World Food Programme

Technical Specifications for:

BARLEY

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Key updates:
- Update of fire-burnt and heated, rotted and severely mildew requirements
- Inclusion on requirement for mycotoxin and heavy metals.

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1. Introduction

Product name (hereafter called the product):

Barley

General description:

This specification applies to the product obtained from varieties of the species Hordeum vulgare L. and distributed generically by WFP.

Definitions and other introductory details:

- BROKEN GRAINS: grains that are less than three-quarters of a whole grain and grains with the germ end broken off.
- FIREBURNT GRAINS: charred or scorched by fire. A cross-section of a fireburnt grain resembles charcoal with numerous air holes. The air holes result in a low weight grain which crumbles easily under pressure.
- FROST: for varieties with hulls—frost-damaged grains have distinctly indented backs, and usually a loose hull. Grains with a light wrinkling from frost are not considered frost-damaged.
For hulless varieties—frost-damaged grains have severe wrinkling and translucent endosperms.
- HEATED GRAINS: have the colour or odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. The hull over the germ of the heated grains often appears discoloured, usually to a golden brown.
- ROTTED GRAINS: are discoloured, swollen, soft and spongy as a result of decomposition by fungi or bacteria. Consider rotted grains in combination with severely mildewed and heated.
- MILDEW: is a fungal condition that develops in unthreshed grain usually under conditions of excessive moisture. The affected grains are grayish in colour and lower in quality. In the evaluation of mildew, consider the number of affected kernels and their severity.
- SEVERE MILDEW: refers to grains that are severely blackened by mildew. See Mildew. Consider severe mildew in combination with rotted and heated grains.
- SPROUTED GRAINS: show definite signs of germination.
- ERGOT: is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.
- INSEPARABLE SEEDS: are those not removed by the cleaning process, usually large seeds including grains other than cereal grains, such as peas, beans, corn, flaxseed and domestic buckwheat.
- OTHER CEREAL GRAIN: include wheat, rye, oats or triticale remaining in the cleaned sample. For grading purposes, spelt and Kamut® are considered as other cereal grains in samples of barley.
- SCLEROTINIA SCLEROTIORUM: fungus producing hard masses of fungal tissue, called sclerotia. The sclerotia vary in

size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.
- STONES: hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight.
- TOTAL FOREIGN MATERIALS: includes Ergot, Excreta, Inseparable seeds, Other cereal grains, Sclerotinia and Stone.
- FILTH: impurities of animal origin, including dead insect.

The following aspects are as per contract:

- GMOs-related requirements
- Shelf-life
- Specific labelling requirements
- Specific product net weight
- Specific packaging type selected from options in applicable packaging specification only

2. Standards

Except when specified otherwise in the contract, the raw materials, the manufacture, testing, packaging and labelling, of the product shall be in strict compliance with the specifications set forth herein, and with the latest edition of the following standards/guidelines (whichever is stricter). Supplier shall not deviate in any way from the specifications without WFP's prior written consent.

Codex Texts can be found in the following webpages:

- Standards: https://www.fao.org/fao-who-codexalimentarius/codex-texts/list-standards/tr/;
- Codes of practice: https://www.fao.org/fao-who-codexalimentarius/codex-texts/codes-of-practice/en/;
- Guidelines: https://www.fao.org/fao-who-codexalimentarius/codex-texts/guidelines/tr/;
- Maximum Residue Limits (MRLs) and Extraneous Maximum Residue Limits (EMRLs) for pesticides: https://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/en/;
- Additionally, Guidelines of International Commission on Microbiological Specifications for Foods can be found here: https://www.icmsf.org/publications/books/.

Applicable Standards

- CODEX GENERAL PRINCIPLES OF FOOD HYGIENE (CXC 1-1969)
- CODEX GENERAL STANDARD FOR CONTAMINANTS AND TOXINS IN FOOD AND FEED (CXS 193-1995)
- CODEX MAXIMUM RESIDUE LIMITS (MRLs) AND CODEX EXTRANEOUS MAXIMUM RESIDUE LIMITS (EMRLs) FOR PESTICIDES
- RECOMMENDED METHODS OF SAMPLING FOR THE DETERMINATION OF PESTICIDE RESIDUES FOR COMPLIANCE WITH MRLS (CXG 33-1999)
- CODE OF PRACTICE FOR THE PREVENTION AND REDUCTION OF MYCOTOXIN CONTAMINATION IN CEREALS (CXC 51-2003)

3. Product Specifications

- The product’s organoleptic characteristics shall be characteristics of the designated product.
- The product shall meet the testing requirements stated in this document.
- Unless otherwise specified, the product quality shall be uniform and practically free of foreign materials, non-target grains/seeds (especially toxic seeds) and soil residues. This is typically accomplished using validated and maintained mechanical cleaning processes such as sieving, gravity separation, aspiration and others (as appropriate). Using of sorted waste materials and residuals resulting from cargo manipulation/cleaning, which can contain pockets of concentrated defective products, filth, and/or toxic seeds, is prohibited (e.g., tailings, sweepings, sorted wastes).
- The producer shall be authorized by competent governmental authorities to process products for human consumption and to export. The authorization of export is only required when the producer supplies WFP internationally.
- GMOs-related requirements shall be as per contract. When non-GMOs or GMOs-free requirements are made in the contract without specifying a maximum limit, the product is considered as acceptable if it contains, consists of or is produced from materials with traces of authorized GMOs in a proportion no higher than 0.9% (if the product is not

consisting of a single ingredient the limit shall be applied to each ingredient considered individually), provided that GMOs presence is adventitious or technically unavoidable, in accordance with Regulation (EC) No 1829/2003 (the latest version in force). Operators must be in a position to supply evidence to satisfy the competent authorities that they have taken appropriate steps to avoid the presence of such material. The EU register of authorised GMOs is available at https://webgate.ec.europa.eu/dyna2/gm-register/.

4. Product Safety

- The product shall not contain any harmful substances including, but not limited to, micro-organisms, heavy metals, pesticides, mycotoxin, foreign matter or anti-nutritional factors, in amounts that may represent a hazard to health. Where there is no applicable standard available, The Joint FAO/WHO Expert Committee on Food Additives (JECFA) and The European Food Safety Authority (EFSA) evaluations shall be considered for guidance limits.
- Fit for human consumption guarantee: Suppliers shall manage the quality of their product and guarantee that the product is 'fit for human consumption' and in line with TIC Council/IFIA Guidelines*.
- The product shall comply strictly with Codex General Standard for Contaminants and Toxins in Food and Feed (CXS 193-1995), Codex Maximum Residue Limits (MRLs) and Codex Extraneous Maximum Residue Limits (EMRLs) for Pesticides and Guidelines of International Commission on Microbiological Specifications for Foods**.
- The product shall be free from toxic or noxious seeds in amounts which may represent a hazard to human health. This includes Crotolaria (Crotalaria spp.), Corn cockle (Agrostemma githago L.), Castor bean (Ricinus communis L.), Jimson weed (Datura spp.), and other seeds that are commonly recognized as harmful to health. A non-exhaustive list of these seeds can be found in ISO 7970.

Link of references mentioned above:
*http://www.ifia-federation.org/content/wp-content/uploads/Fit_for_Human_Consumption_Bulletin_Rev_4.pdf.
**https://www.icmsf.org/publications/books/.

5. Shelf-life

- When shelf life is requested in the contract, products shall have a minimum of 80% of shelf-life remaining when presented to WFP for inspection, unless otherwise authorized by WFP.

Shelf-life duration: n/a months

6. Packaging and Marking

When a WFP contract requires break-bulk delivery and/or empty packaging to be delivered with food, the product packaging, marking and stuffing of containers shall comply with the following specification:

Packaging specification link

Templates for packaging artwork are available in the specification above and additional labelling requirements shall be as per contract.

Other information on packaging and labelling:

- The applicable packaging is without PE inner liner, unless otherwise specified in the contract.
- The following sentence shall be labelled in bold letters: "Allergen statement: may contain wheat, soybeans, oats and rye.".

7. Technical document requirements

When required, suppliers shall submit a Certificate of Analysis of the final product to WFP, along with other documents for payment. Additionally, suppliers shall provide other technical documents upon request from WFP.

8. Analytical Requirements

Suppliers shall follow their own food safety and quality management plan. WFP can conduct tests on products as per the Table below. Additionally, WFP reserves the rights to change this testing plan at any time.
Any products taken for the purpose of weight check and lab testing (including retention samples) shall be replenished by the suppliers. The shipment quantity shall not be less than the purchased quantity. Where non-destructive inspection is done, suppliers shall close the package or replace it.
In addition to the pre-delivery Q&Q inspection, WFP can also perform prior-assessment (e.g., documentation check, production monitoring, audits, assessment of raw materials, etc.).
Suppliers acknowledge that any prior-assessment by WFP or its designated inspection agents does not constitute a determination whether the specifications for the foods set out in this document or any purchase order (including mandatory technical requirements) have been met. Suppliers will be required to comply with their warranty and other contractual obligations whether or not WFP carries out such prior assessment.
The prior-assessment undertaken by WFP or its designated inspection agents will not substitute for the pre-delivery Q&Q inspection and testing of the goods upon delivery to WFP.
The body of the specification shall be considered in order to verify if any additional requirement is applicable to the specific purchase.
Unless otherwise specified, all analysis requirements refer to the product as sold.

Quantitative Requirements

Test Name	Unit	Min	Max	Reference methods (latest versions) *	Test Type
Broken grains	%	0	4	Visual examination	Type A
Ergot	%	0	0.02	Visual examination	Type A
Excreta	%	0	0.01	Visual examination	Type A
Fire-burnt grains	%	0	0.5	Visual examination	Type A
Frost-damaged grains	%	0	2	Visual examination	Type A
Heated, rotted, severely mildewed	%	0	2.5	Visual examination	Type A
Inseparable seeds	%	0	0.2	Visual examination	Type A
Live insects	%	0	0	Visual examination	Type A
Moisture	%	0	14	ISO 712	Type A
Other cereal	%	0	2	Visual examination	Type A
Protein	%	9	12.8	ICC No. 105 **	Type A
Sclerotinia	%	0	0.02	Visual examination	Type A
Sprouted grains	%	0	0.5	Visual examination	Type A
Stones	%	0	0.02	Visual examination	Type A
Test weight	kg/hl	65	100	ISO 7971-1	Type A
Total foreign matter	%	0	2	ISO 605	Type A
Toxic seeds: Crotolaria (Crotolaria spp.)	Seeds/kg	0	1	Visual examination on 3kg sample	Type A
Toxic seeds: Jimson weed (Datura spp.)	Seeds/kg	0	1	Visual examination on 3kg sample	Type A
Toxic seeds: Castor bean (Ricinus communis L.)	Seeds/kg	0	1	Visual examination on 3kg sample	Type A
Toxic seeds: Corn cockle (Agrostemma githago L.)	Seeds/kg	0	1	Visual examination on 3kg sample	Type A

Toxic seeds: Mexican Poppy (Argemone mexicana)	Seeds/kg	0	7	Visual examination on 3kg sample	Type A
Toxic seeds: Cocklebur (Xanthium species)	Seeds/kg	0	7	Visual examination on 3kg sample	Type A
Toxic seeds: Field bindweed (Convolvulus spp.)	Seeds/kg	0	7	Visual examination on 3kg sample	Type A
Toxic seeds: Darnel Ryegrass (Lolium temulentum)	Seeds/kg	0	7	Visual examination on 3kg sample	Type A
Toxic seeds: Morning glory (Ipomoea purpurea)	Seeds/kg	0	7	Visual examination on 3kg sample	Type A
Any other weed seeds not mentioned as a single requirement	Seeds/kg	0	20	Visual examination on 3kg sample	Type A
Filth and dead insects	% m/m	0	0.1	Visual inspection	Type A
Aflatoxins total (B1+B2+G1+G2)	ppb	0	10	ISO 16050	Type B
Aflatoxin B1	ppb	0	5	ISO 16050	Type B
Deoxynivalenol (DON)	ppm	0	2		Type A
Ochratoxin A	ppb	0	5	ISO 15141	Type B
Cadmium (Cd)	mg/kg	0	0.1		Type B
Lead (Pb)	mg/kg	0	0.2		Type B

* or equivalent validated methods.

Qualitative Requirements

Test Name	**Requirements**	**Reference methods (latest versions)** *	**Test Type**
Organoleptic characteristics (texture, appearance, smell, taste)	Bright, clear appearance, natural smell and color	ISO 7301	Type A

* or equivalent validated methods.

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