

Stability of antioxidant compounds during storage of aseptically packaged UHPH-treated apple juice

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SIGNIFICANCE OF ISSUE

Consumers desire healthy products with favourable sensory properties. Ultra-high pressure homogenisation (UHPH) is a non-heat based gentle preservation method intended for different liquid matrixes, e.g. milk [1,2] soymilk [3] and juices [4]. Additionally, juices are highly sensitive products, they can easily change their composition and physicochemical properties during their shelf-life. Tetra Brick® packages have been widely used as a containers for fruit juices and nectars to avoid this degradation. Indeed, apple juice in Tetra Brik containers is one of the most popular of the juice drinks in the market. **In this research UHPH-treated apple juice was followed by aseptic package processing in order to preserve the juice quality in terms of antioxidant content during its shelf-life.**

Figure 1. Apple juice processing flow chart.

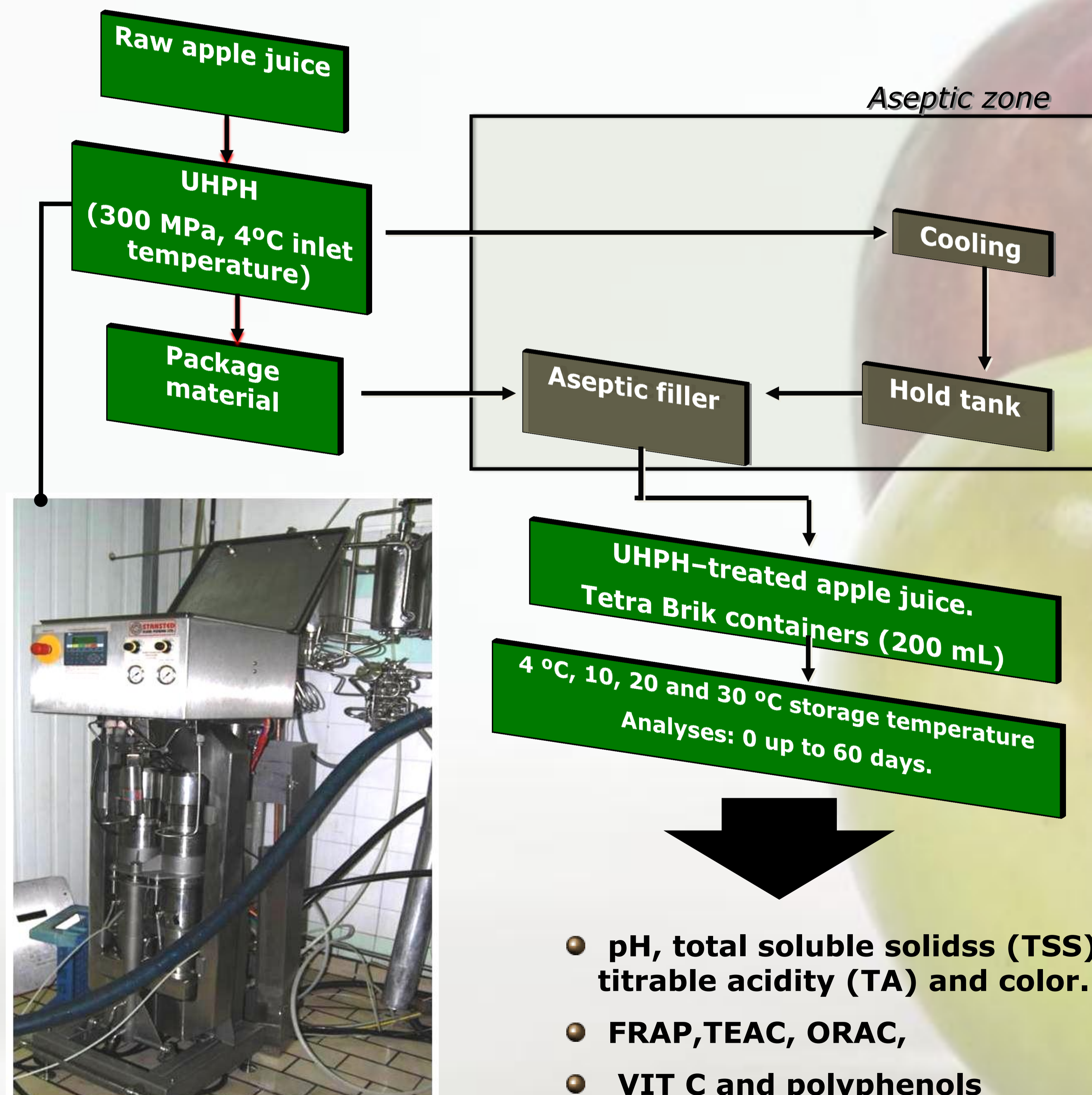


Figure 2. Model/DRG no. FPG 11300:400 Hygienic Homogenizer, Stansted Fluid Power Ltd., Essex, UK

- pH, total soluble solids (TSS), titrable acidity (TA) and color.
- FRAP, TEAC, ORAC,
- VIT C and polyphenols quantification by HPLC

RESULTS

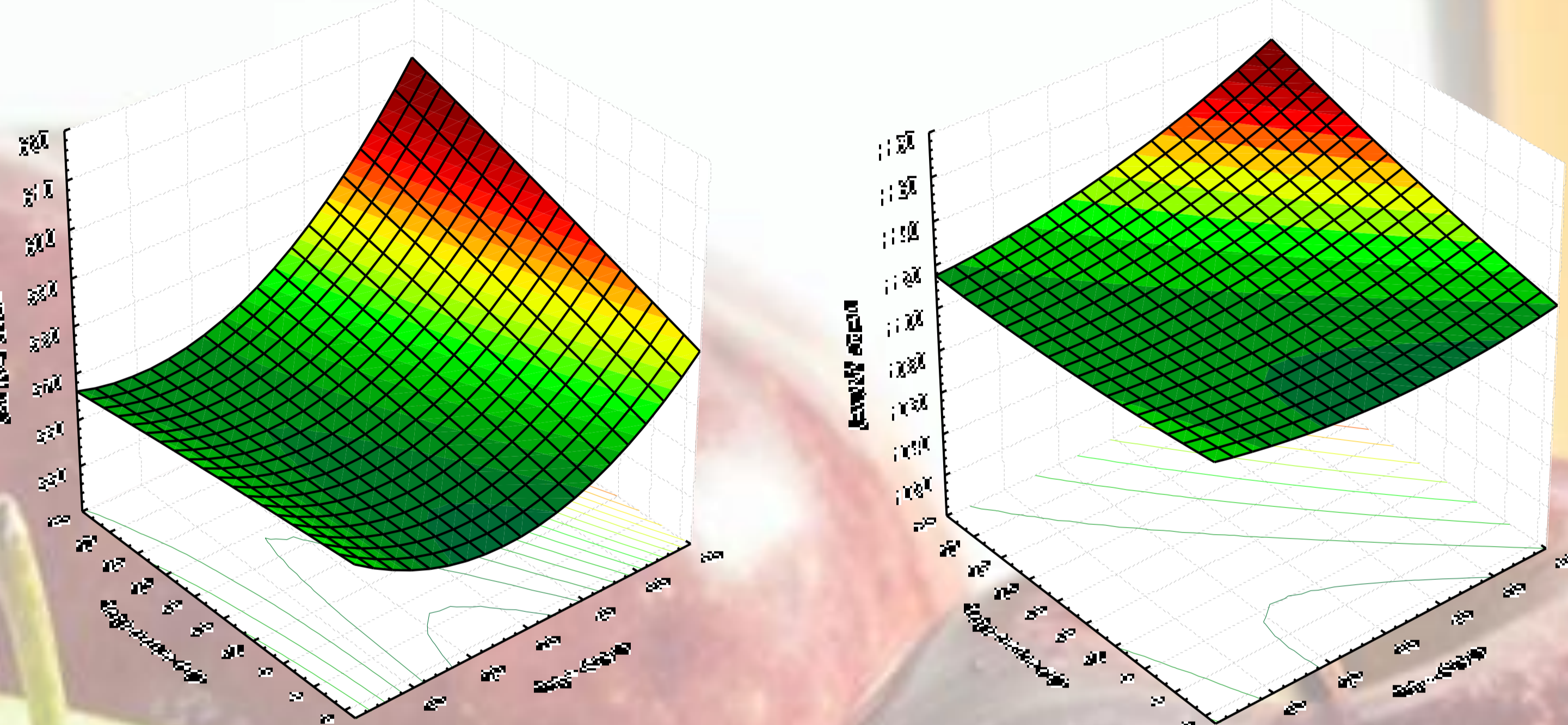
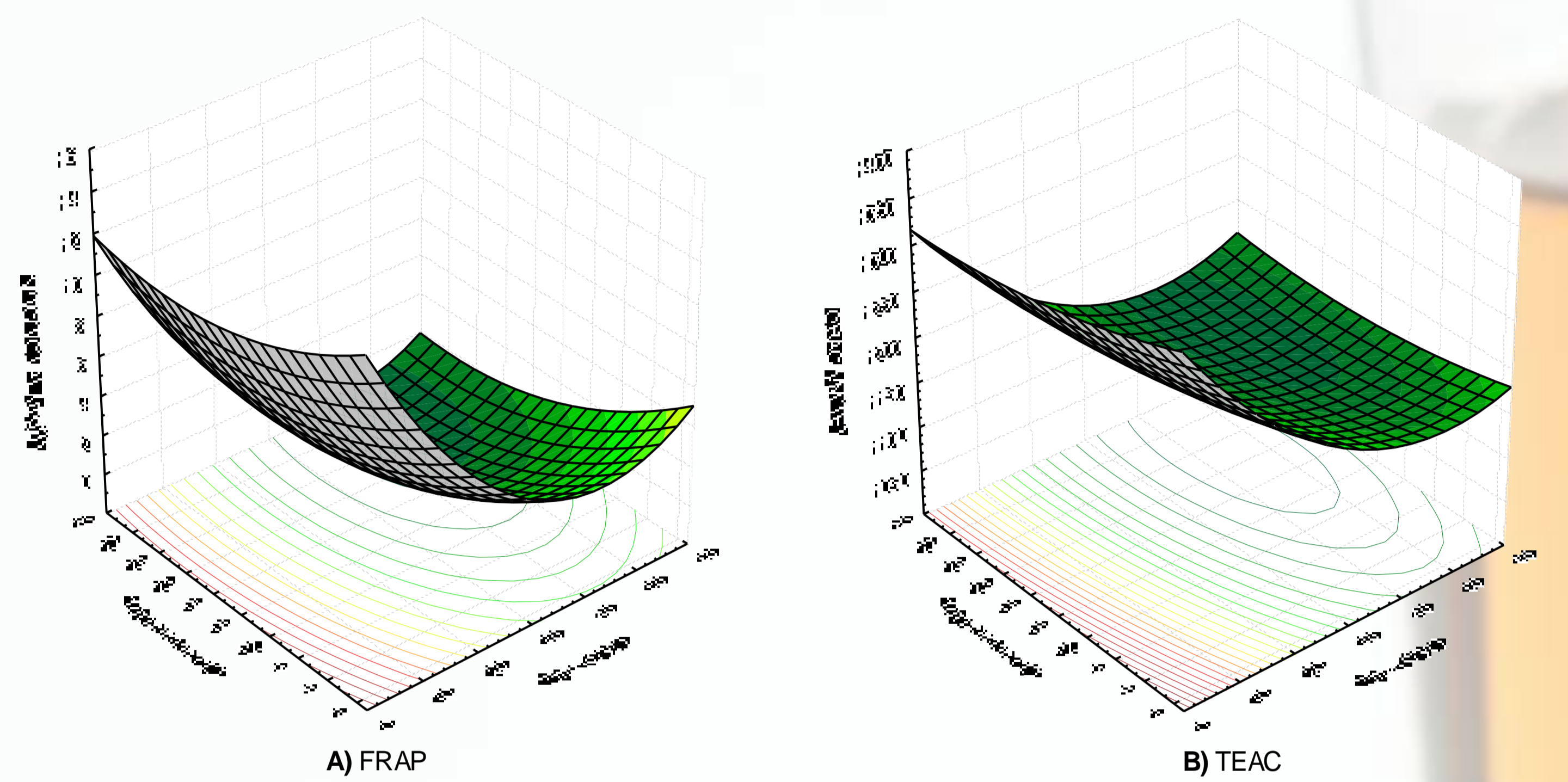


Figure 3. Changes in vitamin C and antioxidant capacity measured by FRAP (a), TEAC (B) and ORAC (C) during storage of UHPH-treated apple juice over 60 days in Tetra Brik containers.

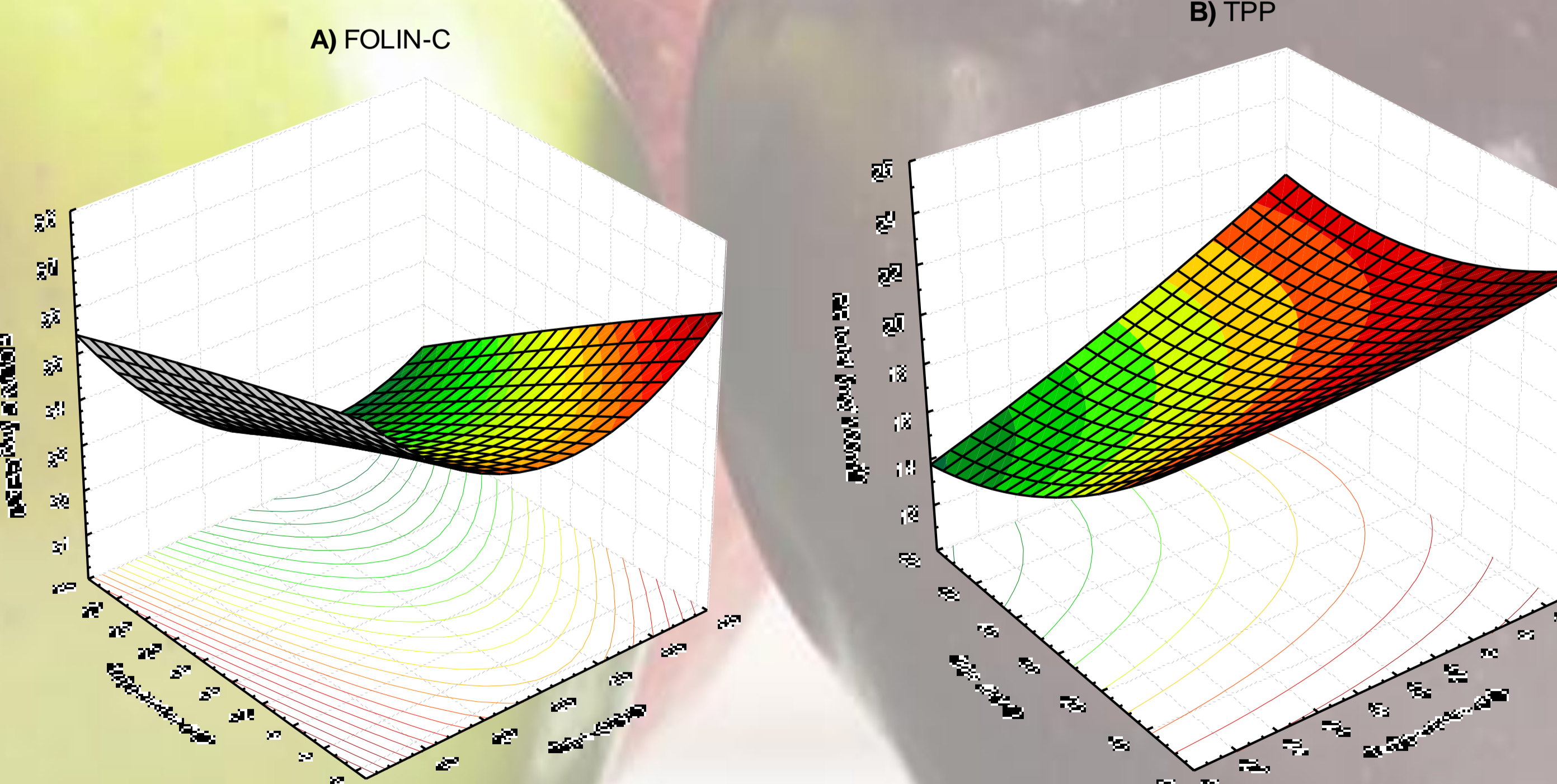


Figure 4. Changes in total phenolics by Folin-Ciocalteu assay (A) and total polyphenolics measured by HPLC (B) during storage of UHPH-treated apple juice over 60 days in Tetra Brik containers

RESULTS

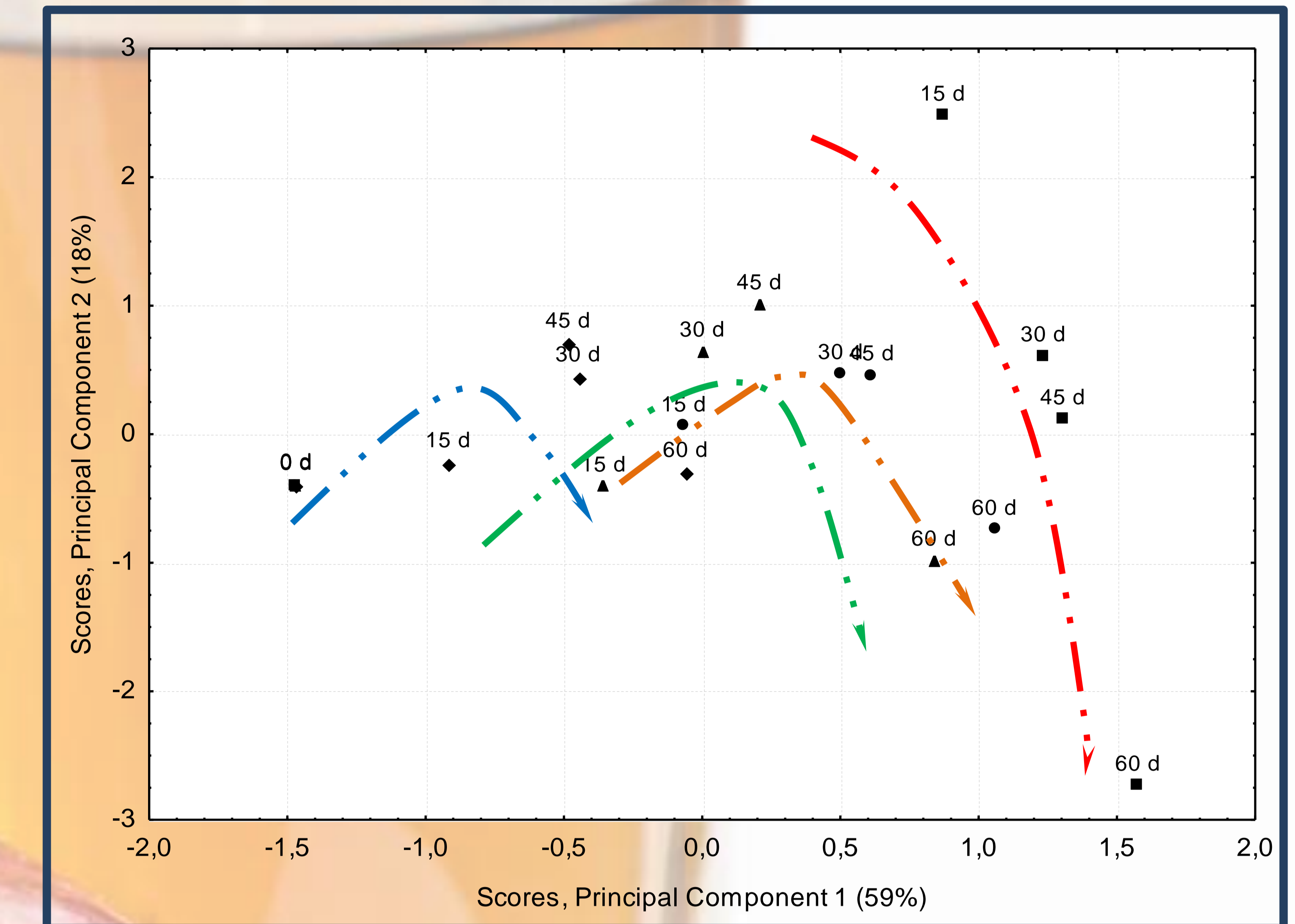


Figure 5. Score plot obtained by PCA including all analyses of the UHPH-treated apple juice aseptically packaged. Samples are identified by temperature from 4 (♦), 10 (▲), 20 (●) and 30 °C (■) and storage time (0, 15, 30, 45 and 60 days).

CONCLUSIONS

During the storage of apple juice, the variation of the physicochemical properties can be considered negligible. The results obtained indicate that Ultra-high pressure homogenisation (300 MPa at 4 °C inlet temperature) seems to be a good alternative to preserve apple juice. Vitamin C was the most affected by storage time and temperature, followed by the polyphenolic compounds. A great increase in the shelf-life of UHPH-treated aseptically packaged was found when the preservation temperature was 4 °C, thus it is recommended to store the juice at this temperature to ensure that it reaches the consumer with a high nutritive value.

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