



ILSI
India

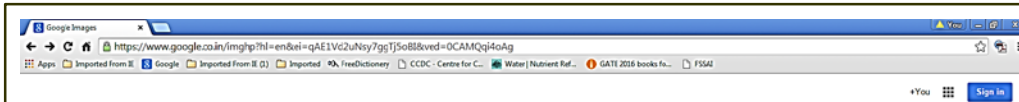
CONFERENCE ON
FOOD ADDITIVES:
SAFETY AND BENEFITS

Food Additives in Beverages
Perception and Needs

April 2015

By - Sunil Adsule

Processed Food = Packaged Food



Social Media: Twitter .Blogs.... Perceptions Drivers in Today's World



Are food additives evil? We have an almost-civil debate wrd.cm/1EboqgZ



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Food additives may be obesity contributors
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"@gabyrogers: Food additives may be obesity contributors short.ninem.sn/U8Ts7Xa" Nothing good will ever come from food full of additives.

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#InsightIndia Indian #food additives market to grow at 12% food.ndtv.com/food-drinks/in

NDTV Food

Indian Food Additives Market to Grow at 12 Percent: Study - NDTV Food

Due to cultural and regional diversities, the pattern of food consumption is not uniform in India resulting in the western region generating the highest demand for food additives.

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Health Blog



Our Top 5 Food Additives to Avoid

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WEDNESDAY, 7 JANUARY 2015

AUTHOR: EMMA SUTHERLAND

It seems that so many foods contain additives but more and more research is saying that the extensive use of these chemicals has a negative effect on our health. Food additives include preservatives, colorings and sweeteners.

Top 5 to Avoid

1. Sulphur dioxide (E220) - is a preservative and research has found a link between the incidence of asthma and the consumption of sulphur dioxide enriched foods. This means the more a child consumes this preservative, the more



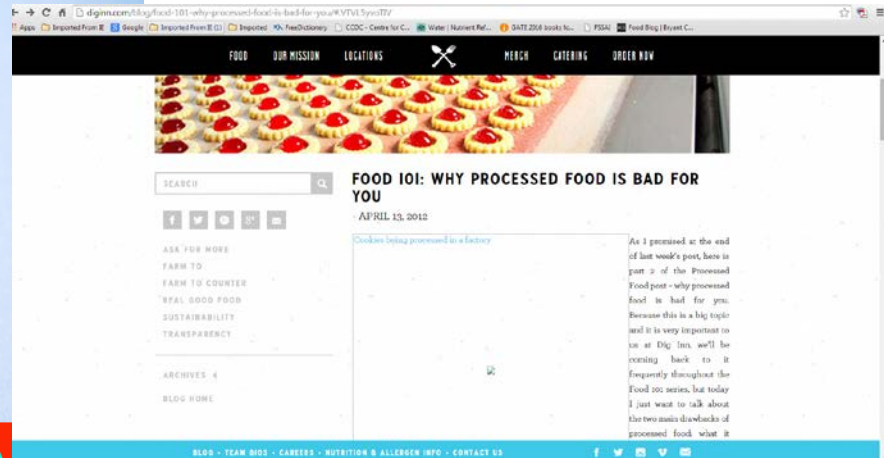
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Probiotica P3

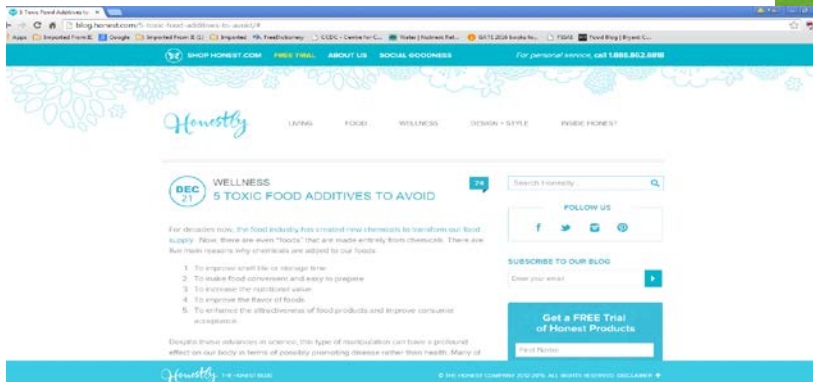
Food Additives – Popular Peceptions



CREEPY FOOD ADDITIVES

where they like to hide, and how to find them

WHICH FOOD ADDITIVES SHOULD YOU AVOID DUE TO HEALTH CONCERNS?



CONCERNS ON FOOD ADDITIVES

- **Food additives - subject of**
 - Public policy, regulatory activity
 - Public interest for decades
- **Common Issues**
 - Long, unfamiliar names similar to complex chemical compounds
 - Low level of science literacy, Complex Labelling
 - Motive of economic adulteration
 - Advertising that have at times taken advantage of food additive or ingredient controversies
 - Improving the perceived quality – thickeners in juice or milk based beverages
 - Use of unapproved additives, colorants
 - Or using approved additives beyond permitted limits



PRESERVATIVE FREE



*Uninformed-Unaddressed Concerns
about the food industry's motives in manufacturing processed foods have
led to increasing negative perceptions among the general public*



Food Processing



Food Processing

- **Food Processing is primarily undertaken**
 - **to transform perishable – at times unpalatable or hardly edible raw material**
into
 - **safe, flavourful, nutritious, stable and enjoyable foods.**
- **It may be considered to include any deliberate change in a food occurring between the point of origin and availability for consumption.**
- **The change could be as simple as rinsing and packaging by a food manufacturer to ensure that the food is not damaged before consumer accessibility, or**
- **As complex as formulating the product with specific additives for controlling microorganisms, maintaining desired quality attributes, or providing a specific health benefit, followed by packaging that may itself play a role in microbial control or quality preservation.**

FOOD PROCESSING - CRITICAL ROLE

- **For centuries, food processing techniques have served useful functions in a progress of mankind**
- **~2 million years ago – cooking, later augmented by fermenting, drying, preserving, and other primitive forms of food processing.**
- **Led to development of the early Food Industry**
 - **Freed people from foraging for food, and ensured adequate nutrition via consistent food supply year round.**
- **The Industrial revolution could not have occurred without a food delivery system that allowed people to leave the farms, migrate to the cities, and engage in useful production of goods and services for society.**

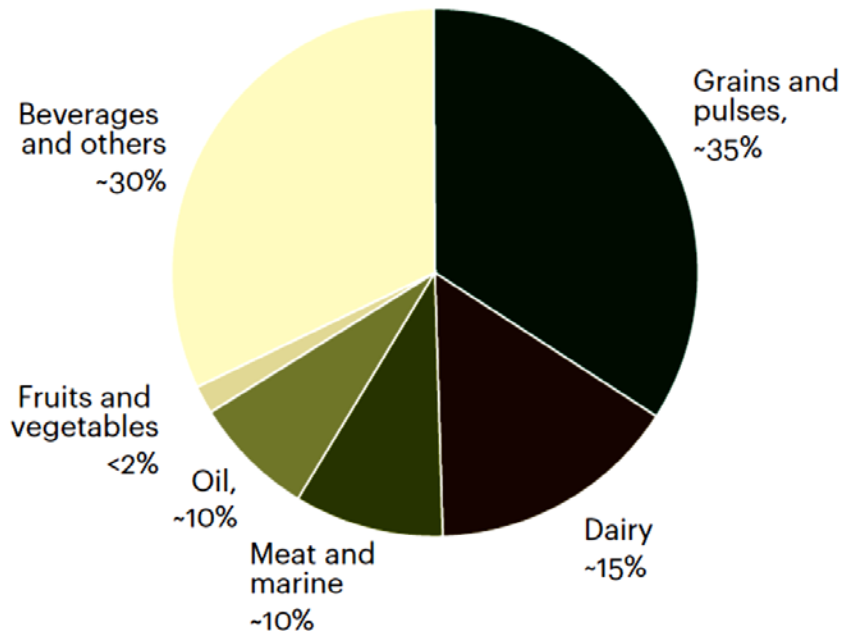
THE STATUS TODAY

- **Contemporary food science and technology have contributed greatly by integrating many other disciplines to enhance food safety**
 - **Biology, chemistry, physics, engineering, materials science, microbiology, nutrition, toxicology, biotechnology, genomics, computer science.**
- **Today, our production-to-consumption food system is complex, and the food is largely safe, tasty, nutritious, diverse, convenient, and less costly and more readily accessible than ever before.**
- **Food Processing, Food additives & Advances in Technology help make that possible.**

Indian Food Industry – Growing ...

Relative share of various food segments in food processing

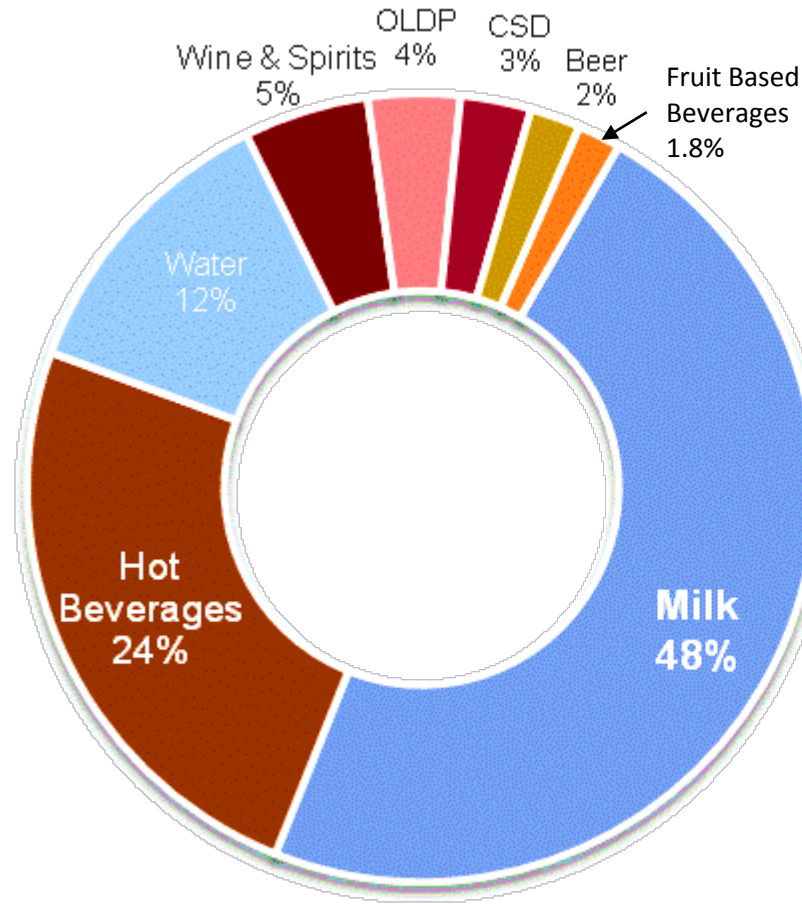
(% share, 2011)



- The size of the food processing sector in India was around USD 180 billion in 2011
- This includes both the organized and unorganized sector where organized forms 50-55% of the overall market
- Grains and pulses, beverages and other foods and dairy products make up around 80% of the total processed food market
- The sector is expected to grow at around 13 percent on a nominal basis and reach size of USD 530-550 billion by 2020.

Packed beverages still 'emerging'-Dairy overwhelms in India

All Liquid Food - India
Share of stomach %
116.3 Bio Litres (2013)



Data Courtesy: Tetra Pak / Indian Beverage Association

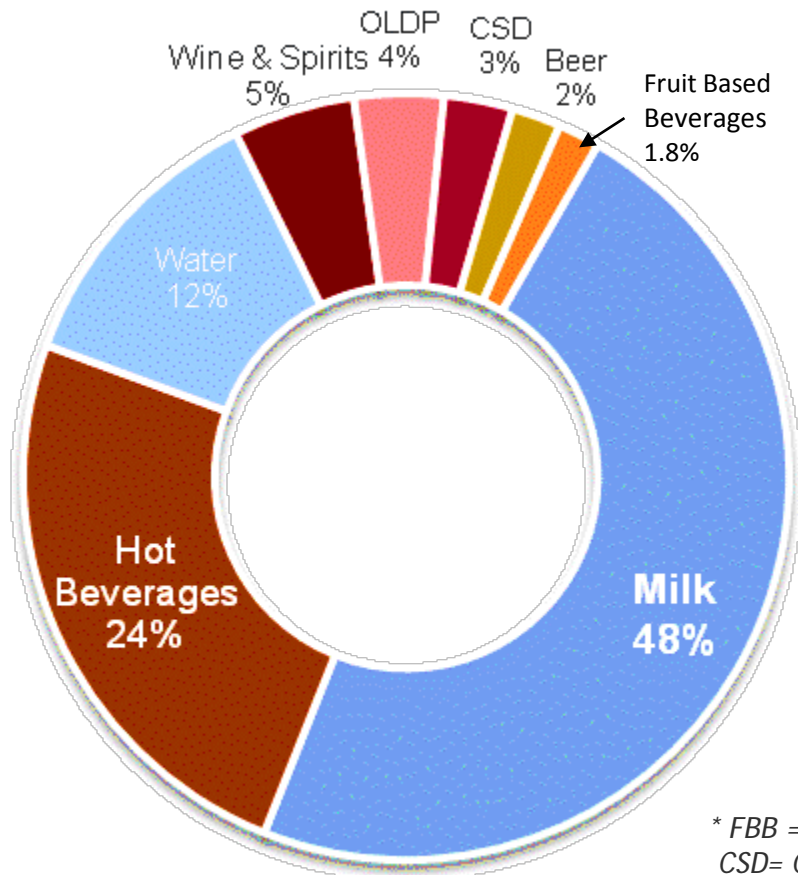
* CSD= Carbonated Soft Drinks
OLDP -Other Liquid Dairy Products

Packed beverages Under-Indexed vs. Global Average

All Liquid Food
Share of stomach %

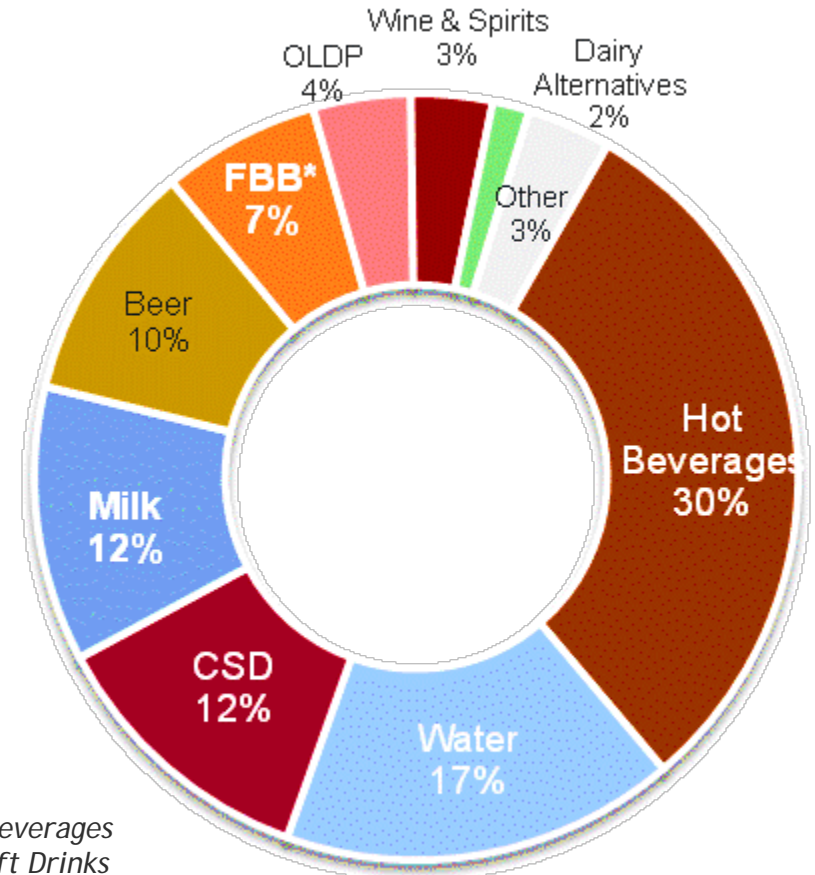
India

116.3 Bio L



World

1816.9 Bio L



* FBB = Fruit based beverages
CSD= Carbonated Soft Drinks
OLDP -Other Liquid Dairy Products

Food Additives - Definition

- **Technically:**

- In addition to the natural composition of foodstuffs, substances that may be incorporated, either directly or indirectly, during the growing, storage or processing of foods, **when introduced purposely to aid in processing or to preserve or improve the quality of the product**



- **Codex: FSSAI**

- Food additive means any substance not normally consumed as a food by itself and not normally used as a typical ingredient of the food, whether or not it has nutritive value, **the intentional addition of which to food for a technological (including organoleptic) purpose in the manufacture, processing, preparation, treatment, packing, packaging, transport or holding of such food results, or may be reasonably expected to result (directly or indirectly), in it or its byproducts becoming a component of or otherwise affecting the characteristics of such foods.**

Why Are Food Additives Added to Food?

○ Food Additives – useful, vital, versatile

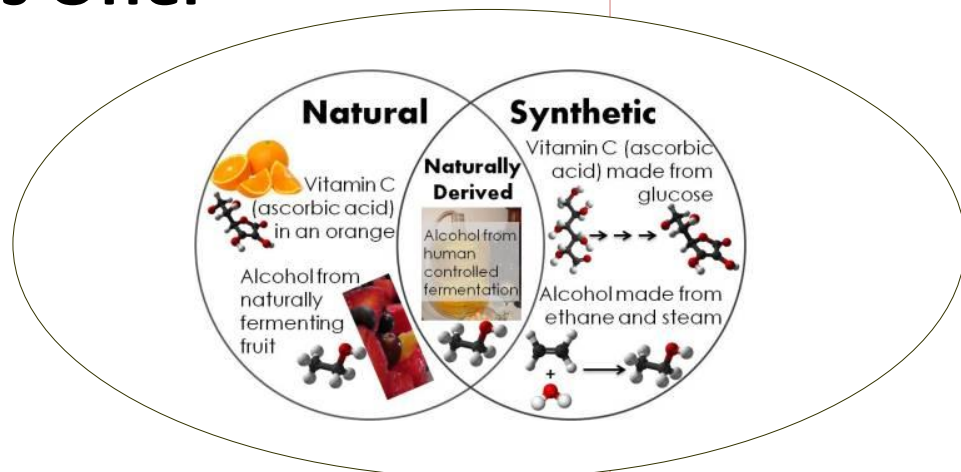
- Additives perform a variety of useful functions in foods that consumers **often take for granted**
- Some additives could be eliminated if we were willing
 - To grow our own food,
 - Harvest and grind it,
 - Spend many hours cooking and canning, or
 - Accept increased risks of food spoilage

○ What Benefit do Additives Offer

- Technological
- Aesthetics
- Convenience

○ Broader Classification

- Natural
- Man - Made



.....Food Additives - The WHY

- **To Maintain or Improve Safety and Freshness:**
 - **Preservatives** slow product spoilage caused by mold, air, bacteria, fungi or yeast. In addition to maintaining the quality of the food,
- **To maintain product consistency – improve mouth-feel:**
 - **Emulsifiers** give products a consistent texture and prevent them from separating. **Stabilizers** and thickeners give smooth uniform texture to deliver on consumer expectation
- **To improve or maintain nutritional value:**
 - **Vitamins and minerals** are added to beverages which is vehicle to deliver targeted nutritional benefits. Such fortification and enrichment has helped address lack nutrients in diet
- **To maintain palatability and wholesomeness:**
 - **Acidulants and Buffering Agents** help control the **acidity and alkalinity of foods**
 - **Antioxidants** prevent flavour oils, oleoresins in beverage emulsions from becoming rancid or developing an off-flavor.
- **To enhance flavor or impart desired color:**
 - Flavouring agents are integral part of beverages. These may be **natural, nature identical or artificial flavors** which besides enhancing taste of beverages also deliver feeling of refreshment & enjoyment. **Colors**, to maintain the appeal of beverages throughout its desired best before period.

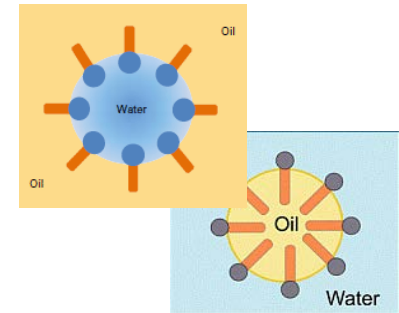
Beverage typically contains



- **Water**
- **Sweetness**
 - **Nutritive/Caloric Sweetener**
 - **Non-Nutritive/Non-Caloric Sweetener**
- **Sourness**
 - **Acidulants , Acidity Regulators**
- **Colourants**
- **Flavouring Agents**
- **Stabilizer / Emulsifier**
- **Preservative**

Beverage Application – Emulsifiers / Stabilizers

- The purpose of emulsifiers & stabilisers is to facilitate the mixing together of ingredients that normally would not mix, namely fat and water.
 - This mixing of the aqueous and lipid phases is then maintained by stabilisers.
- Stabiliser are substances that can stabilise, retain or intensify an existing colour of a foodstuff and substances that increase the binding capacity of the food to allow the binding of food pieces into reconstituted food
- Makes possible new product formats (E.g. Fruit juice + Milk Beverage)
 - Stabilizers used to prevent separation
 - Improve mouth-feel through the desired shelf life



Beverage Application – Preservatives

- **The use of additives in food preservation is, not surprisingly, one of the oldest traditions**
- **Preservatives are probably the single most important class of additives, as they play an important role in the safety of the food supply**
- **Preservatives used in beverage industry**
 - **Salts of Benzoic Acid - Benzoates**
 - **Salts of Sorbic Acid - Sorbates**
 - **Dimethyl Dicarbonate – DMDC – cold sterilant**
 - **Sulphur Dioxide**
- **Manufacturers are upgrading GMP by equipment design & product design to obviate need for preservatives**

Beverage Application – Acidulants

- **One of the basic taste / property of a beverage is its sourness or acidity**
- **Acids are added to beverages to fulfill two main functions:**
 - **To inhibit the growth of micro-organisms such as bacteria, yeasts, moulds**
 - **To improve the taste profile of a beverage by balancing the sweetness**
- **Acidulants used in beverages include**
 - **Citric, Malic, Tartaric, Lactic acid**
 - **Phosphoric acid is used in cola flavoured beverages**
 - **In case of juice drinks – acid naturally present in juice aids in taste balance and preservation**

Beverage Application – Non-caloric Sweeteners

- **Some of popular Low or No Calorie products would not be possible without these sweeteners**
 - **Aspartame**
 - About 200 time more sweet than the sugar. It is disintegrated into aspartic acid, phenylalanine and methanol in the body on digestion.
 - Most commonly used non-caloric options of foods, beverages and medicines
 - **Acesulfame K**
 - 130- 200 times sweeter than Sugar. One limitation it has is that if used in large quantities, it has an after taste.
 - It is used in fruit preserves, dairy products and all types of beverages. It is used to reduce the calories of the products. It is heat resistant and enhances flavors
 - **Sucralose**
 - Sucralose is 600 times sweeter than sugar. It has a good water solubility and excellent stability in a wide range
 - of processed foods and beverages.
 - **Stevia – draft approved under FSSAI**



Beverage Application – Colorants

- Color additives are used in foods
 - to offset color loss due to exposure to light, air, temperature extremes, moisture and storage conditions
 - to correct natural variations in color
 - to enhance colors that occur naturally; and
 - to provide color to colorless foods
- Natural – preferred by consumer
- Artificial – Safe and has excellent stability



Colors help consumers identify products, as illustrated by Glacéau's use of colors to differentiate its 13 *vitaminwater*TM nutrient-enhanced water beverages.

- **Dairy Based & Fruit Juice Based Beverages with**
 - **Plant Stanols**
 - **Omega 3, DHA**

- **Sports Drinks (to be consumed before or during exercise to prevent dehydration)**
 - **Supply carbohydrates, provide electrolytes (such as sodium, potassium, calcium, magnesium) and**
 - **Vitamins or other nutrients**

- **Whey plus fruit juice combination**
 - **Stabilizer to prevent separation & adding mouth-feel**

- **Energy Drinks (Caffeinated Beverages)**

Thank You

References :

