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**DRAFT BELIZE STANDARD
SPECIFICATION FOR WHEAT FLOUR**

Committee Representation

The preparation of this standard for the Standards Advisory Council established under the Standards Act 1992 was carried out under the supervision of the Bureau's Technical Committee for Processed Foods, which at the time comprised the following members:

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DRAFT BELIZE STANDARD SPECIFICATION FOR WHEAT FLOUR

0 FOREWORD

- 0.1 This standard sets out the requirements for wheat flour and describes the methods of sampling and testing that should be used. Wheat flour is now manufactured in Belize. Wheat flour is an important nutritional input in domestic cookery, institutional and/or commercial baking. It provides for an agreed and acceptable level of identity, purity, quality, acceptability, and nutrient value for consumers.
- 0.2 This standard has been adapted from the CARICOM Regional Standard – Processed Foods - Wheat Flour – Specification (CRS 64: 2020).
- 0.3 This standard is also intended to establish best practices in relation to packaging and labeling ensuring pre-packaged wheat flour at the point of production, avoiding re-packaging at retail sale.
- 0.4 This standard will be reviewed and may be revised from time to time to allow for changes in manufacturing technology or consumer preferences in Belize.
- 0.5 In view of the recent decisions in the FAO/WHO Codex Alimentarius/World Food Standards Programme, the use of potassium bromate as a food additive in wheat flour is not permitted by this standard.

1 SCOPE

- 1.1 This standard applies to wheat flour for human consumption prepared from *Triticum aestivum* L. (common wheat) or *Triticum compactum* Host, (club wheat) or mixtures thereof, and includes “self-rising flour”, which is prepackaged for sale.
- 1.2 It does not apply to:
 - a) any product made from durum wheat (hard wheat, *Triticum durum* desf), singly or in combination with other wheat;
 - b) whole meal, whole wheat flour or semolines, farina milled from common wheat, *Triticum aestivum* L., *Triticum compactum* Host., or mixtures thereof or wheat flour to be used in brewing, for the production of starch or gluten, or for non-food industrial use;
 - c) wheat flour in which the protein content has been reduced; and
 - d) wheat flour after the milling process which has been subjected to special treatments other than bleaching or drying and or to which

have been added other ingredients than those mentioned in Clause 5.3 and Clause 6.

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.

2.1 Belize Standards (BZS)

- a) Belize Standard for Labelling Part 3: Labelling of Prepackaged Foods

2.2 Cereals and Grains Association (AACC International)

- a) AACC International Approved Methods 42-11/42-11.01, Aerobic Plate Count
- b) AACC International Approved Methods 42-15/42-15.01, Coliform-Escherichia coli
- c) AACC International Approved Methods 42-25B/42-25.03, Salmonella Bacteria
- d) AACC International Approved Methods 42-30B/42-30.03, Enumeration of Staphylococcus aureus
- e) AACC International Approved Methods 42-50/42-50.01, Mould and Yeast Counts

2.3 Association of Official Analytical Collaboration (AOAC International)

- a) AOAC Official Method 942.23, Thiamine (Vitamin B1) in Human and Pet Foods
- b) AOAC Official Method 944.02, Iron in Flour Spectrophotometric Method Final Action
- c) AOAC Official Method 944.03, Calcium in Flour titrimetric Method First Action
- d) AOAC Official Method 961.14, Niacin and Niacin amide in Drugs, Foods and Feed
- e) AOAC Official Method 970.65, Riboflavin (Vitamin B2) in Foods and Vitamin Pr.

- f) AOAC Official Method 986.15, Arsenic, Cadmium, lead, Selenium and Zinc
- g) AOAC Official Method 986.32/990.12, Aerobic Plate Count in Foods
- h) AOAC Official Method 990.11/991.14, Coliform and Escherichia coli counts in food
- i) AOAC Official Method 2000.06/998.09, Salmonella in foods
- j) AOAC Official Method 995.21/997.02, Yeast and Mould Counts in foods
- k) AOAC Official Method 975.55/987.09/2001.05/2003.07, Staphylococcus aureus in foods

2.4 US Food and Drug Administration (FDA) - Bacteriological Analytical Method (BAM)

- a) Bacteriological Analytical Manual Chapter 3, Aerobic Plate Count
- b) Bacteriological Analytical Manual Chapter 4, Enumeration of Escherichia Coli and the Coliform Bacteria
- c) Bacteriological Analytical Manual Chapter 5, Salmonella
- d) Bacteriological Analytical Manual Chapter 12, Staphylococcus aureus
- e) Bacteriological Analytical Manual Chapter 18, Yeast, Molds and Mycotoxins

2.5 CODEX Alimentarius Commission (CAC)

- a) CODEX STAN 192, General Standard for food additives
- b) CAC/GL 50, General guidelines on Sampling
- c) CXS 193-1995, General Standard for contaminants and Toxins in Food and Feed

2.6 International Organisation for Standardisation (ISO)

- a) ISO 712, Cereals and cereal products- Determination of moisture content-Reference method
- b) ISO 1871, Food and feed products-General guidelines for the determination of nitrogen by the Kjeldahl method

- c) ISO 2171, Cereals, pulses, and dry products- Determination of ash yield by incineration
- d) ISO 16050, Foodstuffs- Determination of aflatoxin B1 and the total content of aflatoxins B1, B2, G1 and G2 in cereals, nuts and derived products-High performance liquid chromatographic method
- e) ISO 24333, Cereal and cereal products

3 TERMS AND DEFINITIONS

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

- 3.1 **enriched wheat flour** means wheat flour containing vitamins and iron, in the proportions specified in Table 2.

NOTE: Where there is a significant nutritional deficiency of calcium, calcium may be added within the limits specified in Table 2.

- 3.3 **food additive** means any substance, the use of which results in it or its by-products becoming a part of or affecting the characteristics of the flour.

- 3.4 **self-rising flour** means flour containing more than 0.4% available carbon dioxide.

- 3.4 **type**, in reference to flour, means a description of the end use for which it is recommended, such as “bread”, “cake”, “pastry”, “cookie”, “biscuit”, “general purpose”, or “all purpose”.

- 3.5 **wheat flour** means the product prepared from grains of common wheat (*Triticum aestivum* L.) or club wheat (*T.compactum* Host.) or mixtures of these two species by grinding or milling processes in which the bran and germ are partly removed and the rest of the grain is comminuted to a suitable degree of fineness and which may contain any of the ingredients and food additives listed in Clauses 5.4 and 6.

4 GENERAL REQUIREMENTS

- 4.1 The wheat from which the flour is milled shall be free from any objectionable matter; be of sound and marketable quality; and complies with Good Agricultural Practices (GAPs).
- 4.2 Any added ingredient shall be of food grade quality.
- 4.3 Food additives shall conform to the specifications of the ‘CODEX STAN 192, General Standard for Food Additives (See section 6).

- 4.4 All processing in the mill, including drying and milling of the wheat; handling of the intermediate products and other treatments of the wheat flour, shall be done so that there are minimal adverse effects on the nutritional value and useful technological characteristics of the flour.
- 4.5 The particle size of wheat flour should be such that not less than 98% by mass of the flour will pass a 212-micron (No. 70) sieve.

5 SPECIFIC REQUIREMENTS

- 5.1 Wheat flour shall conform to the requirements of Table 1 and 2:

Table 1: Specific requirements for wheat flour on a dry matter basis

Characteristic	Requirement	Method of test
Moisture	14.5% max.	ISO 712
Ash, before adding inorganic matter	1.2% max	ISO 2171, AOAC 923.03
Protein (N x 5.7)	7.0% min.	Appendix C

NOTE: If the listed methods of tests are unavailable, other internationally recognized test methods can be used.

Table 2: Specific requirements of protein and ash content for types of flour

Type of Flour	Protein Content*	Ash Content*
All purpose, General Purpose	10.5 to 12.0 %	up to 0.7%
Biscuit	8.0 to 9.0 %	up to 0.45 %
Bread	12.0 to 13.5 %	up to 0.75 %
Cake, Pastry	7.0 to 10.0 %	up to 0.45 %
Whole Wheat Flour	12.0 to 14.5 %	1.3 to 1.9 %
*Refers to 14% Moisture Basis		

5.2 Requirements for Nutrients and Minerals

The vitamins and minerals mentioned in Table 3 shall be present in wheat flour within the specified limits.

Table 3: Limits of vitamins and minerals in wheat flour

Substances	Requirements		Method of test
	Minimum mg/100g	Maximum mg/100g	

Thiamin	0.44	0.77	AOAC Official Method 942.23
Riboflavin	0.25	0.48	AOAC Official Method 970.65
Niacin, Niacinamide	3.5	6.5	AOAC Official Method 961.14
Iron	2.8	5.5	AOAC Official Method 944.02
Calcium (optional)	105	145	AOAC Official Method 944.03
Folic Acid (optional)	0.12	0.18	None defined

5.3 Wheat flour may contain the following ingredients in amounts necessary for technological purposes:

- a) malted wheat flour;
- b) malted barley flour;
- c) malted rye flour;
- d) wheat gluten;
- e) soya bean flour;
- f) legume flour;
- g) the following enzymes:
 - i. amylase;
 - ii. bromelain;
 - iii. glucoamylase;
 - iv. lactase;
 - v. lipoxidase;
 - vi. protease;
 - vii. glucose oxidase
 - viii. lipase; and
 - ix. xylanase.
- h) L-cysteine, as hydrochloride, not more than 90 ppm;
- i) calcium carbonate, calcium sulphate, ground limestone, ground chalk, in amounts needed to conform to the requirements of Table 2 for calcium (if added);
- j) ascorbic acid, not more than 300 ppm (mg/kg); and
- k) monocalcium phosphate, not more than 2500 ppm.

5.4 Self-rising flour shall contain no more than 0.4% of available carbon dioxide.

6 FOOD ADDITIVES WHICH MAY BE USED

6.1 The following food additives may be used in wheat flour, within the limits specified or, where no limits are stated, in accordance with Good Manufacturing Practices (GMPs):

- a) benzoyl peroxide, not more than 75 ppm (mg/kg) (combined with not more than 900 ppm of one or more of the following as carriers: calcium carbonate, calcium sulphate, dicalcium or tricalcium phosphate, magnesium carbonate, starch, potassium or sodium aluminum sulphate)
- b) chlorine, not more than 2,500 mg/kg (ppm);
- c) lecithin, not more than 2000 mg/kg (ppm); and
- d) sulphur dioxide (in flours intended for use in making biscuits or pastry), not more than 200 mg/kg (ppm).

7 HEAVY METALS

Wheat flour shall not contain the following heavy metals in amounts that exceed the limits as specified in Table 4 below:

Table 4: Maximum limits of heavy metals in wheat flour

Element	Maximum Limit ppm
Arsenic (As)	1
Copper (Cu)	20
Lead (Pb)	2
Zinc (Zn)	50

8 PESTICIDES RESIDUES

Where wheat grain used in the production of wheat flour is fumigated to destroy or control infestations by insects, mites, moulds or rodents, the residues of pesticides in the flour shall not exceed those maximum pesticide residue limits established by the CODEX Alimentarius Commission (CF 1211 – Wheat Flour) for pesticides as per Table 5 below:

Table 5: Maximum pesticide residue limits in wheat flour

Pesticide	Maximum Residue Limit (MRL) (mg/kg)
Sulfuryl fluoride	0.1

Piperonyl Butoxide	10
Permethrin	0.5
Methomyl	0.03
Malathion	0.2
Imidacloprid	0.03
Dichlorvos	0.7
Deltamethrin	0.3
Carbaryl	0.2

9 MYCOTOXIN REQUIREMENTS

Wheat flour shall comply with those maximum mycotoxin limits established by the CODEX Alimentarius Commission for this commodity. In particular, total aflatoxin levels in wheat grains for human consumption shall not exceed 20µg/kg (ppb) with B1 not exceeding 5µg/kg (ppb) when tested according to ISO 16050. Also vomitoxin, also called deoxynivalenol (DON), shall not exceed 1 mg/kg in accordance with the General Standard for contaminants and Toxins in Food and Feed, CXS 193-1995.

10 MICROBIOLOGICAL REQUIREMENTS

Wheat flour shall be free from any pathogenic microorganisms and shall comply with the microbiological limits in Table 4 when tested with the methods approved by the relevant authority

Table 6: Microbiological limits and test methods

Microorganism	Maximum limits amt. /g	AOAC Official Method	AACC International Approved Method	FDA BAM
Total Aerobic Plate Count (per g)	10 ⁵	986.32/ 990.12	42-11/42-11.01	Chapter 3
<i>Escherichia coli</i> (per g <10)	Not detectable	990.11/ 991.14	42-15/42-15.01	Chapter 4
Salmonella (per 25g)	Not detectable	2000.06/ 998.09	42-25B/42-25.03	Chapter 5
Yeast and Moulds (per g)	10 ⁴	995.21/ 997.02	42-50/42-50.01	Chapter 18
<i>Staphylococcus aureus</i> (per 25g)	Not detectable	975.55/ 987.09/ 2001.05 / 2003.07	42-30B/42-30.03	Chapter 12

11 FOOD HYGIENE REQUIREMENTS

Wheat flour shall be processed in accordance with GMPs; shall be free from any objectionable matter, micro-organisms and any substances originating from micro-organisms, dirt and filth, rodent contamination and foreign matter in amounts that may reasonably be considered to represent a hazard to health.

12 PACKAGING REQUIREMENTS

- 12.1 Wheat flour shall be pre-packaged in containers at the point of production, which will safeguard the hygienic, nutritional, and technological characteristics of the flour, and protect it against contamination or absorption of moisture. Re-packaging of wheat flour at retail level shall not be permitted.
- 12.2 Containers/Packaging shall be food grade and made of materials which are safe and suitable for the purpose. Examples such as not limited to bags or sacks of new cotton cloth, multi-wallpaper, strong paper, polypropylene film/fibre or new plastic film.
- 12.3 Containers shall not contaminate the product by migration of any toxic substance or give the flour any undesirable odour or flavour.

13 LABELLING REQUIREMENTS

- 13.1 Labelling shall be done in accordance with latest version of the Belize Standard for Labelling Part 3: Labelling of Pre-packaged Foods. In the case of bulk flour, this will be accompanied with standard of identity mutually agreed on by the parties involved and meeting applicable legal requirements of traceability.
- 13.2 The labelling on retail packages of flour shall be clearly and prominently displayed and readily legible under customary conditions of purchase and use.
- 13.3 The information carried on the label shall include:
 - a) the name of the food, “flour”, “wheat flour” or “white flour;”
 - b) any brand name or trade name;
 - c) storage instructions prominently displayed; and
 - d) allergen declaration
- 13.4 Where an indication of the type of flour is included on the label, the protein and ash contents of the flour shall be within the limits set out in Table 2.
- 13.5 Safe handling instructions and instructions for use may also be included on the label.

14 METHODS OF SAMPLING

Sampling shall be done in accordance with the latest version of the ISO 24333 Cereals and cereal products- Sampling or the CAC/GL 50, Codex Standard - General Guidelines on Sampling.

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