Research Exercise Summary

MECHANICAL, TEXTURAL AND SENSORY QUALITIES/PROPERTIES OF MULTI-LAYERED FRUIT LEATHER

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Background

Fruit leathers are well recognized for their nutritive value and vitamin content. Their consumption adds variety to the diet and allows the intake of dietary fiber, vitamins and minerals, while providing a substantial energy input (1). When the production of fruits is in excess, converting edible portions or portions not meeting the canning specifications into value-added products would put in value back to the produce (2-3). Most production of fruits worldwide is seasonal and Israel is not an exception. Insufficient methods of preservation of fruits during harvest/peak seasons lead to postharvest losses or wastages. One alternative snack that can add value to fruits is fruit leather. Fruit leather, often also entitled fruit sheet, fruit bar or fruit roll, is produced by dehydration of fruit puree that include other several food ingredients and additives (4). To avoid the losses therefore, the fruits could be processed into fruit leathers which will ensure the supply of products that include fruit pulp; or products that include a high proportion of processed fruit or vegetable pulp. The product has a stable shelf-life due to its low moisture content and high proportion of carbohydrates (5). When properly dried and packaged, fruit leathers have a shelf life of up to 9 months and when preservatives are added, they can keep for up-to one year (6). Fruit leathers are eaten as snack foods instead of boiled sweets.

Overall Objective

The overall objective of this research exercise work was to study how processing affects some quality parameters of double layered fruit leathers produced from apple and mango pasteurized pulps.

Specific objectives:

• Produce multi-layered fruit leather from purchased purees
• Conduct physical analysis of the processed product
• Study the effect of processing on the sensory qualities of the fruit leather
Methodology

The recipe used in this research exercise work was adapted from Food and Agriculture Organization (FAO) (6). The process started by thawing of the fruit purees. Citric acid, sugar and sodium metabisulphite were then added to the puree to form a mix. The mix was heated at temperatures of 70-80 °C on a mixer with heater plate amid continuous stirring for about 2 h until a final solids content of 85 % was reached. Antifoaming agent was added to avoid excessive foam formation. The hot puree was poured onto greased dishes at 3 mm to 6 mm thick and then spread evenly. The surfaces of the dishes were previously greased with glycerin to prevent the leather from sticking. The leather was placed in the oven for 18-24 h drying period until a final moisture content of about 15-20 % was reached. The product had a soft, leather-like consistency and was packed in plastic bags, labeled with the dates of manufacture and stored in a refrigerator.

Results

Textural analysis, color measurements and sensory tests were done on the final product. It was observed that for an appropriate bite by the consumer, layers of the leather could be put together. The height was ranging from 9.2 mm to 9.5 mm. From the mechanical analysis, it was concluded that the specimen of the product is a chewable material and is not brittle. On average, the color of the fruit leather was moderately liked by the panelists. They preferred the apple layer side compared to the mango layer side. When the apple layer was on top, the average $L^*$ value was 40.7 compared to that when mango layer was on top 36.3, this showed more lightness and it is reflected also on the panelists' preference during the sensory analysis. The $a^*$ average value when apple layer was on top was 6.3 compared to that when mango layer was on top 9.7 and it showed that with the mango layer on top, the leather color tends to move towards red. The $b^*$ average value when the apple layer was on top was 24.3 compared to that when the mango layer was on top 20.3 and it showed that with the apple layer on top, the color tends to move more towards yellowness more than mango. Taste of the product was liked moderately by the panelists. Overall acceptability of the product was liked moderately.

Conclusions

Fruit leather manufacture is worth an investment and would be sufficient if the excesses of fruits will be utilized in a more completed manner, to support agriculture and farmers value added products and higher profit margins. It is a good replacement for sweets and candies because of its nutritional values as established in earlier studies. It also reduces on postharvest losses and wastages. Fruit snacks, whether or not they claim to provide a serving of fruit, do not offer all the nutritional benefits of whole fruit and often contain added sugars (7). The evaluation of the nutrient contents of the final product such as vitamins and mineral contents was not handled in this research exercise work. The production of fruit leathers can therefore be taken on and if this project was to be implemented, it will be very attractive.
and profitable. The following aspects can be recommended for future research and development.

- Evaluation of the nutrient contents of the multilayered product especially the vitamins and mineral contents and possible addition of proteins to the product.
- Final product quality evaluation in terms of physical, chemical and microbiology.

REFERENCES


