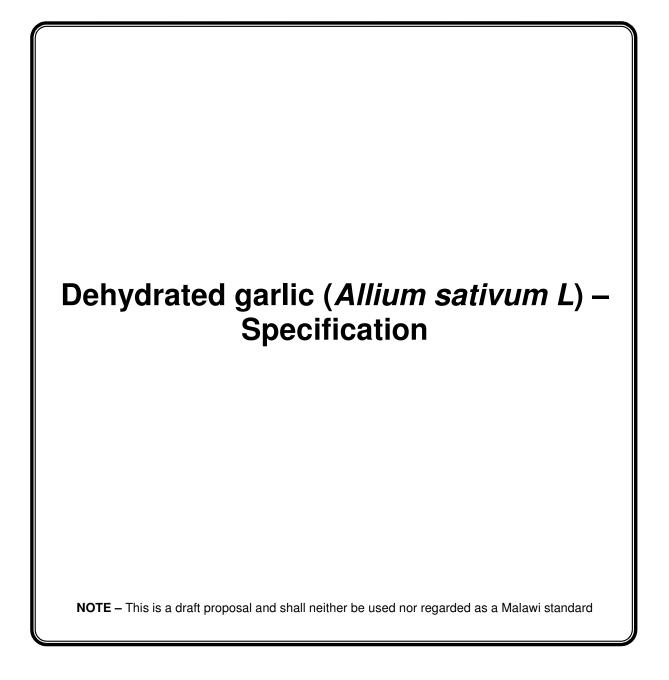
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DRAFT MALAWI STANDARD



Dehydrated garlic (*Allium sativum* L) – Specification

Obtainable from the Malawi Bureau of Standards Moirs Road P O Box 946 BLANTYRE

Tel: +265 1 870 488 Fax: +265 1 870 756 E-mail: <u>mbs@mbsmw.org</u> Web-site: www.mbsmw.org

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FOREWORD

This draft Malawi standard has been prepared by MBS/TC 8, the Technical Committee on *Spices and condiments*, to provide requirements for dehydrated garlic.

The standard is based on the International standard, ISO 5560:1997, *Dehydrated garlic (Allium sativum L)* – *Specification.*

Acknowledgement is made for the use of the information.

TECHNICAL COMMITTEE

This draft Malawi standard was prepared by MBS/TC 8, the Technical Committee on Spices and condiment*s*, and the following companies, organizations and institutions were represented:

Blantyre City Council; Blantyre District Health Office (Ministry of Health); Blantyre ADD; Lilongwe University of Agriculture and Natural Resources (Bunda College Campus); Malawi Bureau of Standards; Nali Limited; Peoples Trading Centre; Rab Processors Ltd; Tajo Foods; and Unilever South East (Malawi) Ltd.

NOTICE

This standard shall be reviewed every five years, or earlier when it is necessary, in order to keep abreast of progress. Comments are welcome and shall be considered when the standard is being reviewed.

DRAFT PROPOSAL

Dehydrated garlic (Allium sativum L) – Specification

1 SCOPE

This draft Malawi standard specifies requirements for dehydrated garlic (Allium sativum L.).

NOTE: The main commercial forms are given in annex B, for information only.

2 NORMATIVE REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. All standards are subject to revision and, since any reference to a standard is deemed to be a reference to the latest edition of that standard, parties to agreements based on this standard are encouraged to take steps to ensure the use of the most recent edition of the standard indicated below. Information on currently valid national and draft Malawi standards may be obtained from the Malawi Bureau of Standards.

MS 19, Labelling of pre-packed foods – General standard;

MS 21, Food and food processing units – Code of hygienic conditions;

MS 139, Spices and condiments – Determination of extraneous matter and foreign matter content;

MS 141, Spices and condiments – Determination of total ash;

MS 142, Spices and condiments – Determination of filth;

MS 918, Spices and condiments – Determination of moisture content – Entrainment method;

MS 919, Spices and condiments – Determination of acid-insoluble ash;

MS 1294, Dehydrated garlic - Determination of volatile organic sulphur compounds;

MS 1299, Spices and condiments - Determination of cold water soluble extract;

ISO 948, Spices and condiments - Sampling.

ISO 565, Test sieves – Metal wire cloth, perforated metal plate and electroformed sheet – Nominal sizes of openings;

ISO 4833, Microbiology – General guidance for the enumeration of micro-organisms – Colony count technique at 30 °C;

ISO 6579, Microbiology – General guidance on methods for the detection of Salmonella;

ISO 6888, Microbiology – General guidance for enumeration of Staphylococcus aureus – Colony count technique;

ISO 7251, Microbiology – General guidance for enumeration of presumptive Escherichia coli – Most probable number technique;

ISO 7937, Microbiology – General guidance for enumeration of Clostridium perfringens – Colony count technique; and

ISO 7954, Microbiology – General guidance for enumeration of yeasts and moulds – Colony-count technique at 25 °C.

3 TERMS AND DEFINITIONS

For the purposes of this standard, the following terms and definitions shall apply:

3.1

dehydrated garlic

finished product obtained on drying the cloves of garlic cultivars (*Allium sativum* L.) without any bleaching or precooking, the cloves being sound and practically free from moulds, diseases, soil, outer skins, stems, leaves and roots

3.2

extraneous matter

vegetable matter originating exclusively from plants, such as particles from skins and roots

4 REQUIREMENTS

Note: Recommendations relating to storage and transport are given in annex C.

4.1 Organoleptic specifications

4.1.1 General

Dehydrated garlic shall conform to the requirements of this standard and on rehydration shall regain characteristics similar to those of fresh garlic.

4.1.2 Colour

The colour of the dehydrated garlic shall be characteristic of the cultivar used, that is, between white and pale cream.

The product shall be practically free from scorched, toasted and baked particles.

4.1.3 Odour

Dehydrated garlic, after rehydration by the method described in annex A, shall have a characteristic, pungent odour, free from foreign odours and off odours, such as those coming from mouldy, rancid, fermented or burnt particles.

4.1.4 Flavour

The flavour of the dehydrated garlic is assessed after rehydration in accordance with the method described in annex A.

The flavour shall be characteristic of parboiled garlic, and free from foreign flavours and off flavours, such as those coming from mouldy, rancid, fermented or burnt particles.

4.2 Freedom from insects, moulds, etc.

Dehydrated garlic shall be free from live insects and practically free from moulds, dead insects, insect fragments and rodent contamination visible to the naked eye (corrected, if necessary, for abnormal vision) or with such magnification as may be necessary in any particular case. If the magnification exceeds x10, this fact shall be mentioned in the test report.

In cases of dispute, the contamination of garlic in powder form shall be determined by using the method specified in MS 142.

4.3 Extraneous matter

The total percentage of extraneous matter, as defined in **3.2** and determined in accordance with MS 139, shall not exceed 0.5 % (m/m).

4.4 Classification

Dehydrated garlic may be divided into the broad categories given in annex B:

- a) dehydrated garlic slices;
- b) dehydrated garlic flakes or pieces ;
- c) dehydrated garlic grits; and
- d) powdered garlic.

4.5 Chemical requirements

Dehydrated garlic shall comply with the requirements specified in table 1, when tested by the specified method.

 Table 1 – Chemical requirements for dehydrated garlic

Characteristic	Requirement	Test method
Moisture content, % (m/m), max.	8	MS 918
Total ash, % (m/m), on dry basis, max.	5.5	MS 141
Acid insoluble ash, % (m/m) on dry basis, max.	0.5	MS 919
Volatile organic sulphur compounds content, % (m/m) on dry	0.3	MS 1294
basis, min.		
Cold water soluble extract, % (m/m) on dry basis,		MS 1299
Min.	70	
Max.	90	

4.6 Microbiological characteristics

Dehydrated garlic shall comply with the microbiological limits outlined in table 2.

Characteristic	Recommended specification		Test method
	m	М	
Microorganisms at 30 °C, per gram, max.	10 ⁵	10 ⁶	ISO 4833
Presumptive E. Coli, per gram, max.	10	10 ²	ISO 7251
Yeasts and moulds at 25 °C, per gram, max.	10 ³	10 ⁴	ISO 7954
Clostridium perfringens, per gram, max.	10	10 ²	ISO 7937
Staphylococcus aureus, in 1 g	Absent		ISO 6888
<i>Salmonella,</i> in 25 g	Absent		ISO 6579

4.6.1 Interpretation

Take five samples.

a) The lot shall be considered as satisfactory if;

- all the results are < m, or

- if two results at most are between *m* and 3 *m*.

b) The lot shall be considered as acceptable if

- two results at most are between 3 m and M (the others being < m).

c) The lot shall be considered as not acceptable if

- more than two results out of five are between m and M (the other being < m), or

- if values above M are observed

5 HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with MS 21.

6 SAMPLING

6.1 Dehydrated garlic powder or grits

Sample the product in accordance with ISO 948, using a conical sampler or other suitable implement to remove aseptically a representative sample.

6.2 Dehydrated garlic slices, flakes or pieces

Certain problems arise as a result of the friability of the product and the danger of settling within the container. It may therefore be necessary to take the entire contents of a single container because, during transport, the garlic may settle with the larger pieces towards to the top and smaller pieces towards the bottom.

The principles of the method described in ISO 948 shall apply with the modifications given in **6.2.1** and **6.2.2**.

6.2.1 Number of containers to be taken

Take from the lot between 0.5 % and 1.0 % of the containers using a table of random numbers agreed between the interested parties. If no table of random numbers is available, take every n^{th} container. However, at least one full container shall be taken.

6.2.2 Preparation of bulk sample

Sieve the contents of each container according to the commercial form considered (see annex B). Prepare the bulk sample by mixing portions of the different sieved fractions in the proportions determined by sieving. The size of the bulk sample shall be at least three times the quantity of product necessary to carry out all the tests required by this Malawi standard.

7 TEST METHODS

Samples of dehydrated garlic shall be tested for conformity with the requirements of this International standard by following the methods of physical, organoleptic and chemical analysis specified in **4.1** to **4.5** and table 1.

8 PACKING AND LABELLING

8.1 Packaging

Dehydrated garlic shall be packed in clean, sound and dry containers made of a material which does not affect the product but which protects it from light and from the ingress of moisture.

The packaging shall also comply with any national legislation relating to environmental protection.

8.2 Labelling

In addition to the requirements prescribed in MS 19, the following specific provisions shall be marked on each package or on a label attached to the package:

- a) name of the product and botanical name and trade names, if any;
- b) name and address of the producer or packer, or trademark, if any;
- c) code or batch number;
- d) net mass;

- e) best before date;
- f) storage conditions;
- g) country of origin;
- h) any other information requested by the purchaser, such as year of production and date of packing, if known; and
- i) whether the product contains additives, and which ones, in the case of countries where they are permitted.

Annex A

(Normative)

METHOD OF REHYDRATION AND SENSORY EVALUATION OF DEHYDRATED GARLIC

A.1 Garlic slices

A.1.1 Apparatus

A.1.1.1 Vessel, of about 500 ml capacity, made of a material which will not impart a foreign taste or affect the colour of the preparation.

A.1.1.2 Dish, made of porcelain or white earthenware.

A.1.1.3 Stainless steel spoon.

A.1.2 Reagent

Use natural, potable water, as neutral as possible.

A.1.3 Preparation

Weigh 10 g \pm 0.1 g of the sample and transfer it to the vessel (A.1.1.1) containing 500 ml of cold water (A.1.2). Bring to the boil and maintain at 99 °C, keeping the vessel covered, for 10 min \pm 1 min.

Make up the volume to 500 ml with cold water (A.1.2) and pour into the dish (A.1.1.2).

A.1.4 Sensory evaluation

Immediately carry out sensory evaluation of the following characteristics, in the order given:

- a) appearance of the cooking water (colour and clarity);
- b) colour of the preparation;
- c) odour;
- d) tenderness; and
- e) flavour.

A.2 Garlic powder, grits, flakes or pieces

A.2.1 Apparatus

A.2.1.1 Vessel, about of 1000 ml capacity, made of a material which will not impart a foreign taste or affect the colour of the preparation.

A.2.1.2 Dish, made of porcelain or white earthenware.

A.2.1.3 Stainless steel spoon.

A.2.2 Reagents

A.2.2.1 Flour, made from durum wheat from the most recent harvest and known to be of good quality.

A.2.2.2 Water

Use natural, potable water, as neutral as possible.

A.2.3 Preparation of the medium

Transfer 1000 ml of cold water (A.2.2.2) to the vessel (A.2.1.1) and add, stirring continuously, 30 g of the flour (A.2.2.1). Heat and continue to stir until the mixture reaches boiling point, then simmer for 2 min.

A.2.4 Mixing the dehydrated garlic with the medium

Weigh, to the nearest 0.001 g, 0.4 g of the garlic, and place it in the dish (A.2.1.2). Add 250 ml of the medium prepared in accordance with A.2.3 and allow standing for 5 min, stirring from time to time.

A.2.5 Sensory evaluation

Carry out sensory evaluation of the following characteristics, in the order given:

- a) odour; and
- b) flavour.

Annex B

(Informative)

COMMERCIAL FORMS OF DEHYDRATED GARLIC

B.1 General information

The various commercial forms of dehydrated garlic are all produced by slicing peeled sound garlic cloves into flat slices (of a thickness agreed between the interested parties), which are dehydrated, graded and further processed as necessary.

B.2 Commercial forms

The following broad categories are recognized in the trade, although commercial contracts may include requirements for particle size.

B.2.1 Dehydrated garlic slices

Product obtained by cutting garlic cloves into slices and removing broken pieces smaller than 4 mm by sieving.

B.2.2 Dehydrated garlic, flakes or pieces

Dehydrated garlic passing through a sieve of aperture size from 1.25 mm to 4 mm according to the case. The particles do not have any definite shape.

B.2.3 Dehydrated garlic grits

Dehydrated garlic passing through a sieve of aperture size from 250 µm to 1.25 mm.

B.2.4 Powdered garlic

Homogeneous product, 95 % of which passes through a sieve of aperture size 250 µm.

Annex C

(Informative)

RECOMMENDATIONS RELATING TO STORAGE AND TRANSPORT CONDITIONS FOR DEHYDRATED GARLIC

D.1 Storage

Packages of dehydrated garlic should be stored in covered premises, well protected from the sun, rain and excessive heat. The storeroom should be dry, free from unpleasant odours and protected against the entry of insects and other vermin.

D.2 Transport

The containers should be clearly marked with warning against careless handling which might lead to perforation of the containers. They should be dry and cool and stored well away from ships' boilers and bilges.

THE MALAWI BUREAU OF STANDARDS

The Malawi Bureau of Standards is the standardizing body in Malawi under the aegis of the Ministry of Industry and Trade. Set up in 1972 by the Malawi Bureau of Standards Act (Cap: 51:02), the Bureau is a parastatal body whose activities aim at formulating and promoting the general adoption of standards relating to structures, commodities, materials, practices, operations and from time to time revise, alter and amend the same to incorporate advanced technology.

CERTIFICATION MARK SCHEME

To bring the advantages of standardization within the reach of the common consumer, the Bureau operates a Certification Mark Scheme. Under this scheme, manufacturers who produce goods that conform to national standards are granted permits to use the Bureau's "Mark of Quality" depicted below on their products. This Mark gives confidence to the consumer of the commodity's reliability.

