

compounds (30%) formed during the sterilisation process. These results indicate that, even though the samples had undergone the same sterilisation process, the oxygen permeability of the pouches impacted the volatile profile of the sterilised chickpeas during the process. After a 40-week storage period, the volatile profiles of the chickpeas stored in the different packaging materials were more different from each other. In the plastic pouches, the discriminant compounds present in higher concentrations were mainly hydrocarbons (33%), ketones (22%) and sulphur compounds (22%), the former two probably resulting from lipid oxidation during storage at higher oxygen availability. In contrast, the chickpeas stored in the aluminium pouches showed a higher concentration of alcohols (33%) compared to the other samples. Probably more alcohols were found in these samples, because less oxidation of alcohols to other compounds, like ketones, took place at lower oxygen availability [6]. This figure also confirms the storage effect for a given packaging.

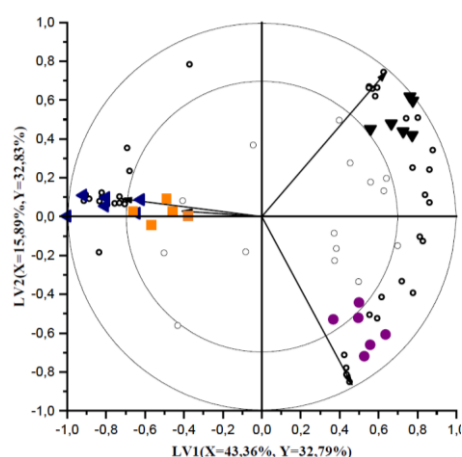


Figure 3: Biplot (LV axes 1 vs 2) of the PLS DA-model on the volatile profile of chickpeas sterilised and stored for 0 weeks (plastic (■), aluminium (◄)) and 40 weeks (plastic (▼), aluminium (●)). Volatile components are represented as open circles and markers with $|VID| > 0.7$ are represented as bold circles. The vectors represent the correlation loadings for the Y-variables (classes). The outer and inner circles on the biplot represent the correlation coefficient of 1.0 and 0.7 respectively, indicating the area where the volatiles that are characteristic for a certain class are present.

Conclusion

It was concluded that processing conditions significantly influence the volatile profile of whole chickpeas. Since the soaked chickpeas were found to contain more ‘beany’ related compounds, it could be stated that thermal treatment can potentially be used to contribute to a more pleasantly perceived chickpea aroma. However, additional sensory testing needs to be performed to confirm which processing conditions give the most desirable aroma.

Moreover, it was concluded that oxygen availability, depending on permeability of the packaging material, significantly impacts the volatile profile of chickpeas during a 40-week storage period at 20 °C. However, additional sensory testing is required to understand if these volatile differences are actually observed by the consumer and if so, which packaging material is most desirable.

Acknowledgement

This research project is part of the FOODENGINE project and has received funding from the European Union’s Horizon 2020 Research & Innovation Programme under the Marie Skłodowska-Curie Grant Agreement No. 765415.

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