Co-Regulation of Aflatoxin in the Formal African Maize Market

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Co-Regulation

Co-regulation as a governance option denotes shared responsibility in a public-private partnership (National Academies, 2010).

The co-regulation of aflatoxin presents a regulatory risk management policy alternative to improve food safety and facilitate trade in Africa’s formal and informal market sectors including small scale millers and vendors, intermediate collection points (aggregators of maize), commercial grain handlers, large scale commercial maize millers, and food safety authorities.

FIGURE 4-1 Options for assigning private-public responsibility to ensure food safety.
SOURCE: Adapted from Garcia-Martinez et al. (2007).
One-Sample Strategy Components

- Monitoring & Corrective Actions
- Approved Equipment & Process
- Management & Recordkeeping
- Training for Individual Employees
- Proficiency Verification Process

- Standardized methods
- Standardized training
- Verification of employee performance
- Documented program outcomes
- Monitoring & corrective actions
- Reduced market and food safety risk
APTECA

Aflatoxin Proficiency Testing and Control in Africa

Handbook

Texas A&M Agrilife Research
at the
Biosciences eastern and central Africa-
International Livestock Research Institute (BecA-ILRI) Hub

Nairobi, Kenya
APTECA: Emphasizes Aflatoxin Testing Accuracy Through

- **Proficiency testing program**
  - One of the big three in ISO 17025:2005 along with traceability and uncertainty

- **Third party verification**
  - Incorporates other ISO 17025 elements in a quality system including customer service (4.7), control of non-conforming product (4.9), improvement (4.10), corrective action (4.11), preventive action (4.12), management review (4.15), personnel (5.2), method validation (5.4), equipment (5.5), measurement traceability 5.6), sampling (5.7), assuring the quality of test results
PROFICIENCY TESTING
ONE OF THE BIG 3 ALONG WITH UNCERTAINTY AND TRACEABILITY

APTECA Proficiency Testing Program
Corn Meal Sample #4
Kenya Milling Industry Performance

RSD

Proficiency Sample Number

APTECA 1
APTECA 2
APTECA 3
APTECA 4
Next Step
THIRD PARTY VERIFICATION
Approval Process

1. Sampling & Testing Plan
2. Proficiency evaluation and qualification
3. Verification of results
Criteria: Grinding

- Grind the entire sample
- Collect at least 500 grams of the ground sample
- 70% of the particles pass through a 20 mesh sieve after grinding
OTSC Monitoring

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

Effective from: 22nd January 2015

Expiry on: 21st January 2018

Chief Executive Officer/Authorised Officer
Corrective Actions

APTECA compares the firm’s aflatoxin result with the Texas A&M AgriLife Research laboratory result and reports the level of aflatoxin to the company’s management. When aflatoxin verification results do not agree, APTECA representatives will perform a review to find the cause of the deviation, and initiate and document corrective actions. Corrective actions may include:

- Adjustment or repair of equipment;
- Retraining of personnel;
- Correction of records;
- Assistance from the firm’s management; and/or
- Suspension or removal of an employee or firm from the program.

<table>
<thead>
<tr>
<th>Location</th>
<th>Area audited</th>
<th>Non-Conformity</th>
<th>Root Cause</th>
<th>Correction</th>
<th>Corrective Action</th>
<th>Date of Completion</th>
<th>Responsible Person(s)</th>
<th>Status on Due Date</th>
<th>Comments</th>
</tr>
</thead>
</table>

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Average chart for a 32ppb working control
Performance curve for aflatoxin accuracy comparing AgriLife and mill laboratory results prior to implementation of APTECA protocol

\[
y = -0.0003x^2 + 0.0149x + 0.9271 \\
R^2 = 0.9335
\]
Performance curve for aflatoxin accuracy comparing AgriLife and mill laboratory results after implementation of APTECA protocol.

\[ y = -8E-06x^3 + 0.0012x^2 - 0.0587x + 1.0866 \]

\[ R^2 = 0.9409 \]
Summary

- APTECA has improved aflatoxin testing accuracy in the formal maize milling sector of Kenya
- Mills comprising approximately 80% of the formal sectors participate in the program, improving food safety for 16 million Kenyans
- Efforts to engage Kenya government authorities to adopt a co-regulation strategy to manage aflatoxin risk is ongoing
- As part of the public-private partnership, aflatoxin test kit manufacturers offer free readers and kits priced comparable to the US
- The millers are now supporting the testing verification portion of the project to help achieve self-sustainability