



The effect of storage conditions on the quality of Australian olive oil

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Background

Extra virgin olive oil is one of the few edible oils which is consumed as a fresh unrefined oil, therefore retaining important compounds relating to oil stability and flavour. The level of polyunsaturated fatty acids and antioxidants present in the oil can have a significant effect on the oxidative stability of the oil. It is important to retain these positive attributes from harvest through to consumption. However, the way in which the oil is stored can have an effect on these attributes in the oil and hence the appeal of the product to the consumer. Exposure to factors such as light, temperature and oxygen can negatively impact on the quality of the oil.

Objectives

Examine changes in the quality of Australian olive oils under different storage conditions. Oils were exposed to light, oxygen and different temperatures to determine the effect on olive oil quality over time.

Materials and methods

Oils were stored:

- at different temperatures -15, 22 and 37°C, (kept in dark and sealed).
- exposed to light and dark (maintained at 22°C and sealed),
- exposed to oxygen and sealed (kept in dark, maintained at 22°C).

Oils were analysed at regular intervals for peroxide value, UV absorption, α -tocopherol, chlorophyll, pyropheophytin, 1,2-diacylglycerol, free fatty acids, total polyphenols, induction time, and fatty acid profile.

The oils were tested by the IOC accredited Australian Olive Oil Sensory panel to determine positive and negative sensory attributes.

Sensory analysis was conducted by the panel using the IOC standard method COI/T.20/Doc. No 15/Rev 2 Method for the organoleptic assessment of virgin olive oil.

Pyropheophytin content, used to detect thermally treated oils as well as aged oils, was measured using the DGF standard method

C-VI 15 (08). The samples were extracted using SPE techniques and then separated using a HPLC equipped with a photo-diode array detector.

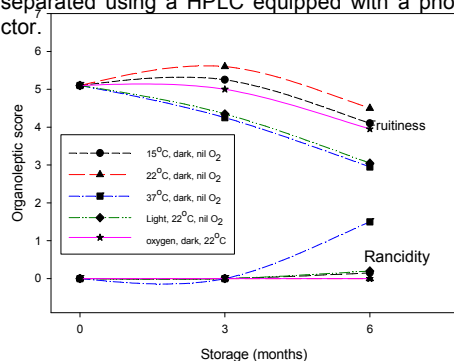


Figure 1 Sensory analysis of Australian olive oil after six months storage

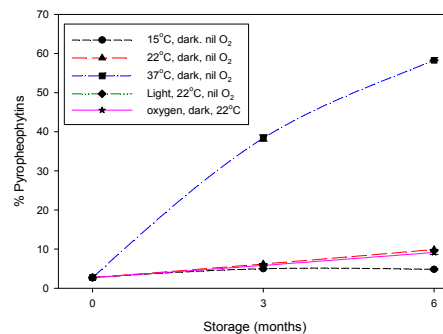


Figure 2 Pyropheophytin content of an Australian olive oil after six months storage. Sample exposed to light had no pyropheophytins after initial analysis.

Results and conclusions

The sensory quality of the olive oil was reduced as fruitiness, a positive attribute, decreased while rancidity increased when the oil was stored at 37°C. Exposure to light also had an effect on the fruitiness of the oil.

Pyropheophytin content was also affected by storage at 37°C, with the level exceeding the Australian Olive Association limit ($\leq 15\%$) after just 3 months storage. After 3 months exposure to light, no pyropheophytins were detected in the oil.

Most parameters analysed were affected to varying degrees by storage conditions, especially exposure to higher temperatures, light and oxygen (results not shown).

Management of storage conditions, such as preventing temperature increases and exposure to light, will result in retention of positive attributes in the oil and minimisation of negative attributes, thereby increasing consumer satisfaction.

Future Research

This project will continue until the oil has been stored for three years under the various conditions. The oil will be analysed regularly both chemically and organoleptically to determine the best storage conditions to maintain high quality Australian oil. The analysis will be repeated for oils with different levels of antioxidants and fatty acid composition.

Acknowledgements

We thank Kerrie Graham for her technical assistance during the analysis of the pyropheophytins and the members of the Australian Olive Oil Sensory Panel in Wagga Wagga for the sensory analysis. This study is supported by the Rural Industries Research and development Corporation and NSW DPI