The Importance and Development of Nutritional Deficiencies in Fortification Process: A Short Communication

Zohra Mahamed*

Department of Food Science and Technology, National University, Ghazipur, Bangladesh

Short Communication

Received: 05-May-2023, Manuscript No. JFPDT-23-98818; **Editor assigned:** 09-May-2023, Pre QC No. JFPDT-23-98818 (PQ); **Reviewed:** 23-May-2023, QC No. JFPDT-23-98818; **Revised:** 30-May-2023, Manuscript No. JFPDT-23-98818 (R); **Published:** 06-Jun-2023, DOI: 10.4172/2321-6204.11.2.005

***For Correspondence:** Zohra Mahamed, Department of Food Science and Technology, National University, Ghazipur, Bangladesh

E-mail: mahamed.zohra@gmail.com

Citation: Mahamed Z. The Importance and Development of Nutritional Deficiencies in Fortification Process: A Short Communication. RRJ Food Dairy Technol. 2023;11:005

DESCRIPTION

Food fortification is the process of adding micronutrients (essential trace elements and vitamins) to food. It can be carried out by food manufacturers or governments as a public health policy aimed at reducing the number of people with dietary deficiencies in a population. Because of local soil or inherent deficiencies within staple foods, the predominant diet within a region may lack specific nutrients; in these cases, adding micronutrients to staples and condiments can prevent large-scale deficiency diseases. Food fortification has been identified as the second of four strategies to reduce the global incidence of nutrient deficiencies by the WHO and FAO. According to the FAO, the most commonly fortified foods are cereals and cereal-based products, milk and dairy products, fats and oils, accessory food items, tea and other beverages, and infant formulas. Each year, it is estimated that under nutrition and nutrient deficiency kill between 3 and 5 million people worldwide [1-4].

Types

Food fortification can also be classified according to the stage at which it is added:

1. Commercial and industrial fortification (wheat flour, maize meal, cooking oils).
2. Bio fortification (crop breeding to increase nutritional value, which can include traditional selective breeding as well as genetic engineering).
3. Home fortification (for example, vitamin D drops).

Examples of fortification in foods

Many foods and beverages have been fortified around the world, either voluntarily by product developers or by law. Although some may see these additions as strategic marketing strategies to sell their product, a lot more work goes into a product than simply fortifying it. To fortify a product, it must first be proven that adding this vitamin or mineral is healthy, safe, and effective. In addition, the addition must adhere to all food and labeling regulations and provide nutritional support [5]. A food developer must also consider the costs of this new product, as well as whether there will be a market for it.

Iodized salt: Iodine Deficiency Disorder (IDD) is the most common cause of preventable mental retardation. Severe deficiencies cause cretinism, stillbirth, and miscarriage. Even mild deficiency, however, can have a significant impact on population learning ability. Today, over 1 billion people worldwide suffer from iodine deficiency, and 38 million babies born each year are not protected from IDD-related brain damage [6-9]. Kul Gautam, Deputy Executive Director of UNICEF, October 2007. Iodized salt has been used in the United States since before World War II. Iodized salts were discovered to be effective in treating goiters in 1821. However, the use of iodized salts as a preventative measure against goiters was not tested in a research trial until 1916. By 1924, it was widely available in the United States. In Canada and the United States, the RDA for iodine is currently as low as 90 g/day for children (4-8 years) and as high as 290 g/day for breast-feeding mothers [10].

Iodine deficiency is linked to intellectual disabilities, hypothyroidism, and goiter. Other abnormalities in growth and development are also possible.

Folate: Folate (as folic acid, a fortification ingredient) helps to lower blood homocysteine levels, form red blood cells, ensure proper cell growth and division, and prevent Neural Tube Defects (NTDs). In many industrialized countries, the addition of folic acid to flour has prevented a significant number of NTDs in infants. Spina bifida and anencephaly are two common types of NTDs that affect between 2500 and 3000 infants born in the United States each year [11-13]. Folic acid supplementation during pregnancy has been shown in studies to reduce the incidence of NTDs by 72%.

Niacin: Since 1938 (when voluntary addition began), niacin (vitamin B3) has been added to bread in the United States, a programme that has significantly reduced the incidence of pellagra. Pellagra was discovered in poor families who relied heavily on maize for food. Although maize contains niacin, it is not bioavailable unless nixtamalized (an alkali treatment common in Native American cultures) and thus did not contribute to overall niacin intake. Pellagra, a niacin deficiency-related disease, was characterized by the three D's-dermatitis, dementia, and diarrhoea. Others could be vascular or digestive issues [14-16]. Common causes of niacin deficiency include alcoholism, anorexia nervosa, HIV infection, gastrectomy, malabsorptive disorders, and certain diseases.

Vitamin D: Vitamin D cannot be added to a wide variety of foods because it is fat-soluble. Margarine, vegetable oils, and dairy products all contain it. Researchers wanted to see if the disease, later known as rickets, could be cured by food after the discovery of curing conditions such as scurvy and beriberi in the late 1800s. Their findings revealed that the cure was sunlight and cod liver oil. Vitamin D was not linked to the treatment of rickets until the 1930s. This discovery led to the fortification of common foods such as milk, margarine, and breakfast cereals. **Fluoride:** Although fluoride is not a required mineral, it is useful in preventing tooth decay and maintaining good dental health. It was discovered in the mid-1900s that towns with high fluoride levels in their water supply were causing brown spotting and an unusual resistance to dental caries in their residents' teeth. This resulted in the safe addition of fluoride to water supplies (or a reduction in naturally occurring levels) in order to retain the properties of resistance to dental caries while avoiding fluorosis (a condition caused by excessive fluoride intake). The tolerable Upper intake Level (UL) for fluoride ranges from 0.7 mg/day for infants aged 0-6 months to 10 mg/day for adults over 65.

CONCLUSION

As a result, food fortification refers to the practice of adding vitamins and minerals to commonly consumed foods during processing in order to increase their nutritional value. It is a tried-and-true, risk-free, and cost-effective strategy for improving diets and preventing and controlling micronutrient deficiencies. Food fortification is an important component of nutrition strategies for addressing micronutrient deficiencies. It is a dynamic field that is evolving in response to the needs of various population groups and industries.

REFERENCES

1. Grobelny P, et al. Amorphization of itraconazole by inorganic pharmaceutical excipients: comparison of excipients and processing method.pharmaceutical development and technology.2005;20:118-127.
2. Nachaegari SK, et al. Coprocessed excipients for solide dosage forms. Pharm Dev Technol. 2004;28:52-65.
3. Marwaha M, et al. Co processing of excipients: A review on excipient development for improved tabletting performance. Int J Appl Pharma. 2003;2:41-47.
4. Rashid I, et al. Chitin–Silicon Dioxide coprecipitate as a Novel Superdisintegrant. J Pharm Sci. 2008; 97:4955-4969.
5. Ranjan A, et al. A Modern Ampelography: A Genetic Basis for Leaf Shape and Venation Patterning in Grape. Plant Physiol. 2014;164:259-272.
6. Charlotte P, et al. Photosynthesis, transpiratin, and water use efficiency of mature grape leaves infected with uncinula necator (Powdery Mildew). Physiology and Biochemistry. 1983;72:232-236.
7. Loughner R L, et al. Influence of leaf trichomes on predatory mite (Typhlodromus pyri) abundance in grape varieties. Exp Appl Acarol. 2008;45:111–122.
8. Estrada M C, et al. Nondestructive methods to estimate leaf area in *Vitis vinifera L*. Ann Bot. 2000;35:696-698.
9. Chitkara M, et al. Mineral content analysis of polyherbal energy bar using x-ray fluorescence technique. Pharmacogn J. 2019;11:1.
10. Khan AH, et al. the status of trace and minor trace elements in some Bangladeshi foodstuff. J Radioanal Nucl Chem. 1989;134:367-381.

11. Santos CT, et al. Characterization and sensorial evaluation of cereal bars with jackfruit. Acta Sci Technol. 2011;33:81-85.
12. Schwarz T, et al. First studies on lead, cadmium and arsenic contents of feed, cattle and food of animal origin coming from different farms in Saxonia. Dtsch Tierarztl Wochenschr. 1991;98:369-372.
13. Singh A, et al. Health risk assessment of heavy metals via dietary intake of foodstuffs from the wastewater irrigated site of a dry tropical area of India. Food ChemToxicol. 2010;48:611-619.
14. Truswell A. Cereal grains and coronary heart disease. Eur J Clin Nutr. 2002;56:1-14.
15. Serna-Saldivar SO, et al. Grain Structure and Grain Chemical Composition. Sorghum and Millets. 2019;4:85-129.
16. Pathak. Development of food products based on millets, legumes and fenugreek seeds and their suitability in the diabetic diet. Int J Food Sci Nutr. 2000;51:409-414.