



BAHAMAS NATIONAL STANDARD

Cocoa and Chocolate products – Specification FDBNS CRS 34: 2018

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BBSQ Foreword

This draft national standard is identical to Caribbean Regional Organisation of Standards and Quality CRS 34: 2018. The national committee responsible for reviewing this standard is Technical Committee 15 Food and Food Products. The standard contains the requirements relevant for The Bahamas.

BBSQ Committee Representation

This Bahamas National Standard was adopted as a national standard under the supervision of the National Technical Committee for Food and Food Products (NTC 15) hosted by The Bahamas Bureau of Standards and Quality which at the time comprised of the following members:

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CARICOM REGIONAL STANDARD

Cocoa and Chocolate products – Specification

CRS 34: 2018



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Committee Representation

This CARICOM Regional Standard was developed under the supervision of the Regional Project Team for Cocoa and Chocolate Products, (hosted by the CARICOM Member State, Trinidad and Tobago), which at the time comprised the following members:

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Foreword

This CARICOM Regional Standard *CRS 34:2018, Cocoa and Chocolate Products – Specification* 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 46th Meeting in May 2018.

This standard is a revision of and supersedes the CCS 34:1994 Chocolate Confectionery and Chocolate Products which was prepared for the Caribbean Common Market Standards Council (CCMSC) and approved in June 1994.

This standard sets the minimum requirements for composition, contaminant limits and quality of cocoa and chocolate products that are manufactured or traded within the Caribbean Community.

The revision of this standard was undertaken by the Regional Project Team for Cocoa and Chocolate Products, hosted by the Food Advisory Committee of the Chemistry, Food and Drug Division, Ministry of Health, Trinidad and Tobago. The revision was undertaken to support the rejuvenated interest and regional growth in the production of fine or flavour chocolate. The major changes from the previous version include:

- a) the addition of new definitions;
- b) requirements for constituents of products not previously captured, including, dark chocolate, coarse-ground chocolate and cocoa shell infusions;
- c) an extended contaminants list to include, including that for microorganisms and heavy metals;
- d) the use of food additives; and
- e) expanded test methods for verifying compliance to the standard.

In preparing this standard considerable assistance was derived from the following documents:

- a) Canada, Food and Drug Regulations, C.R.C., c.870, Division 4. November 24, 2015;
- b) Canada, MFO-11. Microbiological Examination of Cocoa and Chocolate. Health Protection Branch, Ottawa. November 30, 1981.
- c) **Codex Alimentarius Commission, FAO/WHO:**
 - 1) CODEX-STAN 86-1981 (Rev.1 – 2001), Cocoa Butter;
 - 2) CODEX-STAN 87-1981 (Rev. 1 – 2003), Chocolate and Chocolate Products;
 - 3) CODEX-STAN 105-1981 (Rev. 1 – 2001), Cocoa Powders and Dry Mixtures of Cocoa and Sugars;
 - 4) CODEX-STAN 141-1983 (Rev.1 – 2001 and Amended 2014), Cocoa (Cacao) Mass (Cocoa/Chocolate Liquor) and Cocoa Cake;
 - 5) CODEX STAN 192-1995 (Rev – 2016), General Standard for Food Additives;
 - 6) CODEX STAN 234-1991 (Amended 2007), recommended methods of analysis and sampling;
 - 7) CAC/GL 50-2004, General Guidelines on Sampling;
 - 8) Proposed Draft Standard for Chocolate and Chocolate Products (at Step 3 of the Codex Procedure). CODEX ALIMENTARIUS COMMISSION, Twenty-second Session, Geneva, 23 - 28 June 1997;
 - 9) CX/CF 16/10/9 February 2016, , Codex Committee on Contaminants in Foods, Tenth Session Rotterdam, The Netherlands, 4 – 8 April 2016. Proposed Draft Maximum Levels For Cadmium In Cocoa And Cocoa-Derived Products; and

- 10) CODEX REP16/CF Joint FAO/WHO Food Standards Programme, 39th Session, Rome, Italy, 27 June - 1 July 2016. Report of the 10th Session of the CODEX Committee on Contaminants in Foods, Rotterdam, The Netherlands, 4 - 8 April 2016.
- d) Directive 2000/26/EC of the European Parliament and of the Council of 23 June 2000 relating to cocoa and chocolate products intended for human consumption;
 - e) European Union Reference Laboratory for Heavy Metals in Feed and Food (EURL). October 2012. Official methods for the determination of heavy metals in feed and food;
 - f) Food Standards Australia New Zealand Act 1991. Food Standards Code – Standard 2.10.4. Miscellaneous standards for other foods;
 - g) International Microbial Commission for International Commission on Microbiological Specifications for Foods (ICMSF). 1986. Microorganisms in Foods 2: Sampling for Microbiological Analysis. Principles and Specific Applications. 2nd Ed. Blackwell Scientific Publications, New Jersey: USA;
 - h) **International Organisation for Standards**
 - ISO 24153:2009, Random sampling and randomization procedures; and
 - ISO/TS 17728:2015, Microbiology of the food chain – Sampling techniques for microbiological analysis of food and feed samples.
 - i) **Kenya Bureau of Standards**
KS 436-1:2013, Cocoa Powder – Specification: Part 1 – Unsweetened Cocoa Powder;
 - j) United States, Food and Drug Regulations, e-CFR 21: Part 163 – Cacao Products. April 1, 2015;
 - k) Republic of the Philippines. Department of Health, Food and Drugs Administration. February 2013. Guidelines for assessment of microbiological quality of processed foods; and
 - l) Cocoa Beans: Chocolate and Cocoa Industry Quality Requirements. Edited by M.J. End and R. Dand. CAOBISCO/ECA/FCC, Brussels, Belgium. English version ISBN: 978-2-9601817-0-8.

This standard includes the following normative annexes which are indispensable for the proper application of the standard:

- a) Annex B – Summary composition of chocolate products;
- b) Annex D – Sampling for testing; and
- c) Annex E – Test methods for compliance with cocoa and chocolate product requirements;

This standard includes the following informative annex which provides information for guidance purposes only, in the application of this standard:

- d) Annex A – Requirements for beans used in cocoa and chocolate products or chocolate products; and
- e) Annex C – Cadmium requirements for the European Union.

Introduction

Cocoa (*Theobroma cacao* L.) is an important agricultural product in the global economy. World production of cocoa beans rose to over 4.031 million tons 2015/2016 season¹ and in 2016 the global chocolate market was expected to be worth US\$98.3 billion dollars². Essentially, the demand for cocoa has risen three times faster than population growth over the last 15 years and industry forecasts predict a 30% growth over the next decade³.

There are two broad classifications for traded cocoa on the world market, 'bulk or ordinary' and 'fine or flavour' cocoa beans. Fine or flavour cocoa, originating largely from Criollo and Trinitario cacao-tree varieties, contains intrinsic and sought after ancillary flavours, including "fruity", "floral" or "nutty", that are essential in the preparation of premium quality chocolates. An interesting pattern in the rising demand has been an increasing interest in dark and speciality chocolates with particular attention to 'origin specific' dark chocolates. These chocolates either link flavour and intrinsic quality attributes to a particular growing origin (country, region or farm), cacao varieties and set of processing conditions. Furthermore, emerging evidence of the medicinal and nutraceutical value of cocoa, (from different varieties and origins), has created new opportunities in the speciality cocoa sector with positive growth forecasted.

The market for fine or flavour cocoa is small, accounting for only 5% of total world production⁴. It is highly specialized, globalized and selective with its own supply and demand characteristics, but lucrative, with an annual value of over US\$4 billion⁵. The burgeoning origin specific dark chocolate market adds a new dimension to the premium chocolate market within Latin America and the Caribbean being the world's largest producers of fine or flavour cocoa. Apart from traditional importing countries (such as the USA, the EU and Japan) buying beans from the region, increasingly, non-traditional importers, (such as Russia, Eastern Europe, Asia and the Middle East) are looking for diverse and complementary attributes and values of limited cocoa beans and/or cocoa products. The increasing demand for fine or flavour cocoa has contributed to an upward movement of prices paid per tonne. Its reputation for fine or flavour cocoa offers the region a strong competitive advantage while rising demands and prices create a tremendous opportunity. As a result, there has been greatly renewed interest in cocoa production in CARICOM and CARIFORUM member countries. A number of private initiatives have been beneficial to the fine or flavour cocoa industry in the last few years; these include participation of local manufacturers in International Chocolate Awards, the establishment of long term relationships between international importers of sustainable certified cocoa and regional farmers, and the creation of linkages with other economic sectors such as agri-tourism, high end boutique hotels and spas. Paramount in these relationships and alliances is a clear definition and understanding of the value of good cocoa quality. This translates to higher prices paid for the beans, chocolates and other related products. Also, many national cocoa associations, cooperatives and confederations across the Caribbean, are contributing to the promotion of the fine or flavour cocoa sector and building awareness of the income potential of these high end markets.

1) International Cocoa Organization ICCO, (2016a). Quarterly Bulletin of Cocoa Statistics, Vol. XLII - No. 4 - Cocoa year 2015/2016. [online] Available at: <https://www.icco.org/about-us/icco-news/333-quarterly-bulletin-of-cocoa-statistics-november-2016.html>

2) Markets and Markets: 'Global Chocolate, Cocoa Beans, Lecithin, Sugar and Vanilla Market By Market Share, Trade, Prices, Geography Trend and Forecast (2011-2016)' Report.

3) Chocolate Industry Analysis 2016 - Cost & Trends

<https://www.franchisehelp.com/industry-reports/chocolate-industry-report/>

4) International Cocoa Organization, Fine or Flavour Cocoa: What is Fine or Flavour Cocoa?

<http://www.icco.org/about-cocoa/fine-or-flavour-cocoa.html>

5) The Cocoa Industry in CARIFORUM: Background Brief for the 3rd CARIFORUM-EU Business Forum, April 15-16, 2015

Chocolates of Caribbean origin are now sold to luxury shops in European, North American and Asian markets⁶⁾.

The development of standards for both cocoa beans, as well as, cocoa and chocolate products has been lagging behind the rapid growth and evolution in the fine or flavour cocoa and speciality chocolate market. This CARICOM Regional Standard which is a revision of CCS 34:1994, *Chocolate Confectionery and Cocoa Products*, serves in part to address this gap. It brings alignment of the rapid growth in the sector with the need for definitions and technical requirements associated with an expanded range of available cocoa and chocolate products, bearing in mind the new considerations in quality that have come to the fore, since the previous edition.

⁶⁾ The Cocoa Industry in CARIFORUM: Background Brief for the 3rd CARIFORUM-EU Business Forum, April 15-16, 2015

1 Scope

This standard specifies requirements for the composition of food products derived from fermented and dried cocoa beans. This standard does not apply to:

- a) raw cocoa products, that is, products made from cocoa beans which are either unfermented, or unroasted or both and which can be either wet or dry;
- b) confectionery and other food products where chocolate or cocoa powder is merely a flavour; or
- c) non-food products, including, pharmaceuticals and cosmetics.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced documents (including any amendments) applies.

CARICOM Regional Standard

CRS 5, *Labelling of pre-packaged foods*.

CODEX Alimentarius

CODEX STAN 192-1995, *General Standard for Food Additive*; and Joint FAO/WHO Expert Committee on Food Additives. Combined Compendium of Food Additive Specifications, Volume 4 – Analytical methods, test procedures and laboratory solutions used by and referenced in the food additive specifications. Food and Agriculture Organization of the United Nations, Rome.

3 Terms and definitions

For the purposes of this standard the following definitions shall apply.

3.1

chocolate

food derived from cocoa mass or cocoa press cake with cocoa butter or cocoa powder or both, to which sugar or sweeteners or both have been added, with or without addition of emulsifiers and flavours and, which has been homogenized, refined and solidified into bars, cakes, tablets, or other forms

3.1.1

a chocolate or praline

form of chocolate confectionery in bite-sized units, which may enrobe other foods, with or without fillings, flavours or other edible content

3.1.2

chocolate product

food product derived from chocolate

3.2

chocolate confectionery

any solid or semi-solid food where a form of chocolate is an integral composition of the product

3.3

coarse-ground chocolate

product derived from cocoa nibs that are coarsely ground and moulded into balls or other shapes intended for making of a beverage

NOTE Coarse-ground chocolate is also known as creole chocolate, creole cocoa, chocolate or cocoa balls, chocolate or cocoa sticks, or chocolate or cocoa tea.

3.4

cocoa material

edible substances derived from cocoa mass, cocoa butter or cocoa press cake

3.5

cocoa beans

fermented, dried and roasted whole seeds of cultivated varieties of the cocoa tree, *Theobroma cacao* L.

3.6

cocoa butter

fat extracted from cocoa beans

3.7

cocoa butter equivalent

non-lauric vegetable fats, which are similar in their physical and chemical properties to and mixable with cocoa butter in every amount without altering the properties of the cocoa butter

NOTE Cocoa butter equivalent fats are used to replace cocoa butter in chocolate products.

3.8

cocoa liquor

cocoa mass

chocolate liquor

chocolate mass

product obtained by grinding cocoa nibs to an homogenous suspension of fat-free cocoa solids and cocoa fat

3.9

cocoa nibs

roasted cotyledons of cocoa bean freed from shell

3.11

cocoa powder

powdered product prepared from cocoa liquor, from which a portion of the fat may have been removed, with or without the addition of salt, sugar, sweeteners or spices

3.12

cocoa press cake

product obtained from cocoa liquor after the removal of most of the cocoa fat by mechanical pressure

3.13

cocoa products

food products derived from cocoa beans

3.14

cocoa shell infusion

product derived primarily from the shell of cocoa nibs that is intended for making of a beverage

3.15

cocoa solids

dry and fatty components of cocoa including cocoa mass, cocoa butter and cocoa powder

3.16

dark chocolate

type of chocolate with a high cocoa solids content, with or without sugars or milk added and having a rich, intense chocolate flavour

3.17**edible content**

optional or added ingredients in chocolate products including fruits, nuts, caramel, emulsifiers and flavourings but excluding vegetable fat

3.18**flavouring**

products that are added to food to impart, modify, or enhance the flavour of food, with the exception of flavour enhancers considered as food additives under the Codex Class Names and the International Numbering System for Food Additives.

NOTE Flavourings do not include substances that have an exclusively sweet, sour, or salty taste, such as sugar, vinegar, and table salt. Flavourings may consist of flavouring substances, natural flavouring complexes, thermal process flavourings or smoke flavourings and mixtures of them and may contain non-flavouring food ingredients. They are not intended to be consumed by and of itself.

3.19**food additive**

substance the use of which affects the physico-chemical and flavour characteristics of chocolate and includes food colour, preservatives, spices, seasoning or emulsifiers but does not necessarily include any nutritive substance, vitamins, amino-acid, mineral nutrient and spices

3.20**lot**

definite quantity of the product presumed to be produced under uniform conditions and characterized by product homogeneity

3.21**milk****dairy milk**

lacteal secretion from the mammary gland of cows, genus *Bos*, which is free from colostrum

3.22**milk chocolate**

type of chocolate that contains dairy milk

3.23**milk ingredient**

products obtained from partly or wholly dehydrated whole milk, semi- or full-skimmed milk, cream, or from partly or wholly dehydrated cream, butter or milk fat but does not include whey and other derived fractions

3.24**milk solids non-fat**

all components, inclusive of protein, lactose and ash, of milk that remains after both the water and milk fat have been removed from liquid milk

3.25**national competent authority**

Ministry, State agency or other national entity that is legally authorized to administer any requirement pertaining to chocolate and cocoa products

3.26**non-cocoa butter vegetable fat**

plant derived fat other than from cocoa butter

3.27**non-dairy milk**

lacteal secretion from the mammary gland of non-bovine species which is free from colostrum

3.28**packaging**

material to be used for the containment, protection and presentation of the product, including closure devices

3.29**sugar**

products that are comprised of monosaccharides and disaccharides or mixtures thereof as the main ingredient

3.30**sweeteners**

food additives that impart a sweet taste and is either derived from modified sucrose, non-monosaccharides or non-disaccharide sources

3.31**total cocoa solids**

content of any cocoa constituent which can include cocoa butter, cocoa mass, cocoa press cake and cocoa powder or any blend of these

3.32**total milk solids**

entire residue, including the milk fat and milk solids non-fat content, in natural proportions, that remains after removal of all water from liquid milk

3.33**white chocolate**

type of milk chocolate that contains cocoa butter as the only cocoa derivative

4 General requirements

4.1 Cocoa mass, cocoa liquor, chocolate mass or chocolate liquor shall be comprised of:

- f) Cocoa mass of 50 – 60 % by weight of cocoa butter;
- g) not more than 7.0 % by weight of crude fibre;
- h) not more than 8.0 % of ash; and
- i) not more than 0.4 % of ash insoluble in hydrochloric acid.

4.2 The addition of vegetable fats other than cocoa butter shall be cocoa butter equivalent and not exceed 5 %.

NOTE 1 The amount of vegetable fat added is calculated after deduction of the total weight of any edible content, without reducing the minimum contents of cocoa materials. Vegetable fats are not considered to be edible content.

4.3 The type and nature of the vegetable fats used shall be as prescribed by the national competent authority.

4.4 The maximum percentage of edible content, singly or combined, in the finished product shall not exceed 40 % (w/w).

4.5 The minimum percentage of the edible content shall be calculated after the weight of the permitted edible substances has been deducted from the total weight of the final product, including the weight of the filling where appropriate.

4.6 The composition percentages of chocolate products shall be calculated on the chocolate portion alone, after the deduction of any edible content.

4.7 Total cocoa solids and total milk solids shall be calculated on a dry matter basis, after the deduction of the weights of edible content, vegetable fat and any other ingredients specified in the reserved description.

4.8 Where chocolates are filled, the chocolate part of the coating shall be at least 25 % of the total weight of the product.

4.9 Cocoa and chocolate products shall not contain:

- j) colourings;
- k) flavourings that mimic the taste of chocolate or milk fat;
- l) flours; and
- m) animal fats and preparations not derived solely from milk.

NOTE The quality of any food product depends on the quality of the ingredients and the practices that are utilized in production. The minimum requirements for cocoa bean quality and hygienic practices utilized in the production of cocoa and chocolate products are listed in Annex A.

5 Requirements for the composition of chocolate product types

5.1 Unsweetened chocolate

5.1.1 Unsweetened chocolate shall be refined, tempered, homogenized, solidified into bars, tablet, or cakes.

5.1.2 Unsweetened chocolate shall be comprised of the following ingredients, with or without addition of flavour or emulsifiers or both:

- n) cocoa mass;
- o) cocoa powder with added cocoa butter; or
- p) cocoa press cake with added cocoa butter.

5.1.3 Unsweetened chocolate shall contain cocoa butter, crude fibre, and ash within the limits set at 4.1 for cocoa mass, but shall contain no sugars or sweeteners.

NOTE Unsweetened chocolate is used extensively in cooking and baking.

5.2 Chocolate

Chocolate shall be comprised of a minimum content of 35 % by weight of total cocoa solids of which there are:

- a) not less than 18 % by weight of cocoa butter; and
- b) not less than 14 % by weight of fat-free cocoa solids.

NOTE The characteristics of chocolate are similar to the product known as "semi-sweet chocolate" in the USA.

5.3 Sweet chocolate or plain chocolate

Sweet chocolate or plain chocolate shall be comprised of a minimum content of 30 % by weight of total cocoa solids of which there are:

- a) not less than 18 % by weight of cocoa butter; and
- b) not less than 12 % by weight of fat-free cocoa solids. .

5.4 Milk chocolate

5.4.1 Milk chocolate shall be comprised of the following ingredients:

- q) cocoa mass;
- r) cocoa powder and added cocoa butter; or
- s) cocoa press cake and added cocoa butter;
- t) sugar or a mix of sugar and sweeteners; and
- u) milk or milk ingredients or both.

5.4.2 Milk chocolate shall be comprised of the following ingredients with a minimum content of:

- a) 25 % weight of total cocoa solids of which there is not less than 2.5 % by weight of fat-free cocoa solids;
- b) 2.5 % by weight of milk fat;
- c) 10.5 % by weight of milk solids-non-fat; and
- d) 25 % by weight as total fat.

NOTE 1 The requirements for total milk solids in milk chocolate, is not less than 14% in the US and 12% in Canada.

NOTE 2 It is customary in the region to replace part of the cocoa butter, in some products, with hydrogenated vegetable fats which are cocoa butter equivalent.

5.4.3 Where milk is replaced by cream, the product shall have a minimum milk fat content of 5.5 %.

5.4.4 Where milk is replaced by skimmed milk, the product shall have a milk fat content of not greater than 1.0 %.

5.4.4 Products sold as milk chocolate shall contain dairy milk as the only milk ingredient present.

5.5 Chocolate coating or chocolate couverture

5.5.1 Chocolate coating or chocolate couverture shall be comprised of:

- v) cocoa mass;
- w) cocoa powder and added cocoa butter; or
- x) cocoa press cake and added cocoa butter;
- y) vegetable fat, hydrogenated vegetable fat, sugars or sweeteners, with or without the addition of emulsifiers and flavours, as necessary.

5.5.2 Chocolate coating and chocolate couverture shall be comprised of a minimum content of 35 % by weight total cocoa solids of which there are:

- a) not less than 31 % by weight of cocoa butter; and
- b) not less than 2.5 % by weight of fat-free cocoa solids.

5.6 Milk chocolate coating, or milk chocolate couverture

5.6.1 Milk chocolate coating or milk chocolate couverture shall be comprised:

- z) cocoa mass;
- aa) cocoa powder and added cocoa butter; or
- bb) cocoa press cake and added cocoa butter; and
- cc) vegetable fat, hydrogenated vegetable fat, milk solids, sugars or sweeteners with or without the addition of emulsifiers and flavours, as necessary.

5.6.2 Milk chocolate coating or milk chocolate couverture shall be comprised of the following ingredients with a minimum content of:

- a) 25 % by weight of total cocoa solids of which not less than 2.5 % by weight is fat-free cocoa solids;
- b) 14 % total milk solids of which not less than 3.5 % by weight is milk fat; and
- c) 31 % by weight total fat.

5.7 Dark chocolate and extra dark chocolate

5.7.1 Dark chocolate shall be comprised of a minimum of 40% of cocoa solids.

5.7.2 Extra dark chocolate shall comprise of a minimum of 70% of cocoa solids.

NOTE 1 In the USA bitter sweet and semi-sweet chocolates are equivalent to dark chocolate.

NOTE 2 The use of milk as a component of dark chocolate is optional.

5.8 White chocolate

5.8.1 White chocolate shall be comprised of the following ingredients:

- dd) cocoa butter;
- ee) milk or milk ingredients or both; and
- ff) sugar and or sweeteners.

5.8.2 White chocolate shall be comprised of the following ingredients with a minimum content of:

- gg) 20 % by weight of cocoa butter; and
- hh) 14 % by weight of milk solids of which not less than 2.5 % is milk fat.

NOTE A summary table of the requirements for the composition of chocolate products is at Annex B.

6 Requirements for cocoa powder and other cocoa products

6.1 Cocoa powder

6.1.1 Cocoa powder shall be prepared from cocoa mass or cocoa press cake, by powdering the solid, which may have been treated with alkalizing or neutralizing agents (acidity regulators), and shall be comprised of:

- a) not less than 10 % but not more than 20 % by weight of cocoa butter, measured on dry matter basis;
- b) not more than 7 % by weight of moisture; and
- c) salt, spices, flavours and emulsifiers, as required.

6.1.2 High-fat cocoa powder or breakfast cocoa shall be cocoa powder containing more than 20 % by weight of cocoa butter.

6.1.3 Low-fat cocoa powder and fat-reduced cocoa powder shall be prepared from:

- a) cocoa mass with less than 10 % by weight of cocoa butter; and
- b) cocoa mass that is not more than 7 % by weight of moisture.

6.1.4 Cocoa powder products shall be cocoa powder mixed with other food ingredients and contain not less than 25 % by weight of cocoa powder.

6.2 Coarse-ground chocolate

Coarse-ground chocolate shall:

- ii) be prepared from cocoa mass by grinding and moulding into a desired shape;
- jj) have particle size of not less than 200 µm;
- kk) have additions of salt, spices, flavours and emulsifiers as necessary;
- ll) not include flour or starch from wheat, rice or maize; and

mm) be intended for use as a beverage.

6.3 Cocoa butter

6.3.1 Cocoa butter shall be the fat obtained from cocoa mass by mechanical means or solvent extraction.

NOTE Pressed cocoa butter and expeller cocoa butter may be filtered, centrifuged, de-gummed and deodorized, as required by the end product.

6.3.2 Refined cocoa butter shall be cocoa butter that has been further treated by either alkalizing, bleaching or deodorizing.

6.3.3 Cocoa butter shall have the following characteristics:

- a) a refractive index at 40°C (n_d^{40}) between 1.456 and 1.499;
- b) an iodine value (Wijs) between 33 and 42;
- c) a saponification value of not less than 188 and not more than 198 mg KOH per gram of fat;
- d) a clear melting point between 31°C and 37°C;
- e) in the case of press cocoa butter, no more than 0.35 % by weight of unsaponifiable matter;
- f) for expeller cocoa butter, solvent extracted cocoa butter, refined cocoa butter, not less than 0.05 % by weight of unsaponifiable matter; and
- g) for solvent-extracted cocoa butter, not more than 1 mg/kg of hexane, where hexane is used as a processing aid.

6.3.4 Cocoa butter free fatty acids value (FFAV), including that of oleic acid, shall be 0.5 – 1.75 % by weight.

NOTE The cocoa butter free fatty acids value (FFAV) is important when cocoa mass is used for dark chocolate. A significant percentage of the cocoa butter is contributed by the cocoa mass and chocolate will be slower to crystallize and of softer consistency if the overall FFAV of fats exceed 1.75 %.

6.4 Cocoa shell infusion

Cocoa shell infusions that are made from the shell of cocoa beans shall:

- nn) be derived from well fermented and dried cocoa beans;
- oo) comply with the requirements for heavy metal content in Table 1; and
- pp) processed to meet the microbial limits in Table 2.

7 Other ingredients

7.1 Where the following ingredients are used in chocolate and cocoa products the amounts shall be in accordance with good manufacturing practices and requirements of national legislation:

- qq) salt;
- rr) spices;

ss) milk solids;

tt) fruits, nuts, cereals, vegetables;

uu) sugar confectionery, including solids, pastes, and creams;

vv) flavours

7.2 The addition of vegetable fats other than cocoa butter shall not exceed 5 % of the finished product, after deduction of the total weight of any other edible foodstuffs, without reducing the minimum contents of cocoa materials.

Table 1 — Maximum levels for heavy metal contaminants

Chocolate or cocoa product	Arsenic (As) mg/kg	Cadmium (Cd) mg/kg	Copper (Cu) mg/kg	Lead (Pb) mg/kg	Zinc (Zn) mg/kg
Chocolate < 50 % total dry cocoa solids	0.5	0.6	20	1	ns ^a
Chocolate > 50 % total dry cocoa solids	0.5	2.0	ns	ns	ns
Sweet chocolate	0.5	ns	20	1	ns
Milk chocolate < 30 % total dry cocoa solids	0.5	0.2	20	1	ns
Milk chocolate > 50 % total dry cocoa solids	0.5	1.5	ns	ns	ns
Coatings/Couvertures	0.5	ns	20	1	ns
Coarse-ground chocolate	0.5	ns	20	1	50
Unsweetened chocolate	1	ns	35	2	50
Cocoa powders	0.5	2.0	20	1	50
a "ns" denotes that a limit has not been specified.					

Table 2 — Sampling plan and microbiological limits for chocolate and cocoa products

Product	Microorganism	n	c	m	M
Cocoa Powder	Moulds (cfu/g)	5	2	10 ²	10 ⁴
	<i>Salmonella</i> /25 g	5	0	0	na
	Coliforms MPN/g	5	2	1.8	10
	SPC/APC (cfu/g)	5	2	10 ⁴	10 ⁶
Chocolate products	Moulds (cfu/g)	5	2	10 ²	10 ⁴
	<i>Salmonella</i> /25 g	10	0	0	na

Product	Microorganism	n	c	m	M
	Coliforms MPN/g	5	2	1.8	10 ²
	SPC/APC (cfu/g)	5	2	10 ⁴	10 ⁶
Chocolate confectioneries (chocolate bars, blocks bonbons)	Moulds (cfu/g)	5	2	10 ²	10 ³
	<i>Salmonella</i> /25 g	5	0	0	na
	Coliforms MPN/g	5	2	1.8	10 ²
	SPC/APC (cfu/g)	5	2	10 ³	10 ⁶
Key n: number of sample units that are to be drawn independently or randomly from a lot. c: maximum allowable number of sample units exceeding the microbiological limit. m: microbiological limit. M: microbiological limit where a 3-class plan is used. na: where M has not been defined					

8 Food additives

8.1 Food additives, including acid regulators, antioxidants, bulking agents, colouring for surface decoration, emulsifiers, glazing agents and sweeteners, used in chocolate and cocoa products shall be used in accordance with latest edition of CODEX-STAN 192-1995 (Rev 2015), *General standard for food additive*, unless there are digressions in national legislation.

8.2 Food additives shall comply with any applicable specifications of purity and safety, as recognized by the national competent authority.

8.3 Analytical methods for food additives shall be in accordance with those of the Joint FAO/WHO Expert Committee on Food Additives, Combined Compendium of Food Additive Specifications, Volume 4 – Analytical methods, test procedures and laboratory solutions used by and referenced in the food additive specifications. Food and Agriculture Organization of the United Nations, Rome.

9 Contaminants

9.1 Chocolate and cocoa products shall not contain any of the contaminants in excess of the maximum levels stated in Tables 1 and 2.

NOTE Cocoa and chocolate products that are exported are expected to comply to the national requirements of the importing country. Annex C lists the cadmium requirements that take effect in the European Union in 2019.

9.2 The maximum residue limits and extraneous maximum residue limits for pesticides in food shall be in accordance with national regulations.

NOTE The website of the CODEX Alimentarius can be consulted for updates on maximum residue limits or extraneous maximum residue limits for pesticides in foods.

9.3 The microbiological levels in chocolate and cocoa products shall comply with the limits in Table 2.

9.3.1 In the 2-class sampling plan (Attributes plan) the lot shall be rejected if more than 'c' out of 'n' sample tests are unacceptable. See Table 2 for the microbiological limits.

9.3.2 In a 3-class sampling plan (Variables plan) "m" shall separate acceptable counts from marginally acceptable counts and "M" is indicating the boundary between marginally acceptable counts and unacceptable counts. See Table 2 for the microbiological limits.

9.3.3 The elements of the two and three class sampling plans shall be in accordance with Annex D.

10 Packaging

10.1 The integrity of the packaging shall be maintained and protect the product for the intended shelf life of the product.

10.2 Packaging shall withstand all conditions, normally associated with handling, storage, transportation and retail of chocolate and cocoa products without showing visible signs of deterioration.

10.3 The packaging material shall not be susceptible to interactions with the contents.

10.4 The packaging material shall enable labels to be attached to or printed on its surface and remain legible and attached throughout the shelf life of the product.

NOTE Recycled, reused or reconditioned materials are an option for packaging, the use of which is determined by product safety and preservation considerations.

11 Labelling requirements

11.1 The labelling requirements shall be in accordance with the CARICOM Regional Standard CRS 5, *Labelling of pre-packaged foods*.

11.2 The labelling on retail packages of chocolate confectionery and cocoa products shall be:

ww) in the official language or languages of the country in which it is sold;

xx) clearly and prominently displayed; and

yy) readily legible under customary conditions of purchase and use.

11.3 Information in other languages shall be clearly distinguished from that of the official language.

11.4 The information carried on the label shall include:

a) the name of the product, as appropriate; together with an indication of any flavouring, or added food ingredient;

EXAMPLE 1 Milk chocolate with fruit and nuts

EXAMPLE 2 Dark chocolate with peppermint nougat filling.

NOTE It is acceptable to include the avoirdupois equivalent with the SI unit.

b) a list of ingredients in descending order of their proportion by weight where cocoa butter is distinctly identified separately to added vegetable fat; and

c) name of the filling, if any.

11.5 Where the package contains a number of similar units of the same composition, the number of units shall be stated on the label.

11.6 Where the package contains "chocolates" of different forms or compositions, the label shall include the words "assorted" or "assortment", and the list of ingredients stated in approximate order of decreasing proportions by weight.

11.7 The minimum proportion of total cocoa solids in dark and extra dark chocolate shall be stated as a percentage by weight, in accordance with sub clause 4.6.

EXAMPLE cocoa solids% minimum

11.8 Where the labelling is for cocoa powder only, the average fat content of cocoa powder shall be stated as a percentage by weight.

11.9 The label shall include the source of non-dairy milk or the designation appropriate to milk from other non-bovine sources.

EXAMPLE Chocolate with non-diary milk can be labelled as "Goat milk chocolate" if the milk in the product is obtained from animals of the genus *Capra*.

11.10 Where speciality processes, techniques or ingredients have been used these shall be included on the label, as necessary or appropriate.

NOTE Speciality processes and techniques include double fermentation, fruit-infused fermentation and other like processes.

11.11 Geographical indicators or certification marks or both shall be included on the label as necessary or appropriate.

11.12 An expiry date or 'Best Before' date shall be included on the label.

11.13 Where required, nutritional information shall be stated in terms of the Recommended Dietary Allowances or Daily Value %, as established by the national competent authority.

12 Testing

12.1 Samples for testing shall be taken and treated in accordance with Annex D.

12.2 The methods of test included in the Annex E shall be used to determine whether a sample of chocolate or a cocoa product conforms to the applicable requirements set out in this standard.

12.3 Other methods, including more rapid tests, may be used in routine quality control or in an approved quality assurance system, provided that they are widely recognized as reliable, accurate, and responsible.

NOTE These tests are required to be done routinely in the factory, but can be performed at a more specialized laboratory.

Annex A

(informative)

Requirements for beans used in cocoa and chocolate products**A.1 Requirements for cocoa bean quality**

Cocoa beans used in the production of cocoa and chocolate products should:

- a) conform to the requirements of ISO 2451, *Cocoa bean – Specification*; and
- b) have a moisture content of 6.5 – 8.0 % by weight;

A.2 Requirements for processing facilities

Facilities which process cocoa and chocolate products should:

- zz) comply with the requirements of CRS 6, *Code of Practice – General principles of food hygiene*; and
- aaa) adopt the requirements of CAC/RCP 72, *Code of Practice for the prevention and reduction of Ochratoxin A contamination in cocoa applied*.

Annex B (normative)

Summary composition of chocolate products

The requirements for the composition of chocolate products are summarized Table B.1.

Table 3 — Summary composition of chocolate products

Chocolate product	Constituents (% by Weight)						
	Cocoa butter	Fat-free cocoa solids	Total cocoa solids (dry)	Milk fat	Total milk solids (dry)	Total fat (cocoa butter and milk fat)	Sugar and other sweetening agents
Chocolate	≥18	≥14	≥35	— ^a	—	—	—
Sweet chocolate (or plain chocolate)	≥18	≥12	≥30	—	—	—	—
Milk chocolate	≥ 15	≥ 2.5	≥ 25	≥2.5	≥12	≥ 25	≤ 55
Chocolate coating or chocolate couverture	≥ 31	≥ 2.5	≥ 35	—	—	—	—
Milk chocolate coating or milk Chocolate couverture	≥ 25	≥ 2.5	≥ 25%	≥ 3.5	≥ 14	≥ 31	—
White chocolate	≥ 20	—	—	2.5	≥ 14	—	—
Dark	—	—	≥ 40	—	< 5	—	—
Extra dark	—	—	≥ 70	—	—	—	—
^a "—" denotes that the limit has not been specified in the table or it is unnecessary for the limit to be specified.							

Annex C
(informative)

Cadmium requirements for the European Union

The maximum limit for cadmium in Table D.1 is to take effect in the European Union (EU) January 1, 2019.

Table 4 — Maximum cadmium limits for the EU

Product	Cadmium maximum limits (mg/kg)
Milk chocolate with < 30 % total dry cocoa solids	0.1
Milk chocolates with ≥ 30 % total dry solids	0.3
Chocolates with < 50 % total dry cocoa solids	0.3
Chocolates with ≥ 50 % total dry solids	0.8
Cocoa powder sold to the final consumer or as an ingredient in sweetened cocoa powder sold to the final consumer	0.6

Annex D (normative)

Sampling for testing

D.1 Product sampling

D.1.1 Where a consignment consists of products known to come from different manufacturing batches, which can be separated, each batch shall constitute one lot. Packages that have been damaged or contaminated during handling, transport or storage shall be kept separate, and samples from such unsound material shall not be mixed with samples from sound packages.

D.1.2 Samples shall be drawn from the lot by simple random sampling. Samples may be drawn after the lot has been produced or while the lot is being produced.

D.1.3 The sample size for each lot shall be as outlined in Table E.1.

Table E.5 — Single sampling plan for normal inspection

Lot size (units)	Sample size (units)	Lot size (units)	Sample size (units)
2 to 8	2	501 to 1200	80
9 to 15	3	1201 to 3200	125
16 to 25	5	3201 to 10,000	200
26 to 50	8	10,001 to 35,000	315
51 to 90	13	35,001 to 150,000	500
91 to 150	20	150,001 to 500,000	800
151 to 280	32	500,001 and over	1250
281 to 500	50		

D.1.4 Sufficient material shall be taken from each of the packages selected to provide a bulk sample of between 150 g to 300 g of the chocolate or cocoa component of the product, and this shall be stored in a clean, dry, closed container labelled with relevant information.

D.1.5 A laboratory sample is prepared according to the method outlined in E.2.

D.1.6 In cases of dispute, the bulk sample, or the laboratory sample may be divided into three parts, one for each party and one for reference.

D.1.7 The sampling plan for microbiological contaminants shall comply with that in the Table 2.

D.2 Microbiological sampling

D.2.1 Microbiological sampling shall be carried out using either of two plans:

bbb) a two-class attributes or a present/absent plan where the microorganism of concern is not permitted to be present in the food sample; or

ccc) a three-class attributes plan, where the number of microorganisms in a unit-volume is allowable.

D.2.2 A comprehensive sampling plan shall include the following elements:

ddd) the microbe or group of microbes of concern or interest;

eee) number of samples to be tested (n);

fff) testing method;

ggg) microbiological limit consisting of either or both of the following;

- 1) a pre-set threshold concentration (m); and
- 2) a concentration in the sample above which the lot is automatically rejected as unacceptable (M);

hhh) maximum allowable number of samples that yielded unsatisfactory test results (c); and

iii) number of samples which fall into each category of microbiological limit (i.e. acceptable ($\leq m$) / marginal ($> m$ and $\leq M$) / unacceptable ($> M$)).

NOTE The presence/absence type of sampling plan is a special case of a two-class sampling plan. This type of sampling plan is appropriate when dealing with a pathogen which presents either a "severe direct" threat to health or one which presents a moderate threat coupled with potential for extensive spread. In general, a two-class sampling plan is defined in terms of the number of samples "n" to be taken from a given lot, the sample size and a threshold concentration ('m') above which a sample is considered to be marginally unacceptable. In a presence/absence type of sampling plan, the threshold concentration "m" is set to 0, therefore, only one microbiological limit "m". As a result two classes of attributes, $\leq m$ and $> m$, are identified. Samples with detectable pathogen result in rejection of the lot from which the samples are drawn, that is, where $> c$ of n samples are $> m$. The lot will be accepted where all samples are $\leq m$ or $\leq c$ of n samples are $> m$.

NOTE For pathogens presenting a lower threat to health, or for indicator organisms, a concentration-based sampling plan will reduce the likelihood of rejected lots without appreciably increasing health risk. This type of plan includes both two-class plans with a non-zero threshold, that is, where M is not defined and three-class plans, that is, where 'M' has been defined; three attributes are therefore identified, $\leq m$, $> m$ and M. The lot is accepted where $\leq c$ of n samples are within $> m$ and $\leq M$ or all samples are $\leq m$. The lot is rejected where $> c$ of n samples are within $> m$ and $< M$ or any sample is $> M$ or both.

D.3 Treatment of samples

D.3.1 Powdered Cocoa Products

Mix the sample thoroughly and store in well-closed bottles or metal containers, properly labelled.

D.3.2 Chocolate Products

D.2.2.1 The chocolate, which shall not contain added solid ingredients such as fruits, nuts candy, fillings, is chilled until it is hard ($5 - 10^{\circ}\text{C}$), and grated or shaved. The particles are mixed thoroughly and stored in well-closed, properly labelled bottles or metal containers.

D.2.2.2 In the alternative method, the sample shall be melted by placing it in a suitable container, which is partly immersed in a water-bath at about 50°C . The sample is stirred frequently until it has melted and is at $40-50^{\circ}\text{C}$. The container is removed from the bath, stirred, and some of the liquid is taken out for analysis, using a metal or glass tube (about 4 - 10 mm in diameter, fitted with a plunger or a disposable plastic syringe. Ensure that solid ingredients are not taken into the tube or syringe.

Annex E (normative)

Test methods for compliance with cocoa and chocolate products requirements

This Annex provides test methods, outlined in Table F.1, for determining compliance to the various requirements of this standard. The most updated version of the methods shall be used. Any alternate test method shall be acceptable to the national competent authority

Table 6 —Test methods for compliance to this standard

No.	Product	Provision	Test Method	Description
1	Cocoa bean, cocoa mass, cocoa powder	Determination of moisture content	IOCCC 26-1988 IOCCC 1-1952 or AOAC 931.04 AOAC 930:15 or AOAC 977.10	- Gravimetric method - Dean and Stark method - Karl-Fischer method
2	Chocolate, chocolate products	Determination of cocoa butter	AOAC 963.15 or IOCCC 14-1972	Gravimetry (Soxhlet extraction)
3	Chocolate and chocolate products	Determination of non-cocoa butter vegetable fat	ISO 11053:2009 J. Amer. Oil Chem. Soc. (1980), 57, 286-293 J. Amer. Oil Chem. Soc. (1982), 61 (3), 576-581 (where non-cocoa butter vegetable fat is unknown)	High Resolution Capillary gas chromatography Gas chromatography
4	Cocoa (Cacao) Mass or Cocoa/Chocolate Liquor, and Cocoa Cake	Determination of cocoa shell	AOAC 968.10 AOAC 970.23.	- Spiral Vessel Count - Stone Cell and Group Count
5	Cocoa and chocolate products	Determination of total fat (cocoa butter)	AOAC 963.15 or	Gravimetry (soxhlet extraction)

No.	Product	Provision	Test Method	Description
			IOCCC/CAOBISC O 14-1972	Hydrolysis
6	Cocoa and chocolate products	Determination of fat-free cocoa solid	AOAC 931.05	Oven evaporation and factor
7	Cocoa and chocolate products, cocoa butter	Determination of free fatty acids in cocoa butter	IUPAC (1987) 2.201 or ISO 660: 1996 amended 2003 or AOCS Cd 3d-63 (03)	Titrimetry
8	Cocoa butter	Oilseed residues -- Determination of total residual hexane	ISO 8892:1987	Gas Chromatography
9	Cocoa and chocolate products, cocoa butter	Determination of unsaponifiable matter in cocoa butter	IUPAC (1987) 2.401 or ISO 3596:2000 ISO 18609: 2000; or AOCS Ca 6b-53 (01)	Titrimetry after extraction with diethylether
10	Chocolate products	Quantification of cocoa butter equivalents	ISO 23275-2	High Resolution Capillary Gas Chromatography
11	Chocolate products	Determination of centre and coating of filled chocolate	—	All methods approved for the chocolate type used for the coating and those approved for the type of centre concerned.
12	Cocoa and chocolate products	Determination of total ash	AOAC 972.15.	Incineration (dry ashing)
13	Cocoa and chocolate products	Determination of the water-insoluble, water-soluble and acid-insoluble ash	IOCCC/CAOBISC O 25-1998	—

No.	Product	Provision	Test Method	Description
14	Cocoa and chocolate products	Determination of fat-free milk solids	IOCCC/CAOBISC O 17-1973 or AOAC 939.02	• Titrimetry, kjeldahl digestion, after extraction of milk proteins
15	Cocoa and chocolate products	Determination of milk fat	IOCCC/CABISCO 5-1962 or AOAC 945.34 AOAC 925.41b AOAC 920.80	Titrimetry/ Distillation
16	Cocoa and chocolate products	Determination of sugars	AOAC 980.13	Liquid Chromatography
17	Cocoa powder	Determination of Cocoa Powder Fineness (75 micron sieve)	IOCCC/CAOBISC O 11(1970)	• Wet Sieving
18	Coarse-ground chocolate	Determination of particle size	–	• Micrometer and modifications. • Microscope, including computer scanning. • Sedimentation. • Electronic counting, Coulter counter, laser diffraction
19	Cocoa and chocolate products	Determination of arsenic	AOAC 952.13 AOAC 986.15 or ISO 17239 or ISO 6634	• Atomic Absorption Spectrophotometry • Colorimetry
20	Cocoa and chocolate products	Determination of copper	AOAC 971.20 or AOAC 960.40	• Atomic Absorption Spectrophotometry • Colorimetry

No.	Product	Provision	Test Method	Description
21	Cocoa and chocolate products	Determination of lead	AOAC 982:23 AOAC 986.15 AOAC 934:07 AOAC 999:10 AOAC 999:11 or ISO 6633	- Atomic Absorption Spectrophotometry - Colorimetry
22	Cocoa and chocolate products	Determination of cadmium	AOAC 945.58 AOAC 973.34 AOAC 982.23 AOAC 986.15 AOAC 999.11 AOAC 999.10 or ISO 6561-1 or ISO 6561-2	- Dithizone method-spectroscopy - Atomic Absorption Spectrophotometry - Inductively Coupled Plasma
23	Cocoa and chocolate products	Determination of Zn	AOAC 974.27 AOAC 999.10 AOAC 986.15 AOAC 999.11 ISO 6636-2 ISO 6636-1	- Atomic Absorption Spectrophotometry - Polarographic
24	Cocoa and chocolate products	Enumeration of yeasts and moulds	ISO 21527-2 Joint FAO/WHO Expert Committee on Food Additives. Combined Compendium of Food Additive Specifications, Volume 4 – Analytical methods, test procedures and laboratory solutions used by and referenced in the food additive specifications.	Colony count

No.	Product	Provision	Test Method	Description
25	Cocoa and chocolate products	Detection, enumeration and serotyping of Salmonella	ISO 6579-1 Joint FAO/WHO Expert Committee on Food Additives. Combined Compendium of Food Additive Specifications, Volume 4 – Analytical methods, test procedures and laboratory solutions used by and referenced in the food additive specifications. ISO/TS 6579-2	- Microbiological culture - mini-MSRV MPN
26	Cocoa and chocolate products	Enumeration of coliforms Detection and enumeration of coliforms	ISO 4832 Joint FAO/WHO Expert Committee on Food Additives. Combined Compendium of Food Additive Specifications, Volume 4 – Analytical methods, test procedures and laboratory solutions used by and referenced in the food additive specifications. ISO 4831 Joint FAO/WHO Expert Committee on Food Additives. Combined Compendium of Food Additive Specifications, Volume 4 –	- Colony count - Most probable number (MPN)

No.	Product	Provision	Test Method	Description
			Analytical methods, test procedures and laboratory solutions used by and referenced in the food additive specifications.	

NOTE 1 Alternatives or additional test methods may be used as considered acceptable by the National Competent Authority.

NOTE 2 The test methods are based on references inclusive of:

jjj) CODEX-STAN 87-1981 (Rev. 1 – 2003, Amd 2016), Chocolate and Chocolate Products

kkk) CODEX STAN 234-19991 (Amended 2007), recommended methods of analysis and sampling; and

lll) Joint FAO/WHO Expert Committee on Food Additives. Combined Compendium of Food Additive Specifications, Volume 4 – Analytical methods, test procedures and laboratory solutions used by and referenced in the food additive specifications. Food and Agriculture Organization of the United Nations, Rome.

mmm) European Union Reference Laboratory for Heavy Metals in Feed and Food (EURL). October 2012. Official methods for the determination of heavy metals in feed and food.

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CARICOM REGIONAL ORGANISATION FOR STANDARDS AND QUALITY

The CARICOM Regional Organisation for Standards and Quality (CROSQ) was created as an Inter-Governmental Organisation by the signing of an agreement among fourteen Member States of the Caribbean Community (CARICOM). CROSQ is the regional centre for promoting efficiency and competitive production in goods and services, through the process of standardization and the verification of quality. It is the successor to the Caribbean Common Market Standards Council (CCMSC), and supports the CARICOM mandate in the expansion of intra-regional and extra-regional trade in goods and services.

CROSQ is mandated to represent the interest of the region in international and hemispheric standards work, to promote the harmonization of metrology systems and standards, and to increase the pace of development of regional standards for the sustainable production of goods and services in the CARICOM Single Market and Economy (CSME), and the enhancement of social and economic development.

CROSQ VISION:

The leader for the development, implementation and promotion of the Regional Quality Infrastructure (RQI)

CROSQ MISSION:

To facilitate trade and competitiveness of CARICOM products and services for sustainable development through implementation of the RQI.



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