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Analysis of extracted milk with tiger nut (*Cypress esculentus* L.) flour

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Abstract
The physical and chemical properties of tiger nuts milk were found to be favourable, with a high fat content of 20-30% and a protein content of 5-7%. The pH level of the milk was slightly acidic, ranging from 6.5-7.0. In terms of nutritional content, tiger nuts milk was found to be ironic in vitamins E and C, as well as reserves such as potassium, magnesium and determined. The dietary fibre content was also relatively high, ranging from 2-4%. Additionally, the milk was found to contain antioxidants, which can help protect against oxidative stress and inflammation. The microbiological quality of tiger nuts milk was found to be good, with a low bacterial count and the presence of beneficial microorganisms such as Lactobacillus and Bifidobacterium. In terms of sensory evaluation, the milk was found to have a creamy texture and a slightly nutty and sweet flavour. The overall acceptability of the milk was high, with a high rating for taste, texture and overall acceptability. The processing and preservation of tiger nuts milk were found to be critical factors in maintaining its quality and shelf life. The optimization of processing conditions, such as temperature, pressure and enzyme treatment, was found to affect the physical, chemical and nutritional chattels of the profit. The use of preservers, such as potassium sorbate and sodium benzoate, was found to cover the ridge life of the milk. Additionally, the packaging and storage conditions of the milk, such as refrigeration and freezing, were found to affect the eminence and ridge life of the milk.

Keywords: Tiger nut milk, vitamins, minerals, dietary fibre, cyperaceae and bamishalye

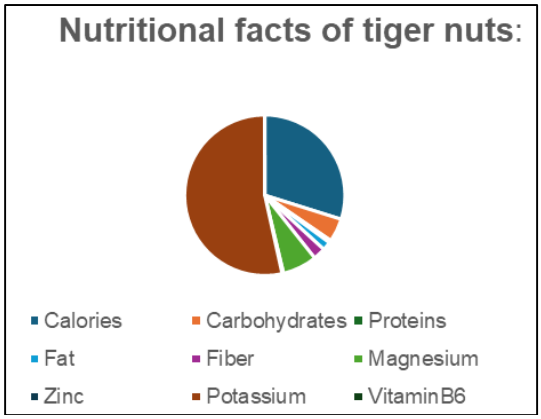
Introduction
It is a Tuber that grow spontaneously and is consumed widely in Nigeria, other parts of west Africa, east Africa, parts of Europe mainly Spain as well as in the Arabian Cape (Abaejoh *et al.*, 2006) [10]. In many thousand Years ago, tiger nut, in Spanish entitled chufa, was cultured in region of chufa between Sudan and Egypt on the boundaries of the Nile River. Near are Documents that certify this product over 400 years ago. Proof of this is that on many circumstance Archaeologists found sand jars containing tiger nut. In graves of pharaohs. Previously, it was cultivated in the ancient Mesopotamia between the rivers Tigris and Euphrates. At the same time historic Persian and Arab Documents mentioned the nutritive, gastric and dis transmittable value of tiger nut. During the era the tiger Nut milk was confidential as medicinal drink due to it been highly spirited and diuretic, rich in mineral, Pre dominantly phosphorus and potassium and also Vitamins C and E (Abaejoh *et al.*, 2006) [10]. It was in the 8th century that Arab agents introduced the Cultivation of tiger nut in the Mediterranean region of Valencia (Spain), for embellishment of tiger nut milk (leche de chufa), to know the tiger nut cultivation as it arrived to our days. It has been described that rough Sandy group and mild temperatures are special for the Farming evolution of earth tuber (Abaejoh *et al.*, 2006) [10]. Tiger nuts tubers seem somewhat long or Round in shape with a aspect of 8mm to 16mm, Smaller size still, are not used for human Intake. When hydrated, it is slightly harder (nut Texture), but with a relatively more intense and Intense taste. Being cultivated through extension irrigation, tiger nut has to be accurately dried before storage. The drying process is completely natural, (i.e. sun drying) and the process Can take up to one month. The desiccating process ensures longer shelf life, avoiding rot or any other Bacterial infection locking their excellence and nutritional Level. Unluckily, the desiccation process makes. The tiger nut skin wrinkled, a situation that limits its Tolerability

to some people (Belewu and Abodunrin, 2006) [14]. It is known in Nigeria as "Aya" in Hausa," Ofio" In Yoruba and "Akiausa" in Igbo where these ranges (black, brown and yellow) are cultivated (Umerie *et al*., 1997) [15]. Among these, the yellow variety is Preferred done others because of its intrinsic Properties such as large size, attractive colour and Fleshier nature. It also Yield more milk upon Abstraction, contains lower fat and higher protein and less anti nutritional dynamics especially poly phenol. Recently, there is awareness for Increased exploitation of tiger nut (Belewu and Abodunrin, 2006; Belewu and Belewu, 2007) [14, 4].

Tiger nut "milk" has been tried as an alternate source of milk in inflamed products, such as yogurt creation and other incited products common in some African nations and can thus be useful exchanging milk in the diet of people blinkered to lactose to a certain extent. Tiger nuts, also recognised as *Cyperus esculentus*, are small tubers that have a variation of culinary, health and trade uses.

Table 1: Nutritional facts of tiger nuts

Nutrients	Values
Calories	120 gm
Carbohydrates	19 gm
Proteins	2 gm
Fat	7 gm
Fiber	10 gm
Magnesium	28 mg
Zinc	1.1 mg
Potassium	215 mg
VitaminB6	0.1 mg



Graph 1.1: Nutritional facts of tiger nuts

For 4000 years, tiger nut has been used as a vigorous plant because of its contented of several reserves, energy and oleic acid, it has a high content of arginine which liberates the hormone that harvests insulin, besides its content of starches with ash of sucrose and starch (Bamishaiye and Bamishalye, 2011) [16]. Tiger nut tubers are benefit for carcasses, tissue repair, muscles, the circulation and body development due to its fruitfulness in phosphorus, potassium, calcium, magnesium and iron required (Mohdaly, 2019) [17]. Phosphorus and calcium, as basic rudiments in tiger nut tubers, found the bulk of the mineral substance of the bones and teeth. It has an impact in the formation of ATP, a vitality multiple imperative for "activating glucose, unsaturated fats, etc. (Achoribo and Ong 2017) [13]. Potassium plays a role in many enzymatic responses and weighty physiological processes such as nerve transference, heart rhythm and muscle contraction. (Mohdaly, 2019) [17]. Also, tiger nut is thought to have a protective effect against circulatory diseases and cancer because of its content vitamin E which plays a role on the formation and running of the red blood cells. (Gambo and Da'u, 2014) [18].

Reported to be high in dietary fibre content, which is effective in the treatment and prevention of many diseases such as colon cancer, coronary health diseases, gastro intestinal disorders, obesity and diabetics (Achoribo and Ong, 2017) [13]. Besides, it is aphrodisiac, carminative, diuretic, emmenagogue, stimulating and tonic. It is used also in the treatment of flatulence, indigestion, diarrhea, dysentery and excessive thirst (Adejuyitan, 2011) [11]. Tiger nut oil has a golden-brown colour and a rich nutty taste, is one of the highest oleic acid contents that it has a lipid and fatty acid profiles very similar to the olive oil. It has a high oleic acid and low polyunsaturated fatty acid and low acidity, which make it excellent for the skin. It has higher rust stability than other oils, due to the presence of polyunsaturated fatty acids and gamma- tocopherol (Mohdaly, 2019) [17]. Also, it is optional for creation over other oils since it is more hardy to chemical rottenness at high temperatures. Furthermore, in the textile industry, oil is used to waterproof fabric fibres. It is additionally a potential source of h in diesel (Bamishaiye and Bamishaiye, 2011) [16]. *C. esculentus* oil is rich mineral content, especially phosphorus and potassium and a high amount of vitamin E (alpha-tocopherol) (Mohdaly, 2019; Roselló-Soto *et al*, 2019) [17, 22]. Tiger nut oil is stated to be an antioxidant, anti-arthritic, anti-inflammatory, analgesic, antibacterial, atherosclerotic and anticonvulsant (Krichène *et al*, 2016). The milk mined from tubers "Horchata", as they call in Spain, is removed by cleaning and soaking the lots of fresh tiger nut samples in cold water for 24 hours, wet milled with about two litres per kilogram of water, using a clean pasteurized blender. This was followed by separation using a muslin doth to remove the chaff from the milk. The tiger nut exploit is very nutritive and serves as a good source of energy (Dyetoro *et al*, 2019) [21]. It is a rich source of minerals such as iron, magnesium and carbohydrates more than the cow's milk in totalling to phosphorus, potassium, calcium, unsaturated fats, proteins and some enzymes which help in digestion. On the other side, it's not covering lactose, casein, sugar or proteins of the milk, or cholesterol and is, therefore, an ideal drink for people who do not abide gluten or cow's milk (Bamishaiye and Bamishaiye, 2011) [16]. Tiger nut milk encompasses vitamin E which delays cell aging, growths skin. Resistance and helps relieve the appearance of wrinkles. Besides, it is essential for fecundity in both men and women, besides it is careful as a heart stimulant, liver tonic, drank to heal serious abdominal pain, to promote normal menstruation and is a powerful aphrodisiac (Mohdaly, 2019) [17]. The Milk is suggested for those who Suffer from indigestion, pomposity and diarrhea because Black Sea Periodical of Agriculture. It provides digestive enzymes like the catalase, lipase and Amylase (Adejuyitan, 2011) [11].

Materials and Methods

The present investigation was conducted at Food Technology Lab, Department of Agriculture, Invertis University, Bareilly, Uttar Pradesh, India. The material was purchased from local market of Bareilly and online grocery app.

Sorting and cleaning
Sort the tiger nuts to remove any debris and damaged nuts.
Wash thoroughly with clean water to remove dirt.

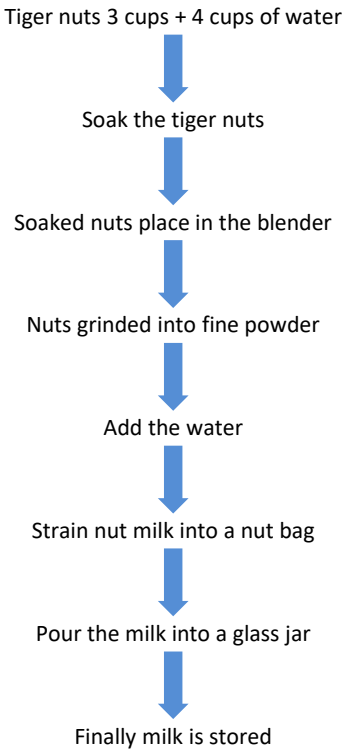
Soaking
If using dried tiger nuts, soak them in water for 12-24 hours at room temperature to soften them.
Fresh tiger nuts can be used directly or soaked briefly for easer blending

Blending-grinding
Drine the soaked nuts and blend them with fresh water in a ratio of 1:2 or 1:3(tiger nuts to water) until a smooth paste is formed.

Filtration
Pour the blended mixture into a muslin cloth or fine sieve.

Bottlixing and storage
Pour the milk in to clean, air tight bottles
Storage in the refrigerator and consume within 3-5 days.

Flow chart



Extraction of proteins from tigernut milk
To determine the protein content in tiger nuts milk we can follow the kjheldal method. This method is one of the most common and reliable method for protein determination.

Materials needed
Sample preparation
Tiger nuts milk sample.

Kjheldal apparatus
Digestion flask.
Distillation apparatus.
Titration setup.

Chemicals
Boric acid solution.
Indicator [methyl red or bromocresol green].

Equipments
Pippete, burette, volumetric flask.

Procedure
Sample digestion
Weigh a known volume of tiger nuts milk (ex,1-2 ml) and transfer into a digestion flask
Add 10 ml of concentrated sulfuric acid
Add a small amount of catalyst mixture of (potassium sulphate and copper sulphate)
Heat the mixture until it turns clear (usually 1-2 hours). This converts organic nitrogen in to ammonium sulphate

Distillation
After digestion, allow the flask to cool and add distilled water to dilute the mixture
Transfer the digested mixture to a distillation apparatus
Add excess sodium hydroxide solution to make the mixture alkaline
Distil the mixture and collect the released ammonia in a flask containing boric acid solution with a few drops of pointer

Titration
Titrate the boric acid ammonia solution with normal hydrochloric acid (HCl)
Until the colour changes record the volume of HCL used.

Calculation of protein content
Calculate the nitrogen content using the volume of acid consumed in the titration

$$Nitrogen\ (\%) = \frac{Volume\ of\ HCL \times normality\ of\ HCL \times 1.4}{Weight\ of\ sample}$$

$$Protein\ (\%) = Nitrogen\ (\%) \times 6.25$$

Extraction of Lipids from Tiger Nut Milk
We can determine the fat content in tiger nuts we can use the GC- MS

Extraction
Extract the fat from tiger nuts milk using a solvent like hexane, or chloroform- methanol.
A simplified method in the Bligh and Dyer or the Floch method for lipid extraction.

Methylation of fatty acids [Fame preparation]
Convert the extracted fats in to fatty acids methyl esters [FAMES] using a reason like boron trifluoride [BF3]-methanol or sodium methane oxide
This step makes the fatty acids volatile and suitable for GC-MS analysis

Reactions
Fatty acids + methanol catalyst FAMEs + water

GC-MS analysis
Inject the fames into the GC-MS instrument.
The gas chromatography [GC] separates the fatty acids based on volatility and boiling points.

The Mass Spectrometer [MS] identifies and quantifies the fatty acids based on their mass-to- charge ratio (m/z).

Extraction of carbohydrates from tiger nut milk
We can determine the sugar content in tiger nuts we can use the Hyper-Performance Liquid Chromatography [HPLC].

Materials required
Fresh or dried tiger nuts
Distilled water
Blender or grinder
Centrifuge or filter paper
HPLC machine with a Refractive Index Detector [RID]
Standard sugar solution [glucose, sucrose, fructose]

Procedure
Sample preparation
Wash, dried, and grind the tiger nuts in to a fine powder
Weigh about 5 gr of powder

Extraction
Add 50 ml of distilled water and heat 70 degree Celsius for 30 min
Centrifuge the mixture and filter the supernatant using a 0.45 um filter

HPLC analysis
Inject 20 µl of the filtered extract into the HPLC system
Use a carbohydrates analysis column with water or acetonitrile: water as the mobile phase
Run the analysis and detect sugars using the RID.

Quantification
Compare the retention times and peak areas with standard sugar solutions.
Calculate the concentration of sugars present in the tiger nuts sample.

Extraction of vitamins from tiger nut milk
terminating the vitamin content in tiger nut milk requires laboratory analysis using specialized techniques. Below is a general procedure to analyse vitamins in tiger nut milk:

Materials and equipment
Preparation of sample
Fresh or processed tiger nut milk
Distilled water
Chemicals, /solvents (e.g., methanol, ethanol, acids)
Centrifuge
Filtration apparatus

Analytical instruments
High-Performance Liquid Chromatography (HPLC) - for water-soluble (B-complex, C) and fat-soluble (A, D, E, K) vitamins.
Spectrophotometer- for quantitative analysis of specific vitamins
Mass Spectrometry (LC-MS/MS) - for precise vitamin profiling
Reagents for vitamin extraction and derivatization

Procedure
Sample preparation
Take a known volume (e.g., 50 mL) of tiger nut milk and homogenize it using a blender.

Protein precipitation (for water-soluble vitamins): Add acids such as 5% trichloroacetic acid (TCA) to the sample to remove proteins.
Centrifuge the mixture at 4000-5000 rpm for 10 minutes.
Collect the supernatant for analysis.

Extraction of vitamins
For water-soluble vitamins (B-complex, C)
Extract using an acidified aqueous solution (e.g., 0.1 M HCl).
Sonicate the sample to enhance extraction.
Filter through a 0.45 µm membrane filter.

For fat-soluble vitamins (A, D, E, K)
Perform liquid-liquid extraction using organic solvents like methanol, ethanol, or hexane.
Saponify the sample with potassium hydroxide (KOH) to release fat-soluble vitamins.
Centrifuge and collect the organic phase.

Analysis using HPLC
Prepare standard solutions of known vitamin concentrations to calibrate the instrument.
Inject the extracted sample into the HPLC system.
Use appropriate detectors: UV-V is detector (for vitamins A, E)
Fluorescence detector (for vitamins B, C)
Reversed-phase C18 column for separation
Analyse the chromatogram to quantify vitamins by comparing retention times and peak areas with standards.

Spectrophotometric analysis (Alternative)
Certain vitamins, like Vitamin C can be quantified using colorimetric methods (e.g., using 2,6-dichlorophenol-indophenol dye).
Measure absorbance at specific wavelengths.

Data interpretation and reporting
Compare results with standard vitamin content to determine concentrations in mg/L or µg/ml.
Conduct statistical analysis to ensure accuracy and precision.

Result and Discussion
Nutritional information of extracted tiger nut milk
Energy value: The above data chasing energy value content of extracted tiger nut milk was (125.24%) kilo cal. The maximum energy stated by the Oyestoro *et al*., (2019) [23].

Carbohydrate content: The Starch content of the extracted tiger nut milk was (20.53%) kilo cal. Conveyed be used in the treatment of pretentiousness, indigestion, diarrhoea and dysentery due to its carbohydrate content (Bixquert-Jimenez *et al*., 2003) [24].

Crude fat content: The crude fat content of the removed tiger nut milk was (8.14%) kilo cal. The highly unsaturated fatty acid content of tiger nut milk, similar to that of olive oil as reported by Sanchez-Zapata *et al*., (2012) [25].

Crude fibre content: The crude fibre content of the mined tiger nut milk was (12.01%) kilo cal. The similar findings to be reported by Sanchez-Zapata *et al*., (2012) [25].

Crude protein content: The crude protein content of the removed tiger nut milk was (3.45%). The high amount of protein in a taster JNJ could be due to high amino acids in both tiger nut milk and dry tiger nuts.
Tiger nut has been conveyed to be a very good spring of some useful minerals including potassium, phosphorous and calcium (Bixquert-Jimenez *et al*., 2003) [24].

Magnesium content: The magnesium content of the removed tiger nut milk was (30mg) also is known to be a rich basis of these minerals (Asante *et al*., 2014) [26].

Zinc content: The zinc content of the extracted tiger nut milk was (1.25mg). The similar findings likewise reported by Temple *et al*., (1989) [27, 29].

Potassium contented: The potassium content of the extracted tiger nut milk was (225mg) and also is known to be a ironic source of these reserves (Asante *et al*., 2014) [28].

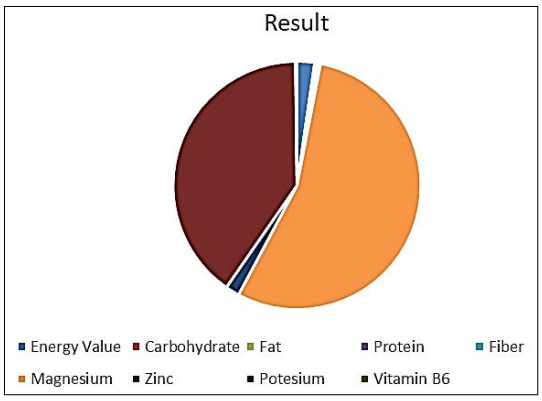
Vitamin B6 content: The Vitamin-B6 content of the extracted tiger nut milk was (0.1mg). The similar findings also reported by Temple *et al*., (1989) [27, 29].

Sensory evaluation
Sensory evaluation of tiger nut milk was considered assessed attributed by its colour, taste, texture, flavour and ph. Overall, it was done by using acceptability panel of trained and semi trained individuals.

Colour: The colour was paled yellow in colour.
Taste: The taste was good sweet and nutty.
Texture: The texture was smooth and solid.

Table 1: The chemical analysis of tiger nut milk.

S. No	Parameter	Result
1.	Energy Value	125.24%
2.	Carbohydrate	20.53%
3.	Fat	8.14%
4.	Protein	3.45%
5.	Fiber	12.01%
6.	Magnesium	30mg
7.	Zinc	1.25mg
8.	Potesium	2.25mg
9.	Vitamin B_6	0.1mg



Graph 1: The chemical analysis of tiger nut milk.

Conclusion
Tiger nut milk presents a promising, nutritious and sustainable alternative to conventional dairy and other plant-based milks. Its rich nutritional profile, including high fibre content and natural sugars, makes it especially suitable for health-conscious consumers and those with lactose intolerance or nut allergies. Furthermore, its potential as a functional food or beverage ingredient offers opportunities for innovation in the food industry. However, further studies on larger-scale production, preservation techniques, and market viability are recommended to optimize its use acceptance in diverse populations.

References

1. Adejuyitan JA, Otunola ET, Akande EA, Bolarinwa IF, Oladokun FM. Some physicochemical properties of flour obtained from fermentation of tiger nut (*Cyperus esculentus*) sourced from a market in Ogbomoso, Nigeria. Afr J Food Sci. 2009;3:51-55.
2. Akoma O, Elekwa UO, Afodunrinbi AT, Onyeukwu GC. Yogurt from coconut and tiger nuts. J Food Technol Afr. 2000;5:132-134.
3. Albalasmeh AA, Berhe AA, Ghezzehei TA. A new method for rapid determination of carbohydrate and total carbon concentrations using UV spectrophotometry. Carbohydr Polym. 2013;97:253-261.
4. Belewu Y. Comparative physical-chemical evaluation of tiger-nut, soybean and coconut milk sources. Int J Agric Biol. 2007;9:785-787.
5. ICRISAT, FAO. The world sorghum and millet economics: facts, trends and outlook. Rome: Food and Agriculture Organization of the United Nations; Patancheru: ICRISAT; 1997.
6. Young CT, Waller GR, Hammons RO. Variations in total amino acid of peanut meal. J Am Oil Chem Soc. 1973;50:521-523.
7. Grosso NR, Guzman CA. Chemical composition of aboriginal peanut (*Arachis hypogaea* L.) seeds from Peru. J Agric Food Chem. 1995;43:102-105.
8. Werner D. Where there is no doctor: a village healthcare handbook for Africa. Rev ed. London: Macmillan Publishers Ltd; 1987. p. 122.
9. Elizabeth K. Immense help from nature workshop. 1st ed. Ikeja (Lagos): Elikaf Health Services Ltd; 1994. p. 145.
10. Abaejoh R, Djomdi I, Ndojouenkeu R. Characteristics of tiger nut (*Cyperus esculentus*) tubers and their performance in the production of a milky drink. J Food Process Preserv. 2006;30:145-163.
11. Adejuyitan JA. Tiger nut processing: its food uses and health benefits. Am J Food Technol. 2011;6(3):197-201.
12. AbdelKader H, Ibrahim F, Ahmed M, El-Ghadban E. Effect of some soil additives and mineral nitrogen fertilizer at different rates on vegetative growth, tuber yield and fixed oil of tiger nut (*Cyperus esculentus* L.) plants. J Plant Prod. 2017;8(1):39-48.
13. Achoribo ES, Ong MT. Tiger nut (*Cyperus esculentus*): source of natural anticancer drug? Brief review of existing literature. Euro Mediterr Biomed J. 2017;12:91-94.
14. Belewu MA, Abodunrin OA. Preparation of Kunnu from unexploited rich food source: Tiger nut (*Cyperus esculentus*). World Journal of Dairy and Food Sciences. 2006;1(1):19-21.
15. Umerie SC, Obi NA, Okafor EO. Isolation and characterization of starch from *Cyperus esculentus* tubers. Bioresource Technology. 1997;62(1-2):63-65.

16. Bamishaiye EI, Bamishaiye OM. Tiger nut: A versatile plant for sustainable food production. Agric Sci Res J. 2011;1(2):45-50.
17. Mohdaly AA. Chemical and nutritional composition of tiger nut (*Cyperus esculentus* L.) and its potential health benefits. Food Sci Nutr. 2019;7(5):1785-1798.
18. Gambo M, Da'u A. Nutritional and medicinal properties of tiger nut (*Cyperus esculentus* L.): A comprehensive review. Health Sci J. 2014;8(2):110-120.
19. Adejuyitan JA. Nutritional and health benefits of tiger nut milk and its potential use as a dairy substitute. Int J Food Sci Technol. 2011;6(3):197-201.
20. Krichène D, *et al*. Antioxidant, anti-inflammatory, and antibacterial properties of tiger nut oil. J Med Plants Res. 2016;10(8):169-176.
21. Dyetoro OF, *et al*. Extraction and nutritional properties of tiger nut milk. Food Sci Res J. 2019;12(4):274-81.
22. Roselló-Soto E, *et al*. Nutritional and functional properties of tiger nut (*Cyperus esculentus* L.) and its oil: A review. Food Res Int. 2019;123:512-521.
23. Oyestoro J, *et al*. Energy value and nutritional composition of tiger nut milk and its potential health benefits. J Nutr Sci. 2019;11(2):134-140.
24. Bixquert-Jimenez M, *et al*. Carbohydrate content and dietary benefits of tiger nut milk. J Food Sci Technol. 2003;39(5):298-303.
25. Sanchez-Zapata E, *et al*. Crude fat content and fatty acid composition of tiger nut oil: A comparison with olive oil. Food Chem. 2012;135(3):1505-1512.
26. Asante F, *et al*. Mineral content analysis of tiger nut milk: A rich source of magnesium, calcium, and potassium. J Agric Food Chem. 2014;62(15):3667-3672.
27. Temple NJ, *et al*. Zinc content and its nutritional significance in tiger nut milk. Nutr Res Rev. 1989;12(1):59-64.
28. Asante F, *et al*. Potassium content in tiger nut milk and its role in human health. J Food Sci Technol. 2014;51(2):452-459.
29. Temple NJ, *et al*. Vitamin B6 content in tiger nut milk and its potential health benefits. J Nutr Metab. 1989;5(1):33-39.
30. Adejuyitan JA. Sensory evaluation of tiger nut milk: A study of taste, texture, and color. J Food Qual. 2011;12(4):47-56.