



# Aflatoxin Proficiency Testing and Control in Africa

## (APTECA)

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**OFFICE OF THE TEXAS STATE CHEMIST**

Texas Feed and Fertilizer Control Service • Agriculture Analytical Service







## Chemical Sampling Information

# Aflatoxin(B<sub>1</sub>)

### General Description

OSHA IMIS Code Number: A165

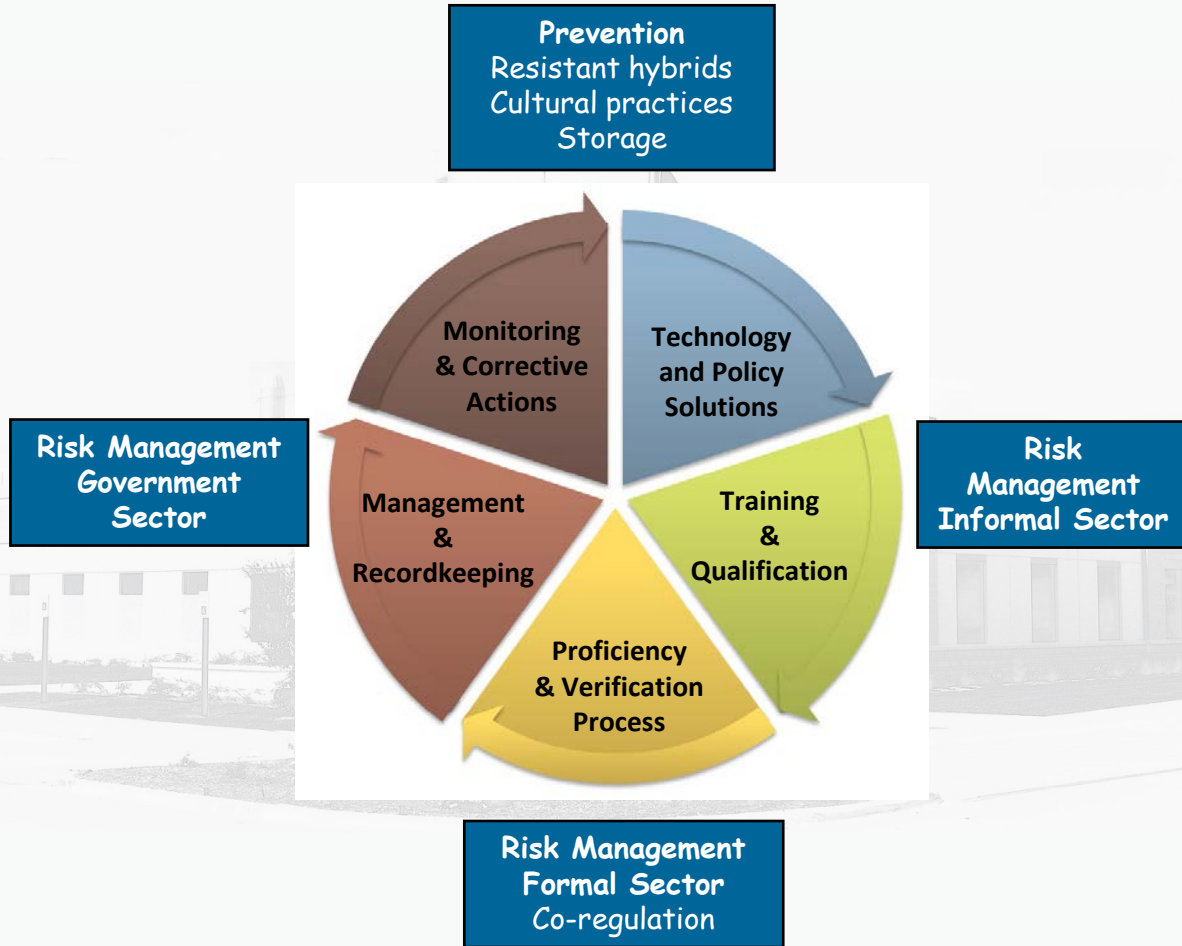
Chemical Abstracts Service (CAS) Registry Number: 1162-65-8

### Health Factors

International Agency for Research on Cancer (IARC) carcinogenic classification: [Group 1, carcinogenic to humans](#)

Health Effects: LD50 (oral, rat) 5 mg/kg

# Aflatoxin Risk Management Cycle





Where do we begin?

# PROFICIENCY TESTING

**APTECA Proficiency Testing Program**

**Corn Meal Sample #4**



Next Step

# THIRD PARTY VERIFICATION

# APTECA

## *Aflatoxin Proficiency Testing and Control in Africa*



Handbook

January 2016

Version 3.1

Texas A&M AgriLife Research

at the

Biosciences eastern and central Africa-

International Livestock Research Institute (BecA-ILRI) Hub

*Nairobi, Kenya*

and

College Station, Texas, USA



# APTECA Process

1. Sampling & Testing Plan
2. Proficiency evaluation, qualification, working control
3. Verification of results
4. Onsite inspection (review of records, observe analyst)

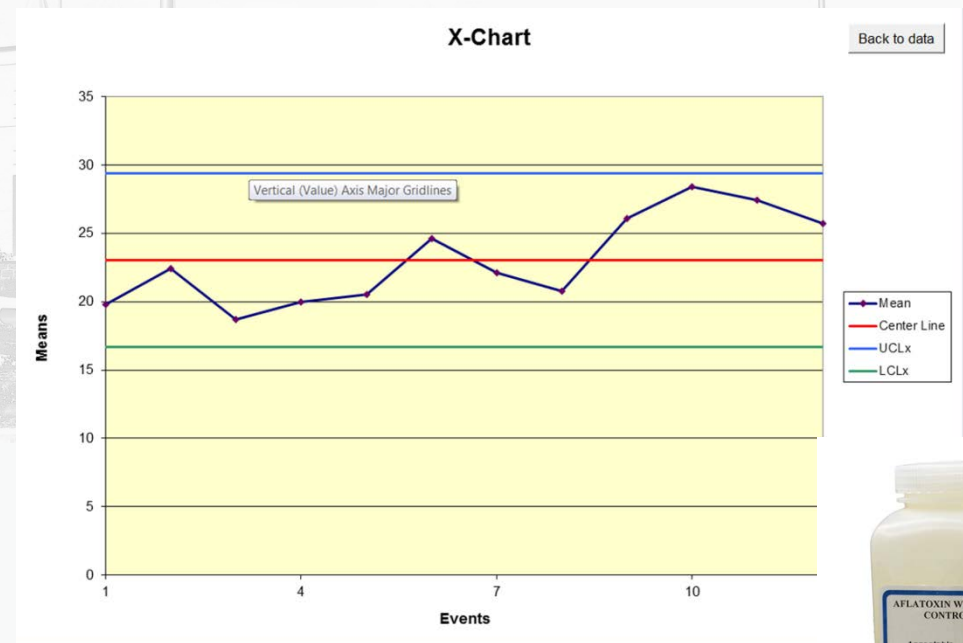
COMPANY  
NAME  
LOGO

APTECA Food Safety Program

April 8, 2015

Name

Signature



# OTSC Monitoring

- ❑ Employee performance
- ❑ Equipment performance
  - Grinder check
  - Lab scale check
- ❑ Control standard record
- ❑ Retained sample analysis in an ISO 17025 accredited lab





Certificate No. KENAS/TL/30

# Accreditation Certificate

This is to certify that

**TEXAS A&M AGRILIFE RESEARCH**

is accredited as a Testing Laboratory  
upon satisfying the requirements of

**ISO/IEC 17025:2005**

General requirements for the competence  
of testing and calibration laboratories

ISO/IEC  
17025-2005  
ACCREDITED

Effective from: 22<sup>nd</sup> January 2015

Expiry on: 21<sup>st</sup> January 2018

Chief Executive Officer/Authorised Officer





Support Research

# TEST KIT VALIDATION



# Test kits validated by OTSC and approved for APTECA

OFFICE OF THE TEXAS STATE CHEMIST

	<u>ROSA FAST (Charm Sciences)</u>	<u>Veratox (Neogen)</u>	<u>Reveal Q+ (Neogen)</u>	<u>AflaTest (Vicam)</u>
<b>Range</b> (GIPSA guideline)	5 – 150 ppb	5 – 100 ppb	5-100 ppb	5 – 1000 ppb
<b>Mechanism</b>	Antigen/Antibody color reading of strip	Antigen/Antibody color reading of solution	Lateral flow	Fluorescence of analyte eluted through a column
<b>Extraction Solvent</b>	100 ml 70/30 Methanol/Water	250 ml 70/30 Methanol/Water	125 ml 65/35 Ethanol/Water	100 ml 80/20 Methanol/Water
<b># of samples/run</b>	Up to 4	Up to ~ 40	1	1
<b>Est. time/kit</b>	3 min.	15 min.	12 min	7 min.
<b>Comments</b>	Keep cold & bring to room temp. for testing	Keep cold & bring to room temp. for testing	Refrigeration not required; Test kit dev. & extractor react quickly	Refrigeration not required; Test kit dev. & extractor react quickly
<b>Reader Cost</b>	2000 samples per year for free reader	No cost if purchasing 20 kits	No cost if purchasing 20 kits	On loan, \$1000 order limit for free shipping of kits
<b>Accessory Part # Est. Cost</b>	Incubator No cost if purchasing 2000 tests	No cost if purchasing 20 kits	Each kit comes complete with all test & accessory materials	12 position pump stand w/ 6 pumps \$1062
<b>Calibration Set Part # &amp; Est. Cost</b>	Included w/ kit	Included w/ kit	Included w/ kit	33020 \$31
<b>Kit Part # Est. Cost</b> <b># Analyses/Kit</b>	LF-AFQ-FAST-100K \$400 + VAT (100 analyses /kit)	8030 \$180 + VAT (40 analyses/kit)	8085 \$140 + VAT (25 analysis/kit)	AflaTest Columns 12022 \$378 (50 pack) VAT included



Support Information

# **WEBSITE TOOLS AND ADOPTION STRATEGY**



# Aflatoxin Proficiency Testing and Control in Africa, Asia, and Americas (APTECA)



Cereal Millers Association and industry leaders, in collaboration with Texas A&M AgriLife Research at the BeCA ILRI Hub (Nairobi, Kenya) support the adoption of aflatoxin proficiency testing and control in Africa (APTECA). The APTECA program utilizes global standards to manage food safety risk. Aflatoxin verification is performed by the AgriLife Research laboratory conforming to the International Organization for Standards ISO/IEC 17025 containing general requirements for the competence of testing and is **accredited** by the Kenya Accreditation Service.

## APTECA verifies manufacturer practices for product safety

- 80% of the formal maize milling sector in Kenya participates in APTECA
- Proficiency testing and verification results confirm program success

## Announcements

- Cereal Millers Association and Suppliers working hand-in-hand to provide affordable aflatoxin test kits.
- APTECA expands aflatoxin proficiency testing program globally.
- Group qualification exercise demonstrates testing competency by 35 government and private sector analysts.

## Resources

- Laboratory Data Reporting
- APTECA HANDBOOK
- Proficiency Program Details
- APTECA Participant Tool Box ▶
- Aflatoxin, a toxin fungal metabolite
- Participant Lists ▶
- ISO 17025
- Agrilife Research ISO Certificate
- COMESA Presentations ▶

## Contact Us

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# Steps in Adoption

## Proficiency Test

- APTECA 7
- Working Control

## Third Party Verification

- Group Qualification
- PLAN
- Implementation & Verification

## Marketing

- Logo
- Conformance to plan and demonstrated proficiency



## APTECA ADOPTION PLAN

In 2016, participants in Rwanda, Tanzania and Uganda do not pay for proficiency testing except for the cost they incur to perform the analysis. Working controls, verification samples run by AgriLife and third party inspection are also provided as no cost except for those costs incurred shipping samples to the AgriLife lab on the ILRI Nairobi campus.

In 2017, the goal is to achieve a self-sustaining program where the participants by \$21 per verification sample (4 samples per month).

Activities Offered at No Cost		
	2016	2017
Proficiency	X	X
Working Control	X	X
Qualification	X	
Testing Verification	X	
Inspection	X	

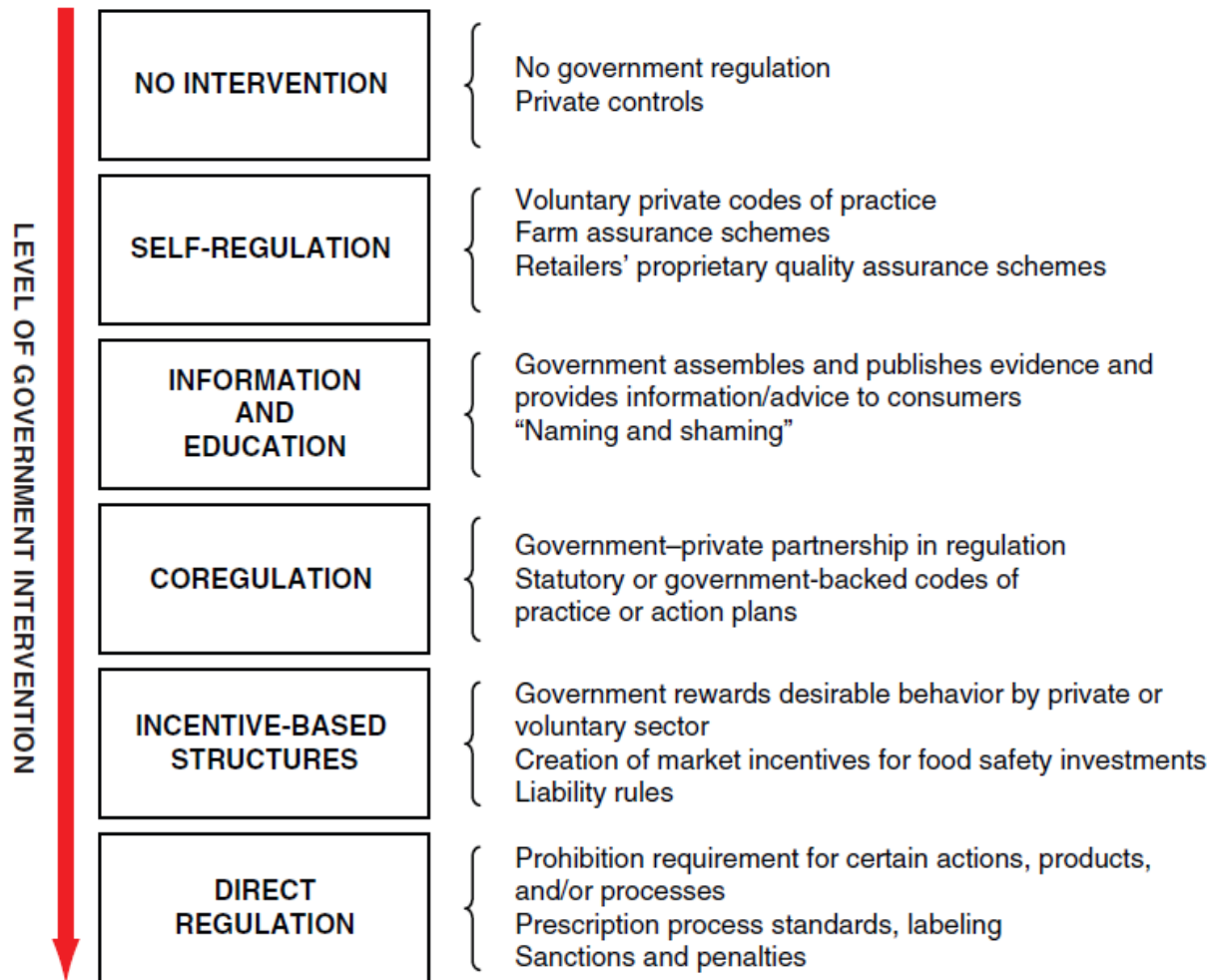
# Aflatoxin Tested Process Verified by APTECA



Conclusion

# CO-REGULATION AS A GOVERNANCE OPTION

# Modes of Governance



# Co-regulation as an aflatoxin risk management strategy



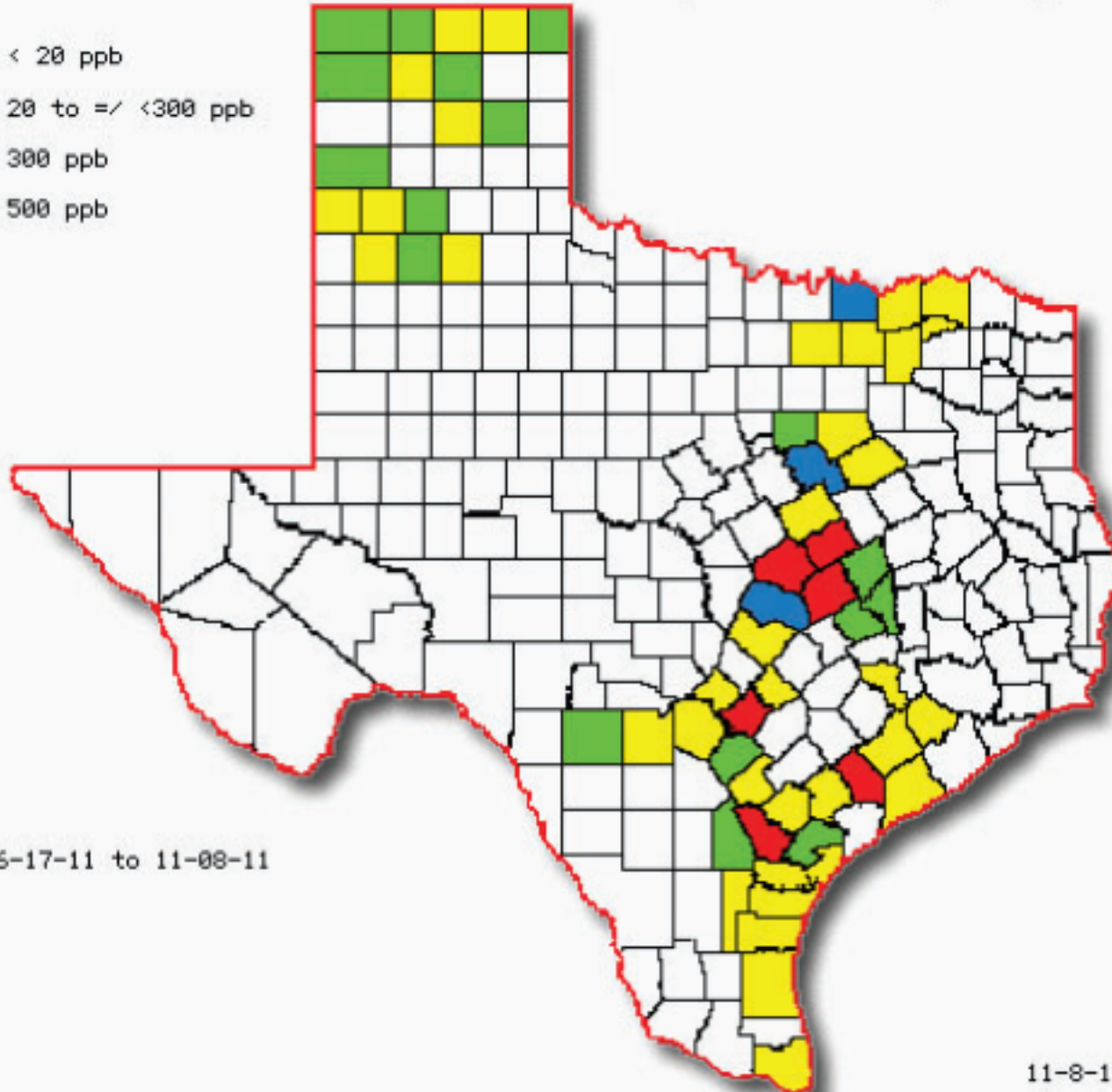
Purchasing

Crop Insurance

Regulatory monitoring

**Highest Level of Aflatoxin in Corn Sampled & Tested by OTSC - 2011 Crop Year By County**

- - = < 20 ppb
- - > 20 to =/ < 300 ppb
- - > 300 ppb
- - > 500 ppb



LEGEND:

06-17-11 to 11-08-11

11-8-11

# 2014 Participation

- ❑ 35 facilities
  - 25 grain elevators
  - 10 feed mills
  - 6 exempt-by-proxy firms
- ❑ 17 counties
- ❑ 187 designees
- ❑ 142 analysts
- ❑ 270 control sample bottles
- ❑ 140 monitoring visits by 9 investigators

