

1 Foreword

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3 The Philippine National Standard (PNS) for Corn (maize) grits (*Zea mays* Linn.) –
4 Grading & classification (PNS/BAFPS 15:2004) was developed to provide uniform
5 guidance on the classification of corn grits based on their physical characteristics and
6 current practices existing in the sectors concerned. It includes sections on the essential
7 composition and quality factors, classification and grading, sampling and methods of
8 analysis, determination of moisture content, packing, marking, contaminants and
9 hygiene.

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11 In 2017, the Bureau of Agriculture and Fisheries Standards (BAFS) took the initiative to
12 review and revise the Standard to account for results of recent studies and advances on
13 the grading and classification of corn grits. This revision is in accordance with the
14 protocol of the Bureau's Standards Development Division (SDD) to review and, if
15 applicable, revise standards every two years, especially those that pose risk to
16 consumer safety and health. A Technical Working Group (TWG) for the revision of the
17 Standard was created and authorized under Special Order Nos. 301 and 814 Series of
18 2017. The TWG was composed of the following agencies and institutions: National Food
19 Authority, National Food Authority – Food Development Center, Department of
20 Agriculture Corn Program, Philippine Center for Postharvest Development and
21 Mechanization, University of the Philippines Los Baños, National Corn Competitiveness
22 Group, Inc., and Philippine Maize Federation Inc.

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24 This document was drafted in accordance with the editorial rules of the BPS Directives,
25 Part 3.

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27 This Standard cancels and repeals PNS/BAFPS 15:2004.

1 Scope

This standard applies to corn grits for direct human consumption milled from kernels of corn, also known as maize, *Zea mays* L.

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.

PNS/BAFS 15:2004, *Corn (maize) grits (Zea mays* Linn.) – *Grading & classification*

3 Terms and definitions

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

3.1**afatoxin**

group of highly poisonous and carcinogenic compounds which are produced by strains of the fungi, *Aspergillus flavus* and *Aspergillus parasiticus* on suitable substrate such as corn, peanuts, copra, and other oilseeds, cassava, etc.

3.2**corn grits**

milled corn grains where the outer covering (pericarp) and germ (embryo) have been removed leaving only the endosperm that passed through different sieve sizes

3.2.1**corn grits No. 10**

corn grits with particle size from 1.69 mm to 2.00 mm which passed through US Sieve No. 10 but are retained in US Sieve No. 12

3.2.2**corn grits No. 12**

corn grits with particle size from 1.42 mm to 1.68 mm which passed through US Sieve No. 12 but are retained in US Sieve No. 14

3.2.3**corn grits No.14**

corn grits with particle size from 1.20 mm to 1.41 mm which passed through US Sieve No. 14 but are retained in US Sieve No. 16

3.2.4**corn grits no. 16**

corn grits with particle size from 1.01 mm to 1.19 mm which passed through US Sieve No. 16 but are retained in US Sieve No. 18

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corn grits No. 18

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corn grits with particle size from 0.842 mm to 1.00 mm which passed through US

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Sieve No. 18 but are retained in US Sieve No. 20

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discolored grits

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corn grits which are materially discolored and damaged by external heat or

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filth

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impurities of animal origin (including dead insects)

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foreign matter

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all matters other than corn grits such as sand, gravel, dirt, pebbles, stones, lumps of

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earth, clay, mud, chaff, straw, and seeds of other crops

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4 Essential composition and quality factors

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4.1 Odor

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100 Corn grits shall have the characteristic odor of corn and shall not have any abnormal or

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foreign odor.

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4.2 Color

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Corn grits shall reasonably be in uniform color according to type.

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4.3 Moisture content

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Water content of corn grits, expressed in percent wet basis as received.

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5 Classification

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Corn grits shall be classified according to type.

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5.1 White corn grits

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White corn grits with not more than the permitted percentage of corn grits of other

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colors as indicated in the quality grade requirement for corn grits. A slight tinge of color

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other than white shall not affect their classification as white corn grits.

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5.2 Yellow corn grits

Yellow corn grits which with not more than the permitted percentage of corn grits of other colors as indicated in the quality grade requirement for corn grits. A slight tinge of color other than yellow shall not affect their classification as yellow corn grits.

5.3 Mixed corn grits

Consist of corn grits of various colors that do not meet the color requirements for either white or yellow corn grits.

5.4 Pigmented corn grits

Consist of corn grits of various colors (e.g., purple, red, brown, blue, black).

6 Grading

Corn grits shall conform to the quality grade requirements specified in Table 1.

Table 1 – Quality grade requirements of corn grits

Grade factors, % by weight maximum	Grade				
	Premium grade	Grade no. 1	Grade no. 2	Grade no. 3	Grade no. 4
Moisture content	14.00	14.00	14.00	14.00	14.00
Aflatoxin (food), µg/kg	20	20	20	20	20
Filth	0.1	0.1	0.1	0.1	0.1
Discolored grits	Trace	0.50	1.00	2.00	3.00
Foreign matter	Trace	0.50	0.80	1.00	2.00
Grits of other color ^a	Trace	0.50	1.50	3.00	5.00
Grits of other sizes	1.00	4.00	7.00	10.00	13.00

^a Does not apply to pigmented corn grits

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7 Sampling and methods of analysis

Sampling method to be used for ascertaining conformance to the requirements of this specification shall be in accordance with the established procedures of the competent authority.

Sampling should be done by classifiers or quality assurance personnel deputized by the competent authority.

8 Determination of moisture content

The moisture content of the grains shall be determined using verified and properly adjusted moisture meters.

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9 Packaging

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163 Corn grits shall be directly packed in polyethylene bag before placing inside
164 polypropylene bag or any appropriate container to protect them from contamination.
165 Corn grits shall be properly packed in 1, 2, 5, 10, or 25 kg packing size to facilitate
166 handling and transport.

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10 Labeling

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170 **10.1** Each container shall have a label or legible characters grouped on the same side,
171 stamped in indelible ink to provide the following:

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173 **10.1.1** Name and type of the product;

174 **10.1.2** Grade and grits size;

175 **10.1.3** Net weight in kilograms;

176 **10.1.4** Name and address of miller, packer, or distributor;

177 **10.1.5** Date of milling;

178 **10.1.6** Moisture content; and

179 **10.1.7** Lot or batch no.

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181 **10.2** The label may also have the following optional information:

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183 **10.2.1** Storability depending on packaging material (e.g., best consumed before [date] if
184 vacuum packed, or [date] if not vacuum packed)

185 **10.2.2** Nutrition information (e.g., protein, fat, carbohydrates, minerals, vitamins,
186 dietary fiber)

187 **10.2.3** Functionality (e.g., antioxidant capacity, glycemic index)

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11 Contaminants

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11.1 Mycotoxins

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193 Corn grits shall not contain more than 20 µg/kg aflatoxin.

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11.2 Heavy metals

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197 Corn grits shall comply with those maximum levels for heavy metals established by the
198 Codex Alimentarius Commission for this commodity.

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11.3 Live insects

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202 Corn grits shall be free of any live stored grain pest.

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11.4 Pesticide residues

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206 Corn grits shall comply with those maximum residue limits established by the Codex
207 Alimentarius Commission for this commodity.

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209 **12 Hygiene**

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211 Corn grits shall be prepared and handled in accordance with appropriate sections of the
212 Recommended International Code of Practice - General Principles of Food Hygiene
213 (CAC/RCP 1-1969, Rev. 2003) and other relevant Codex texts and PNS such as the PNS
214 Code of Hygienic Practice for the Processing and Handling of Corn Grits (PNS/BAFS
215 142:XXXX).

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220**Annex A**
(informative)**US sieve size equivalents**

US sieve size	Tyler equivalent	Opening	
		mm	in
-	2 ½ Mesh	8.00	0.312
-	3 Mesh	6.73	0.265
No. 3 ½	3 ½ Mesh	5.66	0.233
No. 4	4 Mesh	4.76	0.187
No. 5	5 Mesh	4.00	0.157
No. 6	6 Mesh	3.36	0.132
No. 7	7 Mesh	2.83	0.111
No. 8	8 Mesh	2.38	0.0937
No. 10	9 Mesh	2.00	0.0787
No. 12	10 Mesh	1.68	0.0661
No. 14	12 Mesh	1.41	0.0555
No. 16	14 Mesh	1.19	0.0469
No. 18	16 Mesh	1.00	0.0394
No. 20	20 Mesh	0.841	0.0331
No. 25	24 Mesh	0.707	0.0278
No. 30	28 Mesh	0.595	0.0234
No. 35	32 Mesh	0.500	0.0197
No. 40	35 Mesh	0.420	0.0165
No. 45	42 Mesh	0.354	0.0139
No. 50	48 Mesh	0.297	0.0117
No. 60	60 Mesh	0.250	0.0098
No. 70	65 Mesh	0.210	0.0083

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222 Bibliography

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224 CAC/RCP 1-1969 (Rev. 2003), *General Principles of Food Hygiene*

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226 Codex Alimentarius Volume 2. (1993). *Pesticide residues in food*, 2nd ed.

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228 Codex Alimentarius Volume 7. (1996). *Cereals, pulses, legumes and derived products and
229 vegetable proteins, volume 7*, 2nd ed.

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231 National Food Authority. (2002). *Primer on Philippine Grains Standardization Program*.

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233 PNS/BAFS 142:XXXX, *Code of hygienic practice for the processing and handling of corn
234 grits*