



Aflatoxin Contaminant Exports Perspective

NDDB Anand
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Dr. J. S. Reddy
Additional Director
Export Inspection Council, New Delhi



Presentation Outline

- Requirement of Exports
 - Market Access
 - Food Safety
 - WTO – SPS
- Issues related to Dairy Exports
- Issue of Aflatoxin
 - Variability in sampling and testing
 - Regulations governing sampling
 - Regulation - Limits
- Role of EIC – Facilitation of Exports





Requirement for Export

**My product meets CODEX Standard –
Can I Export**

(a) YES

OR

(b) NO

Requirement for Export ...



Market Access

- **Market access will be given after assessing Official Control System of Exporting Country apart from other issues**
- **Importing Country can seek information from exporting country on**
 - **Disease Surveillance Mechanism**
 - **Residue or Contaminant Status**
 - **Traceability System**



Requirement for Export ...

Residue or Contaminant Status

Nation wide Residue Monitoring Plan (RMP)

As part of RMP, periodically samples need to be collected for testing **Aflatoxin in Milk (AFM1)** apart from other compounds

The detailed RMP will have the

- List of substances to be tested, like, Antibacterials, Anthelmintics, Non-Steroidal Anti-inflammatory drugs, Organochlorine compounds including PCBs, Organophosphorus compounds, Heavy metals, Mycotoxins, etc.
- Method of Analysis
- Level of Action (Concentration above which result is deemed non-compliant)

Apart from RMP, each establishment should have Self-Residue Monitoring Plan in place to monitor the levels of different residues and contaminants

Requirement for Export ...



Food Safety

*Food and Agriculture Organization (FAO) stated that food security is set in “when all people, at all times, have physical and economic access to sufficient, **safe** and nutritious food to meet their dietary needs and food preferences for an active and healthy life.”*

*Overall, food safety requirements differ from country to country and can **constitute an important barrier for international trade** in food products, as their main objective is to protect public health*

Requirement for Export ...



Under WTO – SPS provision

A country - To protect health of population (human, plant, animal) can set up a standard which may be stringent than CODEX standard

But such standard should be based on

- Scientific basis and
- After Risk Assessment Studies

Requirement for Export ...



Product must conform to

(a) National standards of the importing country

OR

(b) Contractual specifications agreed to between the foreign buyer and the exporter

(c) In the absence of (a) or (b) above, the minimum specifications notified by the Government of India.



Issues in Milk Product Exports

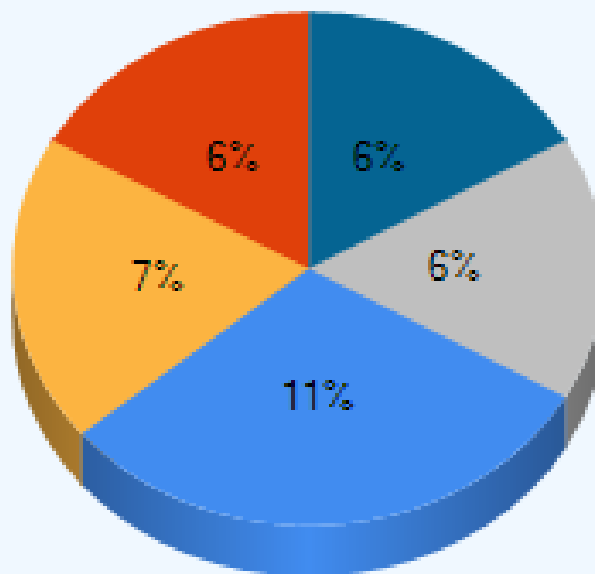
- ➡ Disease Surveillance Mechanism
 - ➡ Presence of FMD, Brucellosis, etc

- ➡ Traceability till Primary Production
 - ➡ Traceability of Milk till Milch animal

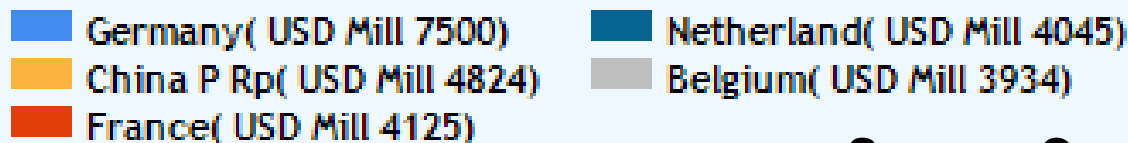
- ➡ Competitiveness in terms of Cost.

Milk Products

Top 5 Importing Countries in World Year: 2017 (Value & % Share in total)



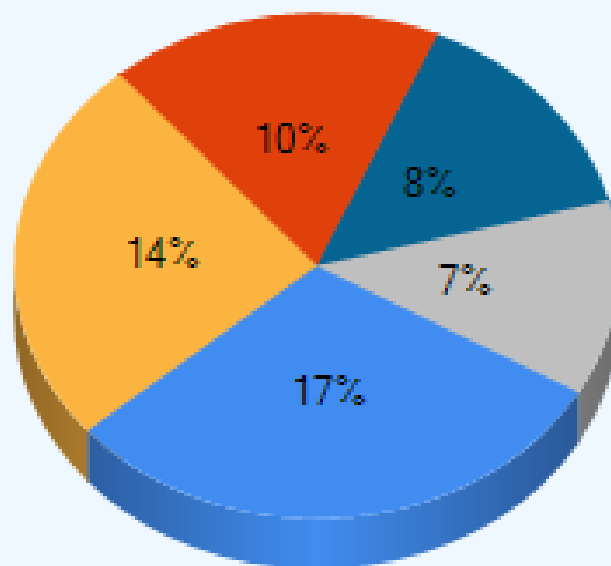
Countries



Source: Comtrade

Milk Products

Top 5 India's Export Destinations Year: 2017-18 (Value & % Share in total)



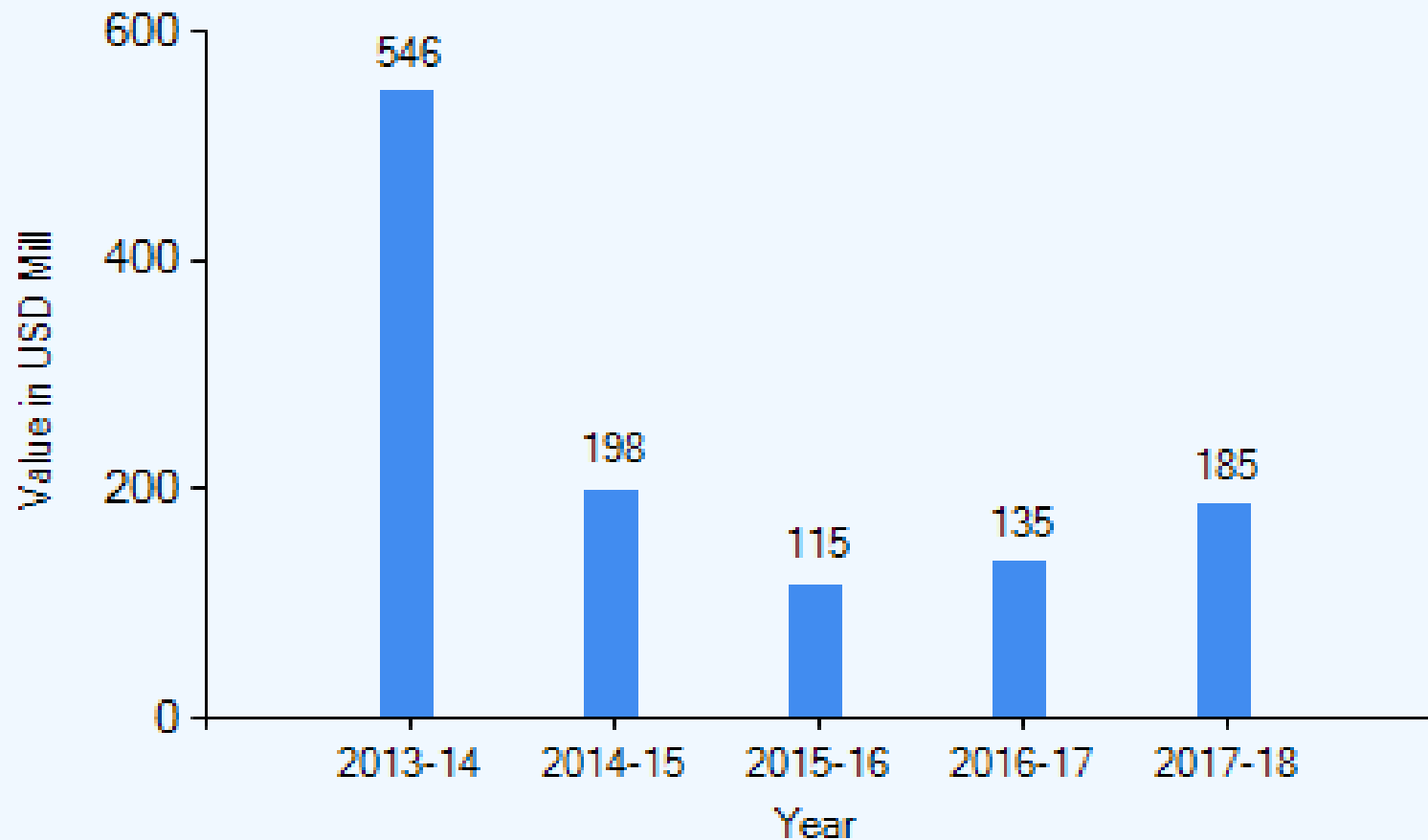
Countries

U Arab Emts(USD Mill 32.2)	Afghanistan Tis(USD Mill 14.6)
Egypt A Rp(USD Mill 26.8)	Nepal(USD Mill 13.6)
Bhutan(USD Mill 18.0)	

Source: DGCIS



INDIA's Export Trend of Milk Products in Last 5 years



Source: DGCIS



Aflatoxin – Concern !

■ Among the 18 different types of aflatoxins identified, the major members are aflatoxin B1 (**AFB1**), B2 (**AFB2**), G1 (**AFG1**), G2 (**AFG2**), **M1 (AFM1) and M2 (AFM2)**. AFB1 is normally predominant in amount in cultures as well as in food products.

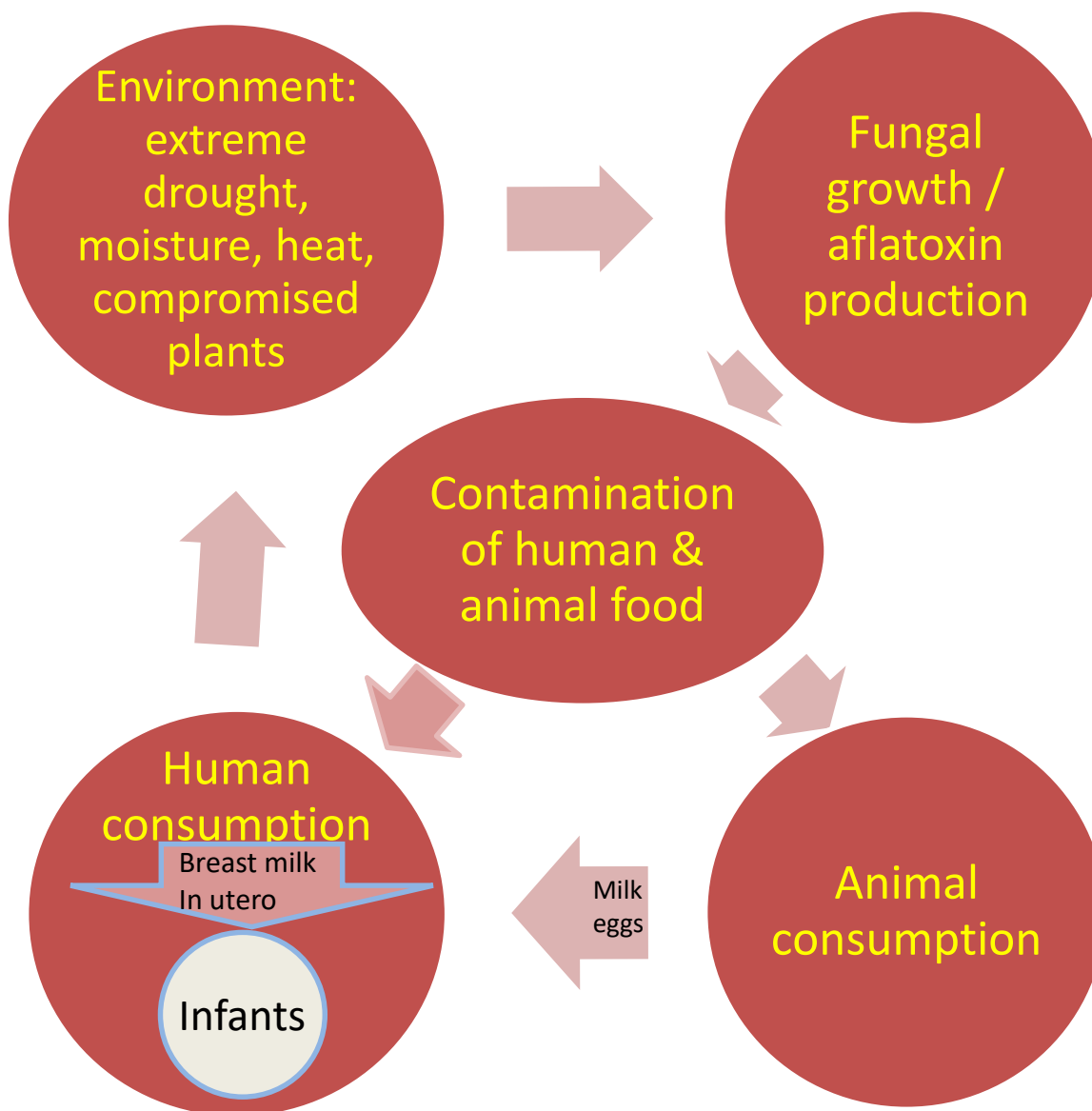
■ **AFM1 and AFM2** are hydroxylated forms of AFB1 and AFB2. AFM1 and AFM2 are major metabolites of AFB1 and AFB2 in humans and animals and may be present in milk from animals fed on AFB1 and AFB2 contaminated feed. AFM1 may be also present in egg, corn and peanut.



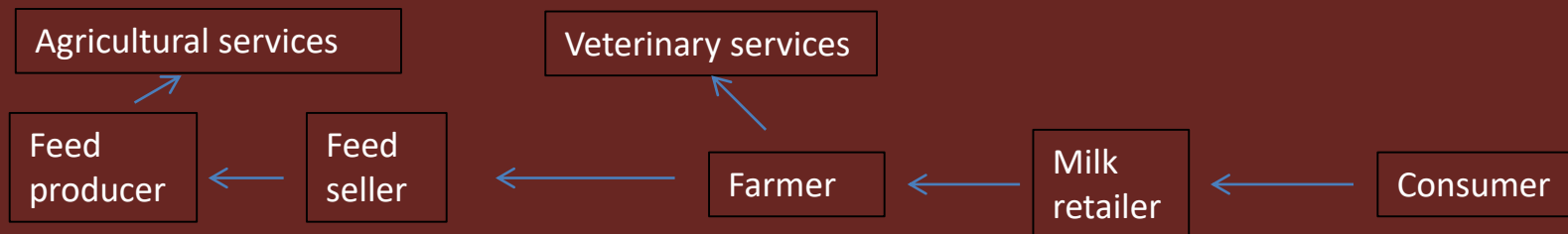
Aflatoxin – Concern ! ...

- Contamination can occur any time from pre-harvest to storage. Poor post-harvest conditions in warm humid area, and bad harvesting and storage practices lead to rapid development of the fungi and higher levels of toxins.
- Contamination of food, feed and agricultural commodities by aflatoxins impose an enormous economic concern, as these chemicals are highly carcinogenic, they can directly influence the structure of DNA, they can lead to fetal mis development and miscarriages, and are known to suppress immune systems

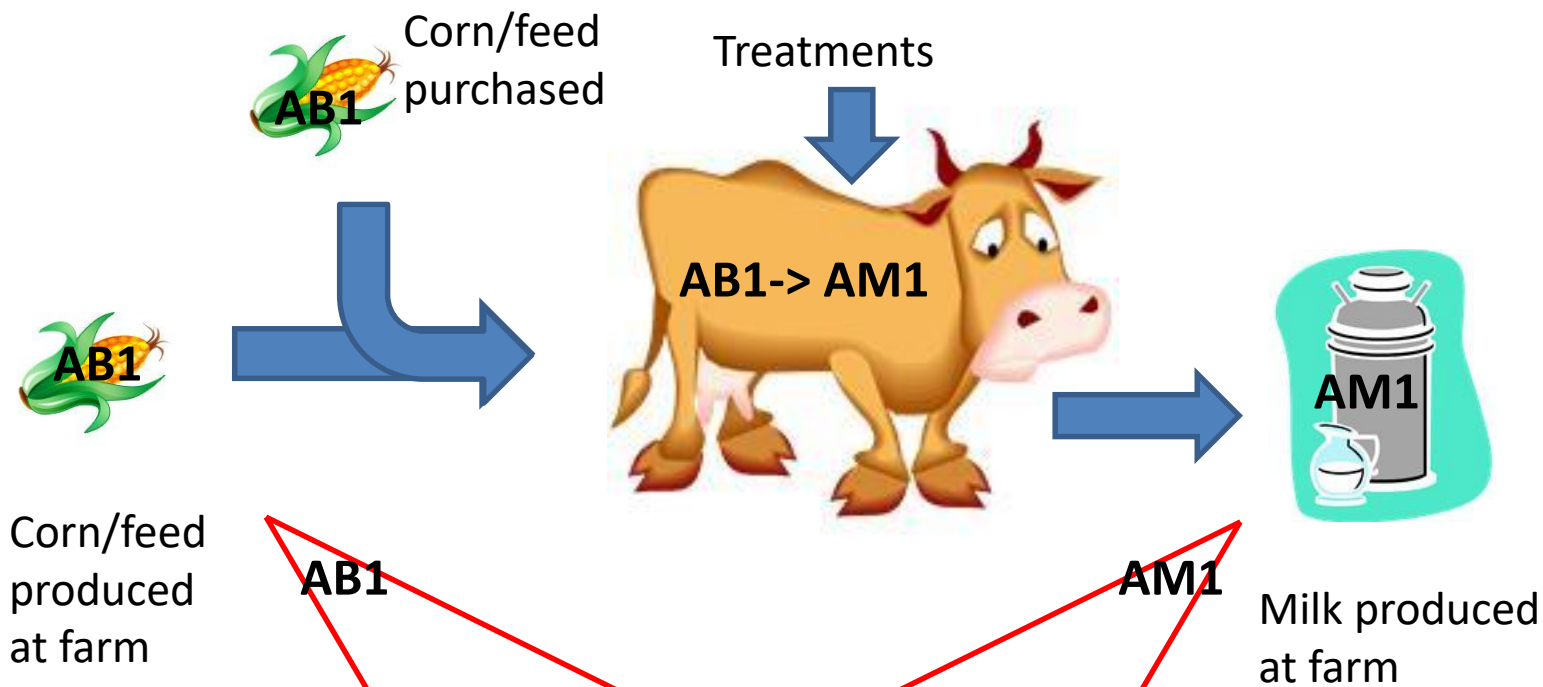
The Aflatoxin Concern?



Economic
flow



Aflatoxin
flow



Human
exposure



Farmer



Consumer

(Source: ILRI...)



Analysis of Mycotoxins

1. **Sampling** = selection of a representative sample
2. **Sample preparation** = grinding, homogenization + sub-sampling
3. **Analysis (screening/confirmation)**
 - a) Extraction of mycotoxins out food/feed
 - b) Sample clean-up
 - c) Detection of mycotoxins in purified extract

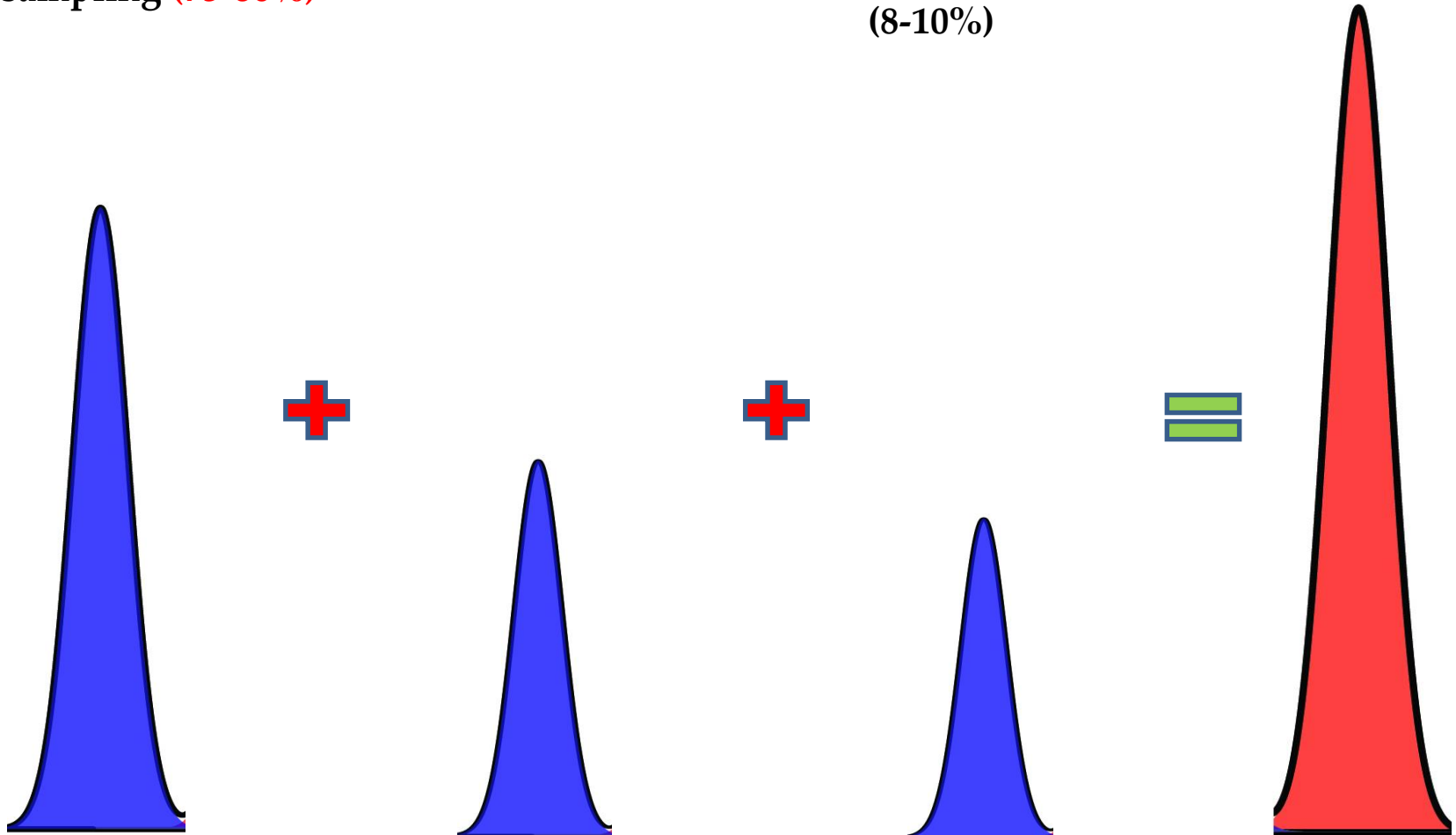
Variability-The actual fact

MU towards
sampling (75-80%)

Error from sample
preparation (10-15%)

MU of
measurement
(8-10%)

Uncertainty of
entire process

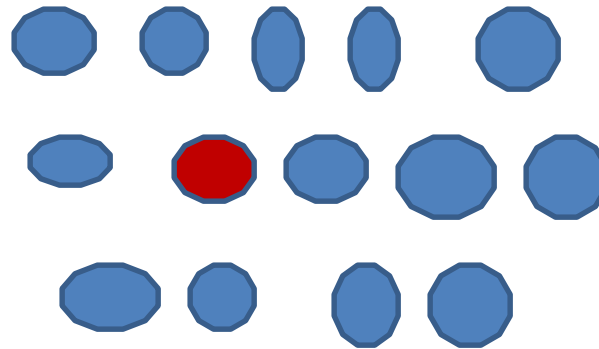


Variability in Sampling



Reason:

The distribution of mycotoxin in the lot. Small percentage peanut may be contaminated and this can lead to high contamination in the whole lot.



Sampling variance increases with lot concentration

Variability- Solution

Sampling



Sampling error



3 kg

80.6 variance

Sample preparation



Sample preparation error



100gm

28.2 variance

Analysis



analysis error



2 measurement

2.3 variance

Regulations Governing Sampling and Testing for Aflatoxins



- **Foodstuff: Reg N° 401/2006, amended by Reg 178/2010 and Reg 519/2014!!**
- **Feed: Reg N° 152/2009**
- **Non EU: Codex (CAC/STAN 193-1995) and amendments.**
- **FOOD SAFETY AND STANDARDS (CONTAMINANTS, TOXINS AND RESIDUES) REGULATIONS, 2011**

Aflatoxin Monitoring and Legislation



- Many countries have legislation with regard to aflatoxins in foods; especially food intended for export
- In the **United States**, the **Food and Drugs Administration (FDA)** uses an action level of **20 $\mu\text{g/kg}$** as the maximum residue limit of aflatoxins allowed in food for human consumption, except for milk
- The **European Union** in 1998 enacted aflatoxins tolerance standards of **2 $\mu\text{g/kg}$** aflatoxin B1 and **4 $\mu\text{g/kg}$** total aflatoxins for human consumption, the strictest in standard worldwide.
- The **Codex Alimentarius commission** proposed **15 $\mu\text{g/kg}$** of total aflatoxins in food

Aflatoxin monitoring and legislation

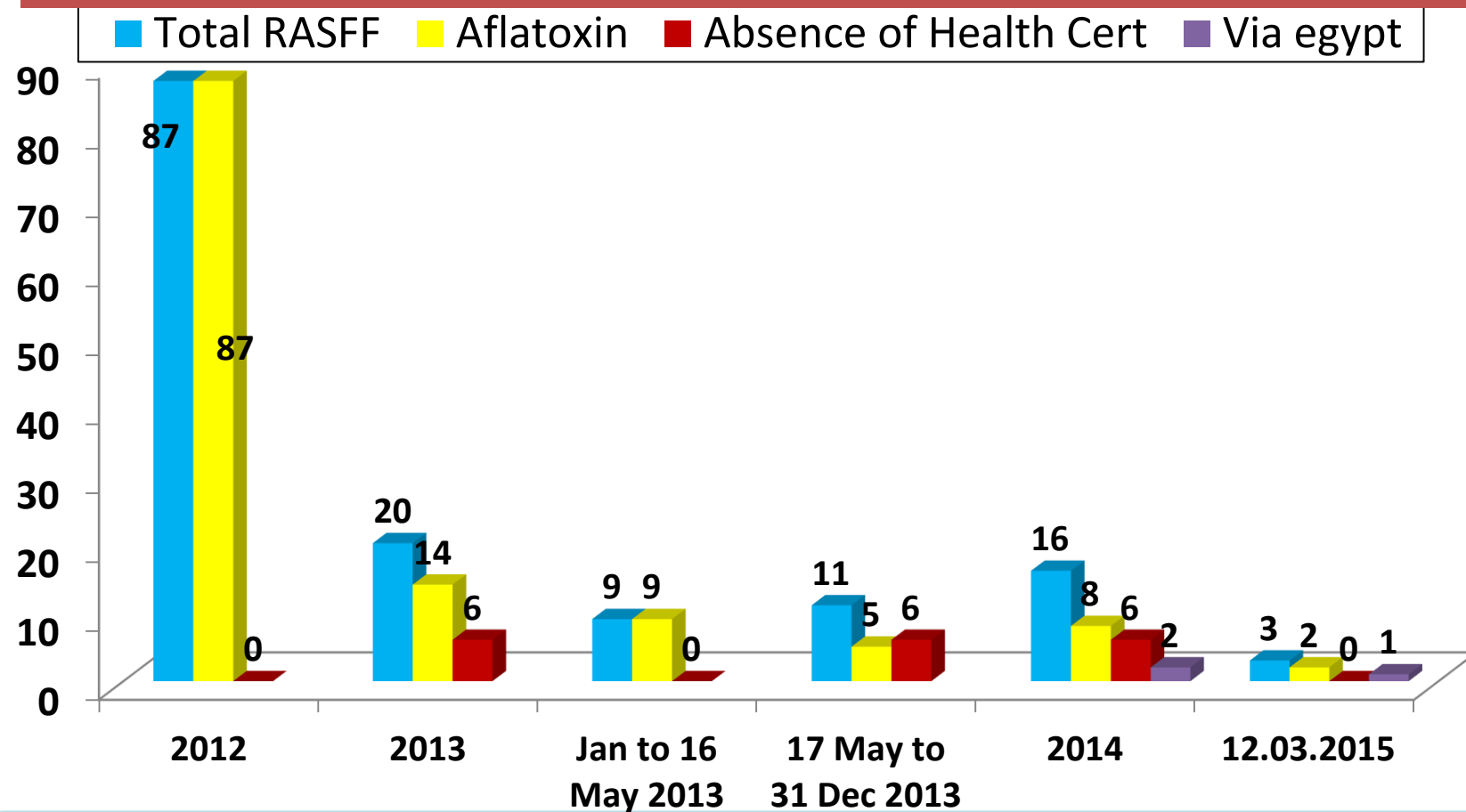


- **India** the limits for Aflatoxin (total) is varying from **10-30 $\mu\text{g}/\text{kg}$ in** food products and Aflatoxin M1 for milk is **0.5 $\mu\text{g}/\text{kg}$**
- The commission of the **European Communities** established a limit for **Aflatoxin M1 of 50 ng/kg for milk** and a variable limit for cheese, depending on concentration caused by drying process or processing.

Rejection trends for Aflatoxin in peanut and peanut products



PEANUT RASFF STATUS (2012 till 12.03.2015)





Mycotoxin Control

- Mycotoxin reduction and control are dependent on the concerted **efforts of all regulators, processors and farmers** along the food production chain.
- Mycotoxin awareness as a public health issue, **strengthening** laboratory and surveillance capacities, as well as establishing early warning system and **training** of farmers on the good agricultural and good management practices are key actions.

Export (Quality Control & Inspection) Act, 1963



Powers of EIC under the Act



- To notify the commodities**
- To specify the type of quality control**
- To establish / adopt or recognize one or more standards.**
- To prohibit the export**

EIC Network





Consignment Wise Inspection (CWI)

1. End Product Testing
2. Every export consignment is inspected and tested based on representative sample.

Food Safety Management System based Certification (FSMSC)





Three Tier Surveillance

- Monitoring Visits
- Supervisory Visit
- Corporate Audit

Laboratory Infrastructure



NABL Accredited (ISO 17025)
GMO Testing - Food and Agricultural Products

Laboratory Infrastructure ...



Real Time PCR





Digital Initiatives








Equivalence Agreements/MoUs/MRAs



- **Custom Union** –
 - Fish and fishery products, Egg products.
 - Raw Meat (chilled/ frozen)
- **EU** - marine products and basmati rice, egg products, honey, animal casings, crushed bones, ossein and gelatine
- **USA (USFDA)** – MoU in March 2015
- **Bhutan (BAFRA)** – MoU – Beef, Pork, Chevron, Animal Feed, F&V, Eggs, dairy products, etc.
- **Australia (AQIS)** – recognized for marine products – seeking for dairy, spices, honey etc.

International Recognition of EIC Equivalence Agreements/MoUs/MRAs



	Basmati Rice by European Commission (for Certificates of Authenticity).
	Black Pepper by United States Food & Drug Administration (USFDA) (as per which, any consignment of black pepper from India, not accompanied by EIA's certificate, is detained on arrival in USA)
	Fish & Fishery Products by European Commission (as per which, the processing units are specifically approved for export to European Union and the names of approved units sent to the European Commission for formal notification, after which they can export to EU countries)
	For 85 commodities including Milk products, fruits and vegetable products, household electrical appliances & switches, steel & steel products, electrical cables and cement etc. which are covered under the import inspection scheme of Sri Lanka, which is being operated by Sri Lanka Standards Institute (SLSI). (as per which, consignments of these commodities when accompanied by EIC's inspection certificate, would not be further subjected to testing by Sri Lankan authorities on its import in Sri Lanka).
	For various food products which include frozen marine products, jam, preserved goods, sauce, sugar syrup, edible oil and fat etc. by Korea Food & Drug Administration (KFDA) under their Approved Foreign Authorized Inspection Organization Scheme.

Continue

International Recognition of EIC Equivalence Agreements/MoUs/MRAs





	Food products and Food packaging materials by the Turkish customs authorities.
	Poultry Meat & its Products by Japan Health Authorities.
	Iron Ore & General Administration of Quality Supervision, Inspection & Quarantine by China
	Egg, Packaged water, Drugs & Pharma, Electrics & Electronics products by Singapore
	Fishery and Aquaculture products by Italy.
	Memorandum between FSVPS of Russian Federation and EIC on food and biological safety of fish & fishery products.
	Recognition of EIC Certification by Govt. of Thailand .

Continue

International Recognition of EIC Equivalence Agreements/MoUs/MRAs



	Agreement on Trade and safety of feed and feed ingredients between the Export Inspection Council of India and the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China.
	Memorandum of understanding between The Export Inspection Council Of India, Ministry of Commerce and Industry and The United States Food and Drug Administration of the Department of Health and Human Services.
	Protocol between the Export Inspection Council, Ministry of Commerce and Industry of the Republic of India and the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China for Health and Safety Regulations on Importing Indian Rapeseed Meal

Exports – A Shared Responsibility





सुगम निर्यात व्यापार में करते भागीदारी
गुणवत्ता नियंत्रण एवं निरीक्षण है हमारी जिम्मेदारी