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Panel training programme for the Protected Designation of Origin "Aceituna Aloreña de Malaga"

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RESUMEN

Formación del panel analítico para la Denominación de Origen Protegida "Aceituna Aloreña de Málaga".

Se presenta el programa de formación de catadores para la Denominación de Origen Protegida (DOP) "Aceituna Aloreña de Málaga". Este programa, de 52 h de duración, se realiza en 2 etapas: una primera de selección (4 h) donde se eligen a los candidatos más adecuados entre industriales y técnicos del sector y una segunda de entrenamiento (48h) que consta de 2 fases: una primera general (12h) donde los catadores aprenden el vocabulario y desarrollan la memoria sensorial y una segunda específica (36h) donde se establece la forma de preparación de la muestra, las condiciones del ensayo, la hoja de perfil y los criterios de aceptación y rechazo para la DOP. Se valoran 9 atributos sensoriales: 4 de olor (frutado, verde/hierba, aliño y láctico), 2 de aroma (frutado y aliño), 2 sabores básicos (ácido y amargo) y 1 de textura (crocante) y la ausencia de defectos. La aceituna Aloreña de Málaga se caracteriza por su olor y aroma afrutado y a aliño, por su sabor amargo y por su textura crocante.

PALABRAS CLAVE: Aceituna de mesa – Análisis sensorial.

SUMMARY

Panel training programme for the Protected Designation of Origin "Aceituna Aloreña de Malaga".

A training programme (52 h) was developed for the Protected Designation of Origin (PDO) Aceituna Aloreña de Málaga quality certification panel. Recruiting of the panel was done by personal interview with open questions between producers and technicians of the product and seven tests were submitted to potential candidates during the selection step (4h). Training was done in two stages: a basic training period (12h) in which the assessors developed their sensory memory and improved their aptitude for detecting, recognizing and describing the sensory stimuli and a specific training period (36 h), in which the sample preparation, test conditions and the sensory profile were established. The specific training finished when the evaluation method and requirements of the Aloreña olives for the PDO were established and the panel work as a whole. 9 positive descriptors were analyzed in order to characterize Aloreña table olives: 4 for odor (fruity, green, seasoning and lactic), 2 for aroma (fruit and seasoning), 2 for basic tastes (acid and bitter) and 1 for texture (crunchy). The Aloreña olive from Málaga is characterized by its fruity and seasoning odor and aroma, bitter taste and crunchy texture.

KEY-WORDS: Olives – Sensory analysis.

1. INTRODUCTION

Europe is known for the diversity of its farming and its agricultural products, which derive from its natural environment and farming methods developed over centuries. Europe has many different regions which have specific production methods and culinary traditions. As the exceptional nature and quality of some products derive from both their place of production and the methods used to make them, European Union law protects the names of these high quality regional food products within the Protected Geographical Status: PDO (protected designation of origin), PGI (protected geographical indication) and TSG (traditional specialty guaranteed).

The cracked, green, seasoned Aloreña is a table olive specialty whose production and consumer demand are progressively increasing (Arroyo-López et al., 2008b). There are three different processing styles of Aloreña table olives: the fresh green olives which develop a lactic fermentation in brine for a minimum of 3 days at a maximum temperature of 15 °C and are subsequently seasoned and finally packed; the traditional olives which also develop a lactic fermentation in brine but for a minimum of 20 days, then are seasoned and packed and cured olives that have a lactic fermentation in brine for a minimum of 90 days and are finally seasoned and packed (BOE nº 43, 2008/02/19).

The production and development area of the Aloreña olive from Málaga is a sub region of the southern Guadalhorce region, situated in the southwest of the province of Malaga (Spain) and has a total area of 230,500 hectares. The olive trees are influenced by the environmental conditions in which they grow, so the production area provides them with some very distinctive climatic characteristics, with moderate winters and

hot summers, that have affected this variety's quality. The product's excellence and its clear differentiation from other varieties moved the Aloreña de Málaga Producer's Association to apply for PDO status in 2009 (EU Dossier number ES/PDO/0005/0785).

In order to obtain a quality certification, it is neccesary to characterize the food product, with the sensory attributes having the most influence in differenciating among products (Pérez Elortondo *et al*., 2006).

Although there are some studies on Aloreña table olives that examine the microbiological status, chemical composition and process (Arroyo-López *et al*., 2007; Arroyo-López *et al*., 2008a; Arroyo-López *et al*., 2008b; Arroyo-López *et al*., 2009; Bautista-Gallego et al., 2010 and Bautista-Gallego *et al*., 2011), their sensory studies have not yet been reported.

The objective of the present work was to present the training programme of the "Aceituna Aloreña de Malaga" PDO panel. The programme includes the necessary criteria to assess the sensory attributes of the three processing styles of Aloreña table olives and the PDO requirements.

2. MATERIAL AND METHODS

2.1. Samples

Table olive samples from the 2009, 2010 and 2011 growing seasons of the three processing styles of the Aloreña variety were used for the panel training and for the establishing of the requirements of the PDO Aceituna Aloreña de Málaga.

2.2. Methods

Selection and Training of the sensory panel

The procedure followed for the seleccion, training and monitoring of assessors was based on the criteria of ISO (1993) and Jellinek (1985). Recruiting of the panel was done by personal interview with open questions between producers and technicians of the product. The selection programme was carried out in two sessions of 2 hours each (4h). Seven tests were submitted to potential candidates with the aim of evaluating their ability to recognize, discriminate and describe stimuli (Table 1). Training (Tables 2 and 3) was done in two stages (48h): a basic training period (12h) in which the tasters developed their sensory memory and improved their aptitude for detecting, recognizing and describing the sensory stimuli, and a specific training period (36 h), in which they became familiarized with the profile sheet of the Aloreña table olives and learnt to recognize and quantify each attribute defined (Galán-Soldevilla *et al*., 2005; Ruiz Pérez-Cacho *et al*., 2005, Pérez-Cacho *et al*.,2005 and 2008). The training finished when the evaluation method, requirements of the Aloreñatable olives for the PDO and the panel work as a whole were established.

2.3. Statistical analysis

Spreadsheet folder-profile software was used to analyze the data. The program was designed in accordance with that established for virgin olive oils opting for a PDO(IOOC, 2005).

3. RESULTS AND DISCUSSION

3.1. Recruiting and selection

The recruiting of individuals was carried out among industrialists and technicians in the table olive sector in the Guadalhorce Valley (Málaga, Spain) area. From 20 individuals initially, 15 were pre-selected and 5 were eliminated, mainly for not having the time available.

Table 4 presents the results obtained in the selection tests. Of the 15 candidates evaluated, 12 were selected. Candidates nº 7, 14 and 15 did not pass the selection criteria and were rejected. Individuals nº 3, 6 and 12 did not pass the recognition and discrimination tests, although they showed a keenness for participating in the panel and it was decided to accept them (Ruiz Pérez-Cacho *et al*., 2005,Berodier *et al*., 1997).

3.2. Basic training

The individuals selected received 12 hours of basic training. This training was structured in theoretical and practical classes in which the candidates learnt the sensory language and the use of reference scales and improved their sensory memory (ISO, 1993, Gallerani *et al*., 2000, Ruiz Pérez-Cacho*et al.,* 2005, ISO, 2008).

3.3. Specific training

The specific training period was carried out in nine sessions (36 h). During the first two sessions (sessions 1-2) the assessors became familiarized with the profile sheet developed by UCO panel, presented as Figure 1 (Galán-Soldevilla and Ruiz Pérez-Cacho, 2010). Sample preparation, serving and tasting procedures were also established. The olive samples were taken directly from the commercial containers and presented in normalized tasting glasses (IOOC, 2010) placing in each a minimum of 5 olives covered in brine from which the seasonings were previously removed. The glasses were covered with watch glasses and kept closed for at least 1 hour at room temperature before tasting. Mineral water was used for mouth rinsing between each sample. In each sample, first the odor was evaluated, then the flavor (aromas, basic tastes, and trigeminal sensations) and, finally, the texture attributes. The evaluation of the odor

Table 1
Selection programme

Test no.	Ability	Test	Reference	Selection criteria*		
				Max. Scoring	Selection %	Acceptance points
1	Basic tastes recognition	Ability to identify four basic tastes in water (sweet, salty, acid and bitter)	Jellinek, 1985	10	70	> 7/10
2	Basic tastes discrimination	Ranking test sweet	Jellinek, 1985	4	50	> 2/4
3	Basic tastes discrimination	Ranking test salt	Jellinek, 1985			
4	Basic tastes discrimination	Ranking test acid	Jellinek, 1985			
5	Basic tastes discrimination	Ranking test bitter	Jellinek, 1985			
Recognition and discrimination criteria selection						**≥ 9/14**
6	Odor recognition and description	Direct olfaction test (orthonasal) of thyme, lemon, lavander, hazelnut and rose	ISO 5496:2006	15	50	> 7/15
7	Ability to describe and communicate sensations (appearance, flavor and texture)	Description test of different table-olive (green and traditional aloreña de Málaga, hojiblanca, gordal and manzanilla)	ISO 8586-1:1993 ISO 22935-1:2009	25 + 3	60	> 17/28
Description and communication criteria selection						**≥ 24/43**
TOTAL SCORES						**≥ 33/57**

*Basic tastes test: 10 different solutions, 1 point for each correct solution.

4 Basic tastes discrimination tests: 1 point for each correct test.

Odor recognition and description test (5 odor substances): describe and identify = 3describe or identify = 2
vague description = 1
no description = 0

Descriptive test of five table-olives: 1 point correct sensory attribute: 1 point max. odor
1 point max. aroma
1 point max. basic tastes
2 point max. texture
3 extra point: ability to communicate sensations

Table 2
Training programme

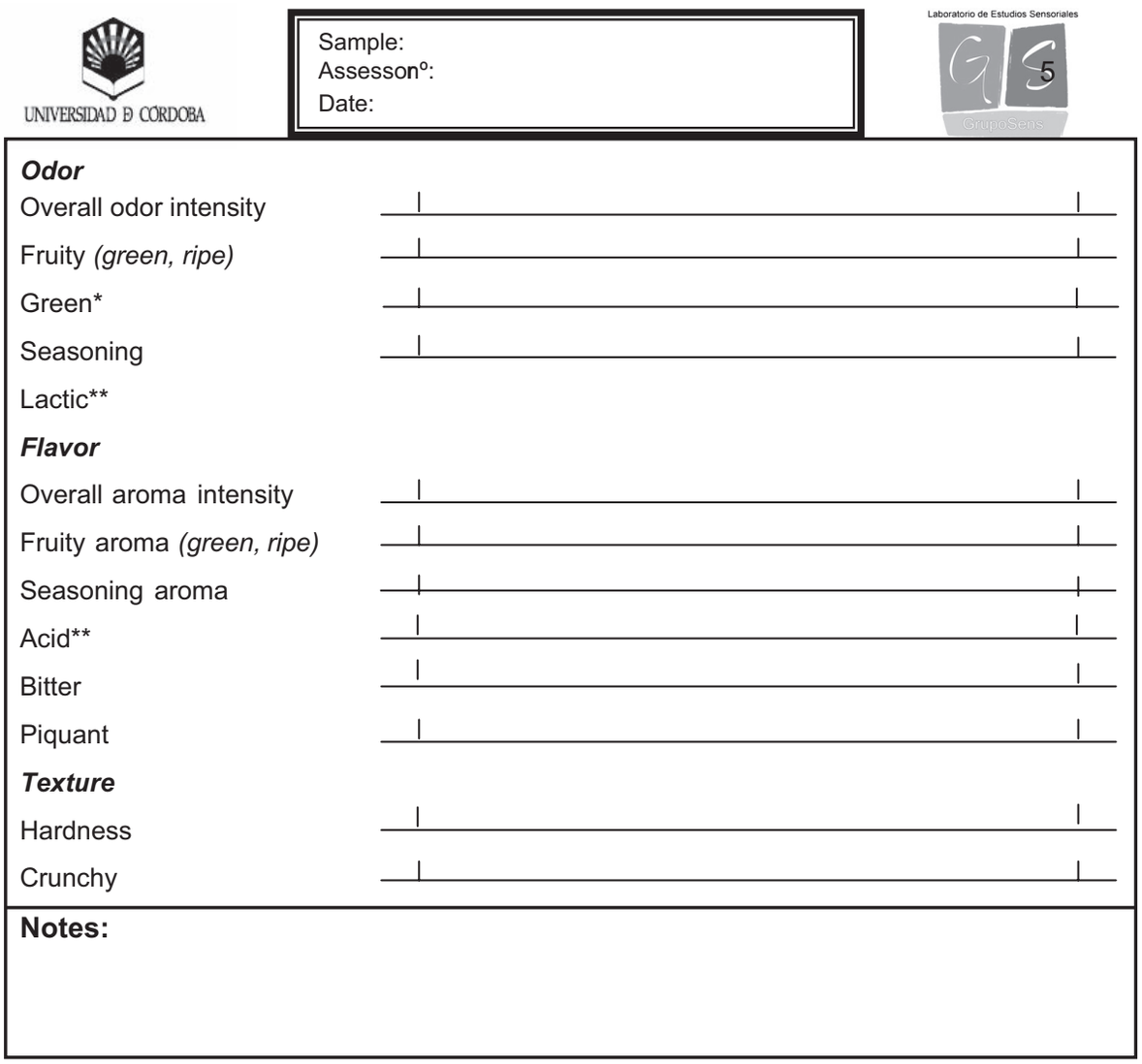
Basic training activities (12 h)	Specific training activities (36 h)
Session 1: introduction to sensory analysis and objective of the project. *Session 2: appearance.* 1. Theory: vocabulary (ISO 5496:2008). 2. Practice: –Color test http://grupoorion.unex.es/index2.html). –Description test (table-olives). *Session 3: texture.* 1. Theory: vocabulary (ISO 5496:2008). 2. Practice: –Standard scales of texture (UNE 87025:1996) –Description test (table-olives) *Session 4: flavor* 1. Theory: vocabulary (ISO 5496:2008) 2. Practice: –Flavor (odor/aroma, basic tastes and trigeminal sensations) recognition test (Table 4)	*Session 1-2:* confirmation of the lexicon developed by the UCO trained panel and development of new terms for describing alora table-olives and establishment of the test conditions. *Session 3-4:* election of references and development of the final sensory profile sheet. *Session 5-8:* use of the sensory profile sheet by the assessors and establishment of the acceptance/ rejection criteria of table- olives for the PDO. *Session 9*: Checking the panel's performance

Table 3
Flavor recognition test

Attributes	References	
Acid	Citric acid	0.3 g are dissolved in 1 L of water. 30 mL of dissolution in plastic cup of 50 mL
Bitter	Caffeíne	0.3 g are dissolved in 1 L of water. 30 mL of dissolution in 50 mL plastic cup
Salty	Sodium chloride	2 g of salt are dissolved in 1 L of water. 30 mL of dissolution in 50 mL plastic cup
Umami	Monosodium glutamate	0.6 g of monosodium glutamate + 0.5 g of soldium chloride in 1 L of water. 30 mL of dissolution in 50 mL plastic cup
Fruity		Extra virgin oil from Aloreña olives. 30 mL in 50 mL plastic cup
Green/grass	cis-3-hexen-1-ol or newly cut grass	1 drop in 50 mL of water or newly cut grass. The olfaction strips are impregnated with the dissolution or the grass is wrapped in aluminium paper
Green/leaf	Olive tree leaf	Several olive tree leaves are wrapped in aluminium paper
Fennel	Fennel	Newly cut fennel in plastic assay tubes with stoppers
Thyme	Thyme	Newly cut thyme in plastic assay tubes with stoppers
Seasoning	Mixture of garlic, red pepper, fennel and thyme in an equal proportion	Mixture of spices in a plastic container with stopper
Acetic acid/ vinegar	Wine vinegar	50% diluted wine vinegar. 2 mL of the dissolution in a plastic assay tube with stopper.
Butyric	Butyric acid	0.1 g dissolved in 1 liter of water. 2 mL of the dissolution in a plastic assay tube with a stopper
Propionic	Propionic acid	0.1 g dissolved in 1 L of water. 2 mL of the dissolution in a plastic assay tube with stopper.
Pungent	Virgin oil from the Picual olive variety	30 mL of dissolution in 50 mL plastic cup
Astringent	A piece of kaki	A small portion of fruit is presented on a white plastic plate with a plastic teaspoono

Table 4
Results of candidates in the selection

Candidate no.	Basic tastes recognition test	Ranking tests	Points (≥ 9/14)	Odor recognition and description test	Table-olives description test	Points (≥ 24/43)	Candidate selected
1	8	3	11	8	20	28	+
2	7	2	9	7	19	26	+
3	6	2	8	6	20	26	+
4	8	2	10	8	20	28	+
5	7	2	9	7	20	27	+
6	6	2	8	8	20	28	+
7	4	1	5	5	15	20	–
8	9	3	12	8	22	30	+
9	9	3	12	8	22	30	+
10	10	3	13	8	20	28	+
11	7	2	9	6	20	26	+
12	6	2	8	6	20	26	+
13	10	3	13	7	20	27	+
14	5	1	6	5	17	22	–
15	4	1	5	5	17	22	–



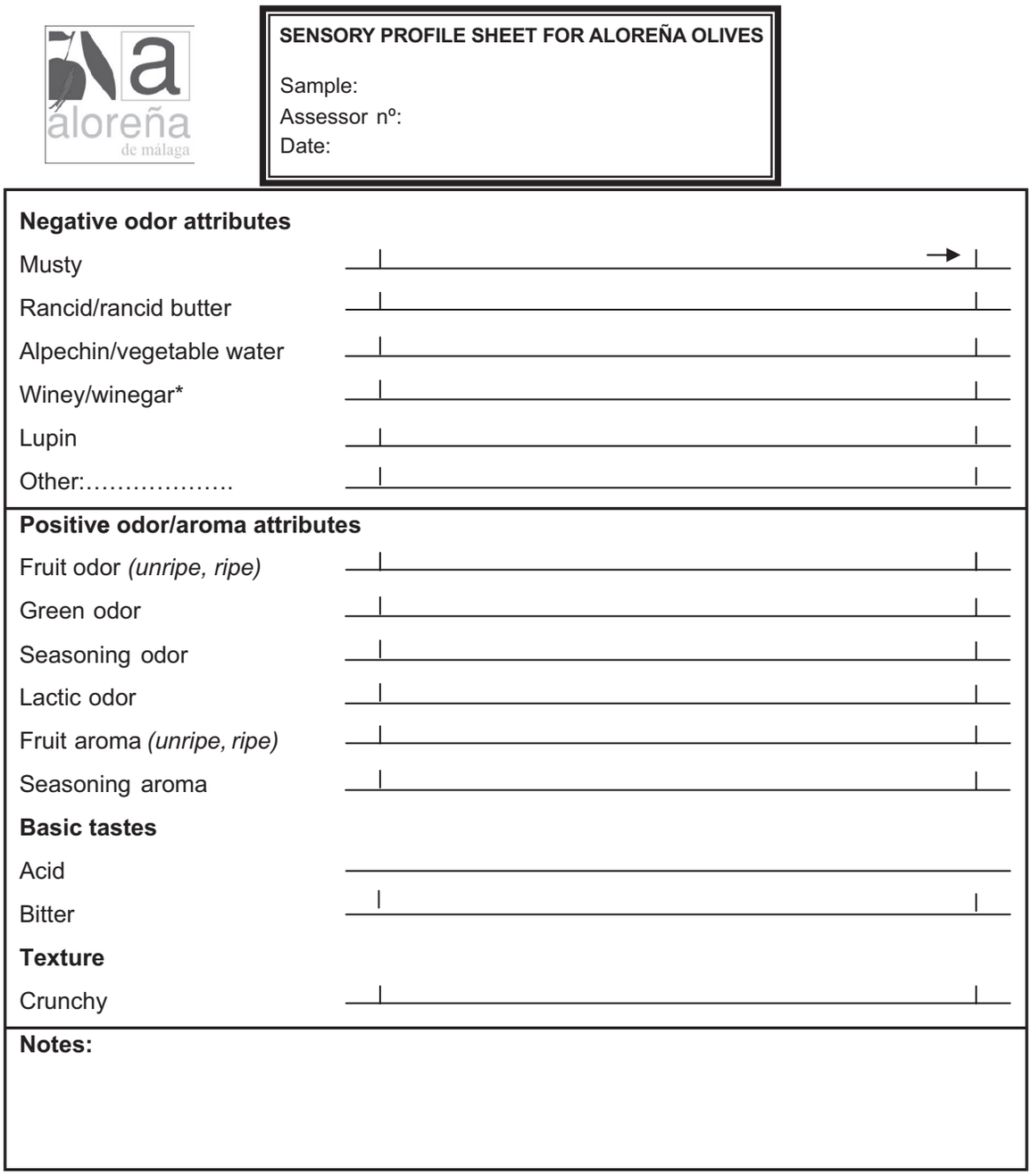
* Only for green and traditional table olives.
** Only for cured table-olives.

Figure 1
Sensory profile sheet Developed by the UCO panel.

was made by direct aspiration of the air over the tasting glass in 2 phases: first with the glass in place in order to detect any possible defects and then after shaking it gently to determine the different odor attributes.

Next, in two sessions (sessions 3-4) some references were selected to facilitate the comprehension and quantification of the attributes and the characteristic profile sheet for the PDO was drawn up (Figure 2). Two sensory attributes, hardness and piquant, were eliminated from the initial profile sheet because they were not relevant for characterizing the Aloreña table olives. Therefore, 9 positive descriptors were maintained to characterize "Aceituna Aloreña de Málaga": 4 for odor (fruity, green, seasoning and lactic), 2 for aroma (fruity and seasoning), 2 for basic tastes (acid and bitter) and 1 for texture (crunchy). In addition, six odor negative attributes (musty/humid, winey/winegar, alpechin/vegetable water, rancid/ rancid butter, lupin and other) were added by the panel according to the International Olive Oil Council (IOOC, 2010). Table 5 shows the sensory attributes, their definitions and the references selected.

During sessions 5-6 of the specific training in open panels, the assessors worked with the profile sheet (Figure 2), learnt to quantify each attribute defined and to work in a group. In sessions 7-8 the panel established the requirements for the PDO Aceituna Aloreña de Málaga in accordance with IOOC (2005) (Table 6). Thus, for the green olives all the descriptors except for the green odor attribute have a mean value higher than 5 and a rCV % lower than 10; for the traditional olives, the seasoning odor and crunchy texture have a mean value higher than 5, the bitter taste higher than 3 and the fruity odor higher than zero, with the rCV % lower than 10 for all the attributes; finally the cured olives should have a seasoning odor and crunchy



*It is not a sensory defect for the cured olives.

Figure 2
Sensory profile sheet Developed by the PDO panel.

texture with a mean value higher than 5 and a rCV % lower than 10. According to IOOC (2005), if the descriptor represents a characteristic that is of particular importance to the designation of origin, the rCV % limit should be as low as possible ($<$ 10) in order to ensure good precision and a reliable measurement. The green odor attribute was the most difficult one to evaluate by the panel and it was decided to choose a reasonable value for the robust coefficient of variation ($<$ 20). In addition, the olives presented for the PDO must correspond to the commercial categories "Extra" or "First" and not have any sensory defects perceptible to the panel except for very slight ones regarding color, shape, pulp or epidermis firmness (IOOC, 2004 and 2010). Once the characteristic profiles of the PDO and its requirements were established, a statistics program was designed (spreadsheet folder-profile, software) for the analysis of the results. This program determines whether or not the samples analyzed fit the profile established by the PDO. The program is designed in accordance with the one established for virgin olive oils opting for a PDO (IOOC, 2005).

In the last session (session 9), nine samples were analyzed in tasting booths in order to check

Table 5
Sensory attributes and references

Sensory attribute	Definition	Reference (R)	Scale value
Positive odor/aroma attributes			
Fruit	Odor/aroma characteristic of fresh olives, either ripe or unripe. It is perceived directly and/or through the back of the nose.	Extra virgin olive oil from Aloreña olive	R = 9
Green	Odor/aroma characteristic of newly cut grass	Newly cut grass or 1 drop of cis-3-hexen-1-ol in 50 ml of water	R = 9
Seasoning	Odor/aroma characteristic of spices and herbs added to the olives (thyme, fennel, garlic, red pepper) in a balanced proportion	Mixture of spices used in seasoning of Aloreña olives in such a proportion that not one stands out over the others	R = 9
Lactic acid	Odor characteristic of milk acidified	A yogurt	R = 9
Negative odor attributes			
Musty	Odor of olives attacked by moulds and yeasts due to prolonged storage in damp places	Standard given by IOOC	
Fusty/Muddy sediment	Odor of oil obtained from olives piled or stored in such conditions as to have undergone an advanced stage of anaerobic fermentation.	Standard given by IOOC	R = 5.7
Winey/ Vinegary	Odor characteristic of fermented olives generating lactic acid, acetic acid, ethyl acetate and ethanol.	50% diluted wine vinegar. 2 ml of the dissolution in a plastic assay tube with stopper.	R = 9
Alpechín/	Odor/aroma recallling that of an oil mill		
Rancid	Odor of oils which have undergone an intense process of oxidation.	Standard given by the IOOC	R = 8.65
Putrid	Odor/aroma recalls the odor of decomposed organic matter		
Others	Any other odor/aroma attribute perceived as a defect in the olive		
Basic tastes			
Acid	Basic taste produced by aqueous solutions of substances like citric acid	0.3 g are dissolved in 1 L of water. 30 mL of dissolution in plastic cup of 50 mL	R = 7
Bitter	Basic taste produced by diluted aqueous solutions of substances like quinine or caffeine	0.3 g are dissolved 1 L of water. 30 ml of dissolution in 50 ml plastic cup	R = 9
Texture			
Crunchy	Mechanical property of texture related to the cohesion and strength necessary to break a product with the teeth.	Gordal olive with stone.	R = 5

the panel's performance (Table 7). The results show that the mean and robust coefficient of variation values for all the attributes and samples evaluated are according to the PDO requirements established except for the fruity odor of sample 8. Therefore, all the assessors worked with good precision and as a whole.

4. CONCLUSIONS

A new descriptive and discriminating language and their standard references were developed over the 15 panel sessions (52 hours) by a highly trained panel. A method was developed for the sensory assessment of Aloreña table olives in order to

Table 6
Aceituna Aloreña de Málaga PDO requirements

Aloreña processing style	Attributes	Median (M)	Robust Coefficient deviation (rCV %)
Green olives	Fruit odor	> 5	< 10
	Green odor	> 0	< 20
	Seasoning odor	> 5	< 10
	Bitter taste	> 5	< 10
	Crunchy	> 5	< 10
Tradicional olives	Fruit odor	> 0	< 10
	Seasoning odor	> 5	< 10
	Bitter taste	> 3	< 10
	Crunchy	> 5	< 10
Cured olives	Seasoning odor	> 5	< 10
	Crunchy	> 5	< 10

obtain a certified product (PDO). This method establishes the necessary criteria to assess the sensory attributes of the three processing styles of "Aceituna Aloreña de Málaga". In addition, this method includes the training program for assessors and the requirements for the PDO "Aceituna Aloreña de Málaga".

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REFERENCES

Arroyo-López FN,Durán-Quintana MC, Romero, C, Rodríguez-Gomez F, Garrido-Fernández A. 2007. Effect of storage process on the sugars, polyphenols, color and microbiological changes in cracked Manzanilla-aloreña table olives. *J. Agric. Food Chem*. **55**, 7434-7444.

Arroyo-López FN, Bautista-Gallego J, Durán-Quintana MC, Rodríguez-Gómez F, Romero-Barranco C., Garrido-Fernández A 2008a. Improvement of the storage process for cracked table olives. *J. Food Eng.* **89**, 479-487.

Arroyo-López FN, Bautista-Gallego J, Durán-Quintana MC, Garrido-Fernández A. 2008b. Effects of ascorbic acid, sodium metabisulfite and sodium chloride on freshness retention and microbial growth during the storage of Manzanilla-Aloreña cracked table olives. *LWT- Food Sci.Technol*. **41**, 551-560.

Table 7
Median value and rCV of sensory attributes evaluated in the three processing styles of Alora table-olives harvested in 2011

Samples		Sensory attributes				
		Fruit odor	Green odor	Seasoning odor	Bitter taste	Crunchy texture
Green olives (S1)	M*	6.2	3.1	7.6	4.9	6.7
	rCV**	7.4	13	4.6	5.6	7.2
Green olives (S2)	M	7.3	4.2	6.4	7.0	6.8
	rCV	2.8	7.3	7.1	7.4	7
Green olives (S3)	M	7.3	4.5	7.7	6.9	7.0
	rCV	7.7	11	8	7.2	7.2
Green olives (S4)	M	6.0	3.5	7.9	7.0	7.0
	rCV	1.5	5	8.3	7.1	7.5
Traditional olives (S5)	M	2.9		5.4	3.9	5.6
	rCV	2.4		7.5	10.5	7.5
Traditional olives (S6)	M	4.2		5.3	4.0	5,7
	rCV	10.1		7.7	3.6	7.5
Traditional olives (S7)	M	3.9		6.5	4.4	6.0
	rCV	9.3		5	7.2	3.2
Traditional olives (S8)	M	3.8		5.0	4,0	4.7
	rCV	15		6.5	3,5	7.2
Cured olives (S9)	M			6.3		5.3
	rCV			8		7.2

*median value (M); ** Robust coefficient of variation rCV.

Arroyo-López FN, Bautista-Gallego J, Segovia-Bravo KA, García-García P, Durán Quintana MC, Romero C, Rodríguez-GomezF, Garrido-Fernández A. 2009. Instability profile of fresh packed ''seasoned'' Manzanilla-Aloreña table olives. *LWT - Food Sci. Technol*. **42**, 1629-1639.

Bautista-Gallego J, Arroyo-López FN, Durán-Quintana MC, Garrido-Fernández A. 2010. Fermentation profiles of Manzanilla-Aloreña cracked green table olives in different chloride salt mixtures. *Food Microbiol*. **27**, 403-412.

Bautista-Gallego J, Arroyo-López FN, López- López A, Garrido-Fernández A. 2011. Effect of chloride salt mixtures on selected attributes and mineral content of fermented cracked Aloreña olives. *LWT- Food Sci. Technol*. **44**,120-129.

Berodier F, Lavanchi P, Zannoni M, Casals J, Herrero L, Adamo C. 1997. Guide d'évaluation olfato-gustative des fromages á páte dure et semi-dure. *LWT-FoodSci. Technol*. **30**, 653-664.

BOE nº 43 de martes 19 de febrero de 2008. Resolución de 21 de enero de 2008, de la Dirección General de Industrias y Calidad Agroalimentaria, por la que se da publicidad a la solicitud de inscripción de la denominación de origen protegida «Aceituna Aloreña de Málaga».

EU Dossier number ES/PDO/0005/0785. Aceituna Aloreña de Málaga. (http://ec.europa.eu/agriculture/quality/door/apliedName.html?denominationId = 1847)

Galán-Soldevilla H, Ruiz Pérez-Cacho P, Jiménez S, Villarejo M, Manzanares AB.2005. Development of a preliminary sensory lexicon for floral honey.*Food Qual. Prefer.***16**, 71-77.

Galán-Soldevilla H, Ruiz Pérez-Cacho P. 2010. Sensory characterization of Aloreña olives. Universidad de Córdoba, Córdoba (Spain). *Private report to the Manzanilla-Aloreña industrial sector*.

Gallerani G, Gasperi F,Monetti A. 2000.Judge selection for hard and semi-hard cheese sensory evaluation. *Food Qual. Prefer*. **11**, 465-474.

IOOC (International Olive Oil Council).(2004). Norma comercial aplicable a la aceituna de mesa. Documentnumber COI/OT/NC nº 1. Madrid.

IOOC (International Olive Oil Council). (2005). Método de valoración organoléptica del aceite de oliva virgen extra que opta a una Denominación de Origen. Documentnumber COI/T.20/Doc. nº 22. Madrid.

IOOC (International Olive Oil Council). (2010). Método para el análisis sensorial de las aceitunas de mesa. Document number COI/OT/MO nº 1. Rev. Febrero 2010. Madrid.

ISO (1993).International standard 8586-1. Sensory analysis. General guidance for the selection, training and monitoring of assessors. Part 1: selected assessors. International Organization for Standardization, Genéve. *Ref. No. ISO 8586-1:1993 (E)*.

ISO (2006).International standard 5496. Sensory analysis. Methodology. Initiation and training of assessors in the detection and recognition of odours. International Organization for Standardization, Genéve.*Ref. No. ISO 5496:2006 (E)*.

ISO (2008).International standard 5492. Sensory analysis. Vocabulary. International Organization for Standardization, Genéve. *Ref. No. ISO 5492:2008 (E)*.

ISO (2009).International standard 22935-1. Sensory analysis. Milk and milk products. Part 1: General guidance for the recruitment, selection, training and monitoring of assessors. International Organization for Standardization, Genéve. *Ref. NoISO 22935-1:2009(IDF 99-1: 2009).*

Jellinek G. 1985. *Sensory evaluation of food.Theory and practice*. Ellis Horwood, England.

Pérez-Cacho, PR, Galán-Soldevilla H, Molina Recio G, León Crespo F. 2005. Determination of the sensory attributes of a Spanish dry-cured sausage. *Meat Sci*. **71**, 620-633.

Pérez-Cacho, PR, Galan-Soldevilla H, Mahatanattawee K, Elston A, Rouseff R. 2008. Sensory lexicon for fresh squeezed and processed orange juices. *Food Sci. Technol. Int.* **14**, 131-142.

Pérez Elortondo FJ, Ojeda M,Albisu M, Salmerón J,Etayo I, Molina M. 2006. Food quality certification: an approach for the development of accredited sensory evaluation methods. *Food Qual. Prefer.* **18***, 425-439.*

Ruiz Pérez-Cacho P, Galán-Soldevilla H, León Crespo F. 2005. Formación de catadores para un panel descriptivo de salchichón. *Alimentaria*. **360**, 29-38.

UNE (1996). UNE 87025. Análisis sensorial. Metodología. Perfil de textura. AENOR, Madrid. *Ref. Nº. UNE 87025:1996.*

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