Panel Procedures

A sensory evaluation taste panel should be looked at as a tool, like any other laboratory analysis method, that follows very specific methodologies to achieve repeatable, reliable, and valid results within acceptable statistical parameters. In order for this to occur, the tasters need to have a high skill level, they must have been well trained, and the samples need to be handled in a method that does not lead to errors. IOC recognized taste panels provide unbiased evaluations of olive oil, which can then be used by regulators to enforce label standards that protect consumers, producers, and processors from fraud in the industry. A known sensory standard provides confidence in the marketplace and trust that the olive oil label is true to the contents of the container.

There are officially recognized olive oil taste panels all over the world. The International Olive Council (IOC) is the unifying entity that maintains the basic standards for sensory evaluation. The organization has developed specific methodologies for selecting and training tasters and provides an official rating and recognition system for taste panels called a ring test, because it involves a circle of taste panels from around the world all taking the test at the same time. All of the world's panels taste and rate the same five oils two times per year and the results are compared using a standard procedure that is analyzed statistically for variability, accuracy, and uniformity. If the panel passes, it becomes "recognized" by the IOC.

IOC procedures require the use of special blue glasses so that color is not identifiable. Before the oils are tasted they are warmed to a uniform temperature of 80^{o}F (26.5^{o}C). A minimum of eight tasters rate each oil individually in silence, usually doing from three to five oils in about 30 minutes. There is a required resting time between oils, and green apples and water are used as palate cleansers, to minimize sensory fatigue.

Specific defects and or positive characteristics are recorded on a profile sheet with an undifferentiated scale that is 10 cm long. The recorded evaluations are measured at the end of the tasting and converted into a number on an intensity scale from 1-10.

Name _____ Date _____ Sample _____

PROFILE SHEET FOR VIRGIN OLIVE OIL

INTENSITY OF PERCEPTION OF DEFECTS:

Fusty/ muddy sediment ├———————————

Musty-humid-earthy ├———————————

Winey-vinegary ├———————————

Metallic ├———————————

Rancid ├———————————

Others (specify) ├———————————

INTENSITY OF PERCEPTION OF POSITIVE ATTRIBUTES:

Fruity ├———————————

☐ green ☐ ripe

Bitter ├———————————

Pungent ├———————————

Analysis of Panel Results

The standard profile sheet includes six standard defects (fusty-muddy sediment, musty, winey, metallic, rancid and "other") and three positive attributes (fruity, bitter and pungent). The marks placed on the profile sheets by the taste panel members are measured and converted into numbers. A statistical software program is used to analyze the data and place each oil into a specific category as Extra Virgin, Virgin, or Lampante oil based on the IOC standards for defect intensity levels and the presence of fruity characteristics; each grade of oil is identified by a standard that defines the intensity level of both positive and negative characteristics. The USDA sensory definition of an *extra virgin* oil, for example, is one in which the mean score of the eight panel tasters is zero defects and > 0 fruitiness. For the other grades with defects, the median of the eight panel members must have noted the same defect. The grade of *virgin* can have a defect intensity up to a mean of 2.5, and *lampante* is defined as having a defect intensity of over 2.5.

If the robust coefficient of variation of the main defect (the one that is perceived with the strongest intensity) is greater than 20% in a defective oil or the coefficient of variation is greater than 10% in an Extra Virgin oil for the fruitiness character, the test must be repeated. This means that the tasters must be quite close in identifying the primary defect in each oil, if it has one, and the intensities of the defect must be within 2 points on the 1-10 cm scale. For fruitiness, the intensity has to be within 1 point on the intensity scale.

Attribute Definitions

Fusty-Muddy Sediment, flavor of oil obtained from olives, which have undergone anaerobic fermentation

Musty, flavor of oil obtained from fruit in which fungi and yeast have developed

Winey-vinegary, flavor of oil reminiscent of wine or vinegar due to aerobic fermentation

Metallic, metal flavor from prolonged contact with raw iron during processing or oil storage

Rancid, flavor of oil that has undergone a process of oxidative breakdown

Other Defects, negatives such as matty, brined, cooked, waste water, frozen, etc.

Fruity, set of varietal characteristic from sound, fresh olives, either ripe or unripe

Bitter, taste of oil obtained from unripe olives, perceived on the back of the tongue

Pungent, biting tactile sensation perceived in the throat, also called picante

It is interesting to note that even with sophisticated laboratory analysis, the most sensitive sensory tool available is the human taster. The capacity of trained human tasters is generally about 100 times more sensitive than machines (electronic noses) for the detection of aromatic volatile compounds in most of the positive and negative attributes of olive oil. This is because the human sense of smell is able to detect, and our brain is able to remember, extremely small concentrations of numerous different complex compounds. Over 3,000 different chemical compounds have been identified in the laboratory as contributing to the flavor of olive oil and there are estimated to be another 7,000 that have not been identified. The human taster can also detect minute differences in texture that contribute to the "mouth feel" of different oils, differences that are very difficult to measure with a laboratory device.

A list of IOC recognized panels can be found in Appendix C or at the following link:
http://cesonoma.ucdavis.edu/files/48142.pdf