

GRENADA NATIONAL STANDARD

RICE-SPECIFICATION

GDS 69: 2017

(CRS 44: 2013)

(AN ADOPTION OF A REVISED REGIONAL STANDARD)

GRENADA BUREAU OF STANDARDS

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Rice-Specification

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CONTENTS

	Page
Foreword	
1 Scope	1
2 Normative References	2
3 Terms and Definitions	2
4 Classification	6
5 Application of this Standard	7
6 General, Organoleptic and Health Characteristics	7
7 Grade Designation	10
8 Grading Requirements	10
9 Compositional Requirements for Enriched Rice	15
10 Packaging and Labelling	15
11 Sampling	16
12 Methods of Test and Analysis	16
Annex A (normative) Recommended List of Equipment used in Testing and Analysis	17
Annex B (normative) Methods of Test and Analysis	20

0. Foreword

- 0.1 This CARICOM Regional Standard was developed in an effort to improve the quality of rice being produced and sold in the Caribbean Community and overseas markets. It is expected that this standard will be utilized by farmers, millers, exporters and other related personnel, thereby promoting standardization for this particular commodity.
- 0.2 In preparation of this standard assistance was derived from the following:
- a) International Organization for Standardization, ISO 24333:2009, Cereals-Sampling (as grain);
 - b) International Organization for Standardization, ISO 7301:2011, Rice - Specification;
 - c) Guyana Rice Development Board, Guyana rice standards specification: Grades and analysis- September Edition, 1993;
 - d) Codex Alimentarius Commission, Pesticide residues in Food Volume 2, Second Edition;
 - e) Codex Alimentarius Commission, CODEX STAN 198-1995; Codex Standard for Rice; and
 - f) United States Standards for Rice, 11 September, 1995.

1.0 Scope

This standard establishes requirements for grades of paddy, cargo rice, milled rice, cargo parboiled rice and milled parboiled rice. It also specifies the general conditions for sampling and the methodologies for assessing the various factors used in the determination of the quality of rice.

2.0 Normative 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.

Association of Official Analytical Chemists(AOAC) International

Official Methods of Analysis of the Association of Official Analytical Chemists (AOAC);

CARICOM Organisation for Standards and Quality

CRCP 5:2010 *Code of Practice - General Principles of Food Hygiene*;
CRS 5:2010 *Labelling of Pre-packaged Food*;

International Organization for Standardization

ISO 712:2009, *Cereal and cereal products - Determination of moisture content* ISO 24333:2009, *Cereal and cereal products – Sampling*.

3.0 Terms and definitions

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

3.1 Broken kernel

means a fragment of the kernel.

3.1.1 Small broken kernel

means a fragment of kernel, the length of which is less than or equal to one-quarter of the average length of the corresponding whole kernel.

3.1.2 Medium broken kernel

means a fragment of kernel, the length of which is less than or equal to one-half but greater than one quarter of the average length of the corresponding whole kernel.

3.1.3 Large broken kernel

means a fragment of kernel, the length of which is less than three-quarters but greater than one-half of the average length of the corresponding whole kernel.

- 3.1.4 Chip**
means a fragment of kernel, which passes through a metal sieve with round perforations 1.4 mm in diameter.
- 3.2 Bulk sample**
means composite the quantity of grain obtained by combining and mixing the increments taken from a specific lot.
- 3.3 Cargo rice**
brown rice
husked rice
means rice from which only the husk has been removed.
- 3.4 Chalky kernel**
means a kernel, whole or broken, of non glutinous rice varieties of which at least three-quarters of the surface has an opaque and floury appearance.
- 3.5 Colour**
refers to the colour (“parboiled light”, “parboiled medium” or “parboiled dark”) designated to parboiled cargo/brown/husked rice, if the parcel meets colour requirements specified in 3.5.1 to 3.5.3.
- 3.5.1 Parboiled light rice**
parboiled rice which is not distinctly coloured by the parboiling process and has an approved whiteness/colour/milling meter reading of 26.0 – 31.0.
- 3.5.2 Parboiled medium rice**
parboiled rice which is distinctly but not materially coloured by the parboiling process and has a Kett whiteness meter reading of 20.0 - 25.9.
- 3.5.3 Parboiled dark rice**
parboiled rice materially coloured by the parboiling process and has a Kett whiteness meter reading of 16.0 - 19.9.
- 3.6 Consignment**
means the quantity of grain dispatched or received at one time and covered by a particular contract or shipping document.

NOTE 1 It may be composed of one or more lots.

NOTE 2 Consignments should be considered in lots not exceeding 500 metric tonnes.

3.7 Damaged kernel
means whole or broken kernels of rice which are distinctly discoloured or damaged by water, insects, heat, or any other means, and parboiled kernels in non-parboiled rice.

3.8 Enriched rice
means forms of milled rice to which nutrients or enriching substances have been added.

3.9 Glutinous rice
waxy rice
means special varieties of rice (*Oryzasativa L. glutinosa*) containing kernels which appear white and opaque .

NOTE The starch of glutinous rice consists almost entirely of amylopectin. This rice has a tendency to stick together after cooking.

3.10 Green kernel
immature kernel
means a whole or broken kernel, which is undeveloped and may be green in colour.

3.11 Heat-damaged kernel
means a whole kernel, which has changed its normal colour as a result of heating.

NOTE Parboiled rice in a batch of non-parboiled rice is also included in this category.

3.11.1 Yellow kernel
means whole kernel, which has undergone, totally or partially, a change in its natural colour and has taken a lemon or orange-yellow tone through heating or other causes.

3.11.2 Amber kernel
means whole kernel, which has undergone, thorough heating or other causes, a slight uniform change in colour over the whole surface which alters the colour of the kernel to a slight amber-yellow

3.12 Increments
means small equal quantities of grains taken from different sampling points in the lot throughout the full depth of the lot.

- 3.13 Sample**
means the quantity of grains removed from the **bulk sample**(3.2) and intended for analysis or other examination.
- 3.14 Lot**
means a stated quantity, presumed to be of uniform characteristics, taken from the **consignment**(3.6), and allowing the quality to be assessed.
- 3.15 Head rice yield**
means an estimate of the quantity of kernels having the length of three-quarters or more of the average length of the whole kernel.
- 3.16 Milled rice**
white rice
means rice obtained after milling which involves removing all or part of the bran and germ from the husked rice.
- 3.16.1 Well-milled rice**
means rice obtained by milling husked rice in such a way that some of the germ, all the external layers and most of the internal layers of the bran have been removed.
- 3.16.2 extra-well-milled rice**
means rice obtained by milling husked rice, to the degree that almost all the germ, all the external layers and the largest part of the internal layers of the bran, and some of the endosperm have been removed.
- 3.17 Non-gelatinized kernel**
means whole or broken kernel of parboiled rice with at least one quarter white or chalky areas due to incomplete gelatinization of the starch.
- 3.18 Paddy**
paddy rice
rough rice
means rice retaining its husk after threshing.
- 3.19 Parboiled rice**
means rice, the starch of which has been fully gelatinized by soaking paddy or cargo/brown/husked rice in water followed by a heat treatment and a drying process.
- 3.20 Red kernel**
means whole or broken kernel, excluding heat-damaged kernels, having a red coloured pericarp (bran layer) covering the complete surface.

- 3.21 Red striated kernel**
red streaked kernel
means kernel, whole or broken, with red streaks, the lengths of which are greater than or equal to one-half of that of the whole kernel, but where the surface covered by these red streaks is less than one quarter of the total surface.
- 3.22 Total milled yield**
means an estimate of the quantity of whole kernels and broken kernels that are produced by the milling of cargo rice to a well- milled degree.
- 3.23 Whole kernel**
head rice
means kernels of rice which are equal to or greater than three-quarters of the average kernel length.
- 3.24 Commercially objectionable foreign odours**
means odours entirely foreign to rice and which make the rice unfit for normal commercial use.

NOTE These odours may result from fertilizer, hides, oil products, smoke, fire-burnt paddy and decaying animal or vegetable matter.

- 3.25 Foreign matter**
means organic and inorganic components other than kernels of rice, whole or broken.

NOTE Organic extraneous matters may include seeds, husk, animal droppings, fragments of straws, etc. Inorganic extraneous matters such as stones, sand, dust, etc.

4.0 Classification

Rice shall be classified as follows:

- a) **Long grain rice** - Rice with 80% or more of kernels having a length of at least 6.67 mm and a length/width ratio of over 3.0 after milling to a well-milled degree;
- b) **Medium grain rice** - Rice with 80% or more of kernels, having a length of 6.20 to 6.66 mm and a length/width ratio between 2.0 and 3.0 after milling to a well-milled degree; and

- c) **Short grain rice** - Rice with 80% or more of kernels having a length of less than 6.20 mm and a length/width ratio of less than 2.0 after milling to a well-milled degree.

5.0 Application of this standard

- 5.1** All determinations shall be made on the basis of the original sample.
- 5.2** Percentages shall be determined on the basis of weight.
- 5.3** Kernels with defects, once assigned to a particular category, shall not be used in another category.
- 5.4** For broken rice assessments, the total broken rice shall be extracted.
- 5.4.1** To estimate the broken rice in mixed varieties, the kernel fragments shall be determined and its length shall be less than three-quarters of the average length of the corresponding whole kernels.
- 5.4.2** Discolouration (yellow, amber and other heat damaged kernels) shall be estimated in the milled sample.
- 5.5** When a kernel has several defects, it shall be classified according to the category in which the maximum permissible value is the lowest.
- 5.6** All parts of kernels which remain in the perforations of a sieve shall be considered to be retained by the sieve.
- 5.7** Average length shall be determined on the basis of measuring the length of one hundred (100) whole kernels chosen at random.
- 5.8** Mechanical sizing of kernels shall be adjusted by methods given by the regulatory authority of the particular Member State.
- 5.9** Moisture content in paddy or milled rice shall be determined by a recommended device as outlined in Annex A and in accordance with the procedures described in Annex B and or by ISO 712:2009.

6.0 General, organoleptic and health characteristics

6.1 General requirements

- 6.1.1** Rice shall be safe and suitable for human consumption and free from:
- a) commercially objectionable foreign odours and flavours;
 - b) foreign matter;

- c) living or dead insects;
- d) insect fragments; and
- e) mites.

6.1.2 Cargo rice shall be free of musty, earthy and mouldy ground odours. There shall be no sour, rancid or acidic odours. If a musty or sour odour is found in cargo rice, the grader shall record this information on the Inspection Certificate.

6.1.3 The product shall be prepared and handled in accordance with the appropriate sections of GDS 3: Part 1: 2011.

6.1.4 Handling, storage and transport procedures shall be established to:

- a) sort food and food ingredients to segregate material which is evidently unfit for human consumption;
- b) dispose of any rejected material in a hygienic manner; and
- c) protect food and food ingredients from contamination by pests or by chemical, physical or microbiological contaminants or other objectionable substances during handling, storage and transport.

6.1.5 Care shall be taken to prevent deterioration and spoilage through appropriate measures which may incorporate temperature, humidity and or other such controls.

6.2 *Contaminants*

Rice shall comply with the maximum residue limits specified in Table 1 for pesticide residues.

Table 1 - Maximum Pesticides Residue Limits

Pesticide residue	Maximum Residue Limit (MRL) mg/kg
Bentazone	0.1
Chlorpyrifos	0.5
Chlorpyrifos-Methyl	0.1
Diflubenzuron	0.01
Diquat	10
Fipronil	0.01
Paraquat	0.05
Thiacloprid	0.02
Trifloxystrobin	5
Cyhalothrin (includes lambdacyhalothrin)	1
Cypermethrins (including alpha-and- zeta cypermethrin)	2
Azoxystrobin	5

7.0 Grade designation

The grade designation for all classes of rice for processing shall be determined in accordance with Clause 8 and assigned according to the following priority:

- a) Extra A;
- b) A;
- c) B;
- d) C;
- e) Sample grade.

8.0 Grading requirements

8.1 Grades shall be assigned in accordance with Tables 2 to 6.

NOTE The characteristics of sample grade rice are defined in 8.2.

Table 2—Requirements of grades of paddy

Factors	Extra A Premium max %	A max %	B max %	C max %
Moisture content	14.0	14.0	14.0	14.0
Damaged kernels (Singly or combined)	1.0	2.5	3.5	4.5
Red kernels	1.0	2.5	3.5	5.5
Heat-damaged kernels	0.1	0.2	0.6	1.5
Green kernels	2.0	3.0	4.0	6.0
Chalky kernels	2.0	3.0	4.0	6.0
Head rice yield (Minimum)	55.0	50.0	45.0	40.0
Total milled yield (Minimum)	70.0	67.0	65.0	63.0

Table 3 — Requirements for grades of cargo rice

Factors	Extra A Premium max %	A max %	B max %	C max %
Moisture content	14.0	14.0	14.0	14.0
Damaged kernels (Singly or combined)	1.0	2.5	3.0	4.0
Red kernels	1.0	2.5	3.5	5.5
Yellow kernels	0.1	0.2	0.6	1.5
Amber kernels	0.5	0.8	1.0	2.0
Green kernels	2.0	3.0	4.0	6.0
Paddy	0.5	1.0	1.5	2.0
Head rice yield (Minimum)	65.0	62.0	61.0	60.0
Total milled yield (Minimum)	88.0	86.0	82.0	80.0
Chalky kernels	2.0	3.0	4.0	6.0
Organic	0.5	1.0	1.0	1.0
Inorganic	0.0	0.0	0.0	0.0
Total foreign matter	0.5	1.0	1.0	1.0

Table 4 (a)—Requirements of grades of milled rice

Factors	Extra A Premium max %	A max %	B max %	C max %
Moisture content	14.0	14.0	14.0	14.0
Damaged kernels (Singly or combined)	0.5	1.0	2.0	3.0
Red striated kernels	0.1	0.5	1.0	2.5
Yellow kernels	0.1	0.2	0.6	1.5
Amber kernels	0.5	0.8	1.0	2.0
Chalky kernels	2.0	4.0	6.0	8.0
Total broken kernels	7.0	10.0	18.0	30.0
- Chips	0	1.0	2.0	3.0
Paddy	0	0.1	0.5	0.5
Organic	0.1	0.2	0.5	0.5
Inorganic	0	0	0	0
Total foreign matter	0.1	0.2	0.5	0.5
Colour classification shall be applicable to all grades analysed on milled samples and shall be in accordance to Table 4 (b).				

Table 4 (b) — Colour classification of milled rice

Category	Whiteness/Colour/Milling meter reading
Well milled rice	38.0 – 39.0
Extra well-milled rice	40.0 – 41.0

Table 5 (a) — Requirements of grades of cargo parboiled rice

Factors	Extra A Premium max %	A max %	B max %	C max %
Moisture content	14.0	14.0	14.0	14.0
Broken	4.0	6.0	8.0	10.0
Damaged kernels (Singly or combined)	1.0	1.5	2.0	3.0
Non-gelatinized kernels	0.1	0.2	0.3	0.4
Red kernels	1.0	1.5	3.0	3.5
Total milled yield (Minimum)	88.0	85.0	82.0	80.0
Head rice yield (Minimum)	84.0	79.0	74.0	70.0
Paddy	1.0	1.0	1.5	1.5
Organic foreign matter	0.1	0.2	0.5	0.5
Inorganic foreign matter	0	0	0	0
Total foreign matter	0.1	0.2	0.5	0.5
Colour classification shall be applicable to all grades analysed on milled samples and shall be in accordance to Table 5 (b).				

Table 5 (b) — Colour classification for cargo parboiled rice

Category of rice	Whiteness/Colour/Milling meter reading
Parboiled light	26.0 - 31.0
Parboiled medium	20.0 - 25.9
Parboiled dark	16.0 - 19.9

Table 6 (a) - Requirements for grades of milled parboiled rice

Factors	Extra A Premium max %	A max %	B max %	C max %
Moisture content	14.0	14.0	14.0	14.0
Paddy	0	0.1	0.2	0.3
Broken kernels	4.0	6.0	8.0	10.0
Damaged kernels (Singly or combined)	0.5	1.0	1.5	2.5
Non-gelatinized kernels	0.1	0.2	0.4	0.6
Red striated kernels	0.5	1.0	1.5	2.0
Organic foreign matter	0.1	0.2	0.5	0.5
Inorganic foreign matter	0	0	0	0
Total foreign matter	0.1	0.2	0.5	0.5
Colour classification shall be applicable to all grades analysed on milled samples and shall be in accordance to Table 6(b).				

Table 6 (b) — Colour classification for milled parboiled rice

Category of rice	Whiteness/Colour/Milling meter reading
Parboiled light	26.0 - 31.0
Parboiled medium	20.0 - 25.9
Parboiled dark	16.0 - 19.9

- 8.2** Sample grade shall be paddy, cargo, milled, cargo parboiled and milled parboiled rice which:
- a) does not meet the requirements for any of the grades from Extra A (Premium) to C;
 - b) is not an approved variety;
 - c) has an objectionable odour;
 - d) is insect-infested or of distinctly low quality.

9.0 Compositional requirements for enriched rice

- 9.1 When the vitamins, minerals and other substances listed in Table 7, are added to the rice they can be combined with harmless substances to render them insoluble in water. These substances can only be added in forms that are harmless and can be assimilated by the body.
- 9.2 If the vitamins, minerals and other substances are to be retained after the rice is washed and cooked, the quantity of the substances listed in Table 7 should be no less than 85 percent of minimum quantity stated.

Table 7 —Limits of vitamins, minerals and other substances used in enriched rice

Vitamins, minerals and other substances	Allowances
Folic acid	Not less than 0.7 mg and not more than 1.4 mg.
Niacin or niacinamide	Not less than 16 mg and not more than 32 mg.
Thiamin	Not less than 2.0 mg and not more than 4.0 mg.
Riboflavin	Not less than 1.2 mg and not more than 2.4 mg.
Vitamin D	Not less than 250 U.S.P units and not more than 1,000 U.S.P units.
Calcium (Ca)	Not less than 300 mg and not more than 1,000 mg.
Iron (Fe)	Not less than 13 mg and not more than 26 mg.
^a Butylated hydroxytoluene	This must be in an amount as not to exceed 0.0033 percent by mass of the finished product.
^a This substance is a preservative which is not used to enrich rice; it is an optional ingredient used in enriched rice.	

10.0 Packaging and labelling

10.1 *Packaging*

The packaging shall preserve the hygienic, nutritional, technological and organoleptic qualities of the product and shall not contain substances which may damage the product or constitute a health risk. Packaging

material shall be new, clean and sufficiently strong to be machine-sewn or sealed.

10.2 ***Labelling***

In addition to the requirements set out in the GDS Labelling of Prepackaged Food Standard, rice packages shall be labelled in compliance with the following provisions:

- a) The label shall have the common name of the rice preceded by the word "enriched" when any enriching substances are added to the milled rice, for example, "Enriched rice" or "Enriched parboiled rice."

- b) When the optional ingredient, butylated hydroxytoluene, is added to the rice, the label shall have the following statement prominently stated on the label: "Butylated hydroxytoluene added as a preservative."

NOTE Such a statement is needed so that it would be understood by the ordinary individual under customary conditions of purchase.

11.0 **Sampling**

The procedures used to carry out sampling of grains shall comply with ISO 24333.

12.0 **Methods of test and analysis**

12.1 The methods of testing and analysis are outlined in Annex B.

12.2 The methods for determining vitamins, minerals and other substances listed in Table 7 shall comply with the latest edition of Official Methods of Analysis of the Association of Official Analytical Chemists (AOAC).

Annex A

(normative)

Recommended list of equipment used in testing and analysis

The recommended list of equipment used in testing and analysis is as follows:

1. Satake testing miller
Model TM - 05
110 VAC 50/60 Hz
2. Leroy testing miller
Model 1 M - 05
110 VAC 50/60 Hz
3. Mc Gill No. 3 rice miller
110 VAC 50/60 Hz
4. Satake mini testing sheller
Model THU - 35 A
110 VAC 50/60 Hz
5. Rimac mini testing sheller
Model TM - 5
110 VAC 50/60 Hz
6. Hercules mini testing sheller
Model MTS - 35 A
Seeburo sample sheller
110 VAC 50/60 Hz
7. Seeburo sample sheller
Model No. 580 DC/B
110 VAC 50/60 Hz
8. Colombini and mini testing sheller
Model G 390/R
110 VAC 50/60 Hz
9. Burrows digital moisture computer
Model DMC 700
110-220 VAC 50/60 Hz

10. Motomco 919 moisture meter
110 VAC 50/60 Hz
11. Dole moisture meter
Model 400
12. Seedburo portable moisture tester
Model MGT
13. Brown duvel moisture tester
Model No. BD-1
110 VAC 50/60 Hz
14. Mechanical conversion oven
Model No. 3515 M
120 VAC 50/60 Hz
15. All purpose laboratory oven
Model No. LO201C
120 VAC 50/60 Hz
20. Carter day dockage tester
Model XT-3
110 VAC 50/60 Hz
21. Seedburo heavy duty boerner divider
Model No. 34
22. Seedburo precision divider
Model No. 106
23. Seedburo riffle divider
Model No. 275
24. Seedburo rice sizing machine
Model No. 539 SET
115 VAC 60 Hz
25. Kett whiteness meter
C-300
90-220 VAC 50/60 Hz
26. Indented plates
Indentations: 3 mm, 4 mm, 5 mm and 5.5 mm

27. Seedburo Moistuire Tester
MD1705
28. Satake Milling/Colour Meter
MM1C

Annex B

(normative)

Methods of test and analysis

B.1 Procedure - Foreign odours/pests

- a) Smell the sample for foreign odours.
- b) Visually examine for the presence of live or dead insects, their fragments and excreta, etc.
- c) Record findings.

B.2 Procedure - Moisture content

- a) Using a divider reduce a sample of 500 g to two samples (replica).
- b) Use a recommended moisture meter (**Annex A**) with its associated procedures to test each sample (replica) for moisture content and record the results.
- c) Combine samples when tests are completed.
- d) The test should be carried out in duplicate.

NOTE An alternative test is ISO 712:2009.

B.3 Procedure for classification length/width ratio

B.3.1 Determination of kernel length

- a) Using a divider, reduce a sample of 200 g to two samples of 35 g each.
- e) From one 35 gram, select 100 whole kernels at random. Each kernel measured individually with a digital caliper, with accuracy of 0.01 mm. The average length is calculated. The procedure is repeated using the second 35 g sample.
- f) The average length of the kernels for both samples is calculated.
- g) Measured kernels are returned to the samples.

B.3.2 Determination of kernel width

- h) Using a divider, reduce a sample of 200 g to two samples of 35 g each.
- i) From one 35 g sample select 100 whole grains at random. The width of each kernel is measured individually with a digital caliper, with accuracy to 0.01 mm. The average width is calculated.
- j) The procedure is repeated using the second 35 g sample.
- k) The average width of kernels for both samples is calculated.
- l) Measured kernels are returned to the sample.

B.3.3 Determination of kernel length/width ratio

B.3.3.1 The kernel length/ width ratio is calculated by using:

- m) The average length calculated previously.
- n) The average width calculated previously.
- o) The following formula below is used to calculate the length/width ratio:

$$\text{length/width ratio} \equiv \frac{\text{average length of grain}}{\text{average length of grain}}$$

B.3.3.2 The length/width ratios of kernels are as follows:

- p) Extra long: > 3.5
- q) Long: 3.0 – 3.4
- r) Medium: 2.0 - 2.9
- s) Short: <2.0

B.4 Procedure - Analysis of total broken kernels

- t) Weigh two approximately 35 g samples to ascertain correct weight.
- u) Remove all broken kernels.
- v) Weigh the broken kernels, and calculate the percentage as follows:

$$\text{broken in sample (\%)} \equiv \frac{\text{weight of broken}}{\text{weight of sample}} \times 100$$

- a) Calculate the average of the two samples and record the result as the representative percentage.
- e) Record result.

B.5 Procedure - Analysis of other factors

- a) **Analyse samples for the following factors as requested in the respective grading requirements after total broken are removed:**

- 1) Red kernels;
- 2) Red striated kernels;
- 3) Non-gelatinized kernels;
- 4) Heat-damaged kernels (Amber and yellow);
- 5) Green kernels;
- 6) Chalky kernels;
- 7) Paddy;
- 8) Foreign matter (Organic and inorganic); and
- 9) Damaged kernels

NOTE Only whole kernels are used in the analysis of the above factors.

- b) Factors are separated and weighed and the percentage of each factor determined as follows:

$$\text{Factor in sample (\%)} = \frac{\text{Weight of factor}}{\text{Weight of sample}} \times 100$$

- c) Calculate the average of the two samples and record result.
NOTE The average is used as the representative percentage.

B.6 Procedure to determine head rice yield

- a) Make a test run in the milling machine with cargo rice to determine the time taken to achieve a well milled degree. This time will vary with different varieties and types.
- b) Having determined the milling time, weigh approximately 200 g of cargo rice and mill for the length of time determined.
- c) Weigh the total milled rice (A) and record the weight obtained. Using a sample divider, reduce the milled rice to two working samples of 50 g each.
- d) Remove all broken kernels from the first 50 g sample. Weigh and record the value of the head rice (B) obtained from this sample.
- e) The head rice yield of the first 50g sample is calculated using the formula below:-

$$\text{Head rice, B, (\%)} = \frac{\text{Head rice} \times 100}{\text{Sample weight}}$$

$$\text{Head rice yield (\%)} \equiv \frac{\left(\frac{B}{100}\right) \times A \times 100}{200}$$

EXAMPLE A worked example is shown below:

$$\begin{aligned} \text{Head rice (B)} &= 42 \text{ g} \\ \text{Total milled rice} &= 131 \text{ g} \\ \text{Sample weight} &= 50 \text{ g} \\ \text{B \%} &= \frac{42}{50} = 0.84 \\ \text{Head rice yield (\%)} &= \frac{0.84 \times 131 \times 100}{200} \equiv 55.02 \text{ \%} \end{aligned}$$

- f) Head rice yield determination is repeated on the second 50 g sample and the average value recorded. If the difference between the results of the two determinations, carried out simultaneously, exceeds 1.0% absolute, the test shall be repeated.

B.7 Procedure for determination of colour

Using a representative sample:

- a) Pass sample through boerner divider and reduce to three sub-samples.
- b) Weigh accurately the same amount for each sub-sample.
- c) Standardise meter by inserting sample case with calibration plate and by pressing sensitivity button reading does not correspond to 86.2.
- d) Place sample holder with first sub-sample into the machine.
- e) Record meter reading.
- f) Discard sample.
- g) Repeat steps c to e using the other two samples.

Meter sensitivity reading can vary by ± 0.4 .

Table 8 – Meter readings

Category	Meter reading
Parboiled light	26.0 - 31.0
Parboiled medium	20.0 - 25.9
Parboiled dark	16.0 - 19.9

B.8 Procedure for analysis of paddy

- a) Weigh 100 g of clean paddy.
- b) Shell the entire sample in a lab sheller.
- c) Weigh a 35 g sample from the shelled paddy.
- d) Analyse the sample for the following factors.
 - 1. Red kernels
 - 2. Green kernels
 - 3. Damage kernels
 - 4. Chalky kernels
 - 5. Heat damaged kernels
- e) These factors are weighed and the percentage of each factor is determined using the formula as stated in the calculation in item f).
- w) Record results

Calculation:

$$\text{Factor in sample (\%)} = \frac{\text{Weight of factor}}{\text{Weight of sample}} \times 100$$

NOTE Both whole and broken kernel are utilised during the separation of the above mentioned.