World Food Programme

Memorandum

21 July 2011

To: P4P Pilot Countries, CDs, DCDs, P4P Country Coordinators, Procurement Officers, Logistics Officers

From: Amir Abdullah
Deputy Executive Director and COO

Subject: P4P Guidance Note 8
Aflatoxin Sampling and Testing LRP and P4P food procurement

Purpose

The purpose of this memorandum is to emphasize the importance of testing for aflatoxin and to highlight the policy, standards and procedures for doing so when WFP procures food regionally or locally, whether through standard LRP or Purchase for Progress (P4P) modalities.

The Food Procurement Manual states: Testing for Aflatoxin is mandatory for all maize and maize products (e.g. CSB, maize meal, etc.) purchased by WFP. See SOP FOR SAMPLING AND TESTING FOR AFLATOXIN (Maize, MML, and CSB)1 https://foodquality.wfp.org/QualityProcedures/StandardOperationProceduresandGuidelines/tabid/500/Default.aspx. Section 13.5.3.

Since early 2010, there has been increased interest and concern (notably from the Bill and Melinda Gates Foundation (BMGF), the International Food Policy and Research Institute (IFPRI), FAO, USAID and the United States Department of Agriculture (USDA) about levels of aflatoxin in maize at a certain latitude (e.g. in the central belt around the equator extending as far as 40 degrees north and south of the equator). The 2010 outbreak of high aflatoxin levels in Kenya (in Eastern and part of Coast provinces) focused attention on the problem - and triggered the setting up of a Task Force by the Kenyan Prime Minister; and the issue was also on the agenda of the USAID Administrator, Mr. Raj Shah, during his visit in May 2010.

1 WFP general specifications are 20 ppb max (unless national regulations are stricter).
BMGF has been convening meetings with interested parties (donors, regional economic communities and governments) and researchers, investigating whether to invest (and to get others to co-invest) in simple and affordable testing techniques, policy changes, and commercialization and delivery mechanisms. Several key donors now expect WFP, given its significant food purchasing footprint, to play a lead role in supporting and or piloting some of testing techniques.

WFP can play a lead role in influencing and supporting public health authorities when contaminated lots have been identified, and together with supply-side partners, work with farmers’ organisations under the P4P initiative to take appropriate mitigation measures. WFP is working closely with FAO at Headquarters for technical advice.

Background

Aflatoxin is a toxic, carcinogenic by-product of fungi that colonize maize and groundnuts, among other crops. In developed countries, exposure to such toxins is successfully limited through stringent food safety regulation and monitoring (by both preventive measures such as Good Manufacturing Practices and Hazard Analysis Critical Control Point (GMP and HACCP) and monitoring at the borders). Unfortunately, this is not the case in developing countries due to the prominence of subsistence farming systems, lack of irrigation, and inadequate drying and storing facilities.

More than 4.5 billion people in developing countries may be chronically exposed to aflatoxins in their diets. Common to tropical climates, aflatoxin contamination most often occurs when crops suffer stress, such as drought or insect infestation. The ingestion of high levels of aflatoxins can be fatal, while chronic exposure may result in serious health conditions such as cancer and liver cirrhosis, weakened immune systems, and possibly also stunted growth. While the full impact of the toxin is unknown, there have been links to aggravation of health in HIV/AIDS patients in populations that subsist on legume and cereal-based diets and milk from their livestock.

There are significant variations in standards and testing requirements across nations. Developed countries regularly test for aflatoxin while many developing countries lack cost-effective ways to test. The extent of the aflatoxin problem in terms of WFP local and regional purchases in sub-Saharan Africa is not fully known because:

a) testing for aflatoxin by WFP’s contracted inspection companies is not yet systematic;

b) inspection companies and laboratories may not always exist in country and may not be experienced enough to analyse aflatoxin levels effectively; and

c) laboratory results are presently stored in the different country offices in different folders.
Therefore as of today, WFP does not have a comprehensive picture regarding levels of aflatoxin presence in the market. So far, for P4P, WFP has had to reject two sets of consignments in Kenya. WFP has also rejected a large consignment of Indian-sourced contaminated maize in 2010, and in 2011 locally produced CSB in East Timor.

**Capacity Building**

WFP is working to strengthen its corporate food safety and quality system. One of the many improvements under implementation is requiring WFP contracted inspection companies to register their results on-line (through a new portal under development) that will enable WFP to: (a) have a full picture of the different issues, and (b) be able to analyse what the major problems are in order to be able to tackle them. Inspection companies will be preselected on their real capability rather than on cost alone. They will have a long-term contract to be able to invest in WFP’s requirement, including the purchase of the necessary aflatoxin testing equipment.

Through a grant from USAID, the WFP Food Quality Unit is rolling out a training package (with equipment including the “Blue Box”2, information cards and face to face training) for procurement and logistics officers working in P4P countries (and eventually selected members of Farmers’ Organisations and supply-side partners) to enable them to test the food at village level stores and provide feedback to farmers early in the process. Inspection companies will then draw a sample, analyse it and provide the results to the WFP country office.

**Policy, Standards and Procedures**

a) **Standard Local and Regional Purchases:**

In June 2010, WFP Procurement Division requested regional and country level procurement officers to systematically check for aflatoxin for all LRP purchases of Maize, Maize Meal and Corn-Soya-Blend in all countries (FPM Section 13.5.3).

<table>
<thead>
<tr>
<th>Official Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The U.S. Food and Drug Administration (FDA) has established the ceiling for aflatoxin presence in human food products at 20 ppb (parts per billion).</td>
</tr>
<tr>
<td>- The European Union standard is 4 ppb in cereals and cereal products (e.g. maize meal).</td>
</tr>
<tr>
<td><strong>WFP general specifications:</strong> 20 ppb max (unless national regulations are stricter)</td>
</tr>
</tbody>
</table>

An independent inspection company should sample the commodity and a recognised, accredited laboratory for aflatoxin testing should analyse the sample (i.e. a laboratory ISO 17025 accredited for aflatoxin).

---

2 A kit containing a set of grain quality testing equipment.
The Standard Operating Procedures (SOP) for sampling and testing for aflatoxin for maize grain, maize meal and corn soya blend, which must be provided to the company and to the laboratory by WFP can be found at: http://foodquality.wfp.org/QualityProcedures/StandardOperationProceduresandGuidelines/tabid/500/Default.aspx. The procedure should be followed strictly.

P4P purchases:

Purchases through P4P modalities are not exempted from aflatoxin testing and where possible, follow the same procedure. However, WFP has developed a sampling plan for P4P, attached in Annex 1; in order assess the risk at the farm gate in a practical and rapid way. WFP is working with FAO to further refine this with input from the field.

Prevention: In high risk areas, maize may be purchased; but the purchasing activities must be accompanied by a programme of capacity building activities developed in collaboration with partners and focused on preventing aflatoxin development. Emphasis on post-harvest handling (PHH), training and appropriate drying and storage techniques and infrastructure is already a key element of most P4P strategies, but it is recommended that both WFP staff and supply-side partners agree with whom and how they will work together on:

- Promoting rapid methods of drying (ideally within 48h after harvest), through either sun drying (on a tarpaulin, or concrete clean space) or mechanical drying.
- Evaluating and adapting storage technologies to local conditions, for example, grain warehouses with dryers and grain moisture testers.
- Promoting good practices such as sorting (i.e. sorting and elimination of mouldy cobs or grains).
- Using sieves and density segregators to reduce mycotoxin contamination.
- Milling maize: as good cleaning and de-braning / de-germing (as done for Maize Meal) will remove a great part of the aflatoxin contamination.

WFP field staff, together with supply-side partners, should clearly explain to the Farmers’ Organizations and traders the risk of aflatoxin at the beginning of the agricultural season (at planting time), and ensure that preventive measures are in place and funded and that marketing expectations are properly managed. Particularly in high risk areas, and where possible, commodities other than maize should be the focus of the P4P efforts.

When consignments test positive for levels of aflatoxin above acceptable limits, WFP staff must inform the public health authorities, who should seize the contaminated lot.

WFP is committed to taking on a greater role in terms of pre-inspection support, at the level of community sheds or at district level warehouses – specifically, training selected WFP staff to use relevant equipment to conduct initial tests prior to the food being aggregated for official sampling by an inspection company.
In addition to building capacity at local level, WFP can play a role in developing capacities at a higher level, specifically:

1. By providing support to appropriate entities to set up laboratories; and
2. By encouraging inspection companies to start operations in new areas (with possible cost implications).

\[\text{As is being done by WFP in northern Mozambique: a MoU with Lurio University has been drawn up to establish a Food Quality Testing laboratory in partnership with CLUSA.}\]
Annex 1: Standard Operating Procedure for Sampling and testing Procedures for P4P Purchases

For small lots: WFP prepares a specific sampling and testing procedure. **Sampling** of 6 – 10kg grains, randomly selected from a lot size < 500MT (see table).

<table>
<thead>
<tr>
<th>Lot size (MT)</th>
<th>Weight or number of sub-lots</th>
<th>Number of incremental samples</th>
<th>Aggregate sample weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;10 and ≤ 20</td>
<td></td>
<td>60</td>
<td>6</td>
</tr>
<tr>
<td>&gt;20 and &lt; 50</td>
<td></td>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>≥ 50 and ≤ 300</td>
<td>100 MT</td>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>&gt; 300 and &lt; 1,500</td>
<td>3 sub-lots</td>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>≥ 1,500</td>
<td>500 MT</td>
<td>100</td>
<td>10</td>
</tr>
</tbody>
</table>

![Diagram of sampling procedure]

In the diagram, a 25 MT lot size is indicated. The sampling process involves taking increments from the top, middle, and bottom of the lot.

- **TOP:** 100g
- **MIDDLE:** 100g
- **BOTTOM:** 100g

Each increment is further divided into 100g portions. The final aggregate sample size is 10 kg.
Figure 1: example of preparation of an aggregate sample for a lot of 25 MT

Once collected the 10kg grains must be thoroughly mixed.

To divide the sample 3 times in order to obtain 1kg grain (see graph 2)
Testing of the 1kg grain sample will be carried out with a rapid test kit.
To take the necessary quantity of maize grain (one cup about 50g) and to grind it with the coffee grinder.
To repeat the operation 4 times to obtain 200g of grounded maize.
To mixed thoroughly the grounded material.
To follow the instruction for testing (provided in the blue box training manual)
If the result is negative, the lot will be purchased and aggregated in a larger warehouse.
If the result is positive to aflatoxin contamination, the lot will be refused and not paid for.
At the large warehouse, an independent inspection company will be asked to make a composite sample (i.e. using the standard SOP) of the aggregated lot and to test it for aflatoxin.
If the result is negative, the lot will be distributed,
If the result is positive to aflatoxin, the lot will be re-tested in smaller portion to see if part of the lot can be salvaged.