

## Table Olive Testing: Updated: 28/7/2020

### 1.0 The Voluntary Standard for Table Olives in Australia:

Signatories to *OliveCare® Code of Best Practice* for table olives are required to undertake specified physical, chemical, microbiological and organoleptic testing of a sample taken from each batch identified on table olive product labels to establish eligibility to apply the *Certified Australian Table Olives™* Trademark, in accordance with *The Voluntary Industry Standard for Table Olives in Australia (RIRDC 2012 – Amended January 2020)*<sup>1</sup>:

- Ref Section 3, Table 2: Physico-chemical characteristics of packing brine or juice after osmotic balance.

**Table 2: Physico-chemical characteristics of packing brine or juice after osmotic balance**

Preparation	Minimum sodium chloride content			Maximum pH			Minimum lactic acidity		
	SCC, MAT	PR, R	P, S	SCC, MAT	PR, R	P, S	SCC, MAT	PR, R	P, S
Treated olives	5	4	GMP	4.0	4.0	4.3	0.5	0.4	GMP
Natural olives	6	6	GMP	4.3	4.3	4.3	0.3	0.3	GMP
Dehydrated and or shrivelled olives	8	8	GMP	GMP	GMP	GMP	GMP	GMP	GMP
Olives darkened by oxidation	GMP	GMP	GMP	GMP	GMP	GMP	GMP	GMP	GMP

**Note:** Refer to the Standard for an explanation of the above acronyms:

**Note:** The relationship between %NaCl and water activity ( $A_w$ ) is set out in the following table:

NaCl (g)	Water (g)	% NaCl	$A_w$
0.9	99.1	0.9	0.995
1.7	98.3	1.7	0.99
3.5	96.5	3.5	0.98
7.0	93.0	7.0	0.96
10.0	90.0	10.0	0.94
13.0	87.0	13.0	0.92
16.0	84.0	16.0	0.90
22.0	78.0	22.0	0.86

- **Water activity** is a ratio of vapour pressures and thus has no **units**. It ranges from 0.0aw (bone dry) to 1.0aw (pure water).
- **Ref Section 9** of the Standard for microbiological criteria for table olives offered for retail sale to the public.

<sup>1</sup> The Voluntary Industry Standard for Table Olives in Australia (NTOC, October 2012 / Amended January 2020) RIRDC 12/111: <https://australianolives.com.au/wp-content/uploads/2020/02/RIRDC-12-111-Australian-Table-Olive-Standard-Kailis-Final.pdf>

Industry microbiological testing requirements is *Escherichia coli* as an indicator organism for faecal contamination, *Clostridium perfringens* as an indicator for contamination by soil born spore forming pathogens, and *Lactobacillus* for effectiveness of Pasteurisation.

- All testing must be undertaken by a NATA accredited laboratory.
- The following minimum testing requirements have been incorporated into OliveCare® and the Australian International Olive Awards (AIOA) testing of table olive exhibits:

## 2.0 Minimum Standards: Physico-chemical and microbiological test parameters

### Retail Ready Products:

#### Table olives in brine - natural (unpasteurised): Brine tested

- Minimum sodium chloride (NaCl): **6% ( $a_w < 0.975$ )**  
Note for bulk unpasteurised olives / food service (NaCl): 8% ( $a_w < 0.95$ ) to 10% ( $a_w < 0.94$ )
- Maximum pH: **4.3**
- Microbiological Criteria - *Escherichia coli*: **Not detectable (<3 cfu/g)**
- Microbiological Criteria - *Clostridium perfringens*: **Not detectable (<10 cfu/g)**

#### Table Olives in brine - treated with sodium hydroxide (NaOH) (unpasteurised): Brine tested

- Minimum sodium chloride (NaCl): **5% ( $a_w < 0.97$ )**  
Note for bulk unpasteurised olives / food service (NaCl): 8% ( $a_w < 0.95$ ) to 10% ( $a_w < 0.94$ )
- Maximum pH: **4.0**
- Microbiological Criteria - *Escherichia coli*: **Not detectable (<3 cfu/g)**
- Microbiological Criteria - *Clostridium perfringens*: **Not detectable (<10 cfu/g)**

#### Test Package 2. Table Olives in brine (Pasteurised): Brine tested

- Maximum pH: **4.3**
- Microbiological Criteria - *Escherichia coli*: **Not detectable (<3 cfu/g)**
- Microbiological Criteria - *Lactobacillus*: **Not detectable (<10 cfu/g)**
- Microbiological Criteria - *Clostridium perfringens*: **Not detectable (<10 cfu/g)**

#### Test Package 3. Table Olives not in brine - Dehydrated / Shrivelled (pasteurised or unpasteurised): Olives tested

- Water activity  $a_w < 0.95$  (**8% NaCl**)
- Microbiological Criteria - *Escherichia coli*: **Not detectable (<3 cfu/g)**
- Microbiological Criteria - *Clostridium perfringens*: **Not detectable (<10 cfu/g)**

#### Test Package 4. Table Olives not in brine - Dehydrated / Shrivelled / Tapenade (Pasteurised): Olives tested (new)

- Maximum pH: **4.0**
- Water activity  $a_w < 0.95$  (**8% NaCl**)
- Microbiological Criteria - *Lactobacillus*: **Not detectable (<10 cfu/g)**
- Microbiological Criteria - *Escherichia coli*: **Not detectable (<3 cfu/g)**
- Microbiological Criteria - *Clostridium perfringens*: **Not detectable (<10 cfu/g)**

**Note:** In the OliveCare® microbiological standard the units are 'CFU'.

CFU refers to "colony forming units", whereas MPN refers to "most probable number".

The difference is that CFU/g is the actual count from the surface of a plate, and MPN/g is a statistical probability of the number of organisms.

Regulatory agencies sometimes prefer MPN rather than CFU “because a colony in a CFU test might have originated from a clump of bacteria instead of an individual, the count is not necessarily a count of separate individuals.” (US EPA 2003).

### 3.0 Table Olive Sensory Assessment:

All table olives must pass sensory and visual assessment undertaken by an approved laboratory (or through participation in a recognised table olive competition).

*In accordance with Section 5.1 IOC Method Sensory Analysis of Table Olives COI/OT/MO No 1/Rev.2, November 2011<sup>2</sup>.*

#### Sensory attributes:

**Bitterness:** The olive shouldn't be bitter to taste but some bitterness can be balanced by the amount of saltiness and olive flavour.

**Saltiness:** The level of salt governs the flavour of the olive and must be balanced with the bitterness and acidity.

**Flavour:** the olive should have an appealing fruit flavour, which for green olives often is a typical fermentation taste but retaining 'olive' character, and for black olives is a stronger olive flavour.

**No negative attributes:** There should be no taste or aroma faults that would render the product unmarketable: Abnormal fermentation (faecal, putrid, butyric, zapatera), musty, rancid, 'cooked', soapy, metallic, earthy, **winey-vinegary\***, or as reflected in achieving a score of 15 or more out of 30 points.

**Abnormal fermentation** Olfactory sensation perceived directly or retro nasally, characteristic of abnormal fermentations. Such fermentation may be:

- **Putrid:** sensation reminiscent of the odour of decomposing organic matter.
- **Butyric:** sensation reminiscent of butter or cheese.
- **Zapateria:** sensation caused by the combination of volatile fatty acids reminiscent of rotten leather.

**Musty:** Olfactory-gustatory sensation perceived directly or retronasally, characteristic of olives attacked by mould.

**Rancid:** Olfactory sensation perceived directly or retro nasally, characteristic of olives that have undergone a process of rancidity.

**Cooked:** Olfactory sensation perceived directly or retro nasally, characteristic of olives that have undergone excessive heating in terms of temperature and/or duration during pasteurisation or sterilisation.

**Soapy:** Olfactory-gustatory sensation reminiscent of soap.

**Metallic:** Olfactory-gustatory sensation reminiscent of metals.

**Earthy:** Olfactory-gustatory sensation reminiscent of soil or dust.

**Winey-vinegary:** Olfactory-gustatory sensation reminiscent of wine or vinegar. (\*except for table olives pickled using vinegar eg traditional Kalamata method)

**Note:** The IOC Trade Standard states that olives may not be sold as table olives where the defect predominantly perceived (DPP)  $\geq 7.0$  (which is astounding given these olives would be inedible!)

#### Textural attributes:

**Hardness:** The olive should have a firm flesh texture, without a tough skin.

**Mouth feel:** The olive should have a smooth flesh texture with some crunchiness.

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<sup>2</sup> IOC Method Sensory Analysis of Table Olives COI/OT/MO No 1/Rev.2, November 2011:  
<http://www.internationaloliveoil.org/documents/viewfile/4130-met-ot-org-eng>

**Flesh-to-pip ratio:** The olive should have a generous flesh that easily bites away from the pip.

### A description example

	Things to look for	Comments
Appearance	Blemish (does the olive appear blemished?)	Clean unblemished fruit characteristic of the Kalamata olive
	Colour (is the olive colour appealing?)	Appealing purple colour
Aroma	First impression - appealing or unappealing aroma? Aromatic, floral? Intense or subdued?	Appealing intense floral aroma
	Malodourous - abnormal fermentation – putrid, butyric, Zapateria (rotten leather) Winey-vinegary, nail polish solvent	No abnormal aroma
Flavour	Evidence of off flavours – rancid, musty, cooked, soapy, metallic, earthy, acidic	No off flavours
	Does the exhibit have any specific olive flavours? What are the levels of bitterness (minor to overpowering)? Evidence of other flavours including varietal, preservation (vinegar, oil), added flavourings (citrus, garlic, chili, herbs)	Pronounced olive flavour, with well-balanced bitterness.
	Flavour balance, Flavour transference - does the aroma match the flavour? Length of flavour (short to lingering)	Well balanced flavours and aroma with lingering flavours
	Saltiness, slight, just right, too salty Acidity - slight, just right, high	Saltiness and acidity just right
Texture	Hardness - finger squeeze test – soft, firm, hard? Bite test – skin thickness – tough, resistant, fine	Firm texture, good skin thickness
	Chewing test - flesh texture– smooth, mushy, granular, lumpy, fibrous Crunchiness – low, moderate, high?	Smooth even mouthfeel with moderate crunchiness
	Ease of flesh removal? Flesh-to-pip ratio, lean, fleshy?	Generous fleshy olive that easily bites away from the pip
<b>Final tasting comment:</b> Attractive purple coloured fruit with no blemishes. Clean floral aroma flowing onto the palate with intense olive flavour and balanced saltiness. Well balanced flavours and aroma with lingering flavours. A firm texture with good skin thickness, moderately crunchiness and generous flesh. The lingering mouthfeel is smooth with balanced bitterness and acidity.		

### Visual attributes:

Samples must be visually appealing:

**SKIN:** The skin of the fruit should be fine, smooth and not wrinkled, yet elastic and resistant to handling damage.

**FLESH:** Should be firm but not woody or granular. Green olives should have firm, crisp flesh, ripe or black olives will have softer flesh due to the fruit being more mature than green olives, however it shouldn't be soggy or flabby.

**BLEMISHES:** Blemishes should be absent however some white spots on green olives are natural. Others such as gas pockets or blistering are caused by processing and organisms and will reduce the point score.

**COLOUR:** Green olives should be bright green to strawy green colour. Some dulling may occur after several months in brine. Lye treated green olives are very bright green. Olives turning colour should be pale pink, and black olives vary from dark pink to black or winey colour.

**Note:** Whilst the addition of ferrous gluconate (INS No. 579) used in the 'California ripe process' as a colour retention agent, is permitted for table olives under the *Australia New Zealand Food Standards Code*, it is not approved under the *OliveCare® Code of Best Practice*, nor in the *Australian International Olive Awards* as a method to darken black olives.

## 4.0 Table Olive Labelling Requirements

The following *Certified Australian Table Olives™* logo is for the exclusive use of Code Signatories, and indicates a product bearing this logo is compliant with the *Voluntary Industry Standard for Table Olives in Australia (RIRDC 2012)*



Table olives must be labelled in accordance Part 11 of the Voluntary Industry Standard for Table Olives in Australia, and consistent with Food Standards Australia New Zealand Food Authority - Food Standards Code, including providing a list of ingredients, the net drained weight and the application of a 'Best Before' date (not exceeding 2 years) to be determined by the producer after which time undesirable changes to the odour, colour, texture or flavour of the product may occur (FSANZ – Food Standards Code Part 1.2.5)

## 5.0 Approved Table Olive Testing Laboratories:

### Modern Olives Laboratory Services

P.O. Box 92 Lara, Victoria

3212 - AUSTRALIA

T: +61 (0) 3 5272 9500 | F: +61 (0) 3 5272 9599 |

E: [lab@modernolives.com.au](mailto:lab@modernolives.com.au) | [www.modernolives.com.au](http://www.modernolives.com.au)

### South Australian Analytical Laboratory (SAALS)

Sinan Al Bayati | Business Development & Client Service

51-53 Lavinia Street,

Athol Park, SA 5012

P: 1300 386 811

E: [lab@saals.com.au](mailto:lab@saals.com.au)

M: 0413 428 428

W: [www.saals.com.au](http://www.saals.com.au)

### ALS Food & Pharmaceutical

22 Dalmore Drive, Scoresby VIC 3179

Phone: +61 3 8756 8111 Fax: +61 3 9763 1234

Email: [FoodAustralia@ALSGlobal.com](mailto:FoodAustralia@ALSGlobal.com)

<http://www.alsglobal.com/>

### Mérieux NutriSciences trading as Silliker Australia (lab & office) (also Brisbane Sydney & Perth)

Kim Manning / Technical Sales Co-ordinator

20-22 King Street, Blackburn

VIC Australia 3130

Tel: +61 (3) 8878 2100

Email: [sales.au@mxns.com](mailto:sales.au@mxns.com)

<http://www.merieuxnutrisciences.com.au/au/eng/contacts/contact>

### **Agrifood Technology**

PO Box 728, Werribee, VIC 3030, Australia

Phone VIC: (03) 9742 0555

Email [lab.vic@agrifood.com.au](mailto:lab.vic@agrifood.com.au)

PO Box 1546, Bibra Lake, WA 6965

Phone WA: (08) 9418 5333

Email: [lab.wa@agrifood.com.au](mailto:lab.wa@agrifood.com.au)

<https://www.agrifood.com.au/index.php/contact>

### **National Measurement Institute**

1/153 Bertie Street, Port Melbourne Vic 3207

Tel: +61 3 9644 4888 Fax: +61 3 9644 4999

Web: [www.measurement.gov.au](http://www.measurement.gov.au)

Email: [customerservice@measurement.gov.au](mailto:customerservice@measurement.gov.au)

## **6.0 Indicative table olive testing costs:**

### **Physico-chemical: (\$30- \$130)**

- Modern Olives Laboratory Services (MO)
- South Australian Analytical Laboratory (SAALS)
- Silliker Australia
- ALS Food & Pharmaceutical

### **Microbiological: (\$50- \$250)**

- Modern Olives Laboratory Services (MO)
- South Australian Analytical Laboratory (SAALS)
- Silliker Australia
- ALS Food & Pharmaceutical

### ***Optional Physical (Grade classification): (\$120)***

- *Modern Olives Laboratory Services (MO)*

### **Sensory (defects): (\$50-\$100)**

- Modern Olives Laboratory Services (MO)
- Silliker Australia
- Entry into competitions

### ***(ANZFA) Nutrition Information Panel (NIP): (~\$400)***

- *Modern Olives Laboratory Services (MO)*
- *South Australian Analytical Laboratory (SAALS)*
- *National Measurement Institute (NRS)*

### ***(ANZFA) Pesticide Residues : (\$350- \$750)***

- *Modern Olives Laboratory Services (MO)*
- *South Australian Analytical Laboratory (SAALS)*
- *Silliker Australia*
- *National Measurement Institute (NRS)*

## 7.0 Indicative Test Prices:

Test	Modern Olives (prices include GST) 2019	SAALS 2018	Silliker Australia (prices include GST) 2018	ALS 2018	Uni Adelaide 2018
NaCl	\$35.01	\$63.35+GST	\$43.69	\$20.00+GST	Free: Competition testing only
Water Activity	\$39.00	\$39.04+GST	\$57.97		Free: Competition testing only
pH	\$11.67	\$15.86+GST	\$24.17	\$8.00+GST	Free: Competition testing only
E. coli and coliform	\$28.12	\$16.62+GST	\$24.53 each	\$20.00+GST	
Lactobacillus	\$29.72	\$28.82+GST	\$61.42	\$17.00+GST	
Yeast & Mould	\$21.37	\$22.18+GST	\$23.56		
Clostridium perfringens	\$79.87	\$26+GST	\$48.57		
Enterobacteriaceae	\$26.16				
Coag +ve Staph	\$33.75	\$25.49+GST	Spread Plate \$31.20		
Salmonella / 25 g	\$40.10	\$44.90+GST	\$57.02		
Listeria mono / 25 g	\$64.47	\$54.88+GST	\$57.02		
*Full Microbiology	<sup>MO</sup> \$239.32	*\$170.71+GST	*\$218.34		
AOA Test package 1	\$154.67		\$119.40		
AOA Test package 2	\$184.39		\$137.14		
AOA Test package 3	\$143.00		\$109.52		
DEHP Method and LOR	\$450.00		\$448.80		
Pesticide Residues - supermarket screen	\$745.00	\$327.33+GST	\$448.80		
Nutritional Information	@\$420 Table olives	\$370+GST	Incl Dietary Fibre \$472.43		
Sensory # (defects only)	#\$52.51		##\$14.40		
Size grading	\$35.01				

\* Salmonella, *Escherichia coli*, *Cogaulase +*, *Clostridium perfringens*, *Listeria monocytogenes*.

<sup>MO</sup> Rapid Aerobic Count Plate, *E.coli* and *Coliform*, *Rapid Yeast and Mould* and *Salmonella*

@ Energy, Fat (total and saturated), Sugar, Protein, Sodium

# MO Sensory tasting only will be done if microbiology tests are included, otherwise only visual inspection will be carried out.

% MO flesh/stone ration, size grading

## Silliker Australia sensory testing includes: Container appearance, Sample appearance, Sample colouration, Odor, Texture, Packaging OR Other Organoleptic Observations - Tasting cannot be done in our lab due to OH&S restrictions & SOP