Commission Regulation (EEC) No 2568/91 of 11 July 1991 on the characteristics of olive oil and olive-residue oil and on the relevant methods of analysis

[F1ANNEX XII

THE INTERNATIONAL OLIVE COUNCIL'S METHOD FOR THE ORGANOLEPTIC ASSESSMENT OF VIRGIN OLIVE OIL

Textual Amendments

F1 Substituted by Commission Implementing Regulation (EU) No 1348/2013 of 16 December 2013 amending Regulation (EEC) No 2568/91 on the characteristics of olive oil and olive-residue oil and on the relevant methods of analysis.

Appendix

Method for calculating the median and the confidence intervals

Median

$$\mathrm{Me} = \left[p(X < x_m) \leq \tfrac{1}{2} \text{ and } p(X \leq x_m) \geq \tfrac{1}{2} \right]$$

The median is defined as the real number X_m characterised by the fact that the probability (*p*) that the distribution values (X) are below this number (X_m), is less than and equal to 0,5 and that simultaneously the probability (*p*) that the distribution values (X) are below or equal to X_m is greater than and equal to 0,5. A more practical definition is that the median is the 50th percentile of a distribution of numbers arranged in increasing order. In simpler terms, it is the midpoint of an ordered set of odd numbers, or the mean of two midpoints of an ordered set of even numbers.

Robust standard deviation

In order to arrive at a reliable estimate of the variability around the mean it is necessary to refer to the robust standard deviation as estimated according to Stuart and Kendall (4). The formula gives the asymptotic robust standard deviation, i.e. the robust estimate of the variability of the data considered where N is the number of observations and IQR is the interquartile range which encompasses exactly 50% of the cases of a given probability distribution:

$$s^* = \frac{1{,}25 \times \mathrm{IQR}}{1{,}35 \times \sqrt{N}}$$

The interquartile range is calculated by calculating the magnitude of the difference between the 75th and 25th percentile.

$$\mathrm{IQR} = 75\text{th percentile} - 25\text{th percentile}$$

Where the percentile is the value X_{pc} characterised by the fact that the probability (*p)* that the distribution values are less than X_{pc} is less than and equal to a specific hundreth and that simultaneously the probability (*p)* that the distribution values are less than or equal to X_{pc} is greater than and equal to that specific hundredth. The hundredth indicates the distribution fractile chosen. In the case of the median it is equal to 50/100.

$$\text{percentile} = \left[p(X < x_{pc}) \leq \tfrac{n}{100} \text{ and } p(X \leq x_{pc}) \geq \tfrac{n}{100} \right]$$

For practical purposes, the percentile is the distribution value corresponding to a specific area subtended from the distribution or density curve. To give an example, the 25th percentile represents the distribution value corresponding to an area equal to 0,25 or 25/100.

In this method percentiles are computed on the basis of the real values which appear in the data matrix (percentiles computing procedure).

Robust coefficient of variation (%)

The *CVr%* represents a pure number which indicates the percentage variability of the set of numbers analysed. For this reason it is very useful for checking the reliability of the panel assessors.

$$\mathrm{CV}_r = \frac{s^*}{\mathrm{Me}} \times 100$$

Confidence intervals of the median at 95%

The confidence intervals at 95% (value of the error of the first kind equal to 0,05 or 5%) represent the interval within which the value of the median could vary if it were possible to repeat an experiment an infinite number of times. In practice, it indicates the interval of variability of the

test in the operating conditions adopted starting from the assumption that it is possible to repeat it many times. As with the *CVr%*, the interval helps to assess the reliability of the test.

$$\mathrm{C.I._{upper}} = \mathrm{Me} + (c \times s^*)$$

$$\mathrm{C.I._{lower}} = \mathrm{Me} - (c \times s^*)$$

where C = 1,96 for the confidence interval at the 95% level.

An example of the calculation sheet is presented in Annex I to the standard IOC/T 20/Doc. No 15.

References

(1) Wilkinson, L. 1990. Systat: The system for statistics. Evanston, IL.SYSTAT Inc.

(2) Cicchitelli, G. 1984. Probabilità e Statistica. Maggioli Editore, Rimini.

(3) Massart, D.L.; Vandeginste, B.G.M.; Deming, Y.; Michotte, L. 1988. Chemometrics. A textbook. Elsevier. Amsterdam.

(4) Kendall, M.G.; Stuart, A. 1967. The advanced theory of statistics. Vol. 1. Hafner Publishing Co.

(5) McGill, R.; Tukey, J.W.; Larsen, W.A. 1978. Variation of Box Plots. The American Statistician, 32, (2), 12-16.

(6) IOC/T.28/Doc. No 1 September 2007, Guidelines for the accreditation of sensory testing laboratories with particular reference to virgin olive oil according to standard ISO/IEC 17025:2005.

(7) IOC/T.20/Doc. No 14.

(8) IOC/T.20/Doc. No 15.

(9) ISO/IEC 17025:05.]

Status:
Point in time view as at 04/12/2016.

Changes to legislation:
There are outstanding changes not yet made to Commission Regulation (EEC) No 2568/91. Any changes that have already been made to the legislation appear in the content and are referenced with annotations.