Freezing is being studied as a procedure for long-time storage of olive fruit maintaining their initial quality characteristics. This operation includes an initial blanching step, followed by the freezing itself and thawing.

Fresh olive fruits (Olea europaea L. var. Manzanilla and Hojiblanca), collected at the appropriated ripening stage, were blanched by immersion in a water bath at 95 °C for 2.5 min, subjected to a calcium treatment (with ascorbic acid at 0.03%, citric acid at 0.5% and 100 mM of CaCl₂), immediately frozen by forced convection with air at -30 °C, packed under slight vacuum, stored at -24 °C (48 h) and thawed by immersion in sodium hydroxide (NaOH) solution at 1%.

TEXTURE: Penetration tests were carried out with a 2 mm diameter cylinder probe using a TA.HDPlus Texture Analyser (Stable Micro Systems Ltd., Godalming, UK) equipped with a 300 N load cell. Firmness measurement of samples was quantified by puncturing the fruit at a crosshead speed of 0.5 mm s⁻¹ up to maximum applied force of 15 N. From force-distance curves, the force (N) of the peak necessary to break the cuticle of the olive (F₂, hardness of the cuticle) and area (Nmm) under the force-distance curve between F₄ point (corresponding to half distance between F₂ and F₃) and the maximum applied force F₃ (corresponding to 15 N) (consistency of the pulp) were obtained [1].

Despite calcium treatment, in this study, blanching operation had the most negative effect on alterations in drupe consistency. Compared to the untreated samples, in both cultivars, significant decreases in the hardness of the cuticle and pulp consistency were observed, varying from 8.96 to 5.55 N and 9.66 to 6.19 Nmm in Manzanilla fruit and from 12.6 to 7.53 N and 11.3 to 6.48 Nmm in Hojiblanca one. In olives subjected to processing, blanching is the most drastic step, resulting in cell separation and firmness loss, which is related to the chemical modifications on the galacturonic acid-rich pectic polysaccharides [2]. Our overall results also suggest that the blanching treatment induces large degradation of polysaccharides in both olive drupes. However, subsequent freezing and thawing in NaOH at 1% only cause an additional slightly loss of cuticle hardness and pulp consistency, with respect to the mechanical properties of fresh fruit, of 6.9 and 9.2% in Manzanilla and 8.0 and 12.8% in Hojiblanca olives, respectively. Besides, differences between mechanical properties of blanched and blanched + frozen/thawed drupes were not significant.

TOTAL CHLOROPHYLLS CONTENT (TCC) and TOTAL CAROTENOIDS CONTENT (TCC) were determined by a spectrophotometric assays [3] and OLEUROPEIN by HPLC [4].

- **Total chlorophylls content (TCC)** in Manzanilla (45.81±1.35 µg/g fw) was statistically higher than in Hojiblanca (35.52±3.38 µg/g fw)
- Blanching did not significantly change the TCC in Hojiblanca olive, but significantly increased (up to 32%) in Manzanilla one.
- Blanching+Freezing maintained the TCC of both fresh olive fruits (Manzanilla and Hojiblanca).
- **Total carotenoids content (TCC)** was significantly higher in Hojiblanca (90.55±6.6 µg/g fw) than in Manzanilla (68.42±3.4 µg/g fw).
- Blanching increased (p<0.05) TCC by 68% and 14% in Manzanilla and Hojiblanca, respectively.
- Blanching+Freezing increased by 70% the initial TCC of both fresh olive fruits (Manzanilla and Hojiblanca).
- **Oleuropein** content in Manzanilla (2.48±0.07 mg/g fw) was higher than in Hojiblanca (0.19±0.02 mg/g fw).
- Blanching increased 8 and 52 times the Oleuropein extracted in Manzanilla and Hojiblanca, respectively.
- Blanching+Freezing presented similar Oleuropein than blanched olives.