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भारतीय खाद्य सुरक्षा और मानक प्राधिकरण
Food Safety and Standards Authority of India
(खाद्य सुरक्षा एवं मानक अधिनियम, 2006 के तहत स्थापित एक वैधानिक प्राधिकरण)
(A Statutory Authority established under the Food Safety & Standards Act, 2006)
(गुणवत्ता आश्वासन प्रभाग)
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दिनांक: 16 नवंबर, 2023/Dated:16th November,2023

आदेश/Order

Subject-Guidelines on sampling of Fortified Rice Kernels (FRK) and Fortified Rice (FR)

(I) The Scientific Panel on Methods of Sampling and Analysis has approved the Guidelines on sampling of Fortified Rice Kernels (FRK) and Fortified Rice (FR) (Annexure-I).

(II)The Guidelines may be implemented either by Governmental food control authorities, or by professionals themselves (self-inspection performed by producers and/or traders).

(III) This guideline has been issued with the approval of competent authority.

स्वीटी बेहेरा
Sweety Behera
(गुणवत्ताआश्वासन)
(Quality Assurance)

To:

1. The Secretary, Department of Food & PD, Ministry of Consumer Affairs, Food and Public Distribution, Krishi Bhawan, New Delhi - 110001.
2. The Chairman & Managing Director, Food Corporation of India, Headquarters, New Delhi - 110001.
3. All Regional Directors/Designated Officers/Central Licensing Authority.
4. All Food Safety Commissioners
5. All FSSAI Notified Laboratories

Copy to (for information):

1. PS to Chairperson, FSSAI, New Delhi.
2. PS to CEO, FSSAI, New Delhi.
3. ED (RCD), FSSAI, New Delhi.
4. Advisor (Science and Standards), FSSAI, New Delhi.
5. CITO FSSAI, New Delhi- to upload on the FSSAI website.

Annexure-I

Guidelines on sampling of Fortified Rice Kernels (FRK) and Fortified Rice (FR)

1. Objectives:

- To provide guidelines for sampling of fortified rice kernels (FRK) and Fortified Rice (FR) to ensure drawal of representative samples by enforcing officials. The prescribed method of sampling are designed to ensure that fair and valid sampling procedures are used when FRK and FR are being tested for compliance with a particular commodity standard.

2. Scope:

- These Guidelines may be implemented either by Governmental food control authorities, or by professionals themselves (self-inspection performed by producers and/or traders).
- It is applicable for the determination of heterogeneously distributed fortificants, undesirable substances, contaminants and parameters usually homogeneously distributed like those use to assess quality or compliance with specification.

3. Definitions:

- a. **Consignment:** The physical quantity of grain on offer, dispatched or received at one time, and covered by a particular contract or shipping document. It may be composed of one or more lots or parts of a lot.
- b. **Laden** -Term to describe a partly or completely full state, as for wagon, lorry, barge or ship.
- c. **Lot** - A defined quantity of a commodity that has been produced or

manufactured under the same basic conditions on the same day, at the same establishment,
and identified under the same batch number or the entire production for a certain period of time from which samples are to be taken.

- d. **Primary sample (or increment)**- A small quantity of rice taken at one time from a single position from a stationary lot. A series of primary samples is taken from different parts of the stationary lot, so that when they are bulked, they are representative of the lot/container. If collected from a lot of prepacked rice it will normally be in the form of a unit.
- e. **Composite (Bulk) sample**- Quantity of commodity obtained by combining and mixing the increments taken from a specific lot. The sample comprises all of the sample units drawn for examination or testing purposes from a particular lot.
- f. **Laboratory sample**- Representative quantity of commodity obtained by division of the bulk sample and intended for analysis finally submitted to the laboratory for analysis.
- g. **Representative (Random) sample**: A sample in which the characteristics of the lot from which it is drawn are maintained. It is in particular the case of a simple random sample where each of the items or an increment of the lot has been given the same probability of entering the sample i.e. all elements in the lot have an equal and independent chance of being included in the sample.
- h. **homogenization**- thorough blending by mechanical or manual means so that contaminants and physical properties are evenly distributed throughout the aggregate or laboratory sample.
- i. **Official (Legal) Sample** : Sample taken in a manner so that it can serve as the basis for enforcement and/or legal action and handled in a manner that preserves integrity as evidence including identity, ownership, traceability and a clear record of chain of custody.
- j. **Surveillance Sample** : Taken as part of routine inspections or surveys to identify any lack of compliance with state, federal or other laws and regulations.

General principles taking into consideration while drawing samples of Fortified Rice Kernels & Fortified Rice

1. Proper sample size, suitable containers are to be taken for sampling and proper packing & sealing is to be done to prevent spoilage/damage before analysis.
2. Increment samples from each lot shall be mixed to give a bulk sample of an appropriate quantity. Laboratory samples are obtained by the successive division and reduction of the bulk sample.
3. Samples shall be as representative as possible of the lots from which they are taken. Therefore, as the composition of a lot is seldom uniform, a sufficient number of increments shall be taken and carefully mixed, thus giving a bulk sample from which, the laboratory samples are obtained by successive divisions or otherwise.

4. All manual sampling equipment and mechanical samplers used shall be clean, dry and made from material, which will not contaminate the commodity being sample. The metal tool should be dry before being used to collect samples.
5. Sampling shall be carried out in such a manner as to protect the samples, sampling instruments, and the containers in which the samples are placed, from contamination from rain, dust, etc. If walking on grain cannot be avoided, precautions in the form of protective clothing should be taken to prevent contamination of the grain.
6. Sample must be submitted with proper sample ID in sealed condition.
7. **Tools for sampling:**

The sampling is a procedure which requires a great deal of care. It is strongly recommended that the task be entrusted to personnel who have been trained to use the appropriate apparatus.

Tools for bags and sacks

Grain probes

Using a hand probe is the only effective method of obtaining a representative sample from grain in a sack. Grain probes essentially fall into two distinct styles –

- (i) Compartmented (or partitioned)
- (ii) Open handle probes.

Lacking compartments, which are actually due to partitions within the tube itself, the open handle probes actually allow you to pour the samples that you obtain from the probe directly into a sample container. The open-throat probe tends to draw more grain from the top portion.

The primary difference between the two being the presence or absence of compartments within the probe.

Hand probes come in different lengths. The sample is more representative of the lot if the probe reaches the bottom of the sack.

5. Steps for using hand probe

- a. With the slots on the probe closed, insert the probe at a slight angle (10 degrees).
- b. With the slots facing upward, open the probe and move it up and down in two short motions to fill the compartments.
- c. Close the probe, withdraw it from the grain and empty the grain onto a canvass or trough that is slightly longer than the probe you are using. If you are using an open-throat probe, pour the grain from the open end of the probe directly into a clean, dry container.
- d. Collect the sample in a dry, clean container.

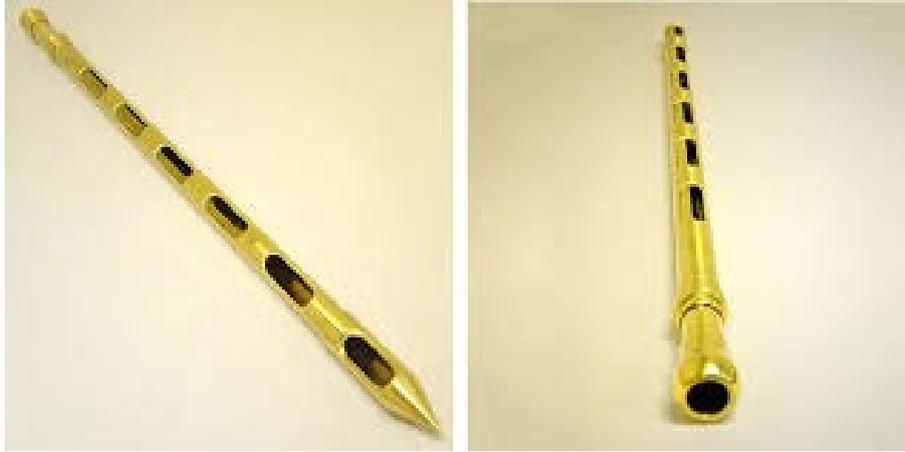


Fig: (1) Compartment hand probe



Fig: (2) Probe after collection of increment sample

6. Method of taking sample:

(1) Sampling from bags

The increments of sample shall be taken from different parts of a bag (for example top, middle and bottom) by means of a sack/bag spear from the number of bags specified in Table

Selection of bags to be sampled			
S. No.	Number of Bags	Number of Bags to be sampled	Approximate Size of composite sample(kg)
(i)	Upto 10 Bags	Each Bag	Lot sizes <50 tonnes bulk sample size should be 5 kg.

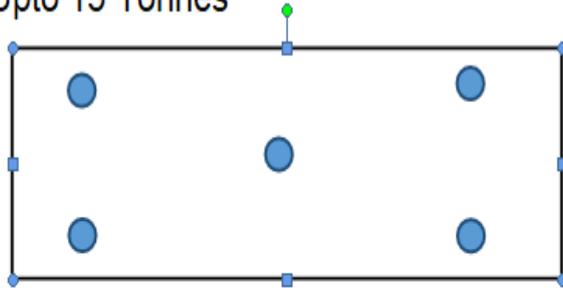
(ii)	10 to 100 bags	10 bags	Lot size 50-500 tonnes, composite sample size should be 0.01 % of the total lot size Lot sizes > 500 tonnes, the size of the composite sample should be 50 kg.
(iii)	More than 100	Square root (approx.) of total number, taken according to a suitable sampling scheme	

(2) Sampling from rail or road wagons, Lorries, barges or ship

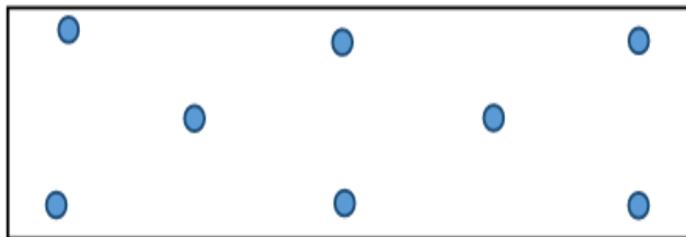
Increments shall be taken throughout the whole depth of the lot. Suggested patterns are as follows:

Selection of Sampling point		
S. No.	Quantity of stock	No of Sampling point (Minimum)
(i)	Upto 15Tonnes	5
(ii)	15 to 30Tonnes	8
(iii)	30 to 500 Tonnes	11

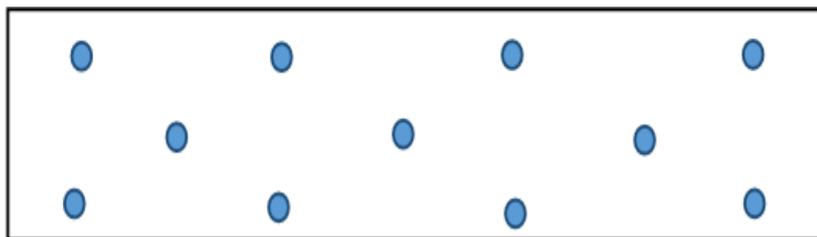
(i) Upto 15 Tonnes



(ii) 15 to 30 Tonnes



(iii) 30 to 500 Tonnes



(iv) Above 500 Tonnes

Take the square root of the tonnage in the static bulk. Divide by two and round up to the next whole number. This is the minimum number of increments that is to be obtained. If circumstances dictate that more increments are required to obtain fair average samples of the static bulk, then more shall be taken. They shall be obtained from samples taken randomly from different positions in the bulk.

Tonnage	Square root	No of increments
500	22.4	12
1000	31.6	16
2000	44.7	23
4000	63.2	32
6000	77.4	39
8000	89.4	45

10000	100	50
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When using mechanical samplers, increments shall be taken from a minimum of three different sampling points.

Sampling scheme for consignments of more than 100 bags

The consignment shall be divided into $(n - 1)$ groups containing n or $(n - 1)$ bags; the remaining bags group.

Examples :

a) A consignment comprising 200 bags

- The square root of 200 = 14.042, therefore $n=14$;
- make up 14 groups of 14 bags (i.e. total of 196 bags);
- draw up a list from 1 to 14; cross out one number, for example 7;
- sample the 7th bag from each group of 14 bags;
- the remaining group (i.e. 4) is smaller than 14 bags, so sample one bag from this group at random.

A total of 15 bags have therefore been selected.

b) A consignment comprising 2000 bags

- The square root of 2000 = 44.721, therefore $n = 45$;
- make up 44 groups of 45 bags (i.e. total of 1980 bags);
- draw up a list from 1 to 45;
- cross out one number; for example 20;
- sample the 20th bag from each group of 45 bags;
- the remaining group (i.e. 20) is smaller than 45 bags, so sample one bag from this group at random.

A total of 45 bags have therefore been selected.

7. Protocol of Sampling

- Identify the total number of bags in the lot.
- Determine the number of bags to be sampled and number of increments to be taken from each bag.
- Collect required number of Increments from each bag using a probe.
- Increment should be taken from different parts of bag (i.e. top, middle and bottom).
- Combine all the collected increments to obtain the composite sample.
- Mix thoroughly to obtain a homogeneous composite sample.
- Divide the composite sample using either a mechanical sample divider or by coning and quartering

- Prepare four laboratory samples.
- Each laboratory sample should contain a minimum of one kg
- Pack, seal and label the container of sample.

Bulk sample

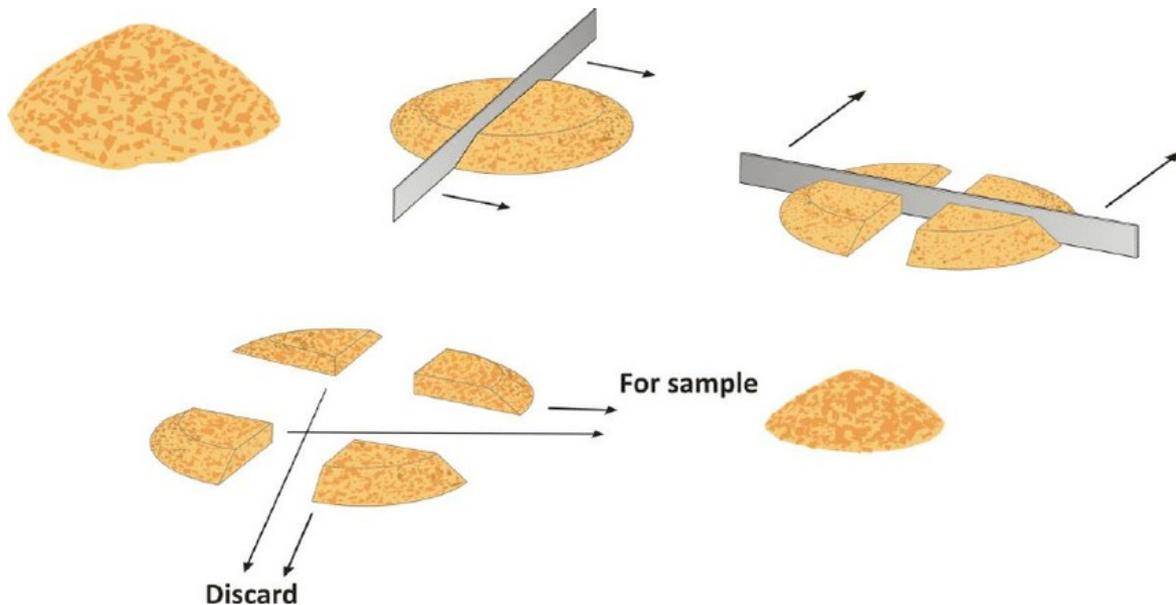
The bulk sample shall be formed by combining the increments and mixing them thoroughly.

Division of bulk sample

Divide the bulk sample to obtain the required number of laboratory samples by coning and quartering or by using one of the sample dividers

Coning and quartering

- Mix the sample thoroughly on a clean non-absorbent surface.
- Draw the Fortified Rice Kernels/Fortified Rice into a conical heap.
- Flatten the top of the heap and divide into quarters.
- Reject the two diagonally opposite quarters and mix the remaining two.
- Repeat the complete process until the required laboratory sample is obtained.



Coning & Quartering

8. Packaging and labelling of samples

Preparing the laboratory sample

Governmental food control authorities, or by professionals themselves (self-inspection performed by producers and/or traders) shall draw the samples of fortified rice depending on the lot size and prepare the requisite number (4) of laboratory samples from the composite sample using the dividing techniques. Each laboratory

sample should be a minimum of one kg.

Packaging of samples-

- The laboratory samples shall be packed in clean containers/gunny bag. The containers shall be completely filled and the closures shall be sealed to prevent loosening or tampering.
- Use sound, clean, dry shipping containers and packaging materials. Pack samples tightly to prevent moisture absorption.
- The bags and other containers shall carry the seals

Labels for samples

- If paper labels are used for the labelling, they shall be of a suitably high quality for the purpose.
- The information, written on the labels or directly on the bags, shall be indelibly marked, using a marker which will not cause any odour in the sample.
- A duplicate label may be included in the sample container provided that the sample is not intended for the determination of moisture content or the content of some other ingredients.

The following information shall include on the label:

- a. Name of product
- b. Identification mark or lot number
- c. Date of sampling
- d. Place of sampling
- e. Destination
- f. Quantity of consignment
- g. Number of bags/lot size
- h. Number of laboratory sample
- i. Name of Firm/seller
- j. Name of sampler

9. Dispatch of samples:

The sample drawn should be transported to the testing laboratory as quickly as possible. Whenever possible, samples should be kept and transported at ambient temperature, dry, out of direct sunlight and in a non humid condition.

10. References:

1. IS 14818:2000 Cereals and pulses and milled products- Sampling of static batches.
2. Sampling Rules-The Grain And Feed Trade Association

3. ISO 24333:2009 Cereal and Cereal Products – Sampling
4. FSSAI Manual for Food Safety Officers