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ANALYSIS OF FOODGRAINS
PART 2 - REFRACTION

BUREAU OF CEYLON STANDARDS

METHODS OF ANALYSIS OF FOOD GRAINS
PART 2: REFRACTIONS

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Gr. 3

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This Standard does not purport to include all the necessary provisions of a contract.

SRI LANKA STANDARD
METHODS OF ANALYSIS OF FOOD GRAINS
PART 2: REFRACTIONS

FOREWORD

This Sri Lanka Standard Specification has been prepared by the Drafting Committee of the Bureau on Methods of Analysis of Food Grains. It was approved by the Agricultural and Chemicals Divisional Committee of the Bureau of Ceylon Standards and was authorised for adoption and publication by the Council of the Bureau on 1978-12-01.

All standard values given in this specification are in SI units.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with CS 102*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

In the preparation of this standard the assistance gained from the publications of the Indian Standards Institution is gratefully acknowledged.

*CS 102 *Presentation of numerical values.*

1 SCOPE

This part of the standard prescribes the method for the determination of refractions in food grains to assess the marketable quality.

2 TERMINOLOGY

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

2.1 food grains: Include edible cereals, millets and pulses (see SLS...*).

2.2 refractions: All components in food grains which differ from sound grains. These are detailed in 2.2.1 to 2.2.11.

2.2.1 Foreign matter shall include:

a) Inorganic matter as sand, gravel, dirt, pebbles, stones, lumps of earth, clay and mud;

b) Organic matter as chaff, straw, seeds of weeds and other inedible grains; and

c) Insect infested grains, major insect parts, insect larvae, pupae and adults.

2.2.2 other food grains: Any food grain other than the grain concerned.

2.2.3 varietal admixture: The presence of a variety of the same grain other than the variety under consideration.

2.2.4 shrivelled or immature: Grain kernels or pieces of grain kernels that are not fully developed.

*SLS ... *Terminology for food grains (under preparation).*

2.2.5 broken: Pieces of kernels that are less than three-fourth of the size of the kernel. In the case of dhal, pieces that are less than the size of three-fourths of the split pulse shall be considered as brokens.

2.2.6 damaged: Kernels or pieces of kernels that are sprouted or internally damaged as a result of heat, microbes, moisture or weather.

2.2.7 slightly damaged or touched: Kernels or pieces of kernels that are damaged or discoloured superficially so as not to affect the quality of the material.

2.2.8 discoloured: Kernels or pieces of kernels that have changed the colour as a result of deteriorative changes.

2.2.9 insect damaged: Kernels that are partially or wholly bored.

2.2.10 kernels with husk: Kernels or pieces of kernels carrying husk on one-sixteenth or more portion.

2.2.11 fragments: In the case of split pulses, pieces of kernels that are one-eighth of the full size of the split pulse shall constitute the fragments.

3 TEST SAMPLE

3.1 lot: Lot shall be a stated proportion as indicated in SLS....* and SLS ...**. From this lot a composite sample of about 2500 g shall be drawn on the basis of SLS...* and SLS...**. The composite sample shall be reduced to about 500 g by dividing on a sample divider, in case, sample divider is not available, empty the container of the composite sample on a flat smooth

**SLS...Methods for sampling of cereals and pulses (under preparation).*

***SLS...Methods for sampling bigger size food grains (under preparation).*

surface and mix thoroughly. Spread the composite sample in a circular layer of about 12-mm to 25-mm thickness. Scoop out 500 g of sample from centre, sides and different points taking care that no foreign matter is left over from the grain which has been scooped. This sample weighing about 500 g shall constitute the test sample.

4 APPARATUS

4.1 *Analytical balance,* of sensitivity 5 mg.

4.2 *Sieves*

4.2.1 Sieves of appropriate sizes conforming to CS 124* shall be used.

4.2.2 A solid bottom pan shall be used at the bottom.

4.3 *Enamelled plates,* flat type; 300 mm diameter with raised rims.

4.4 *Small scoop,* with handle of mild steel; it may be in any of the following sizes:

Length	Width	Height
mm	mm	mm
105	100	25
75	65	25
25	20	25

4.5 *Forceps,* of about 100 mm length.

4.6 *Magnifying glass,* having a magnification of 10.

*CS 124 Test sieves.

5 PROCEDURE

5.1 Preliminary examination

Visually examine the test sample as a whole for its general condition, infestation and for any deleterious material hazardous to human health which could render the grain inedible. Assess whether the test sample is wholesome, clean, dry and in sound marketable condition. Report on odour as well.

5.2 Determination of foreign matter

Foreign matter is removed by passing the sample through a sufficient number of sieves of appropriate sizes.

5.3 Refractions other than foreign matter

Mix the contents of the sieves freed from foreign matter together and spread out evenly on a flat smooth surface as in 3.1. From this spread, take exactly the specified quantity required for analysis for the grains under test, as indicated in Table 1, from different sides and the middle, by means of small scoops. Place the weighed quantity on enamel plate. Then pick out by hand with the help of magnifying glass, if necessary, various items of refractions, other than foreign matter in the order given in Table 2. Separate these refractions from the weighed sample and weigh on the analytical balance. Then calculate the percentage of various individual refractions separately on the quantity taken for actual analysis (see Table 1).

TABLE 1 - Quantity of sample to be taken for determining refractions other than foreign matter *(See 5.3)*

Serial No.	Food grain	Mass in g (Min.)
1	Wheat	50
2	Maize	50
3	Rice	20
4	Barley	50
5	Gram	50
6	Other pulses	25
7	Millets	20

TABLE 2 - Order in which refractions should be separated from the weighed sample *(See 5.3)*

Serial No.	Refractions
1	Other food grains.
2	Damaged.
3	Discoloured.
4	Insect damaged.
5	Fragments.
6	Brokens.
7	Slightly damaged or touched.
8	Kernels with husk.
9	Shrivelled or immature.
10	Varietal admixture.

5.3.1 Carry out the analysis in duplicate and report their average.

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