

Food Adulteration and Its Impact on Health

Rodana Pantha

Lecturer, Home Science, P.K.M Campus

E-Mail: rodana.pantha@gmail.com

Abstract

Food adulteration is the addition or mixing of inferior, harmful, substandard, useless or unnecessary substances to foods. This loses the nutritional content and quality of food items. Adulteration poses a number of health hazards which include health diseases and weaken the immune system. The main objectives of this study was to aware of consumer about food adulteration and use of organic food items. Department of Food Technology and Quality Control under Ministry of Agricultural and Cooperatives is the major Government Institution responsible for food safety and quality management. There is a need of public campaign to make the general public aware about the quality of food items. We consumer should be aware of and conscious while buying food items. This study is based on the informations taken from secondary sources. At the end some suggestions and recommendations are given for improving the health status of consumers.

Key words : Adulteration, Health hazard, Immune system, Quality control.

Introduction

Food is essential for sustenance of life. We all eat food and gain energy for different metabolic activities. All living organisms need food for growth, work, repair, and maintaining life processes. There are different types of food available today in the market, and on a daily basis, we all depend on various food sources, including vegetables, fruits, cereals, pulses, legumes, etc.

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 quality of the food item in raw form or prepared form, which may result in the loss of actual quality of food item. These substances may be either available in food items or non-food items.

Adulteration of food is not a novel phenomenon . Historical records show its existence in all civilizations since antiquity. The holy Vedas and Bible have references as testimony to this fact. However, with the advancement of science and technology in food production and manufacturing there is a trend emerging towards violating the quality of food by resorting to adulteration; this is the burning issue which has to be dealt with by any food control agency in the present day.

Adulteration or contamination of natural food products is one of the major challenges in today's society. Despite various actions and penalties, the practice of adding adulterant is quite common in developing countries. It consists of a large number of practices, e.g. mixing, substitution, concealing the quality, putting up decomposed foods for sale, misbranding or giving false label and addition of toxicants. Adulteration of food consists of substitution of cheaper or inferior substances wholly or in the part, which affects adversely the nature, substance or quality of the food. The practices of adulteration of food stuffs and marketing of substandard or materials of poor quality is widely prevalent in Nepal and India. It has been roughly estimated that 50 percent of marketed foodstuffs available today are adulterated in one way or another. One of the causes of adulteration is that there is wide gap between production and supply of food articles. The temptation for quick gain and easy profits amongst most merchants, slow action by the authorities, the poor enforcement of the food laws. Almost all foods, milk, cereals, pulses, spices, ghee, oils, and beverages are adulterated in India and Nepal.

Food adulteration is the addition or mixing of inferior, harmful, substandard, useless or unnecessary substances to foods. This spoils the nature and quality of food items and is considered food adulteration. Adulteration is simply the way of changing the composition of any food item such that it loses the nutritional content. Every food item has certain nutrients which are healthy for the body but adulteration brings down this value and affects the quality to a large extent. This is the reason people are getting more prone to health problems.

Adulteration poses a number of health hazards which include health diseases, weaken the immune system and lots more.

Lead chronic health problem: Minerals oils, zinc substances which used in food items lead to abortion and damage the brain of baby, if pregnant mother eat such food items. Also food colours added to food items can be the reason of liver damage, allergies and lots more.

Increases the impurity in the food: Adulterated food items increases the impurities thus making them imperfect for the consumption. If you consume this item you are bound to have side effects which can either be short-term or long-term one.

Lack of nutritional value: Readymade food is made using poor quality ingredients which not only brings down the nutritional content but can have change in taste as well if kept for a long time. So you compromise with the taste as well as your health.

Thus we can say that adulteration is definitely not good. There can be a number of reasons of adulteration like the wrong packaging, use of insecticides or pesticides, use of preservatives and lots more. One can do nothing about it but just take measures and try to use quality products only for cooking. This will ensure healthy cooking and you will be able to stay away from various kinds of health problems. So avoid ready-made food

and always use home prepared healthy food. In earlier times, people used to prepare different food items at home, so that it was fresh, clean and healthy. But today, everyone is so busy that they do not have time to cook food at home and depends on instantly made items. These have different kinds of preservatives that are used to keep them in good condition for a long time. But these are really harmful and have an adverse effect on our health and causes different types of health hazards.

In the early nineteenth century, many adulterants were used in foods like pepper, essential oils, vinegar, beverages (coffee, tea, beer, and wine), butter, bread, etc. In the western countries there is a rising concern over the safety of the food supply and many remedial actions, both voluntary and enforce, have been taken. Food adulteration, apart from cheating the consumers, often results in disorders of diseases.

Some foods commonly adulterated are :

Pulses are adulterated with khesari dal and other pluses with inferior quality. Khesari dal, grayish color triangular in shape, use in adulteration of bengal gram and red gram dal. Diet containing over 30 % of khesari dal for 2 to 6 months can cause lathyrus condition.

Some seeds, barks, leaves and other materials are dressed up to look like genuine food stuffs for marketing as genuine products or to adulterate the pure ones. Roasted tamarind and date seeds are ground into coffee powder, and exhausted tea leaves or colored saw dust are mixed into fresh tea. Powdered bran and saw dust in wheat flour and ground spices. Fats and oils are easily adulterated. Cheap edible and non-edible oils might be added in the genuine oils. But it is difficult to detect such adulteration . Ghee is often mix with hydrogenated oils and animals fat. Synthetic colors and flavours are added to other fats to make them appear like ghee.

Food grain adulteration involves mixing sand or crushed stones to increase the weight of food grains. Cereal grains and pulses are mixed with plastic beads that resemble grains in color and size. Very often, water is also sprayed on grains to increase the weight. Chilli powder is often mixed with brick powder, while tea leaves are often mixed with used tea leaves. These adulteration are very harmful to the consumer organizations and consumer seriously.

Milk adulteration are found in most of the places in many countries. Milk adulteration involves adding water in milk and removing the beneficial fats from milk. Often soymilk, starch, groundnut milk, and wheat flour are added to milk. This makes the milk less nutritious and its results in milk being useless for the consmer.

Coloring matter added in the foods for example, addition of lead chromate in the turmeric. Talc and chalk powders to adulterate wheat flour , arrowroot powder, panir and confectionary.

Adulteration can bring down our health and affect the quality of life. As adulteration alters the composition of the food item, it increases the impurities thus making them imperfect for the consumption. If we consume such impure food stuffs we are bound to have side effects which can either be short-term or long-term one.

Types of Adulteration Seen in Nepal

Food material	Common adulterants
Cereals such as wheat, rice	Mud, grits, soapstone bits
Pulses	Coaltar dyes, khesari dal, bengal gram with tapioca flour or yellow dye
Ice-cream	Non-permitted color, artificial sweetness, other fats and gelling agents
Curry powder	starch colored brown by coal-tar dyes
Haldi (turmeric) powder	Lead chromate powder
Dhania (corriander) powder	Starch, cow dung or horse dung powder
Black pepper	Dried seeds of papaya
Chilli powder	Saw dust, brick powder
Tea Dust /leaves	Black gram husk, tamarind seeds powder, saw dust, used tea dust
Coffee powder	Date husk, tamarind husk, chicory
Asafetida (hing)	Sand, grit, resins, gums
Mustard seeds	Seeds of prickly poppy argemone
Edible oils	Mineral oils, argemone oil
Butter	Starch, animal fat
Ice cream	Cellulose, starch, non-permitted colors
Fresh green peas in packing	Green dye
Milk	Extraction of fat, addition of starch and water
Ghee	Vanaspati ghee

In Nepal, there is hardly food product being sold in the market which is not adulterated. Take for instance, spices, turmeric, dried ginger, sugar, edible oils, like mustard oil, ghee, milk etc. Even the food grains and pulses are adulterated with substandard varieties and, at times, even small pieces of stones.

Sometimes, certain kinds of powder of some dried ingredients is mixed in milk to make it thicker and look like standard milk containing the required quantity of fat as it exists in natural standard milk. We often hear the news dairy-owners using caustic soda, soapy water, groundnut oil etc in milk which is not good for health of people. Hence, it is the questions of nations health. If people are saved from the cheating of the adulterators

they can lead a healthy and disease free life. Strict actions should be taken against the recalcitrant. There should not be only heavy fines but also long rigorous imprisonments for the adulteration. Needless to say adulteration should be like any other serious crime and the perpetrators should not be fined late just for political or any other consideration.

Consequences of Adulteration

From the contamination it is easy to guess that adulteration can have two results that affect the consumer. One is based on the health hazard; for example argemone oil causing epidemic dropsy, tricresyl phosphate (TCP) resulting in paralysis and death; pulses adulterated with khesari dal if used in long time may cause lathyrus condition . If pregnant woman use more adulterated food in pregnancy it affect growing fetus, and have miscarriage, pre mature birth, low-birth weight of the baby. Mother may face many health problems. The other is on the economic matter that is paying more money for the cheaper product.

Food Act and Food Law

Objectives of Food Legislation

- To protect consumers against hazards to their health arising from consumption of food.
- To protect the consumers against fraudulent practices in food trade.
- To ensure fair practice between food handlers.
- To help minimize wastages or losses or to dumping of hazardous and substandard foods.

In Nepalese context, food act and laws are discussed below.

Basic Structure of Food Act

The food act 2023 (1966) was promulgated by the late King Mahendra for the welfare of the people with aims to protect people from health hazards and commercial frauds. Food regulation is known as Food Regulation 2027 (1970).

Food Act 2023, has been amended severals times. The act and rules are continuously being amended as an attempt to comply with international standards and qualitties. Traditionally food safety related rules and regulations were basically based on inspecting and analysing end products to ensure safety of the food. But this approach has been increasingly replaced by total quality management i.e 'farm to fork' approach which focuses all level of production, processing, transportation, and trading.

Some features of Food Act 2023 are :

- The Acts bans on production , sale, and distribution of substandard , adultrated and hazardous food items
- It prohibits the misbranding or sales by false statement .
- It detains the suspected food food items supposed to have health hazard if used.
- There is a provision of licening for the food establishments, stores, shops etc.

- It clearly states the liabilities of the offence committed by food manufacturer or seller.
- It has a provision of standardization of food for quality.
- Analysis of the food materials in the specified laboratory.
- HMG as plaintiff.
- Authority to deal with offences.
- Provision of appeal if not satisfied with the decision.
- Provisions to make rules.

Food Regulation 2027

It is based on the food act just to make it functional. The act is implemented after the regulation is formulated and for the formulation of the regulation, the act gives direction to develop the rules. In the light of food regulation, it has nine parts.

- Part one: States preliminary analysis of food
- Part two: Central food research laboratory
- Part third: Food inspector
- Part four: Analysis of food
- Part five: Standardization committee
- Part six: Packing and labelling of food
- Part seven : Prohibition and regulation of sales
- Part eight : Use of colors and preservatives
- Part nine: Condition of licensing

Responsibility of a Food Control Agency

In order to meet the set objectives of food legislation, the food control agency has the responsibility to deal with planning, programming, monitoring, evaluation and the overall impact of the activities. Consumers should be well aware of the objectives of the organization and their participation is vital to strengthen these activities.

Mechanism for Food Control

- Food inspectors collect suspicious sample in duplicate from the market/ industry
- Send the sample to public analysts
- Public analysts sends the report to the food inspector
- With the recommendation of district attorney, the inspector files the case
- Chief of the District Officers decides the case in this regard
- Appeal within 35 days of the decision date could be made

Areas Coverage for the Food Control System

- The food act previously implemented in certain selected districts, but now the law has been executed in all the districts of Nepal.
- It also has a regional offices and the quarantine laboratories in the four customs (Kakarvitta, Birjung, Tatopani and Mahendranagar). The one and only goal to extend the offices is to control the food quality and protect the consumer's health.

Government Legal Action Against Adulterated / Substandard Food Stuffs

The food and drug administration enforces the act by :

- Seizure (removal of product from market).
- Ban against an individual or company to stop from either introducing an adulterated or mis branded food in country commerce.
- Criminal prosecution , where action is taken against an individual or company and penalty may be a fine or jail sentence.
- Selling contaminated food can result in imprisonment for 1 to 5 years and a fine of Rs 50,000 or both.
- The government has registered a bill in the parliament to consolidate the laws related to food hygiene and quality so that those who produce ,process, and export contaminated food, import, transport and sell it can be imprisoned for up to five years.
- If you produce low quality food or sell it in bulk, you can be imprisoned for up to 3 years or fine Rs 30,000 to Rs 3,00,000 or both.
- If the food system is operated without a permit , if the prescribed conditions are not followed ,there will be a fine of Rs 10,000 to 50,000 or imprisonment for up to one year.

Ways of Food Safety Governance

- Producer: Follow the good agriculture practices.
- Processor: Ensure production of safe food. Upgrade facility design and official food control system.
- Handler: Safe handling ensuring the safety and stability.
- Governments
 - a. Grading of foods and food products.
 - b. Regular examination and monitoring on HACCP in production and marketing chain adulteration.
 - c. Legal action against poor grades.
- Consumer: Consumer should demand safe products, and strictly follow the direction for storage and use.

Department of Food Technology and Quality Control under Ministry of Agriculture and Cooperatives is the major government institution responsible for food safety and quality management . Generally, DFTQC is (1961) responsible to regulate food in the market and ready to eat while DoA and DIs are responsible to regulate primary production and some processing. Department of Food Technology and Quality Control at Babarmahal referred 81 cases of food adulteration to the district administration offices in fiscal year 2006. Pasteurised milk, ghee products, milk products , mustard oil, vegetable ghee, and tomato ketchup were adulterated in that time. In 2010, water, milk, clarified butter, cooking oil adulterated cases were found in Nepal said senior food officer.

International membership of Codex, alimentarius commission , World Trade Organization , Food and Agriculture Organization, member of SAARC, World Organization for animal health (OIE) , member of Bay of Bangal initiative for Multi-sectoral Technical and Economic Cooperation (BIMSTEC). National for Standards (NCS) is the government body responsible to approve and endorse Nepalese Standard. Nepal is one of the active members of South Asian Regional standards organization(SARSO) established in 1990 and has been involved in the formation of regional standard of foods and food processing methods . Separate government institution called Food Standardization Board (FSB) is present according to the provision in the Food Act 1996 which make recommendations to the government about food standards, principles and guidelines according to international practices and principles.

According to DFTQC 2009 , Nepal Standards related food are as follows: Milk and milk products- 18, Fats and oils- 16 , Fruits and vegetables products- 17 , Spices and condiments- 22, Tea, coffee, cocoa and their products- 3 , Salt- 2 , cereals pulses and their products- 23, and processed drinking water- 2, sweetening agent- 3 , sweet and confectionary- 3 . Total 109 products are according to Nepal Standards.

Conclusion

Food adulteration is a simply way of changing composition of any food which loses the nutrients content. Food adulteration in Nepal is increasing day by day. It is hard to find a food product being sold in the market which is not adulterated. Adulteration can bring down our health and affect the quality of life. The Government of Nepal formulated the food act and food regulation but the adulteration is increasing day by day. So the consumer must be aware about food adulteration and buy that foods which are organic and have standard logo.

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