



# **Food Analysis and Mitigation Strategies**

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# FOOD

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- Food Means any article used as food or drink for Human Consumption other than Drug and also includes:
    - Any article which enters or used in the composition or preparation of food
    - Any flavoring matter or condiments
    - Any other article notified by the Central Govt.
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# Law of Land

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- ❑ No person shall Manufacture, Sell, Stock, Distribute, Transport or Exhibit for sale any article of food, including prepared, ready to served or irradiated food except under a license/Registration by **FSSAI**.
  
- ❑ **Exact Situation is Different**

# Food Safety

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- Assurance that food will not cause harm to the consumer when it is prepared and/ or eaten according to its intended use.

# International Trade : India

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## FY 2011-12 (Total)

- ❑ Export \$ 304 Billion (20.94% Growth)
- ❑ Import \$ 488 Billion (32.15% Growth)

## FY 2011-12 (Food & Agri)

- ❑ Export \$ 21.35 Billion (56% Growth/Share 8.7%)
- ❑ Import \$ 27.19 Billion

**No Estimate of Domestic Production**

# National/International Regime: Food Safety

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**FSSAI/FAO, WHO, WTO, CODEX,  
OIE, IPPC including SPS, TBT**

## **1. Consumer Safety**

(Prime Importance)

## **2. Fair Trade Practice**

(Fraud/Adulteration)

# Food Safety Issues

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## Intentional/Unintentional

- Physical Hazards
- Chemical Hazards
- Biological Hazards

## Adulteration Hazards

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# National Regime: Ensuring Food Safety

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## The Primary Responsibility is of National Food Control System

□ In India there are Multiple Competent Authorities

- 1. FSSAI (Domestic & Import),**
- 2. EIC (Export).**

# Global Food safety issues



Export Inspection Council of India

# Food Safety Issues Travel Very Fast

## Food Safety Information Travel Faster than Sound and Light



# STREET FOOD

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- ❖ 2.5 billion people eat street food every day across the world
  - ❖ Use of unsafe water for processing, cleaning & Serving
  - ❖ Poor hygienic conditions, personal hygiene
  - ❖ Hygiene and Sanitation Conditions around.
  - ❖ Lack of food safety issues awareness
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# TIRUPATI (Pilgrim)



## Food Sabotage

- ❖ Appximate 60,000/- persons are fed free
- ❖ **'Shram Daan'**: Any one can be involved in cooking, cleaning and serving activities
- ❖ Religious faith involvement
- ❖ Contamination can occur due to poor sanitation

# VAISHNO DEVI



❖ Appx 30,000/- persons are fed in a day.

❖ 'Shram Daan': Any one can be involved in cooking , cleaning activities, serving etc.

❖ Religious faith involvement  
❖ Lack of availability of portable water at such hieght



# MID- DAY MEAL



❖ **Midday Meal Scheme:** It is the popular name for school meal programme in India which started in the 1960s

❖ Primary school children (6-14 years) form about 20 per cent of the total population.

❖ lunch/snacks/meal free of cost to school children on school working days.

❖ According to this scheme 13.6 million SC children and 10.09 million ST in classes I-V are to be fed every day.

❖ Rubbing the plates with soil followed by a quick rinse after.

❖ Unclean uniform worn and floor where children are made to sit to have their food.

# INDIAN WEDDING



❖ **Big fat functions with impressive menu**

❖ **Involvement of large number of families and friends**

❖ **Possibility of Serving of stale/contaminated and chances of adulterated food.**



❖ **Preparation of food in unclean utensils.**

❖ **Poor personal hygiene of the individual preparing and serving the food.**

# FLIGHT CATERING



- ❖ **Variety of Meals & customers to be catered by Airlines**
- ❖ **Chances of Cold Chain is ruptured**
- ❖ **Any contamination at Centralized Kitchen**
- ❖ **Possibly Cross –contamination may occur**

# POLITICAL PARTIES



- ❖ ~~Cross country~~ meetings at large scale

- ❖ Religious functions like Iftaar party

- ❖ Involvement of Political personnel/ official delegates of importance (VVPIs)



# HOTEL/ RESTAURANTS



- ❖ Large number and variety of customers ( domestic/ international)
- ❖ Specialized Menu (Buffet)
- ❖ Working round the clock
- ❖ possibility of Cross-contamination when fresh food is prepared or stored on the same surface as spoiled food

# Threats: Food Defense

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- ❑ **Food borne illness-** Disease transmitted to humans by eating Unsafe/Contaminated food.
- ❑ **Outbreak-** Development of food borne illness by two or more people that eat a common food that is identified as the source of the illness.

# Possible Reasons for Outbreak/Food poisoning

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## **1. Natural Food Poisoning**

- This is caused by type of plant and fish that are toxin to humans
- E.g. rhubarb leaves, poisonous mushroom, puffer, fish.

## **2. Chemical Food Poisoning**

- **This is caused by chemicals accidentally or negligently getting into food.**
- **E.g. Overuse of insecticides, cleaning agents, heavy metal contamination of fish from industrial areas.**

# Continued

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- **3. Bacterial Food Poisoning**

- **Five most common bacterial poisoning are:**

- **1. Salmonella, 2. Staphylococcus aureus**

- **3. Clostridium perfringens, 4. Bacillus cereus-**

- **5. Vibrio parahaemolyticus**

- **4. Viral Food borne Infection**

- **Viruses are transported by the food to the human body and than multiply.**

- **E.g. Hepatitis A, Gastroenteritis**

# Causes of Outbreak/Food Borne

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- **Intentional Contamination**
- **Failure to thoroughly cook or heat food**
- **Failure to properly cool processed food**
- **Infected employees who practice poor personal hygiene**
- **Food allowed to remain at bacteria-incubating temperatures**
- **Raw contaminated ingredients incorporated into foods that receive no further heat treatment**
- **Cross contamination of processed foods**

# Important Pillars of National Food Control System

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- ❑ Legislation/Regulation
- ❑ Inspection
- ❑ Testing (Backbone) **Food Chemist**
- ❑ Enforcement

# Food Analysis

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- Inspection**
  - Sampling**
  - Examination**
  - Testing**
  - Reporting**
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**Input**

- To a Laboratory is
- **(Sample)**

**Output**

- Analytical Data
- **(Test Report)**

**Decision**

- Trade & Commerce **(Import/Export)**
- Safety **(Environment/Research)**

# REQUIREMENT OF Food Testing

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- ❑ Estimated to be 10 folds by 2020
- ❑ Estimated 200 Lakhs Food Business Operators in India
- ❑ Safe 3 Meals a day for over 1.2 Billions
- ❑ Critical Parameters: Environmental Contaminants (Dioxins, PCBs, PAHs,) Residues of antibiotics and its Epimers, Pesticides and its Isomers.

# Targets to Ensure Food Safety

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## Chemical Hazards

1. MRL
2. MRPL

## Biological Hazards

1. Limit Value (Hygiene/Safety Indicator)
2. Absent

## Physical Hazards

1. As per Regulation

# Target of an Analyst

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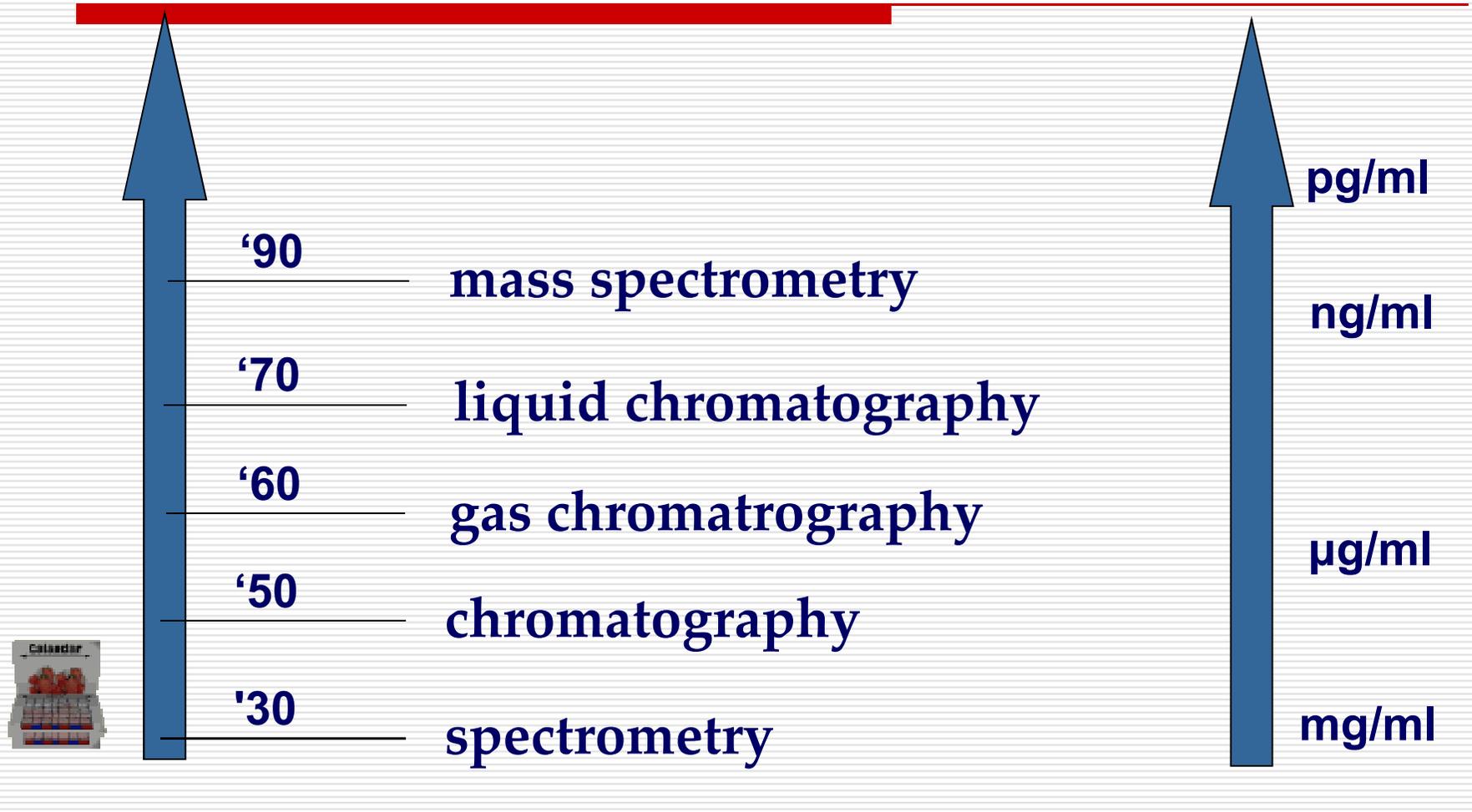


## **By All Means:**

Achieve the value of a constituent/  
contaminant in a given Matrix  
**(as nearer as possible to the  
Assigned/True Value)**  
to facilitate reliable decisions.

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# History



# Mitigation Strategies

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- Surveillance
- Intelligence
- Market Survey
- Access Control
- Education
- Awareness
- Authorization
- Training
- Strengthen Food Control System
- Security Checks (CCTVs)
- Quick and Highly Sensitive Food Testing
- Quick Decisions

# EIC / EIA Network



# Laboratory Infrastructure



# Important to Achieve *“Win-Win” Situation*

**Improved food safety**  
***Less illness, Less Medical and  
Social costs and Less Poverty***

**Food trade access**

*International trade  
capability*  
*Safe national trade*

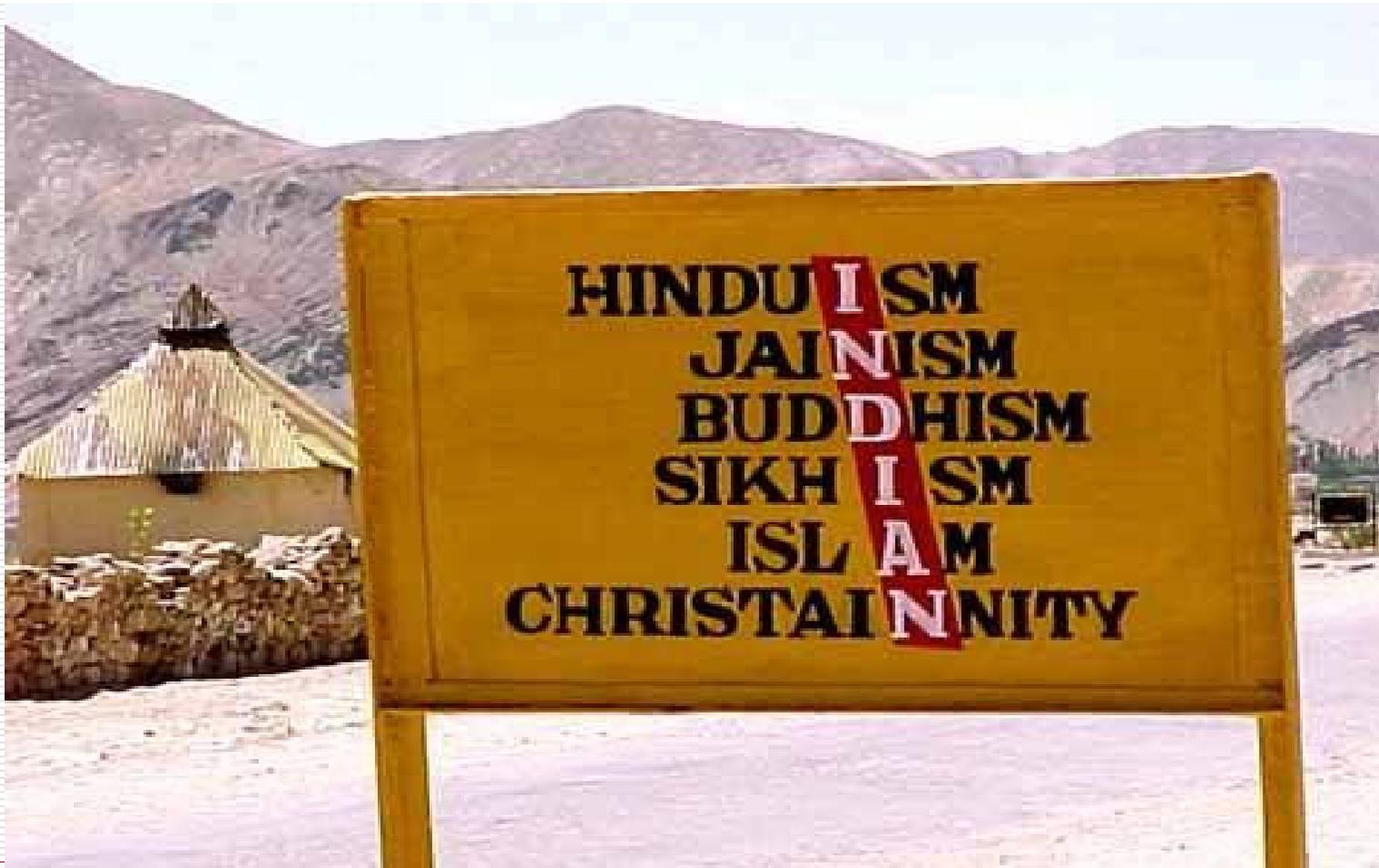
**Improved health**

*Improved participation in  
national development*

**Overall  
Development**

# Thank You & Jai Hind

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