

Quality Regaining Power: How the Olive Oil Sector is Striving to Give Us Its Best

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ABSTRACT: This paper explores how olive oil was traditionally produced and how the centrifugal system has changed this for the better. It gives an overview of bad practices and corruption in the sector and looks at how the International Olive Council, the EU and others are continually regulating and educating to combat these issues. Chemical analysis and sensory of analysis, key to the regulation of olive oil, is explained, as well as the categorisation of the different types and grades of olive oil. Labelling, which gives the consumer information and confidence in the oil they buy, has been regulated and is summarised. The paper gives an overview of the current education of panel tasters, producers and children. Finally, key factors in the selection and storing of extra virgin olive oil is outlined for consumers.

The history of olive oil extends back thousands of years and the health properties of extra virgin olive oil have always been known, particularly in its indigenous areas. These health properties were also acknowledged in, for example, Britain where it was ‘virtually unattainable’ (Paterson 2017) and sold ‘in an atmosphere redolent of rubbing alcohol, camphor and cough syrup’ as a medicine (Mueller, 2013, p. ix). Judy Ridgway in *The Olive Oil Diet* describes how fats in general fell victim to bad press in the 1970s (Poole and Ridgway, 2016). She outlines some of the numerous studies which are now backing up the health claims always known to the Mediterraneans. She quotes the ten-year EPIC study of 40,000 Spaniards which found that those who consumed as little as two spoons of olive oil per day were 50% less likely to die from heart disease and those who used the most olive oil were 26% less likely to die from any health problem. Not only that, but extra virgin olive oil has been found to be anti-inflammatory and anti-aging (Poole and Ridgway, 2016, p. 28–37) and protective against certain forms of cancer (Putinja, 2015), diabetes (Paravantes, 2011) and Alzheimer’s (DiSalvo, 2017) — all illnesses of great relevance to modern society.

Olive oil is now back on the agenda. Consumption of it has risen worldwide. The International Olive Council (IOC) has stated that the expected world consumption of olive oil for 2018 is 2.889 million tons (Market Newsletter, 2017). Northern Europe has also taken to olive oil. There are no definite figures for Ireland but, anecdotally and through personal experience, the interest in olive oil is increasing. However, one important element needs to be understood — the benefits from extra virgin olive oil come from high

quality oil and there are many cases where oil is not only of debatable quality but rancid, which is detrimental to health. The reasons for this can be anything from the quality of the olives, their harvesting (time and method), their storage, the time lapse between harvesting and milling, the conditions and equipment in the mill itself, the storage of the oil and the conditions under which it is transported and again stored before sale. As a result of failures in any of the above, people often accept the taste of faulty rancid oil as normal. Alexander Devarenne, cofounder of Extra Virgin Alliance, relates to Curtis Cord, founder of *The Olive Oil Times*, (Devarenne, 2015) how on offering people an old rancid, fusty oil and a new, fresh, peppery oil, the participants selected the former as the oil they preferred. Devarenne had to rephrase the question to ‘which do you think tastes fresher?’ to get them to select the quality oil.

This is not only a problem in the States, often the Mediterraneans (??) themselves think that these oils are good. Steven Jenkins, owner of Fairway Markets, one of the first stores to introduce quality oils to the United States told Curtis Cord in an interview (Jenkins, 2016) that he is attempting to shatter the ‘oh, I’m Italian, I’ve been using olive oil all my life’ myth. The problem as he sees is:

[...] all you folks that have a cousin down the road, your Italian cousin down the road that’s been giving you all your olive oil since you were tiny, since you were a kid [...] that came from his own grove and you became inured to that crumbly, lousy, stupid olive oil that he harvested way too late but that had not yet completely degraded [...] that olive oil is not going to improve.

This is backed up by Abdellatif Ghedira, executive director of the International Olive Council, who stated ‘fortunately, the olive oil today has nothing to do with what our grandparents used many years ago. Today consumers have become more demanding and are also able to appreciate the qualities of aroma, flavour and above all, their healthy properties.’ (Olimerca, 2016).

It was reported from The Spanish food conference, *What Do Consumers Know about the Quality of Olive Oil?*, that Spaniards were unaware of both the improvements made in the quality of olive oil and its health benefits (Butler, 2011). Nieves Ortego (editor of business magazine *Oleo* and host of the conference) reported that only 3% of Spaniards knew the difference between the different categories of olive oil (although three out of four claimed to know) and 90% did not understand the term single varietal, even though the variety of olive is stated on the bottle.

However, knowledge and education, along with government regulation and the setting of international standards mean that the quality of olive oil is improving. The traditional way of milling is being used less and less and the new ways are predominating. The old method consisted of grinding the olives with large granite millstones, usually turned by a donkey. The olives were crushed under the weight of these stones into a paste, which was spread on to esparto mats which were subsequently stacked on top of each other and placed in a screw type press (later replaced by the hydraulic press) and squeezed. This was the first 'cold pressing' of the olives and was the best quality. In the 'second pressing' hot water was applied to extract the additional oil from the leftover pomace and produced a lesser quality oil.

The disadvantages of this method included 'discontinuity of the process, contamination of the oil diaphragms and high labour cost' (Ayoub, 2006). Additionally, this method resulted in a limited daily yield as it was a slow process, and it exposed the olive paste to air and to high temperatures resulting from the high pressure of the presses. Heat, light and oxygen impact heavily on the quality of olive oil and this exposure meant that the oil could be easily damaged from the beginning. This, combined with other practices that are largely discontinued now, often resulted in low quality oil. For example, farmers in the past would use olives that had fallen to the ground (which produces the defect of having a musty quality), leave the olives sitting for periods in sacks (resulting in the defect of being musty and winey-vinegary through fermentation) and had little urgency about sending the olives to the mill (olives should be milled within a maximum of twenty four hours).

Currently the vast majority of olive oil is extracted using a centrifugal system. Tom Mueller relates the story of the De Carlo family (Mueller, 2013) who were one of the first to use this system in Italy in 1979. Saverio De Carlo stated that he was jeered for using 'new-fangled technology' (Mueller, 2013, p. 20) instead of the hydraulic press which had been used for generations. In the first year of use he encountered problems with the centrifugal system, resulting in his producers refusing to bring their olives to him and the reinstallation of the old system. At great financial risk De Carlo continued to work on the centrifugal system with engineers from Alfa Laval, who had designed the system, to eventual success. De Carlo noted that:

Our clients started the year using the presses, but they would stop by and tasted my oil from the centrifuge. They wouldn't say anything. Their faces wouldn't change expression. They'd just taste the oil and walk away. But the next time they came in with a batch of olives, they'd want to use the centrifuge instead. These were the very same people who the previous year had accused me of trying to ruin my family and my father's good name, with my new-fangled contraptions and crazy ideas (Mueller, 2013, p. 21).

The typical milling factory now consists of standard machinery including the centrifugal system. The olives are brought to the mill in vented plastic crates (rather than sacks) by the producer and stacked in a queue. Many of the producers wait with their olives in order to inspect each stage of the process. The olives are put into a type of flat, upward elevator and put through a washing process, at the end of which any dirt, leaves and twigs are filtered out. The olives are then crushed using stainless steel rollers and transferred to the malaxer, which mixes the paste and where small oil droplets group together into bigger ones. The centrifugal system then spins the paste at high speed, separating the oil from the pulp and the water. The oil is then stored in large stainless steel tanks. Throughout this process the temperature is tightly controlled and is not allowed to go above 28 degrees. This is termed cold extraction. Unlike the traditional method, this type of milling is a continuous process. Once the olives are fed into the first machine, the process continues uninterrupted until the oil flows out the other end. This method also protects the olives from damage from exposure to oxygen and high temperatures and results in 'fine oils with really high polyphenol content' (Poole and Ridgway, 2016, p. 82). Amirante stated that 'total phenols as well as induction time values are higher in oils obtained by the centrifugal decanter of two phases' (Amirante et al, 2010).

Judy Ridgway stated that the advantages of the centrifugal system in conclusion was 'to reduce damage to the olive, to protect against antioxidant loss and to reduce waste' (Poole and Ridgway, 2016, p. 94). Labour costs are also reduced.

Corruption

Extra virgin olive oil has suffered damage to its reputation over the years due to lack of enforcement of regulations or corruption in its milling practices. In 2016, when Stiftung Warentest, a German consumer protection organisation, had twenty six extra virgin olive oils selected randomly from supermarket shelves and tested by expert tasters, only half of them were deemed extra virgin (Stiftung Warentest, 2016). In addition, five were declared 'highly polluted'. Similarly, in a University of California study 60% of twenty one extra virgin samples were deemed not to be extra virgin, with some of them regarded as being 'unfit for human consumption' (Wang, Frankel and Flynn, 2012).

In Italy, Agromafia is a serious issue. The Italian farming lobby, Coldiretti, believe that the adulteration of wine, cheese and extra virgin olive oil results in thirteen billion euros a year for the mafia (Whitaker, 2016). Author, Tom Mueller believes that the profit from adulterated extra virgin olive oil is three times better than cocaine (Ibid). Adulterated olive oil comes in two forms. Lower grade olive oils (often imported from other countries) are mixed with a small amount of quality extra virgin and then sold, illegally labelled, as extra virgin which commands a higher

price in the marketplace. The Italian newspaper *La Repubblica* asked the question ‘why, in comparison with the 250,000 tons of olive oil we export, do we import 470,000. Where do they go? How are they mixed?’ (Butler, 2011). Alternatively, a seed oil is used, to which chlorophyll and beta-carotene are added for colour and taste and is again fraudulently labelled extra virgin (Henley, 2012).

Several issues arise from these practices. Italy’s extra virgin olive oil reputation is being severely damaged through the highlighting of these activities. Secondly, consumers are not receiving the health benefits associated with quality olive oil (in fact the oil may be detrimental to their health). Added to this, where seed oils are passed off as olive oil, a threat is posed to the health of those allergic to seed oils who buy the oil unaware of its contents. ‘We are faced with a global deception for consumers that causes enormous economic and image damage to the Italian production and exportation of food products’ stated Coldiretti, who argued for a documented supply chain which ensured ‘all processes must take place in Italy, with strictly Italian products’ that were ‘immediately recognizable as totally Italian, thanks to the origin labelling, the transparency of the supply chain and price formation, and to the link with its territory’ (Coldiretti, 2011).

The Italian Minister of Agriculture, Maurizio Martina stated ‘the action of checking traceability has been enhanced so we can trace the products from their entrance to the ports up to their processing and marketing. We need to state very clearly there is no room for people breaking the rules’ (Marino, 2014).

The Italian government have also set up a food fraud section (locally known as the FBI of food). As part of this there are sixty trained olive oil tasters who can detect fraud in olive oil by tasting the product. Sergio Tirro demonstrated to Bill Whittaker of CBS television how to make ‘fake’ olive oil by taking a portion of seed oil and adding chlorophyll which gave it the appearance of olive oil (Whittaker, 2016). He called these adulterated oils ‘bombs’ for people who are allergic to seed oil. Whittaker subsequently sent three samples of the top selling brands of extra virgin oil in the United States to the Italian panel. The results showed that none were extra virgin and that the top selling brand was lampante (deemed unfit for human consumption).

International Olive Council

The International Olive Council (IOC) was set up in 1959 in Spain and functions as a world forum on olive oil. Its work includes setting policies and standards for all issues relating to olive oil, promoting world consumption and supplying statistics on world markets. The categorisation and quality of olive oil is determined through both chemical testing and sensory analysis and the IOC has set out standards and procedures for both. Abdellatif Ghedira, current executive director of the International Olive Council, states ‘the organoleptic evaluation of virgin olive

oils is a fundamental criterion of quality and is part of our commercial standard at the same level as the physico-chemical parameters’ (Ghedira, 2018). The organoleptic assessment is officially regulated in Europe by the E.U. (Commission of the European Communities, 2008). The United States is in agreement

Chemical analysis and sensory analysis are both required for a full assessment of the quality of olive oil; they are complementary procedures. Chemical analysis provides valuable information about the current condition of an oil, but there is no single test that can definitively determine everything (Olive Oil Commission, 2018).

Chemical analysis involves the testing the acidity levels of the oil (free fatty acids). High acidity levels can be a sign of poor quality olives, delays in bringing the olives to the mill, improper storage and mismanagement of temperature control during extraction. Peroxide levels are tested to measure the amount of oxidation in the oil, high levels of peroxide are an indication of low quality oil and rancidity. The measurement of UV light is also used to measure the quality/rancidity of an oil and can detect if the oil has been adulterated with refined oil. The Pyropheophytins test (PPP) measures the level of pheophytins and pyropheophytins (resulting from the breakdown of chlorophyll) and can detect if the oil has been refined or deodorised. Testing for DAGS (1,2- and 1,3-diacylglycerol) also indicate whether the oil is high quality or made from poor quality olives or has undergone any process of refinement. It can also indicate the age of an oil (IOC, 2011).

The IOC has been working on methods of detection of adulterated oil since 1988 to detect the presence of seed oils such as sunflower, rapeseed and soybean as well as olive pomace oil (IOC, 2018). The following is the official definition and category identification from the International Olive Council:

Virgin olive oils are the oils obtained from the fruit of the olive tree (*Olea europaea L.*) solely by mechanical or other physical means under conditions, particularly thermal conditions, that do not lead to alterations in the oil, and which have not undergone any treatment other than washing, decantation, centrifugation and filtration. Virgin olive oils fit for consumption as they are include:

Extra virgin olive oil: virgin olive oil which has a free acidity, expressed as oleic acid, of not more than 0.8 grams per 100 grams, and the other characteristics of which correspond to those fixed for this category in the IOC standard.

Virgin olive oil: virgin olive oil which has a free acidity, expressed as oleic acid, of not more than 2 grams per 100 grams and the other characteristics of which correspond to those fixed for this category in the IOC standard.

Lampante virgin olive oil: virgin olive oil not fit for consumption as it is, designated lampante virgin olive oil, is virgin olive oil which has a free acidity, expressed as oleic acid, of more than 3.3 grams per 100 grams and/or the organoleptic characteristics and other characteristics of which correspond to those fixed for this category in the IOC standard. It is intended for refining or for technical use.

Olive oil is the oil consisting of a blend of refined olive oil and virgin olive oils fit for consumption as they are. It has a free acidity, expressed as oleic acid, of not more than 1 gram per 100 grams and its other characteristics correspond to those fixed for this category in the IOC standard. The country of retail sale may require a more specific designation.

Olive pomace oil is the oil comprising the blend of refined olive pomace oil and virgin olive oils fit for consumption as they are. It has a free acidity of not more than 1 gram per 100 grams and its other characteristics correspond to those fixed for this category in the IOC standard. (Olive pomace oil is the oil obtained by treating olive pomace with solvents or other physical treatments) (IOC, n.d.).

Sensory Analysis

Sensory analysis of olive oil involves the meeting of a panel of expert tasters and their resulting assessment, discussion and grading of olive oil. Strict guidelines are set down by the IOC with regard to panel leaders, panel tasters, equipment used and tasting method (IOC, 2015).

Panel leaders

The panel leader is responsible for the selection of the tasting panel and the requirements are clearly laid out. S/he must be an expert in the field of olive oil as well as being trained in sensory analysis. Their duties involve the organisation and running of the sensory analysis panel and responsibility for ensuring that samples are stored in the proper conditions and remain anonymous. They also collect the results of the sensory analysis from each panel member and make sure that it is statistically processed. They are under obligation to never influence the performance of a taster, or equally to allow panel members to influence each other, ensuring that the process is an unbiased, objective assessment of the olive oil. When the results are collected from each taster, he/she enters the results into the computer which calculates the average under each section. Moreover, 'It is the duty of the panel leader to motivate the panel members by encouraging interest, curiosity and a competitive spirit among them' while the 'tasters must act like real sensory observers, setting aside their personal tastes and solely reporting the sensations they perceive.'

Tasting panel

A tasting panel consists of eight to twelve experienced tasters who are trained in sensory analysis. Different organisations set out their minimum hours of experience needed before they are allowed to take part in a panel. Guidelines for tasters include abstaining from food for at least one hour before tasting, not drinking coffee or smoking for thirty minutes before tasting, not using any fragrant soaps or wearing perfume. In my own experience in Italy, lecturers in this area have even referred to a taster's state of mind, stating that any kind of psychological upset can influence the taster's objective assessment of oil. During the course of the tasting, tasters work in silence and with no interruptions. The IOOC have recommended the best time for tasting to be between the hours of 10am and noon. A panel can however participate in up to three sessions per day, with no more than four samples in each session. The palate is cleansed between oils with a slice of apple and some water.

Equipment and conditions

Specially designed tulip shaped blue glasses are used for each sample and the oil is heated to 28 degrees on a special heater in the taster's booth, this is regarded as the optimum temperature for releasing the oil's compound and being able to recognise the organoleptic differences. The room temperature is set between 20 degrees and 25 degrees celsius. Each booth contains a machine for heating the oil, the profile sheet, pen, water, apple and the oils. The tasters remain separate from each other and only meet after to discuss the results.

Tasting procedure

The taster begins by gently swirling the oil around the tasting glass before removing the glass top and smelling the oil a number of times. The taster will then taste the oil, coating the inside of the mouth fully. They then continue with a process called *strippaggio*, whereby the taster draws in air at the sides of the mouth causing the aroma to go through the nasal passages and allowing full tasting of all the features of the oil. Generally, oil tasters do not spit out the oil as the characteristic of pungency is noted in the back of the throat, however spittoons are available.

Each taster uses a standard profile sheet when assessing the oil. The taster firstly assesses whether the oil contains any negative characteristics (defects) through smell. Judy Ridgway stated that 'the human nose can detect the defect of rancidity at concentrations as low as 1:10,000 dilutions. (Poole and Ridgway, 2016, p65). The IOC have outlined a series of defects, the main defects being Fusty/Muddy Sediment, Musty, Winey/Vinegary, Rancid and Frostbitten. The positive characteristics of Fruitiness, Bitterness and Pungency (or Pepperiness/Spiciness) are then assessed by taste. Both positive and negative characteristics are rated in intensity from one to ten. The olive oil is then classified as follows:

- (a) Extra virgin olive oil: the median of the defects is 0 and the median of the fruity attribute is above 0;
- (b) Virgin olive oil: the median of the defects is above 0 but not more than 3.5 and the median of the fruity attribute is above 0;
- (c) Ordinary virgin olive oil: the median of the defects is above 3.5 but not more than 6.0, or the median of the defects is not more than 3.5 and the median of the fruity attribute is 0;
- (d) Lampante virgin olive oil: the median of the defects is above 6.0 (IOC official definition).

Labelling

Regulations regarding the labelling of olive oils have been set down by the European Commission (European Union Law, 2012).

They include requiring that all the relevant information must be together in the same size font (a minimum size is stated) and in the main line of vision of the consumer. Storage advice should be placed on the back label of the bottle and if a harvest year is stated, all the oil in the bottle must be from that year. If the oil is sold in the United Kingdom and Ireland, it must have all the information in English on the bottle (gov.uk, 2014). The commission also recommended that both checks and sanctions should be increased against those who do not comply with the law and that this should be detailed to the commission on a yearly basis.

Furthermore and perhaps most importantly, the correct categorisation of the oil (extra virgin, virgin, olive oil, olive pomace oil) must be on the label and must meet the requirements of those categorisations as follows:

Extra virgin olive oil: superior category olive oil obtained directly from olives and solely by mechanical means

Virgin olive oil: olive oil obtained directly from olives and solely by mechanical means

Olive oil: olive oil comprising exclusively of olive oils that have undergone refining and oils obtained directly from olives

Olive pomace oil: pomace oil comprising exclusively of oils obtained by treating the product obtained after the extraction of olive oil and oils obtained directly from olives (European Union Law, 2012).

Sensory analysis training

In 1983 The National Organization of Olive Oil Tasters (Organizzazione Nazionale Assaggiatori Olio di Oliva (ONAOO) was founded in Italy. It was the first olive oil

tasting school in the world and trained its students in all aspects of olive oil tasting, from production to marketing.

Over the last number of years training courses for olive oil tasters have been expanding. IRVEA began its programme in English in 2014 in a bid to open up this skill to an international audience. The IOC also offer courses in English. Every year the number of courses on offer worldwide are multiplying, reflecting a rising interest in olive oil not only in western countries but also in Asian countries such as Japan, China and Taiwan. The courses that I have attended in Italy and Spain have had numerous people from different nationalities participating including Polish, Japanese, Chinese, Taiwanese, Brazilian, Lebanese and Jordanian. Many of these have taken their skills back to their own countries in order to set up classes there. Other organisations or individuals promoting olive oil and teaching tasting programmes currently are Savantes (Australia), Judy Ridgway (United Kingdom), O'live & Italy (Italy), IRVEA (Italy), IRTA (Spain), Curtis Cord (Olive Oil Times, United States) and Alexandra Devarenne (Extra Virgin Alliance, United States).

These courses cover aspects such as harvesting, production, regulation, olive varieties, health benefits, culinary uses but mostly focus on taste training. A number of them certify the student at the end of the course. Savantes has its own strict testing procedure which, if passed, will recognise participants as members or associate members. Others, such as O'live & Italy, use standardised recognised tests. This ensures that the quality of the training remains high. As a direct result of completing a number of these courses, I have now trained interested people in Ireland how to taste olive oil. In terms of participating in a panel test or judging in international competitions, this is a skill that needs time and experience to hone. However, for the average person who would like to learn what to look for and in terms of teaching the procedure, it is not difficult to learn. Past participants on my course now range from culinary students, gourmet shop staff, the public, chefs, restaurant owners and others interested in quality food in general. The School of Culinary Arts and Food Technology, Dublin has taken a lead in this by asking me to host olive oil tasting classes for both students and lecturers.

Education of children

Olive oil producing countries are not only promoting olive oil to the adult consumer, but also to children. Coldiretti has launched education programmes to teach children about olive oil. In Rome last year they hosted an olive oil tasting seminar for children between the ages of four and nine. Di Noia, who gave the seminar said 'I think children are very important for the future. If they know how to use their senses, they can choose the correct food, and high quality food is important for our health' (Kirchgaesner, 2016). In these seminars he is also attempting to reach

adults by encouraging children to get their parents to taste oil before they buy it and to avoid cheap brands. 'Children have a better sense of taste than adults and they haven't been conditioned yet to the names of brands', (Kirchgaesner, 2016).

Children are also being involved in international competitions. In the BIOL International awards, fifty children form part of a children's panel and work alongside the adult panel to select the best oils from a child's taste perspective. The aim of BiolKids is to teach children about quality oil and foods as well as organic farming (Premiobiol, 2017). The fifty jurors are selected from the 1,300 children from all over Italy who take part in the programme and who then receive training in oil tasting, before joining the adult panel. The slogan for the children is 'extra virgin olive oil, always healthy: always healthy extra virgin.'

The Olvinus International Awards also have a children's section, the Olvinus Children Awards (Olvinus, 2017). The jury consists of children between eight and fifteen, who have trained as tasters for one year. In 2017 the children selected fifty nine oils for taste and quality (Olvinus, 2017). Again, the organisers are actively thinking ahead and educating the future consumers of olive oil.

On a more local level in Italy, olive oil producer/educator Maria Paolo Gabusi brings primary school children to her olive grove, free of charge, to teach children about how quality olive oil is produced and how to taste it for quality and flavour. Gabusi's own article, *Teach Kids to Have Better Adults*, sums up her attitude to the potential power of children (Gabusi, 2017).

Similarly, in 2017 in Spain 1,524 children from twenty schools in the lower socio-economic areas of Spain attended thirty-two workshops on olive oil, where they were taught about olive oil harvesting and production and its place in their culture/tradition, as well as being involved in an olive oil tasting programme (Olimerca, 2018).

Producers

In conversation with Lino Olivieri, an Italian extra virgin olive oil producer, we discussed the small producer. Olivieri emphasised the cultural and community attachment to the olive grove. 'We don't think of it as owning our olive trees, we think more of looking after them for the next generation.' He compares the Italian groves to the more mechanised production of the intensively farmed groves in Spain and says that Italy cannot compete with this level of production. However, in his business he oversees every part of the process, from harvesting to the extraction of the oil. Italians are competitive about their olive oil, he says, they all want to produce the best olive oil. This ties in well with Anne Meneley's conversation with a number of Italian producers, who told her that if their oil is not certified as extra virgin, they will bottle it under a different label (Meneley, 2007).

In discussion with Yasmin Abdo, a Spanish producer with 255 hectares in Spain, however, the same passion can

be heard. She speaks about supervising the process 'from flower to final bottled product' where strict control is exercised over every part. Their secret, she says 'is knowing how to combine family olive-picking tradition and history with the latest production methods.' They began the process of becoming organic in 1996 and in 2006 built their own mill to ensure that they could comply fully with the standards.

Consumer knowledge

Consumer knowledge can be quite limited, particularly in countries such as Ireland where there is little tradition of olive oil. Keeping in mind that light, heat and oxygen have a detrimental effect on oil is key to better understanding. It is best to avoid olive oil in glass bottles as they are not protected from light and therefore deteriorate more rapidly. Dark bottles or tins are a better choice. Deborah Krasner relates how she was told by a seller that olive oil in glass bottles can go rancid after eighty hours spent close to fluorescent light. Equally, olive oil should not be stored near a cooker but rather in a cool, dark cupboard at a temperature of about sixteen degrees (Krasner, 2012, p. 19).

Once the bottle has been opened, it is advisable to use it over a few months and it is better therefore to buy it in small quantities. However, if an olive oil is treated well, it can remain stable (with deteriorating flavour) for up to two years. When buying olive oil, the consumer should read all the information on the bottle, beginning with the best before date. This date is approximately eighteen months to two years after harvest and the buyer can therefore gauge how old the oil is. Extra virgin olive oil is at its best when young and fresh. They should also check if the oil comes from a single country of origin or is a blend of oils. Finally, a buyer should avoid low cost extra virgin olive oil and expect to pay a reasonable price for it. Judy Ridgway states 'there is a definite relationship between quality and the cost of an oil. Low cost oils tend to be blends of mass-produced oils [...] it is simply more expensive to produce high-quality premium oils' (Poole and Ridgway, p. 99).

Conclusion

The olive oil industry has, in the past, succumbed to bad practices and corruption. However, with increasing regulation from the International Olive Council, the European Union, government bodies and invested organisations, the outlook for the quality of olive oil is optimistic. Individual producers, both large and small, are striving for the best possible product through good practices and strict oversight of every stage of their production. There is a wide availability of courses to train people in the olive oil sector in areas such as harvesting, regulation and overall production. Sensory analysis courses are also now widely available in many European languages,

including English. Finally, and perhaps most optimistically, children are being educated from an early age about quality olive oil and its benefits and are learning the skill of olive oil tasting. This bodes well for the future, as not only can they begin to influence their parents in their selection of olive oil but, as future consumers, this will lead to an expectation and demand for high quality extra virgin olive oil.

About the author

Karen Cryan has been involved in extra virgin olive oil since 2013. She has completed training in the sensory analysis of olive oil in London, Italy and Spain. Karen is the first Irish associate member of the internationally recognised *Extra Virgin Olive Oil Savantes* and hosted the first Irish *Savantes* masterclass in olive oil tasting in Dublin in 2017. Also in 2017 she participated in the judging panel for the *Armonia International Extra Virgin Olive Oil Competition* in Parma, Italy. Presently she teaches extra virgin olive oil tasting in Ireland. Karen set up an olive oil tasting group in Dublin in 2016, where oil enthusiasts can meet informally to taste and enjoy various olive oils.

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