

# Physico-chemical properties and sensorial appreciation of a new fermented probiotic beverage enriched with pea and rice proteins

Allahdad Z.<sup>a</sup>, Manus J.<sup>a</sup>, Aguilar-Uscanga B. R.<sup>b</sup>, Salmieri S.<sup>a</sup>, Millette M.<sup>c</sup>, Lacroix M.<sup>a1</sup>.

<sup>a</sup>Research Laboratories in Sciences Applied to Food, Canadian Irradiation Center, INRS-Institut Armand-Frappier, Health and Biotechnology Centre, Institute of Nutrition and Functional Foods, 531 des Prairies blvd, Laval, Québec, H7V 1B7, Canada.

<sup>b</sup>Research Laboratory of Industrial Microbiology. Centro Universitario de Ciencias Exactas e Ingenierías, Universidad de Guadalajara. 1421, Blvd. Marcelino Garcia Barragan. Col. Olímpica, 44430. Guadalajara, Jalisco, Mexico.

<sup>c</sup>Bio-K Plus International Inc., Preclinical Research division, 495 Armand-Frappier blvd, Laval, Québec, H7V 4B3, Canada.

Journal: Plant Foods for Human Nutrition

---

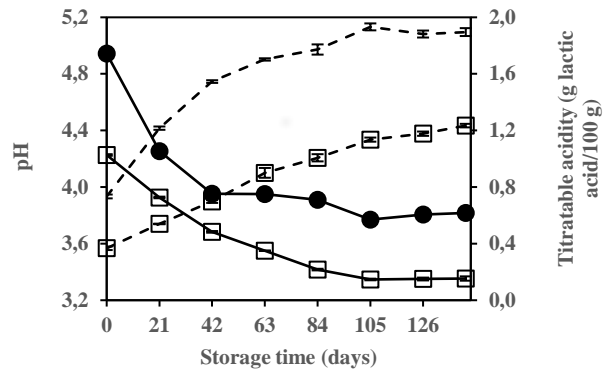
<sup>1</sup> Corresponding author. Dr. Monique Lacroix, Email: [Monique.Lacroix@inrs.ca](mailto:Monique.Lacroix@inrs.ca). Tel: 450-687-5010 # 4489.

Fax: 450-686-5501

**Table 1S.** Effect of the storage at 4 °C on the color of CNF, CF, PRNF and PRF beverages.

Days		CNF	CF	PRNF	PRF
<b>0</b>	<i>L</i>	38.0 ± 0.8 <sup>bcB</sup>	43.0 ± 1.0 <sup>abC</sup>	34.0 ± 2.0 <sup>abA</sup>	39.7 ± 0.2 <sup>bB</sup>
	<i>C</i>	12.3 ± 0.7 <sup>abA</sup>	15.0 ± 0.9 <sup>abBC</sup>	13.3 ± 2.0 <sup>aAB</sup>	17.1 ± 0.7 <sup>bcC</sup>
	<i>h</i>	80.1 ± 0.4 <sup>cB</sup>	81.2 ± 2.7 <sup>bB</sup>	73.8 ± 1.1 <sup>aA</sup>	72.3 ± 0.4 <sup>aA</sup>
<b>21</b>	<i>L</i>	35.3 ± 2.4 <sup>aAB</sup>	42.3 ± 0.8 <sup>aC</sup>	32.8 ± 0.8 <sup>aA</sup>	36.3 ± 0.8 <sup>ab</sup>
	<i>C</i>	13.6 ± 0.8 <sup>bA</sup>	17.1 ± 0.8 <sup>cB</sup>	12.4 ± 0.9 <sup>aA</sup>	18.2 ± 1.0 <sup>cB</sup>
	<i>h</i>	78.2 ± 1.4 <sup>bB</sup>	78.4 ± 0.6 <sup>ab</sup>	73.7 ± 0.3 <sup>aA</sup>	73.4 ± 0.3 <sup>bA</sup>
<b>42</b>	<i>L</i>	39.3 ± 1.9 <sup>cB</sup>	44.8 ± 1.7 <sup>bcC</sup>	35.6 ± 0.8 <sup>bcA</sup>	40.9 ± 1.5 <sup>bB</sup>
	<i>C</i>	13.6 ± 1.2 <sup>bA</sup>	16.2 ± 1.0 <sup>bcB</sup>	13.4 ± 0.7 <sup>aA</sup>	16.3 ± 0.6 <sup>abB</sup>
	<i>h</i>	78.1 ± 0.7 <sup>bB</sup>	79.3 ± 1.1 <sup>abB</sup>	73.8 ± 0.7 <sup>aA</sup>	74.2 ± 0.7 <sup>cdA</sup>
<b>63</b>	<i>L</i>	36.9 ± 0.1 <sup>abB</sup>	42.0 ± 0.6 <sup>aD</sup>	34.3 ± 0.8 <sup>abA</sup>	39.8 ± 0.2 <sup>bcC</sup>
	<i>C</i>	12.5 ± 0.6 <sup>abA</sup>	14.8 ± 0.3 <sup>abB</sup>	12.5 ± 0.4 <sup>aA</sup>	15.5 ± 0.9 <sup>abB</sup>
	<i>h</i>	76.6 ± 0.2 <sup>abB</sup>	78.8 ± 0.6 <sup>aC</sup>	73.4 ± 0.3 <sup>aA</sup>	73.7 ± 0.2 <sup>bcA</sup>
<b>84</b>	<i>L</i>	37.6 ± 0.7 <sup>bcA</sup>	43.0 ± 1.3 <sup>abC</sup>	37.1 ± 0.5 <sup>cdA</sup>	41.2 ± 0.9 <sup>bB</sup>
	<i>C</i>	13.0 ± 0.9 <sup>abA</sup>	15.3 ± 0.6 <sup>abB</sup>	13.3 ± 0.9 <sup>aA</sup>	15.3 ± 0.9 <sup>abB</sup>
	<i>h</i>	77.8 ± 0.3 <sup>abB</sup>	78.2 ± 0.9 <sup>abB</sup>	73.4 ± 0.3 <sup>aA</sup>	74.3 ± 0.2 <sup>cdA</sup>
<b>105</b>	<i>L</i>	36.6 ± 0.4 <sup>abA</sup>	41.9 ± 0.8 <sup>abB</sup>	37.0 ± 0.8 <sup>cdA</sup>	40.7 ± 1.1 <sup>bB</sup>
	<i>C</i>	12.1 ± 0.6 <sup>aA</sup>	14.8 ± 0.8 <sup>abB</sup>	12.1 ± 0.2 <sup>aA</sup>	15.2 ± 0.3 <sup>abB</sup>
	<i>h</i>	78.0 ± 1.2 <sup>abB</sup>	78.6 ± 0.3 <sup>abB</sup>	73.2 ± 0.4 <sup>aA</sup>	73.8 ± 0.3 <sup>bcA</sup>
<b>126</b>	<i>L</i>	37.9 ± 0.6 <sup>bcA</sup>	43.4 ± 0.9 <sup>abC</sup>	37.7 ± 0.9 <sup>dA</sup>	40.9 ± 1.3 <sup>bB</sup>
	<i>C</i>	11.9 ± 0.3 <sup>abA</sup>	15.6 ± 0.3 <sup>abB</sup>	12.1 ± 0.6 <sup>aA</sup>	15.7 ± 0.6 <sup>abB</sup>
	<i>h</i>	80.0 ± 0.6 <sup>cD</sup>	78.6 ± 0.3 <sup>aC</sup>	73.6 ± 0.5 <sup>aA</sup>	74.8 ± 0.2 <sup>dB</sup>
<b>143</b>	<i>L</i>	38.4 ± 0.5 <sup>bcB</sup>	42.6 ± 0.1 <sup>aD</sup>	36.8 ± 0.4 <sup>cdA</sup>	41.2 ± 1.0 <sup>bcC</sup>
	<i>C</i>	12.3 ± 0.6 <sup>abA</sup>	15.3 ± 0.7 <sup>abB</sup>	12.5 ± 0.6 <sup>aA</sup>	15.7 ± 0.6 <sup>abB</sup>
	<i>h</i>	79.1 ± 0.6 <sup>bcC</sup>	79.6 ± 0.3 <sup>abC</sup>	73.4 ± 0.4 <sup>aA</sup>	74.4 ± 0.6 <sup>cdB</sup>
<b>ΔE</b>		0.46	1.07	2.97	2.18

Data expressed as mean ± standard deviation (n = 3). CNF: non-fermented control beverage. CF: fermented control beverage. PRNF: non-fermented pea-rice beverage. PRF: fermented pea-rice beverage. Mean values with different lowercase letters within the same column of the same parameter are significantly different ( $P \leq 0.05$ ). Mean values with different uppercase letters within the same raw are significantly different ( $P \leq 0.05$ ).



**Fig. 1S.** Variation of pH-values (symbolized as full lines) and titratable acidity (symbolized as dotted lines) of fermented control beverage (□CF) and fermented pea-rice beverage (● PRF) during the storage period of 143 days at 4 °C. Values are means of three replicates experiments. Error bars indicates standard error of three replicates measurements.