



Technical Specifications for MUNG BEANS

Specification reference: **Dry Mung bean grains**

Version: **V13.0**

Date of issue: **20 September 2013**

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1. SCOPE

This specification applies to dry **Mung beans (or Green grams) grains** of (*Vigna radiata* (*L*) *Wilczek*), purchased by WFP.

2. DEFINITION

Purity includes the seed coat and kernel whether intact or defective. It excludes all other plant material of the pulse in question. Purity is generally the opposite of Foreign Material.

Defective kernels are mung beans that are bin burnt & heat damaged, broken, split, shrivelled & immature, insect damaged, mouldy, poor color, sprouted, stained & weather damaged.

Bin burnt & Heat-damaged kernels are mung beans and pieces of mung beans that are materially discolored and damaged by heat (Exposure to severe heat during storage. Heating occurs via mould damage or incorrect drying of high moisture grain).

Broken kernels are mung beans in which the cotyledons are separated or one cotyledon has been broken.

Splits include split mung beans, broken seeds that are less than three-quarters of the whole seed, and cotyledons that are loosely held together by the seed coat.

Shrivelled are mung beans which are underdeveloped, thin and wrinkled over its entire surface.

Immature Grains which are not fully developed, normally smaller in size than the mature grains, shrivelled and off colour.

Mouldy kernels: Fungal growth may be visibly apparent on the seed coat or kernel as a fungus of various colours

Insect damaged kernels are characterized by a perforation of the seed coat in conjunction with a discoloration penetrating into the cotyledon.

Poor color: seed coats or kernels are not considered good colour.

Sprouted: The seed coat has split and the primary root has emerged.

Foreign material is any material that is not mung bean grains or fragments of mung bean grains. This includes:

- *Foreign Seeds (Weed seeds), including other edible grains*
- *Empty seed pods or pieces of seed pods of mung beans*
- *Empty seed pods, pieces of seed pods or seed pods containing seeds of all other weed seeds*
- *Unmillable Material*
- *Grasshoppers and Locusts*
- *Ryegrass Ergot*
- *Snails*
- *Field Insects*
- *Stored grain Insects (dead and pieces).*

Unmillable material includes soil, sand stones, pieces of snail, pieces of Stored Grain Insects, pieces of Field Insects (except Grasshoppers and Locusts) and other non-vegetable matter.

Other edible grains: Any edible grains (including oilseeds) other than the one which is under consideration

3. REFERENCE

Australian pulses standard 2013/2014 (<http://www.pulseaus.com.au>)

Canada Grain Commission: Official grain grading guide- Soybeans (<http://www.grainscanada.gc.ca>)

Codex Standard for certain pulses grains (Codex Stan 171-1989, rev. 1-1995).

Standard and specification for soybeans, soybean oil and soybean meal-American Soybean Association (source: <http://www.asaim-europe.org/backup/pdf/standardsfor.pdf>)

4. PRODUCT SPECIFICATION

4.1 General requirements

- | | |
|------------------------|---|
| • Moisture content: | 14.0% max |
| • Organoleptic: | Clean and bright appearance, Natural odour |
| • Purity: | 99.0% min (by weight) |
| • Defective: | 4.0% max (by weight) |
| • Insect damaged: | 0.2% max (by weight) |
| • Immature: | 3.0% max (by weight) |
| • Foreign material: | 1.0% max (by weight) |
| • Unmillable material: | 0.25% max (by weight) |
| • Other edible grains: | 0.5% max (by weight) |
| • Live insects: | Nil |
| • Production year: | As per contractual agreement |

4.2 Toxic or noxious seeds

The products covered by the provisions of this specification shall be free from the following toxic or noxious seeds in amounts which may represent a hazard to human health.

- *Crotalaria* (*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.

4.3 Contaminants

4.3.1 Heavy metals

Mung beans shall be free from heavy metals in amounts which may represent a hazard to health.

4.3.2 Pesticide residues

Mung beans shall comply with those maximum residue limits established by the Codex Alimentarius Commission for this commodity.

4.3.3 Mycotoxins

Mung beans shall comply with those maximum mycotoxin limits established by the Codex Alimentarius Commission for this commodity.

4.4 Hygiene

4.4.1 It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), and other Codes of Practice recommended by the Codex Alimentarius Commission which are relevant to these products.

4.4.2 To the extent possible in good manufacturing practice, the products shall be free from objectionable matter.

4.4.3 When tested by appropriate methods of sampling and examination, the products:

- shall be free from micro-organisms in amounts which may represent a hazard to health;
- shall be free from parasites which may represent a hazard to health; and
- shall not contain any substance originating from micro-organisms in amounts which may represent a hazard to health.

5. PACKAGING AND MARKING

As per contractual agreement.

6. STORING

Mung beans must be stored under dry, ventilated and hygienic conditions.

7. SAMPLING REQUIREMENTS

Representative samples can be drawn according to international sampling method standards at the bagging section or in the warehouse.

For packed units, sampling frequency and reference method are showed in *table 1*. One laboratory samples of about 3 kg is required by lot or sub-lot of 500MT maximum.

For the bulk (static and flowing), the sampling must follow the rules described in paragraphs 5.2 of ISO 24333-2009.

Table 1: Sampling rules

Lot or sub-lot size (MT)	Number of increment	Place of sampling	Reference (or equivalent)
≤100	3 % of bags and minimum 50 bags (e.g. 60 increments for a lot of 100 MT, packed in 50 kg bag)	Warehouse or during production	GAFTA 124-2
101-500	3 % of bags <i>Example:</i> - 120 increments for a lot of 200 MT, packed in 50 kg bag - 180 increments for a lot of 300 MT, packed in 50 kg bag - 240 increments for a lot of 400 MT, packed in 50 kg bag - 300 increments for a lot of 500 MT, packed in 50 kg bag		

7. ANALYTICAL REQUIREMENTS

The principal analyses/tests in table 2 must be performed in order to check if the quality of the **Mung beans** meets above requirements. Additional analyses shall be defined in case of further quality assessment.

Table 2: List of compulsory analyses/tests and reference method

No	Analyses/tests	Limit	Reference method (or equivalent)
1	Moisture content	14.0% max (by weight)	ISO 24557:2009
2	Organoleptic	Clean and bright appearance, Natural odour	<i>Organoleptic examination</i>
3	Purity	99.0% min (by weight)	<i>Visual examination</i>
4	Defective	4.0% max (by weight)	<i>Visual examination</i>
5	Insect damaged	0.2% max (by weight)	<i>Visual examination</i>
6	Immature	3.0% max (by weight)	<i>Visual examination</i>
7	Foreign material	1.0% max (by weight)	<i>Visual examination</i>
8	Unmillable material	0.25% max (by weight)	<i>Visual examination</i>
9	Other edible grains	0.5% max (by weight)	<i>Visual examination</i>
10	Live insects	Nil	<i>Visual examination</i>
11	GMO (<i>only if required</i>)	Negative (<0.9% of GMO material as per EU regulation 1830/2003)	

A guide for grading is presented in annex 1.

Annex 1: Guide for grading of Mung bean grain

The grading shall be performed as follow:

- Draw and weight a test portion (about 500g)
- Separate the test portion into component groups
- Weigh materials of the component groups
- Express the amount of material groups in percentage (guide in table 3)

Table 3: Record sheet for grading of mung bean grain

Mass of the test portion (grams) gr (M)		
Component	Mass of component (grams)	Result calculation (expressed in %)
<i>Bin burnt & Heat-damaged kernels</i>	a	
<i>Broken kernels</i>		
<i>Splits</i>		
<i>Mouldy kernels</i>		
<i>Sprouted</i>		
<i>Stained</i>		
<i>Poor color</i>		
Insect damaged kernels	b	= b x 100 / M
Immature	c	= c x 100 / M
Defective kernels		= (a + b + c) x 100 / M
Unmillable material	d	= d x 100 / M
Other edible grains	e	= e x 100 / M
Live insect	f	
<i>Other foreign material</i>		
Foreign material		= (d+ e + f) x 100 / M
Purity		= (M - d- e - f) x 100 / M