

Final Report

Australian Olive Industry Code of Best Practice Implementation

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Project code:

OL13007

Project:

Australian Olive Industry Code of Best Practice Implementation – OL13007

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Summary

Project objectives:

OL13007: Australian Olive Industry Code of Practice Implementation aims to enhance consumer confidence in Australian olive products:

- By providing a formal mechanism for certification of Australian olive products in both domestic and export markets, through the application of Australian Olive Association (AOA) Certification Trade Marks for Australian olive products.
- By supporting and monitoring industry compliance with *The Australian Standard for olive oil (AS5264-2011)*¹, the *ANZFA Food Standards Code*², and the *Australian Consumer Law (ACL)*³, by undertaking regular Australian market surveys.
- By improving the rate of adoption of existing technology and providing an enabling environment for industry to build olive industry skills and capacity through training olive industry enterprise trainers, the development and delivery of competency based e-learning modules and facilitated training workshops, implemented in collaboration with regional olive associations.
- This project also links with and supports the following Hort Innovation projects:
 - *OL14003: Essential work to facilitate increased exports to China, Removing Roadblocks and enhancing Competitive Advantage*, through supporting a training program and providing a mechanism for exporter certification.
 - *OL16006 - Olive communication program*, through providing a comprehensive communication channel to levy payers and other stakeholders.
 - *OL 16010 - National olive industry conference and trade exhibition*, through providing a forum to deliver project outputs to levy payers and other stakeholders.
 - *OL16011 - Risk and crisis management planning for the olive industry'*, through providing HACCP based risk management templates and a training program.

Target audience:

The primary audience is Australian olive producers and brand owners, their supply chain partners including food service distributors, retailers and exporters.

Note: Through the ⁴*Australian Extra Virgin Olive Oil Everyday* website, Australian consumers are also informed of OliveCare® certified brands.

Key activities:

- Develop and implement OliveCare® Code of Best Practice training modules.
- Build information resources and review and streamline OliveCare® documentation.
- Undertake Australian market surveys of EVOO and other olive product quality.
- Build Code of Best Practice membership and compliance.

Key outputs:

Industry reports, training materials, operational manuals and guides, templates, newsletters and other communications to Signatories relating to:

- Managing registration of up to 200 Code of Best Practice Signatories, including audit of OliveCare® certification compliance requirements – food safety plan, product testing, and label content.

¹ Standards Australia Limited, Australian Standard for Olive Oil and Olive-Pomace Oil AS5265-2011, SAI Global Ltd. Available at: <http://www.australianolives.com.au/article-detail/australian-standard-5264-2011>

² ANZFA Food Standards Code: <http://www.foodstandards.gov.au/code/Pages/default.aspx>

³ The Australian Consumer Law: <http://consumerlaw.gov.au/the-australian-consumer-law/>

⁴ Australian Extra Virgin Olive Oil Everyday: <https://australianextravirgin.com.au/brands/>

- Undertaking Australian market survey testing of 60 olive oil products per annum including certified Code oil, non-Code oils (both Australian and imported) as well as constructive feedback to brand owners – A total of 180 products tested over three years.
- Developing and implementing 6 training modules, including online e-learning versions.
- Updating and modularising OliveCare® documentation, including Product Manuals, HACCP style Food Safety / Food Quality Plans, Approved Chemical Use lists, and other website based resource materials.
- Building OliveCare® membership, and establish regular communication with members including e-newsletters, annual compliance audit and constructive feedback to individual Signatories.

Key outcomes:

This project aims to enhance consumer confidence in Australian olive products in both domestic and export markets, by:

- Providing a mechanism to certify Australian EVOO products, thereby underpinning consumer confidence in Australian EVOO products, and helping to secure higher prices for Australian olive oil. In a high cost producer country it is essential that producers are able to compete on product quality not on price.
- Building olive industry skills and capacity through development of VET accredited training modules.
- Supporting compliance with the Australian Standard AS5264-2011, ANZ Food Standards Code and Australian Consumer Law (ACL).

OliveCare® publication outputs:

These are listed later in this report.

Recommendations for future R&D and practical application to industry:

1. To extend training resources to include e-modules covering best practice olive processing and oil storage, and IPDM in the olive grove. In addition the project will benefit from development of work books and assessment tools to link the olive e-learning modules to Units of Competency from the National Training Framework (NTF) that can lead to a recognised VET qualification or statement of attainment. Convening regional workshops to present these resources to levy payers is also highly desirable.
2. To continue the Australian market survey of olive product quality, with sampling to include OliveCare® certified and non-certified EVOO (both Australian and imported brands). There is also value in continuing to undertake laboratory calibration involving a total of 15 EVOO samples to be quality tested by both NSW DPI and Modern Olives.
3. Whilst this project has demonstrated a high level of MRL compliance, however an issue was identified with some products labelled as 'organic' having detectable chemical residues. It is therefore recommended that the Australian market survey continue to include a limited chemical residue survey of selected products.
4. That OliveCare® membership be expanded through targeting:
 - Small growers (<5,000 litres annual production) by developing a value proposition supporting a unique sales proposition of having the highest quality standards and EVOO product in the world.
 - Post farm-gate / supply chain – retailers, distributors, food service including chefs and trainees, by moving to an on-line compliance checklist approach.

This will involve addressing potential barriers to OliveCare® participation, as well as promoting the benefits of OliveCare® participation to potential members.

Keywords

accredited training; AOA; Australian market survey; Australian Standard; Code of Best Practice; e-learning; EVOO; freshness testing; IOC Standard; OliveCare®; olive products

Introduction

Project linkages to the Industry Strategic Investment Plan (SIP):

OL13007 was initially developed to support the following objectives and strategies from the ⁵*Australian Olive Industry RD&E Plan 2010-2015 (RIRDC 10-155)*:

Objective 2: To maintain the current high quality product while improving productivity, profitability and environmental management through all stages of the supply chain (nursery > grove > processing > storage).

- **Strategy 2.6:** Development of a quality assurance program, including quality standards, for Australian olive products:
 - The Code of Best Practice roll-out for olive oil needs to continue and be extended to table olive production, olive oil processing and environmental matters.
- **Strategy 2.8:** Develop guidelines for production of olive products:
 - The intent of this strategy is to produce easy to read guidelines, particularly for the smaller producer and processor, which enable the production of a high quality and safe olive products with a minimal environmental footprint.

Objective 4: To build an educated, collaborative, innovative and skilled industry workforce and a cost effective, well-funded Research, Development and Extension program:

- **Strategy 4.1.1:** Determine effective methods of providing producer education:
 - The challenge is to find an efficient and cost effective means of providing up-to-date producer education, recognising both the geographical spread of olive producers across the continent and variations in their access to on-line communications.

The project also aligns with the following objectives and strategies in the new ⁶*Olive Strategic Investment Plan 2017-2021 (Hort Innovation)*:

Outcome 1: Improved on-farm productivity, sustainability and product quality:

- **Strategy 1.1:** Promote world-best practice in grove management to increase productivity and quality, through:
 - Industry extension program (High) - implementation of the OliveCare[®] Code of Best Practice program.
- **Strategy 1.2:** Promote world-best practice in olive oil production, storage and packaging to maintain quality and increase consumer confidence, through:
 - Monitoring data on product quality in the market place (Medium) - this includes monitoring EVOO brand compliance with the Australian and IOC Standards for olive oil, and for table olive brands, compliance with the ⁷*Voluntary Standard for Table Olives in Australia (RIRDC 12-111)*, and the ⁸*IOC Trade Standard applying to table olives COI/OT/NC no. 1 (December 2004)*.
 - Active encouragement of brand owners of imported olive oils to comply with the Australian Standard for olive oil (Medium),
 - A review of existing R&D on best-practice storage conditions for olive oil and develop simple, consistent and timely messaging to remind growers how best to store their EVOO. Messaging should also be developed for retailers and food-service industry on how to store/ present EVOO to ensure it has the best chance of reaching its best-before-date. (Medium)

Outcome 3 – Greater skills, capacity and knowledge in the industry:

- **Strategy 3.1:** Communicate and extend outcomes of industry R&D (High), through:
 - An extension / adoption strategy for the industry, potentially including:
 - Developing a continuing professional development (CPD) program to be undertaken by growers as a requirement of the OliveCare[®] Code of Best Practice.

⁵ Australian Olive Industry RD&E Plan 2010-2015 (RIRDC 10-155): <https://rirdc.infoservices.com.au/downloads/10-155>

⁶ Olive Strategic Investment Plan 2017-2021 (Hort Innovation): <https://horticulture.com.au/wp-content/uploads/2017/04/HortInnovation-olive-SIP.pdf>

⁷ Voluntary Standard for Table Olives in Australia (RIRDC 12-111): <https://www.agrifutures.com.au/wp-content/uploads/publications/12-111.pdf>

⁸ IOC Trade Standard applying to table olives COI/OT/NC no. 1 (December 2004): <http://www.internationaloliveoil.org/documents/viewfile/3626-normoteng>

- Developing extension packages and delivery models appropriate to the industry, including pest and disease management fact sheets and ‘electronic reminders’. (High)

Historical background:

Olive oil has a history of use spanning millennia; originating in the eastern Mediterranean and gradually spreading west and into the ‘New World’, with Spain by far being the largest producer in the world. Olive oil is a tried and proven product, its many uses include health and nutrition, skin care and cosmetics, and as a fuel for lighting (prior to the discovery of alternatives - whale oil, coal gas, petroleum oil and LPG).

As highly valued and versatile product olive oil has unfortunately been subject to a long and continuing history of fraudulent commercial activity, including misrepresentation of quality and adulteration with cheaper seed and nut oils.

The good news is that olive oil quality has improved markedly with modern science based cultivation, processing and storage methods. In parallel olive oil standards and testing methods have been developed to underpin quality and provenance assurances provided to consumers by olive oil producers and marketers.

Never-the-less, ongoing industry vigilance is required, with quality and provenance of olive oil continuing to be misrepresented by a minority of unscrupulous traders. Examples include: Older ‘tired’ and defective olive oils being deceptively-labelled as Extra Virgin Olive Oil; Brands with Italian provenance style labels with small print ‘bottled in Italy from olive oil sourced from Spain, Tunisia and other Mediterranean countries’; and the so called ‘Tuscan Blend’ olive oil with labels decorated with olives and olive trees with small print ‘contains 95% canola oil’!

There are many grades of olive oil as defined by various government and industry standards. Olive oil is classified by defined quality grades: *Natural olive oil* is the oil pressed from the olive fruit without the use of heat or chemicals. The highest quality grade of Natural olive oil is ‘*Extra Virgin Olive Oil*’ (EVOO) that exhibits flavoursome well balanced fruity, bitter and pungency (FBP) attributes, without any taste or aroma (organoleptic) defects; followed by ‘*Virgin Olive Oil*’ (VOO), which is a lower quality olive oil which is permitted to have a limited score for defects, and ‘*Lampante Olive Oil*’ which is quite unpalatable, highly defected olive oil, generally regarded as not fit for human consumption without further processing, (however some of the older Mediterranean diaspora have developed a taste for this old world product, it also make good soap).

Processed olive oils comprise ‘*Refined Olive Oil*’, which is a bland tasting heat treated product from which all olive flavour and healthy anti-oxidants have been removed. This product is often blended with a small percentage of VOO or EVOO to improve flavour. Then there is ‘*Pomace Olive Oil*’ which is extracted using solvents from olive processing waste as an oil recovery operation; again it may be blended with VOO or EVOO to improve flavour. These lower quality olive oils are primarily used for cooking in food service (restaurant and hotel kitchens), and in food manufacturing such as in baked products, and to make vegetable oil spreads.

According to the⁹*Australian Competition & Consumer Commission (ACCC): Extra virgin olive oil is the fresh juice from the olive and is considered to be the highest grade olive oil.....There are international and local voluntary industry standards that provide guidance for producers and consumers as to what chemical and flavour properties extra virgin olive oil should have. The Australian Consumer Law prohibits labelling olive oil as extra virgin if it is not of this quality.*

In the Australian marketplace the two most relevant standards under which olive oil grades are defined and test parameters specified are both voluntary industry standards:

Standards Australia Ltd. Australian Standard for Olive Oil and Olive-Pomace Oil AS5265-2011, (known as the Australian Standard), endorsed by the Australian Olive Association Ltd (AOA).

¹⁰*International Olive Council (IOC). Trade Standard Applying to Olive Oils and Olive Pomace Oils*

⁹ ACCC – Olive Oil: <https://www.accc.gov.au/consumers/groceries/olive-oil>

¹⁰ International Olive Council Trade Standard applying to olive oils and olive-pomace oils, COI/T.15/NC No 3/Rev.11 July 2016: <http://www.internationaloliveoil.org/documents/viewfile/9708-norma-english>

COI/T.15/NC No 3/Rev.11 July 2016. (known as the IOC Standard), endorsed by the Australian Olive Oil Association (AOOA).

The *Australian Standard* is robust and consumer focused, with an emphasis on product quality and freshness; in contrast to the *IOC Standard* has a focus on facilitating international trade, whilst its lower standards permit inferior quality oils with a measurably reduced shelf life to be classified and traded as EVOO or VOO.

Australian market survey:

Systematic Australian market survey testing commenced in 2011, following the introduction of the Australian Standard. Through OL13007, over the past 3 years, a further one hundred and eighty five (185) Australian and imported olive oils labelled as EVOO were purchased from supermarkets, independent retailers, or ‘on-line’, with testing undertaken by NSW DPI Wagga Wagga, (a National Association of Testing Authorities, Australia (NATA) and American oil Chemists Society (AOCS) accredited laboratory, and International Olive Council (IOC) accredited sensory panel), for selected chemical and sensory parameters for compliance against both the Australian Standard and the IOC Standard.

OliveCare® implementation:

The Australian Olive Industry’s Code of Best Practice, now rebranded as OliveCare® was developed in 2005 to underpin and enhance the high quality of Australian olive products and associated production processes. OliveCare® has since been revised and extended to include certification of table olives and other olive products and encompasses the entire olive supply chain from growers to retailers and food service.

OliveCare® incorporates the provisions of the Australian Standard for Olive Oils and Olive Pomace Oils (AS5264-2011[®]) which was introduced in July 2011), the Voluntary Industry Standard for Table Olives in Australia which was introduced in 2012, as well as the Australia New Zealand Food Standards Code and related legislation, Australian Consumer Law (ACL), and international rules and codes with similar aims, such as those of the American Oil Chemists Society (AOCS), International Standards Organisation (ISO) and, International Codex Alimentarius Commission (Codex).

Accredited training program:

OL13007 has pioneered the development of a nationally VET accredited olive industry training program; working with River Murray Training (RMT), a Registered Training Organisation (RTO) to develop accredited e-learning modules that support the OliveCare® Code of Best Practice. These modules are designed to link to relevant national training competency standards that fit within the requirements of Certificate III in [Food Processing](#) (FDF30111).

Methodology

I. Code of Practice membership and compliance:

The Australian Olive Industry's Code of Best Practice, now rebranded as OliveCare® was developed in 2005 to underpin and enhance the high quality of Australian olive products and associated production processes. OliveCare® has subsequently been revised to include table olives and other olive products and encompasses the entire olive supply chain from growers to retailers and food service.

The OliveCare® program provides the required tools to:

- Establish authenticity and quality of Australian olive products;
- Provide surety and confidence for consumers in Australia and overseas in relation to Australian olive products;
- Establish a framework that encompasses good business practice with HACCP-style production controls and environmental responsibility;
- Build olive industry skills and capacity;
- Deal effectively with complaints; and
- Establish a compliance culture within the industry in relation to the Australian Consumer Law (ACL).

AOA has registered a portfolio of trade marks for OliveCare® certification, detailed at [Appendix 1](#), that are applied to certified brands.

AOA appoints the OliveCare® Administrator who is responsible for implementation of the program, including maintaining a register of Signatories, undertaking compliance audits, issuing compliance certificates and rectification orders, and making recommendations to AOA for any improvements. The OliveCare® Manual specifies the operation of the program including roles of the Administrator.

The OliveCare® Administrator works closely with Signatories with failed products to identify causal factors and set rectification requirements, as well as providing constructive feedback to other brand owners.

In July 2017 OliveCare® was extended to cover export producers participating in the Authentic Services 'Olive Route' program. Export Signatories are required to implement both Biosecurity and Environmental Strategies, including setting appropriate biosecurity and environmental targets, developing metrics, record keeping and continuous improvement methodology, to protect the reputation of Australian olive products in export markets.

II. Undertake Audit of Code Certification compliance requirements:

All Code Signatories are required to provide annually to the OliveCare® Administrator evidence of:

- Being a financial member of AOA and the OliveCare® Code of Best Practice
- Having a Product Risk Assurance or HACCP style food safety / food quality plan - either 'in-house' or as part of a proprietary third party certification arrangement. This should include a Corrective Action Request (CAR) procedure to deal with quality complaints, negative feedback, audit failures, on-farm inefficiencies, accidents or lapses in processes, procedures or performance. (*template available*).
- Undertaking annual product testing (at NSW DPI or Modern Olives), meeting AS5264-2011 requirements for classification for each product certified as required under the OliveCare® Code of Best Practice:
Minimum Oil Chemistry: Free Fatty Acids (FFA), Peroxide Value (PV), Ultra-Violet Absorption (UV) - (ΔK , K232 & K270). These parameters may be tested using NIR for Australian oils where the laboratory has achieved robust calibration.
- Sensory assessment undertaken by NSW DPI or Modern Olives (or through participation in a recognised olive competition).
- (Highly recommended) Oil Freshness: Pyropheophytin A (PPP's), 1,2 Diacylglycerols (DAG's), tests which enable an objective calculation of BBD, plus
- Having product labels compliant with AS5264-2011, Australian Consumer Law and OliveCare® labelling requirements (*please provide the Administrator with copies of all product labels – EVOO, flavoured olive oil, and table olives.*)

- Using a documented product trace back system including unique batch codes, supply chain records and a product recall system in place (*template provided*).
- Using product Best Before Dates supported by technical evidence (*laboratory testing*).

OliveCare® compliant members are authorised to use the Certified Australian Extra Virgin Olive Oil Trade Mark logo, which is an assurance to consumers that the branded EVOO product is authentic Australian EVOO that meets the AS5264-2011. Compliant brands are also listed by state of origin on the Australian Extra Virgin website: australianextravirgin.com.au/brands/.

OliveCare® Signatories also receive a monthly newsletter packed with useful information and tips on product certification, grove management best practice (with a focus on IPDM), olive oil and table olive processing best practice, product storage best practice.

III. Undertake Australian market surveys

Undertake Australian market survey testing (a total of 180 over 3 years) including certified Code oil assessing - selected chemical and sensory parameters for compliance against the Australian Standard for Olive Oil and Olive-Pomace Oil AS5265-2011 (AS), as well against the International Olive Council Trade Standard applying to olive oils and olive-pomace oils (IOC), COI/T.15/NC No 3/Rev.11 July 2016, and EU Regulation No 1348/2013(EU). Testing includes:

- Oil Chemistry: Free Fatty Acids (FFA), Peroxide Value (PV), Ultra-Violet Absorption (UV) - (ΔK , K232 & K270) – (using wet chemistry for imported samples, and IR for Australian samples),
- Oil Freshness: Pyropheophytin A (PPP's), 1,2 Diacylglycerols (DAG's), plus
- Sensory Analysis for defects undertaken in accordance with the *International Olive Council Method for the Organoleptic Assessment of Virgin Olive Oil, COI/T.20/Doc. No 15/Rev. 7, February 2015*¹¹, by an accredited panel.

Visual checks for label compliance with the *Australian Standard for Olive Oil and Olive-Pomace Oil AS5265-2011*, the *ANZFA Food Standards Code*, and *Australian Consumer Law (ACL)*, are undertaken by the OliveCare® Administrator

In the July 2017 market survey samples were also screened by the a government laboratory - the *National Measurement Institute (NMI)* for pesticide residues (*Supermarket Screen Lists 3 and 5 - Combined GCMS/LCMSMS*) covering contaminants, organochlorines, organophosphates, herbicides, acaricides, fungicides, phenols, carbamates, synthetic pyrethroids, insecticides, and plant growth regulators, and assessed against the ¹²*Australia New Zealand Food Standards Code Schedule 20 – Maximum residue limits*.

The OliveCare® Administrator provides constructive feedback on test results provided to the responsible party - Signatories, other producers and distributors - including how to achieve improved quality outcomes. Where there are persistent problems with particular brands and the relevant company is unwilling to take corrective action, the matter is may be reported to the ACCC for action.

EVOO Test Parameters:

1. LOT IDENTIFICATION/BATCH NUMBER:

This is important for traceability. Olive oil needs to be traceable back to the grove in order to comply with HACCP regulations.

IOC STANDARD: **10.1.6 Lot Identification states...** each container shall be embossed or otherwise permanently marked in code or in clear writing to identify the producing factory and the lot.

AUSTRALIAN STANDARD: **12.2.6 Lot Identification states....** each container shall be embossed or otherwise permanently marked in code or in clear writing to identify the producing factory and the lot in accordance with the Australian New Zealand Food Standards Code.

¹¹ International Olive Council Method for the Organoleptic Assessment of Virgin Olive Oil, COI/T.20/Doc. No 15/Rev. 7, February 2015: www.internationaloliveoil.org/documents/viewfile/3685-orga6

¹² *Australia New Zealand Food Standards Code Schedule 20 – Maximum residue limits*: <https://www.legislation.gov.au/Details/F2017C00647>

2. NET CONTENTS; NAME AND ADDRESS, and COUNTRY OF ORIGIN:

All oils tested comply with both the requirements of the IOC Standard and the Australian Standard AS 5264-2011, which incorporates the FSANZ Food Standards Code labelling requirements.

3. BEST BEFORE DATE/DATE OF MINIMUM DURABILITY:

A best before date (BBD) is a producer's guarantee that the product being sold will remain of that grade up until the BBD. FSANZ has stated that all food is required to be date marked and this obligation is stated clearly in the Australia New Zealand Food Standards Code (The Code): Standard 1.2.5 Date Marking of Packaged Food. There are some date marking exceptions but olive oil does not fall in to those exemption categories.

Industry Definition: Shelf-life: is the length of time, under normal storage conditions, within which no off-flavours or defects are developed and quality parameters such as peroxide value and specific absorbance are retained within accepted limits of the relevant standards.

IOC STANDARD 10.1.7.1 **Date of minimum durability** states in the case of pre-packaged products intended for the end consumer, the date of minimum durability (preceded by the words "best before end") shall be declared by the month and year in un-coded numerical sequence. The month may be indicated by letters in those countries where such use will not confuse the consumer; if the shelf life of the product is valid to December, the expression "end (stated year)" may be used as an alternative.

Note: The IOC Standard makes no reference as to how this date of minimum durability is to be objectively determined.

AS STANDARD 4.3 **Best-before date** states... a date that signifies the end of the period during which the intact package of oil, if stored in accordance with stated storage conditions, will remain fully marketable and will retain any specific qualities for which express or implied claims have been made.

Note: According to the AS STANDARD:

The best-before date shall be supported by technical evidence.

Methods used to determine oil durability may include:

- (a) Oil oxidative stability index in accordance with Clause 13.20 (AOCS Cd 12b-92 – Rancimat®)
- (b) Fatty acid profile in accordance with Clause 13.3 and antioxidant content in accordance with Clause 13.18:

(Tocopherols and tocotrienols contents, using high-performance liquid chromatography, shall be determined in accordance with ISO 9936.)

Note: OliveCare® has adopted the Modern Olives methodology to objectively determine Potential 'Shelf Life' from the lowest value derived from the following 3 estimations: Induction time (IND), Pyropheophytins a (PPPs) % and 1,2 Diacylglycerides (DAGs) % testing:

- hours of induction time (IND) at 110°C x 1 = expected shelf life (in months)
- (17.0% - PPPs) / 0.6% = expected shelf life (in months)
- (DAGs – 35.0%) / FFA* factor = expected shelf life (in months)

*FFA factor = 1.7% (if FFA < 0.4%); 2.1% (if 0.4% < FFA < 0.6%); or 2.5% (if FFA > 0.6%)

Note: The higher the FFA level the faster the oil will oxidise, and the shorter the shelf-life..

Note: An alternative method for shelf life prediction is described in the following articles:

¹³*Shelf-Life Prediction of Extra Virgin Olive Oils Using an Empirical Model Based on Standard Quality Tests* by Claudia Guillaume and Leandro Ravetti, Modern Olives (Journal of Chemistry Volume 2016). Also published in the September 2017 edition of Australian & New Zealand Olivegrower & Processor© magazine as ¹⁴*Determining*

¹³ *Shelf-Life Prediction of Extra Virgin Olive Oils Using an Empirical Model Based on Standard Quality Tests* by Claudia Guillaume and Leandro Ravetti, Modern Olives (August 2016): <https://www.hindawi.com/journals/jchem/2016/6393962/>

¹⁴ *Determining shelf life: how can small growers do it on a minimum budget?* by Leandro Ravetti, technical director BBL, September 2017 edition of Australian & New Zealand Olivegrower & Processor© magazine: <https://olivebiz.com.au/magazines/olivegrower/back-issues/>

shelf life: how can small growers do it on a minimum budget?

4. FREE FATTY ACIDS (FFAs):

Free fatty acidity is a chemical parameter of olive oil which is an indicator of its quality. For extra virgin olive oils, it ranges from 0 to 0.8%, with the lower the percentage the better. Free acidity levels increase through breakdown of the major oil molecules in the fruit (triglycerides) early in the production process. Higher quality oils will exhibit low free acidity. The content of free fatty acids in grams per 100 grams is expressed as a percent of free oleic acid.

IOC STANDARDS *state* ...that the oil must be less than or equal to 0.8% m/m expressed in oleic acid
AUSTRALIAN STANDARDS *state*... that the oil must be less than or equal to 0.8% m/m expressed in oleic acid

5. PEROXIDE VALUE (PA's):

Peroxides, which are flavourless, are generated from the oxidation of polyunsaturated fatty acids in the oil. Peroxides are unstable, usually building up slowly and leading to oil rancidity.

The likelihood of peroxides becoming rampant increases during storage. Peroxide Value identifies the early stages of oxidation and is a measure of the oxidation of olive oil expressed as milliequivalents of active oxygen per kilogram of oil. In very old oils peroxide levels can drop as the peroxide is converted into further compounds.

IOC STANDARDS *states* ... that the oil must be less than or equal to 20 in milleq. Peroxide oxygen per kg/oil.

AUSTRALIAN STANDARDS *states*... that the oil must be less than or equal to 20 in milleq. Peroxide oxygen per kg/oil.

6. ABSORBENCY IN ULTRA-VIOLET:

UV tests determine the ultraviolet light absorbance measured by shining UV light through the oil at several specific wavelengths. Absorbance at K232 nm (nanometers), K270 nm and Delta (Δ)K2 correlate with the state of oxidation by detecting specific oxidized compounds, some generated from secondary oxidation, and may also indicate adulteration with refined oils.

ABSORBANCY IN ULTRA VIOLET- K232 nm

IOC STANDARD *states*... limit of less than or equal to < 2.50, however commercial partners in the country of retail sale may require compliance with these limits when the oil is made available to the end consumer.

AOA STANDARD *states*... limit of less than or equal to < 2.50 Absorbance (K) of a 1% (m/v) solution of the oil in the specified solvent, with reference to pure solvent in a 1 cm path length cell.

ABSORBENCY IN ULTRA-VIOLET – K270 nm (cyclohexane)/268 nm (iso-octane)

IOC STANDARD *states*... limit of less than or equal to < 0.22.

AOA STANDARD *states*... limit of less than or equal to < 0.22

ABSORBENCY IN ULTRA-VIOLET – Delta K

IOC STANDARD *states*... limit of less than or equal to < 0.01

AOA STANDARD *states*... limit of less than or equal to < 0.01

7. PYROPHEOPYTIN a (PPP's):

Chlorophyll pigments break down to pheophytins and then pyropheophytins (PPP's) upon ageing and/or thermal degradation of olive oil. An elevated level of pyropheophytins is an indicator for oil that is oxidized and/or adulterated with cheaper refined oils. Thermal treatment of oil at elevated temperatures increases the pyropheophytine A content. PPP's greater than 17% are an indicator of unpermitted thermal treatments, old oil or the presence of refined oil.

IOC STANDARD: The International Olive Council does not recognise this effective method of detecting

adulterated and refined olive oils. However Australia, Germany, South Africa and major retailers in Europe all make use of this technique.

AUSTRALIAN STANDARDS states... Pyropheophytin (PPP's) less than or equal to 17%

8. DIAGLYCERIDES (DAG's):

Triacylglycerols (TAGs) are the principal components (98%) of olive oil; during the breakdown of triacylglycerols, diacylglycerols (DAG's) are formed. In fresh olive oils made from sound olives 1,2-diaclyglycerols are the predominant form of the DAG component of olive oil. Ageing and/or processing damaged olives increases the proportion of 1,3-diaclyglycerols in the DAG component of olive oil. The measure used in this test is the ratio of 1,2 to 1,3 diacylglycerols.

The higher the ratio the better the oil. An elevated level of 1,3 DAGs indicates that the oil is old, oxidized, of poor quality, and/or badly processed. This test is useful for assessing the genuineness of virgin olive oils throughout their life.

IOC STANDARD: The International Olive Council does not recognise this effective method of detecting adulterated and refined olive oils. However Australia, Germany, South Africa, Italy and major retailers in Europe all make use of this technique.

AUSTRALIAN STANDARDS states... the ratio of 1,2/1,3 -Diaclyglycerols (DAG's) greater than or equal to 35%

9. OXIDATIVE STABILITY (IND): *(Project funding for this test was not provided)*

AUSTRALIAN STANDARDS states... Oxidative stability index is an indicator of stability and shelf life properties of oils. The determination entails speeding up the oxidation process in the oil under heat and air current and monitoring volatile substances associated with rancidity.

Note: All oils and fats have a resistance to oxidation which depends on the degree of saturation, natural or added antioxidants, pro-oxidants or prior abuse. Oxidation is slow until this resistance is overcome, at which point oxidation accelerates and becomes very rapid. The length of time before this rapid acceleration of oxidation is the measure of the resistance to oxidation and is commonly referred to as the "induction period", or Oxidative Stability Index, measured in hours, where each hour of resistance equates to a potential shelf life of 1 month. This method is useful to determine potential shelf-life when used in conjunction with PPP and DAG testing. Used alone the method tends to overestimate potential shelf life in older oils.

IOC STANDARD: Makes no reference to oxidative stability

10. ORGANOLEPTIC / SENSORY:

IOC STANDARDS states... EVOO should have zero organoleptic defects.

AUSTRALIAN STANDARDS states... EVOO should have zero organoleptic defects

Samples that exhibit negative sensory attributes (defects), commonly muddy sediment, rancid or frosted, or having zero fruity attribute; reflecting poor fruit quality and or processing methods, or poor product storage conditions.

11. INCORRECTLY LABELLED AS EVOO:

Brands of olive oil labelled as Extra Virgin Olive Oil, are reclassified against the relevant standards according to the test results.

IV. OliveCare® Code of Best Practice training:

OL13007 has pioneered the introduction of an accredited olive industry training program, detailed in the next section of this report.

The project has also supported the development of Tastebook™, an AOA distance education sensory training initiative in appreciating, describing and improving Extra Virgin Olive Oil and Table Olives.

Outputs

1. Code of Best Practice training development and implementation, and review of OliveCare® documentation (6 units over 3 years), (ref: MS102, MS106 and MS107 Reports): **Partially achieved:**

OL13007 has pioneered the development of an accredited olive industry training program. Working with River Murray Training (RMT), a Registered Training Organisation (RTO), generating the following outputs:

- Developed a suite of six accredited e-learning modules comprising 10 ‘on-line’ interactive presentations that support the OliveCare® Code of Best Practice, including implementing a HACCP Style Food Safety / Food Quality Plan, Export Readiness training, and Sensory Assessment training for competition judges of evoo and table olives.
- All e-learning modules are designed to link to relevant national training competency standards that fit within the requirements of Certificate III in [Food Processing](#) (FDF30111).
- Six olive industry enterprise trainers have been trained by RMT to build industry capacity to deliver OliveCare® training to olive producers, which was to be undertaken in collaboration with state and regional olive industry associations. Enterprise trainers have completed TAESS00007 Enterprise Trainer – Presenting. This nationally accredited skill set is the minimum qualification required by the National Skills Standards Council (NSSC) for workplace trainers and is specifically designed for people who train others in the workplace, including coaching of individuals or small groups. (To become a fully qualified trainer, participants need to complete two units: TAED301A: Provide work skill instruction and BSBCMM401: Make a presentation.
- Interested trainees need to register with Gill Ireland at River Murray Training on 0409 280 387 or gillian.ireland@r-m-t.com.au to be issued with a username and password to log onto website that hosts the e-learning program. A registration fee of \$68 will be charged to participants by RMT.
- Further details on the on-line e-learning registration process is provided at [Appendix 2](#).
- Apart from limited trialing of the 6 e-modules, to date there is only one olive producer registered to participate in the program. Our previous expectation was that the industry enterprise trainers would work with state and regional associations to host regional workshops to introduce the training materials and sign up industry participants to the program. Unfortunately this did not eventuate as both enterprise trainers and regional associations were looking for seed funding to enable this activity, (noting these resources had not been allocated to the project).
- Subsequently the project team has identified the following program linkages that provide opportunity to promote and leverage participation in the e-learning program:
 - The ‘HACCP Style Food Safety / Food Quality Plan’ e-modules link to project *OL16011 - Risk and crisis management planning for the olive industry* – this program will be rolled out by AOA over the next 12 months.
 - The ‘Export Readiness’ e-modules also link to project *OL14003: Essential work to facilitate increased exports to China, Removing Roadblocks and enhancing Competitive Advantage*, and will be incorporated into participation in the Au-thentic export program to China which is ongoing.
 - The ‘Sensory Assessment’ e-modules for evoo and table olive judging also link to the Tastebook™ training program, which is ongoing.
- In addition AOA is actively promoting participation in OliveCare® and the e-learning program through participation in the EVOO Everyday program and via the OL17001 IPDM project regional workshops. In summary the previous timeline for implementing the e-learning program was unrealistic and needs to be extended and adequately resourced.

OliveCare® Signatories were included in the first two rounds of Tastebook. Disappointingly we recorded participation from only 50 (33%) of the 150 Code Signatories, which appears to be at odds with expectation that Signatories should strive for product excellence!

Modularisation, revision and simplification of Code documentation is critical to the success of this project, and is ongoing. The revised Code of Best Practice documentation released under the *OliveCare*[®] includes:

- *OliveCare*[®] Manual
- *OliveCare*[®] Application Form & Agreement
- Guide to completing the *OliveCare*[®] Checklist
- *OliveCare*[®] Product Guides for EVOO and Table Olives
- *OliveCare*[®] HACCP Style Plan templates for EVOO and Table Olives
- *OliveCare*[®] Labelling Templates for EVOO and Table Olives
- *OliveCare*[®] e-learning training modules
- *OliveCare*[®] Newsletters have been issued on a 6 monthly basis to Signatories from July 2014 to August 2017, and monthly thereafter.
- Other *OliveCare*[®] information resources posted on the AOA and OliveBiz websites are listed later in this report.

2. Australian market survey (180 samples over 3 years), (ref: MS103 MS105 and MS108 reports):

Achieved:

Since the commencement of OL13007 in July 2014, the team has surveyed one hundred and eighty five (185) Australian and imported olive oils labelled as Extra Virgin Olive Oil (EVOO) were purchased from supermarkets, independent retailers, or ‘on-line’, with testing undertaken by NSW DPI Wagga Wagga, (a National Association of Testing Authorities, Australia (NATA) and American oil Chemists Society (AOCS) accredited laboratory, and International Olive Council (IOC) accredited sensory panel), for selected chemical and sensory parameters for compliance against both the Australian Standard and the IOC Standard.

OL13007 has reviewed 382 EVOO sample test results covering all Australian market survey samples purchased and tested between July 2012 and September 2017 (63 months), including:

- 192 Australian EVOO products samples – with 35% failing to meet the Australian Standard for evoo classification- resulting in re-classification of 20% as VOO and 16% as Lampante.
- 190 Imported EVOO products samples – with 66% failing to meet the Australian Standard for evoo classification – resulting in re-classification of 41% as VOO and 26% as Lampante.
- The data indicates that Australian EVOO product failure (as measured against the Australian Standard) on an annual basis has varied between 26% and 42%, whereas imported brands have made a dramatic improvement in 2017 to 37% from a high failure rate of 79% in 2015/16.

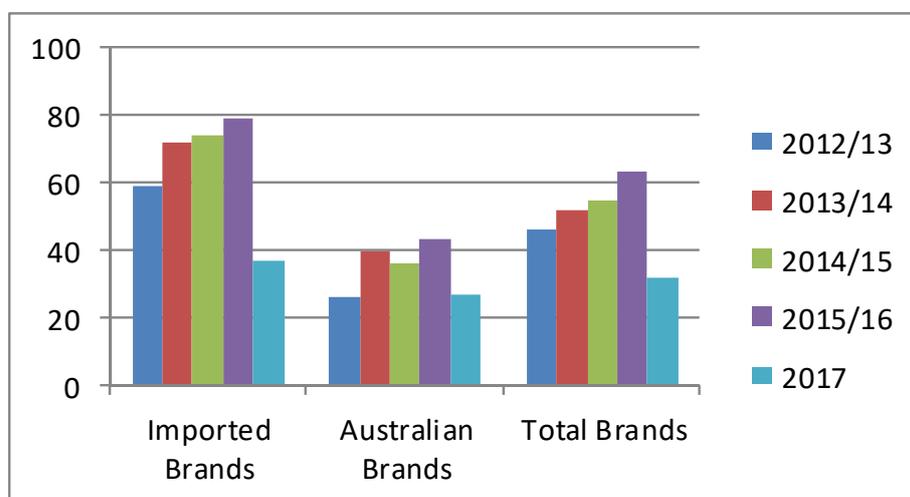


Figure 1: Percentage brand failure (against the Australian Standard)

Reasons for product failure over the 5 years of surveys include:

- **Sensory Defects (all standards):** A total of 139 (36%) of the 382 products comprising 42 (22%) Australian and 97 (51%) imported, exhibited negative sensory attributes (defects), including: muddy sediment, and rancid, with many also having zero fruity attribute, variously reflecting poor fruit quality and or processing methods, or poor product storage conditions.
- **Chemical Analysis (all standards):** A total of 56 (15%) of products comprising 29 (15%) Australian and 27 (14%) imported, failed one or more of the chemical test parameters: Free Fatty Acids (FFA), Peroxide Value (PV), Ultra-Violet Absorption (UV) - (deltaK, K232 &K270), variously reflecting poor fruit quality, poor processing methods, poor product storage conditions, secondary oxidation and use of refining methods (detected in several imported oils).
- **Freshness Analysis (Australian Standard only):** A total of 121 (32%) products comprising 46 (24%) Australian and 75 (39%) imported, failed Pyropheophytin A (PPP's), and / or 1,2 Diacylglycerols (DAG's), which are proven and useful measures of determining EVOO quality and freshness, as well as for the detection of deodorised (soft processed) olive oils.

Reports covering the 5 years of Australian market survey testing are available on the AOA website¹⁵.

Over the 5 years of the Australian market survey from July 2012 to September 2017 (63 months):

- 26 (22%) of the 129 OliveCare® certified brand samples tested failed to meet the requirements for EVOO classification under AS5264-2011.
- 42 (41%) of the 102 Australian non- certified brand samples tested failed to meet the requirements for EVOO classification under AS5264-2011.
- 135 (89%) of the 151 Imported brand samples tested failed to meet the requirements for EVOO classification under AS5264-2011.

In the most recent (July 2017) survey involving 26 Australian olive oil products labelled as EVOO, 7 (27%) samples, didn't meet the requirements of the Australian Standard (AS5264-2011) for classification as EVOO, whereby:

- 2 (8%) failed chemistry testing, (including 1 OliveCare® certified product),
- 5 (19%) failed freshness testing (including 2 OliveCare® certified products), and
- 5 (19%) failed sensory testing (including 3 OliveCare® certified products).

Of the 7 failures, 5 products were reclassified as Virgin Olive Oil (VOO), and 2 as Lampante Olive Oil.

The failure rate for OliveCare® certified products was 3 of 17 samples (17.5%), and for non-certified Australian products was 4 of 9 samples (44%), demonstrating that the OliveCare® Code of Best Practice program is having a measurable impact on EVOO quality with 60% fewer test failures than non-certified products. However it remains of concern to AOA that consumers are not able to purchase EVOO OliveCare® certified products with absolute certainty of its quality - with the exception of the few stand out brands that have never failed Australian market survey testing undertaken over 5 years:

- **BBL (Cobram Estate): AOA Certified**
 - Failed AS: 0/16 = 0% (5/5 passed the 2017 market survey)

Meaning Australian Cobram Estate branded products have been tested a total of 16 times with no samples failing the *Australian Standard*.
- **BBL (Red Island): AOA Certified**
 - Failed AS: 0/7 = 0% (1/1 passed the 2017 market survey)

Meaning Australian Red Island branded product has been tested a total of 7 times with no samples failing the *Australian Standard*.
- **Coles / Macro Australian / Coles Finest Mallee: Not Certified**
 - Failed AS: 0/8 = 0% (2/2 passed the 2017 market survey)

Meaning Australian Coles branded products have been tested a total of 7 times with no samples failing the *Australian Standard*.

These survey results are consistent with a ¹⁶CHOICE market survey of 23 EVOO Australian and imported

¹⁵ Australian market surveys: <http://www.australianolives.com.au/article-detail/aoa-market-survey-test-results>

¹⁶ Can you trust the 'extra virgin' label on olive oil? (CHOICE 2017): <https://www.choice.com.au/food-and-drink/nuts->

products also undertaken in July 2017, in which a total of 2 (22%) out of the 9 Australian olive products tested failed to meet EVOO specifications under the IOC Standard; comprising 1 (14%) failure of 7 OliveCare® certified products tested, and 1 (50%) failure of the 2 non-certified Australian products tested. Whilst 3 (21%) of the 14 imported oils failed to meet the IOC Standard.

Take home messages for producers and marketers of olive oil:

- Olivecare® certified Australian EVOO products have a much superior record of compliance with olive oil standards over other Australian and imported products, however Australian producers and marketers should not ‘rest on their laurels’, given imported olive oils were much improved in the latest (July 2017) survey.
- OliveCare® Signatories should apply to approved products, the certification trade marks detailed at [Appendix 1](#), to provide a quality assurance to consumers.
- Australian market survey ‘freshness testing’ of new season EVOO products has found that many products have less than the usually stated 24 months of potential shelf life, sometimes a low as only 12 months. The industry practice of routinely applying a 2 year ‘Best Before Date’ on EVOO without supporting test data is to be strongly discouraged.
- Olive oil producers and marketers should give increased attention to stock control, and regularly and independently test olive oil stocks to ensure product meets EVOO test parameters (this also applies to producers and marketers who purchase bulk EVOO from various sources.)

A limited market survey of pesticide, fungicide and herbicide residues in olive oil:

A limited residue survey of Australian and Imported olive oil products comprising a total of 59 samples - 27 Australian and 32 imported products, was undertaken between April 2015 (3 samples), April 2016 (4 samples) and July 2017 (52 samples) as part of the Australian market survey.

Only four of the 180 analytes measured were found to be above the limit of detection these were:

- Paraquat + Diquat (Sprayseed) herbicide – 2 (50%) of the 4 samples tested (all imported products).
- Flurofen / Oxyflurofen herbicide – 3 (5%) of the 59 samples tested (all Imported products)
- Chlorpyrifos / Chlorpyrifos methyl insecticide -5 (8.5%) of the 59 samples tested (all imported products).
- Pyraclostrobin /Azoxystrobin fungicide – 4 (8%) of the 59 samples tested (all Australian products).

Pleasingly, none of the residue detections in the 15 (25%) products tested of were above Australian MRLs. However, for ‘brand x’ imported EVOO product, the Paraquat residue level of 0.037 mg/kg exceeds the EU standard of 0.02 mg/kg (olives), indicating this product could not be legally sold in the EU.

The detection of Paraquat and Diquat (Sprayseed herbicide) and Oxyfluofen residues in a total of 5 (16%) of 32 imported products tested, also suggesting these products are made using olives collected off the ground, in which case the oil is unlikely to be of EVOO classification, this is consistent with the Australian market survey results for ‘brand x’ products over the past 5 years where 13 of the 15 products tested were found not to be of EVOO classification, similarly for ‘brand y’ products that have been tested a total of 6 times and failed on all 6 occasions.

The other residue issue arising from July 2017 OliveCare® market survey is that 1 Australian ‘organic’ product (4%) and 1 imported ‘organic’ product were found to have measurable pesticide residues (below the Australian MRLs), in contradiction to their ‘organic’ claim.

Other market survey outputs:

Olive oil blends:

The Australian market survey testing has also examined olive oil blends, vegetable oil spreads; as well as table olives and flavoured olive oils (in conjunction with AOA competition testing and assessment).

Eight (8) products labelled as “Olive Oil” blends, were purchased from supermarkets and tested for compliance against the relevant Australian and International product standards (as detailed above). Only 2 products failed to meet the requirements for classification as olive oil blends under the Australian Standard due to having no detectible fruity attribute.

Vegetable oil spreads:

Four (4) commercial vegetable oil spreads labelled as “olive oil spreads” were purchased from supermarkets and their labels examined for compliance with Australian Consumer Law. Whilst it is commendable that these spreads contain olive oil - all 4 products have potentially misleading labels - trading on the healthy reputation of olive oil. A more transparent product description would be “Vegetable Oil Spread - containing x% Australian olive oil (specify grade)”.

Italian provenance:

The Australian market survey has investigated misleading claims of Italian provenance for products exported from Italy, where significant volumes of olive oil are sourced from Spain and North African producer countries, then blended in bottled in Italy for export.

Table olives:

Over the 3 Australian production seasons, thirty eight (38) commercial table olive products have been purchased and tested against the *Voluntary Standard for Table Olives in Australia (RIRDC 2012)*, as well as the *IOC trade standard applying to table olives, COI/OT/NC no. 1 of December 2004*.

The encouraging message for Australian table olive producers and consumers alike is that locally produced table olives are measurably superior to product currently available on supermarket shelves - which are mostly imported from Spain, Greece, Italy, and Turkey.

Review of the Australian market survey and competition testing and reporting protocols:

The review included temperature monitoring of survey test samples, test parameters, report consistency and credibility of test results. Some variation in interpretation of negative sensory parameters between the 2 accredited laboratories has been identified, and further panel training needs identified.

3. Code of Best Practice membership (increase from 150 to 200 over 3 years), (ref: *MS103, MS105 and MS108 Reports*): **Not Yet Achieved:**

- Since the commencement of OL13007 in July 2014, Code membership has remained steady at around 150 Signatories, this figure which represents approximately 45% of the 330 AOA financial grower members (as at 30 June 2018), and 33% of the estimated 450 commercial olive industry enterprises in Australia; however Code membership continues to represent in excess of 90% of total Australian olive oil production, which for the year ended June 2017¹⁷ was 16,568 tonne, equivalent to 19.2 million litres, largely due to the active participation of Boundary Bend Ltd (Cobram Estate and Red Island brands).
- In the 4 years since the commencement of the project in July 2014, there has been a membership turnover of 44 Signatories or 11 (7%) per annum - primarily due to rationalisation of supply chains, crop failures, low productivity and profitability of smaller producers as well as several larger WA groves.
- Targeted invitations are regularly issued to prospective members, including competition entrants, participants in “The Olive Route” export program, and Tastebook™ sensory training program.
- To date a total of 9 OliveCare® Signatories have joined the Olive Route export program (seven EVOO producers and two table olive producers). Unfortunately the phthalate contamination issue is limiting EVOO producer participation in export to China.
- A current list of Code certified Signatory brands is provided on the new consumer website EVOO Everyday: www.australianextravirgin.com.au
- Individual Letters / emails sent to Code of Practice Signatories – Re: Audit of Code Compliance Requirements.

¹⁷ 2016/17 Australian Horticulture Statistics Handbook: <https://horticulture.com.au/resource/australian-horticulture-statistics-handbook/>

Under New Management:

¹⁸Australian Food Integrity Certification Services Ltd trading as *Au-thentic Services* has been appointed by AOA to manage *OliveCare™* Code of Best practice, and Signatory use of AOA Certification Trade Marks as of 1 July 2017.

Au-thentic Services has also been licensed by AOA to adapt the Code of Best Practice IP for an export program called *OliveCare™ Export*, under which Signatory olive products will be accredited for selected export markets, using a uniquely coded authenticity sticker, linked to an authentication webserver.

Peter McFarlane a Director of *Au-thentic Services*, and consultant to AOA continues to serve as the *OliveCare®* Administrator.

¹⁸ Australian Food Integrity Certification Services Ltd trading as Au-thentic Services : <https://au-thentic.com.au/>

Outcomes

1. Increased industry participation in OliveCare®:

Metrics for evaluation of this objective:

- Number of OliveCare® Signatories – growers / supply chain: 150
- Number of OliveCare® Signatories participating in ‘the olive route’ export program: 9

2. Providing a formal mechanism for certification of quality Australian olive products:

Metrics for evaluation of this objective:

- Industry coverage of CoP (% by number and by production): 33% of commercial producers, 90% of production.
- Product testing compliance in 2017: 83% of 150 Signatories (noting 5 Signatories had no crop in that year)
- Product traceability compliance – use of batch codes. 94% of 47 certified brands surveyed.
- Product label compliance and use of CTMs. 77% of signatories have provided OliveCare® compliant labels, with 60% of Signatories using OliveCare® certification trade mark(s) on their products and/ or websites.
- Food Safety / Food Quality Plans in place: 64% of Signatories have provided evidence of having some level of food safety / quality plan in place. This ranges from the basic OliveCare® template through to third party accredited HACCP plans.

3. Building olive industry skills and capacity through development and delivery of competency based training modules and provision of other teaching and learning resources:

Metrics for evaluation of this element:

- Training modules developed: 6 modules comprising 10 on-line self-pacing presentations posted on the RMT website.
- Enterprise trainers accredited: six
- Regional training programs delivered: None to date – will require additional funds.
- Participation in training program. One to date – will require additional promotion of e-learning modules.
- Participants achieving competency based training accreditation: None to date – will require additional time.
- Participation in the Tastebook™ sensory training program: 50 (33%) of the 150 Code Signatories.
- OliveCare® Newsletter editions: 15 to June 2018.
- Resources published AOA / OliveBiz websites: 20

4. Supporting and monitoring industry compliance with Australian Standards, ANZ Food Standards Code and Australian Consumer Law (ACL):

Metrics for evaluation of this element:

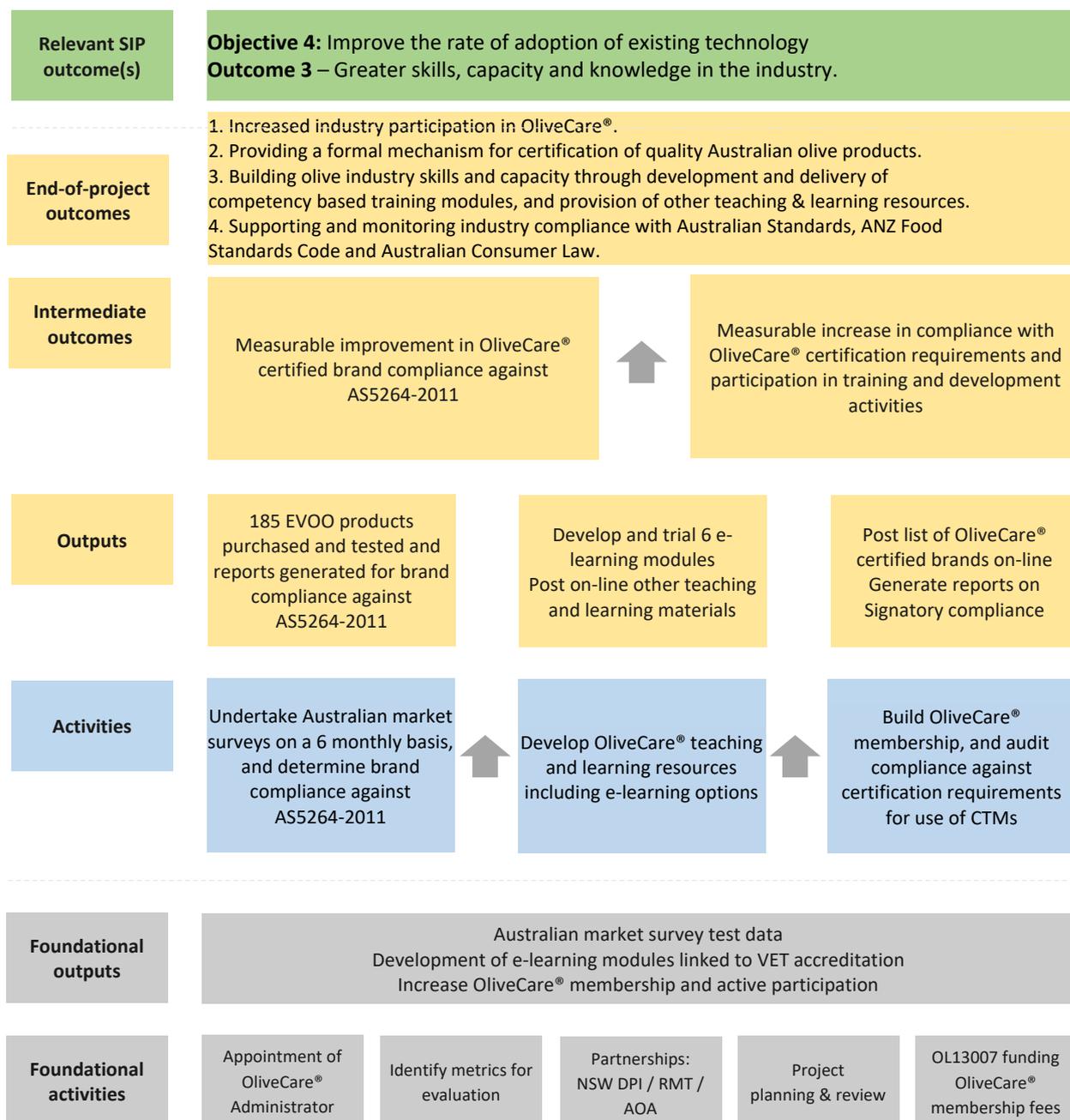
- Number of olive products tested: 185 EVOO products, 8 olive oil blends, 4 vegetable oil spreads, 38 table olive products.
- Changes in EVOO quality measured via the AOA’s AIOA database: This data is yet to be statistically analysed, however feedback from the AOA head judge is that a measurable improvement in the performance of EVOO exhibits has occurred over the past 3 years moving average scores from bronze to silver medals.
- Analysis of Australian market survey test results for compliance against relevant trade standards: Of the 382 EVOO samples purchased and tested between July 2012 and September 2017 (63 months), 26 (22%) of the 129 OliveCare® certified brands failed to comply with AS5264-2011, compared with a failure rate of 42 (41%) for the 102 non-certified Australian brands tested, and a failure rate of 135 (89%) for the 151 imported brands tested.
In the July 2017 survey brand performance improved, with 3 (17.5%) of the 17 OliveCare® certified brands tested failing to meet AS5264-2011, with 4 (44%) of the 9 non-certified brands tested failing to meet AS5264-2011, with 9 (37.5%) of the 24 imported brands tested failing to meet AS5264-2011.

- *Compliance / breach letters sent to brand owners: All brand owners are contacted with individual results of the Australian market survey, and constructive feedback is provided. In total 130 brand owners including 50 OliveCare® certified brand owners have been contacted regarding survey test results.*

Note: Critical success factors and impediments for this project are being addressed including lowering the cost of Code compliance, streamlining code documentation and support materials, and increased promotion of the CTM Logos to consumers.

Monitoring and evaluation

Noting a monitoring & evaluation plan was not required at the commencement of OL13007, the following provides an overview of monitoring and evaluation activities undertaken in the course of the project using the Hort Innovation format:



Domain*	Key evaluation questions
<p>Effectiveness</p>	<p>1 To what extent has the project achieved its expected outcomes?</p> <p>The project has exceeded expected outcomes for its market survey work.</p> <p>The project has met expectations for development of e-learning and other teaching and learning resources but has not met training delivery and uptake expectations.</p> <p>The project has not achieved the expected growth in OliveCare® membership from 150 to 200, in spite of considerable effort, however barriers to membership have been identified.</p>
<p>Relevance</p>	<p>2 How relevant was the project to the needs of intended beneficiaries?</p> <p>This project remains very relevant to the needs of intended beneficiaries, by providing a quality systems approach to improve the performance of olive producers and the quality of their products, with the ultimate aim of building consumer confidence in Australian olive products.</p>
<p>Process appropriateness</p>	<p>3 How well have intended beneficiaries been engaged in the project?</p> <p>There is a high level of engagement by the OliveCare® administrator with signatories – both individually, primarily through email and telephone contact, and collectively through the monthly OliveCare® newsletter, as well as via AOA publications and websites.</p> <p>4 To what extent were engagement processes appropriate to the target audience/s of the project?</p> <p>Because of cost considerations, project beneficiaries are primarily engaged electronically, however many olive producers prefer face to face contact. This could be achieved by convening more regional workshops.</p>
<p>Efficiency</p>	<p>5 What efforts did the project make to improve efficiency?</p> <p>The Australian market survey program operates smoothly and efficiently.</p> <p>The efficiency in development of the e-learning modules increased with experience.</p> <p>With compliance, the OliveCare® administrator is developing check lists for growers to self-evaluate, however when it comes to provision of documents for desk audit, this requires a lot of time to chase Signatories, especially for those that don't participate in any EVOO competitions which provide summary testing and judging results to cross reference for OliveCare® Signatories. It is difficult to see how this process can be made any more efficient, and can be expected to become even more time consuming with the proposed membership growth.</p>

Recommendations

Recommendations for future R&D and practical application to industry:

OliveCare® Code of Best Practice training:

1. It is recommended to extend training resources to include e-modules covering best practice olive processing and oil storage, and IPDM in the olive grove. In addition the project will benefit from development of work books and assessment tools to link the olive e-learning modules to Units of Competency from the National Training Framework (NTF) that can lead to a recognised VET qualification or statement of attainment. Convening regional workshops to present these resources to levy payers is also highly desirable.

Market surveys:

2. It is recommended that the national market surveys of olive product quality continue, (suggested a total of 180 over 3 years) including OliveCare® certified and non-certified EVOO products (both Australian and imported brands), with testing for selected chemical and sensory parameters for compliance against the Australian Standard for Olive Oil and Olive-Pomace Oil AS5265-2011 (AS), as well against the International Olive Council Trade Standard applying to olive oils and olive-pomace oils (IOC), COI/T.15/NC No 3/Rev.11 July 2016, and EU Regulation No 1348/2013(EU).

There is also value in continuing to undertake laboratory calibration involving a total of 15 EVOO samples to be quality tested by both NSW DPI and Modern Olives.

3. Whilst this project has demonstrated a high level of MRL compliance, an issue was identified with some products labelled as organic with detectable chemical residues. It is therefore recommended the market survey include a limited chemical residue survey of these products.

Code of Best Practice membership and compliance:

4. It is recommended that OliveCare® membership be expanded by targeting:

- Small growers (<5,000 litres annual production) by developing a value proposition to support a unique sales proposition of having the highest quality standards and EVOO product in the world.
- Post farm-gate / supply chain – retailers, distributors, food service including chefs and trainees – by moving to an on-line compliance checklist approach.

This will involve addressing potential barriers to OliveCare® participation, including:

- Annual Costs:
- Perceived time and effort: additional reading, documentation, compliance activities, administration.
- Lack of awareness and promotion of the Certification Trade Marks / Everyday promotional program, and the need for the Australian industry to maintain its reputation for product quality and excellence.
- Farm gate perspective – lack of appreciation of the need to operate as a connected supply chain.

As well as promoting the benefits of OliveCare® participation to potential members, including:

- Product Certification / Compliance Certificates – these are very popular with exporters and farmers market sellers.
- Use of Certification Trade Marks – interestingly only about 60% of OliveCare® members currently use the CTMs - increased promotion of the logo should improve use.
- Linkage with the Everyday program / website – popular with Signatories
- Access to OliveCare® extension and training materials - OliveCare® News, e-learning modules

Noting: Many olive producers are very small and only trade locally - often involving friends and neighbours, and may not even harvest a crop every year as they don't invest in good grove management. Whilst these groves are not sustainable they do present a biosecurity challenge and need to be engaged by the industry.

Refereed scientific publications

None to report

OliveCare® information resources posted on the AOA Website:

Olive Chemical Permits: <https://australianolives.com.au/chemical-permits/>

Australian Table Olives an Overview 2016: <https://australianolives.com.au/industry-snapshot/>

AOA Certified Table Olive Compliance: <https://australianolives.com.au/aoa-certified-table-olive-compliance/>

Critical Control Points – EVOO: <https://australianolives.com.au/critical-control-points-evoo/>

Labelling Information: <https://australianolives.com.au/labelling-information/>

Managing Anthracnose in Olives: <https://australianolives.com.au/managing-anthracnose-in-olives/>

Managing Olive Lace Bug: <https://australianolives.com.au/managing-olive-lace-bug/>

Tastebook™ training resources: <https://australianolives.com.au/tastebook/>

AOA Market Survey Test Results: <https://australianolives.com.au/aoa-market-survey-test-results/>

Why have OliveCare®: <https://australianolives.com.au/why-have-olivecare/>

Sign up to OliveCare®: <https://australianolives.com.au/sign-up-to-olivecare/>

Risk Assurance: <https://australianolives.com.au/risk-assurance/>

OliveCare® Newsletters: <https://australianolives.com.au/newsletters/>

OliveCare e-training resources posted on the River Murray Training website:

Olive industry e-learning modules are hosted on the RMT website at: <http://www.r-m-t-online.com>

- *Module 1 - Introduction to the Code of Practice and Market Surveys*
- *Module 2 - Quality and Food Safety Plans*
- *Module 3 - Managing Quality Along the Supply Chain*
- *Module 4 - The Export Program*
- *Module 5 - Sensory Assessment of Extra Virgin Olive Oil*
- *Module 6 - Sensory Assessment and Judging of Table Olives*

Articles and reports posted on the OliveBiz website:

AOA 2017 Market Survey of olive oil products labelled as EVOO, available at:

<https://olivebiz.com.au/aoa-2017-market-survey-olive-oil-products-labelled-evoo/>

Also published in the Australian & New Zealand olivegrower and processor® magazine (December 2017 edition – pg 8): <https://olivebiz.com.au/magazines/olivegrower/back-issues/>

AOA Certified Australian Table Olive Compliance Arrangements: Australian & New Zealand olivegrower and processor® magazine (December 2014 edition – pg 34):

<https://olivebiz.com.au/magazines/olivegrower/back-issues/>

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ENDS

Acknowledgements

The author acknowledges the constructive support provided throughout the project by staff and directors of the Australian Olive Association Ltd, officers of the DPI NSW olive oil testing laboratory and sensory panel, trainers at River Murray Training Pty Ltd, Hort Innovation funding and program staff support, and OliveCare® Signatories who have so enthusiastically participated in OL13007.

Intellectual property, commercialisation and confidentiality

The IP created in this project is the copyright © to written, audible, and visual assets created for the extension program throughout the life of the project. This IP is assigned by the Research Provider to Hort Innovation, not-with-standing the rights of the Research Provider to use and sub-license this IP to others royalty free for its internal purposes or by consent by Hort Innovation its use for specified purposes for the benefit of the Australian horticultural industries.

The Australian Olive Association Ltd (AOA) has agreed to host information resources created during this project, on the AOA and OliveBiz websites, which enables this information to be made available to all olive industry participants on an ongoing basis. These resources include the publications and training materials listed in a previous section of this report.

Note: The olive industry e-learning modules are hosted on the RMT website at: <http://www.r-m-t-online.com> these resources may be accessed by anyone on payment of a registration fee to the site managers.

AOA Pre-existing IP:

The AOA owns the following pre-existing IP as utilised in this project:

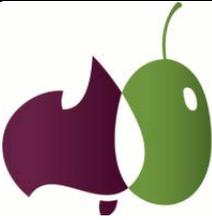
- OliveCare® Certification Trade Marks including Certified Australian Extra Virgin®, Certified Australian Table Olives®, Certified Australian Flavoured Olive Oil®,
- OliveCare® Manual and Product Guides©,
- OliveCare® HACCP based templates for EVOO and Table Olives©,
- ANZ OliveGrower & Processor Magazine© (OG&P) – quarterly printed (hardcopy) magazine;
- Olive Industry Directory Year-Book©.
- Friday Olive Extracts© (FOE) – weekly e-newsletter,
- OliveBiz® website,
- AOA Website.

The AOA also owns industry databases created and maintained using AOA resources. These databases enable the AOA to communicate with all participants in the olive industry supply chain.

The AOA has authorised the use of its IP royalty free, to enable this project to be undertaken.

Appendices

Appendix 1: Use of AOA Certification Trade Marks:

	<h2>Use of AOA Certification Trade Marks</h2>	
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The Australian Olive Association Ltd (AOA) Code of Best Practice has been rebranded as OliveCare®. The application of the following AOA Certification Trade Mark (CTM) logos is the consumers’ guarantee of both safety and quality. These CTMs are for the exclusive use of Code Signatories:

AOA Certification Trade Mark	CTM Conditions of Use
	<p>For use on OliveCare® certified AUSTRALIAN EXTRA VIRGIN OLIVE OILS that comply with the Australian Standard (AS5264-2011) classification requirements for EVOO.</p> <p>To be used in accordance with Appendix 9 – Australian Extra Virgin™ logo</p>
	<p>For use on promotional materials relating to OliveCare® certified AUSTRALIAN OLIVE OIL products.</p> <p>To be used in accordance with Appendix 10 – Australian Extra Virgin Logo</p>
	<p>For use on OliveCare® certified AUSTRALIAN TABLE OLIVE PRODUCTS that comply with the classification requirements under the Voluntary Standard for Table Olives in Australia (RIRDC 2012).</p> <p>To be used in accordance with Appendix 2 – product labelling</p>
	<p>For use on OliveCare® certified AUSTRALIAN FLAVOURED OIL PRODUCTS that comply with the requirements under COP Appendix 2.4 – Flavoured Olive Oil Labelling Guidelines, and Appendix 3 – Flavoured Olive Oils.</p>
	<p>For use on OliveCare® certified products MADE USING AUSTRALIAN EVOO that comply with the requirements of COP Appendix 2.5 - Other Products Made with Australian Olive Oil Labelling Guidelines.</p>

Appendix 2: Accessing OliveCare® on-line training modules:



Workplace
Training
Specialists
Provider No. 94073

River Murray Training Pty Ltd
 ABN 70 087 953 142
 Adelaide Office
 226 Jeffcott Street
 NORTH ADELAIDE SA 5006
 ph: 0409280387



The Australian Olive Association working with River Murray Training (RMT) has developed 6 e-learning modules with the aim of building industry skills and facilitate implementation of AOAs Code of Best Practice (CoP).

Modules include Food Safety & Quality, HACCP, export readiness and sensory training.

These 6 e-learning modules are linked to Units of Competency from the National Training Framework (NTF), and can lead to a recognised VET qualification or Statements of Attainment.

This program was developed as part of the OliveCare® – phase 1 project, funded from the Olive Levy through Hort Innovation.

How to access the OliveCare® e-learning modules on-line:

- **Step 1:** Participants need to register with Gillian Ireland at River Murray Training gillian.ireland@r-m-t.com.au or admin@r-m-t.com.au

Note: For sustainability of the on-line training program a nominal enrolment fee of \$68 will be charged for participants accessing modules. This charge will be deducted from assessment fees for those who choose to undertake competency assessment and receive a Statement of Attainment.

Please complete the attached registration form and send to Gillian Ireland. This will generate an invoice for \$68 which must be paid by direct debit to complete your enrolment.

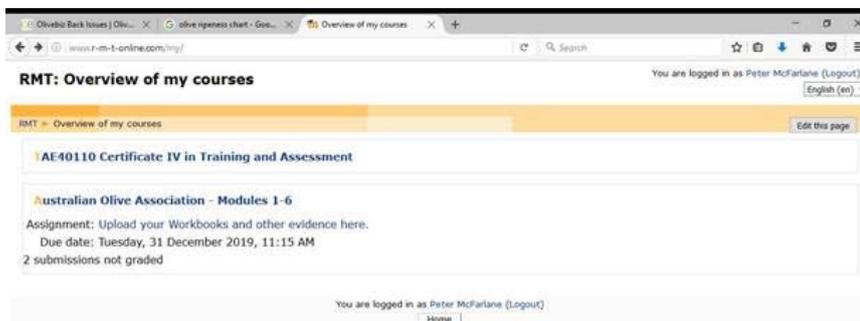
Note: you will also need to apply for a Unique Student Identifier (USI) at: <http://www.usi.gov.au/create-your-USI/> to include when filling out this form.

Participants will be issued with a username and password to log onto website that hosts the AOA on-line training program: <http://www.r-m-t-online.com>

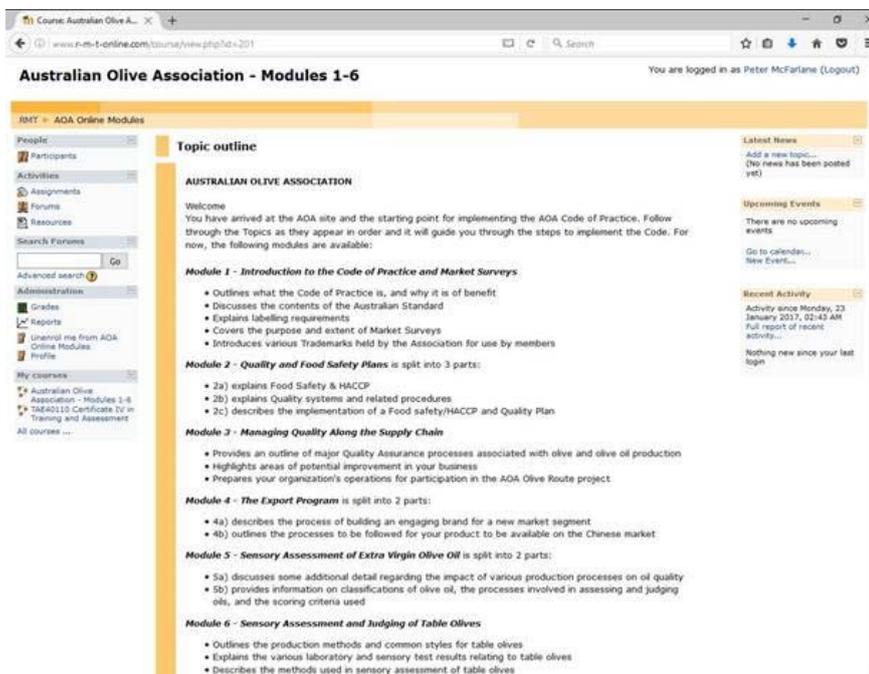
- **Step 2:** Use your web browser to access the RMT site: <http://www.r-m-t-online.com>



- **Step 3:** Enter your allocated username and password:



- **Step 4:** On the overview screen select “Australian Olive Association Modules 1-6”.



- **Step 5:** Read the topic outline and then click on the start button for each of the self-pacing e-learning modules.

The website also includes workbooks and lots of support materials.

Where is this leading?

- Integrated training, with the 6 e-learning modules are linked to Units of Competency from the National Training Framework (NTF).
- These competencies can be bundled with other units to achieve a formal qualification such as *Certificate III in Food Processing*, or *Certificate IV in Production Horticulture*.
- RMT is developing workbooks to record participants evidence for achieving competency in the following accredited units:

UNIT CODE	UNIT NAME		Nominal Hours	Workbook / Assessment	OliveCare® Module
FDFFS2001A	Implement the food safety program and procedures	Core	30	Yes / Yes	1 & 2 Introduction to CoP, Food Safety & Quality
FDFFS3001A	Monitor the implementation of quality and food safety programs	Core	70		
FDFTEC3001A	Participate in a HACCP team		50		
FDFOP2063A	Apply quality systems and procedures		30		
FDFPPL3001A	Participate in improvement processes		40		
FDFPPL3005A	Participate in an audit process		50	Managing Quality Evidence Workbook – still to be developed	3 Managing quality along the supply chain
FDFTEC3003A	Apply raw materials, ingredient and process knowledge to production problems		60		
AHCPHT403A AHCPHT403	Develop harvesting and processing specifications to produce an olive oil		100		
TLIA3018A TLIA1807C	Organise despatch operations		40	Export Workbook - still under development	4 Building creative Brands / Export
TLIA2009A TLIA2009	Complete and check import/export documentation		30		
AHCPHT401A AHCPHT401	Assess olive oil for style and quality		100	Taste Book Project provides evidence for assessment- still under development	5A Producing high quality EVOO / 5B Sensory Assessment and judging of EVOO
FDFOP2014A FBPOPR2014	Participate in sensory analyses		40		
AHCPHTXXX	Assess table olives for style and quality (To be developed using AHCPHT401 as a template)		100	Awaiting outcome of competency development from Industry Skills Council	6 Sensory Assessment and judging of Table Olives
FDFOP2014A FBPOPR2014	Participate in sensory analyses		40		
AHCPMG302	Control plant pests, diseases and disorders <i>This unit of competency describes the skills and knowledge required to control plant pests, diseases and disorders, taking into consideration Integrated Pest Management options. The unit describes the skills and knowledge required to identify a range of pests, diseases and disorders and beneficial organisms, assess damage or threat to plants and select and apply pest and disease controls and timing of operations. It includes preparing and calibrating equipment, monitoring the effectiveness of controls and keeping records.</i>		80	Under Consideration	7 Integrated pest management

This is a great opportunity to further develop skills and knowledge in HACCP principles, Export development and Sensory assessment of EVOO (and table olives), with the option of leading towards a formal VET qualification or statement of attainment.

Contact Gillian Ireland at River Murray Training on ph: 0409 280 387, or e-mail: gillian.ireland@r-m-t.com.au or admin@r-m-t.com.au

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