

Organoleptic Assessment of „Extra Virgin“ Olive Oil Combined with Sensory Evaluation of Harmony and Persistency Including Aroma Description

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Initial Position

Within the European Union the official organoleptic assessment of Olive Oil is based on the standards of the International Olive Council (IOC) as well as the EC Regulation 640/2008 of the European Commission. The so called "Panel Test" considers the detection of certain negative attributes as well as the intensity measurement of fruitiness besides bitterness and pungency. This sensory evaluation leads to the classification of Olive Oil as either "Extra Virgin", "Virgin" or "Lampant". In case of the grade "Extra Virgin", which is our main interest in the study at hand, the minimal request is only a median of defects equal to zero (= 0) and a median of fruitiness above zero (> 0).

Approach

Reality on the international Olive Oil market shows (Figure 1), that on the classification level "extra virgin" – that means within one and the same category – there is a broad range of sensory totally different olive oils merged together. There are differences coming from the diversity of origins and olive varieties but as well from the quality levels for either blends or monovarieties. The latter is not at all visible and the consumer would urgently appreciate help for orientation within the category of "extra virgin" Olive Oils. In order to solve this problem, the study at hand did define further attributes as there are "Harmony", "Persistency" and certain aroma descriptors that suit for a profiling of Olive Oils.

Definitions

Harmony: Degree of balance of all positive characteristics or – in case of lower quality – the degree of disharmonic balance, including olfactory, gustatory, tactile and kinesthetic stimuli. Harmony includes the intensity of positive attributes as well as their complexity [Bongartz, Oberg, 2009]

Balance ("well balanced"): Oils that show no lack of balance between olfactory, gustatory and tactile sensations respectively no median of bitterness / pungency that is two points higher than the one of fruitiness [IOC, 2008]

Persistency: Lasting nature / Length of time that retronasal (positive) sensations persist in the mouth [IOC, 2007]

Aromatic description: Set of positive olfactory sensations characteristic of the oil, depending on the variety of olives and either reminiscent of green or of ripe fruit [IOC, 2007]

Methodology and Validation

This extended objective methodology was cross-validated by the German (DOP) and the Swiss Olive Oil Panel (SOP) and allows as well a sensory differentiation of Olive Oils on a very high quality level as a differentiation of Olive Oils below standard level. The attribute "Harmony" is evaluated on a 10 cm scale that leads from "totally disharmonious" over "average" to "complex / harmonious" (Figure 1). The attribute "Persistency" is evaluated as well on a 10 cm scale, but in this case the scale leads from "very short" over "average" to "very long" (Figure 2).

The robust coefficient of variation (CVr) of "Harmony" and "Persistency" has to be below 10%, single results that exceed a standard deviation of 1.5 have to be eliminated as outliers and the minimum number of valid results must be at least 6.

References:

- VERORDNUNG (EG) Nr. 640/2008 DER KOMMISSION vom 4. Juli 2008 zur Änderung der Verordnung (EWG) Nr. 2568/91 über die Merkmale von Olivenölen und Oliventresterölen sowie die Verfahren zu ihrer Bestimmung
- Bongartz A., Oberg D., 2009: „Organoleptic Assessment of „Extra Virgin“ Olive Oil Combined with Sensory Evaluation of Harmony and Persistency including Aroma Description, unpublished
- IOC, 2005: METHOD FOR THE ORGANOLEPTIC ASSESSMENT OF EXTRA VIRGIN OLIVE OIL APPLYING TO USE A DESIGNATION OF ORIGIN
- IOC, 2007: „SENSORY ANALYSIS OF OLIVE OIL“, METHOD FOR THE ORGANOLEPTIC ASSESSMENT OF VIRGIN OLIVE OIL, COI/T.20/Doc. No 15/Rev. 2

defective / totally unharmonious (≤ 3)	unharmonious (3.1 – 4.4)	average (4.5 – 5.4)	harmonious (5.5 – 6.4)	complex / harmonious (≥ 6.5)
single defects without median, totally inharmonious aspects (e.g. gallic bitterness)	many inharmonious aspects	no negative aspects, few aroma components, often overripe	more complex aroma profile, flavour above average	very complex aroma profile, pronounced harmony / persistency, excellent flavour

Figure 1: „Harmony“ Scale (10 cm)

very short	short	average	long	very long
positive aspects do not last at all	positive aspects do last less long than average	medium persistency	positive aspects last longer than average	positive aspects do last very long

Figure 2: „Persistency“ Scale (10 cm)

Study

During 2007 and 2008 overall 1025 "extra virgin" Olive Oils were evaluated by the German (DOP) and the Swiss Olive Oil Panel (SOP). Among them were 685 Olive Oils of Standard Quality (from the market) and 339 of Premium Quality (from the International Olive Oil Award – Zurich (IOOA)). Figure 3 shows that – considering the "Harmony" of these Oils – the Standard Oils are rated at lower levels compared to the Premium ones that are mainly found at higher levels. "Labels" for the different ranges of the scale explain the different quality levels within the category "extra virgin" (Table 1).

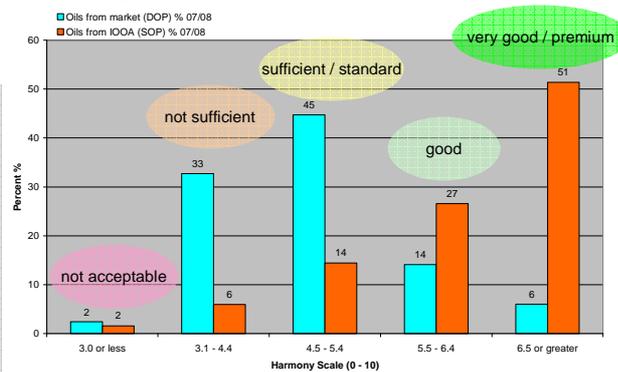


Figure 3: Harmony of „extra virgin“ Olive Oils of the years 2007/2008

Table 1: „Labels“ within the category of „extra virgin“ Olive Oils

Label	Description / Meaning
not acceptable	panel results show various single defects, but no significant median for a defect; there might be partly unknown defects, perhaps totally inharmonious aspects like for example a certain gallic bitterness; on a whole these oils are more virgin than extra virgin
not sufficient	often and mainly blends out of the low prize category, which show many inharmonious aspects
sufficient / standard	no negative aspects at all, but also nothing exciting concerning the presence of aroma components; these oils are often overripe and not always perfectly blended, mainly blends of the low prize category
good	these oils are above average in flavour; they show an already more complex aroma profile that can be traced back to the variety used or the excellence of the blend
very good / premium	oils with a very complex aroma profile, a pronounced harmony and persistency and therefore an excellent flavour

Conclusion

The main benefits for the olive oil market (producers, retailers, consumers) appears in the possibility of not only an evaluation but also a differentiation of quality within the category of "extra virgin". The methodology is applicable not only for Premium but likewise for Standard Oils.

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