DEVELOPMENT AND CHARACTERIZATION OF SALTY COOKIE SNACK TYPE FORMULATED WITH BARU BY-PRODUCTS (Dipteryx alata Vog.)

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Abstract
The aim of this study was to develop and characterize salty cookies snacks using baru (Dipteryx alata Vog.) oil and partially defatted baru almond flour as baru almond by-products.

Key words:
Baru, fatty acids, total fiber.

Introduction
Almond baru (Dipteryx alata Vog.) presents high amount of dietary fiber, unsaturated fatty acids and minerals. So the aim of this study was to develop and to characterize salty snacks with functional claim, replacing the original ingredients by baru oil and partially defatted almond baru flour.

Results and Discussion
Chemical composition of baru almond, partially defatted baru flour and snacks according to AOCS, (2009), and total fiber (TF) by PROSKY et al. (1984).

Fatty acid composition of baru oil were determined by gas chromatography (HARTMAN and LAGO, 1973).

Mineral composition of almond, partially defatted baru flour and snacks were determined by elemental microanalysis by Scanning Electron Microscopy (SEM) and Energy Dispersive System (EDS) (GOLDSTEIN and NEWBURY, 1992).

Breaking strength of the salty snacks was analysed using a texturometer TA-XT Plus (JORGE, RODRIGUEZ and HOMBRE, 1999).

Development of snacks: Formulation 1: 20% substitution of wheat flour by partially defatted baru flour and 40% of extra virgin olive oil by baru oil; Formulation 2: 80% substitution of wheat flour by partially defatted baru flour and 85% of extra virgin olive oil by baru oil.

Chart 1. Chemical composition of a serving size (30g) of the salty snacks and percentage of adequacy in relation to the Recommended Daily Value (% DV).

<table>
<thead>
<tr>
<th>Nutrients by serving size</th>
<th>Formulation 1</th>
<th>%DV</th>
<th>Formulation 2</th>
<th>%DV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>4.40g</td>
<td>-</td>
<td>3.73g</td>
<td>-</td>
</tr>
<tr>
<td>Ash</td>
<td>0.66g</td>
<td>-</td>
<td>0.80g</td>
<td>-</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>10.67g</td>
<td>3.28</td>
<td>5.60g</td>
<td>1.72</td>
</tr>
<tr>
<td>Proteins</td>
<td>4.30g</td>
<td>5.73</td>
<td>5.26g</td>
<td>7.01</td>
</tr>
<tr>
<td>Lipids</td>
<td>6.58g</td>
<td>14.62</td>
<td>9.52g</td>
<td>21.16</td>
</tr>
<tr>
<td>FAT</td>
<td>3.39g</td>
<td>13.56</td>
<td>5.09g</td>
<td>20.36</td>
</tr>
<tr>
<td>Energetic value</td>
<td>105.55kcal</td>
<td>5.28</td>
<td>108.76kcal</td>
<td>5.44</td>
</tr>
</tbody>
</table>

- Salty snacks could be considered a food with high fiber content, as they present more than 6g of TF/100g (BRASIL, 2012).

Chart 2. Fatty acid profile of the baru almond (%).

<table>
<thead>
<tr>
<th>Fatty acid</th>
<th>Baru almond oil (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C18:1 (oleic) –ω9</td>
<td>48.26 ± 0.04</td>
</tr>
<tr>
<td>C18:2 (linoleic) –ω6</td>
<td>25.59 ± 0.03</td>
</tr>
<tr>
<td>C18:3 (linolenic) –ω3</td>
<td>0.15 ± 0.01</td>
</tr>
</tbody>
</table>

Total unsaturated fatty acids 76.37
MUFA 50.63
PUFA 25.74

- Minerals concentration in a serving size of salty snacks were similar in the Formulation 1 and 2, especially potassium (68.88mg), phosphorus (51.36mg), copper (59.53mg), zinc (44.20mg) and calcium (28.24mg).

- The salty snacks presented a break force of 1.2N (Formulation 1) and 0.4N (Formulation 2).

Conclusions
- The high oleic fatty acid content (ω9) in snacks, associated with high levels of TF can support the increase in HDL-c levels and reduce LDL-c levels when consumed as part of a balanced diet.
- The use of oil and partially defatted baru flour in different products can collaborate to reducing waste and adding nutritional value to food. Moreover it can also contributes to the sustainable development of native areas in Brazil like Cerrado.

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References
HARTMAN, L.; LAGO, R. Laboratory Practice. v.22, n.6, p.475-476. 1973;
HARTMAN, L.; LAGO, R. Laboratory Practice. v.22, n.6, p.475-476. 1973;
JORGE, M.C.; RODRIGUEZ, I.; HOMBRE, R. Alimentaria. v. 36, n. 305, p.73-76. 1999;

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