# Food Adulteration and Health Hazards

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# Food Adulteration

# Food Adulteration

According to *CODEX Alimenterius Commission* of FAO/WHO –a food is said to be adulterated if-

- The food contains toxic, putrid or decomposed substance

- Contains product of **diseased animal** or **dead** other than by slaughter
- Prepared, packed or stored under insanitary condition
- Container is composed of any deleterious substance

- Any of its components is **replaced** or **removed**
- Relabeling on **‘expired’** foods or drinks
- Misbranding
- Violation of good manufacturing practices (GMPs)

# Misbranding

**False and deceptive information on label of a product regarding-**

- **Product identity, ingredients and net contents**
- **Date of manufacture and expiry**
- **Identity of manufacturer and distributor**

**-To induce the consumer to buy the product**

# Good Manufacturing Practices (GMPs)

**Conform to the guidelines recommended by *Agencies* that control**

**Authorization and licensing for**
*manufacturing, packaging and for sale of food and drugs.*

**To ensure that the products-**

- Are of acceptable quality and
- Do not pose any health risk

# Motive of Adulteration

**Just to make money by fraudulence.**

**Manufacturers, cultivators, importers, traders all are involved in this unethical act.**

**Products of reputed companies and high brand names are also target for adulteration.**

# Magnitude of adulteration

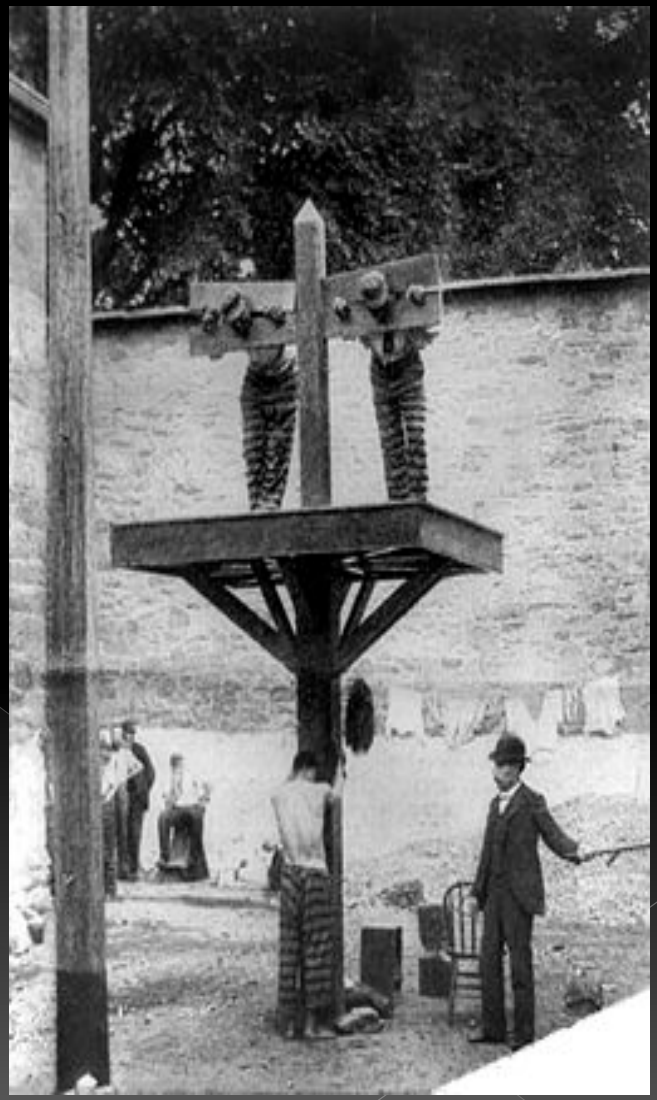
# Ancient & Medieval Era

- **Practice of adulteration is as old as the act of buying and selling foods for cash or commodities.**
- **Adulteration was common in ancient *Rome and Athens*.**
- **After the18$^{th}$ Century food adulteration became dangerously widespread**

- **It has now progressed from simple fraudulence to a highly sophisticated business aimed at ‘masking the process of adulteration.’**

- In 1319 a butcher was put in the ***pillory*** for selling unsound beef in England.

- 100 years ago **lead salt** was used in beer to make it sweeter, strychnine to give it bitterness.



# 20th Century

- In 1927, over 70 people died in USA taking Sulphanilamide elixir in which Diethylene Glycol was used in place of alcohol.

- 'Spanish Toxic Oil Syndrome' broke out in Spain in 1981 due to use of denatured rapeseed oil . Aniline was added with it. About 20000 fell sick, 450 died.

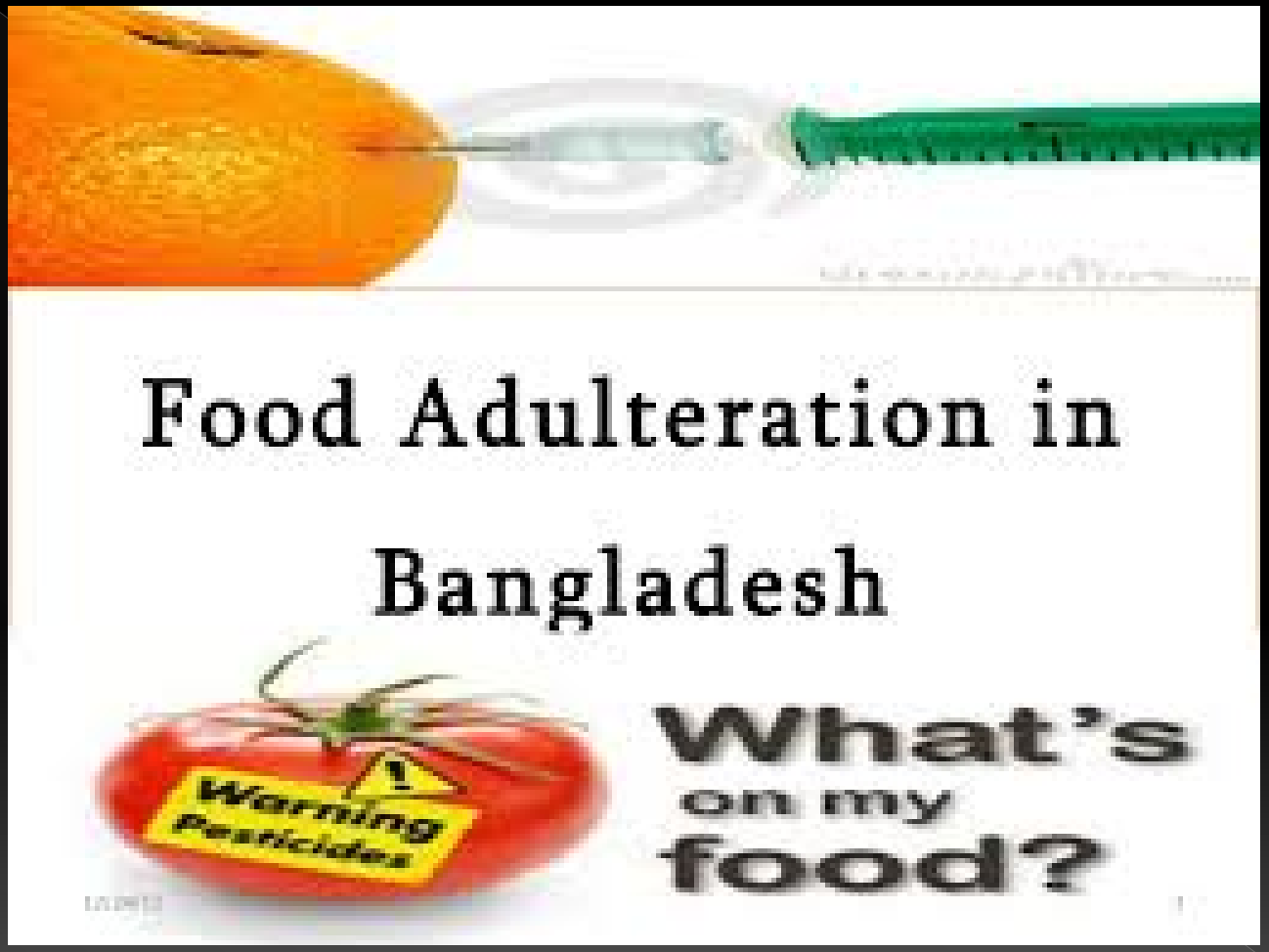
- In 1990, a man died in Miami, USA after having soft drink adulterated with cocaine.
- In 1995, USFDA seized 17 tons of counterfeit Simian baby food from 50 supermarkets in California, USA.

# 21th Century

- **The 2008 Chinese milk scandal involved milk and infant formula being adulterated with melamine.**

  **Amongst 300,000 victims 6 died, 54,000 hospitalized.**

**On 16 July 2013, at least 23 students died and dozens more fell sick at a primary school in Bihar , India after eating a midday meal contaminated with pesticide.**


Food Adulteration in
Bangladesh
Warning
Pesticides
What's
on my
food?

# Very often we feel shattered seeing…

সমকাল

3 July 2012

P 21

## বিদেশি ফল নিয়েও সংশয়

কাইয়ুম খোকন



বিদেশি ফলের কৌটাজাত পাওয়া যাচ্ছে

ছবি : ফাহিম সিদ্দিকী

Fahim Siddiqi / White Star

Packets of calcium carbide are being prepared in the Sabzi Mandi so that they can be placed into the crates of unripe fruit.—Fahim Siddiqi / White Star

theindependent

11 August 2012

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## 3 fall sick eating adulterated fruits

STAFF REPORTER

**BARISAL, AUG 10:** Three of a family were hospitalised Friday after eating chemically treated fruits in the city.

The victim and hospital sources said Kabir Al Humayun, 42, a businessman, purchased two Kg Malta (an orange type fruit) at Tk 280 from a mobile fruit vendor of Hospital Road on Thursday and ate those at Iftar with family members.

Soon, they started to feel severe stomach pain with loose motion.

Following deterioration of their condition Kabir, and his daughters Oishi, 3, Arshi, 6 months, were admitted at Ambia Diagnostic Center and Hospital of the city on early Friday.

Attending doctors at the hospital said the victims became sick after taking the fruit treated with chemicals for ripening and sweetening.

**Institute of Nutrition and Food Science of DU in 1980s revealed -**

**60% of the population suffered malnutrition due to intake of adulterated food.**

**IPH and WHO in their joint study on food adulteration in Dhaka City in 2003 found -**

- **96% of sweetmeats,**
- **24% of Biscuits ,**
- **54% of breads and**
- **59% of Ice Creams**

**were extensively adulterated.**

**Public health laboratory of Dhaka City Corporation in a random survey in 2004 found**

**-76% of food items in the market were adulterated.**

IPH in 2012-2013 tested 10000 samples of 50 different food items and found 60% of the samples were adulterated with-

Formalin, Calcium Carbide, Sodium Cyclamate, Textile dyes, Urea, DDT, Aldrin, Chlordane, Heptachlor, Melamine, burnt engine oil, hormone, sulphuric acid etc.

# Common Victims

**Street food vendors are the important component of the food supply chain.**

**Being:** ***reasonably priced, conveniently available, ready to eat***

**– People in street and public places become victim of adulteration.**

Even in highly reputed restaurants rotten and perishable food items are ***stored, sold*** and ***served*** to the consumers.

# *Please Answer 3 questions..*

**Q.1** Saffron is a popular coloring agent used in sweetmeats specially Zorda in wedding party. While it costs $10,000/lb (17,00,000/kg)

Do you think we actually use it for coloring ?

**Q2.** Apple sold at 150 Tk /kg, how we get 200ml bottle of apple juice with Tk 20 only?

**Q3.** Cows milk is Tk. **80/L.** Conversion to **390 ml** condensed milk needs to evaporate more than **2 litres** of whole milk **(costing Tk 160)**

**How we get it only with Tk. 50-55?**

**Safe food from *Farm to Fork* is the genuine expectation.**

**We earn to satisfy our hunger but might be by eating**

***Toxic dyes,***
***Saw-dust,***
***Cow and***
***Horse dung.***

# From Farm to Table

**PRODUCTION**
Agriculture
Fisheries
Livestock

Pure Food Act, 2013

Bangladesh Pure Food Ordinance,1959 and Pure Food Rules,1967

Farm gate

Harvest → Transport → Processing → Prepare and Market → Consumer

Imports → Processing

# Impact of Food Adulteration

## Health Hazards

| FOOD | ADULTERANT | EFFECTS |
| --- | --- | --- |
| Rice | Sand, marble chips, stones, Plastic rice | Damage to digestive tract |
| Puffed rice | Urea, Sodium hydrosulphide | GIT problem |
| Flour | Chalk Powder | GIT problem |

BEWARE OF
PLASTIC RICE

| | | |
|---|---|---|
| Jam and pickle | Coal tar dye, Metanil Yellow | Cancer, fetal abnormality, mental retardation |

| | | |
|---|---|---|
| **Fruits** | **Lead arsenite, Calcium carbide Ethephon Formalin Injection of dye** | **Chills, Cramps, Paralysis, Death** |

# Banana- Day1-Day6- After Ethephon Spray

| | | |
|---|---|---|
| Fruit juices, soft drinks, etc. | Contact with cadmium plated vessels | Liver and kidney damage, Prostate cancer |
| Jaggery (Gur) | Washing soda | Vomiting, Diarrhoea |

| | | |
|---|---|---|
| Bottle and Jar water | Contaminated pond water, WASA supplied city water | Gastroentiritis, Hepatitis |

| Brown Sugar | Sand | |
|---|---|---|
| Sugar | Urea, sand | Stomach disorder |

**Tea**

**Saw dust, Used and exhausted tea leaves**

| | | |
|---|---|---|
| Turmeric powder | Metanil Yellow Aniline dyes | Carcinogenic |
| Chilli powder | Artificial colors, Brick powder | Cancer, Stomach problems |

| | | |
|---|---|---|
| Black pepper | Seeds of papaya and light berry | Stomach, liver problems |

| Vegetables | Artificial color, Formalin | Carcinogenic |
| --- | --- | --- |

| | | |
|---|---|---|
| **Milk** | **Snail (looks more frothy)** | **Stomach disorder** |
| | **Formalin**<br>**Water, flour, powdered milk, detergents** | |
| | **Removal of fat** | |
| **Powdered milk** | **Melamine** | **kidney stones** and **renal failure** |

| | | |
|---|---|---|
| Edible oils | Argemone oil | Epidemic dropsy, Loss of vision, Heart diseases, Tumor |
| | Mineral oil | Liver damage, Carcinogenic |
| | Rancid oil | Destroys vitamin A and E |

| | | |
|---|---|---|
| Spilt pulse/ chaana dal | Split Khesari dal | Lathyrism |
| Bason | Khesari dal powder | Lathyrism |

| | | |
|---|---|---|
| Butter | Animal Fat | carcinogenic |
| Cheese | Cotton seed oil | |
| Ghee | Vanaspathi<br>Palm oil | |

Fish

Formalin,
Tanned-hide
feed
containing
arsenic

Dry fish

DDT, sorbicon, turmeric and chilli powder

Liver and pancreatic cancer, reduced fertility

| | |
|---|---|
| Meat | Formalin<br>Toxic red dye |
| Chicken | Fed with<br>tanned-hide<br>rich in arsenic |

**BLRI also showed that broiler meat and egg showed presence of antibiotic residue of Ciprofloxacin, Sulfonamide, Oxytetracycline and Enrofloxacin in high level.**

# Cakes, biscuits

Rotten flour
Rotten eggs
Burnt oil
Date
expired milk powder
Textile dyes
Impure water

| | | |
|---|---|---|
| Sweetmeat | Sodium cyclamate | Cancer, Fetal abnormality |

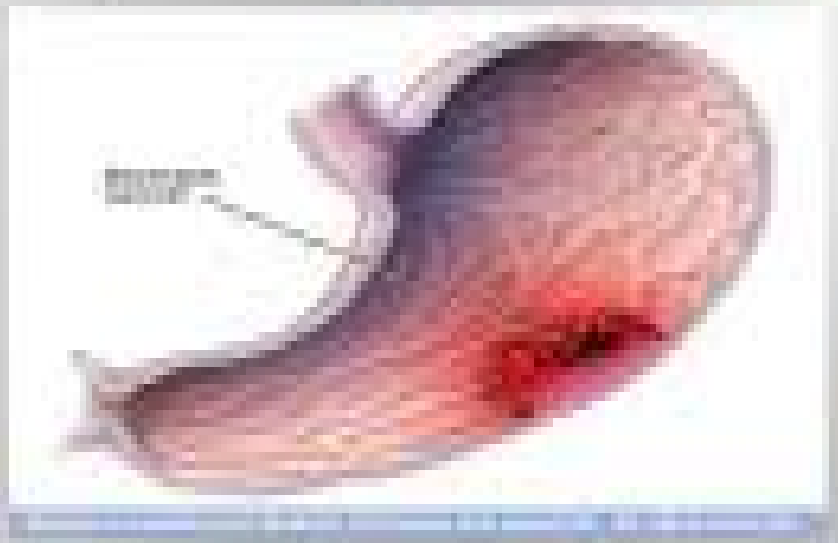
EETS
Diwali
Offer
BUY ANY
SWEET &
GET
HEALTH
INSURANCE
FREE

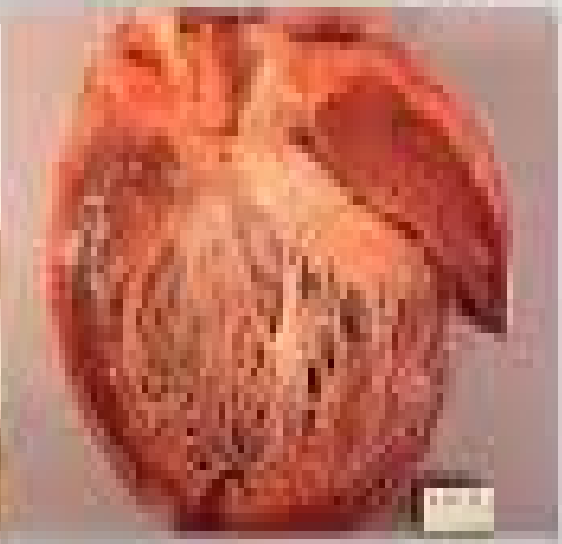
Travelers and floating people usually suffer from acute health hazards

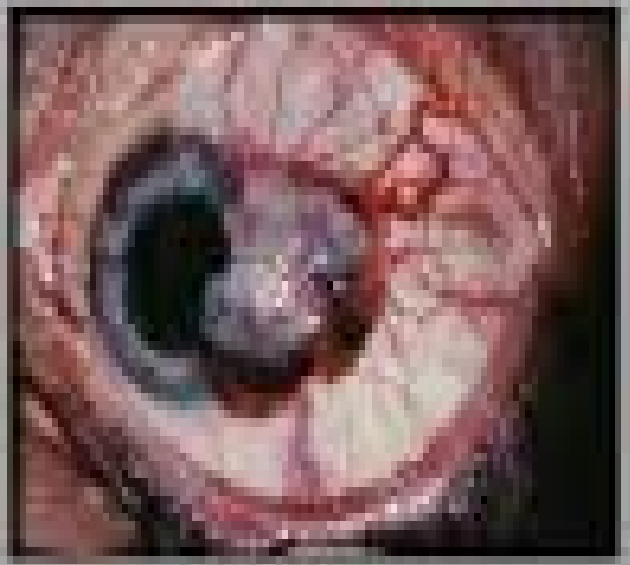
*but*

The community suffers life threatening toxicity through cumulative effect.

# EFFECTS OF ADULTERATION ON HUMANS







**Poribesh Bachao Andolon** in a study shows

-7.9 million people in South Asia die every year by non-contagious diseases and

'Food Adulteration' is marked as one of the most important reason .

**WHO published – chemical exposure to toxic level is suspected to be involved in causing -**

- **Carcinoma**
- **Cardiovascular disease**
- **Kidney, liver dysfunction**

- Hormonal Imbalance
- Premature birth
- Suppression of Immune system
- Impaired development of nervous system
- Mental health problems and
- Learning disabilities

Bull, you can try some fresh grass
Eat me, if you can

# Prevention food adulteration

**Food safety issues require the adoption of-**

- ***Food safety policies***
- ***Legislation*** **and**
- ***Standards***

**consistent with international requirements.**

# Food safety and quality control framework

## A. *Policies*

- National Food Policy 1996
- National Food and Nutrition Policy 1997
- National Agriculture Policy 1996
- National Fisheries Policy 1998
- National Health Policy 2000

- National Livestock Policy 2007
- Product Labeling Policy 2006
- National Policy for Safe Water and Sanitation 1998
- Export and Import Policy 2009-2012

# B. Laws

- The Bangladesh Pure Food Ordinance 1959
- Bangladesh Pure Food (Amendment) Act 2005
- The Cantonments Pure Food Act 1966
- The Bangladesh Pure Food Rules 1967

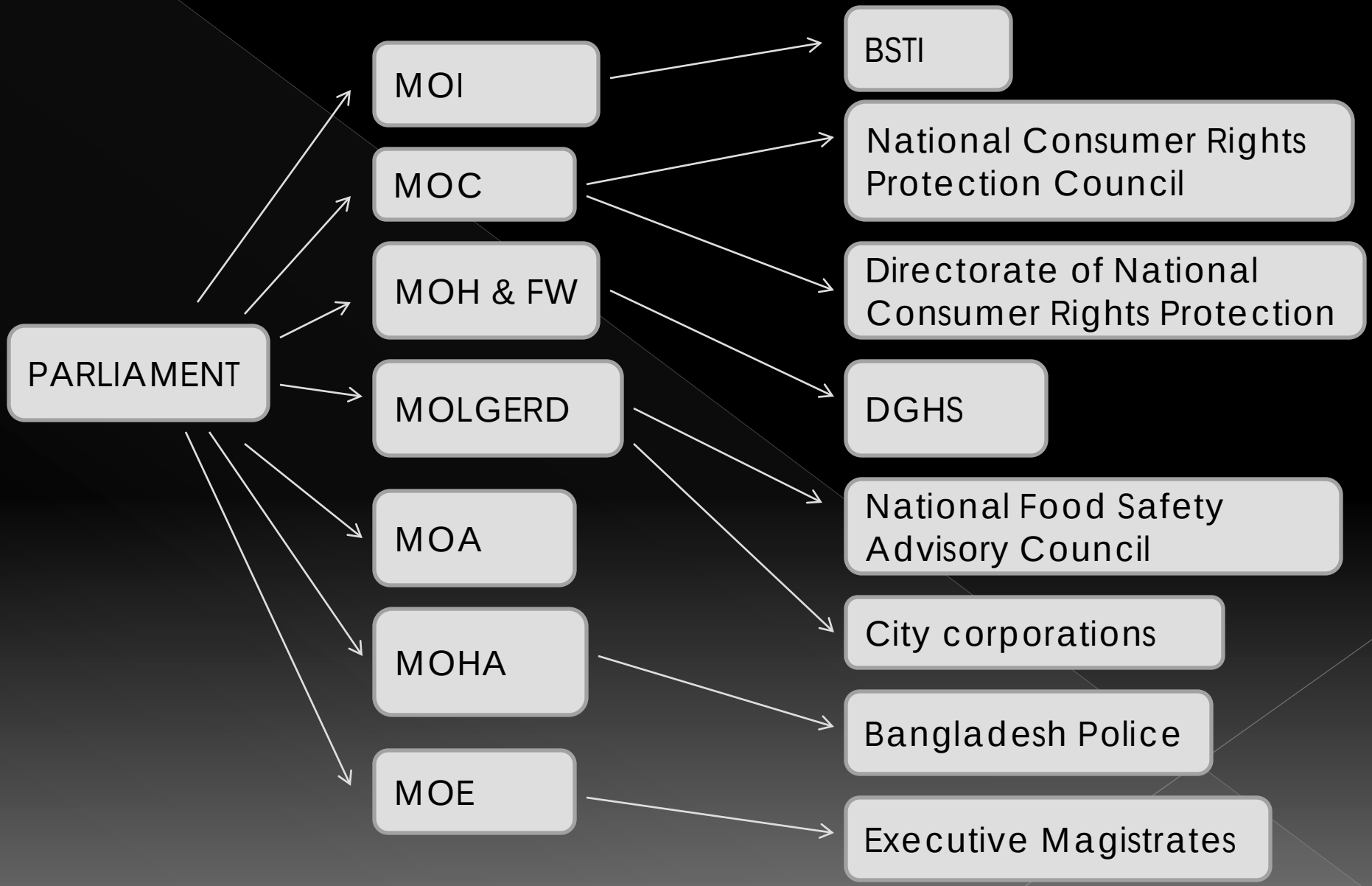
- Fish Feed and Animal Feed Act 2010
- Agricultural Pest Ordinance 1962
- BSTI Ordinance and many others
- The Bangladesh Food Safety Act 2013

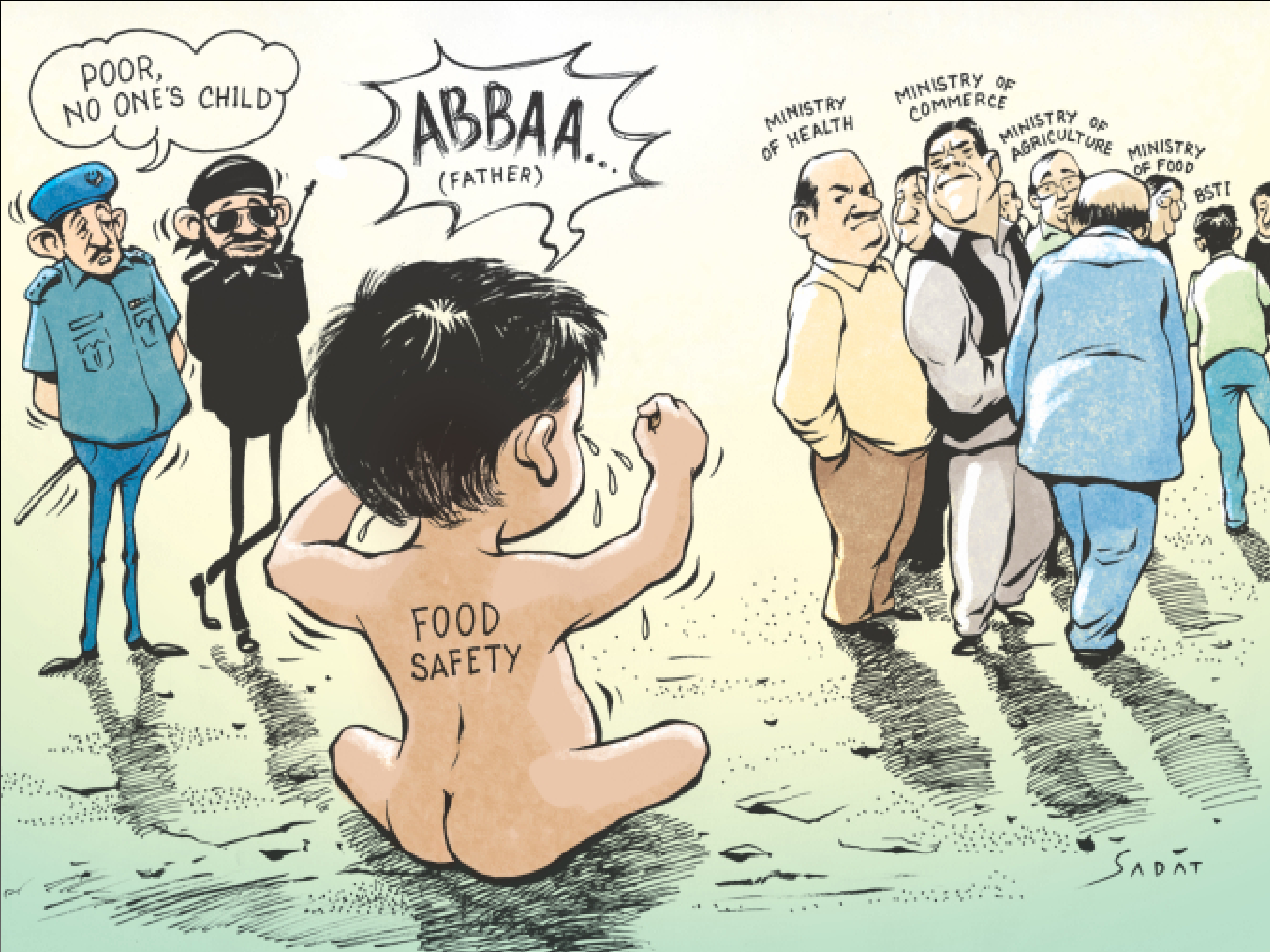
# Laboratories for food analysis

- Public Health laboratory(IPH)
- BSTI (Ministry of Industries)
- Food testing Laboratory (Ministry of Food & Disaster management)
- Food testing Laboratory (Dhaka City Corporation)

- Institute of Food Radiation Biology, Bangladesh Atomic Energy Commission
- Institute of Food Science Technology, BCSIR
- Institute of Nutrition & Food Science, University of Dhaka

# Regulatory framework




POOR, NO ONE'S CHILD
ABBAA...
(FATHER)
FOOD SAFETY
MINISTRY OF HEALTH
MINISTRY OF COMMERCE
MINISTRY OF AGRICULTURE
MINISTRY OF FOOD
BSTI
SADAT

# Limitations

**Modern food control system needs**

- **Scientific analysis**
- **Transparent decision making process**

Don't give him any more food
Don't give him anything to eat or drink
Don't do anything
Give him food and water
Too Many Advisers
Give him only water and munkoyo
Take him to the clinic
Give him ORS

- Unfortunately the policies and laws are not of much use
- No rigorous standards for commodities

# And so news comes with Headline

***'Focus is on Formalin only, when every chemical has health hazards'***

# Means to overcome

**The government should take adequate measures for -**

- **Better coordination among concerned agencies**
- **Implementation of international agreements through concerned ministries.**

- Strenthening of food inspection with skilled manpower.
- Promotion of ethical practices among the business community
- Active role of Consumer Right groups against the menace

মোবাইল কোর্টের
ক্ষমতা বৃদ্ধি করুন
খাদ্যে ভেজালকারীদের
শাস্তি বৃদ্ধি করুন
খাদ্যে ভেজাল প্রতিরোধে
মানব বন্ধন Human Chain
Create Awarness Against Adulteration
World Watch Society

ফরমালিন মুক্ত মাছ চাই

**Rigorous punishment should be put into food act.**

***Valid methods of analysis must be developed keeping pace with newer techniques of adulteration.***

eat
right.

Thank You