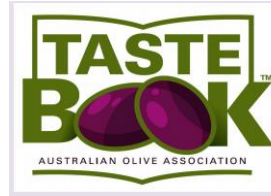




Department of
Primary Industries



**Hort
Innovation**
Strategic levy investment

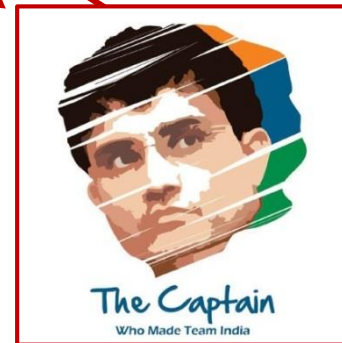
**OLIVE
FUND**



Australian Olive Industry Sensory Training Program

Dr Soumi Paul Mukhopadhyay
Sensory & Consumer Researcher- Horticulture

My City



Journey started from India, travelled around the world for work and now settled in Australia....not sure where is the next destination.....

My Culture

Food is an intricate part of my culture and upbringing-
hence “Sensory perception” is always important for me.....



Education (2000-2006)



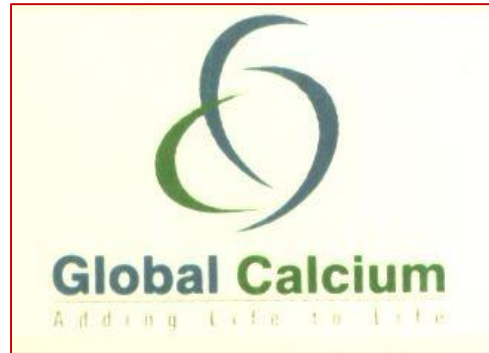
B.Sc. Agriculture
(2000-2004)

M.Sc. Food Technology
(2004-2006)

FMCG Industry Career (2006-2012)



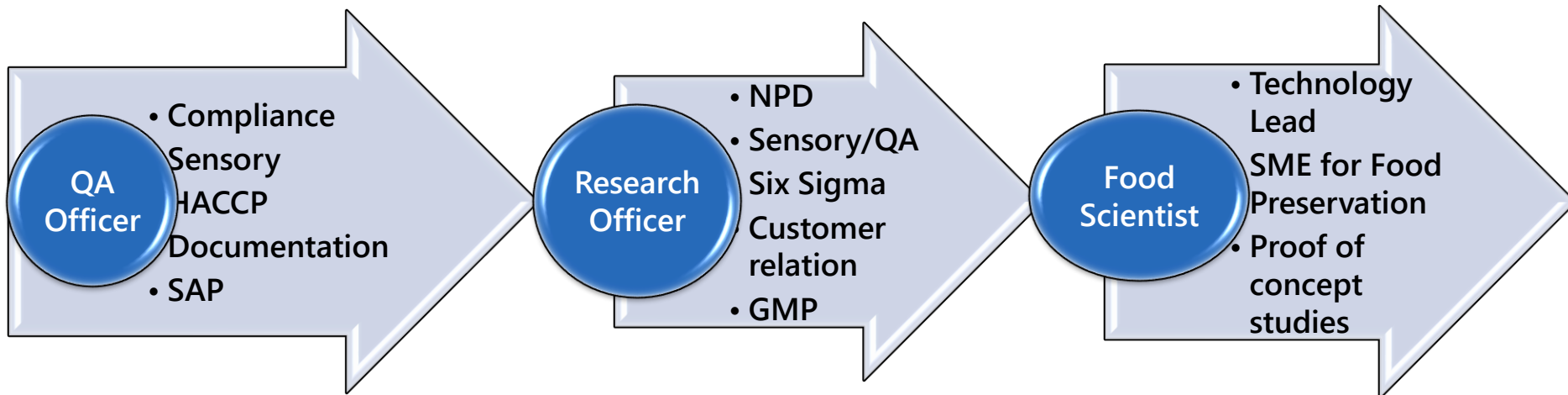
India



India



India & Italy



Varied industry experience...

Research Career (2012-2015)



PhD Food Science (specialisation in Sensory and Consumer Science)

GROUND COVER | SEPTEMBER - OCTOBER 2015

YOUNG SCIENTISTS IN GRAIN

35

Kyabra and PBA HatTrick top consumer study

By Nicole Baxter

Research aimed at giving Australian desi chickpeas an advantage in the global food market shows how different varieties are better suited to different cooking methods.

GRDC-supported PhD student Sourmi Paul Mukhopadhyay, based at Charles Sturt University (CSU) near Wagga Wagga, New South Wales, says the sample of Kyabra[®] she examined was particularly well suited for processing into whole puffed chickpeas (a common snack food in southern India) and cooked chickpea dhal.

However, the PBA HatTrick[®] sample was preferred for the production of another major Indian snack food, fried split chickpeas.

For the past three years, Mrs Paul Mukhopadhyay, a food scientist from India, has been investigating the sensory attributes that drive consumers' preferences regarding whole puffed chickpeas, fried split chickpeas and cooked chickpea dhal.

Working under the supervision of CSU's Associate Professor Paul Prentzel, Professor Chris Blanchard, Professor Anthony Saliba and Dr Jennifer Wood, from the NSW Department of Primary Industries, Mrs Paul Mukhopadhyay has identified what Indian and Australian consumers like and dislike about a selection of Australian chickpeas.

To do this, Mrs Paul Mukhopadhyay returned to India in 2012 to learn how to make puffed whole chickpeas, fried split chickpeas and cooked chickpea dhal according to traditional Indian methods.

In the first study, commissioned by the Central Food Technological Research Institute in India, she discovered that the Indian chickpea samples examined had a puffing yield of 60 per cent, whereas the four Australian samples had a reduced puffing ability.

However, after selecting another 12 different chickpeas from a single trial and testing them in Australia herself, Mrs Paul Mukhopadhyay was delighted to find the puffing yield of Kyabra[®] was about 50 per cent, which is considered to be commercially acceptable for puffing.

"We now know Kyabra[®] has the ability to puff well and is well liked by consumers, scoring higher than an imported Indian product produced by Bam's Foods," she says.

"If this trend is supported across trials it may be beneficial to segregate Kyabra[®] in the future and target it to the southern part of India where the market demands chickpeas with high puffing yields."

For frying and cooked dhal, the Australian chickpeas tested performed well but PBA HatTrick[®] stood out in the consumer preference study.

As part of her research, Mrs Paul Mukhopadhyay conducted an online survey of 813 Indian consumers and 775 Australian consumers and found the level of awareness about chickpeas and their associated different food uses was much higher in India than in Australia.

"There is ample opportunity to popularise chickpeas in the Australian diet



Charles Sturt University PhD student Sourmi Paul Mukhopadhyay with fried, split, puffed and raw chickpeas used as part of her investigations into the performance and market acceptance of Australian chickpeas in India and Australia.

by highlighting them as gluten free, high in protein and low in fat," she says.

When chickpea prices are high, Mrs Paul Mukhopadhyay says field peas are often substituted for chickpeas, because uncooked field pea dhal looks similar to raw chickpea dhal. However, the results of her sensory study showed consumers could detect significant differences between the split chickpeas and some field peas in their cooked forms.

To assist pulse breeders in improving

the quality and market acceptance of Australian chickpeas, Mrs Paul Mukhopadhyay has developed a preference map to show where these Australian chickpea and field pea samples stand in terms of meeting the preferences of Indian and Australian consumers. ☺

GRDC Research Code DAN00139

More information: Sourmi Paul Mukhopadhyay, 0405 230 274, smukhopadhyay@csu.edu.au.



Desi chickpeas



Split Desi chickpeas



Kabuli chickpeas

Back to Food Industry (2016 onwards....)



Sensory Technologist, Australia

Main role:

***Sensory Program development
and execution- Grocery business for 4
individual categories***



Back to Research (2017 onwards....)



Department of
Primary Industries

**Sensory and Consumer Researcher
NSW Horticulture**



Having a consumer oriented research and product development is important in today's market.....



Changing shift in today's consumer trend.....

The latest census found that only slightly more than half of Australia's residents today have two Australian-born parents and **more than one in four Australian residents were born overseas.**

This shift in the population make-up also means a shift in shopping habits, preference, behaviours and expectations, as well as a influence and purchasing power towards ethnic-Australian consumers.



Today's consumer is.....

Provenance

**Follow food
trends**

**More
educated**

**Clear about
food sensory
attributes**

**Aware about
safe food**

**Technologically
savvy**

**Health and
brand
conscious**

**Environmental
conscious**



“THE CORE
OF OLIVE OIL
TASTING IS
ASSESSING
QUALITY.”



The image shows five white, rectangular tiles arranged in a horizontal row. Each tile has a single letter carved into it, spelling out the word 'TRUST'. The tiles are resting on a dark, textured surface that appears to be a piece of weathered wood or stone with visible cracks and grain. The lighting is warm, casting soft shadows from the tiles onto the surface below them.

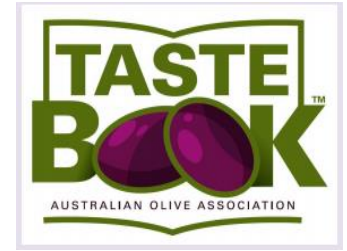
T R U S T

**Takes years to build,
seconds to break and
forever to repair.**

Context....

- ❑ The Australian olive industry has a domestic and international reputation for producing superior quality olive products.
- ❑ Rigorous sensory evaluation and consistent knowledge of the sensory panel and judges have to be continued with global standards and accreditation- to maintain this consistent and superior quality of Australian olive products in domestic and international markets.
- ❑ Quality sensory testing depends on well trained, highly skilled panellists and competition judges and training resources required not only to maintain existing panellist quality but also aims to develop new panellists/judges.

Why we are doing this.....



- ❑ Support and maintain the ongoing knowledge of accredited sensory panellists and nationally accredited competition judges;
- ❑ Encourage new entrants and educate beginners on how to assess organoleptically the quality, flavour and presentation of Australian extra virgin olive oil (EVOO) and table olives (TO) to match evolving and increasing market demands.

Project stages.....



- Understand the baseline and training requirements
- Ensure expectations are clearly understood
- Identify the knowledge gap

Understanding requirements

Series of integrated Training

- TasteBook™ quarterly training
- Workshops in designated regions
- Masterclass in conjunction with AOA conference

- Improved knowledge and skill set for all participants about various sensory attributes of EVOO and TO products
- Encouragement and education of new entrants

Final survey, report & recommendations



Understanding olive oil sensory descriptors- Diversity in the sensory attributes

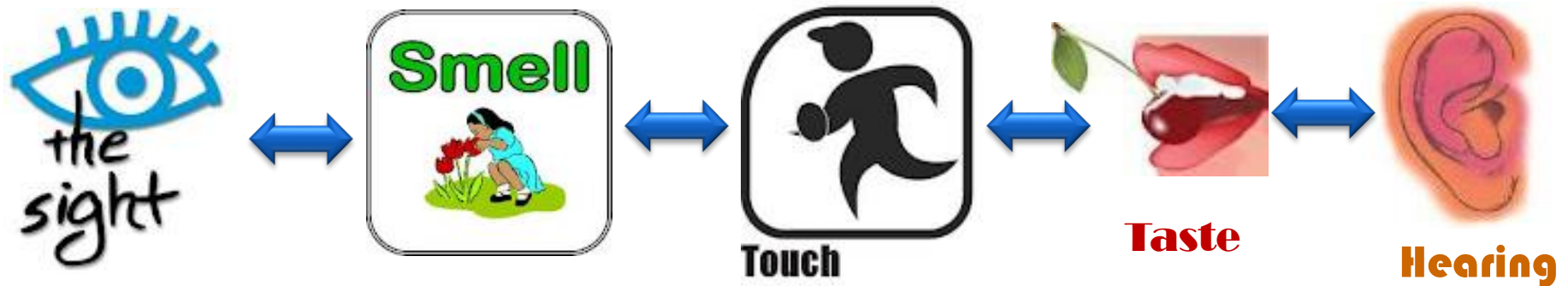


**Consistent National
framework of training**

HOW TO TASTE A TRULY
EXTRA VIRGIN



What is sensory evaluation?



- ❖ Appearance
- ❖ Shape
- ❖ Colour
- ❖ Consistency

- ❖ Odour
- ❖ Volatile molecules

- ❖ Tactile sensation

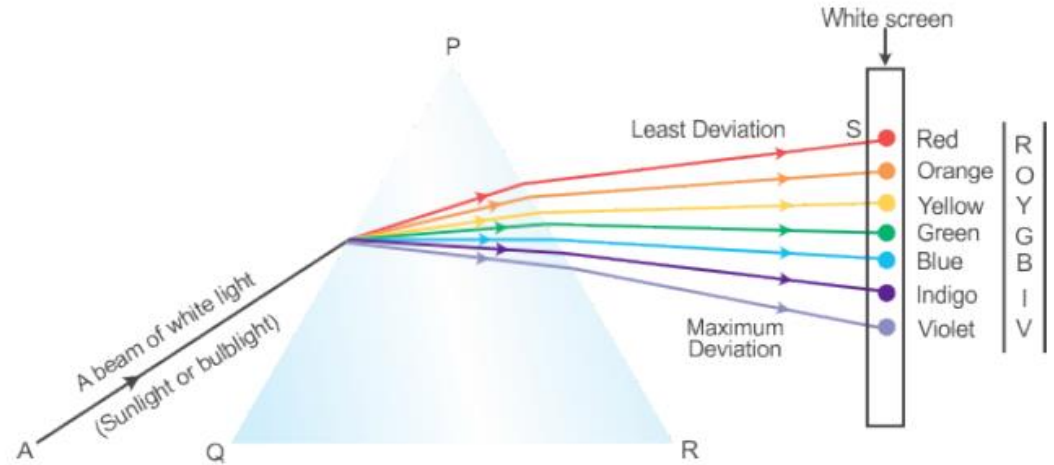
- ❖ Sweet
- ❖ Sour
- ❖ Bitter
- ❖ Salty
- ❖ Savoury

- ❖ Crunching
- ❖ Crackling
- ❖ Popping
- ❖ Bubbling

Colour and light

White light comes from sun, electric lights firelight and candles

Contains different light travelling at different wavelengths

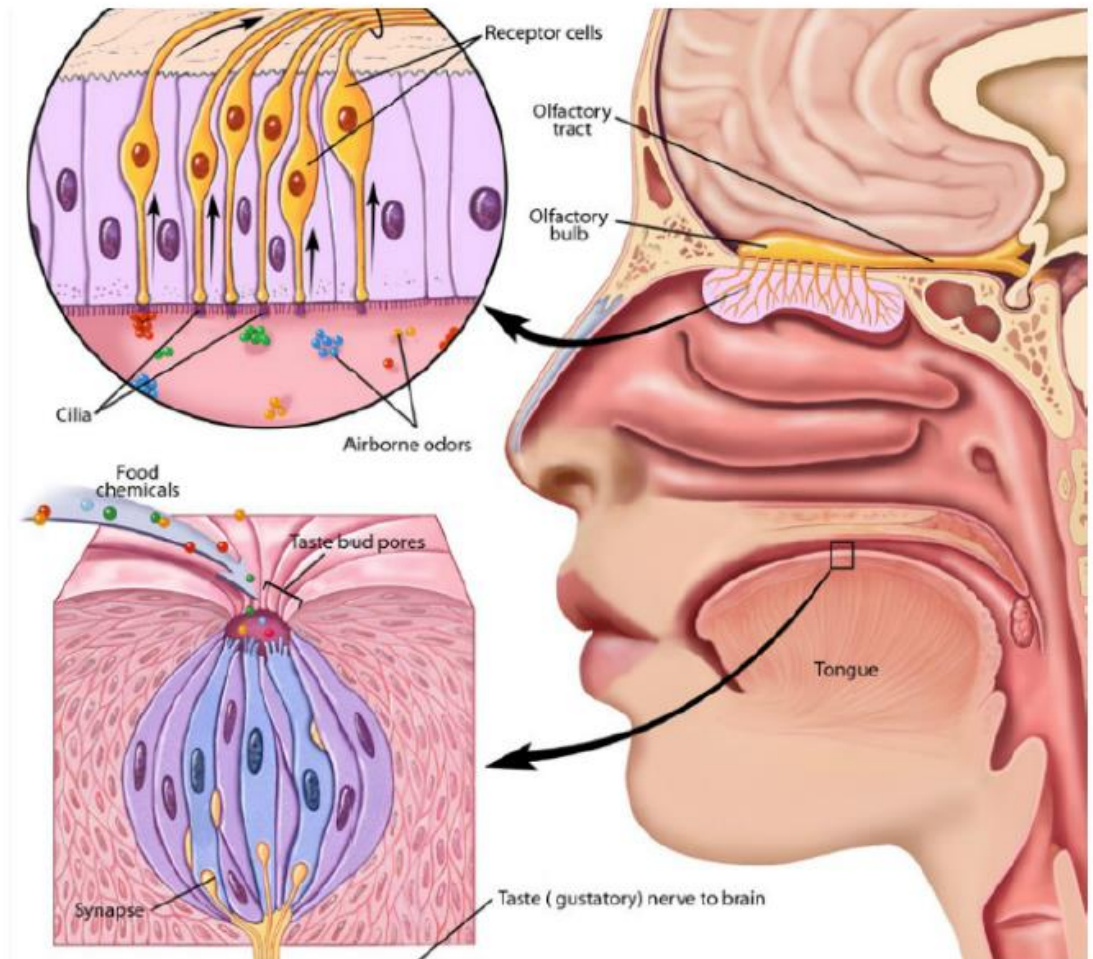


Light source affects colour perception

- Image shown left is from fluorescent light sources
- Left top Daylight deluxe, cool white, daylight, Green, Red and Yellow (bottom right)

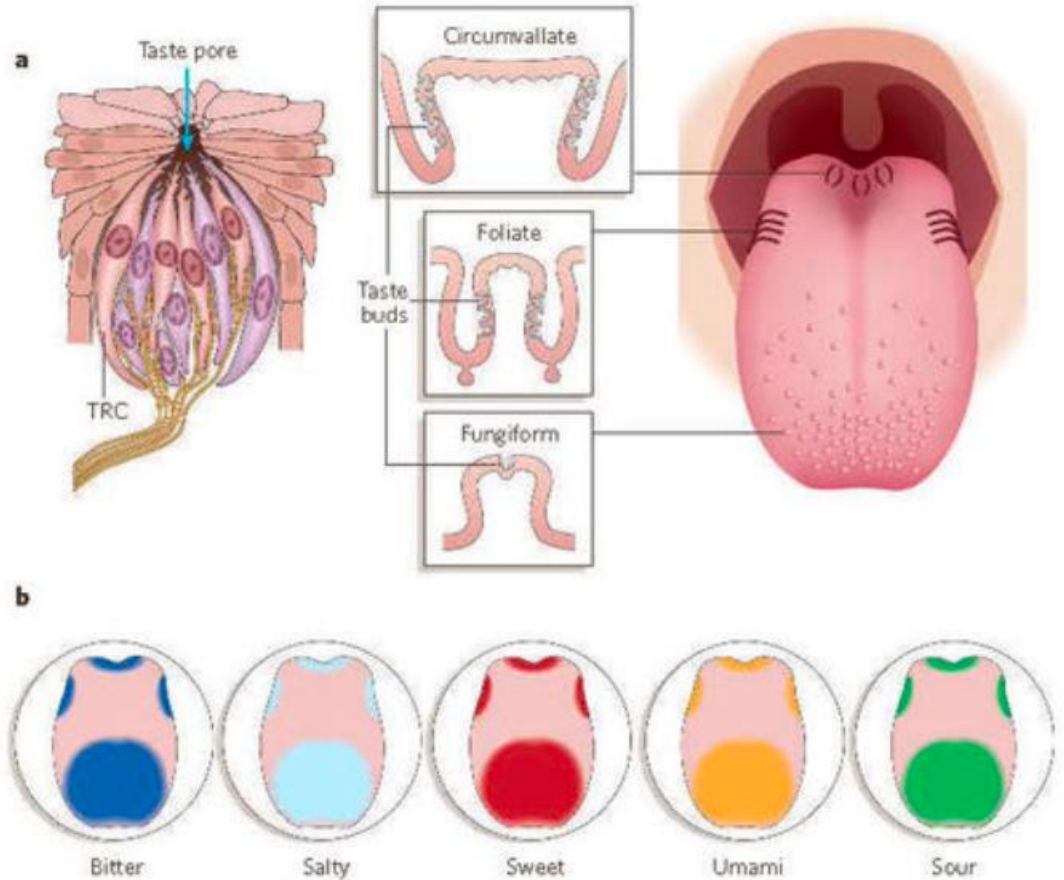


Interaction of taste and smell to get flavour



The papillae and taste buds

- a. taste bud
- b. modern taste map

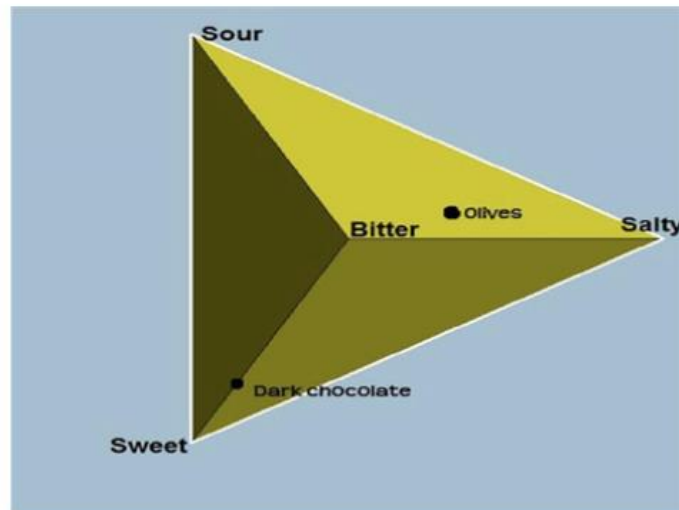


Flavour includes

- taste
- odour (smell)
- tactile sensations (sensations that can be felt)

Taste interactions

- Taste interaction can be represented in a tetrahedron



Receptors

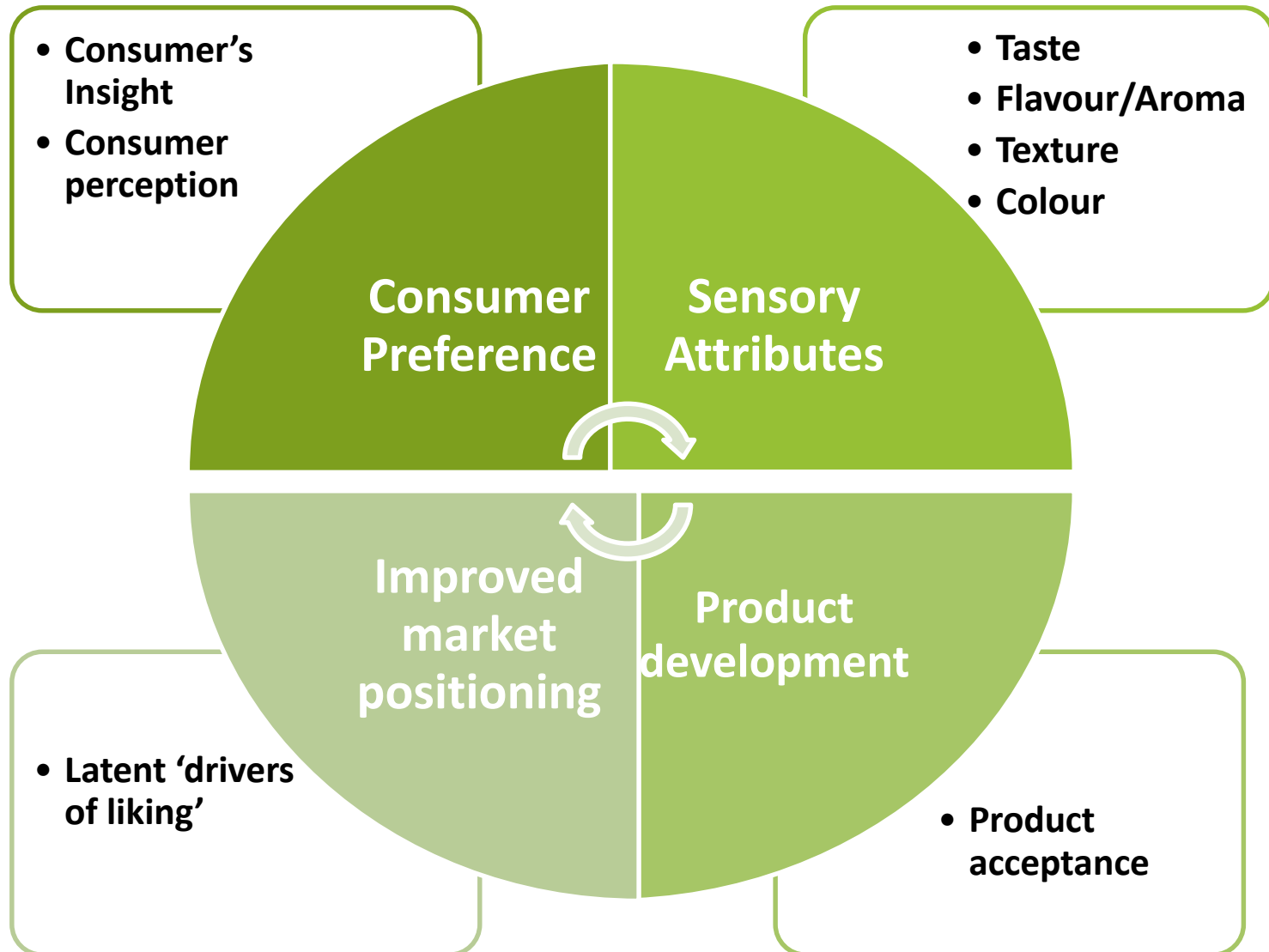
- **Tactile:**
 - respond to the way in which sample is deformed when handled
- **Kinesthetic:**
 - respond to sensations of movement and position of jaw



Mouthfeel

- refers to the sensations in the mouth during eating
- depends on the physical properties of density, viscosity and surface tension and on the chemical properties of the food.
- **After-feel** - lingering sensation after swallowing
- **After-taste** – taste remaining in mouth after swallowing.

Sensory attributes- Key drivers for consumer preferences



Producer-Priority Selection

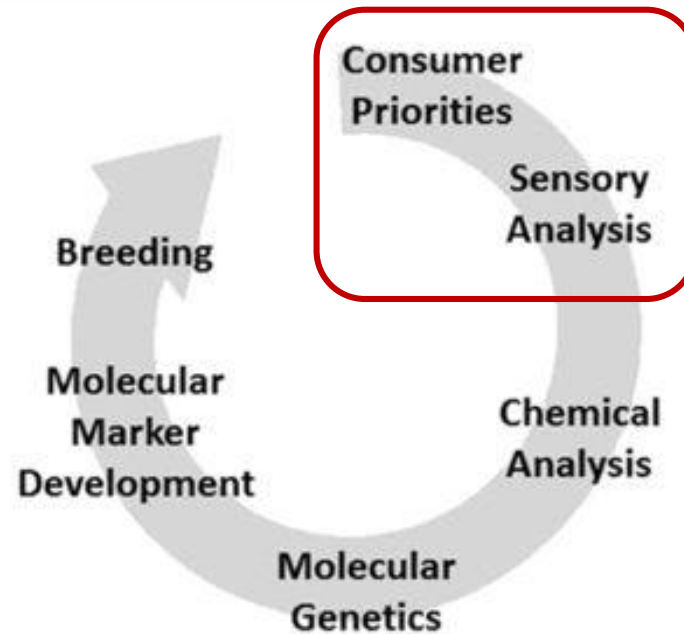
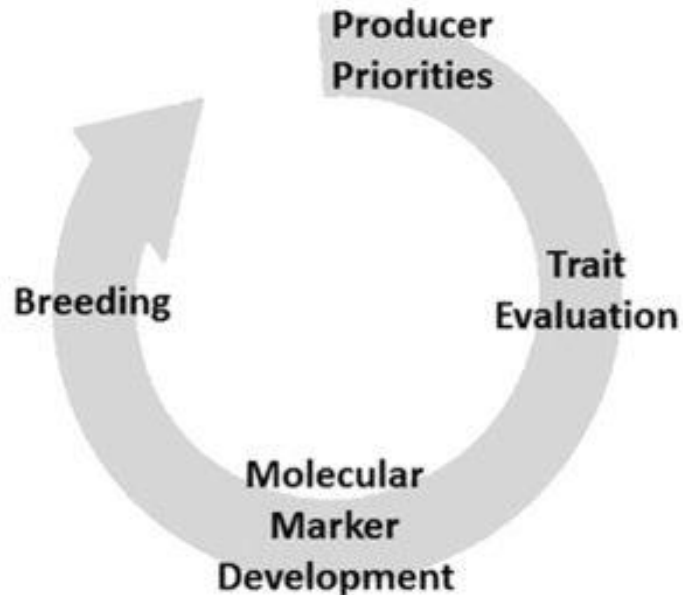
Consumer-Assisted Selection

**BREEDING
PRIORITIES**

Disease resistance
Shelf life
Yield
Appearance
Uniformity

Flavor
Aroma
Novelty
Nutrition
Sustainability

**BREEDING
PROCESS**



Sensory methods

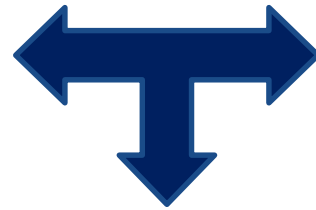
Effective Testing

- ❖ *Objective* facts
- ❖ Trained Panel: 8-12

Affective Testing

- ❖ *Subjective* preferences
- ❖ Untrained panel: >50

Descriptive Analysis



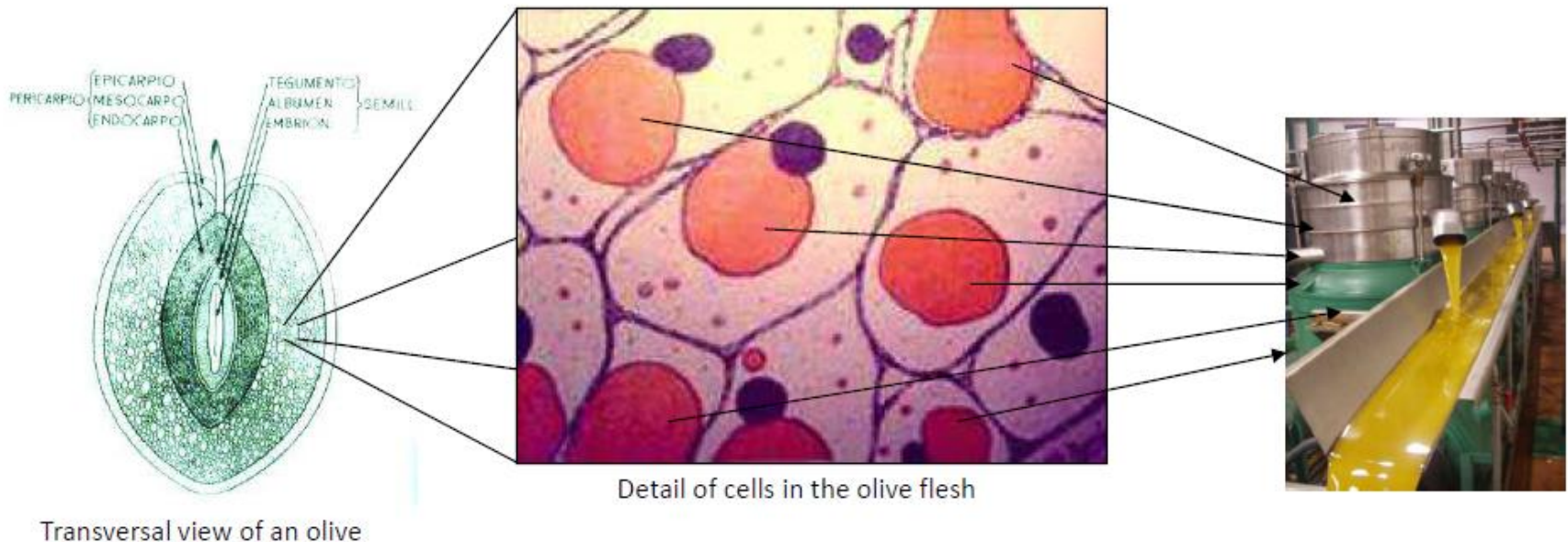
Consumer Evaluation

Flavour Preference Map



What is olive oil?

Olive oil is the oil obtained solely from the fruit of the olive tree (*Olea europaea* L.), to the exclusion of oils obtained using solvents or re-esterification processes and of any mixture with oils of other kinds.



How is olive oil made?



Collecting the fruits



Fruits in the washing equipment



Double grid hammer crusher



Olive paste in first malaxer

How is olive oil made?

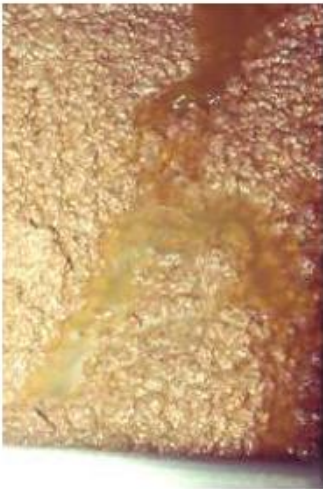
Decanter separating olive oil from paste



Olive oil storage



Vertical separators clarifying the oil



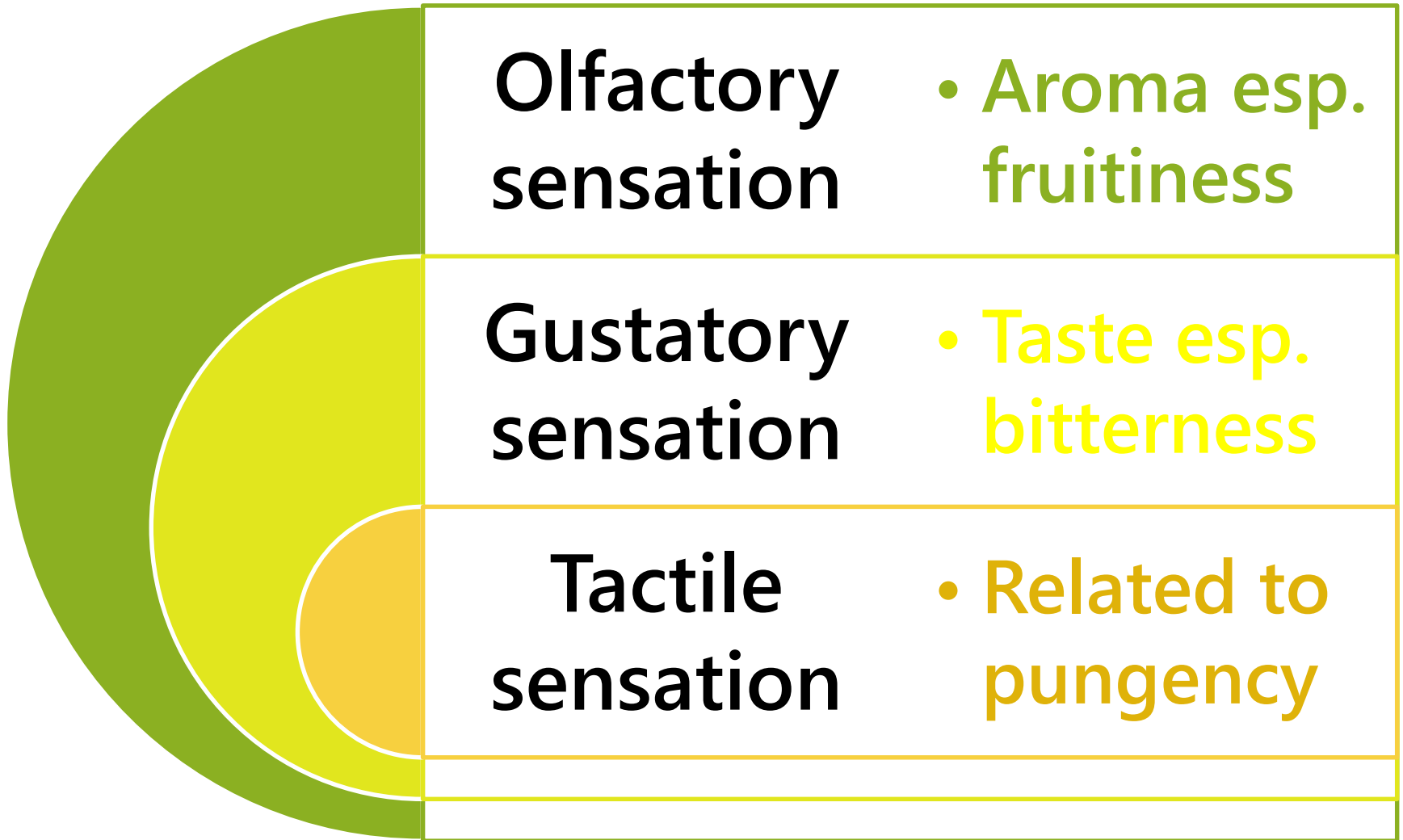


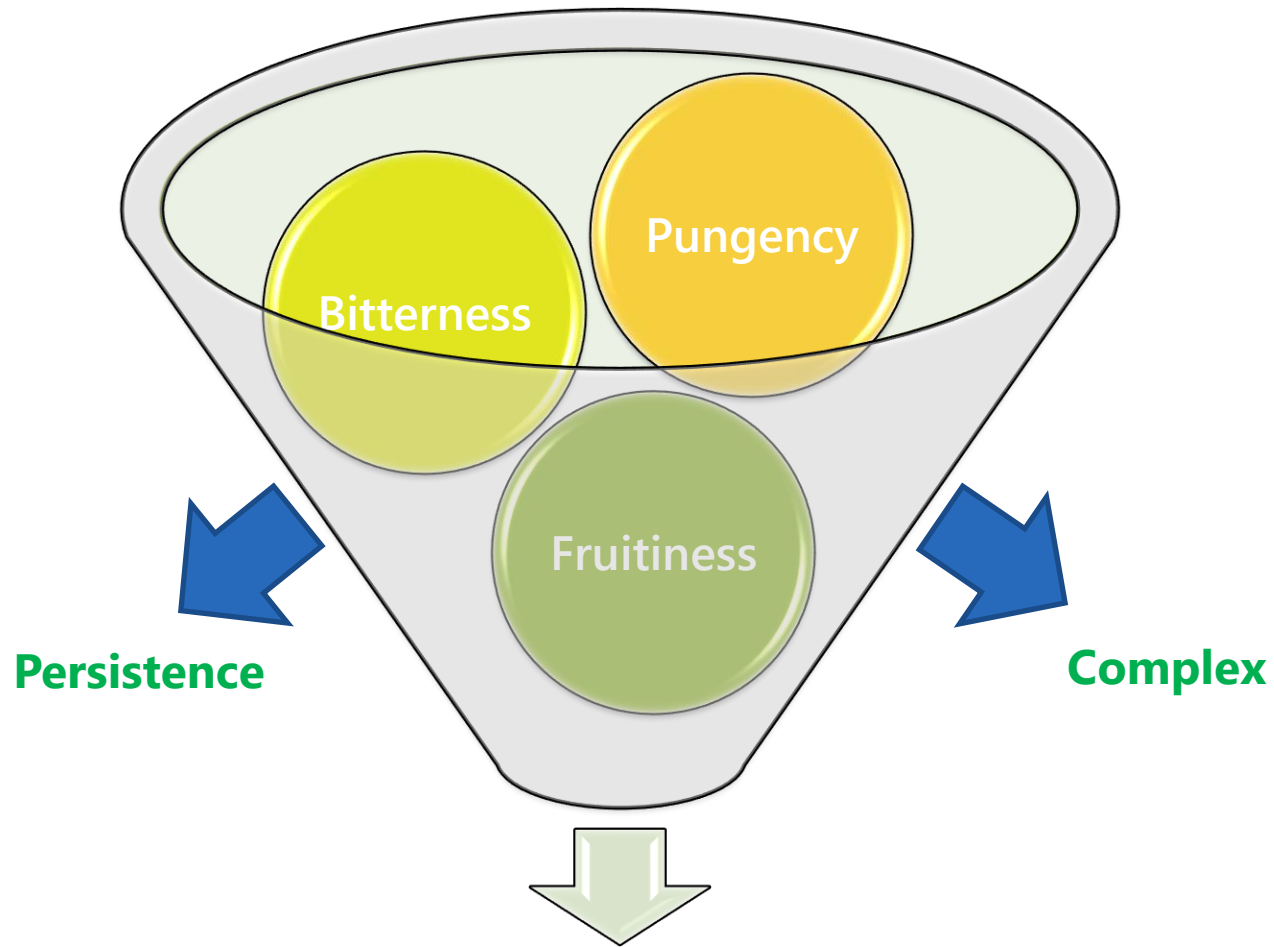
Fruity

Bitterness

Pungency







Balance/Harmonius

NEGATIVE ATTRIBUTES

A powerful sense of smell enables us to detect tired or aging oil, or a defect. The defect can be due to the time of harvest, long delays between harvesting & processing of fruit, weather conditions, processing & storage of oil (eg. rancidity).

The oil has an unpleasant taste of stale nuts or ripe fruit. Or, little fruit on the palate. A thick, pasty feel on the tongue.

Overly bitter
Overly
peppery/pungent
Short finish
Unbalanced
Unpleasant aftertaste

POSITIVE ATTRIBUTES

A powerful sense of smell enables us to recognise attributes by holding the glass for 30 seconds to our nose. Aroma can be intense – dark greens, sorrel, grassy, herbaceous, green banana or tomato, through to softer fruits such as apple, pear, fresh nuts and tropical fruit.

Fresh oils with an olive fruitiness are a strong indication of high quality oils. Pleasant enticing flavours range from green vegetable or tomato through to banana, citrus or salad leaves. As you begin to swallow, more sensations appear, such as bitterness & pungency, both complementing each other.

Complex – Multi dimensional, balanced or harmonious. Persistence – long lasting with a pleasant aftertaste.

AROMA

FLAVOUR

COMPLEXITY PERSISTENCE

DECISION

HOW TO TASTE OLIVE OIL

Pour a little olive oil into a glass.



Warm the glass, and hence the oil, in your hands to release the volatile aromas.



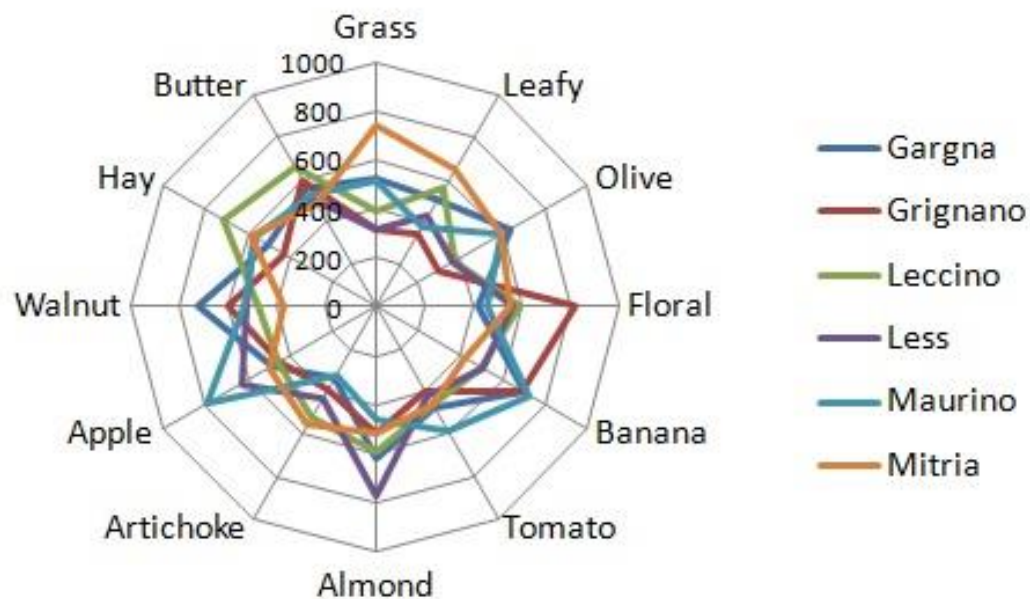
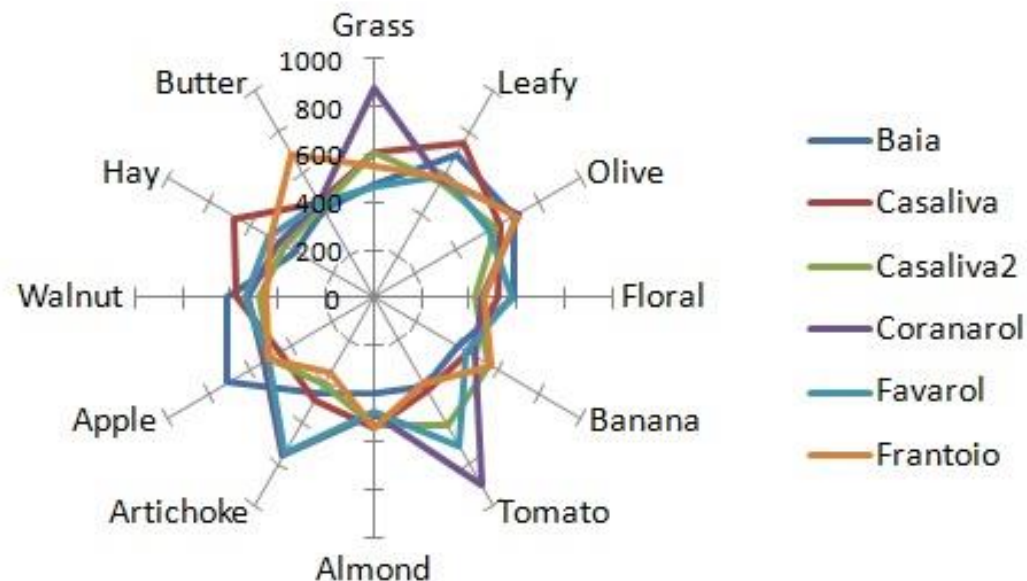
Bring the glass to your nose and inhale two or three times, taking in the fragrance.



Take a small sip of the oil, allow to slide on to your tongue (but do not swallow). Now with your mouth slightly open, suck in some air.



Multidimensional sensory flavour profile

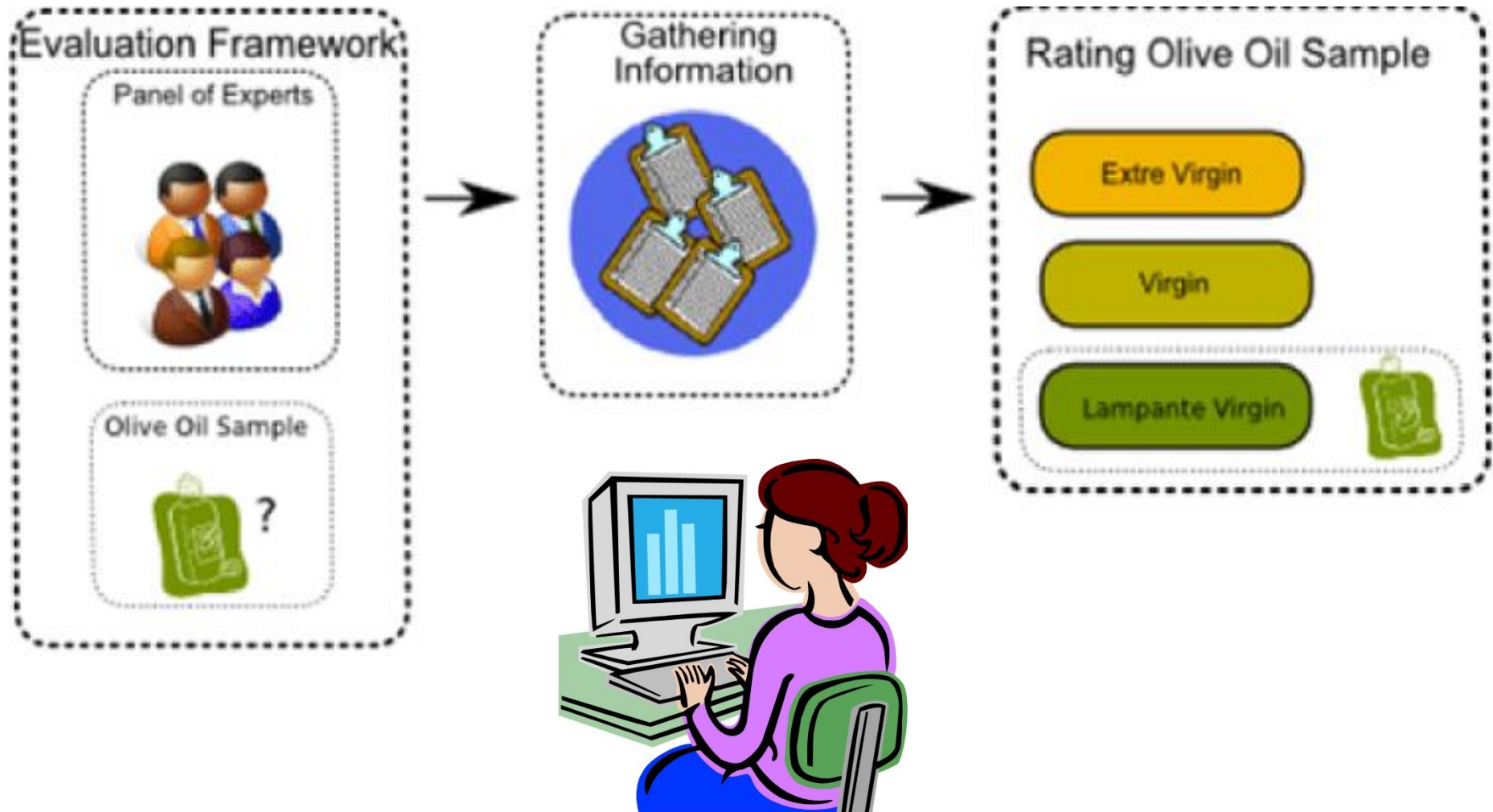


Complex

Varieties Descriptors

Frantoio	Leccino	Barnea	Picual	Coratina	Koroneiki	Arbequina
Buttery	Caramel	Banana Fruit	Tomato fruit	Green grass	Green grass	Red apples
Floral	Tofi	Banana skin	Tomato leaves	Woody	Cut grass	Confectionary
Dried Herbs	Vanilla custard	Buttery	Fig tree / leaves	Cut grass	Green tomatoes	Tropical fruits
Green almonds	Condense milk	Shallots	Overripe apples	Leafy	Green banana	Creamy
Walnuts	Vanilla biscuits	Grassy	Cat pee	Nutty	Timber	Berries
	Cream	Woody		Green almonds	Pine	Ripe fruits
		Sea weeds		Smoky	Smoky	Condense milk

Streamlining the evaluation process...





Harnessing Provenance- need to support and promote Australian olive products



What we are going to achieve.....

- ❑ Maintain and improve knowledge (recency of practice) of the accredited sensory panel and competition judges nationally;
- ❑ New entrants to the Australian olive industry are equipped with the sensory assessment skills necessary to ensure the delivery of a quality product;
- ❑ Identified stakeholders better understand and are confident in undertaking sensory assessments of EVOO and table olives.





The Competitions



The competition has three main sections, **Extra Virgin Olive Oil**, **Flavoured Olive Oil** and **Table Olives**.



Oils are judged out of a maximum of 100 points. The extra virgin and flavoured oil medal scoring range is: Gold Award (86-100 points), Silver Award (76–85 points) and Bronze Award (65–75 points). Table olive entries are judged out of a maximum of 30 points. The table olive medal scoring range is: Gold Award (25-30 points), Silver Award (22-24 points) and Bronze Award (19-21 points).



Medals are awarded based on the final agreed score. More than one medal of each type (except major trophies) can be awarded within each class.



To win a major award for Extra Virgin and Flavoured Oils, the entry must have scored 80 or more points. A major Table Olive award entry must have scored a minimum of 22 points. All Gold medal winning entries are retasted to identify 'Best of Class' and 'Best in Show' awards.



EVOO 100 Point Scoring Sheet

Name of judge:

Panel No:

Class:

Sample No.	Individual Points			Total	Other Judges		Agreed Points	Award	Comments
	Aroma	Flavour	Harmony Complex						
	/35	/45	/20						
TB-5A					Please do not worry about other judges, just try to assess all 4 samples yourself and put a score				
TB-5A									
TB-5A									
TB-5A									

Defective: <50, No Medal: 50-64, Bronze: 65-75, Silver: 76-85, Gold 86-100 ©Australian Olive Association Ltd.



WHAT MAKES A GOLD MEDAL EXTRA VIRGIN OLIVE OIL? When first smelling a gold medal extra virgin olive oil it is fresh and clean (fault free). It shows excellent fruit intensity with a variety of different aromas and scents. In the mouth the aromas transfer to the palate and are as intense or more intense than on the nose. It tastes fresh, vibrant and clean. The oil feels light and creamy (not oily) on the palate. Depending on oil style, bitterness, pepper and/or astringency are present in varying degrees. A mild oil has little or no levels of pepper and pungency whilst a robust oil has significantly higher levels. Either way, they are in balance and do not over power the fruit or mouthfeel. A gold medal oil has a flavourful lingering finish. To finish, the oil is fresh, balanced, complex and harmonious. You will want to drink it.





BOUNDARY BEND LTD. COBRAM ESTATE ULTRA PREMIUM HOJIBLANCA

94/100, Class 5A Spanish Mild

Fresh mint, green tea, rocket, artichoke and floral notes on the nose following through strongly onto the palate. The oil tastes even better than the fresh aroma. Light mouthfeel with a mild and balanced bitterness and pungency. Long flavourful length with lingering texture. Complex and multidimensional. A harmonious oil.



BEST IN CLASS



W₂O OLIVES EXTRA VIRGIN OLIVE OIL

96/100, Class 3 Robust

Fresh and clean aromas of wet grass, lemon verbena, eucalyptus pea shoots and salad herb. Good transfer to palate with more rocket and sorrel. Complex, well balanced bitterness, astringency and pepper and a long lingering length. A premium oil. Three dimensional with lots going on.



BEST EVOO IN SHOW



**BEST EVOO IN SOUTHERN
HEMISPHERE**



BEST EVOO IN AUSTRALIA



BEST EVOO FROM NSW/ACT



BEST IN CLASS

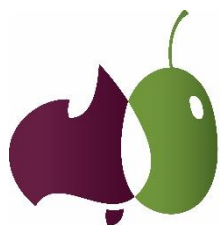


WHAT MAKES A GOLD MEDAL FLAVOURED OIL? On first impression a gold medal flavoured oil is fresh and clean (fault free). On smelling the oil, it shows excellent intensity of the flavouring element/s (lemon, rosemary, garlic etc.) and in some cases fresh olive character. A gold medal oil has varying attractive aromas highlighting the flavouring element/s and where possible fresh olive oil. The aromas and flavours are authentic and pure representations of the flavouring (not artificial). In the mouth the aromas transfer to the palate and are as intense or more intense than on the nose. It tastes fresh, vibrant and clean. The oil feels light and creamy (not oily) on the palate. The oil's level of bitterness, pepper and/or astringency is balanced with the flavouring element/s. A gold medal oil has a flavourful lingering finish. To finish, a gold medal flavoured oil showcases the flavouring element/s purely as well as be fresh, balanced, complex and harmonious. You will want to get in the kitchen and start cooking.

peppercorn
lemon
bronze
flavour
aromatic
fragrant
garlic
floral
truffle
length
gold
complex
lime
cumin
green
chilli
ginger
vibrant
flavoured-oils
agrumato
basil
intense
creamy
cinnamon
zesty
lemongrass
silver
distinct
delicious
lovely
lingering
herbal
mouthfeel
garam-masala
spice
grapefruit
rosemary



Thank you for your participation!



AUSTRALIAN OLIVE
ASSOCIATION_{LTD}

This workshop program has been funded by Hort Innovation, using the Hort Innovation olive research and development levy, co-investment from the NSW Department of Primary Industries, the Australian Olive Association and contributions from the Australian Government. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture.

**Hort
Innovation**
Strategic levy investment

**OLIVE
FUND**