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Food safety "From farm to plate make food safe"

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ABSTRACT

Food safety is a scientific discipline describing handling, preparation, and storage of food in ways that prevent foodborne illness. This includes a number of routines that should be followed to avoid potentially severe health hazards. Food safety considerations include the origins of food including the practices relating to food labeling, food hygiene, food additives and pesticide residues, as well as policies on biotechnology and food and guidelines for the management of governmental import and export inspection and certification systems for foods. Food can transmit disease from person to person as well as serve as a growth medium for bacteria that can cause food poisoning. In developed countries there are intricate standards for food preparation, whereas in lesser developed countries the main issue is simply the availability of adequate safe water, which is usually a critical item.

Keywords: Who Theme 2015, Food Adulteration, Preservatives, Agmark Standards, Codex Alimentarius Commission, Food Safety and Satndard Act, 2006.

INTRODUCTION

Every year, the World Health Organization selects a priority area of global public health concern as the theme for World Health Day, which falls on 7th April, the birthday of the Organization. The theme for World Health Day 2015 is Food Safety- a theme of high relevance to all people on the planet. Food safety is an area of public health action to protect consumers from the risks of food

borne diseases as unsafe food can lead to a range of health problems. [1]

DISCUSSION

Food safety: A prerequisite for food security [1, 2]

- **Changes** in food production, distribution and consumption; changes to the environment; new and emerging bacteria and toxins; antimicrobial resistance—all increase the risk that food becomes contaminated.
- The WHO helps and encourages countries to prevent, detect and respond to food borne disease outbreaks—in line with the **Codex Alimentarius**, a collection of international food standards, guidelines and codes of practice covering all the main foods. World Health Day 2015 is an opportunity to alert governments, manufacturers, retailers and the public to the importance of food safety—and the part each can play in ensuring that the food on peoples' plates is safe to eat.

WHO's Five Keys to Safer Food [1]

- Avoid overcooking when frying, grilling or baking foods as this may produce toxic chemicals.
- In your kitchen, store chemical products in a safe place.
- Do not re-use containers that were initially used to store chemicals to store food.
- Practice safe food handling when selling food at markets.Keep clean – separate raw and cooked food – cook thoroughly – cook food at safe temperatures – use safe water and raw materials.
- When eating food from street vendors or buffets in hotels and restaurants, make sure that cooked food is not in contact with raw food that could contaminate it.
- Make sure the food you eat is prepared and kept in good hygienic conditions
- When there is any doubt about the safety of drinking water, boil or treat it before drinking.

Prevention and Control [1]

- Farm Strategies
- Farm strategies that can be implemented to help control *Salmonella*
- Serologic testing, fecal or hide culturing of animals to identify carriers of the bacteria.
- Once identified
- Segregation of those animals
- Removal from the food production chain (in poultry)
- Another option is the use of vaccines.
- As there are many different bacteria and viruses known to cause foodborne illness, the development of vaccines for them continues to evolve.
- Vaccines are not 100% effective
- With the various serotypes of bacteria and immune status of animals,
- Implementing strict protocols and minimize the number of rodents and wild birds
  - As they are often carriers of bacteria, will also help reduce the transmission.
- Isolating new animals will also help decrease the chance of spread.
- Irradiation
- Irradiation of the end meat product has been in use in the United States since 1986 for the control of parasites in pork.
- In 1990, the FDA approved the use of radiation for the control of bacterial pathogen reduction in poultry (approved in 1992 by USDA).
- Irradiation works by affecting the living cells of organisms and damaging it to the point it cannot survive.
- Foods that are irradiated will be marked with a distinctive logo on the package.
- Irradiation does not affect the taste quality of the food and the nutrients remain essentially the same.
- Need to handle the food product in the same way as unirradiated foods because they are not sterilized and can become contaminated after the irradiation process.

What Is Food Adulteration? [2]

Under the Prevention of Food Adulterant Act 1954, the food adulteration consists of large number of practices, e.g., mixing, substitution, concealing quality, and addition of toxicants in the food.

Any article of food is adulterated -

- ❖ If any inferior or cheaper substance has been substituted wholly or in part.
- ❖ If the article has been prepared, packed or kept under insanitary conditions.

- ❖ If the article consists in part filthy, rotten, decomposed or diseased animal or vegetable or is infested with insects.
- ❖ If the article is obtained from diseased animal.
- ❖ If the article contains any poisonous ingredient.
- ❖ If the article has unprescribed coloring substance or the colouring substance is in excess of the prescribed limits.
- ❖ If the article contains any prohibited or excessive preservatives.
- ❖ If the quality or purity of the article falls below prescribed standard.
- ⦿ The Centre for Science and Environment (CSE) in 2003 had challenged the bottled water industry's claims of being 'pure' when its laboratory had found pesticide residues in bottled water sold in Delhi and Mumbai.
- ⦿ CSE announced that 12 soft drink brands collected for testing from in and around Delhi contained residues of four toxic pesticides and insecticides - lindane, DDT, and malathion.
- ⦿ In all the samples, the levels of pesticide residues far exceeded the maximum permissible limit which is 0.0005 mg.
- ⦿ Each sample had enough poison to cause long-term cancer, damage to the nervous and reproductive systems, birth defects and severe disruption of the immune system.
- ⦿ According to the centre, soft drinks in India had high pesticide residues because the soft drink and bottled water industry used an enormous amount of ground water as the basic raw material. However CSE found no pesticides in tests of Coke and Pepsi soft drink brands sold in the United States.

Preservatives [3]

- Food-preservatives have a very extensive use, which often constitutes adulteration.
- Salt is the classic preservative, but is seldom classified as an adulterant.
- Salicylic, benzoic, and boric acids, and their sodium salts, formaldehyde, ammonium fluoride, sulphurous acid and its salts are among the principal preservatives.
- ⦿ Some preservatives have been conclusively shown to be injurious when used for long periods.
- ⦿ Oil of mustard seeds is usually adulturated with argemone seeds.
- ⦿ Chilli powder is usually adulterated with Saw dust and brick powder.
- ⦿ Pickles and canned vegetables are sometimes coloured green with copper salts
- ⦿ Butter is made more yellow by adding animal fat.
- ⦿ Turmeric is used in mustard and some cereal preparations.
- ⦿ Apples are the basis for many jellies, which are colored so as to simulate finer ones.
- ⦿ In confectionery,
- ▪ Dangerous colours, such as chrome yellow, prussian blue, copper and arsenic compounds are employed.
- ▪ Artificial flavoring compounds are employed in the concoction of fruit syrups, especially those used for soda water.

What we can do? [3]

- Food Adulteration occurs in rural as well as urban areas.
- Option is to buy branded and ISI-marked products.
- Even if these branded items cost a little extra, it is worth paying the extra amount to safe guard your health.
- If doubt its quality, the company concerned can be approached.
- Preserve grocery bills so that the company can take necessary steps regarding the complaint.
- If any person manufactures for sale, stores, sell imports or distributes any article of food which is adulterated or misbranded,
- He is liable under the PFA Act to be punished with imprisonment and fined.
- If one find that any food is adulterated,
- Then do not keep silent.
- Complain to Prevention of Food Adulteration Department in your city / town / district and
- Report to the newspapers and make more and more people aware to take joint action.
- Law against food adulteration
- The Prevention of Food Adulteration Act, 1954
- Aims at making provisions for the prevention of adulteration of food.
- The Act extends to the whole of India

WHEN ARE FOODS MISBRANDED [4]

A. If it is an imitation of, or is a substitute for, or resembles in a manner likely to deceive, another

article of food, and is not conspicuously labelled so as to indicate its true character,

B. If it is falsely stated to be the product of any place or country,
C. If it is sold by a name which belongs to another article of food.
D. If the package containing it is deceptive with respect to its contents, in any manner, such as label, statement, design or device which is misleading
E. If the package containing it, or the label thereon, bears the name of a fictitious individual or company as the manufacturer or producer of the article
F. If it is not labeled in accordance with the requirements of Food Act and the Rules.

- Prohibition on the manufacture, sale, etc. of certain food articles
- ⦿ No person shall manufacture, store, sell or distribute
- ❖ **Any adulterated food,**
- ❖ **Any misbranded food,**
- ❖ **Food articles to be sold under licence without fulfilling the conditions of the licence,**
- ❖ **Any food article which is prohibited by the Food (Health) Authority in the interest of public health**
- ❖ **Any food article in contravention of any other provision of the Act or the Rules or any adulterant.**
- Prohibition on use of certain expressions while labelling of edible oils and fats

The package, label or the advertisement of edible oils and fats shall not use the expressions

- Super-Refined,
- Extra-Refined,
- Micro-Refined,
- Double-Refined,
- Ultra-Refined,
- Anti-Cholesterol, Cholesterol Fighter, Soothing to Heart, Cholesterol Friendly,
- Saturated Fat Free or such other expressions which are exaggerations of the quality of the product. (Rule 37 D).

- ○ PROHIBITION ON USE OF ACETYLENE GAS (carbide gas) in artificially ripening of fruits (Rule 44 AA).
- ○ PROHIBITION ON SALE OF FOOD ARTICLES COATED WITH MINERAL OIL,
- Except in accordance with the permitted standards. (Rule 44 AA and Appendix B).
- ○ PROHIBITION ON SALE OF ADMIXTURES OF GHEE OR BUTTER or on its use as an ingredient in the preparation of an article of food. (Rule 46).
- ⦿ RESTRICTION ON USE AND SALE OF ARTIFICIAL SWEETENERS
- Except that saccharin sodium can be added to carbonated water, supari, pan masala and pan flavouring material within the specified maximum limit
- And aspertaine may be sold for diabetic use under medical advice. (Rule 47).
- ⦿ PROHIBITION ON SALE OF PERMITTED FOOD COLOURS
- I.e. Synthetic colours, or their mixtures or any preparation of such colours, except under a license. (Rule 48A).
- *Conditions for sale of a food article*
- Every utensil or container,
- Used for manufacturing, preparing or containing any food or ingredients, for packaging of edible oils and fats, meant for sale,

  Shall be maintained in a clean and sanitary condition, away from impure air or dust, properly covered at all times
- Use of rusty containers, improperly tinned copper or brass containers, containers of aluminum or plastic not conforming to ISI specifications, etc., in preparation of food
- is also prohibited and such utensils or containers shall not be used for any other purpose.
- Purchaser may have food analyzed
- ⦿ A purchaser of any article of food, or a recognized consumer association,
- may also get an article of food analyzed by the public analyst on payment of the prescribed fees
- ⦿ Thereafter, the purchasers have to follow the same procedure as Food Inspectors.
- ⦿ If the article of food is found to be adulterated, the fees paid by the purchaser or the association shall be refunded.

PROCEDURE FOR SAMPLING AND ANALYSIS

Any food Inspector can enter and inspect any place where an article of-

- Food is manufactured
- Stored for sale
- Stored for the manufacture of any other article of food for sale
- Exposed or exhibited for sale
- Where any adulterant is manufactured or kept
- Take samples of such article of food or adulterant for analysis
- Notice will be issued by the Inspector in writing then and there to the seller indicating his intention
- Three samples are taken and the signature of the seller is affixed to them
- One sample is sent for analysis to Public Analyst under intimation to the Local Health Authority
- The other two samples are sent to the local health authority for further reference
- The Centre plays a vital role in proper coordination, monitoring and surveillance of the programme throughout the country.

OFFENCES AND PENALTIES [4]

- Import, manufacture, storage, sale or distribution of any food article which is adulterated by allowing its quality or purity to fall below the prescribed standard..
  - Penalty is minimum imprisonment of six months that may extend upto 3 years and minimum fine of Rs 1000.
  - Import, manufacture, storage, sale or distribution of any adulterant not injurious to health.
  - Penalty is minimum imprisonment of six months that may extend upto 3 years and minimum fine of Rs 1000
- Preventing a Food Inspector from taking a sample or exercising his powers.
  - Penalty is minimum imprisonment of six months that may extend upto 3 years and minimum fine of Rs 1000
- Giving a false warranty in writing in respect of any food article.
  - Penalty is minimum imprisonment of six months that may extend upto 3 years and minimum fine of Rs 1000
  - Sale or distribution of any food article containing any poisonous or other ingredient injurious to health, which is likely to cause death or grievous bodily harm.
    - Penalty is minimum imprisonment of three years that may extend upto life and minimum fine of Rs 5000

- Food Additives are defined as non-nutritious substances which are added to food, generally in small quantity, to improve its appearance, flavor, texture or storage properties.(WHO,1955)
- Food Additives can be intentional or unintentional.
- Enrichment – restore lost nutrients to food (addition of iodine to salts)
- Fortification – increase nutritional value of food (addition of Iron in cereal foods for children)
- Unintentional Additives:
- Insecticides
- Fungicides
- Herbicides
- Plant Growth Regulators
- Hormones and Antibiotics
- Functions/Purposes
- Prolong shelf life
- Preserve color
- Enhance flavor
- Improve nutritional value
- Maintain freshness
- Prevent spoiling
- Emulsifiers

Risks

- Cancer, birth defects, allergies, and health problems can result. For example, certain preservatives such as nitrites and nitrates can lead to the production of toxic substances, e.g., nitrosamines that have been implicated in cancer aetiology.
- Oil is soluble in body fat. For example adulteration of mustard oil with argemone oil causing dropsy.

- Codex Alimentarius Commission
- Established 1962 by Joint committee of WHO and FAO
- Currently 169 Member Countries

Regulations [4]

- Food hygiene and quality
- Food additives,
- Food labelling and marketing
- Food import, export and certificate system.
- Food Labelling requirements under Codex Alimentarius

- Name of the food
- List of ingredients (in descending order)
- Net content and weight
- Name and address of the manufacturers
- Country of Origin
- Lot number of the product
- Date of manufacture and storage instructions
- Instructions for use

The Agmark standards [4]

- The Directorate of Marketing and Inspection enforces the Agricultural Produce (Grading and Marketing) Act, 1937. Under this Act Grade standards are prescribed for agricultural and allied fields.
- AGMARK is a Quality Certification Mark.
- It ensures quality and purity of a product.
- Standards are being harmonized with international standards keeping in view the WTO requirements. Certification of agricultural commodities is carried out for the benefit of producer/manufacturer and consumer

Products available under AGMARK are as follows

- Pulses
- Vegetable oils
- Spices
- Wheat Products
- Milk products
- Bureau of Indian Standards (BIS)
- The Bureau of Indian Standards (BIS), the National Standards Body of India, resolves to be the leader in all matters concerning Standardization, Certification and Quality. It was established in 1986.

Main Activities

- To provide new thrust to standardization and quality control
- To evolve a national strategy for according recognition to standards and integrating them with growth and development of production and exports.
- Food safety and standard act,2006
- An act to consolidate the laws relating to food was passed by Indian Parliament on 23rd August, 2006.
- It established a new regulatory national body, the **Food Safety and Standard Authority of India** to regulate and monitor the manufacture, processing, storage and distribution of food.
- It has its headquarters in NEW DELHI and 8 regional offices in Delhi, Chandigarh, Lucknow, Guwhati, Mumbai, Kolkata, Cochin and Chennai.

CONCLUSION

World Health Day is an opportunity to partner with other organizations to advocate for better health. We can contact local authorities, schools, WHO office, newspaper, TV and radio stations and the wide range of entities involved in the production and delivery of safe and healthy food to get the message out and raise awareness on why food safety is important.

No conflict of Interest

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