



Current Trends In Fortified Food And Beverages

Agenda

- What is fortification
- Types of Fortification
- Prevailing Regulations on Fortification
- Current Industrial Trends in Fortification
- Summary

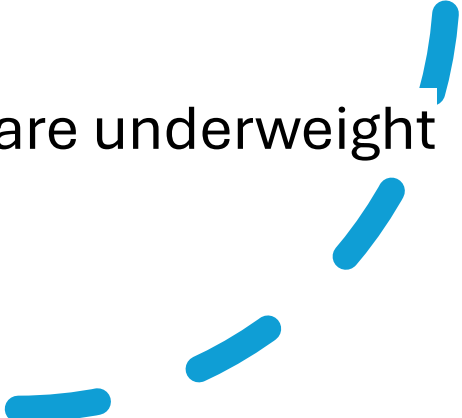


What is Fortification ?

- Fortification is the practice of **deliberately increasing** the content of one or more **micronutrients** (i.e., vitamins and minerals) to improve the nutritional quality of the food
- It safe and cost-effective strategy for **improving diets** and for the **prevention** and control of **micronutrient deficiencies**.
- Help to restore the micronutrient content lost during processing.



Why is Food Fortification required ?

- India has a very high burden of micronutrient deficiencies caused **by Vitamin A, Iodine, Iron and Folic Acid** leading to Night Blindness, Goiter, Anemia and various birth defects. According to the National Family Health Survey (NFHS-4).
 - 58.4 percent of children (6-59 months) are anemic
 - 53.1 percent women in the reproductive age group are anemic
 - 35.7 percent of children under 5 are underweight
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MALNUTRITION

- Lack of Balanced Diet
- Lack of variety in the diet
- Socio-economic Status
- More Utilization of Processed foods





Food Fortification...

- Food Fortification is 100-year-old (dating as far back as the 1920s in Europe and North America when the first salt was iodized)
- Still, most common and widely used fortified food at global level is Iodized Salt (160 countries)
- India is one of the first countries globally with fortification of Vanaspati (1953) &
- Universal Salt Iodization (1962)

FSSAI Regulations

- Food Safety and Standards (Fortification of Foods) Regulations, 2016
- The Fortified Processed Food shall provide 15-30% of the Indian adult RDA of micronutrient based on an average calorie intake of 600 kcal from processed foods.
- High Fat Sugar Salt (HFSS) Foods shall be excluded from Fortified Processed Foods category.
- “fortificant” means a substance added to food to provide micronutrients but does not include nutraceuticals or foods for Special Dietary Uses;



FORTIFIED
SAMPOORNA POSHAN



Types of Food Fortification

- **Mass Fortification**
 - Government Driven
 - **Targeted fortification**
 - Government / NGO Driven
 - **Market Driven Fortification**
 - Voluntary Fortification
 - Business- oriented Initiative
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Mass Fortification / Targeted Fortification

- 1 REACHES A LARGE SECTION OF POPULATION
- 2 NO CHANGES IN EATING PATTERN REQUIRED
- 3 SAFE AND HEALTHY INTERVENTION
- 4 COST EFFECTIVE- HIGH COST TO BENEFIT RATIO
- 5 NO CHANGES IN TASTE, FLAVOUR & AROMA

fssai FOOD SAFETY AND STANDARDS AUTHORITY OF INDIA
Inspiring Trust, Assuring Safe & Nutritious Food
Ministry of Health and Family Welfare, Government of India

Food Fortification Resource Centre
www.ffrc.fssai.gov.in

Explore the Fortified Product Range!

FORTIFIED
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Fortified Milk: Vitamin-A & Vitamin-D

Double Fortified Salt: Iron and Iodine

Fortified Wheat Flour: Iron, Folic acid, Vitamin B12

Fortified Rice: Iron, Folic acid, Vitamin B12

Fortified Oil: Vitamin-A & Vitamin-D

	Vitamin A	Prevents Night Blindness		Iron	Prevents Anaemia
	Vitamin D	Supports Strong Bones		Folic Acid	Important for Foetal Development
	Iodine	Required for Normal Growth		Vitamin B12	Good for Nervous System

Milk Fortification



Toned, double toned, skimmed milk or standardized milk shall be fortified with the following micronutrients, at the level given in the table below:

S. No.	Nutrients	Level of Nutrient per litre of toned/double toned/skimmed milk/Standardized Milk	Source of Nutrient
1.	Vitamin A	270 µg RE - 450 µg RE	Retinyl Acetate or Retinyl Palmitate
2.	Vitamin D	5µg -7.5 µg	*Cholecalciferol or *Ergocalciferol (*Only from plant Source)

Note: Vitamin A (retinol): 1 IU= 0.3 µg RE (Retinol Equivalent); Vitamin D (Cholecalciferol or Ergocalciferol):1 IU= 0.025 µg

Oil Fortification



Sl. No.	Nutrient	Level of nutrient	Source of nutrient
1.	Vitamin A	6 $\mu\text{g RE}$ - 9.9 $\mu\text{g RE}$ per gm of oil	Retinyl acetate or Retinyl palmitate
2.	Vitamin D	0.11 μg – 0.16 μg per gm of oil.	*Cholecalciferol or *Ergocalciferol (*Only from Plant Source)

Note: Vitamin A (retinol): 1 IU= 0.3 $\mu\text{g RE}$ (Retinol Equivalent); Vitamin D (Cholecalciferol or Ergocalciferol): 1 IU= 0.025 μg

Wheat / Maida / Rice Fortification



Sl.No.	Nutrient	Level of fortification per Kg
1.	Iron- Ferrous citrate or Ferrous lactate or Ferrous sulphate or Ferric pyrophosphate or electrolytic iron or Ferrous fumarate or Ferrous BisGlycinate;	28 mg- 42.5 mg *
	or Sodium Iron (III) Ethylene diamine tetra Acetate Trihydrate (Sodium feredetate-Na Fe EDTA);	14 mg- 21.25 mg
2.	Folic acid	75 µg- 125 µg
3.	Vitamin B12- Cyanocobalamine or Hydroxycobalamine;	0.75 µg- 1.25 µg

Sl.No.	Nutrient	Level of fortification per Kg
1.	Zinc- Zinc Sulphate;	10 mg- 15 mg
2.	Vitamin A- Retinyl acetate or RetinylPalmitate;	500 µg RE- 750 µg RE
3.	Thiamine (Vitamin B1)- Thiamine hydrochloride or Thiamine mononitrate;	1 mg- 1.5 mg
4.	Riboflavin (Vitamin B2)- Riboflavin or Riboflavin 5'-phosphate sodium ;	1.25 mg- 1.75 mg
5.	Niacin(Vitamin B3) - Nicotinamide or Nicotinic acid;	12.5 mg- 20 mg
6.	Pyridoxine(Vitamin B6)- Pyridoxine hydrochloride;	1.5 mg- 2.5 mg

Double Fortified Salt



Sl.No.	Component	Level of nutrients	Source of nutrients
1.	Iodine content	15-30 parts per million (on dry weight basis)	Potassium Iodate]
2.	Iron content (as Fe)	850-1100 parts per million	Ferrous sulphate or Ferrous Fumarate

Fortification of Processed Foods

- Fortified Cereal Products / Bakery Products

S. No.	Nutrients/Source	Level of nutrient per 100 g
1	Iron (mg) Ferrous citrate or Ferrous lactate or Ferrous sulphate or Ferric pyrophosphate or electrolytic iron or Ferrous fumarate or Ferrous bis glycinate; or Sodium Iron (III) Ethylene diamine tetra acetate, trihydrate (Sodium ferredetate -Na Fe EDTA);	1.4-2.7
2	Folic acid (µg)	8-16
3	Vitamin B12 (µg) - Cyanocobalamine, or Hydroxycobalamine	0.08-0.16

S. No.	Nutrients/Source	Level of nutrient per 100 g
1.	Zinc (mg): Zinc Sulphate	1.0-1.9
2.	Vitamin A (µg RE): Retinyl acetate or Retinyl Palmitate,	48-96
3.	Thiamine (Vitamin B1) (mg): Thiamine hydrochloride or Thiamine mononitrate;	0.1-0.19
4.	Riboflavin (Vitamin B2) (mg): Riboflavin or Riboflavin 5'-phosphate sodium ;	0.11-0.22
5.	Niacin(Vitamin B3) (mg): Nicotinamide or Nicotinic acid;	1.3-2.6
6.	Pyridoxine (Vitamin B6) (mg): Pyridoxine hydrochloride;	0.2-0.3

Fortified Fruit Juices:

S. No.	Nutrients/Source	Level of nutrient per 100 m L
1.	Vitamin C (mg): Ascorbic acid	6-12]



Market Driven Fortification

- Voluntary Fortification
- Business- oriented Initiative to add /Fortify the food

Current Fortification Trends.....

• 1. Interest in Healthier Lifestyles

- The COVID-19 pandemic had impacted global food and beverage market as more consumers look for products to help support their health
- Vitamin C Product
- Vitamin C + Zinc
- Vitamin C + Zinc + Phytochemicals

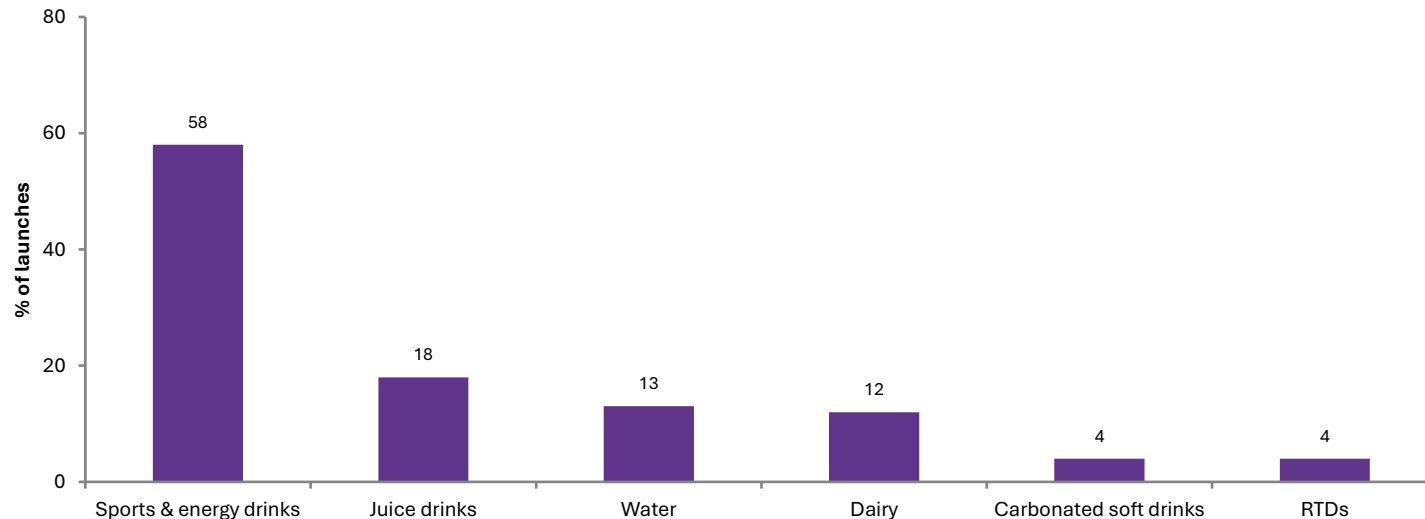
Glucose with Added Advantage of **Immunity Boosters** Vitamin C & Zinc



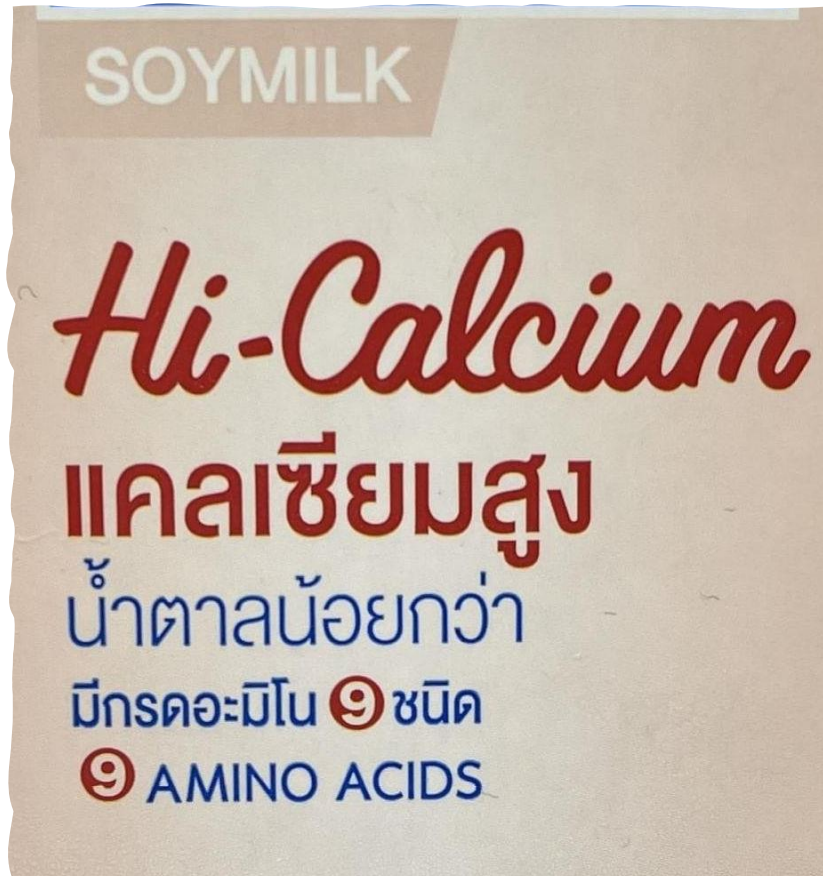
2. Requirement of Energy boost

- A lack of energy is also something many consumers are facing due to stress and lifestyle changes.
- Where we are now:
 - B Vitamins / Caffeine / Amino acids
- New Fortification trends
 - BCAA, Electrolytes, Phytochemicals

Global: % of food and drink launches with a vitamin/mineral fortification claim, by top 10 categories, 2018-23



3. Bone & Joint Health



- Where we are now:
 - Milk & Oil Fortification with Vitamin A, & D is mandated by law
 - Yogurt & Spreads & Dairy Alternatives are been fortified with calcium
- New Fortification trends
 - Vitamin D, Vitamin K, Calcium & Magnesium
 - Collagen – Good Source of protein
 - Phytoextracts- Soy Isoflavone & Curcumin – Bone Density

4. Mind/Body Health Drinks

Tea Premixes, RTD Tea, Herbal Soft drinks, Powder flavored Beverage

- Where we are now:
 - Fortified with Vitamin & mineral for - energy & immunity
- New Fortification trends
 - Omega-3- fatty Acids- Heart healthy fat
 - Magnesium - Sleep
 - Chromium & Zinc – Glucose Control
 - Chamomile, Valerene, Theanine – Relaxation & stress

5. Gut Health Trends

Juices & Nectars, Non-Carbonated Beverages, Plant Based Beverages

- Where we are now:

Fortified with Vitamin A, C & E & B vitamins

- New Fortification trends

- Fibers +++
- Probiotics and Gut health
- Natural Antioxidant (Carotenoids) – eye Health / Heart Health



6. Healthy Breakfast Cereals

- Where we are now:
 - All Natural, Fruit content, High fiber, Preservative free
- New Fortification trends
 - Omega-3- fatty Acids- Heart healthy fat
 - Zn, Folic acid, B Vit, Magnesium
 - Melatonin- Sleep

Summary

- **Mass fortification**
 - Staple Foods – Salt, Oil, Milk, Rice Wheat & Maida
 - Processes Foods- Cereal products, Bakery Products & Juices
- **Voluntary Fortification**
 - Fortification by Vitamin & Minerals
 - Other Food Bioactive Fortification
 - Phytochemical Fortification
 - Multigrain flour fortification
 - Prebiotics and probiotics fortification
 - PUFA fortification
 - Fiber and bioactive fortification





- Thank You

