



Enhancing Nutrition

A Deep Dive into Cereal Fortification

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Abstract

Food fortification, a crucial intervention in addressing micronutrient deficiencies, has emerged as a vital strategy to enhance global public health. This practice involves enriching common foods, particularly cereals, with essential vitamins and minerals. Understanding the diverse fortification methods, recommended fortificants, and the availability of fortified products is instrumental in comprehending its impact on nutrition and well-being. This study explores various fortification

techniques such as dry mixing, spraying, coating, pelleting, extrusion, dissolution in water, and encapsulation. Essential micronutrients like iron, folic acid, vitamin B12, zinc, vitamin A, thiamine, riboflavin, niacin, and pyridoxine are meticulously incorporated, ensuring precise supplementation levels. Examples from the market highlight the availability of fortified cereal products, such as wheat flour and rice, emphasizing the practical implementation of fortification strategies.

Introduction

Food fortification, a deliberate intervention aimed at enriching food with essential micronutrients, plays a pivotal role in improving the nutritional quality of our

diets. This practice involves strategically adding vitamins and minerals to common food items, offering a practical solution to address micronutrient deficiencies,

especially in developing nations. Among these fortified foods, cereals and their derivatives are prominent targets due to their widespread consumption. Understanding the methods of fortification, the recommended fortificants, and the availability of fortified cereal products in the market is vital in comprehending the impact of this nutritional strategy on public health. Cereal fortification not only addresses deficiencies but also empowers

communities to make informed dietary choices. This comprehensive approach significantly contributes to public health, fostering a fortified future for all. By enhancing the nutritional content of widely consumed foods, food fortification stands as a beacon of hope, ensuring essential vitamins and minerals reach millions and promoting a healthier, fortified future for communities worldwide.

Methods of Cereal Fortification

1. **Dry Mixing:** Commonly used for cereal flours and powdered products, where a nutrient premix is added during processing.
2. **Spraying:** Employed for processed foods like corn flakes, ensuring nutrients are added without compromising the food's texture.
3. **Coating:** Applied to rice grains, where vitamins are sprayed and then coated to prevent losses during washing and cooking.
4. **Pelleting:** Utilized for rice, incorporating vitamins into pellets made from broken kernels.
5. **Extrusion:** A method specifically applied to fortify rice during extrusion processes.
6. **Dissolution in Water:** Suitable for liquid products like milk, beverages, and baked goods, ensuring uniform nutrient distribution.
7. **Encapsulation:** Prevents nutrient interactions and loss, notably used in double fortification of salt.

Recommended Fortificants for Rice, Atta & Maida: fortification@fssai.gov.in

In the realm of fortification, a spectrum of essential micronutrients is meticulously chosen to enhance the nutritional value of food products. Among these, iron takes a prominent position, with options like Ferric pyrophosphate (28 mg-42.5 mg) and Sodium Iron (III) Ethylene Diamine Tetra Acetate Trihydrate, commonly known as Sodium Ferredetate (Na Fe EDTA) (14 mg-21.25 mg), providing crucial iron supplementation. Folic acid, a vital B-vitamin, is added within the range of 75 µg-125 µg, ensuring the prevention of neural tube defects and supporting overall health. Vitamin B12, an indispensable nutrient, is fortified in the range of 0.75 µg-1.25 µg, aiding in neurological function and red

blood cell formation. Zinc, a mineral essential for various physiological processes, is incorporated in the form of Zinc Oxide (10 mg-15 mg), contributing significantly to immune function and wound healing. Vitamin A, crucial for vision and immune support, is included as Retinyl Palmitate within the range of 500 µg RE-750 µg RE. Thiamine, or Vitamin B1, vital for energy metabolism, is fortified using Thiamine Hydrochloride or Thiamine Mononitrate (1 mg-1.5 mg). Riboflavin (Vitamin B2), playing a pivotal role in cellular development, is added as Riboflavin or Riboflavin 5'-Phosphate Sodium (1.25 mg-1.75 mg). Niacin (Vitamin B3), essential for DNA repair, is

incorporated as Nicotinamide or Nicotinic Acid (12.5 mg-20 mg). Pyridoxine (Vitamin B6), crucial for brain development and function, is fortified using Pyridoxine Hydrochloride within the range

of 1.5 mg-2.5 mg. These precise fortification levels ensure that individuals receive optimal nutritional support, addressing deficiencies and promoting overall health and well-being.

Market Availability of Some Fortified Cereal Products:

1. Wheat Flour:

- Harmony Foods Pvt. Ltd. - Harmony Chakki Fresh Atta (AP & TN)
- Kumar Chakki - Kumar Chakki Atta (Haryana)
- NavBharat Flour Mills - Vitamin Plus (J & K)
- General Mills Pvt Ltd. - Pilsburry (Gujarat)

- Jagganath Rice Mill - Risshta Atta (Odisha)
- Mishkat Aggro Industries - Energetic (Gujarat, MP & Maharashtra)
- ITC - Aashirwad Atta (Delhi)

2. Rice:

- DCP Foods Pvt Ltd - Asbah (PAN India)
- LT Foods Pvt Ltd - Daawat Rozana (PAN India)

Conclusion

Cereal fortification stands as a beacon of hope in the realm of nutrition, ensuring essential vitamins and minerals reach millions. By understanding the diverse methods of fortification, the recommended fortificants, and the availability of fortified

products, we empower communities to make informed dietary choices. This comprehensive approach not only addresses nutritional deficiencies but also contributes significantly to public health, fostering a healthier, fortified future for all.

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