Production of Orange Beverage from Cantaloupe Seed and Evaluation its Shelf Life During Storage Time

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Introduction

Cantaloupe (Cucumis melo L.) belongs to Cucurbitaceae family and is native to Africa and Asia. The seeds of cantaloupe, however, are not much consumed (2,3). In recent years, the seed kernels have been used as the basis for a number of soups and stews (3) where act as a thickening, emulsifying, fat binding and flavoring agents (2,4). The oil is also used and is highly valued (3). It is thought that melon seeds could be processed into a milk-like product, similar to soybean drinks (2,3). Apart from manipulation of soybean processing conditions, masking of soymilk with flavor additives such as fruit juice, coffee, and vanilla or coconut cream has been reported to improve the flavor of soymilk (2). Similarly, in this work, orange concentrate incorporated into cantaloupe seed milk at 17% (v/v) significantly improved acceptability of the beverage.

Materials & Methods

Cantaloupe seed milk was prepared according to Baghaei et al. method (2008). Orange concentrate (17%, v/v) was used to mix with cantaloupe seed milk. This amount of concentrate decreased pH to 4.7. For setting pH on 4.15, some lime juice was added. The obtained beverage was pasteurized at 85 °C for 10 min, hot filled into sterile bottles and stored at refrigerator (4 °C) temperature for 42 days.

PH and soluble solids were measured by a digital pH meter (Metrohm 691) and Abbe refractometer (RG, 701,_Officeine, Gathled), respectively. Mold and yeast counts were conducted with Sabouraud Dextrose Agar at 30 °C in 5-7 days intervals (4). Organoleptical test was performed by A panel team of ten trained-judges and based on 5-point hedonic scale.

The experiments were conducted as a factorial with completely randomized design. Analysis of variance and Duncan Multiple Range Test were used to analyze data for significant differences between means (p<0.05).

Result & Discussion

Chemical, sensory and microbial attribute changes of the formulated beverage during storage time are shown in table 1, 2. The regression relationship between pH (x) and sensory parameters of orange-cantaloupe seed beverage showed that only taste (y) was highly correlated with pH (p=0.022<0.05). The obtained equation is:

\[ y = 4.44 + 0.037x \]

\[ r = 0.68 \]
Conclusion

Adding orange concentrate to cantaloupe seed milk decrease pH from 6.83 (pure cantaloupe seed milk) to 4.15. It seems that a combination of orange concentrate and heat treatment (85 °C/10 min) provided a beverage which is chemically, microbially and sensorily stable for at least 6 weeks.

![Graph of pH changes during storage time of orange-cantaloupe seed beverage.](image1)

**Figure 1**- pH changes during storage time of orange-cantaloupe seed beverage.

![Graph of total acceptability score changes during storage time of orange-cantaloupe seed beverage.](image2)

**Figure 2**- Total acceptability score changes during storage time of orange-cantaloupe seed beverage.
**Table 1-** Chemical, microbial and sensory properties of orange-cantaloupe seed beverage

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Score</th>
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<tbody>
<tr>
<td>pH</td>
<td>4.314&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Brix</td>
<td>17.00&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Taste</td>
<td>3.669&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Color</td>
<td>3.707&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Body</td>
<td>3.475&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Total acceptability</td>
<td>3.442&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Molds and yeasts</td>
<td>X</td>
</tr>
</tbody>
</table>

X, no growth.
Table 2- Influence of storage time on chemical, microbial and sensory properties of orange-cantaloupe seed beverage

<table>
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<th>Attribute</th>
<th>1</th>
<th>7</th>
<th>14</th>
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<td>4.207&lt;sup&gt;bc&lt;/sup&gt;</td>
<td>4.260&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4.339&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>4.416&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.387&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
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<td>17.00&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>17.00&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
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<td>3.386&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td>Molds, yeasts</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

X, no growth.

Means within a column with the same superscript were not significantly different (p> 0.05).
References


Oil extraction by SC-CO$_2$ from different fractions of hazelnuts

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Supercritical CO$_2$ (SC-CO$_2$) can be properly regarded as a oil solvent safer than hexane able to offer higher quality final products, above all from a toxicological point of view.

The possible commercial application of this innovative technology in hazelnuts processing, requires that the high costs involved in supercritical fluid extraction (SFE) could be partially counterbalanced by the commercial valorisation of hazelnuts by-products. In particular, the external layer (epicarp) of these kernels are very rich of phenolic compounds well known for their antioxidant properties. So the peeling residues of roasted hazelnuts could represent an interesting possible source of antioxidants to be utilised not only in food industry, but also in pharmaceutical field. The industrial utilisation of this promising by-product involves in any case the preliminary extraction of its lipid fraction before to carry on the phenols separation. This paper reports the preliminary results concerning the SC-CO$_2$ extraction of oil from: milled kernels; flour of roasted and peeled hazelnuts; peeling residues.

The extraction yield and selectivity was evaluated by operating at different temperature/pressure set, respectively ranging from 293 to 328 K and from 10 to 70 MPa. Moreover the identification of the best working conditions (temperature and pressure) was carried out by a kinetic model based on Fick's law.

Keywords: hazelnut, by products, oil, SC-CO2

Production of Orange Beverage from Cantaloupe Seed and Evaluation its Shelf Life during Storage Time

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A beverage from cantaloupe (Cucumis melo L.) seeds was produced to make a waste product available for human consumption. In this study, a novel beverage was made. moisture, carbohydrate, fat, protein, ash, some minerals include sodium, potassium, phosphorus, calcium, iron and copper analysis were conducted to determine the nutritional value of the beverage, following a consumer panel test to evaluate its acceptability. The results showed that cantaloupe seed beverage was a good source of protein (1.52%), fat (2.15%), phosphorus (41.3 ppm), potassium (17.0 ppm) and calcium (9.2 ppm). The overall acceptability score indicated the beverage was liked very much (4.05 on a 5-point hedonic scale).

Keywords: Cantaloupe seed, Cucumis melo L., Orange beverage, Storage stability

Crystallisation behaviour of lipids in oil-in-water nanoemulsions

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Nowadays there is an increasing interest of the food industry on the possibility to design "tailor-made" foods, which are able to fulfil specific consumer needs. In particular, the attention is focused on foods with enhanced sensorial performance and/or improved capacity to protect health and well being. One of the most promising strategies to produce foods really fulfilling the characteristics for which they are designed is the exploitation of the self-assembly properties of lipids to form nano-size structures. In fact, a guest molecule could be effectively incorporated inside self-assembly lipid structures and then delivered and protected into foods.

The physical properties of lipids used to obtain the nanostructures greatly affect the chemical stability as well as the rate of release of the compounds delivered. At present very few information are available on physicochemical properties of small-size lipid materials.