 e-ISSN No. 2584-1025

Coconut Water as a Functional Beverage: Bring the Nature Closer

Soham Deshpande[1], Nitin Suradkar[2], Soumitra Chaudhary[3], Sudeep Shinde[4]
1,3 & 4. Students, MIT School of Food Technology, MIT Art, Design and Technology University, Pune.
2. Assistant Professor, MIT School of Food Technology, MIT Art, Design and Technology University, Pune.
*Email id: nitin.suradkar@mituniversity.edu.in

Abstract

Coconut water, the clear liquid found inside young coconuts, has garnered attention globally for its refreshing taste and potential health benefits. This review explores the nutritional composition and diverse health-promoting properties of coconut water. Firstly, coconut water is a low-calorie beverage rich in electrolytes, particularly potassium and sodium, making it an effective hydrating option, especially after physical exertion or in hot climates. Its natural sweetness and minimal fat content also render it suitable for individuals seeking weight management solutions. Secondly, the presence of potassium in coconut water plays a pivotal role in supporting heart health by aiding in the regulation of blood pressure levels, thus potentially reducing the risk of cardiovascular diseases. Lauric acid, another component found in coconut water, has demonstrated cardio-protective effects, further enhancing its cardiovascular benefits. Moreover, coconut water's fiber contributes to improved digestion, promoting gastrointestinal health and regularity. It may also alleviate indigestion and mitigate acid reflux symptoms. Studies suggest that coconut water consumption may help prevent the formation of kidney stones by reducing urinary crystal concentration and enhancing hydration. Additionally, its antioxidant properties, attributed to vitamin C and other compounds, confer protection against oxidative stress, potentially lowering the risk of chronic ailments such as cancer and diabetes. Furthermore, coconut water's hydrating properties extend to skin health, fostering a clear complexion and combating dryness and inflammation. Its immune-boosting potential, attributed to vitamins and minerals, including vitamin C, enhances the body's ability to ward off infections and illnesses. Despite its myriad benefits, moderation is crucial, especially for individuals with kidney-related issues or those on low-potassium diets. Overall, coconut water stands as a natural, nutritious beverage offering a spectrum of health advantages, making it a valuable addition to a balanced diet.

Keywords: coconut water, nutritional value, health benefits, hydration, heart health, digestion.

Introduction

Coconut water has gained worldwide recognition due to its high electrolyte content and low-calorie content. More than two out of every five Brazilians and seventy-five percent of Indians say they drink coconut water. It's especially well-liked by Gen Z and Millennial customers throughout Europe. The increased demand from customers for naturally useful and healthier drinks is met by coconut water.[1]

Mature coconuts are a good source of potassium and iron. The white meat inside the shell of a coconut contains about 86% of its calories, which are from fat, mostly

 e-ISSN No. 2584-1025

saturated fat. However, the coconut's water has less than 1% of it. Thus, there are no cholesterol and 99% fat in the pure coconut water. Naturally fat-free and low in food energy (16.7 calories or 70 kJ per 100 g), it has a high potassium and mineral content that makes it a suitable sports drink. Young coconuts are used to extract coconut water, which is an almost transparent, opaque juice or water with a faint almond flavour. It makes a good electrolyte drink since it is naturally low in fat and calories, cholesterol-free, and has the right amounts of calcium, magnesium, potassium, and salt.[1]

It is ingratiating, naturally pleasant, aids in appropriate digestion, naturally clears the pathways leading to the urine, and naturally lubricates our bodily systems. These are just a few of the many health benefits of young, tender coconut water: it is naturally low in natural sugar, low in fat (99% fat free), low in carbohydrates, keeps the body cool and at the right temperature, contains organic compounds with growth-promoting properties, treats malnourishment, effectively treats kidney and urethral stones, is a natural drink for infants experiencing intestinal disturbances, is an excellent oral rehydration medium, is an all-natural isotonic for all ages, naturally diuretic, and because it contains saline and albumen, it's a great beverage for individuals suffering from cholera.[2]

Literature review

Vitamins: Ascorbic acid is present in young, tender coconut water. Ascorbic acid is present in concentrations ranging from 2.2 to 3.7 mg/ml. The ascorbic acid level progressively decreases when the water-surrounded kernel hardens. The B group of vitamins is also present in the coconut water.[3]

Sugars: Fructose and glucose, two naturally occurring sugars, are essential components of young, tender coconut water. Throughout the first several months of maturity, the natural sugar content of the coconut water gradually rises from 1.5% to 5.0–5.5% percent. When the coconut reaches full maturity, this process gradually starts to return to about 2 percent. The sugars that appear as fructose, glucose, and sucrose (reducing and non-reducing sugars), respectively, are in the early stages of development. Reducing sugars disappear as the coconut ages, while sucrose only emerges later and gets more abundant.

Table 1: Nutrients in Mature Coconut Water

Nutrient	Units	Value per 100 grams of edible portion
Proximates		
Water	g	94.99
Energy	kcal	19
Energy	kj	79
Protein	g	0.72
Total lipid (fat)	g	0.20
Ash	g	0.39
Carbohydrate, by difference	g	3.71
Fiber, total dietary	g	1.1
Sugars, total	g	2.61
Minerals		
Calcium, Ca	mg	24
Iron, Fe	mg	0.29
Magnesium Mg	mg	25
Phosphorus, P	mg	20
Potassium, K	mg	250
Sodium, Na	mg	105
Zinc, Zn	mg	0.10
Copper, Cu	mg	0.040
Manganese, Mn	mg	0.142
Selenium, Se	mg	1.0
Vitamins		
Vitamin C, total ascorbic acid	mg	2.4
Thiamin	mg	0.030
Riboflavin	mg	0.057
Niacin	mg	0.080
Pantothenic acid	mg	0.043
Vitamin B-6	mg	0.032
Folate, total	mcg	3

Minerals: A variety of important minerals, including calcium, sodium, potassium, copper, iron, phosphorus, sulphur, and chlorides, are present in young, delicate coconut water. Potassium is one of the

 e-ISSN No. 2584-1025

minerals that makes up more than half of the coconut water's content. The concentration of coconut trees is significantly influenced by the environment in which they are grown. With its high potassium content, young, delicate coconut water is the ideal electrolytic balance for human health. This increases the amount of urine produced, which aids in the body's removal of hazardous waste.

Protein: The protein content of coconut water is negligible. Young coconut water has a greater protein content % of alanine, arginine, cystine, and serene than cow milk. Young coconut water has less of a chance of giving patients shock because it doesn't include any complicated proteins.[4]

Amino Acid Composition of Coconut Water: The following Table 2 shows the percentage of each amino acid of the total protein content [5]

Table 2: Percentage of Each Amino Acid of the Total Protein Content

Amino Acid	% of total Protein
Alanine	2.41
Arginine	10.75
Aspartic acid	3.60
Cystine	0.97 - 1.17
Glutamic acid	9.76 - 14.5
Histidine	1.95 - 2.05
Leucine	1.95 - 4.18
Lysine	1.95 - 4.57
Proline	1.21 - 4.12
Phenylalanine	1.23
Serine	0.59 - 0.91
Tyrosine	2.83 - 3.00

Total soluble sugar (TSS) in coconut water: It was found that MCW had higher levels of TSS, a measure of CW sweetness, than TCW. After two months of full maturity, the kernel of a coconut starts to develop, which is when the TSS value starts to decrease. The soluble ingredients in the coconut water are absorbed by the growing kernel.
As a result, the TSS value of older coconuts decreased, and it was shown that TCWs had significantly higher TSS than MCWs ($P<0.05$).
The starting TSS values of the mature coconut and delicate coconut could be doubled, from 3.9 to 7.9°Brix for the mature coconut and from 6.0 to 12.1°Brix for the tender coconut, respectively, utilising the freeze-concentration method used in this study.

Preservation Methodology [3]

Coconut water treated thermally: Due to its stellar safety record and expanding need for new product development, the food processing industry has grown throughout time. Consumers are expecting high-quality products; thus, researchers and the food industry are investigating alternate processing methods to replace traditional ones. Applying heat to food products in order to pasteurise, cook, or preserve them is known as thermal processing. The characteristics of food, including its safety, flavour, and nutritional value, can all be greatly impacted by thermal processing.

Thermal processing is commonly employed to enhance the product's quality and safety, as well as prolong the shelf life of chemical workers. The concept of thermal processing, which mostly involves in-container food sterilisation, has come a long way since Bigelow and Ball developed the first scientific model for calculating the lowest amount of safety sterilising procedure in 1920. Heat processing is the most widely used method for preventing food spoiling and extending its useful shelf life. The liquid is heated during the thermal processing of CW in order to achieve some objectives, including as pasteurisation, sterilisation, and preservation. This process improves the general calibre of product, increases the CW's shelf life, and gets rid of potentially dangerous bacteria and enzymes. CW is frequently treated

thermally with methods like spray drying, heat treatment, and ultra-high temperature (UHT) treatment. However, thermal processing can also result in modifications to the physicochemical properties of the CW, such as alterations to its flavour, colour, and aroma. For this reason, in order to get the intended outcome without compromising the quality of the product, it's imperative to carefully consider the aims and choose the optimal thermal processing approach.

Conclusion

Coconut water (CW) is a naturally occurring, nutrient-dense beverage derived from coconut palm plants, which are commonly grown in tropical climates. Because of its effectiveness as a cure, coconut water is known as the "water of life" in many parts of the world. In 2021, Indonesia is expected to produce 17.16 million metric tonnes of coconuts, making it the world's largest producer of the fruit. Naturally isotonic, coconut water is named so because it includes electrolytes like potassium and sodium. is a popular beverage all over the world due to its various health benefits and delicious flavour? Due to its high content of essential minerals including calcium, magnesium, and potassium, it is a popular sports beverage among fitness enthusiasts and athletes.[6]

Coconut water has multiple functions as a tropical drink, traditional medicine, microbiological growth medium, and ceremonial gift. Its chemical makeup and physicochemical properties also make it a flexible ingredient for usage in the food sector. Consumer demand is increasing, so it's critical to prepare, distribute, and preserve TCW. Further research is needed on the possible health benefits of CW as well as its use in the food and pharmaceutical industries.

Using heat treatment to pasteurise fresh coconut water at a low temperature. The optimal process temperature was found to be 80 degree C for two minutes, followed by a quick cool down to 30 degree C, which led to a decrease in mesophilic microorganisms, lactic acid bacteria, yeasts, and moulds. There were not many differences found in the physical, chemical, and nutritional characteristics. There was a decrease in its volatile portion but no change in the content of dry matter, soluble solids, sugars, or vitamins. Coconut water that has been pasteurised can be used as fuel. Consume before it becomes too old to be kept at room temperature for more than a month. Sample that is refrigerated could last for almost a year.

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