Abstract

Adulteration of foods has become a national issue. The problem is not only ignoring the human rights for safer

food but also endangering public health seriously with numerous acute and chronic diseases. Our future generation

will be seriously affected with vulnerable physical and mental growth inflicted by food adulteration. This paper

describes the impact of consumption of adulterated foods on human health and the roles of the concerned

authorities to eradicate it. The key objective of this paper is not to blame or undermine anyone. We intend to

inform the current scenario of food adulteration and wish to bring a positive change through proper measures by

the concerned regulatory authorities.

Key words: Food adulteration, food safety, toxicity, public health, human rights

Introduction

In the time of indivisibility, interdependence and

interrelatedness of human rights, the right to safe food

acclaims significant bearing on the right to health, right to

food and most importantly right to life (Leon, 2014). But

now-a-days in Bangladesh, human rights for safe food are

ignored indiscriminately. As per the news, features and

articles published in different newspapers in Bangladesh,

most of the foods manufactured or processed are either

adulterated in varying degrees or unsafe for human

consumption.

Adulteration in a broad and legal sense is the

debasement of any article. So, adulteration of food means

substandard foods, which fails to comply with the

definition of safe food by the Food and Agriculture

Organization (FAO) and World Health Organization

(WHO). Anyway, adulteration of food and food products

can be unintentional and/or intentional. Unintentional

adulteration includes naturally occurring substandard

foods, due to lack of rainfall, drought, poor storage

condition, etc. On the other hand, intentional adulteration

is done with the intent to defraud or cheat the consumers.

The addition of wheat flour to powdered ginger with

enough capsicum to restore the pungency and enough

curcuma to maintain the natural color is a typical example

of intentional adulteration. This is also known as

sophistication, which means no stone is left untouched to

produce a food item which would probably look even

better than a naturally grown/produced food and food

products. This is more serious, which is affecting the

health of our citizens, including much our innocent

children.

The problem of adulteration persists at every level of

food from preparation to consumption. Most of the food

manufacturers, processors, restaurant owners and so forth

are all involved in one way or another in this unethical

practice of adulteration. Foods are adulterated by using

various harmful chemicals and toxic artificial colors.

Rotten and perishables foods are stored, sold and served to

consumers. Uses of poisonous chemicals in perishable

foods are evident in highest degrees which are

endangering the lives of the people (Derek, 2013).

The supply of unsafe foods is negatively contributing to

the public health seriously with numerous acute and

chronic diseases. This paper has focused the blindfolding

of the traders and retailers to social commitment and the

limitation of law implementation agencies to combat the

current food security problems prevailing in Bangladesh.

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Current scenario of food adulteration

Unsafe foods are responsible for a number of diseases

in the entire world. Bangladesh, a member of Least

Developed Countries (LDCs) of South Asia, is not an

exception in this case. Consumption of unsafe food is a

serious threat to public health in Bangladesh for the last

couple of decades. A survey conducted by the Institute of

Nutrition and Food Science, University of Dhaka in early

1980s revealed that inadequate diets and intake of

adulterated foods are responsible for the malnutrition of

60% of the people of Bangladesh (http://www.assign-

mentpoint.com). The Institute of Public Health (IPH) in

Dhaka and the World Health Organization (WHO) in their

joint study on food adulteration in 1994 tested 52 street

vendors and found that all of their food samples were

contaminated with different types of pathogenic

microorganisms (Badrie et al., 2006). They also conducted

another study in 2003 in Dhaka city and found that 96% of

sweetmeats, 24% of biscuits, 54% of breads and 59% of

ice creams were extensively adulterated (Rahman et al.,

2005). This study also revealed that over the preceding

decades, some 50% of the food samples tested in IPH

laboratory were marked as adulterated (Badrie et al.,

2006). Similarly, a recent official statistics published by

the Ministry of Health and Family Welfare (MOHFW) of

the Government of the People’s Republic of Bangladesh

(GoB) revealed that nearly half of the food samples have

been found adulterated when tested by the IPH from 2001

to 2009 (Directorate General of Health Services, 2012).

This GoB statistics indirectly demonstrated that the

situation of the prevailing food adulteration concerns in

Bangladesh has not been improved over the past 10 years.

A recent report by the ‘Poribesh Bachao Andolan’

disclosed that about 7.9 million (79 lakh) people in South

Asia die every year by non-contagious diseases and food

adulteration is marked as one of the most important

reasons. The report also warned that if this food

adulteration cannot be prevented now, it will affect the

mental growth of our next generation (The Daily

Observer, 22 June 2014).

According to a report of the Daily Star published on

11 August 2011, the basic food items on the market like

rice, fishes, fruits, vegetables and sweetmeats are

adulterated with hazardous chemicals in an indiscriminate

manner. A random survey by the Public Health Laboratory

of Dhaka City Corporation in 2004 indicated that more

than 76% of food items on the market were found to be

adulterated and the level of food adulteration varied 70%

to 90% (The Daily Star, 11 August 2011). Very recently,

Transparency International Bangladesh (TIB) disclosed

that at least 4.5 million people were directly affected by

the consumption of tampered foods in Bangladesh (The

Daily Star, 22 March 2014). According to a report (The

Daily Star, 28 April 2014), The Food and Agriculture

Organization (FAO) of the United States tested fruits,

vegetables, milk and milk-products in a government

laboratory and revealed that all of the tested food stuffs

contained banned pesticides that pose serious health

hazards. The presence of toxic substances in these samples

was about 20 times more than that set by the European

Union. Still the degree of adulteration is rising alarmingly

in an epidemic manner (Mahfuz and Mahin, 2014;

Mahfuz, 2014; Rimon, 2014; Parvez, 2014).

Examples of some food adulteration

Food items that are commonly adulterated include

fruits, vegetables, milk, fishes, sweetmeats, rice, wheat,

meat, oil, ghee, spices, egg, soft drink, juice powder, baby

foods and so on (Mahfuz, 2014). Fruits are adulterated

with calcium carbide, ethephon, formalin, injections of

colors and sweeteners. Vegetables are adulterated with

formalin and toxic dyes while fish with formalin (The

Daily Star, 01 November 2009). According to the findings

of the National Food Safety Laboratory of the

Government of the People’s Republic of Bangladesh

(NFSL), some regular food items like carrot, bean, tomato,

banana, mango etc. are contaminated with toxic pesticides.

DDT (Dichloro diphenyl trichloroethane) is used in dried

fish at a higher concentration. Milk is adulterated with

formalin, addition of dirty water, removal of fat, addition

of wheat flour or powder milk, sorbitol and detergent as

thickening agents. Powder milk is adulterated with

melamine and banned pesticide (The Daily Star, 30

January 2007). Aldrin was also found in milk and milk

products (Nath, 2014). Meat is often adulterated with

formalin and toxic red color. Ghee is adulterated with

animal fat or palm oil (The Daily Star, 12 July 2007; 7

December 2008). Vegetable oils are adulterated with

cheap non-edible oils. Rice is adulterated with stone

particles, urea and artificial colors. Chili powder is

adulterated with brick dust and sudan red color, while

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turmeric powder is adulterated with metanil yellow and

colored chalk powder. Black pepper is adulterated with

dried papaya seeds and honey is with colored sugar syrup.

Tea is adulterated with exhausted tea leaves and saw dust.

Puffed rice (muri) is adulterated with hydrose (sodium

hydro sulfite) and urea to make it whiter and bigger in size

(The Daily Star, 28 July 2011; 4 August 2012; Mahfuz

and Mahin, 2014; Mahfuz, 2014). Sweetmeats are

adulterated with toxic sodium cyclamate, colors and

formalin (Mahfuz and Mahin, 2014; Mahfuz, 2014). Jilapi

(a kind of sweetmeat) is adulterated with burnt engine oil

and toxic textile dyes (Farooque, 2014).

Packaged and bottled drinks and fruit juices are

manufactured with harmful chemicals and ingredients.

Cakes, biscuits, sweetmeats, etc. are made with rotten

flour, rotten eggs, burnt oil, dirty water, date-expired

imported powder milk, textile dyes, chemicals and essence

at unhygienic places (Khan, 2014). Textile dyes although

highly injurious to health are randomly used in many types

of food items as coloring agents. Papayas and bananas are

artificially ripened by carcinogenic chemicals. In the

fasting month of Ramadan, iftar (breaking of fast) items

like peaju, alur chop, kabab etc. are prepared by using

burnt oil, which severely affects the digestive system

(Mahfuz and Mahin, 2014; Mahfuz, 2014; Rimon, 2014;

Parvez, 2014). Drinking water in bottle and jar is

adulterated by impure, contaminated, unhygienic pond

water, WASA (Water Supply Authority) supplied city

water and so on (Rimon, 2014).

Recently it has been reported that there has been

bumper production of pineapple in Bangladesh this year

(The Independent, 19 Aug 2014) but it is very unfortunate

that some growers were seen to spray formalin and other

chemicals to their products (The Daily Star, 20 August

2014).

Major causes of food adulteration

Adulteration of food items began a couple of decades

ago and this practice is increasing day by day. Dishonest

traders, importers and manufacturers, cultivators and

processing agencies are involved in these unethical

practices. There is no paucity of laws and regulations to

control adulteration of food in Bangladesh such as

Bangladesh Standard Testing Institute (BSTI) Ordinance

of 1985, and the Pure Food Ordinance of 2005. These

rules encompass the offences like fake licenses, poor

quality of food, substandard infrastructure and lack of

hygiene, food adulteration, food impurity, incorrect

information on food packages, selling products with

expired date etc. However, the problem lies in its

sustained and appropriate implementation by the credible

authorities. Occasionally, the regulatory authorities

become active and conduct mobile courts to penalize

sellers and/ or producers for selling adulterated food

products for a short period of time.

Besides, scarcity of test reagents, instruments and

manpower is very much noticeable. In fact, the Ministry of

Health and Family Welfare, Ministry of Food, Ministry of

Agriculture, Local Government Division, Ministry of

Fisheries and Livestock, Ministry of Commerce, Ministry

of Industries, Ministry of Home Affairs and Ministry of

Information should play the vital role in food security

issues but as per the news published in various newspapers

they are unable to do it probably due to lack of manpower,

motivation and many other reasons.

Please think and change your mind set

We would like to bring some very simple and relevant

examples of adulterated food and food products which we

consume regularly, but do not try to realize the problems.

If we think the followings then hopefully we all can make

a difference:

(a) Whole milk is normally sold in the market at 60-

70 taka/liter. If we try to convert it to evaporated milk or

more popularly condensed milk then about 80% of the

moisture need to be vaporized. So to get a can of

condensed milk (390 g) we need at least 2-2.5 liters of

whole milk, which will cost about 150 taka. If this is the

situation then how can we expect to get a can of

condensed milk with only 50-55 taka? Should we get

condensed milk of acceptable quality? The answer is no.

(b) Apples are sold in the market at 120-150 taka/kg.

How much fresh juice can we obtain from 1 kg of fresh

apple? If we realize this then why do we expect to get

about 200 ml of any fruit juice with 20 taka only. Again,

we need to change our attitudes and expectations.

(c) If we try to dissolve chili powder in water, it will

never give a bright red colored solution immediately. This

is because not 100% of the powder chili will undergo

solubilization in water. So how do we get immediate

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bright red color of some packed chili powder? Because it

contains unauthorized textile color or colors which have

been banned long time ago from the food color category.

(d) Saffron is a popular coloring agent which is used

in preparing various sweetmeats, especially zorda (a

special type of desert with bright yellow color) which is

very common in any wedding party. It looks great and

taste is also good. But how does it get its bright yellow

color? Many of us consider that saffron has been used as

the coloring agent. But saffron is too expensive to be used;

about US $2000-10000 per pound depending upon the

quality. Although cheaper varieties are available, still that

will be too much if we compare with the so called food

grade (?) yellow color that we frequently use in cooking.

So can we still think that saffron is always used in zorda?

Again the answer is no.

(e) There are many examples of similar common

phenomena, which we use in our daily life but never think

about the cost and quality together. However, it is

important to note that even we pay high price there is no

guarantee of getting quality product in our country.

Impacts of food adulteration on human health

Consumption of adulterated food items may cause

asthma, sore throat, larynx constriction, bronchitis, skin

infections, allergic reactions, diarrhea, hematuria,

circulatory failure, numbness, dizziness, kidney failure,

stomach cancer, liver cancer, nervous disorders and many

other diseases (The Daily Star, 28 July 2011). Researches

have revealed that consumption of formalin directly

through food can cause different types of cancers,

especially the lung cancer (Wooster et al., 2005; WHO,

1988). After consumption of adulterated food items,

thousands of people are becoming sick. Children are the

worst victims. About three million people suffered from

diarrhea during 2005-2009 and about 15% of children died

in 2011 as reported by the Directorate General of Health

Services (Nath, 2014). The long term effects are also very

severe especially the incidence of renal failure, liver

damage and cancer which are increasing alarmingly in

Bangladesh. Heavy metals, such as lead, chromium and

arsenic accumulate in the body that might cause kidney

and liver damage and develop abnormality among children

(Khan, 2014).

Textile dyes for short term use may cause diarrhea

and gastrointestinal problems but in the long run, these

materials accumulate in the body with serious health

hazards.

The burnt oil developed after repeated cooking

severely affects the digestive system. In case of very

young children, the liver is not matured enough to

metabolize and break down the toxins. This may affect the

development of immune system. So, our children are at

high risk due to such adulteration (Dhaka Mirror, 23

August 2009; The Independent, 24 February 2014).

According to the general information regarding food

risk published by WHO, human exposure to chemicals at

toxic levels as well as nutritional imbalances are known or

suspected to be involved in causing cancer, cardiovascular

diseases, kidney and liver dysfunctions, hormonal

imbalance, reproductive disorders, birth defects,

premature births, immune system suppression,

musculoskeletal diseases, impeded nervous and sensory

system development, mental health problems, urogenital

diseases, old-age dementia and learning disabilities.

Therefore, the protection of diet from these hazardous

conditions is essential to protect public health (WHO,

2009).

Ways to prevent food adulteration

Many countries around the world are concerned about

handling issues with the food adulteration. Food and Drug

Administration (FDA) was established in the United

States in 1906 and Food Safety and Standard Authority

started functioning in India in 2011 with trained personnel

with the ability of enforcement of laws and understanding

of its complications from scientific knowledge and

background. The question of human rights, accurate

detection of offence and also extent of punishments are the

prime issues to counteract the adulteration problems. In

our country, Bangladesh Standard and Testing Institute

(BSTI) was established in 1985 and Consumer Right Act,

2009 was approved by the parliament with the functioning

of a department under the guidance of a council headed by

the commerce minister. Sometimes, the law enforcing

agencies maintain strong vigilance to detect such cases of

adulteration. In fact, there are arrangements to detect the

defaulters with the laboratory tests and enforce the

existing laws to combat the menace but concerted efforts

and manpower are inadequate. Early in June 2014, the

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Dhaka Metropolitan Police also started an anti-formalin

drive in and around the capital to check formalin in

seasonal fruits and destroyed tonnes of fruits, mainly

mangoes and litchis (Daily Prothom Alo, 1 July 2014). At

that time a formalin-checking operation was started by a

joint team of BSTI and mobile court occasionally. There

are at least two dozen other chemicals used by

unscrupulous traders in food items for food adulteration

which should also be monitored.

FAO Food Safety Project Team has analyzed gaps,

overlaps, strengths and weaknesses in the currently

available food inspection and enforcement systems and

recommended ways to strengthen food inspection and

enforcement services for domestically produced and

imported foods (FAO, 2010).

Many suggestions have already been emerged in

curbing adulteration of foods (The Independent, 24

February 2014; Dhaka Tribune, 15 March 2014; The

Financial Express, 21 August 2014). Following concerted

efforts might be beneficial for preventing food

adulteration.

1. Sustainable development of mass awareness among

people against the consequence of food adulteration

on long term health.

2. Severe and exemplary punishment to the food

contaminators. Life imprisonment or capital

punishment may be considered depending upon the

degree of offences and ultimate effect.

3. Strengthening food inspection service with skilled

manpower and valid analytical instruments as well as

proper enforcement of relevant laws in a sustainable

manner.

4. Lowering the safety limit of the amount of pesticide

and other toxicant residues in food items as per

international guidelines.

5. Educating the primary- and secondary level students

regarding the fatal impacts of food adulteration

through academic curriculum.

6. Training of farmers on the use of alternative and safe

chemicals by the zonal agricultural department.

7. Promotion of ethical practices among the business

community with direct participation of the business

leaders.

8. Active role of the consumer rights groups against this

menace.

9. Implementation of all international agreements and

protocols on safe food by the government through

concerned ministries.

10. Involvement of the health related scientists from all

universities and institutes to cross-check the market

products time to time through laboratory analysis by

independent research with the help of governmental

support and grant.

11. Declaration of reward by the government for

providing information regarding food adulteration

syndicate, factory, selling points, supply chain, etc.

Laws against food adulteration

The government should take adequate measures for

better coordination among law enforcement and other

concerned agencies, to check food adulteration and ensure

safe food. The provision of exemplary punishment should

be inserted into the food act. There are several laws and

regulations to control adulteration of food in Bangladesh

such Pure Food Ordinance, 1959 and Pure Food Rules,

1967; The Animals Slaughter (Restriction) and Meat

Control (Amendment) Ordinance, 1983; Bangladesh

Standard and Testing Institution Ordinance 1985

(amended as Bangladesh Standard and Testing Institution

Amendment Act 2003); Destructive Insects and Pests

Rules (Plant Quarantine) 1966, amended up to 1989;

Agricultural Produce Market Act 1964 (revised in 1985);

Fish Protection and Conservation Act, 1950 (latest

amendment in 1995); Marine Fisheries Ordinance 1983

and Rules 1983; Fish and Fish Products (Inspection and

Quality Control Ordinance, 1983; Fish Products

(Inspection and Quality Control) Rules’ 1997; The

Essential Commodity Act 1957, 58, 64; The Food or

Special Courts Act 1956; The Food Grain Supply

(Prevention of Prejudicial Activity) Ordinance 1956; The

Pesticides Ordinance 1971 and The Pesticide Rules-1985.

Bangladesh Food and Nutrition Policy 1997 and National

Policy of Nutrition 1997; Bangladesh Food Policy 1998;

Comprehensive Food Security Policy 2001 and New

National Food Policy 2006; National Agriculture policy

1999; Bangladesh Health Policy 2002. The degree of

punishment in the existing act of Bangladesh Standards

and Testing Institution (BSTI) regarding food adulteration

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is maximum three years imprisonment or Tk. 2 lakh fine

or both, which is not enough to prevent food adulteration.

The government should implement all international

agreements and protocols on food security and the

standards of safe food regarding import and export to

check food adulteration (Dhaka Tribune, 15 March 2014).

Recently, the cabinet of the Government of the

People’s Republic of Bangladesh approved the Formalin

Control Act 2014 on June 30, 2014 with provision for a

maximum punishment of lifetime jail and fine of Tk. 20

lakh or both to stop misuse of formalin. According to the

law, it is mandatory for traders to have licenses to import,

stock, sell and market formalin. The law provides for

maximum 7 years imprisonment or 5 lakh taka fine or

both in case of violation of the terms of formalin license

and stockpiling of formalin illegally at houses, offices,

business establishments or in vehicles. The law also has a

provision of maximum 10 years imprisonment or 20 lakh

taka fine for possessing equipment for formalin

production. Police can arrest any offender without court

permission if a case is filed under the act. For immediate

implementation, the authorities will use mobile court

drives. Besides, formalin control committees will be

formed in every district and upazilla to supervise

enforcement of the act (The Daily Star, 1 July 2014). Very

recently the government has decided to implement the

Safe Food Act 2013 from 1 February 2014 (The Daily

Star, 28 January 2015).

Conclusion

Consumption of adulterated food items severely

affects the human health by producing many acute and

chronic diseases. It is very essential to stop food

adulteration. The Government of the People’s Republic of

Bangladesh should eradicate the practices of food

adulteration to save the lives of citizens. There are

hundreds of laws in the country including the new anti-

formalin act 2014, but not many of them are enforced

properly. Government should enact and implement these

laws to ensure safe food without delay. Checking at the

retail level only will not bring enough positive impacts.

The whole supply chain from the producers and importers

through wholesalers to retailers will have to be checked

and cleaned. Regular monitoring by appropriate agencies

should continue it in a sustainable manner for controlling

food adulteration. Simultaneously, a consumer awareness

campaign will have to be started. Adequate measures by

the concerned authorities, civil societies, print and

electronic media, social organizations and even consumers

can make a difference to ensure food security and safe

food for all. We hope this situation will change and our

citizen will get safe food for a healthy life.

In the United States, Food and Drug Administration

(FDA) has been established which is comprised of trained

personnel with the capability of enforcement of laws to

monitor quality of the foods and drugs available in the US

market. If the Drug Administration of Bangladesh is

reformed in similar fashion of FDA, then better control of

adulteration of food and drug in Bangladesh will be

possible for the welfare of our population.

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