

## **Bakery products & fortification, regulations for fortification**

Thursday, 15 April, 2021

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Food Fortification means deliberately increasing the content of essential micronutrients in a food so as to improve the nutritional quality of food and to provide public health benefit with minimal risk to health. The fact that no food has all the nutrients in it, food fortification plays a key role in targeting a particular micronutrient and fortifying the food which lacks that micronutrient in order to reduce the risk of any deficiency in the population or specific population group.

Fortification aids in meeting the requirement or recommended intake of one or more micronutrients, a fortified food also helps in improving the health and maintains the nutritional quality of foods. A fortificant is a substance added to food to provide micronutrients but does not include nutraceuticals of foods for special dietary uses.

A food to be fortified for masses requires scientific proof of the bioavailability of the micronutrients in the body. Specific mandatory requirements for fortification of foods is given by Government of India. According to FSSAI heme iron should not be used wherever iron is used as a source of nutrient in any form in any food products. According to FSSAI the following food products can be fortified, namely- Salt, Milk, Atta, Maida, Oil and Raw rice.

Bakery foods include cakes, pastries, breads, biscuits and so on, where a significant amount of wheat flour and maida are used to prepare the baked products which are then mixed with other ingredients and are heat processed to remove the moisture which in turn provides a proper shape and texture to the baked products. 60 per cent of the bakery products are sold from the unorganised sector due to the low cost and traditional way of baking the products.

Nowadays, Indians are becoming more aware about the kind of food that is available in the market, its pros and cons due to social media. Organised sector can increase their share in the market by providing the consumers with innovative products and can try food fortification in order to add value to the product and improve its quality. More research and development studies are required in the bakery sector for food fortification. Fortification of nutrients in the bakery products may also cause some undesirable taste, texture or colour which needs to be improved by more research and development studies.

Since, Wheat flour and maida are the two essential ingredients that are used in the bakery industry and FSSAI has also mentioned that the fortification of these two ingredients can be done by addition of iron, folic acid and Vitamin B-12. Where iron in the form of Ferrous

citrate/Ferrous lactate/Ferrous Sulphate/Ferric pyrophosphate/electrolytic iron/Ferrous fumarate/Ferrous BisGlycinate can be done at the level of 28-42.5 mg per kg or Sodium Iron (III) Ethylene diamine tetra acetate Trihydrate with a fortification level of 14 mg -21.25 mg per kg, for folic acid the level of fortification is 75 µg-125 µg per kg, for Vitamin B-12 the level of fortification is 0.75 µg-1.25 µg per kg. Also, Wheat flour and maida can be fortified with Zinc in the form of zinc sulphate (10 mg- 15 mg per kg), Vitamin A-Retinyl acetate/Retinyl palmitate(500 µg RE- 750 µg RE per kg), Vitamin B1-Thiamine- hydrochloride thiamine mononitrate (1 mg-1.5 mg per kg), Vitamin B2-Riboflavin (1.25 mg- 1.75 mg per kg), Vitamin B3- Niacin- Nicotinamide/Nicotinic acid (12.5 mg- 20 mg per kg), Vitamin B6-Pyridoxine- Pyridoxine hydrochloride(1.5 mg- 2.5 mg per kg). Oil is also one of the essential ingredients used in the bakery industry and according to FSSAI can be fortified with Vitamin A and D. The use of these fortified ingredients will significantly raise the nutritional profile of the baked products.

The Challenge while fortifying in baked goods is that of the solubility and absorption of these nutrients in the body. Since, Vitamins are not heat stable there is a possibility that the vitamins may be lost during the process of baking. Raw materials that are fortified with minerals are quite stable but may possibly change the taste, texture or colour of the product and more research work on the flavor and texture profile as well as bioavailability of these micronutrients must be done. As of now FSSAI has not provided any guidelines for fortification of baked foods as more research work needs to be done.

**General obligations required by food manufacturers for fortifying food ingredients includes the following points:**

1. Undertaking on quality assurance and submission of the evidence of the steps taken.
2. Certification from a laboratory regarding the compliance of fortified food according to the regulations.
3. Up-to-date record keeping of the fortificants and the manufacturing process.
4. Appropriate monitoring procedures at every step of the process.
5. Random testing of fortificants and fortified foods.
6. Regular audit of technical equipment and processes.
7. Following good manufacturing practices specified by FSSAI.
8. Reference of the purity criteria of fortificants.

Every package of fortified food shall carry the following statement 'fortified with (Name of the fortificant)' and the logo of food fortification given by FSSAI below which a tagline 'Sampoorna Poshan Swasth Jeevan' needs to be declared. Packages containing food fortified with iron shall carry a statement 'People with Thalassemia may take under medical supervision'. Claims regarding the fortified food can be made by the manufacturers under the FSSR, 2011.

Although, there are no specific guidelines provided by FSSAI for fortification of baked food products, raw materials that are fortified with the specified micronutrients can be added which will probably increase the nutritional value of the baked food products and would certainly have valuable nutritional claims.