

Influence of Processing Temperature on Quality and Drying Kinetics of a Mixed Fruit Leather

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Introduction

- ❖ Fruit leathers, or fruit roll-ups, have high nutritional values, especially in terms of energy, minerals, antioxidants, and dietary fibre. Different fruit leathers are available in the market.
- ❖ Although natural additives do not always have a beneficial role compared to chemical ones, in most cases they are believed to be healthier and could provide added value to the product (Carocho, et al. 2014).

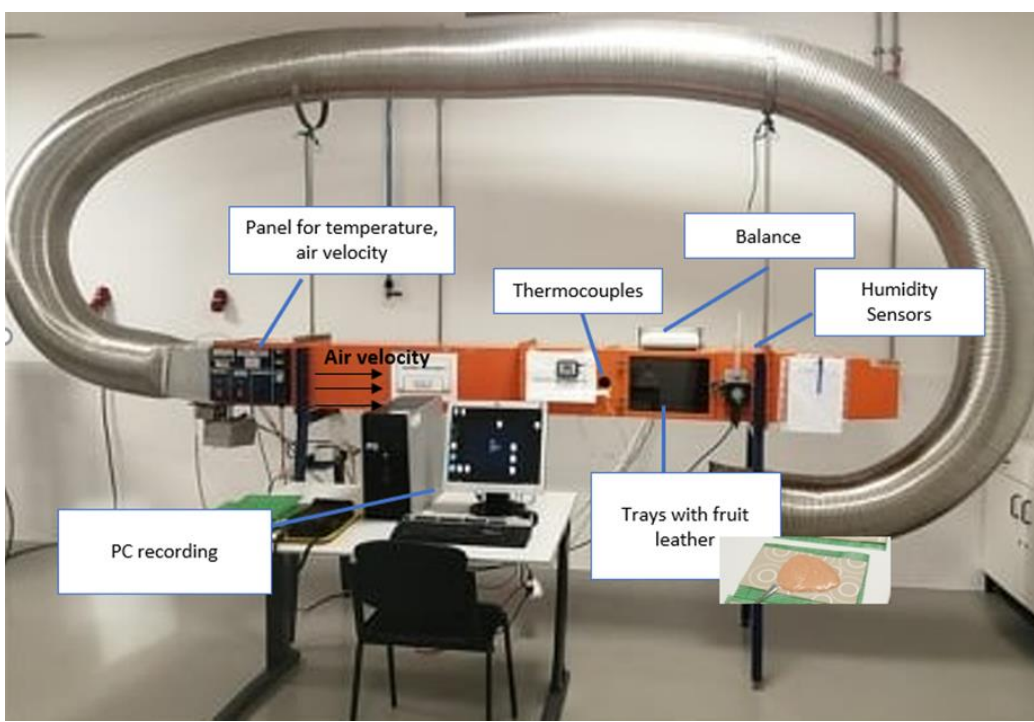
Márcio Carocho, Maria Filomena Barreiro, Patricia Morales, and Isabel Ferreira. 2014. "Adding Molecules to Food, Pros and Cons: A Review on Synthetic and Natural Food Additives." Comprehensive reviews in Food Science and Food Safety 13 (4): 377-399. doi:https://doi.org/10.1111/1541-4337.12065.

Materials & Methods

List of ingredients for one batch

Ingredient	Weight (g)	% Total
Bananas	321	44.03
Pears	249	34.16
Strawberries	124	17.01
Honey	21	2.88
Lemon	14	1.92
Total Weight	729	100

Convective air-drying
temperature: 60°C, 70°C and 80°C
air velocity: 1.29 m/s



Final product and packaging at 25 °C
- package of reversible metallized polypropylene foil.



Quality Analysis

- ✓ Water activity (a_w)
- ✓ Water content
- ✓ Colour
- ✓ Texture
- ✓ Phenolic compounds

a_w meter
Aqualab



colorimeter
Minolta CR-400



texture analyzer
TA.XT. plus



Conclusions

- ✓ Overall, the mixed fruit leather can be considered stable throughout storage, as confirmed by several Anova analyses.
- ✓ A natural mixed fruit leather that combines the benefits of different fruits can be a healthy alternative as a snack with long-term storage and can be an answer to the increasing demand of people seeking healthier and more natural products.

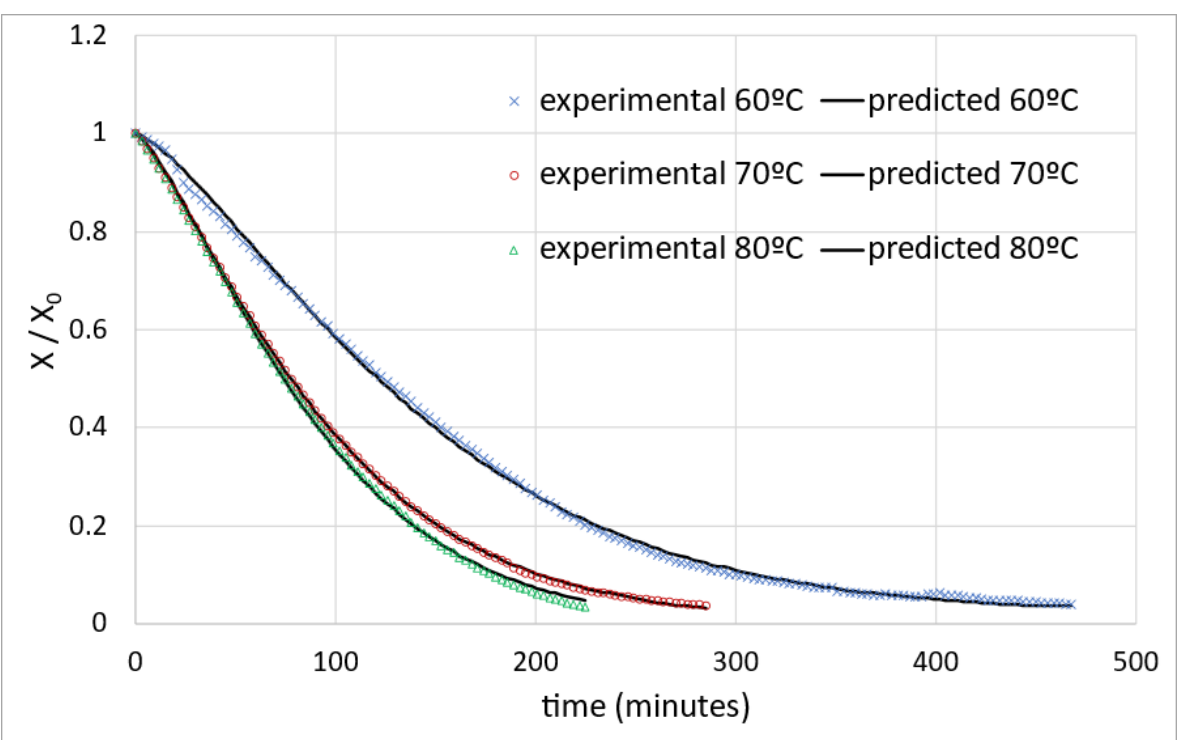
Objectives

- To develop a mixed fruit leather recipe with no chemical additives
- To study the impact of different processing temperatures on the final product's physico-chemical properties.
- To adjust the experimental drying curves to different thin-layer drying models and find the one that adjusts best.
- To assess whether the mixed fruit leather is stable over storage.

Results & Discussion

Processing Kinetics

Processing kinetics data and predicted values described by the Page Model



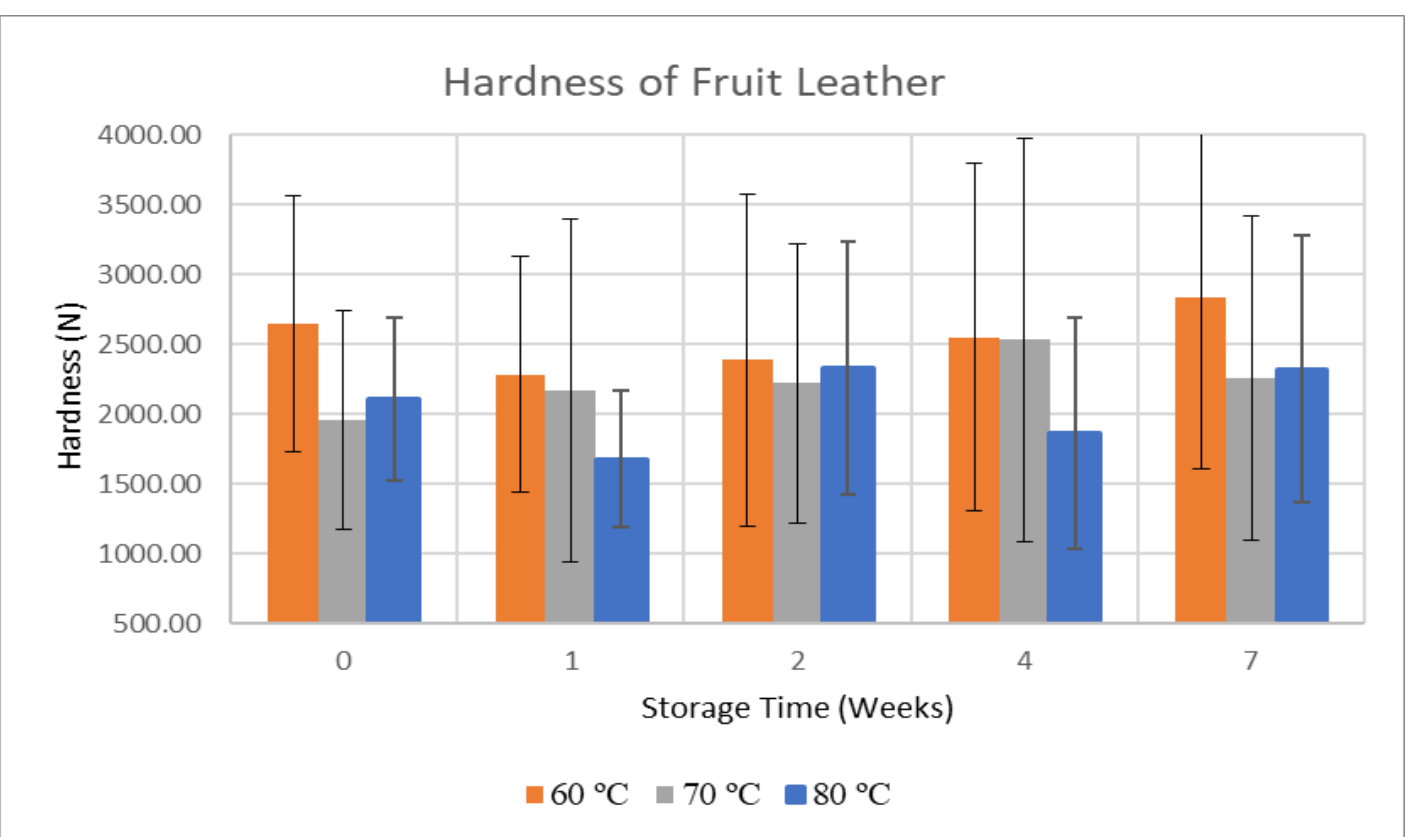
Page model:

$$\frac{X - X_e}{X_0 - X_e} = \exp(-k t^n)$$

The processing constants - k increased with increasing processing temperatures.

Storage results

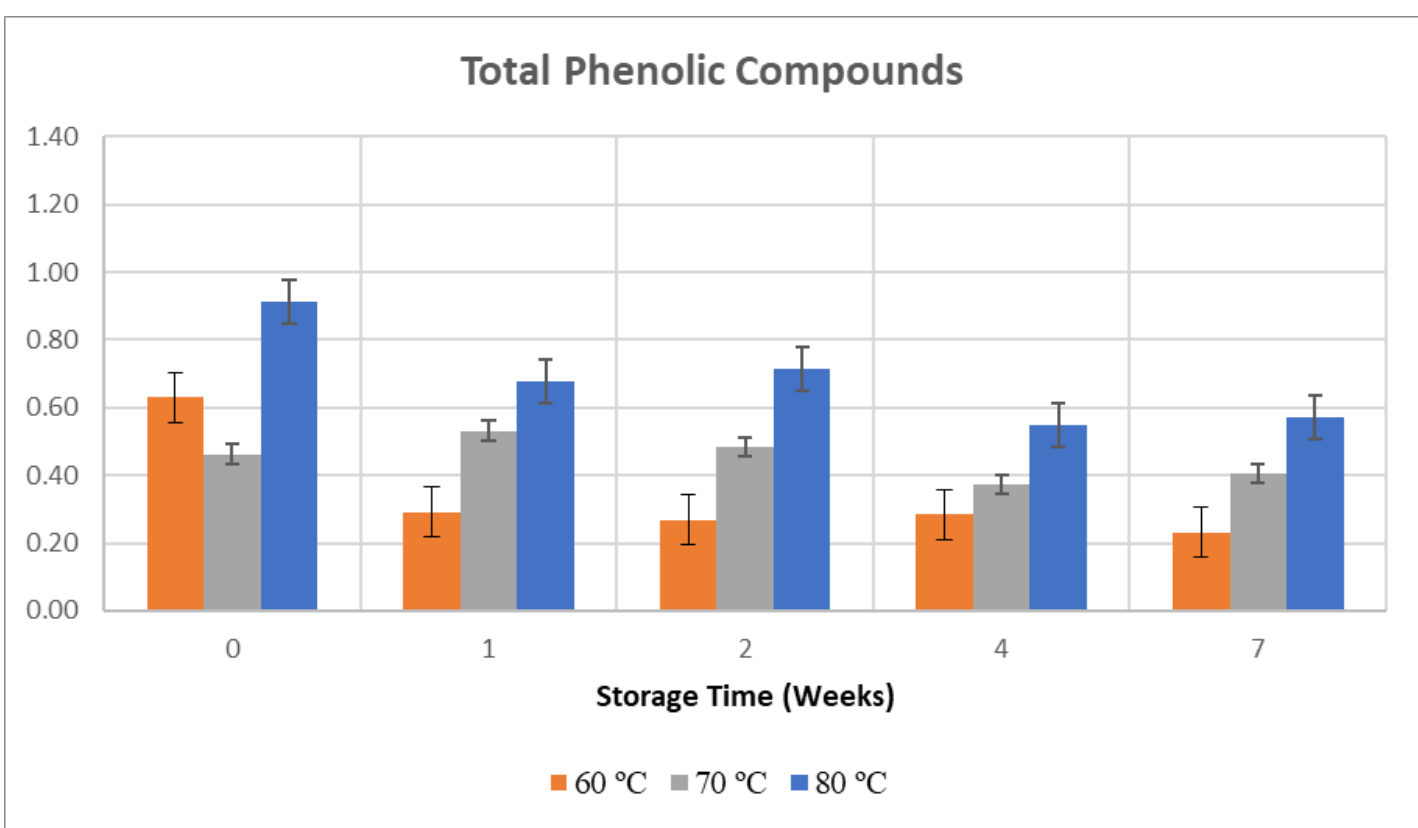
Texture { hardness
adhesiveness
chewiness



Regarding texture parameters, there were no clear observable tendencies along storage time.

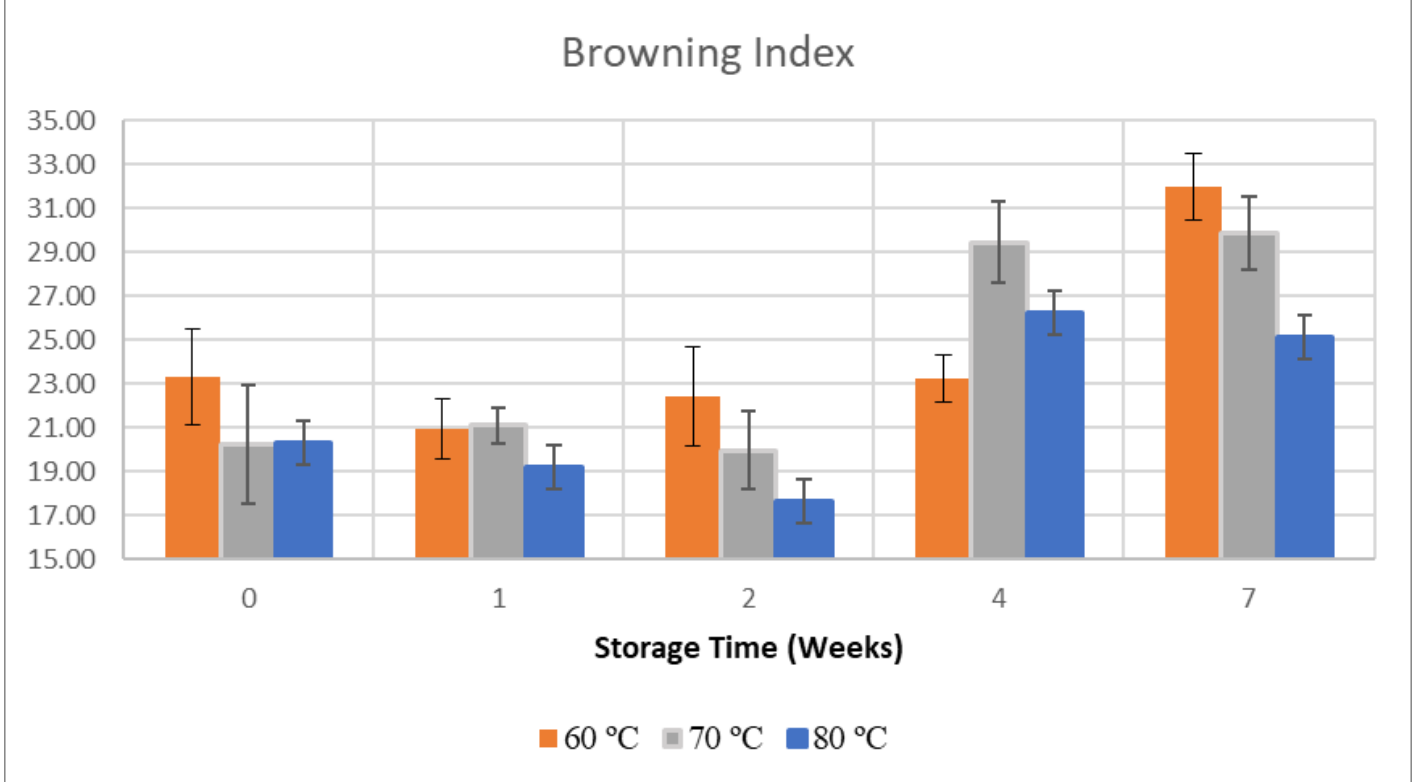
Storage results

Total phenolic compounds - expressed in normalized values



Total phenolic compounds, water content and water activity did not seem to be impacted by the processing temperatures and were stable throughout storage.

Browning Index of fruit leather



Colour was affected by storage, as L* and Browning Index values were significantly different, indicating browning of the fruit leather after the first month. Colour was not impacted by the processing temperatures.

Acknowledgements

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