

Investigating the sensory acceptance of tropical fruit based products

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Fruits have been used to design functional foods due to the presence of bioactive compounds and their antioxidant capacity. *Hylocereus polyrhizus* (dragon fruit) and *Averrhoa carambola* (star fruit) are tropical fruits that have been used to control diseases such as hypertension and type 2 diabetes in the traditional medicine of different countries ^(1,2). Due to their high water content and their short shelf life, different preservation methods, such as freezing and drying have been used to maintain their properties as much as possible and to allow their transport and storage to different regions ⁽³⁾. However, several factors such as the effect of the food matrix, the release of nutrients, the design of products and their sensory perception need to be determined in products formulated with preserved fruit ⁽⁴⁾. The aim of this study was to establish the sensory acceptance of beverages based on fresh, frozen and dried dragon fruit and star fruit. Six tropical fruit-based beverages were prepared. Three were formulated using dragon fruit in fresh, frozen and dried forms to contain 290 micrograms (μg) of Gallic acid equivalents (GAE) per milliliter (mL) of total phenolic content; three more based on fresh, frozen and dried star fruit were formulated with 490 μg GAE/mL total phenolic content. A hedonic test was conducted using Compusense Cloud software to determine the overall acceptance of the six beverages in order to evaluate five different attributes using a 9-point scale (9= 'like extremely', 1= 'dislike extremely'): appearance, colour, taste, viscosity and mouthfeel. Ethical approval was obtained from the University Research Ethics Committee (Reg. No. UREC 201379). IBM SPSS Statistics software, version 27, was used to carry out a Friedman non-parametric test and Wilcoxon post hoc test with a Bonferroni correction to compare the sensory acceptance of beverages. 26 participants (8 males and 18 females) between 18 and 50 years were recruited. The overall acceptance was significantly different between tested products, $\chi^2(5) = 20.276$, $p = 0.001$. Post hoc tests showed a significant difference ($p = 0.003$) between dried and fresh star fruit based products. Fresh and frozen dragon fruit-based beverages as well as the fresh star fruit product were the most preferred, ranking between 'like slightly' and 'like moderately' for overall acceptance. Attributes such as appearance, colour and taste influenced the like-dislike response. The results of this study provide valuable data to consider hedonic test as a tool to determine the attributes linked to acceptability, and to establish the influence of food matrix on sensory attributes. Fresh and frozen dragon fruit and fresh star fruit based products could be used in *in vivo* studies to evaluate the effect of polyphenols on health biomarkers.

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References

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