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Short Communication

Fortification of Food

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INTRODUCTION

Food Fortification (FF) is described as the addition of one or more important nutrients to a food, whether or not they are typically present in the food, in order to prevent or rectify a proven deficit of one or more nutrients in the general population or specific demographic groups [1]. As a result, fortification varies from enrichment, which is the act of reintroducing nutrients to a meal that have been lost during refining or production. Since the 1930s, fortification has been used to target specific health conditions such as iodine deficiency through the iodization of salt, anaemia through the fortification of cereals with iron and vitamins, and neural tube deficiency through the fortification of cereals with iron and vitamins.

Biofortification, microbial biofortification, and synthetic biology are examples of food fortification, as well as commercial and industrial fortification and home fortification. Because different processes and procedures are utilised to fortify the target meals, the various forms of FF are distinct. Biofortification is the process of employing conventional breeding techniques and/or technologies to create micronutrient-dense staple crops. Biotechnology (genetic engineering) is a more modern method of biofortifying staple crops, and it has received a lot of attention in recent years. The transgenic 'Golden Rice,' which has twice the usual levels of iron and substantial amounts of beta-carotene, is the most well-known example of this technique. Probiotic bacteria (mainly lactic acid bacteria) are used in microbial biofortification to generate carotene either in the foods we eat or directly in the human gut. Commercial and industrial fortification is the process of adding micronutrients to commercially accessible items such as wheat, rice, cooking oils, sauces, and butter while they are being manufactured. Home fortification consists of providing micronutrients in the form of packets or pills that may be added to food during cooking.

Food Fortification in Developed and Under developed countries

The fact that required dietary requirements for several nutrients are frequently not fulfilled through regular diet has justified the growing range of fortified foods. While FF is still extensively employed, fortification legislation is presently gaining more attention than the technology involved, owing to real concerns about over-fortification as producers seek to exploit fortification as a marketing strategy. However, fortification has been credited with almost eliminating micronutrient deficiencies in industrialised countries. Although it is widely acknowledged that FF is a preferred and cost-effective method of treating micronutrient deficiency, its effectiveness in impoverished nations has yet to be shown. One of the stumbling blocks is the lack of simple and cost-effective technologies for fortifying foods with stable and bioavailable nutrients while maintaining conventional taste and aesthetic standards.

Through salt iodization, progress has been achieved in Southeast Asia in lowering iodine deficiency. The fortification of sugar with vitamin A improved the population's vitamin A status in Central American countries. Flour fortification with iron has been applied in Chile and Venezuela over the past two decades, resulting in an improvement in the population's iron status. Rice is consumed by Asian civilizations, yet rice fortification methods are restricted. With growing wheat flour consumption in Asia, numerous nations, including India, Indonesia, and the Philippines, began fortification programmes with iron, vitamin A, folic acid, and other B vitamins. In Sri Lanka, wheat flour fortification was tried, but no good results were discovered. Other foods in Thailand, such as noodles and fish sauce, are fortified with micronutrients. Despite this, MND continues to impact a large portion of the people in the region.

In contrast to developed countries, however, different considerations go into the establishment of FF programmes, such as determining the need for nutritional intervention, determining required levels of fortification, selecting appropriate carriers and fortificants, and determining which technologies to use in the fortification process and finally, a system must be established to determine if the program's nutritional goals are being reached.

Reduction of micronutrient deficiency

Food fortification has reduced the prevalence of formerly prevalent micronutrient deficiencies (MNDs) and improved the health (as well as other critical indicators like economic and educational status) of a substantial proportion of the population(s) affected [2]. Iodine, iron, vitamin A, and zinc deficiency were listed as among the world's most significant health risk factors in the World Health Report of 2002 [3]. Dietary improvement, supplementation, FF, and global public health and other disease management efforts are the four major methods identified to address MNDs. Food fortification has reduced the prevalence of formerly prevalent micronutrient deficiencies (MNDs) and improved the health (as well as other critical indicators like economic and educational status) of a substantial proportion of the population(s) affected. Iodine, iron, vitamin A, and zinc deficiency were listed as among the world's most significant health risk factors in the World Health Report of 2002. Dietary improvement, supplementation, FF, and global public health and other disease management efforts are the four major methods identified to address MNDs.

CONCLUSION

FF offers numerous benefits over other interventions since it does not need a change in the population's eating habits, may supply a large percentage of the required dietary intakes for a variety of micronutrients on a continuous basis, and does not require individual compliance. It may frequently be integrated into the existing food production and delivery system, allowing it to be sustained over time. The limitations of fortification are well known. It alone cannot correct micronutrient deficiencies when large numbers of the targeted population have little or no access to fortified food, whether due to poverty or location, when the level of micronutrient deficiency is too severe, or when the metabolic demand for micronutrients is increased by the presence of infections. FF interventions may also be limited by a variety of safety, technical, and economic considerations.

As a result, good fortification programme development necessitates not only an assessment of the program's potential influence on the population's nutritional condition, but also its practicality in a particular environment and it needed to be controlled by proper legislation.

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