# XV ENCONTRO DE QUÍMICA DOS ALIMENTOS

MADEIRA

5-8 DE SETEMBRO DE 2021


## ESTRATÉGIAS PARA A EXCELÊNCIA,

## AUTENTICIDADE, SEGURANÇA

## E SUSTENTABILIDADE ALIMENTAR

CQM
CENTRO DE QUÍMICA DA MADEIRA

UNIVERSIDADE da MADEIRA

SOCIEDADE PORTUGUESA DE QUÍMICA

ROYAL SOCIETY OF CHEMISTRY

EuChemS
European Chemical Society

http://xveqa.events.chemistry.pt/

# Livro de Resumos

# XV Encontro de Química dos Alimentos


**Hotel Meliã Madeira Mare,**

**Funchal, Madeira**

**5 a 8 de setembro de 2021**

# Ficha Técnica

**Titulo**

Livro de Resumos do XV Encontro de Química dos Alimentos: Estratégias para a Excelência, Autenticidade, Segurança e Sustentabilidade Alimentar

**Autores**

José S. Câmara

Jorge A. M. Pereira

Rosa Perestrelo Gouveia

**Edição**

José S. Câmara

Jorge A. M. Pereira

Rosa Perestrelo Gouveia

**Editor**

Universidade da Madeira, Centro de Química da Madeira

**ISBN**

978-989-8805-68-3

**Data**

Setembro de 2021

# PC-D57: Effect of different liquid medium on canned tuna

**Ferreiro N, Ramalhosa E, Fernandes C, Rodrigues N,**

*Centro de Investigação de Montanha (CIMO), ESA, Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal*
**Email:** nuno.ferreiro@ipb.pt

Olive oil and fish are two products with a great tradition in Portugal and high importance in the Mediterranean Diet. The beneficial properties of these foods for health, associated with their sensory characteristics, make them highly appreciated by consumers. Virgin olive oil is a vegetable oil rich in monounsaturated fatty acids with unique organoleptic properties that distinguish it from other edible oils. According to the intensity of fruitiness, extra virgin oils can be classified as ripe fruity and green fruity, and the latter as mild, medium and intense, depending on the intensity of the fruitiness. In turn, fish is a source of protein and, depending on the species, of unsaturated fat. The combination of these two nutritionally rich foods results in a product with excellent nutritional and sensory qualities, meeting the constant need for innovation in the industry.

With the present work, the effect of using extra virgin olive oils (AVE) with different intensities of fruitiness (ripe fruity, light green fruity and intense green fruity) as a filling liquid in canned tuna was studied in comparison with other liquids that are commonly used (refined olive oil and sunflower oil) in terms of physicochemical and sensory characteristics. For each of the selected liquid medium (ripe AVE; light green AVE; intense green AVE; refined olive oil; and sunflower oil) five cans were filled, which were closed in a crimping machine and pasteurized following the usual procedure in the industry (Figure 1). All samples were analysed after one month. The following parameters were determined for each sample: colour using the CIELAB scale, pH, moisture content[1] and ash content[2]. Texture profile analysis was performed on a TA.XT. Texture Analyzer Plus (Stable Microsystems, Godalming, UK) using the TPA method (Texture Profile Analysis) and the sensory analysis was determined following the ISO guidelines[3,4,5], with some adaptations. The total phenols were determined in the liquid medium.

Concerning the colour, the hue (h) of the samples had an average value close to 76, varying between 74.4 in the intense green olive oil and 76.6 in the light green olive oil. Regarding pH, this ranged between 5.53 and 5.62, with the lowest value being observed in refined oil. With regard to moisture and ash contents, mean values of 60% and 1.3% (f.w.) were determined, respectively. Regarding the texture, the hardness evaluated by the maximum peak, varied between 12.5 and 17.5 kg, with the lowest value being observed in the light green olive oil. In terms of fracturability (first peak), this ranged between 3.4 and 4.1 kg, with the lowest value being observed in the intense green olive oil. In the sensory evaluation, it was observed that tuna had the highest colour in refined oil and the lowest in sunflower oil. As for the tuna aroma, it was found that this was more intense in sunflower oil, refined olive oil and ripe olive oil. In ripe, light green and intense green olive oils, grape aromas with intensities ranging from 2.4 to 3.3 were detected. Regarding tuna flavour, it was more intense in sunflower oil, refined olive oil and ripe olive oil. Total phenols were not detected in sunflower oil and refined olive oil. In the remaining liquid medium, the values varied between 190 and 304 mg Gallic Acid Equivalents/Kg of olive oil for the ripe olive oil and the intense green olive oil, respectively.

To conclude, it was found that of all the liquid medium used in this trial, no major differences were observed, except for sensory analysis and in the content of total phenols in the liquid medium, which improved according to the increase in the fruitiness of the olive oils.


**Figure 1**: Tuna cans for analysis.

**Acknowledgements**: The authors are grateful to the Foundation for Science and Technology (FCT, Portugal) for financial support by national funds FCT/MCTES to CIMO (UIDB/00690/2020) and to Associate Laboratory for Green Chemistry-LAQV (UIDB/50006/2020). Nuno Rodrigues thanks to National funding by FCT- Foundation for Science and Technology, P.I., through the institutional scientific employment program-contract.

**References: [Calibri 8]**

1. AOAC 925.40-1925, Loss on drying (moisture) in nuts and nut prod
2. AOAC (2000), Official Methods of Analysis of AOAC International, 17th Ed,; Horwitz, W.; AOAC: Arlington, VA, Vol, II (1-3).
3. ISO 11036:2020 Sensory analysis — Methodology — Texture profile
4. ISO 4121:2003 Sensory analysis — Guidelines for the use of quantitative response scales
5. ISO 13299:2016 Sensory analysis — Methodology — General guidance for establishing a sensory profile