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**Question**

1. List and explain the types of food fortification?

2. Enumerate FIVE advantages and disadvantages of food fortification

**Answer**

1. **Types of food fortification**

* BIOFORTIFICATION:  is the process by which the nutrient density of food crops is increased through conventional plant breeding, and/or improved agronomic practices and/or modern biotechnology without sacrificing any characteristic that is preferred by consumers or most importantly to farmers.
* MICROBIAL BIOFORTIFICATION AND SYNTHETIC BIOLOGY: Plant growth promoting microorganisms are known to fortify micro- and macro-nutrient contents in staple food crops through various mechanisms such as siderophore production, zinc solubilization, nitrogen fixation, phosphate solubilization, etc. Inoculation of potential microorganisms along with mineral fertilizers can increase the uptake of mineral elements, yield and growth.
* COMMERCIAL AND INDUSTRIAL FORTIFICATION: Industrial food fortification refers to adding micronutrients and minerals to industrially processed and widely consumed edible products. One advantage of industrial food fortification is that it requires limited changes in consumer behavior compared to other micronutrient interventions.
* HOME FORTIFICATION: is an innovation aimed at improving diet quality of nutritionally vulnerable groups, such as young children. The term Micronutrient Powders (MNP) refers to sachets containing dry powder with micronutrients that can be added to any semi-solid or solid food that is ready for consumption.

1. **Advantages of food fortification**

* Food fortification does not require people to change their eating habits, thus it is socially acceptable.
* The effects are both fast and broad.
* It does not affect organoleptic properties.
* Providing nutrients through the regular food supply and distribution system reduces cost.
* It is the safest strategy as the added nutrients provided in the diet are low but in constant amounts.

**Disadvantages of food fortification**

* While fortified foods contain increased amounts of selected micronutrients, they are not a substitute for a good quality diet that supplies adequate amounts of energy, protein, essential fats and other food constituents required for optimal health.
* A specific fortified foodstuff might not be consumed by all members of a target population. Conversely, everyone in the population is exposed to increased levels of micronutrients in food, irrespective of whether or not they will benefit from fortification.
* Infants and young children, who consume relatively small amounts of food, are less likely to be able to obtain their recommended intakes of all micronutrients from universally fortified staples or condiments alone; fortified complementary foods may be appropriate for these age groups. It is also likely that in many locations fortified foods will not supply adequate amounts of some micronutrients, such as iron for pregnant women, in which case supplements will still be needed to satisfy the requirements of selected population groups.
* Fortified foods often fail to reach the poorest segments of the general population who are at the greatest risk of micronutrient deficiency. This is because such groups often have restricted access to fortified foods due to low purchasing power and an underdeveloped distribution channel. Many undernourished population groups often live on the margins of the market economy, relying on own-grown or locally produced food.
* Technological issues relating to food fortification have yet to be fully resolved, especially with regard to appropriate levels of nutrients, stability of fortificants, nutrient interactions, physical properties, as well as acceptability by consumers including cooking properties and taste