

Food Adulteration in Contemporary India: Emerging Trends and Remedies

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Received: December 15, 2019; Accepted: April 17, 2020

ABSTRACT

Food Adulteration can be defined as the practice of adulterating food or contamination of food materials by adding few substances which are collectively called the adulterants. Adulterants are the substance or poor quality products added to food items for economic and technical benefits. Addition of these adulterants reduces the value of nutrients in food and also contaminates the food, which is not fit for consumption. Food adulteration rate in India has almost doubled over the last 5 years according to data sourced from FSSAI annual reports. Food adulteration rate in India stood at 13% in 2011-12 which increased to 23% in 2016-17. Against this backdrop, this paper attempts to explain the emerging trends of food adulteration in India and its remedies.

Keywords: Adulterants, Food adulteration, India, Remedies, Trends

INTRODUCTION

Food adulteration is fast growing worldwide as an industry. Global market of adulteration and fake goods is more than several hundred billion dollars which constitutes more than 10 percent of total trade. Indian market constitutes more than 30 percent of such trade, and rising very fast on day today basis. Urban markets are particularly flooded with fake and duplicate goods. You name any item: food or drinks, medicines or cosmetics, petrol or diesel, electronic or electrical, music or play, motor parts, books, stationary items, building material including postage stamps, currency notes or coins, we find ourselves surrounded by them. Food Adulteration can be defined as the practice of adulterating food or contamination of food materials by adding few substances which are collectively called the adulterants. Adulterants are the substance or poor quality products added to food items for economic and technical benefits. Addition of these adulterants reduces the value of nutrients in food and also contaminates the food, which is not fit for consumption. These adulterants can be available in all food products which we consume daily, including dairy products, cereals, pulses, grains, meat, vegetables, fruits, oils, beverages etc.

FOOD ADULTERATION IN CONTEMPORARY INDIA

Food adulteration rate in India has almost doubled over the last 5 years according to data sourced from FSSAI annual reports. Food adulteration rate in India stood at 13% in 2011-12 which increased to 23% in 2016-17. Adulteration is a legal term meaning that a food product fails to meet the legal standards. One form of adulteration is an addition of another substance to a food item in order to increase the quantity of the food item in raw form or prepared form, which may result in the loss of actual quality of food item. It is the process in which the quality of food is lowered either by the addition of inferior quality material or by extraction of valuable ingredient. It not only includes the intentional addition or substitution of the substances but biological and chemical contamination during the period of growth, storage, processing, transport and distribution of the food products, is also responsible for the lowering or degradation of the quality of food products.

According to Rajalakshmi (1974), real or artificial gap between supply and demand results in a great temptation for shop-keepers for either adulterating the food sold or for selling foods of inferior quality. Swaminathan (1974) defines adulteration as the process by which the quality of the product is reduced through the addition of baser substances or through removal of vital elements.

MAJOR ADULTERANTS AND REASONS FOR ADULTERATION

Table 1: Cereals, Food Grains and their Products

Food group	Grounds for non-compliance	Reasons/indications
Rice, Wheat, Ragi, Jowar, Rusk, Sooji, Rawa	Living worm and web formation, Living and dead insects	Improper storage facilities (high humidity), Careless handling (insects might be present while harvesting from fields)
	Extraneous matter like jute threads, stones, mud, etc.	Economic benefits are derived by increasing the weight with mud and stones. Lack of proper handling practices might act as an entry point for extraneous matter
	Foreign starch	To add bulk
	Less gluten	This acts as an indication of poor quality of grains.

Table 2: Nuts

Food group	Grounds for non-compliance	Reasons/indications
Groundnut	Insects present	Improper storage facilities (high humidity), Careless handling (insects might be present while harvesting from fields)

Table 3: Legumes and Pulses

Food group	Grounds for non-compliance	Reasons/indications
Moong whole, Bengal gram whole, Toor dal, Horse gram, Green gram	Presence of extraneous matter	Economic benefits are derived by increasing the weight with mud and stones. Lack of proper handling practices might act as an entry point for extraneous matter
	Living and dead insects found	Improper storage facilities (high humidity), Careless handling (insects might be present while harvesting from fields)
	Damaged grains	Improper handling practices while harvesting, processing, etc. cause such defects.

Table 4: Milk/Milk Products

Food group	Grounds for non-compliance	Reasons/indications
Cow milk, Buffalo milk, Toned milk, Mixed milk, Standardized milk, Butter, Ghee, Full cream milk, Curd, Khowa	Low fat and SNF	There is a huge gap between demand and supply in the dairy industry; hence the water is added to increase the quantity of milk.
	Sugar and NaCl detected	Sugar is added to improve taste and mask defects in taste. Sugar may also be added to increase consistency. Salt is added as way to increase the solid non-fat in milk.
	Baudouin test positive	Butter and ghee which is Baudouin test positive indicate that they have adulterated with vanaspati. The cost of ghee being higher and gap between demand and supply makes manufacturers to opt for such methods of adulteration.
	Presence of foreign proteins	
	Presence of neutralizers	Middlemen add neutralizers like alkali bicarbonates, carbonates and hydroxides which improve the shelf life of milk by neutralizing the developed acidity.
Milk and milk products	Presence of detergents	Detergent has been found to be the youngest entry among the list of adulterants in milk; used for the emulsification of externally added vegetable fat by adding detergent to emulsify and dissolve oil in water to give frothy solution the characteristic white colour of milk, followed by addition of caustic soda to neutralize acidity which prevents its transportation.
	High BR value	Indicates adulteration with vegetable oils and fats. The reason behind this is to have monetary gains and a gap in demand and supply.
	Low Reichert Value	Indicates that palm oil or even sheep body fat is added in ghee, such methods of adulteration.
	Presence of foreign proteins	
	Presence of neutralizers	Middlemen add neutralizers like alkali bicarbonates, carbonates and hydroxides which improve the shelf life of milk by neutralizing the developed acidity.

Table 5: Sugar/Sugar Products

Food group	Grounds for non-compliance	Reasons/indications
Jaggery, Sugar, Sugar-boiled confectionery, Rasgulla	Less sugar and sucrose content	
	Dead ants, Fungus infestation	Poor storage conditions
	Presence of non-permitted colours	To make the sweets more appealing to the customer

Table 6: Spices

Food group	Grounds for non-compliance	Reasons/indications
Turmeric powder, Masala powder, Sambar powder	Metanil Yellow	To enhance colour
	Presence of rice starch	To add bulk
	Added salt	To add bulk
	High moisture content	Poor storage conditions

Table 7: Oils

Food group	Grounds for non-compliance	Reasons/indications
Mustard oil, Rice bran oil	High BR value	Addition of palm oil
	High Saponification value	Presence of free fatty acids, indicating rancidity
	High Belliar Turbidity Temperature	Presence of groundnut oil and gingelly oil
	High acid value	Presence of free fatty acids, indicating rancidity

REMEDIES FOR PREVENTING FOOD ADULTERATION

In the previous section, we have seen the various types of food adulteration along with reason for adulteration. These were based on the current trends in India. For prevention of food adulteration, apart from various IPC and CrPC sections, we have Food Safety and Standard Act, an effective implementation of which would ensure the prevention of Food Adulteration in India.

Food Safety and Standards Act, 2006

The Food Safety and Standards Act was introduced in the year 2006 by the FSSAI to regulate the complete aspects of processing, manufacturing, distribution, and other aspects to ensure better services. The PFA had many defects and thus a new law Jim moving those defects was necessary for food safety throughout the country. The FSSA supersedes all the previous laws relating to the food safety, like the Fruit Product Order of 1955, The Meat Food Products Order

of 1973, The Vegetable Oil Products (Control) Order of 1947, The Edible Oils Packaging (Regulation) Order of 1998, The Solvent Extracted Oil, De oiled Meal and Edible Flour (Control) Order of 1967 and The Milk and Milk Products Order of 1992. This act not only relates to Lane standards on specific food items but also regulating the maintenance hygiene and sanitation around all premises to avoid risking human health. This act also provides sufficient infrastructure headed by the FSSAI headquarters in Delhi. The act further provides scientific advice and support to the central and state governments for making laws.

This act empowers the central government to make rules throughout the country. Some of the laws enacted by the government are:

- Food Safety and Standards (Licensing and Registration of Food Businesses) Regulation, 2011.
- Food Safety and Standards (Packaging and Labelling) Regulation, 2011.
- Food Safety and Standards (Laboratory and Sampling Analysis) Regulation, 2011.
- Food Safety and Standards (Food Product Standards and Food Additives) Regulation, 2011.

This act gives a detailed instruction on various components of food processing, which are discussed below:

I) Packaging and Labelling: This regulation tells us that there are different sorts of items such as the- free bundled items, exclusive items that need to follow the general necessities of packaging, and labeling. The declaration required is bound to be either in English or Hindi thereby not preventing the use of any other additional language, the name of the substance should be noticeable, clearly read by the consumers even in typical conditions of use. the food should not be presented in any manner which is false or misleading to the consumer. whereby the container is covered by the wrapper, the wrapper Cal contains all the necessary information. Further, every packet should also carry the information Such as the name of the food, list of ingredients, nutritional value in the product, declaration of the product is vegetarian or non-vegetarian, information regarding food additives, along with the name and complete address of the manufacturer. best before use and used by date, Country of origin for imported foods, and instruction for use are another requirement specified according to the regulation.

II) Licensing Registration and Health and Sanitary Permits: According to the regulation, a permit has to be obtained from the authorized authority under the guidelines of the FSSA to start or nourish business. The regulation only permits FSSA as the legitimate authority to give license to the food business operator. thereby no food business is allowed to commence unless a license

is possessed by it. the regulation also ensures maintenance of sanitary and hygienic conditions specified in each food category by the food business operators.

III) Signage and Customer Notices: Along with the registration of license, taking of hygiene and sanitation, Packaging and labeling, the FSSAI also have certain provisions with regard to the advertisement of products by the food business operators. ‘Advertisement’ by FSSAI refers to any audio or visual publicity, represented by the means of any light, sound, print, electronic media, website, or includes any notice, circular, or any other document. According to the regulation, no advertisement shall be made of any food product which is misleading or false for the consumers. Further, the regulation prohibits any person to take part in Any unfair practices for the purpose of promotion, sale, distribution of his or her product. A visual representation or orally or in writing is also not permitted for promotion If the product is falsely representing the standard of quality of the product, old composition, or gives the false guarantee of the product which is not based on adequate or scientific justification.

Offenses and Penalties under Food Safety and Standard Act

Section 48 lays down the provisions of offenses and penalties, which provides those circumstances opposed and is liable for causing who food adulteration by adding a substance or removing an important element from the food.

- A penalty of up to 5 Lac rupees is imposed on the manufacturer if the food product is not of the quality as per the rules and regulations by the act.
- Manufacturing for sale, storage, distribution, or importing of the sub-quality product may even lead to a fine of up to 5 Lac rupees.
- Selling, storing, distribute but importing misbranded food products may cause a penalty of up to 5 Lac rupees.
- According to the act, misleading or deceptive advertisements may lead to a fine of up to 10 Lac rupees.
- A penalty of 1 Lac rupees is imposed for manufacturing, storing, distributing, but important food products that contain extraneous material.
- A penalty of two Lac rupees is imposed on the food business operator who fails to comply with the provisions of the act.
- Under unhygienic and unhealthy conditions, a fine of up to one Lac rupees can be imposed on the processor or the manufacturer.

- The act further also imposes a penalty on possession of adulterants.
- Apart from the penalties, imprisonment is also laid down for misleading information in the form of advertisements, notices, or interfering with the food safety officer during the sampling of the product.
- Apart from penalties and imprisonment, the person not falling the provisions may be liable to pay compensation to the victim.

SUGGESTIONS TO PREVENT FOOD PREVENTION

- Improved Storage Facilities:** Degraded storage is one of the most important reason for unintentional sub-standardization of food grains, legumes and spices. Improving storage facilities, adopting technological advancements and regular monitoring could reduce this problem to a great extent.
- Newer technologies for detection of adulteration:** New machines and techniques should be developed and made accessible to common people to enable them detecting adulteration in food.
- Awareness among consumers:** Awareness campaigns should be done at mission mode to make people understand about ill effects of food adulteration.
- Increased Production:** Shortage of production coupled with higher demand gives scammers opportunity to add sub-standard adulterants to increase the quantity. It is one of the most common reason for adulterated milk. Government should identify such products and take steps to improve the production.
- Price control:** Higher prices is another reason for food adulteration in India. People tends to buy cheaper goods. Scammers sell adulterated sub-standard foods at cheaper prices, which are otherwise costly. Government should work towards price control in the market. If products are available at reasonable rate, a well aware consumer won't buy any cheaper goods knowing the chance of adulteration.

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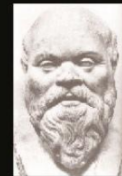
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How to Cite: Soopa, M. S., & Panwar, K. S. (2020). Food Adulteration in Contemporary India: Emerging Trends and Remedies. *SOCRATES*, 8(1), 64-71. Retrieved from <https://www.socratesjournal.com/index.php/SOCRATES/article/view/431>



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