

DRAFT SAINT LUCIA NATIONAL STANDARD

DNS 25

COCONUT OIL — SPECIFICATION (CRS 23: 2017, MOD)

Stage 40 – Enquiry stage

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Saint Lucia Bureau of Standards, (2017)

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THIS IS A MODIFICATION OF CARICOM REGIONAL STANDARD, CRS 23, 2017

GENERAL STATEMENT

The Saint Lucia Bureau of Standards was established under the Standards Act (No. 14 of 1990) and started operations on 01 April 1991. A broad-based 15-member Standards Council directs the affairs of the Bureau.

The Standards Act gives the Bureau the responsibility to develop and promote standards and codes of practice for products and services for the protection of the health and safety of consumers and the environment as well as for industrial development in order to promote the enhancement of the economy of Saint Lucia. The Bureau develops standards through consultations with relevant interest groups. In accordance with the provisions of the Standards Act, public comment is invited on all draft standards before they are declared as Saint Lucia National Standards.

The Bureau also administers the Metrology Act No. 17 of 2000. This legislation gives the Bureau the responsibility to regulate all weights and measures and to manage and co-ordinate the metrication of Saint Lucia.

The Bureau operates a Product Certification Scheme applicable to all products for which national standards exist. If a product satisfies all the requirements for certification, a licence to carry the Saint Lucia Standard Mark is issued to the manufacturer of the product. The presence of the mark on a product indicates that the product conforms to all the requirements of a specific national standard and assures consistent quality (of the product) to the consumer.

The Bureau is a member body of the International Organisation for Standardisation (ISO), an affiliate member of the International Electrochemical Commission (IEC) and a member of the CARICOM Regional Organisation for Standards and Quality (CROSQ) and the Pan American Standards Commission (COPANT). The Bureau is the local agent for several foreign standards bodies such as the British Standards Institution (BSI) and the ASTM International (formerly known as the American Society for Testing and Materials). The Bureau serves as the enquiry point for the World Trade Organisation (WTO) on matters pertaining to the Technical Barriers to Trade (TBT) Agreement. The Bureau also serves as the National CODEX Alimentarius enquiry point with responsibility for coordinating national positions on CODEX matters.

In accordance with good practice for the adoption and application of standards, Saint Lucia National Standards are subject to review every five years. Suggestions for improvements are always welcomed at any time after publication of the standard.

COCONUT OIL — SPECIFICATION (CRS 23: 2017, IDT)***AMENDMENTS ISSUED SINCE LAST PUBLICATION***

Amendment No.	Date of Issue	Type of Amendment	Text(s) Affected

DRAFT FOR PUBLIC COMMENT

ATTACHMENT PAGE FOR SLBS AMENDMENT SHEET

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COCONUT OIL — SPECIFICATION (CRS 23: 2017, IDT)

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The following persons comprised the Technical Committee which was responsible for the overseeing the adoption:

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Saint Lucia Bureau of Standards

DRAFT SAINT LUCIA NATIONAL STANDARD

DNS 25

COCONIT OIL — SPECIFICATION (CRS 23: 2017, IDT)

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Representing

Back to Roots

General Interest

Inter-American Institute for Cooperation
on Agriculture

Natmed Limited/ Caribbean Blue
Naturals

Coconut Factory limited

Frootsy Foods Limited

Saint Lucia Manufactures Association

Ministry of Commerce, Industry,
Enterprise Development and Consumer
Affairs

Saint Lucia Bureau of Standards

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Foreword

This national standard is a modification of CRS 23: 2017 Coconut oil - Specification. This standard represents a revision of national standard SLNS 25: 1992 Specification for coconut oil. This second edition was adopted by the national standards council on...

This new edition contains international recognised tests methods for parameters of coconut oil. New requirements for fatty acid composition and antioxidants have been included. This new edition represents requirements for current technological advancements and manufacturing practices.

This standard is intended to provide requirements for crude and refined coconut oil which is compatible with a system of quality assurance. It also provides uniform level of acceptance for quality for the different types of coconut oil manufactured and traded in Saint Lucia.

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

- a) American Oil Chemists' Society
Official and Tentative Methods of the American Oil Chemists' Society;
- b) Association of official Analytical Chemists (AOAC)
Official Methods of Analysis — Food Composition, Additives, Natural Contaminants, 15th Edition, 1990; Volume Two;
- c) International Standardization Organisation
ISO 5555: 2002 Animal and Vegetable Fats and Oils –Sampling
- d) CODEX Alimentarius Commission
Standard for Names Vegetable Oils, (CODEX STAN 210-199), Revised 2009, Amendment 2015);

General Standard for Contaminants and Toxins in Food and Feed (CODEX STAN 193-1995) Revised 2009, Amendment 2015).
- e) Standards and Industrial Research Institute of Malaysia
MS 239: 1987 Specification for Coconut Oil;
- f) Asian and Pacific Coconut Community
APCC Quality Standard for Virgin Coconut Oil, 2009.

Modifications have been made to the CARICOM Regional Standard to include references to Saint Lucian National Standards where they exist. Where reference is made to the CARICOM region it implies Saint Lucia.

1 Scope

This standard specifies the requirements, methods of sampling and testing for coconut oil intended for domestic and commercial use.

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.

International Organization for Standardization

- ISO 660, *Animal and vegetable fats and oils — Determination of acid value and acidity*
- ISO 661, *Animal and vegetable fats and oils — Preparation of test sample*
- ISO 662, *Animal and vegetable fats and oils — Determination of moisture and volatile matter content*
- ISO 663, *Animal and vegetable fats and oils — Determination of insoluble impurities content*
- ISO 3596, *Animal and vegetable fats and oils — Determination of unsaponifiable matter — Method using diethyl ether extraction*
- ISO 3657, *Animal and vegetable fats and oils — Determination of saponification value*
- ISO 3960, *Animal and vegetable fats and oils — Determination of peroxide value — Iodometric (visual) endpoint determination*
- ISO 3961, *Animal and vegetable fats and oils — Determination of iodine value*
- ISO 5555, *Animal and Vegetable Fats and Oils — Sampling*
- ISO 6320, *Animal and vegetable fats and oils — Determination of refractive index*
- ISO 6321, *Animal and vegetable fats and oils — Determination of melting point in open capillary tubes (slip point)*
- ISO 9936, *Animal and vegetable fats and oils — Determination of tocopherol and tocotrienol contents by high-performance liquid chromatography*
- ISO 10539, *Animal and Vegetable Fats and oils — Determination of Alkalinity*
- ISO 15305, *Animal and vegetable fats and oils — Determination of Lovibond colour*
- ISO 18609, *Animal and vegetable fats and oils — Determination of unsaponifiable matter — Method using hexane extraction*

American Oil Chemists' Society (AOCS)

- AOCS Ca 6b-53, *Unsaponifiable Matter*

- AOCS Cc 7-25, *Refractive Index*
- AOCS Cc17-95, *Soap in Oil Titrimetric Method*
- AOCS Cd 1d-1992, *Iodine Value of Fats and Oils Cyclohexane-Acetic Acid Method*
- AOCS Cd 3-25, *Saponification Value*
- AOCS Cd 3d-63, *Acid Value*
- AOCS Cd 5-40, *Reichert-Meissl, Polenske, and Kirschner Values, Modified AOAC Methods*
- AOCS Cd 8d-90, *Peroxide Value Acetic Acid-Isooctane Method*
- AOCS Ce 8-89, *Determination of Tocopherols and Tocotrienols in Vegetable Oils and Fats by HPLC*

Saint Lucia Bureau of Standards

- SLNS 1-1, *Specification of labelling of commodities - Part 1 General Principles*
- SLNS 1-2, *Specification for Labelling of commodities – Part 3 Labelling of pre-packaged foods*
- SLCP 1-1 *Code of practice for the general principles of food hygiene – Part 1: Food production and processing*

American Organization of American Chemists

- AOAC 993.20, *Iodine Value of Fats and Oils Wijs (Cyclohexane–Acetic Acid Solvent)*

CODEX Alimentarius Commission

- CAC/GL 21 – 1997, *FAO/WHO Codex Alimentarius, Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods*
- CODEX STAN 193-1995, *FAO/WHO Codex Alimentarius General Standards for Contaminants and Toxins in Food and Feed*

3 Terms and definitions

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

3.1 acid value

weight of potassium hydroxide (KOH), expressed in milligrams, required to neutralise the free fatty acids present in one gram of the coconut oil

3.2 admixture

combination of different substances retaining their individual properties

3.3 coconut oil

oil obtained from the mature kernel of the coconut (*Cocos nucifera* Linnaeus) by a process of expression, solvent extraction or by an approved method of processing

3.4 coconut milk

white, creamy and smooth liquid extracted from the grated flesh of mature fresh coconuts

3.5 competent authority

a Minister, Ministry or any named Agency or number of Agencies legally authorised to administer separately or jointly, any requirement pertaining to coconut oil

3.6 copra

dehydrated or dried coconut kernel

3.7 expression

process of extracting milk or oils by using pressure

3.8 good manufacturing practice(in relation to a food additive)

maximum level, recommended by the CODEX Committee on Food Additives, for an additive in a product to achieve a particular objective

3.9 Wijs iodine value

mass of iodine expressed in grams absorbed per 100 grams of the coconut oil, when determined using Wijs' solution

3.10 mature kernel

whole kernel 9 to 12 months' old

3.11 melting point

temperature at which the oil softens or becomes sufficiently fluid to slip or run

3.12 moisture content

the ratio of mass of water and other volatile substances in a sample to the mass of solids in the sample expressed as a percentage

3.13 polenske value

indicator of how much volatile fatty acid can be extracted from fat through saponification

3.14 refractive index

ratio of the velocity of light in the first of two media to the velocity in the second as it passes from one into the other

NOTE The refractive index expresses the ratio between the sine of the angle of incidence of the ray of light and the sine of the angle of refraction when a ray of light of known wavelength passes from air into the oil. Refractive index can be used as a measure of total solids in solution and purity of substances and so on.

3.15 Reichert-Meissl value

volume, expressed in millilitres, of 0.1M aqueous sodium hydroxide solution required to neutralise the steam-volatile water-soluble fatty acids distilled from 5 grams of the oil under the precise conditions specified in the method

3.16 oleaginous material

having the nature or qualities of oil

3.17 saponification

a chemical reaction in which an oil or fat is heated with an alkali, such as potassium Hydroxide (KOH), to make soap

3.18 saponification value

mass of potassium hydroxide (KOH) required to saponify completely one gram of oil or fat

3.19 specific gravity

ratio of the weight in air of a given volume of the oil at 30 °C to the weight in air of an equal volume of water at 30 °C

3.20 unsaponifiable matter

fraction of substances in the oil which is not saponified by sodium hydroxide but which is soluble in ordinary fat solvents

4 Product description**4.1 Crude coconut oil**

Crude coconut oil shall be the product obtained by expression and/or solvent extraction from the copra of the coconut *Cocos nucifera* L. and shall be free from admixture with other oils or fats.

4.2 Refined coconut oil

Refined coconut oil shall be the product obtained from copra of the coconut, *Cocos nucifera* L. by the process of expression or solvent extraction or both, and which has been neutralised, bleached with bleaching earth or activated carbon, or both, and deodorised with steam. A physical refining process may also be used where there is a wash with citric acid to remove gum bleaching and steam-stripping or deodorising. The product shall be free from admixture with other oils or fats.

4.3 Virgin Coconut Oil

Virgin coconut oil (VCO) is obtained from fresh and mature kernel of the coconut (*Cocos nucifera* L.) by mechanical or natural means with or without the application of heat, which does not lead to alteration of the nature of the oil. VCO has not undergone chemical refining, bleaching or deodorising. It can be consumed in its natural state without the need for further processing. Virgin coconut oil consists mainly of medium chain triglycerides, which are resistant to peroxidation. The fatty acids in virgin coconut oil are distinct from animal fats which contain mainly of long chain saturated fatty acids. Virgin coconut oil is colourless, free of sediment with natural fresh coconut scent. It is free from rancid odour or taste.

5 General requirements

5.1 The coconut oil shall be obtained from good quality coconut milk or copra.

5.2 Solvent extracted oil shall be obtained from the oleaginous material using a food grade solvent.

5.3 The coconut oil shall be clear and free from rancidity, adulterants, sediment, suspended impurities and separated water.

5.4 The coconut oil shall be free from admixture with other oils or fats when tested according to the methods prescribed.

5.5 Crude, refined and virgin coconut oils shall also conform to the physical and chemical requirements set out in Table 1, when determined by the appropriate methods.

Table 1 — Physical and chemical requirements for coconut oil

Item	Characteristic	Requirements			Methods of Test
		Refined	Virgin	Crude	
1	Specific Gravity at 30 °C / 30 °C	0.915 – 0.920	0.915 – 0.920	0.908 – 0.921	IS 548-1
2	Refractive Index at 40 °C	1.4480 – 1.4490	1.4480 – 1.4490	1.4480 – 1.450	ISO 6320: 2000; or AOCS Cc 7-25
3	Melting Point (°C)	22.0– 26.0	22.0 - 26.0	22.0 – 26.0	ISO 6321
4	Colour (Lovibond Units): 1 in. cell	< 5.0Y < 1.2R	Colourless	< 5.0Y < 2.0R	ISO 15305
5	Saponification Value; mg KOH/g oil	248 – 265	248 – 265	248 – 265	ISO 3657; or AOCS Cd 3-25
6	Iodine Value (Wijs)	6.3 – 10.6	6.3 – 10.6	6.3 – 10.6	Wijs; or ISO 3961; or AOAC 993.20; or AOCS Cd 1d-1992; or NMKL 39
7	Unsaponifiable matter; max. % (m/m)	0.5	0.5	0.8	ISO 3596; or ISO 18609; or AOCS Ca 6b-53
8	Acid value; mg KOH/g	0.6	4	10	AOCS 3d-63
9	Peroxide value; milli-equivalents peroxide oxygen /kg	Up to 10	Up to 15	Up to 15	AOCS Cd 8b-90; or ISO 3960
10	Moisture and volatile matter at 105 °C; max. % (m/m)	0.2	0.2	0.5	ISO 662
11	Insoluble impurities; max. % (m/m)	0.05	0.05	0.5	ISO 663
12	Soap Content; max. % (m/m)	0.005	-	-	ISO 10539; or AOCS Cc 17-95
13	Polenske value Reichert-Meissl value	13.0 7.5	13.0 6.0 – 8.0	13.0 6.0 – 8.0	AOCS Cd 5-40 or ISO 660
14	Smoke Point (°C)	177	177	177	

5.6 When required, the fatty acid profile of coconut oil given in Table 2, shall be determined by the methods described in Official and Tentative Methods published by American Oil Chemists' Society (latest edition) or alternatively Official Methods of Analysis published by the Association of Official Analytical Chemists (latest edition).

NOTE The number of double bonds in a molecule is indicated by 0, 1, 2 or 3 following the number of carbon atoms.

Table 2 — Fatty acid profile for coconut oil

Fatty acid	%(m/m) of total fatty acid
C6:0 Caproic	Non Detectable (ND)-0.7
C8:0 Caprylic	4.6 – 10.0
C10:0 Capric	5 – 8
C12:0 Lauric	45.1 – 53.2
C14:0 Myristic	16.8 – 21.0
C16:0 Palmitic	7.5 – 10.2
C16:1 Palmitoleic	ND
C18:0 Stearic	2.0 – 4.0
C18:1 Oleic	5.0 – 10.0
C18:2 Linoleic	1.0 – 2.5
C18:3 Linolenic	ND – 0.2
C20:0 Arachidic	ND – 0.2
C20:1 Gadoleic	ND – 0.2
C22 and higher	ND

5.7 Samples falling within the appropriate ranges specified in Table 2 are in compliance with this standard.

NOTE Supplementary criteria may be considered, as necessary, to confirm that a sample is in compliance with the standards.

EXAMPLE National geographical and/or climate variations.

6 Food additives

6.1 In the preparation of coconut oil for commercial sale, all food additives in the product shall:

- a) have functional significance;
- b) be legally permitted for use with the product in accordance with good manufacturing practice; and
- c) be used, whether singly or in combination, in accordance with good manufacturing practices.

6.2 No food additives shall be used in virgin coconut oil.

6.3 The use of food additives in crude and refined coconut oils shall be limited to the types and values specified in 6.4 to 6.7.

6.4 Colours

The following colours are permitted for the purpose of restoring natural loss in processing or the purpose of standardising the colour, as long as the added colour does not deceive or mislead the consumer:

- a) Beta-carotene;
- b) Canthaxanthine;
- c) Beta-apo-8-caratenal; and
- d) Methyl and ethyl esters of beta-apo-8-caratenic acid.

6.5 Antioxidants

Antioxidants shall be limited to the types and amount specified in Table 3.

Table 3 — Recommended permissible antioxidants in coconut oil

Antioxidant	Maximum level
Ascorbyl palmitate and Ascorbyl stearate	500 mg/kg individually or in combination
Mixed tocopherols concentrate	300 mg/kg individually or in combination
Alpha- tocopherol	
Synthetic gamma- tocopherol	
Synthetic delta tocopherol	
Propyl gallate	100 mg/kg
Tertiary hydroxyquinone (TBHQ)	120 mg/kg
Butylated hydroxyanisole (BHA)	175 mg/kg
Butylated hydroxytoluene (BHT)	75 mg/kg
Any combination of galletes, BHA, BHT, and/or TBHQ	200 mg/kg but individual limits are not to be exceeded
Dialauryl-thiodipropionatee	200 mg/kg

6.6 Antioxidant-synergists

Antioxidant-synergists are permitted to the types and amounts specified in Table 4.

Table 4 — Recommended antioxidant-synergist for coconut oil

Antioxidant-synergist	Maximum level
Citric acid	GMP
Sodium dihydrogen citrates and Trisodium citrates	GMP
Isopropyl citrates and Monoglyceride	100 mg/kg individually or in combination

6.7 Anti-foaming agent

Antifoaming agent shall be limited to polydimethyl siloxane and shall not exceed the limit of 10 mg/kg.

7 Contaminants

7.1 Heavy metals

Coconut oils shall comply with the maximum levels for heavy metals established by the CODEX Alimentarius Commission for this commodity as per *CODEX STAN 193 – General standard for contaminants and toxins in food and feed*.

7.2 Pesticide residues

Pesticide residue in coconut oils shall not exceed those maximum pesticide residue limits established by the CODEX Alimentarius Commission for this commodity as per *CAC/MRL 1 – Maximum residue limits (MRL) for pesticides*.

8 Hygiene

It is recommended that coconut oils be prepared and handled in accordance with the requirements of the most recent revision of the *SLCP 1-1 Code of Practice for general principles for Food Hygiene*.

Coconut oils shall comply with any micro-biological criteria established in accordance with the most recent edition of *Codex Alimentarius Commission CAC/GL 27 Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods*.

9 Packaging

9.1 Containers shall be clean, with stoppers or tightly closed lids and shall not leak.

9.2 The containers used should be of food grade quality and inert to coconut oil.

9.3 Coconut oil in bulk shall be shipped in vessel deep tanks or wing tanks with steam coils, in tank trucks, in lighter or other appropriate containers.

10 Marking and labelling

10.1 External packaging for shipping shall be marked in accordance with *SLNS 1-1 Specification for labelling of commodities – Part 1 General principles*, unless otherwise specified.

10.2 Retail containers shall be labelled in accordance with the relevant Saint Lucia national standard *SLNS 1-3 Specification for Labelling of Commodities Part 3: Labelling of Pre-packaged Foods* and or national labelling standards for pre-packaged foods.

10.3 Label claims for fortification with vitamins or any other essential food constituent shall be in accordance with the latest edition of the *CODEX standard CAC/GL1 General Guidelines on Claims* A claim may be made only in cases where a single serving of the product provides one-sixth of the recommended daily dietary allowance of the named vitamin or other essential food constituent.

11 Sampling

Product sampling shall be in accordance with ISO 5555, *Animal and Vegetable Fats and Oils — Sampling* and ISO 661, *Animal and vegetable fats and oils — Preparation of test sample*.

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