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Dried Raw Seaweed – Specification

DEPARTMENT OF AGRICULTURE
PHILIPPINES

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Foreword

The Philippine National Standard (PNS) for Dried Raw Seaweed was prepared as part of the project of the Bureau of Agriculture and Fisheries Products Standards (BAFPS) with the Bureau of Agricultural Research (BAR) entitled ñQuality Standardization on Selected Fishery Productsò. A technical working group (TWG) was created through Special Order Number 100 Series of 2006 identifying members and experts that shall be involved in the formulation the draft standards for fishery products.

In collaboration with the industry and the regional offices of the Bureau of Fisheries and Aquatic Resources (BFAR) and Bureau of Product Standards, Department of Trade and Industry (BPS-DTI), the TWG presented the draft standards for public consultation in Zamboanga City and Quezon City.

The PNS for Dried Raw Seaweed aims to provide common understanding on the scope of the standard, quality requirements, classification according to quality, tolerances, contaminants, hygiene, packaging, marking or labeling, sampling, and definition of defectives.

This standard cancels and replaces PNS 602:1992 ñDried Seaweeds for Carrageenan ï Specifications.ò The following significant changes have been made with respect to previous edition:

1. Scope was expanded to cover other processed products from dried raw seaweed other than carrageenan;
2. Definition of terms was revised and other important terms were included;
3. Quality requirements were revised to meet good quality dried raw seaweed;
4. Sections for Classification According to Quality and Definition of Defectives were included; and
5. Other Sections were revised to fit with this new standard.

This standard is subject for review/revision every three (3) years or as necessary.

1 Scope

This standard prescribes quality specifications and safety requirements of dried raw seaweed of the class Rhodophyceae (red seaweed) such as but not limited to *Kappaphycus spp.* and *Eucheuma spp.*

2 References

The references referred to in this standard are listed in the back cover.

3 Definitions

For the purpose of this standard, the following definitions shall apply:

3.1
class
shall refer to the designation of dried raw seaweed quality according to the established government standard thereof

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

3.3
contaminants
any biological or chemical agent, foreign matter, or other substances not intentionally added to dried raw seaweed which may compromise food safety and suitability

3.4
impurities/debris
other seaweed, plastic, wood, dirt and other foreign matters other than sand and salt

3.5
seaweed
a loose colloquial term encompassing macroscopic, multicellular, benthic marine algae. The term includes some members of the red, brown and green algae

4 Requirements

4.1 Dried raw seaweed must be of one species only.

4.2 Dried raw seaweed must be mature, having a culture period of sixty (60) to seventy-five (75) days.

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

Table 1 – Specifications for dried raw seaweed

Criteria	*Kappaphycus spp.*	*Eucheuma spp.*	Test methods
Moisture content (MC), (% max)	40	35	Annex A
Clean anhydrous seaweed (CAS), (% min)	47	52	Annex B
Impurities, (% max)	3	3	Annex C
Sand and salt, (% max)	10	10	Annex D
Color	Definitely not black	Definitely not black	

5 Classification according to quality

A. *Kappaphycus spp.*

Class	MC (% max)	CAS (%min)	Impurities (% max)	Sand and salt (% max)
A	35 and below	52 and above	3	10
B	36-39	48-51	3	10
C	40	47	3	10

B. *Eucheuma spp.*

Class	MC (% max)	CAS (%min)	Impurities (% max)	Sand and salt (% max)
A	30 and below	57 and above	3	10
B	31-34	53-56	3	10
C	35	52	3	10

6 Tolerances

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

7 Contaminants

The product shall comply with the maximum residue levels established by the Codex Alimentarius Commission and/or authority for this commodity.

8 Hygiene

It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice ï General Principles of Food Hygiene (CAC/RCP 1 ï 1969, Rev.4-2003) and other relevant Codex texts.

9 Packaging

Seaweed shall be packed in appropriate containers that will adequately protect the product from normal hazards of transportation and handling.

10 Marking or labeling

Each container shall be legibly labeled with the following information, if appropriate.

10.1 Name of the product;

10.2 Class, variety name;

10.3 Net weight in kilograms;

10.4 Lot/Batch number or code number;

10.5 Name and address of producer/packer/distributor; and

10.6 The words ñProduct of the Philippinesò.

11 Sampling

Sampling method to be used for ascertaining conformance to the requirements of this specification shall be in accordance with Annex E.

12 Definition of defectives

The sample unit shall be considered as defective when it exhibits any of the properties defined below.

12.1 Impurity

The presence in the sample unit of impurity other than salt and sand of more than 3%.

12.2 Higher moisture content

The presence in the sample unit of moisture content of more than 40% for *Kappaphycus spp*. and 35% for *Eucheuma spp.*

12.3 Higher sand and salt content

The presence in the sample unit of salt and sand of more than 10%.

Annex A

Determination of moisture of seaweed

A1 Method A ï Determine moisture of seaweeds by direct reading using the moisture meter.

A2 Method B ï 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. Record weight as w_o ;

b) Dry dish plus sample to constant mass at a temperature of 60°C to 85°C. Record weight as w_f ; and

c) Calculate Percent Moisture using the following formula:

$$\text{Percent Moisture} = \frac{w_o - w_f}{w_o} \times 100$$

where:

w_f weight of the seaweed after drying
w_o weight of the seaweed before drying

Annex B

Determination of sand and total salt

B1 Get a one (1) kilogram representative sample of the seaweed raw material;

B2 Weigh 250 g into a 2-L beaker;

B3 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;

B4 Decant the solution into a 1-L volumetric flask and dilute to volume distilled water. Save the sand for further analysis;

B5 Mix the solution well and measure a 50 ml aliquot into a 250-ml volumetric flask;

B6 Dilute to volume with distilled water. Mix well and measure a 10 ml aliquot into an Erlenmeyer flask;

B7 Add 5 drops of K_2CrO_4 and titrate with standard 0.100 N $AgNO_3$ to end point (tinge of orange brown);

B8 Calculate % total salt (total chlorides) using the following formula:

$$\% \text{ total salt} = \frac{V\ AgNO_3 \times N\ AgNO_3 \times \frac{35.50}{1000} \times 100}{250 \times \frac{50}{1000} \times \frac{10}{250}}$$

B9 Wash the sand from step B4 with distilled water 3 times;

B10 Put the sand into a pre-weighed porcelain crucible;

B11 Dry in the oven at 105°C to constant mass. Record weight as W_d; and

B12 Calculate % sand using the following formula:

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

where:

W_d is the weight of the dried sand in grams

Annex C

Determination of impurities/debris

C1 Weigh 250 grams laboratory sample. Record weight as W_O;

C2 Remove debris and other foreign material by hand.

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

C4 Calculate Percent Impurities/Debris is calculated by the formula:

$$\% \text{ Impurities/debris} = \frac{W_D}{W_O} \times 100$$

where:

W_D is the mass of debris/impurities and other foreign materials in grams

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

Annex D

Calculation for clean anhydrous seaweed (CAS)

D1 To calculate for clean anhydrous seaweed, the following formula is used:

CAS = Original mass of seaweed ï (moisture +mass of salt & sand + mass of impurities)

D2 Percent Clean Anhydrous Seaweed is obtained by the formula:

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

where:

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

Annex E

Method of sampling

E1. Definition of terms

For the purpose of this method, the following definitions shall apply:

E1.1 bulk sample ï the quantity of seaweed obtained by combining and mixing the primary sample taken from a specific lot.

E1.2 consignment ï the quantity of seaweed dispatched or received at one time and covered by a particular contract or sipping document. It may be composed of one or more lot.

E1.3 laboratory sample ï the quantity of seaweed removed from the bulk sample and is intended for analyses or other examination.

E1.4 lot ï composed of seaweed belonging to the same species intended to be uniform in characteristics regarding post harvest treatment.

E1.5 primary sample ï 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)**
1 to 5 bags/bales	All bags/bales
6 to 49 bags/bales	5 bags/bales
50 to 199 bags/bales	10% of the bags/bales
200 bags/bales or more	$\tilde{a}\bar{n} + 1$ 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, 3é etc. up to r and so on. Withdraw from the lot every rth bag/bale thus counted for sampling, the value of r is 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.

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.

References

The following referenced documents are indispensable for the application 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.

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