**Introduction**

The problem of food adulteration persists at every level of food from preparation to consumption. Most of the foods, 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 perishable 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.

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 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). 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).

Major causes of food adulteration:

Food can be adulterated intentionally and unintentionally. Unintentional adulteration is the result of ignorance or lack of facilities to maintain food quality. This may be caused by spillover effect from pesticides and fertilizers. Inappropriate food handling and packaging methods can also result in adulteration.Whereas Intentional adulteration is usually done for financial gain.Since every consumer wants to get a maximum quantity of a commodity at lower prices, the traders make use of this fact and the quality of the products lowers through the addition of toxic or harmful substances or removal of the nutritional one.

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).

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 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 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).

**OBJECTIVES OF THE STUDY:**

**General Objective:**

* To know knowledge & practice of rural people about food adulteration in Kanishail villages of Golapgonj Upozila.

**Specific Objectives:**

1. To see the knowledge of common food items are being adulterated.
2. To know the common adulterants used.
3. To have an idea about the specific adulterants with which common food items are usually adulterated.
4. To see the knowledge about the deleterious effects of adulterants.
5. To determine the protective measures they take to make food items safer.
6. To obtain socio-economic characteristic of the respondents.

**METHODOLOGY:**

* **Type of study:** Cross sectional type of descriptive study.
* **Study place:** Kanishail village of Golapgonj upozila, Sylhet.
* **Study population:** All the people of Kanishail village who are at least 18 years of age.
* **Sample size:** 176
* **Sampling technique:** Convenience type of sampling was done.
* **Data collection instrument:** A semi-structured questionnaire was used to collect data.
* **Data collection technique:** Data was collected from the respondents by the researchers (students) themselves by face to face interview.
* **Data analysis:** On completion of data collection, data were tabulated after checking & verification. Data were analyzed by simple statistical method using a computer.

**RESULTS**

**Table No – 01: Distribution of respondents according sex.**

|  |  |  |
| --- | --- | --- |
| Sex | Frequency | Percentage (%) |
| Male | 40 | 22.73% |
| Female | 136 | 77.27% |
| Total | 176 | 100% |

This table shows that Male respondents are 22.73% and female are 77.27%

**Table No – 02: Distribution of respondents according to age.**

|  |  |  |
| --- | --- | --- |
| Age (years) | Frequency | Percentage (%) |
| 18-22 | 33 | 18.75% |
| 23-27 | 39 | 22.16% |
| 28-32 | 37 | 21.03% |
| 33-37 | 15 | 12.29% |
| >32 | 67 | 38.06% |
| Total | 176 | 100% |

This table shows that 18.75% respondents are of the age group 18 – 22 years, 22.16% are of 23-27 years. 21.03% are of 28 – 32 years group, and 38.06% are of the age group 32 and above.

**Table No – 03: Distribution of respondents according to educational qualification**

|  |  |  |
| --- | --- | --- |
| Educational qualification | Frequency | Percentage (%) |
| Illiterate | 43 | 24.43% |
| Primary | 78 | 44.32% |
| SSC | 39 | 22.16% |
| HSC and above | 16 | 9.09% |
| Total | 176 | 100% |

This table shows that 44.32% respondents studied up to primary level, 22.16% upto SSC and 09.09% upto HSC or above. 24.43% are illiterate.

**Table No – 04: Occupation of respondents**

|  |  |  |
| --- | --- | --- |
| **Occupation** | **Frequency** | **Percentage (%)** |
| Housewife | 123 | 69.89% |
| Service holder | 4 | 02.27% |
| Business | 8 | 04.55% |
| Farmer | 11 | 06.25% |
| Migrant lives abroad | 0 | 0% |
| Laborer | 12 | 6.82% |
| Others | 18 | 10.23% |
| **Total** | **176** | **100%** |

This table shows that 69.89% are housewives, 2.27% are service holder, 4.55% are business, 6.25% are farmer, 6.82% are laborer and others 10.23%.

**Table No – 05: Occupation of the respondents’ spouse**

|  |  |  |
| --- | --- | --- |
| **Occupation** | **Frequency** | **Percentage (%)** |
| House Wife | 41 | 23.30% |
| Job Holder | 4 | 2.28% |
| Business | 31 | 17.61% |
| Farmer | 31 | 17.61% |
| Migrant lives abroad | 10 | 5.68% |
| Laborer | 35 | 19.88% |
| Others | 24 | 13.64% |
| **Total** | **176** | **100%** |

This table shows that 23.30% respondents spouse are house makers, farmer 17.61%, job holder 2.28%, business 17.61%, immigrant 5.68%, labour 19.88% and 13.64% are engaged in other occupations.

**Table No – 06: Distribution of respondents according to number of family members.**

|  |  |  |
| --- | --- | --- |
| **Family Members** | **Frequency** | **Percentage (%)** |
| 2 -4 | 47 | 26.70% |
| 5 -7 | 77 | 43.75% |
| >7 | 52 | 29.55% |
| **Total** | **176** | **100%** |

This table shows that 26.70% families’ have 2-4 members in their family, 43.75% have 5-7 and 29.55% have more than 7 members in their family.

**Table No – 07: Distribution of respondents according to number of children.**

|  |  |  |
| --- | --- | --- |
| **No of children in a family** | **Frequency** | **Percentage (%)** |
| 1-2 | 53 | 30.11% |
| 3-4 | 55 | 31.25% |
| >4 | 21 | 11.93% |
| **Total** | **176** | **100%** |

This table shows that 30.11% respondents have 1-2 children, 31.25% respondents have 3-4 children, 11.93% respondents have more than 4 children, and 26.71% .

**Table No – 08: Distribution of respondent according to their monthly family income.**

|  |  |  |
| --- | --- | --- |
| **Monthly income** | **Frequency** | **Percentage (%)** |
| ≤ 5000 | 65 | 36.93% |
| 5001-10000 | 56 | 31.81% |
| 10001-15000 | 27 | 15.34% |
| >15000 | 28 | 15.92% |
| **Total** | **176** | **100%** |

This table shows that 36.93% respondents earn ≤ 5000 taka, 31.81% respondents earn 5001-10000 taka, 15.34% respondents earn 10001-15000 taka, and 15.92% respondents earn >15000 taka.

**Table No – 09: Distribution of respondents according to their knowledge when a food item is said to be adulterated.**

|  |  |  |
| --- | --- | --- |
| **Items** | **Frequency** | **Percentage (%)** |
| Rotten food | 61 | 34.66% |
| Addition of color | 33 | 18.75% |
| Mixing of harmful substances | 35 | 19.89% |
| Others | 11 | 6.25% |

\*Multiple responses

This table shows that, 34.66% respondents said that food is adulterated when it is rotten, 18.75% said by addition of color, 19.89% is said that food is adulterated by anything added which is harmful.

**Table No – 10: Distribution of respondents according their knowledge of food items that are** **usually adulterated.**

|  |  |  |
| --- | --- | --- |
| **Knowledge** | **Frequency** | **Percentage (%)** |
| Rice | 30 | 17.05% |
| Lentil | 13 | 7.39% |
| Oil | 24 | 13.64% |
| Fish | 106 | 60.23% |
| Vegetables | 125 | 71.02% |
| Fruits | 113 | 64.20% |
| Spice | 25 | 14.20% |
| Milk | 23 | 13.07% |
| Juice | 10 | 5.68% |
| Sweets | 19 | 10.79% |
| Ghee | 2 | 1.14% |
| Bakery food | 13 | 7.39% |
| Doesn’t know | 6 | 3.41% |
| Others | 4 | 2.27% |

\*Multiple responses

This table shows that the common food items those are being adulterated and 71.02% said it is vegetable, 64.20% said it is fruits, 60.23% said it is fish , 17.05, said it is rice, 14.20% said it is spice, 13.64% said it is oil, 13.07% said it is milk , 10.79% said it is sweets, 7.39% said it is lentil and bakery food, 5.68% said it is juice, 3.41% have no idea 2.27% said other food items.

**Fig. No. : 1. Distribution of respondents according to knowledge about usually used adulterants in food.**

\*Multiple Responses.

This figure shows that the respondent said food is adulterated with colour 31.21% formalin 73.86%, carbide 3.97%, urea 11.93%, chemical 13.63% brick powder 13.06%, water 8.52% don’t know 16.47%

**Table No – 11: Distribution of respondents according to their knowledge about usually used adulterants in food:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Food item** | | **Frequency** | **Percentage (%)** |
| Fish | 1. Formalin | 137 | 7.79% |
| 1. Colour | 16 | 9.9% |
| 1. Don’t know | 42 | 23.86% |
| Vegetable | 1. Cloth colour | 13 | 7.38% |
| 1. Insecticides | 52 | 27.84% |
| 1. Excess compost | 49 | 27.18% |
| 1. Don’t know | 76 | 43.18% |
| Masala | 1. Colour | 17 | 9.65% |
| 1. Wood Powder | 13 | 7.38% |
| 1. Brick Powder | 80 | 45.45% |
| 1. Dung | 01 | 0.56% |
| 1. Others | 13 | 7.38% |
| 1. Don’t know | 74 | 42.04% |
| Fruits | 1. Carbide | 04 | 2.27% |
| 1. Formalin | 112 | 63.63% |
| 1. Colour | 13 | 7.38 |
| 1. Don’t know | 57 | 32.38% |
| Dry fish | 1. DDT | 04 | 2.27% |
| 1. Salt | 43 | 24.43% |
| 1. Colour | 06 | 3.40% |
| 1. Don’t know | 123 | 69.88% |

\*Multiple responses

This table shows that the respondents said fish is adulterated with formalin 7.79%, colour 9.9%, don’t know 23.88%, vegetable with colour 7.38%, insecticides 29.54% excess composed 27.84% , don’t know 43.18% masala with colour 9.65%, wood powder 7.38% brick powder 45.45%, dung 0.56%, others 7.38%, don’t know 42.04%, fruits with carbide 2.275, formalin 63.63%, colour 7.38%, don’t know 32.38% and dry fish with DDT 2.27%,salt 24.43%, colour 3.40%, don’t know 69.88%.

**Fig. No. : 2. Distribution of respondent according to their knowledge of harmful effects of food adulterant on human.**

\*Multiple responses

This figure shows that 35.23% respondents of knowledge about harmful effects of cancer 21.59%, disability 21.51%, even death 26.7%, others and 22.73% peoples are didn’t know.

**Table No – 12: Distribution of respondents according to their queries they do while buying package food.**

|  |  |  |
| --- | --- | --- |
| **Checking of quality.** | **Frequency** | **Percentage (%)** |
| Whether date expire or not | 130 | 51.59% |
| Quality of company | 42 | 16.67% |
| Quality of packet | 18 | 7.14% |
| Price | 16 | 6.35% |
| Seal of BSTI | 14 | 5.56% |
| Previous experience | 10 | 3.96% |
| Don’t know | 22 | 8.73% |

This table shows that 51.59% respondents buy packaged food observing whether data expired or not 16.67%, of respondent observing its quality of company , 7.14% of respondent check quality of packet 6.35% of respondent consider price 5.56% of respondent check seal of BSTI 3.96% check with previous experience, 8.73% have no idea of checking food while buying packaged food.

**Table No – 13: Distribution of respondents according to their queries they do while buying open food**

|  |  |  |
| --- | --- | --- |
| **Checking of quality.** | **Frequency** | **Percentage (%)** |
| Freshness | 109 | 46.19% |
| Colour | 24 | 10.17% |
| Cleanliness | 46 | 19.49 |
| Smell | 20 | 8.47% |
| Don’t know | 27 | 11.44% |

\*Multiple responses

This table shows that 46.19% of respondents buy open food observing its freshness. 10.12% respondents observing its colour 4.24% respondents observing its price 19.49% respondents observing its cleanliness. 8.47% of respondents observing its smell.11.44% respondents don’t about checking food while buying open food.

**Fig. No. :3. Distribution of respondents about allowing to their children to eat chocolate, ice-cream, cheeps etc.**

This figure shows that 46.59% respondent allow their children to eat chocolate and ice-cream, 15.34% respondents said they do not allow and 38.07% respondents don’t know about it.

**Table No – 14: Distribution of respondents according to their knowledge about the harmful effect of adulteration food on children’s mental and physical development.**

|  |  |  |
| --- | --- | --- |
| **Response** | **Frequency** | **Percentage (%)** |
| Yes | 138 | 78.41% |
| No | 38 | 21.59% |
| Total | 176 | 100% |

This table shows that 78.41 if respondents has some knowledge about the harmful effects of adulterated foods on children’s mental and physical development and 21.59% respondents has no knowledge regarding it.

**Table No – 15: Distribution of respondent according to their knowledge about testing of iodized salt at home.**

|  |  |  |
| --- | --- | --- |
| **Response** | **Frequency** | **Percentage (%)** |
| Rightly known | 45 | 25.56% |
| Wrongly known | 12 | 6.82% |
| Not known | 119 | 67.62% |
| Total | 176 | 100% |

This table shows that 25.56% respondents has on accurate knowledge about testing of iodized salt at home, 6.82% respondents has a wrong knowledge and 67.62% respondents has no knowledge responding it.

**Fig. No. :4. Distribution of respondents according to their knowledge of inspecting fish either adulterated or not**

This figure shows that 46.59 respondents ha an according knowledge of inspecting fish either adulterated or not, 9.66% has a wrong knowledge and 43.75% , respondents has no knowledge regarding it.

**Table No – 16: Distribution of respondents according to their action when they noticed the food item is adulterated..**

|  |  |  |
| --- | --- | --- |
| **Action Taken** | **Frequency** | **Percentage (%)** |
| Inform the sanitary inspector | 7 | 3.89% |
| Throw away | 110 | 61.11% |
| Consume | 25 | 13.89% |
| Return to the Shopkeeper | 25 | 13.89 |
| Others | 13 | 7.22% |
| Total | 176 | 100% |

This table shows that 3.89% respondent inform the sanitary inspector, 61.11% respondent throw away, 13.89% respondent consume, 13.89% respondent return to the manufacturer, 7.22% respondent takes other precautions it the food id adulterated.

**Table No – 17: Distribution of respondents according to their knowledge about freeing of adulterants.**

|  |  |  |
| --- | --- | --- |
| **Do people know the ways to make food free from adulteration** | **Frequency** | **Percentage (%)** |
| Yes | 67 | 38.07% |
| No | 109 | 61.93% |
| **Total** | **176** | **100%** |

This table shows that about 38.07% know the way to make food free from adulteration whereas 61.93% doesn’t know the way to make food free from adulteration.

**Table No – 18: Distribution of respondents according to their methods to make the food free from adulterants.**

|  |  |  |
| --- | --- | --- |
| **Methods** | **Frequency** | **Percentage (%)** |
| By washing with hot water | 159 | 86.76% |
| By washing with salt and hot water | 9 | 13.24% |
| Others | 08 | 77% |
| Total | 176 | 100% |

This table shows that 86.76% respondent make food free from adulteration by washing with hot water, 13.24% respondent make food free from adulteration by washing with salt and hot water.

**Fig. No. :5. Source of information about food adulteration**

This figure shows that 18.18% respondents get information about food adulteration from newspaper, 81.65% respondents from television, 5.68% respondents from radio, 30.68% respondents from known person, 5.68% from others.

**Table No – 19: Opinion regarding training of family members**

|  |  |  |
| --- | --- | --- |
| **Quality** | **Frequency** | **Percentage (%)** |
| Husband or male | 13 | 7.39% |
| Wife or Female | 11 | 6.25% |
| Both male and female | 138 | 78.41% |
| Unknown | 4 | 9.66% |
| **Total** | **176** | **100%** |

This table show that 7.39% husband or male should be made aware or trained about the procedure to prevent food adulteration, 6.25% wife or female should be made aware or trained about the procedure to prevent food adulteration, 78.41% both male and female should be made aware or trained about the procedure to prevent food adulteration, 9.66% are unknown about.

**Table No – 20: Distribution of respondents according to how can be the children aware about food adulteration.**

|  |  |  |
| --- | --- | --- |
| **Quality** | **Frequency** | **Percentage (%)** |
| Parents and relatives | 120 | 68.18% |
| Teachers | 91 | 51.7% |
| Others | 19 | 10.795% |

\*Multiple responses

This table shows that 68.18% of the respondents believe to aware the children through parents and relatives, 51.7% through teachers and 10.795% through others.

**DISCUSSION**

Food safety is an important public health issue. Day by day it is getting worst dimensions with various types of health impacts at all levels of the society. Underdeveloped and developing countries with low socio-economic condition and lack of education employing an alarming situation. This cross sectional descriptive study was carried out to have an idea about the knowledge and practice regarding food adulteration of rural people. One hundred seventy six respondents were interviewed.

**Socio-demographic information of the respondent**

In this study regarding the sex of the respondents, majority were female, 77.27%and only 22.73% were male. This may be due to the fact that we interviewed the respondents in evening time when the male were engaged in their daily activities outside their residence.

(Ref. Table No. – 1)

Regarding the age of the respondents 18.75% respondents were of the age group 18-22 years, 22.16% were of 23-27 years group, 21.03% were of 28-32 years group, 12.29% were of 33-37 years group and 38.06% aged 32 or more. It is seen that 44.32% respondents studied up to primary level, 22.16% up to SSC and 9.09% up to the level of HSC or above. (Ref. Table No. – 2 &3)

We recorded the occupations of the respondents and found 69.89% respondents were housewives, 2.27 % were service holders, 04.55% were businessmen, 06.25% farmer,10.23% were engaged in other occupations. 23.30% respondents spouse were house makers, farmer 17.61%, job holder 2.28%, business 17.61%, immigrants 5.68%, laborers 19.88% and 13.64% were engaged in other occupations. In relation to numbers of total family members; 26.70 % families have 2- 4 members in their family, 43.75% have 5-7 and 29.55% have more than 7 members in their family. (Ref. Table No. – 4, 5 & 6)

Regarding the number of children the respondents have; 26.71 % respondents have no child, 30.11% respondents have (1-2) child, 31.25 % respondents have (3-4) children, and 11.93% respondents have 4 or more children. We also had an idea about the financial status of the respondents and found 36.93% respondents earn ≤ 5000 taka, 31.81% respondents earn 5001-10000 taka, earn 10001-15000taka and 15.92% respondents earn >15000 taka.

(Ref. Table No –7 & 8)

**Knowledge of the respondents regarding food adulteration**

34.66 % said that food is said to be adulterated when it is rotten, 19.89 % said by anything added which is harmful, by artificial colour 18.75%. In a study conducted in 2006 in Dhaka city; among the respondents, 23% said rotten food, 19.89% said anything added which is harmful, 16% said substandard food, 15% said chemicals, 12% said artificial colour, did not know 13%. So, the knowledge found far better than the consumers of Dhaka city. It is to be mentioned here that the time gap is 10 years. So this improvement in knowledge may be due to the fact that for the last few years Government and different organisations are very much concerned in educating the people in this regard. (Ref. Table – 9)

Regarding common food items those are being adulterated; 13.64% respondents said it is oil, 60.23% said fish, 71.02% said vegetables, 64.20% said fruits, 14.20% said spices, 13.07% said milk, 17.05% said puffed rice, 5.68% said juice, 10.79% sweetmeat, 1.14% said Ghee, 2.27% common salt, 09.09% fast food, 18.18% bakery food , 01.14% have no idea and 03.41% said other food items. In this regard in the same study mentioned before conducted in 2006 in Dhaka city the respondents said; oil 43%, fish 33%, vegetables 31%, fruits 19%, spices 18%, milk 15%, puffed rice 9%, juice 7%, sweetmeat 6%, butter 3%, common salt 3%, fast food 2%, bakery food 1%, did not know 4%. Again the respondents showed better knowledge in our study findings might be due to the same reason mentioned earlier in the previous paragraph. (Ref. Table – 10)

Regarding the common food adulterants those are being used, the respondents said; 31.21% said adulterants are colour, 11.93% said adulterants are urea, 73.86% said adulterants are formalin, 13.63% said adulterants are chemicals, 13.06% said adulterants are brick dust, 03.97% said adulterants are carbide, 8.52% said adulterants are water, 16.47% don’t know adulterant materials, 01.7% said other adulterants not in the list. In the study conducted in 2006 in Dhaka city mentioned earlier; among the respondents of Dhaka city said colour 40%, urea 22%, formalin 21%, chemicals 17%, brick dusts 2%, carbide 1%, sand 1%, water 1%, 11.37% don’t know adulterant materials, 01.14% mentioned other adulterants. This study shows that the respondents are more aware in much more numbers than of the Dhaka city in 2006 regarding formalin, chemicals, brick dust, sand, carbide etc. (Ref. Table no-11 and Fig. – 1)

Fish adulteration is a worst concern in Bangladesh especially in cities. In this regard the respondents said that fish is adulterated with formalin 66.24%, with colour 9.9%, don’t know 23.86%. For vegetable with colour 7.38%, don’t know 43.18%; Fruits with Formalin 63.63%, colour 7.38%, don’t know 32.38%; Shutki with colour 3.40%, DDT 2.27% and don’t know 69.88%. Spices are costly and amongst the common items that are being adulterated. The respondents said Spice is adulterated with colour 9.65%, with wood dust 7.38%, with brick dust 45.45%, don’t know 42.04%. Knowledge about the deleterious effects of adulterated food. (Ref. Fig-2)

**Steps taken by the respondents to avoid harmful effects of adulterated food.**

We saw the how consumers buy food items while adulteration is a common practice. It is revealed that 51.59% respondents buy packaged food observing whether data expired or not 16.67%, of respondent observing its quality of company , 7.14% of respondent check quality of packet 6.35% of respondent consider price 5.56% of respondent check seal of BSTI 3.96% check with previous experience, 8.73% have no idea of checking food while buying packaged food. 19.32% of respondents buy open foods observing its colour, 46.19% of respondents observing its freshness, 8.47% of respondents check its smell, 19.49% of respondents observe it’s cleanliness, 6.35% of respondents consider the price and 11.44% respondents have no idea of checking food while buying open foods. Children are very much vulnerable to food adulteration as bakery products are usually preferred by the children as tiffin in the school and as snakes in the home as well. More than third of the respondents; 46.59% said they allow fast food and bakery food to their children, 15.34% don’t allow. In this regard it is seen that 78.41% respondents know about the harmful effects of adulterated food on children’s mental and physical development and 21.59% respondents don’t know about the harmful effects of adulterated food on children’s mental and physical development.

(Ref. Table –12, 13, 14 and Fig – 2 & 3)

Knowledge regarding testing of iodized salt found poor. Only 25.56% respondents know well about the testing of iodised salt, 6.82% respondents know wrongly about the test of iodised salt and 67.62% respondents don’t know about the test of iodised salt at all. About the knowledge of testing fish for formalin found poor too; 46.59% respondents know correctly, 9.66% know incorrectly, 43.75% don’t know at all. (Ref. Table –15 & Fig. – 4)

Food safety requires consciousness of the consumers. But it is observed that 3.89% of the respondents inform sanitary inspector though 61.11% respondents throw these, 13.89% eat these, 13.89% return these, and 02.22% do other things. 38.07% know the way to make food free from adulteration whereas 61.93% doesn’t know the way to make food free from adulteration. 86.76% respondents make food free from adulteration by washing with hot water, 13.24% respondent make food free from adulteration by washing with salt and hot water. Very few; 18.18% respondents got the information from Newspaper, from Television 84.65%, known person 30.68%, 5.68% from Radio and others 5.68%. (Ref. Table –16, 17, 18 and Fig. – 5)

Awareness and education is essential to combat with food hazards. In this regard the respondent’s opinion is quite good. A very few numbers; 7.39% respondents said male should be educated, 6.25% said female, 9.66% respondents remain undecided but the majority’ 78.41% said both male and female should be taught. Children are the future of the nation. Besides food adulteration practice worsening day by day. We don’t know what shape it will take in future. So, we do not have option that to teach them adequately. In this regard 68.18% respondents said that the relatives should take responsibilities, 51.7% said school teachers and 10.79% said others should play the role. (Ref. Table – 19, 20)

**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. If the Drug Administration of Bangladesh is reformed, then better control of adulteration of food and drug in Bangladesh will be possible for the welfare of our population.

**RECOMMENDATIONS**

1. Sustainable development of mass awareness among people against the consequence of food adulteration on long term health effect.
2. Severe and exemplary punishment to the food contaminators. 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. Educating the primary- and secondary level students regarding the fatal impacts of food adulteration through academic curriculum.
5. Strengthening the law enforcing power and activities of Bangladesh Standards and Testing Institute (BSTI) to prevent food adulteration from root to retail market level.

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