DRAFT TANZANIA STANDARD

Dried Seaweed – Specification

DRAFT FOR STAKEHOLDERS' COMMENTS

TANZANIA BUREAU OF STANDARDS

0. FOREWORD

Seaweed refers to macroscopic, multicellular, benthic marine algae which includes some members of the red, brown and green algae. Seaweed are essential to marine life for food and habitat and they have been a key part of the human diet for thousands of years.

This Tanzania Standard was prepared in order to ensure quality and safety of dried seaweed produced locally as well as to give guidance to traders and consumers of dried seaweed in Tanzania.

In the preparation of this Tanzania Standard, considerable assistance was derived from: PNS/BAFPS 85:2012, *Dried raw seaweed- Specification*

In reporting the results of a test or analysis made in accordance with this Tanzania Standard, if the final value, observed or calculated is to be rounded off, it shall be done in accordance with TZS 4 (see clause 2).

DRAFT FOR STAKEHOLDERS' COMMENTS

1. SCOPE

This Tanzania Standard prescribes the requirements and the methods of sampling and test for dried seaweed including Spinosum *(Eucheuma denticulatum)*& Cottonii *(Kappaphycus alvarezii)* species intended for industrial use or human consumption.

2. NORMATIVE REFERENCES

The following referenced standards are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced standard (including any amendments) applies.

TZS 4: 2009, *Rounding off numerical values*

TZS 109 *Code of hygiene for food processing units – General*

3. TERMS AND DEFINITIONS

For the purpose of this Tanzania Standard, the following definitions shall apply.

3.1 seaweed
A cluster of macroscopic, multicellular, benthic marine algae. The term includes some members of the red, brown and green algae

3.2 clean anhydrous seaweed (CAS)
seaweed removed of moisture, salt, sand and impurities

3.3 impurities/debris
other macrophites, plastic, wood, dirt and other foreign matters other than sand and salt

3.4 contaminants
any biological or chemical agent, foreign matter, or other substances not intentionally added to dried seaweed which may compromise food safety and suitability

3.5 food grade containers
containers which shall safeguard the hygienic, safety, nutritional, technological, and organoleptic qualities of the product

4 REQUIREMENTS

4.1. General requirement
4.1.1 Description
Dried seaweed shall be a product produced by drying fresh harvested seaweed of single specie under the sun or any other method to attain recommended moisture content(MC).

4.1.2 Colour
The colour of seaweed varies, they may be found in red, purple, green, brown and white.

4.1.3 Impurities
Dried seaweed shall not contain impurities in amount that exceed levels specified in Table 1.

4.2 Specific Requirement.

Dried raw seaweed must meet the following criteria as shown in Table 1.

DRAFT FOR STAKEHOLDERS' COMMENTS

Table 1: Dried seaweed specific requirement

Criteria	*.K.alvarezii*	***E.** denticulatum*	**Test methods**
Moisture content, %max	40	38	Annex A
Clean anhydrous seaweed(CAS), % min	30	40	Annex B
Impurities,%max	3	3	Annex C
Salt as KCl,max	25	20	Annex D
Sand,%max	1	1	Annex D

4.3 Grading

4.3.1 *Kappaphycus spp.*

The quality classification of the above specie seaweed is as prescribed in Table 2 below
Table 2: Grades of seaweed (*Kappaphycus spp**)***

Grade	**MC (% max)**	**CAS (%min)**	**Impurities (% max)**	**Salt as KCl (% max)**	**Sand (% max)**
A	35	35	3	25	1
B	38	33	3	25	1
C	40	30	3	25	1

4.3.2 *E.denticulatum*

The quality grading of the above specie seaweed is as prescribed in table 2 below
Table 3: Grades of seaweed (*E.denticulatum*)

Grade	**MC (% max)**	**CAS (%min)**	**Impurities (% max)**	**Salt as KCl (% max)**	**Sand (% max)**
A	33	45	3	20	1
B	35	43	3	20	1
C	38	40	3	20	1

Note: In all classifications, 70% from the sample sizes shall pass the analyses for moisture content, clean anhydrous seaweed, impurities, salt (as KCl), and sand in order for a lot to be allowed for each shipment.

5. CONTAMINANTS

5.1 Heavy Metal contamination

Dried seaweed shall comply with those maximum heavy metal limits established by the Codex Stan 193.

5.2 Pesticide residues

Dried seaweed shall comply with those pesticide maximum residues limits established in the Codex pesticide residues in food online data base.

6. HYGIENE

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with TZS 109 *Code of hygiene for food processing units – General*

7. SAMPLING AND TESTS

DRAFT FOR STAKEHOLDERS' COMMENTS

7.1 Sampling
Sampling of dried seaweed shall be done in accordance with Annex E

7.2 Tests
Tests of dried seaweed shall be done as directed in Table 1

8. PACKAGING, MARKING AND LABELLING

8.1 Packaging
Seaweed shall be packed in food grade containers

8.2 Marking and labelling
In addition to the requirement of TZS 538, the following specific labelling requirements shall apply and shall be legibly and indelibly marked Name of the product

i. Species name
ii. Class
iii. Year of harvesting
iv. Net weight;
v. Lot/Batch number or code number;
vi. Name and address of producer and or/packer/distributor
vii. Country of origin
viii. Declaration of intended use
ix. Storage condition
x. Best before date
xi. Packing date

DRAFT FOR STAKEHOLDERS' COMMENTS

Annex A: Determination of moisture of seaweed

A1 Method A – Determine moisture of seaweed by direct reading using the moisture meter.

A2 Method B – Oven Drying
A2.1 Apparatus: Thermally controlled drying oven

A2.2 Procedure:
a) Weigh one hundred grams of seaweed laboratory sample in a pre-weighed moisture dish the record weight as wo

b) Dry dish plus sample to constant mass at a temperature of 60°C-65°C for *Eucheuma spp* and 80°C-85°C for *Kappaphycus spp.* in 12 to 16 hours. Record weight as wf ; and

c) Calculate Percent Moisture using the following formula:

$$\text{Percent Moisture} = \frac{wo - wf}{wo} \times 100$$

where:

wf weight of the seaweed after drying

wo weight of the seaweed before drying

Annex B

Calculation for clean anhydrous seaweed (CAS)

B1**.** Percent Clean Anhydrous Seaweed is obtained by the formula:

$$\% \text{ CAS} = \frac{CAS}{WO} \times 100$$

where:

CAS, is the mass of clean anhydrous seaweed in grams
WO, is the original mass of seaweed taken for analysis in grams

Annex C

Determination of impurities/debris
C1 Weigh 250 grams laboratory sample. Record weight as WO;

C2 Remove debris and other foreign material by hand.

C3 Weigh the impurities/ debris and other foreign materials. Record weight as WD; and

C4 Calculate Percent Impurities/Debris by the formula:

$$\% \text{ Impurities/debris} = \frac{WD}{WO} \times 100$$

where:
WD is the mass of debris/impurities and other foreign materials in grams

DRAFT FOR STAKEHOLDERS' COMMENTS

WO is the mass of laboratory sample taken for analysis in grams

Annex D

Determination of salt (as KCl) and sand

1. Salt as KCl

D1 Get a one (1) kilogram representative sample of the seaweed raw material;

D2 Weigh 250 g into a 2-L beaker;

D3 Add about 900 ml of distilled water, soak the seaweed overnight to remove the sand and salt. Remove the seaweed, stir the solution very well to completely dissolve the salt;

D4 Decant the solution into a 1-L volumetric flask and dilute to volume distilled water. Save the sand for further analysis;

D5 Mix the solution well and measure a 50 ml aliquot into a 250-ml volumetric flask;

D6 Dilute to volume with distilled water. Mix well and measure a 10 ml aliquot into an Erlenmeyer flask;

D7 Add 5 drops of K2CrO4 and titrate with standard 0.100 N AgNO3 to end point (tinge of orange brown);

D8 Calculate % salt (as KCl) using the following formula:

$$\% \text{ salt (as KCl)} = \frac{V_{AgNO_3} \times N_{AgNO_3} \times \frac{74.50}{1000} \times 100}{250 \times \frac{50}{1000} \times \frac{10}{250}}$$

II. Sand

D9 Wash the sand from step D4 with distilled water 3 times;
D10 Put the sand into a pre-weighed porcelain crucible;
D11 Dry in the oven at 105^{0}C to constant mass. Record weight as Wd; and

D12 Calculate % sand using the following formula:

$$\% \text{ sand} = \frac{Wd}{250} \times 100$$

where:

Wd is the weight of the dried sand in grams

Annex E

Method of sampling

E1. Definition of terms
For the purpose of this method, the following definitions shall apply:

DRAFT FOR STAKEHOLDERS' COMMENTS

E1.1 bulk sample – the quantity of seaweed obtained by combining and mixing the primary sample taken from a specific lot.
E1.2 consignment – the quantity of seaweed dispatched or received at one time and covered by a particular contract or shipping document. It may be composed of one or more lot.
E1.3 laboratory sample – the quantity of seaweed removed from the bulk sample and is intended for analyses or other examination.
E1.4 lot – composed of seaweed belonging to the same species intended to be uniform in characteristics regarding post harvest treatment.
E1.5 primary sample – a small quantity of seaweed taken from a bag/bale from a lot.

E2. Sample size

The size of the sample (n) which is the number of bags/bales to be taken from a lot depends on the size of the lot (N) and shall be in accordance with Table 2.

Table 2 – Sampling plan for seaweed

Lot size (N) Size of the sample (n)	Size of the sample (n)
1 to 5 bags/bales All bags/bales	All bags/bales
6 to 49 bags/bales 5 bags/bales	5 bags/bales
50 to 199 bags/bales 10% of the bags/bales	10% of the bags/bales
200 bags/bales or more	$\sqrt{n} + 1$ where n= number of bags/bales

where n= number of bags/bales

E3. Sampling procedure

The sample shall be taken at random from the lot and in order to achieve this, a random number table agreed upon between the buyer and seller should be used. If such table is not available, the following procedure shall be adopted:

a) Starting from any bag/bale, count the bags/bales as 1, 2, 3… etc. up to r and so on. Withdraw from the lot every rth bag/bale thus counted for sampling, the value of ris equal to

$$r = \frac{N}{n}$$

where:

N is the total number of bags/bales in the lot;
n is the number of bags/bales to be taken (see Table 2)
b) If r is a fractional number, its value shall be taken as equal to the integral part of it.

E3.1 When the product is in movement, samples may be taken at the time of loading or unloading of the bags/bales. For this purpose, the number of bags/bales to be taken shall also be in accordance with Table 2. The value of r shall be calculated as indicated above, and every rth bags/bales counted during loading or unloading shall be removed for sampling.

E3.2 Take primary samples, by means of an appropriate sampling instrument, from different parts of each bags/bales selected.

E3.3 A series of primary samples should be taken from different positions in the lot.

E4 Bulk sample

E4.1 Thoroughly mix all the primary samples taken as described above to form the bulk sample.

E4.2 The size of the bulk sample shall be more than three (3) times the quantity of sample required to carry out all the tests required in the specification.

DRAFT FOR STAKEHOLDERS' COMMENTS

E5 Laboratory samples

E5.1 Divide the bulk sample into three (3) or more equal parts. Each part thus obtained constitutes a laboratory sample; one (1) of these samples is intended for the buyer and another for the seller. The third sample, bearing the seals of the buyer and of the seller (or of their representatives) if they were present at the time of sampling or of the person who sampled the lot, shall constitute the reference sample to be used in case of dispute between buyer and seller; it shall be kept at a place acceptable to both parties.

E5.2 Samples for test shall be one (1) kilogram.

DRAFT FOR STAKEHOLDERS' COMMENTS