2022

Standard Operating Procedures for Fortified Rice Manufacturers

FOOD SAFETY AND STANDARDS AUTHORITY OF INDIA

Fortified Rice is milled rice (of any variety) blended with extruded rice shaped kernels, fortified with essential vitamins and minerals, in the ratio 1:100.

Rice, when fortified, shall contain mandatory micronutrients (Iron, Folic Acid, and Vitamin B12), or optional (Zinc, Vitamin A, Thiamine, Riboflavin, Niacin, and Pyridoxine) as per levels given by Food Safety and Standards (Fortification of Foods) Regulations, 2018.

RAW MATERIAL PROCUREMENT

- The millers will procure the FRK directly from the FSSAI Licensed FRK manufacturers who will be required to submit Certificate of Analysis (CoA) from FSSAI notified NABL laboratories for the FRK.
- The CoA of FRK should mention the levels of all micronutrients, method used for testing, standards and Limit of Detection (LOD).
- Utmost care is to be taken in manufacturing, packaging, handling and storage of fortified kernels as the finished product is mixed with rice and distributed for consumption to consumers.
- Milled rice in which FRK will be blended should comply with rice specification as per Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011.
- All the incoming raw materials should be visually examined for any kind of abnormalities or deviation from FSSAI specification. It needs to be ensured that the FRK resembles the regular rice in its colour, sheen, consistency, dimension and texture.

BLENDING OF FORTIFIED RICE

Blending of milled rice with FRK is carried out to obtain fortified rice. The blending operation is similar to a normal mixing process of two different solid particles. To form a perfect homogeneous blend, several parameters play a significant role:

- bulk density of FRK and milled rice
- size of the FRK and milled rice grains
- time of blending
- design of blending equipment
- ratio of the two different particles in the blend.

Blending Systems:

Batch Blending Process: Consists of two hoppers of which one is filled with FRK and the other with regular milled rice. These two hoppers are connected to a dosing system which controls the grain flow and feed rate into the blender. The dosing system feeds the milled

rice and FRK in desired ratio to the blender. After blending both for an appropriate time period, the fortified rice is collected from the blender for weighment and packaging.

Continuous Blending Process: In this method, rice mills have large cylindrical graders, which can be used as blenders. It uses existing infrastructure-cylindrical graders, diversion valves and silos, which require a dosing system to integrate the rice mill setup.

BLENDING EFFICIENCY TEST (BET)

1. During fortified rice production, draw sample every hour from the production line (approximately 200 gm).
2. From this, weigh 100 gm sample.
3. Identify the FRK from this sample by visual examination or iron spot test.
4. Segregate the FRK from the sample.
5. Count the number of FRK.
6. Look for compliance in the chart (Chart 1, Annexure 1).
7. In case the result is deviating from target value, make appropriate modifications in the process.
8. Record the results in a batch monitoring chart (Annexure 2).

QUALITY ASSURANCE

1. Every manufacturer and packer of fortified rice shall give an undertaking on quality assurance and submit evidence of steps taken in this regard.
2. The undertaking shall be given twice a year, and shall include, the following:
    a. certification by a notified food laboratory that the fortified food is in compliance with the provisions of the Act and regulations and standards specified therein;
    b. up-to-date record keeping and continuous inventory of fortificants used in the manufacturing or packing process and the source of its procurement;
    c. appropriate monitoring procedures at different stages of manufacturing or packing process and the records thereof;
    d. random testing of fortificants and fortified food;
    e. regular audit of technical equipment and processes

PACKAGING, LABELLING AND STORAGE

1. All fortified food shall be packaged in a manner that takes into consideration the nature of the fortificant added and its effect on the shelf life of such food.
2. It is advised that fortified rice is bagged in the same 50 kg gunny bags specified by FCI with proper labelling as per FSSAI guidelines to distinguish fortified rice from regular rice.
3. Every package of fortified food shall contain the words, “Fortified with…..(name of the fortificant)” and the +F logo on its label. It may also carry a tagline “Sampoorna Poshan Swasth Jeevan” under the logo.

4. Provisions of the Food Safety and Standards (Packaging and Labelling Requirements), 2011, shall also apply to fortified foods.
5. Every package of food, fortified with Iron shall carry a statement, "People with Thalassemia may take under medical supervision."
6. All manufacturers and packers of fortified food complying with the provisions of the Act and rules or regulations made thereunder on fortified food shall be permitted to make a nutrition claim in relation to an article of fortified food under the Food Safety and Standards (Packaging and Labelling Requirements), 2011.
7. The food material should not be stored directly over the floor, but it should be stored over the pallets or tarpaulin sheet away from the wall

Role of Fortified Rice Manufacturers

- Fortified Rice manufacturers should have valid milling license and a valid license for processing of fortified rice under Category 6.0 of the Indian Food Categorization System (FSS Act, 2006).
- All fortified rice manufacturers to obtain +F endorsement on the FOSCOS portal.
- +F logo to be used per the FSSAI standards and gazette notification on food fortification.
- The rice mills shall comply with all Good Manufacturing Practices (GMP), and food-safety guidelines according to schedule 4 of the FSS Regulations, 2011 and maintain HACCP.
- The manufacturing and food safety practices must comply with all statutory and regulatory guidelines of the state/region where the product is manufactured.
- QA/QC should be done at the rice mills through blending efficiency counts - for which the millers and their staff should be trained.

Good Manufacturing Practices (GMP)

- Construction materials should be safe, non-toxic, and approved for use in a food-processing facility.
- All of the equipment, walls, floors, doors, windows, and fixtures must meet approved standards.
- The plant layout should be such that it can avoid accumulating dirt and can be easily cleaned and sanitized.
- Adequate numbers of hand-washing area should be constructed in the facility to facilitate good hygiene practices.

Annexure 1
STANDARDISATION OF FORTIFIED RICE KERNEL COUNT

1. From the lot of FRK received, randomly select 10% bags for sampling.
2. Open each bag and draw sample from each bag (approx. 50 g sample)
3. From each sample drawn, weigh 1 g FRK in duplicate.
4. Count the number of FRK in 1 g FRK from each sample and record in the chart as given below:

Sample No.	**Duplicate sampling**	
	1	**2**
1		
2		
3		
4		
5		
6		
7		
8		
Average of each set of sample	**"A"**	**"B"**
Take average of "A" and "B" to attain the **TARGET VALUE** of FRK from the batch **(X)**.		

5. Calculate lower limit (X-10%) and upper limit (X+10%) for the batch and record in Chart 1.

Chart 1: Target value of FRK

Lower Limit	X-10%
TARGET VALUE	**X**
Upper Limit	X+10%

Note: Standardisation of FRK Count is to be conducted for every batch of FRK received.

Annexure 2

BLENDING EFFICIENCY LOG-SHEET

Target Value: X		**Lower Limit: X-10%** **Upper Limit: X+10%**	
S.No.	**Date**	**Time**	**Count**