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1. Introduction

The prevalence of veganism, awareness of animal welfare, the concept of lower environmental impact, and improved health have created an opportunity for plant-based beverages to thrive. Given the global interest in food security, it is essential to investigate the mineral composition and economic potential of some underutilized crops. Tigernut milk is one of the appreciated plant-based beverages, and a healthy source of nutrients with no allergy-causing components, yet they are highly underutilized. The potential of tigernut as a milk alternative that can mitigate micronutrient deficiencies in a growing population could be a valuable resource in public health strategies aimed at promoting SDG 2 AND 3.

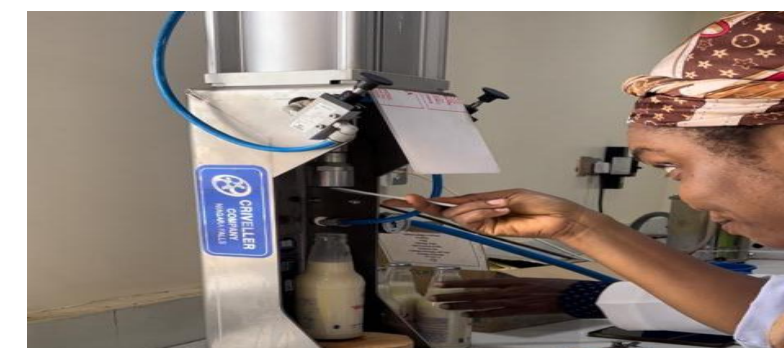
2. Aim of the study

- ❖ To produce tigernut milk using different pre-treatment methods (boiling, malting, soaking)
- ❖ To bottle and sterilize tigernut milk.
- ❖ To assess the mineral composition of the tigernut milk

3. Materials and Methods



Raw material and processing



The capping was performed using an automated capping machine(Officine Pesce bottling system PG 93/C , Italy)



A thermocouple was used to achieve an F₀ (F zero)



Bottled Tigernut milk

ANALYSIS: Mineral composition (AOAC 2005)

- Statistical analysis: The mean and standard deviation were calculated and analyzed using single-factor ANOVA Software

Mineral composition of fresh and sterilized tigernut milk |

Pre-processing method	Variety	Post-packaging	Calcium (mg/100 g)	Magnesium (mg/100 g)	Iron (mg/100 g)	Sodium (mg/100 g)	Potassium (mg/100 g)	Copper (mg/100 g)
Malting	Yellow	Fresh	78.90 ^a ±0.08	71.86 ^a ±0.04	0.76 ^a ±0.00	212.50 ^a ±7.07	136.25 ^a ±1.77	14.43 ^{bc} ±0.81
	Yellow	Sterilized	79.07 ^a ±0.07	47.82 ^a ±0.25	0.70 ^a ±0.09	136.25 ^a ±5.30	103.75 ^a ±1.77	17.28 ^a ±1.61
	Brown	Fresh	78.61 ^a ±0.12	71.59 ^a ±0.00	1.26 ^a ±0.00	192.50 ^a ±3.54	83.75 ^a ±1.77	12.73 ^a ±1.61
	Brown	Sterilized	39.84 ^a ±0.11	48.50 ^a ±0.56	1.21 ^a ±0.08	190.00 ^a ±3.54	118.75 ^a ±1.77	13.29 ^a ±0.81
Soaking	Yellow	Fresh	38.70 ^a ±0.06	46.87 ^a ±0.03	0.94 ^a ±0.07	215.00 ^a ±3.53	111.25 ^a ±1.77	15.57 ^{ab} ±0.81
	Yellow	Sterilized	39.76 ^a ±0.00	48.23 ^{ab} ±0.00	0.83 ^a ±0.09	107.50 ^a ±3.53	116.25 ^a ±1.77	16.14 ^{ab} ±1.60
	Brown	Fresh	39.66 ^a ±0.17	72.32 ^a ±0.09	1.27 ^a ±0.00	201.25 ^a ±5.30	110.00 ^a ±0.00	14.43 ^{bc} ±0.81
	Brown	Sterilized	39.77 ^a ±0.00	48.27 ^{ab} ±0.04	1.27 ^a ±0.00	133.75 ^a ±1.77	77.50 ^a ±3.53	15.57 ^{ab} ±0.81
Boiling	Yellow	Fresh	80.04 ^a ±0.01	48.56 ^a ±0.02	1.61 ^a ±0.09	257.50 ^a ±3.54	131.25 ^a ±1.77	17.84 ^a ±0.80
	Yellow	Sterilized	79.45 ^a ±0.04	48.17 ^{ab} ±0.00	1.52 ^a ±0.00	208.75 ^a ±1.77	123.75 ^a ±1.77	16.14 ^{ab} ±1.60
	Brown	Fresh	78.98 ^a ±0.00	47.94 ^a ±0.05	1.39 ^a ±0.00	160.00 ^a ±3.53	220.00 ^a ±3.54	6.48 ^a ±0.80
	Brown	Sterilized	79.64 ^a ±0.06	24.19 ^a ±0.07	1.21 ^a ±0.09	268.75 ^a ±1.77	191.25 ^a ±5.30	8.75 ^a ±0.81

Values are mean ± standard deviation of duplicate determinations. Means in the same column bearing different superscripts are significantly different at p<0.05

5. Discussions

While potassium recorded the highest value, 460mg-526.25mg for the yellow and brown variety. There was no significant difference (p<0.05) in the copper content in both varieties. The values of calcium found in the tigernut are adequate for teeth and bone development in children. The result showed that tigernut milk is rich in micronutrients, which means that they are highly refreshing and a good source of natural refreshment. sterilization had little effect on the mineral content of tigernut milk, although there was a decline in the calcium content of the malted brown. However, there was a significant increase in the potassium content. In addition, variation in the mineral content of the samples could be attributed to the different processing methods (soaking, boiling, and malting) used in this study

Acknowledgements



4. Results

Mineral composition (mg/100 g) content of tigernut tubers Values are mean ± standard deviation of duplicate determinations.

Micronutrient	Yellow variety	Brown variety
Calcium	79.92 ^{**} ±0.01	119.70 ^{**} ±0.00
Magnesium	121.21 ^{**} ±0.06	169.41 ^{**} ±0.00
Iron	1.73 [*] ±0.09	2.24 [*] ±0.09
Sodium	395.00 ^{NS} ±17.68	392.50 ^{NS} ±0.00
Potassium	460.00 ^{**} ±0.00	526.25 ^{**} ±8.84
Copper	17.84 ^{NS} ±0.81	15.57 ^{NS} ±0.81

^{**}: Means in the same row are significantly different at p<0.01.

^{*}: Means in the same row are significantly different at p<0.05.

NS: Means in the same row are not significantly different at p<0.05.

6. Conclusion

This study has shown that tigernut contains essential minerals. From the result of the study, it can be concluded that tigernut is a good source of some minerals, and having these minerals present, it could serve as an important dietary supplement.

References

Asante, F.A., Ellis, W.O., Odure, I. and Saalia, F.K. (2014a). Effect of soaking and cooking methods on extraction of solids and acceptability of tigernut (*Cyperus esculentus* L.) milk. *J. Agric. Stud.* 2(92):76-86.

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