

NUTSHELL OF REFRESHING AND HEALTH ENHANCING POWER OF COCONUT WATER

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ABSTRACT

In most tropical countries with long coastlines where coconut palms grow in abundance, coconut water has always been used as a refreshing drink and a health enhancer. The people of the Pacific Islands respect the coconut and use all of its parts for food and medicine. It is only recently that this humble natural beverage has started receiving the attention it clearly deserves in North America. Coconut water is the nearly colorless liquid contained within a coconut. Although it used to be referred to as the milk of coconut, or coconut milk, earlier, it is not to be confused with the white milky liquid extracted from coconut meat. In its natural form, coconut water is a light, mildly sweet drink with a very slight nutty taste and astringent feel. It cannot compete with sodas or sports drinks in sweetness, but this pure drink is surprisingly satisfying. Coconut water from fresh, tender coconuts is the best, but it is now available bottled, with or without added sugar and flavors. The best, of course, is the 100% natural, with no added sugar or other preservatives or coloring.

KEYWORDS: Coconut, Coconut milk, Coconut water, Coconut meat, Electrolytes.

Coconut in Hindu Mythology: *The 3 eyes of coconut represent Lord Shiva. The black shell represents Lord Kartikeya, white coconut inside represent Ma Gauri and inside water represent Ma Ganga.* The miracle of

coconut is whenever it falls on ground it never falls on any ones head even a person is standing under coconut tree. Very rarely if it falls on any ones head also it's said that he is going to live long life more than 100 years.



Figure 1: Three eyes of coconut.

Lord Shiva and Ganesha story: One day as a child when Lord Ganesha was playing he was attracted by his father's third eye and he went to touch it. Lord Shiva stopped him and said "I am going to give you a special ball to play and thus coconut came on earth which also has 3 eyes." So coconut is very special to Lord Ganesha and coconut is offered to him. Next, the breaking of coconut symbolizes the breaking of the ego. The coconut represents the human body and before the Lord it is shattered – breaking the 'aham' or ego and symbolically total surrendering and merging with the Brahman –

supreme soul. Coconut is also an important aspect in *Kalasha* or *Poorna Kumba*. Apart from this there is numerous other symbolic meaning to the coconut. Most of them revolve around its appearance like the three eyes on the coconut represent the three eyes of Lord Shiva.

INTRODUCTION

Coconuts grow on large palm trees known scientifically as *Cocos nucifera*. Despite the name, the coconut is a fruit rather than a nut. The coconut palm is a palm tree in the family Arecaceae (palm family). It is a large palm,

growing to 30 m tall. It has leaves that are 4–6 m long. The term coconut refers to the fruit of the coconut palm. The coconut tree is a monocot. There are many coconut palms on the coasts of India, America, South Sadan, and Bangladesh. **Coastal areas of India: Gujarat–1214.7 Km, Andhra Pradesh–973.7 Km, Tamil Nadu–906.9 Km, Maharashtra–652.6 Km, Kerala–569.7 Km, Odisha–476.4 Km, Karnataka–280 Km, Goa (with Daman & Diu)–160.5 Km, West Bengal–157.5Km, Pondicherry–30.6Km.** People of this area use coconut milk in cooking. Women use coconut oil as oil for their hair. The coconut's shell is relatively hard, but can be broken. Because its shell is hard, it can be used as an ingredient to make craftworks. Coconut milk is also used in many drinks. Coconut oil is often in food and soaps. People in Sri Lanka use coconut flowers for wedding celebrations. In the Maldives it is the National tree. The coconut is not actually a nut, but is in fact a drupe. Coconuts grow in tropical countries. The flesh of a

coconut is white and can be eaten raw or used in cooking. It is used in many of the foods we eat for flavor. It is native to tropical areas.^[1]

Coconut water is the clear liquid inside coconuts (which are fruits of the coconut palm). In early development, it serves as a suspension for the endosperm of the coconut during the nuclear phase of development. As growth continues, the endosperm matures into its cellular phase and deposits into the rind of the coconut pulp.

Harvesting: Fresh coconuts are typically harvested from the tree while they are green. A hole may be bored into the coconut to provide access to the liquid and meat. In young coconuts, the liquid and air may be under some pressure and may spray slightly when the inner husk is first penetrated. Coconuts which have fallen to the ground are susceptible to rot and damage from insects or other animals.

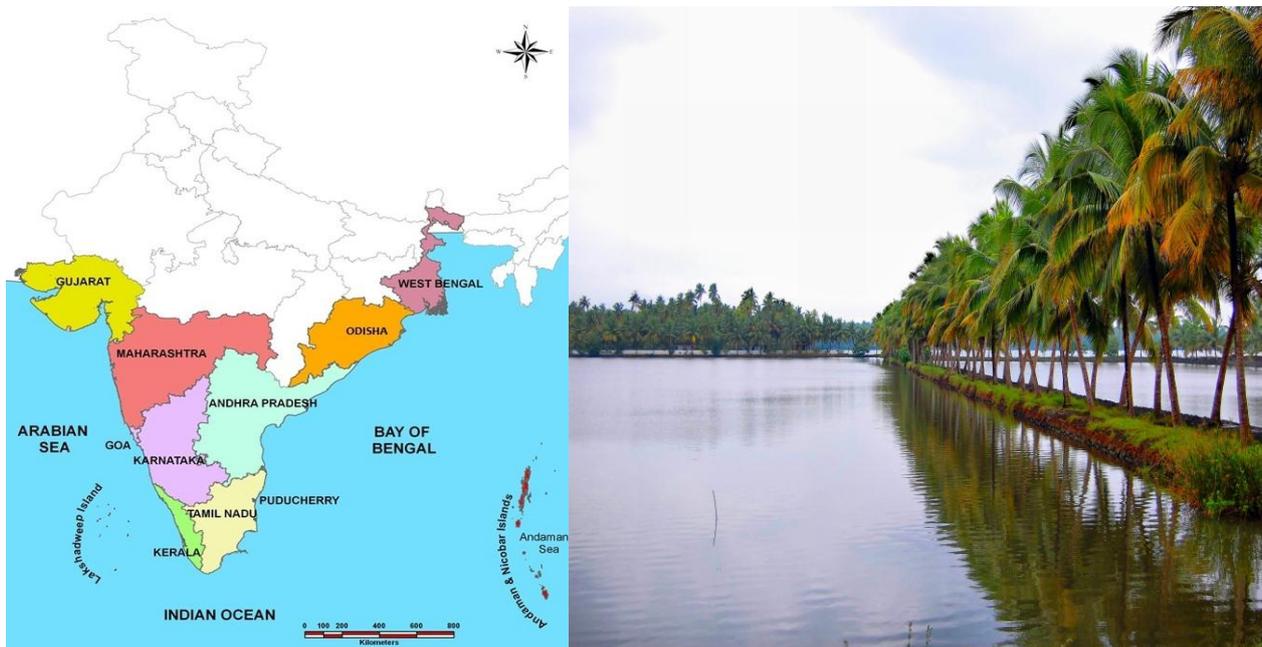


Figure-2: Coastal regions on India.

Medical use: Coconut water has been used rarely as an intravenous rehydration fluid when medical saline was unavailable. The story of coconut water being similar to human blood plasma originated during World War II when British and Japanese patients were given coconut water intravenously in an emergency because saline was unavailable. Since then, this rehydration technique has been used only for short-term emergency situations in remote locations where plasma is not available. Although substituting coconut water for saline is not recommended by physicians today, it was a common practice during the Khmer Rouge regime in Cambodia from 1975 to 1979. The Documentation Center of Cambodia cited the practice of allowing untrained nurses to administer green coconut water during the Pol Pot regime as a crime against humanity.

Folk medicine: Coconut water has been used in the folk medicine practices of Jamaica for such uses as the treatment of diarrhea.

Risks: One presumed factor arising from excessive consumption of coconut water is an over-abundance of potassium in the blood (hyperkalemia), inducing acute kidney failure, heart arrhythmia, loss of consciousness and eventually death. Hyperkalemia and loss of consciousness after the consumption of several liters of coconut water were reported only as a clinical case study in association with one individual's use of a commercial product following physical exertion.

Table-1: Coconut water [Nutritional value per 100 g (3.5 oz)].

Coconut water [Nutritional value per 100 g (3.5 oz)]							
Nutrition	Value	Nutrition	Value	Nutrition	Value	Nutrition	Value
Energy	79 kJ (19 kcal)	Protein	0.72 g	Phenylalanine	0.037 g	Glycine	0.034 g
Carbohydrates	3.71 g	Tryptophan	0.008 g	Tyrosine	0.022 g	Proline	0.030 g
Sugars	2.61 g	Threonine	0.026 g	Valine	0.044 g	Serine	0.037 g
Dietary fiber	1.1 g	Isoleucine	0.028 g	Arginine	0.118 g	Vitamins	(%DV)†Qty
Fat	0.20 g	Leucine	0.053 g	Histidine	0.017 g	Thiamine (B1)	(3%) 0.030 mg
Saturated	0.176 g	Lysine	0.032 g	Alanine	0.037 g	Riboflavin (B2)	(5%) 0.057 mg
Monounsaturated	0.008 g	Methionine	0.013 g	Aspartic acid	0.070 g	Niacin (B3)	(1%) 0.080 mg
Polyunsaturated	0.002 g	Cystine	0.014 g	Glutamic acid	0.165 g	Pantothenic acid (B5)	(1%) 0.043 mg
Vitamin B6	(2%) 0.032 mg	Folate (B9)	(1%) 3 µg	Choline	(0%) 1.1 mg	Vitamin C	(3%) 2.4 mg
Calcium	(2%) 24 mg	Copper	(2%) 0.04 mg	Iron	(2%) 0.29 mg	Magnesium	(7%) 25 mg
Manganese	(7%) 0.142 mg	Phosphorus	(3%) 20 mg	Potassium	(5%) 250 mg	Selenium	(1%) 1 µg
Sodium	(7%) 105 mg	Zinc	(1%) 0.10 mg	Water	95 g		

Human consumption and derivative products:

Coconut water has long been a popular drink in the tropical countries where it is available fresh, canned, or bottled. Coconuts for drinking are served fresh, chilled or packaged in many places. They are often sold by street vendors who cut them open with machetes or similar implements in front of customers. Processed coconut water for retail can be found in ordinary cans, Tetra Packs, or plastic bottles, sometimes with coconut pulp or coconut jelly included. Coconut water can be fermented to produce coconut vinegar. It is also used to make nata de coco, a jelly-like food.

Nutritional value: Providing 19 calories in a 100 ml amount, coconut water is 95% water and 4%

carbohydrates, with protein and total fat content under 1% each. Coconut water contains small amounts of vitamins and dietary minerals, all fewer than 10% of the Daily Value.^[2]

Anecdotal sources describe coconut water is used in India for the senicide of elderly people, a procedure known as thalaikoothal. In this custom, the elderly person is made to drink an excessive amount of coconut water, eventually resulting in fever and death, the exact causes of which have not been determined. In recent years, coconut water has become a very trendy beverage. It is tasty, refreshing and also happens to be very good for you. It is loaded with several important nutrients, including minerals that most people don't get enough of.

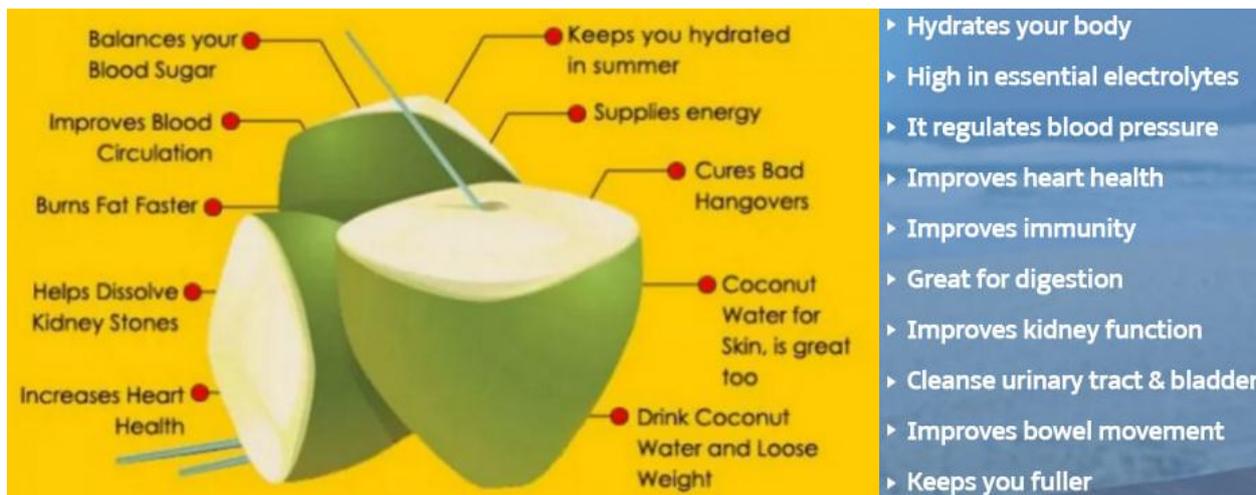


Figure-3: Health benefits of coconut water.

Health benefits of coconut water

1. Good source of several nutrients: Coconut water is the juice found in the center of a young, green coconut. It helps nourish the fruit. As the coconut matures, some of the juice remains in liquid form, while the rest ripens into the solid white flesh known as coconut meat. Coconut water is produced naturally in the fruit and contains 94% water and very little fat. It should not be confused with coconut milk, which is made by adding water to grated coconut meat. It contains about 50% water and is very high in coconut fat. Coconuts take 10–12 months to fully mature. Coconut water typically comes from young coconuts about 6–7 months of age, although it's also found in mature fruit. An average green coconut provides about 0.5-1 cups of coconut water. One cup (240 grams) contains 46 calories, as well as: [RDI=Recommended Daily Intake].

Carbohydrates: 9 grams. **Fiber:** 3 grams. **Protein:** 2 grams. **Vitamin C:** 10% of the RDI. **Magnesium:** 15% of the RDI. **Manganese:** 17% of the RDI. **Potassium:** 17% of the RDI. **Sodium:** 11% of the RDI. **Calcium:** 6% of the RDI.

A 1-cup serving of coconut water has only 46 calories, making it a relatively low-calorie drink that can be

substituted for other sweet beverages. Drinking coconut water in place of a high-calorie drink, like flavored soda, can help you lose weight over time because you'll be consuming fewer calories in total. Unsweetened coconut water can be another great option for people with acid reflux. This beverage is a good source of helpful electrolytes such as potassium (K^+). These electrolytes promote pH balance in the body, which is crucial for controlling acid reflux. According to the traditional wisdom of ancient yoga practitioners, bowel regularity is the foundation of physical health. Food entering the body contains many indigestible and undesirable elements, including toxins. They should be eliminated as soon as possible. Any obstruction in this natural process can result in the accumulation of these toxic substances in the digestive tract. The origin of most diseases can be traced back to our gut. The soluble fiber in coconut water helps regulate bowel movements. In fact, many yogis (practitioners of the traditional health system of yoga) start their day with fresh coconut water.

Benefits: Coconut water is found in young coconuts and is a good source of fiber, vitamin C and several important minerals.



Figure 4: Coconut water drinking.

2. Antioxidant properties: Free radicals are unstable molecules that are produced in the cells during metabolism. Their production increases in response to stress or injury. When there are too many free radicals, the body is said to be in a state of oxidative stress, which can damage cells and increase the risk of disease. Research on animals exposed to toxins has shown that coconut water contains antioxidants, modifying free radicals so they no longer cause harm. One study found that rats with liver damage showed significant improvement in oxidative stress when they were treated with coconut water, compared to rats that received no treatment. In another study, rats were fed a high fructose diet and then treated with coconut water. Free radical activity decreased, as well as blood pressure, triglycerides and insulin levels. So far, no studies have investigated this antioxidant activity in humans.^[3]

Benefits: Coconut water contains antioxidants that protect cells from damaging free radicals.

3. Antidiabetic properties: Research has shown that coconut water can lower blood sugar levels and improve other health markers in diabetic animals. In one study, diabetic rats treated with coconut water maintained better blood sugar levels than other diabetic rats. The same study also found that the rats had lower levels of HbA1c, a measure of long-term blood sugar control. Another study found that providing the water to rats with diabetes led to improvements in blood sugar levels and reductions in markers of oxidative stress, including malondialdehyde (MDA). However, controlled studies need to confirm these effects in humans. Nevertheless, with three grams of fiber and a digestible carb content of only six grams per cup, coconut water can easily fit into a diabetic meal plan. In addition, it is a good source of magnesium, which has been shown to improve insulin sensitivity and decrease blood sugar levels in people with type 2 diabetes and pre-diabetes. It is an awesome electrolyte replenishment drink, but it's not just great for people with diarrhea or those who sweat.

Benefits: Studies on diabetic animals suggest that it may improve blood sugar control. It's also a good source of magnesium, which may increase insulin sensitivity and reduce blood sugar levels.

4. Prevent kidney stones: Drinking enough fluids is important for kidney stone prevention. Although plain water is a great choice, one study suggests that coconut water may be even better. Kidney stones form when calcium oxalate and other compounds combine to form crystals in the urine. These can then form stones. However, some people are more susceptible to developing these stones than others. In a study on rats with kidney stones, coconut water was found to keep crystals from sticking to the kidneys and other parts of the urinary tract. It also reduced the number of crystals formed in the urine. The researchers believe that it helped reduce free radical production that occurred in

response to high oxalate levels in urine. However, this is the first study that has investigated coconut water's effects on kidney stones and more research is needed in this area. Most diets are high in sodium and low in potassium. Sodium puts a lot of stress on the kidneys because it promotes fluid retention. When sodium is high, kidneys have to work harder to eliminate excess water. On the other hand, potassium acts as a diuretic, helping the kidneys flush out water. A single cup of coconut water can provide enough potassium to keep the kidneys in good health. Its diuretic effect is beneficial in preventing kidney stones. The arginine in coconut water increases blood circulation to all organs including kidneys.

Benefits: Early animal research suggests that water from coconuts may potentially prevent kidney stones by reducing crystal and stone formation.^[4]

5. Support heart health: Drinking coconut water may be helpful to reduce heart disease risk. In one study, rats that consumed coconut water had reductions in blood cholesterol and triglycerides. They also experienced significant decreases in liver fat. The same researchers conducted another study in which rats were fed a similar diet and treated with the same dosage (4 ml/100 g of body weight) of coconut water. After 45 days, the coconut water group had a reduction in cholesterol and triglyceride levels that rivaled the effects of a statin drug used to lower cholesterol. However, it's important to note that this was a very large dose. In human terms, it would be equivalent to a 150 lb (68 kg) person consuming 91 oz (2.7 liters) of coconut water per day. Nevertheless, the finding that it reduced cholesterol as effectively as a statin drug is very impressive and should be further investigated. Unlike coconut milk, coconut water is naturally low in sugar, sodium and fat and high in potassium, magnesium and calcium. A study published in Fall 2006 in the "Journal of Medicinal Food" indicates that coconut water lowers total cholesterol and "bad" LDL cholesterol, while raising "good" HDL cholesterol. Coconut water is an excellent general health tonic. It is treated as such in countries where it is available locally. Young children suffering malnutrition, pregnant and lactating mothers who require extra nutritional inputs, elderly people and convalescents who cannot derive sufficient nutrition from food, all benefit from coconut water. It is not just because it contains minerals, B-complex vitamins, amino acids, cytokines and many other beneficial phytochemicals. The bioavailability of all these substances makes this natural health drink far better than any other health drink formula around. Even if you don't have a specific condition, you should consider adding pure coconut water to your daily diet for improved overall health and energy. It is truly a gift from nature that should be respected.

Benefits: Animal studies suggest that coconut water may have powerful cholesterol-lowering properties.



Figure 5: Coconut water vendor.

6. Reduce blood pressure: It may be also be a great beverage for keeping blood pressure under control. One small study gave coconut water to people with high blood pressure. 71% experienced significant improvements to systolic blood pressure, which is the higher number of a blood pressure reading. Additionally, it contains an impressive 600 mg of potassium in 8 oz (240 ml). Potassium has been shown to lower blood pressure in people with high or normal blood pressure. What's more, one animal study found that coconut water has anti-thrombotic activity, which means it should help prevent the formation of blood clots.

Benefits: Coconut water may help lower blood pressure and potentially decrease the risk of blood clots forming in the arteries.

7. Beneficial after prolonged exercise: Coconut water may be the perfect beverage for restoring hydration and replenishing electrolytes lost during exercise. Electrolytes are minerals that play several important roles in the body, including maintaining proper fluid balance. They include potassium (K^+), magnesium (Mg^{++}), sodium (Na^+) and calcium (Ca^{++}). Two studies found that coconut water restored hydration after exercise better than water and equal to high-electrolyte sports beverages. The participants also said it caused less nausea and stomach discomfort. However, another study comparing high-electrolyte beverages found that coconut water tended to cause the most bloating and stomach upset.

Benefits: Coconut water is effective at replenishing fluids and electrolytes after exercise. It is comparable to other sports beverages.

8. Delicious source of hydration: Coconut water is slightly sweet with a subtle, nutty flavor. It's also fairly low in calories and carbohydrates. The water is extra fresh when it comes directly from the coconut. Simply press a straw into the soft part of a green coconut and start drinking. Store the coconut in the refrigerator and consume it within two to three weeks of purchase. You

can also buy bottled coconut water at most grocery stores. Some bottled brands contain added sugar or flavoring agents. It can be used in smoothies, chia seed pudding, vinaigrette dressing or substituted for plain water whenever you want a bit of natural sweetness. If you have a dry and dull skin, a splash of coconut water or a gentle dab of it can rehydrate your skin instantly. Besides this, coconut water is a fantastic hydrating alternative to water. Drinking it can cure dehydration, thereby keeping your skin soft and supple. And if you drink large amounts of coconut water to get enough sodium, you'll soon realize that coconut water does have a laxative effect," it said. "But as a refreshing occasional drink, coconut water is fine." Similarly, coconut is believed to control sugar craving and help burn fat. Electrolytes are essential minerals and mineral salts that regulate muscle and nerve function in our body. Blood pressure and blood pH are also regulated by electrolytes. Sodium (Na^+), Potassium (K^+), Magnesium (Mg^{++}), Calcium (Ca^{++}), Chloride (Cl^-), Phosphate (HPO_4^-) and Bicarbonate (HCO_3^-) are the seven major electrolytes in the body. The positive and negative charges carried by these ions are responsible for the electrical activity within muscle fibers and nerve cells. The body gets these important substances from food and employs different mechanisms to maintain them at optimum levels. But excessive sweating, bleeding and loss of bodily fluids from the gastrointestinal tract can cause imbalances and deficiencies, throwing the normal functions like heartbeat and muscle contraction out of gear. For example, deficiency of potassium and magnesium affects muscle contraction and causes muscle cramps. This is why high potassium foods like bananas are recommended after bouts of exercise and sports practice. A cup of coconut water not only has more than 600 mg of potassium, which is one and a half times of what you get from a banana, but has over 250 mg sodium, about 60 mg magnesium, 58 mg calcium and 48 mg phosphorus. So whenever there's a possibility of developing electrolyte imbalance, coconut water is what you can turn to for a quick fill up.^[5]

Benefits: Coconut water can be consumed directly from green coconuts or in bottles. Avoid brands with added sugar, sweeteners or flavors.



Figure 6: Coconut water & Coconut tree.

9. Helps to do weight loss: The weight loss claim of coconut water is under the radar, not because of any doubt regarding its efficacy, but because of apprehensions about how it is achieved. To state it more clearly, some people think that coconut water consumption leads to weight loss by causing diarrhea. It is highly probable that one would get loose/frequent motions if coconut water, or almost any food for that matter, is taken in excess. It just an example of how “too much of a good thing can be bad” for you. When it comes to weight loss diet, people tend to overdo it. Coconut water is a low-calorie thirst quencher that is both highly filling and satiating. Merely replacing your regular high-sugar drinks with coconut water makes it a valuable weight loss tool. Coconut water contains fiber that keeps you feeling full for longer periods. If you have a glass of it half an hour before a meal, you will eat less. The diuretic and anti-inflammatory properties of coconut water also may be responsible since they both reduce water retention and bloating.

10. Coconut water is super healthy: Coconut water is a delicious, nutritious and natural beverage that is extremely good for you. While coconut water is low in calories, rich in potassium and fat and cholesterol free, the evidence that it is actually better than plain water for simple hydration is unfortunately lacking. Compared to typical sports drinks, coconut water has fewer calories, less sodium, but higher amounts of potassium. An upset stomach is often thought to result from indigestion, but it can be caused by any number of things, including mild gastrointestinal infections and food allergies. Whatever the reason for the upset stomach, the lining of the stomach is inflamed and this can cause common symptoms such as nausea, bloating, uneasy feeling and loss of appetite. Coconut water works in a variety of ways to soothe the stomach lining. An inflamed stomach lining cannot absorb even water and sugars from food. It is often accompanied by loss of essential minerals such as sodium, potassium, calcium and magnesium. Coconut

water contains tannins, which are known to reduce inflammation. ‘Brat,’ (which stands for banana, rice, applesauce and toast) has been a traditional remedy for upset stomach. Coconut water can take its place as it contains more potassium than bananas. It also provides other minerals, vitamins and some natural sugar in an absorbable form. Coconut water can even handle mild infections. It contains lauric acid which is abundant in human breast milk. The body converts lauric acid into monolaurin, a compound with proven antimicrobial properties. If a stomach problem is the result of bacterial or protozoan infections or stomach flu, frequent drinks of coconut water can help. The tannins in the water also have antibacterial properties.^[6]

CONCLUSION

Coconuts are not nuts; they are the fruit of a tall palm *Cocos nucifera* with large, spreading fronds. The actual edible part is the seed kernel inside the fibrous fruit. What is unique about this seed is the large quantity of edible liquid contained within the kernel. What’s more: it is hermetically sealed in several protective layers that keep moisture, mold and bacteria from contaminating this nature’s bounty. The people of Hawaii call it “neolani” for good reason. It literally translates to “dew from the heavens.” The tops of fresh tender coconuts are usually cut open with a sharp machete to access the goodness inside, which includes both the water and the jelly-like meat. But did you know that there’s another way to get the coconut water? When a machete is not available, native islanders remove the outer husk by hitting the coconut on a rock to loosen it off the inner shell. This hard shell of the coconut has three eyes and the largest among them is softer than the others. You can actually poke a hole in this eye with a stick and then upturn the shell over your mouth or insert a straw to suck up the water. It looks like nature designed this soft eye specifically for accommodating a drinking straw. Actually, it is to help the baby plant come out easily when a mature coconut sprouts. When you drink coconut water directly from a freshly cut coconut it is as clean

and pure a drink as you can get. It does not contain any artificial preservatives, nor does it need any additives to make it palatable. It is a far cry from the sodas and juices your palate is familiar with, but most people who get to taste fresh coconut water fall in love with it. Although mild in taste, it satisfies thirst and refreshes the body.

Coconut water has the ability to rehydrate you very quickly because it is readily absorbed into the body. In fact, coconut water is recognized as more hydrating than pure water. Coconut water is identical to human blood plasma and was used for transfusions during World War II. In places with hot and humid climates where coconut trees naturally grow, people get dehydrated very often due to heavy sweating. Locals and tourists alike find that coconut water is more hydrating than plain water or fruit juices (which are loaded with sugar and artificial ingredients). In addition, the mineral salts naturally occurring in coconut water speed up the absorption of water through the gut wall. People who have lost a lot of blood are given coconut water, so are those who are dehydrated because of frequent vomiting and diarrhea. Coconut water is usually well-tolerated by people who suffer from nausea and aversion to food due to metallic taste in the mouth. It is often given to women who cannot keep down any food during the first trimester of pregnancy. It is also common for those who undertake severe fasting for extended periods to break it with a drink of coconut water.

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