CARICOM REGIONAL STANDARD

PACKAGED NATURAL COCONUT WATER — SPECIFICATION

DCRS 3: 201X

CARICOM Regional Organisation for Standards and Quality (CROSQ)
2nd Floor, Baobab Towers
Warrens, St Michael
Barbados
Telephone: 246-622-7677
Fax: 246-622-6778
Email: crosq.caricom@crosq.org
Website: http://www.crosq.org

ISBN XXXX-XXXX-XXX
ICS xx.xxxx

AMENDMENTS ISSUED SINCE PUBLICATION

AMENDMENT NO.	DATE OF ISSUE	TYPE OF AMENDMENT	NO. OF TEXT AFFECTED	TEXT OF AMENDMENT

ATTACHMENT PAGE FOR CRS AMENDMENT SHEETS

Committee representation

This CARICOM Regional Standard was developed under the supervision of the Regional Technical Sub-Committee (RTSC 1) for Coconut Water, hosted by the CARICOM Member State, Jamaica which at the time comprised the following members:

Members	Representing
Dr Andre Gordon **(Consultant)**	Technological Solutions Limited (TSL)
Mr Adrian Reid	CocoLife Coconut Fusions
Mr Casman Samuel	Little Nut Farm Coconut Water" – Kalinago Foods
Mrs Cheryl Lewis	Barbados National Standards Institute
Mr Donald Hinds **(Chairman)**	Independent
Ms Euleen Alleyne	Administrative Secretary, CROSQ
Mr Ezra Ledger	St. Vincent and the Grenadines Bureau of Standards
Mrs Jennifer Bullock	St. Vincent and the Grenadines Bureau of Standards
Ms Kellye-Jean Barnaby	Barnhill Organics
Mr Kenny Daniel	Saint Lucia National Coconut Stakeholders Forum
Dr Linroy Christian	Department of Analytical Services, Antigua & Barbuda
Mr Lloyd Pascal	Dominica Export Import Agency
Mr Marnus Cherry	Saint Lucia
Ms Phillipa A. O'Connor **(Technical Secretary)**	Bureau of Standards Jamaica (BSJ)
Mr Raymond Trotz	National Stakeholders Platform for Coconuts Guyana
Mr Reinier Taus	Surinaams Standaarden Bureau (SSB)
Mr Tanwir Hassankhan	Surinaams Standaarden Bureau (SSB)
Mrs Tiffany Hedge-Ross	Jamaica Agricultural Commodities Regulatory Authority (JACRA)
Ms Toni-Moy Stewart	Scientific Research Council (SRC)
Dr Wendy Thomas	Technological Solutions Limited (TSL)
Ms Wendy-Ann Ramrattan	Chemistry Food and Drug Division, Ministry of Health
Mr Xanthe Dubuison	Saint Lucia Bureau of Standards

Contents

Page

(This page was intentionally left blank)

Foreword

This CARICOM Regional Standard has been developed under the authority of the CARICOM Regional Organisation for Standards and Quality (CROSQ). It was approved as a CARICOM Regional Standard by the CARICOM Council for Trade and Economic Development (COTED) at its xx th Meeting in MM YYYY.

This standard is intended to outline the specifications for packaged natural coconut water offered for sale in CARICOM Member States. It was necessary to develop this standard so as to streamline the industry and clearly differentiate the product of undiluted natural coconut water. This document must be read in conjunction with the CARICOM Regional Code of Practice, CRCP 2, Code of hygienic practice for packaged natural coconut water.

In formulating this standard considerable assistance was derived from the following:

CODEX Alimentarius Commission
CODE OF HYGIENIC PRACTICE FOR DESICCATED COCONUT (CAC/RCP 4-1971)

Jamaican National Standard
JS 300:2005, *Specification for packaged natural coconut water;*

JS 36: 1991, *Specification for Processed foods: General requirements*

Food & Agricultural Organization of the United Nations,
2007 - Rosa Rolle, Good practice for the small-scale production of bottled coconut water;

Jackson JC, Gordon A, Wizzard G, McCook K and Rolle R,
Changes in chemical composition of coconut (Cocos nucifera) water during maturation of the fruit, Journal of the Science of Food and Agriculture 84: 1049-1052, 2004;

Gordon, A and Jackson, J,
2017. Case study: application of appropriate technologies to improve the quality and safety of coconut water. In: Gordon, A. (Ed.), Food Safety and Quality Systems in Developing Countries: Volume Two: Case Studies of Effective Implementation. Academic Press, London, UK, pp. 185–215.

United States Department of Agriculture
National Nutrient Database for Standard Reference for Nuts, Coconut Water (liquid from coconuts, Release 20, 2007;

Caribbean Food & Nutrition Institute/Pan American Health Organization,
Food Composition Tables for use in the English-speaking Caribbean 2nd Edition, 1998.

PHILIPPINE NATIONAL STANDARD PNS/BAFPS
2016 Draft Code of Hygienic Practice for Chilled Young Coconut water/drink

PNS/BAFPS 28:2006 Chilled young coconut water/drink – Specification

European Fruit Juice Association
6.27 Reference Guideline for Coconut Water/Juice – PROVISIONAL (Published May 2017)

1 Scope

This standard applies to packaged natural coconut water, as defined in clause 3, which is offered for sale and consumption. It only applies to coconut water which has been packaged in its natural state without the use of additives.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CARICOM Regional Organisation for Standards and Quality
CRCP 2, *Code of hygienic practice for packaged natural coconut water*

CRS 5, *Labelling standard for pre-packaged foods*

CRCP 5, *General principles of food hygiene*

CODEX Alimentarius Commission
Pesticide residues in food - Maximum residue limits

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
additive
substance, natural or artificial, added to the product to enhance its quality or preservation

3.2
contaminant
physical, chemical and biological matter which is not naturally found in the product

3.3
natural coconut water
undiluted, natural, untreated, unsweetened liquid endosperm contained within the white fruit flesh of the nut (Cocos nucifera) and which is not expressed but is obtained from sound fruit by manual or mechanical processes without the use of additives or additional water.

3.4
normal colour
hazy to clear

3.5
packaged natural coconut water
natural coconut water filled into sealed containers of various compositions, forms and capacities

3.6
solid endosperm
white tissue fruit / flesh of the coconut

3.7
technical regulation
government document that lays down product characteristics or their related processes and production methods, including the applicable administrative provisions, with which compliance is mandatory.

3.8
standard
document approved through consensus by a recognized (standardization) body, that provides, for repeated and common use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is not mandatory.

3.9
standardization body
organization whose primary activities are developing, coordinating, promulgating, revising, amending, reissuing, interpreting, or otherwise producing technical standards.

4 Specifications

4.1 Physico-chemical properties

Packaged natural coconut water shall be in conformity with the physiochemical quality specifications outlined in Table 1.

Table 1 — Physico-chemical properties

	Limits Min - Max
pH[A]	5.0-5.9
Brix[B]	3.8 – 7.5
[A] The pH of coconut water may fall below 5.0 (to as low as 4.6) and still be natural and unadulterated. However, research (Gordon and Jackson, 2017) shows that it would be spoilt and so should not be allowed to be sold. The AIJN/EU allows a maximum pH of 5.9, even though this is in the range where pinking of the coconut water can occur. [B] Adjusted to give a wider range than previously allowed and based on the Philippines Standard for Chilled Young (6-9 months) Coconut Water. Note that for coconut water destined for the EU, the minimum Brix allowed is 4.5.	

4.2 Microbiological standards

Packaged natural coconut water shall be in conformity with the microbiological quality specifications outlined in Table 2.

Table 2 — Microbiological standards for packaged natural coconut water

Parameter	Limits CFU/ml
Total Aerobic Plate Count	$< 1 \times 10^4$
Total Coliform Count	<1.0 x 10
E. coli	Absent

Yeast & Mould Count	<250
Staphylococcus aureus	Absent
Salmonella	Absent
Listeria	Absent

4.3 Organoleptic requirements

The end product shall have the normal colour, flavour and odour characteristics of the natural coconut water.

4.4 Defective product

Packaged natural coconut water that fails to meet one or more of the applicable quality requirements, as outlined in 4.1 to 4.3 shall be considered as defective.

4.5 Standard requirements

The packaged natural coconut water shall have all the requirements outlined above in order to be considered safe and used for commercial activities.

NOTE There are additional parameters that make packaged natural coconut water of high quality. These are voluntary. See Annex B (Table B1).

5 Quality control

Quality control shall be performed as set out in CRCP 2 and, for mandatory criteria in Section 4.4 and Section 7, in accordance with Annex A.

6 Food additives

No natural or artificial substance or ingredient shall be added to the coconut water to enhance its quality or preservation. Chemicals present in the product should only be those which are there as a result of the natural development of the fruit while on the tree.

7 Contaminants

Packaged natural coconut water shall:

a) be free from adulterants and extraneous matter;

b) the heavy metals shall be as per table 3 below;

c) comply with the maximum pesticide residue limits established by the Codex Alimentarius Commission for similar products, as outlined in CODEX Alimentarius Commission Pesticide residues in food - maximum residue limits; and

d) comply with the maximum residue limits established by the CODEX Alimentarius Commission for other agents used in the growing process.

Table 3 — Heavy metals limits for packaged natural coconut water

Heavy metals	Limits
Arsenic	0.05 mg/kg
Cadmium	0.05 mg/kg
Lead	0.03 mg/kg
Mercury[C]	0.01 mg/kg
[C] From 6.27 Reference Guideline for Coconut Water/Juice – PROVISIONAL (Published May 2017), AIJN European Fruit Juice Association	

8 Hygiene

8.1 All steps in the packaging of natural coconut water shall be performed without unnecessary delay and under conditions which shall prevent the possibility of contamination, deterioration or the increase of pathogenic and spoilage micro-organisms.

8.2 Products covered by the provisions of this standard shall be prepared and handled in accordance with the appropriate sections of CRCP 2 and CRCP 5.

9 Labelling

9.1 The labelling of packaged natural coconut water shall be in accordance with CRS 5. In addition, the following specific provisions apply:

a) the name of the product shall be 'Packaged Natural Coconut Water';

b) the label shall include the statement 'Keep refrigerated';

c) where product is frozen the best before date is from the date of thawing . Where product is refrigerated the best before date is from date of manufacturing.

d) Where products are frozen a manufacturing date must be included

9.2 Where the product meets the requirements of Table B.1 of Annex B, it may be labelled high quality.

Annex A
(normative)

Product testing and sampling protocol

A.1 Product Testing

The food safety parameters should be confirmed by product testing by accredited laboratories. The table below with recommended microbiological testing methods provides a guide to assist in method selection.

Table A.1 — Product Testing

Parameter	Recommended Method	Alternate Method
Total Aerobic Plate Count (TAPC)	Salfinger and Tortorello (2015). 8.71 and 8.72 Mesophilic Aerobic Plate count, *Compendium of Methods for the Microbiological Examinations of Foods* (5th edition), page 98. Washington, D.C: APHA Press.	3M Rapid Petrifilm Aerobic Plate Count Method
Total coliform	AOAC Official Method 991.14 Coliform & E. coli in foods.	3M Rapid Petrifilm Coliform Count
Staphylococcus aureus	BAM 12.0	Neogen Rapid Method (24 hrs)
E. coli	Direct count methods and 3M Petrifilm	
Yeast and Mould	AOAC Official Method 997.02 Yeast & Moulds count in foods.	3M Rapid Petrifilm Yeast & Mould Count (normally 3 days) or Standard Method (5+ days)
Staphylococcus aureus	3M Rapid Petrifilm *Staphylococcus aureus* Plate Count (AOAC Method 2001.05)	Equivalent Standard Method
Salmonella	BAM 5.0 and 5.1	Neogen Rapid Method (24 hrs)
*Listeria**	Neogen Rapid Detection system	30 hours

A.2 Sampling Protocol

The sampling exercise is a critical activity, both for quality control and regulatory purposes, and shall follow the guidelines below to govern the process:

Samples for microbiological tests shall be:

- Taken in a manner to avoid contamination

- Taken by trained persons (factory and/or regulatory personnel)

- Representative samples (10 or more) must be taken from each batch and composited, with duplicate sub-samples of appropriate volume being taken from the composite for analyses. Samples to be composited may be taken from packages of different sizes as long as the product contained in the packaging material is from the same batch of natural coconut water being assayed.

- Samples must be transported to the laboratory or for shipment to same at refrigeration temperatures (<4.0°C)

- Refrigerated samples must be tested within 24 hours of being taken

- If transporting chilled samples is not possible due to distance and lack of appropriate containers, then samples should be frozen within 24 hours of manufacture and transported frozen. Frozen samples should be thawed in a refrigerator and once thawed should be tested as soon as possible and not greater than 24 hours after thawing. The process of thawing should not exceed 24 hours.

- Frozen samples which thaw during transit should be discarded or, if tested, the laboratory must be informed that the sample integrity might be compromised due to inadvertent thawing.

- For larger shipments being sampled for regulatory action, the sampling should be carried out in a manner that ensures that it represents the lot/batch. The development of statistically sound sampling plans should be developed.

- When samples are to be transported across borders, then arrangements should be made with the relevant Customs Authorities to reduce the time taken to clear the shipment.

Annex B
(informative)

Additional Quality Guidelines for Packaged Natural Coconut Water

Table B.1 — Quality guidelines[1)]

	Range g/100 mL
Titratable Acidity % (vol/vol)	0.02 – 0.09
Total Fat	0.02 – 0.2
Potassium Content	>1,400ppm

D) Data derived from “6.27 Reference Guideline for Coconut Water/Juice – PROVISIONAL (Published May 2017), AIJN European Fruit Juice Association” and the Philippine National Standard PNS/BAFPS 28:2006 Chilled young coconut water/drink – Specification