

AFLATOXINS: FINDING SOLUTIONS FOR IMPROVED FOOD SAFETY

Aflatoxin Management in the World Food Programme through P4P Local Procurement

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Aflatoxins are a major concern for the World Food Programme (WFP). The organization procured more than 2.1 million metric tons of mixed commodities from international markets in 2012, including 417,000 metric tons of maize grain and approximately 49,000 metric tons of maize meal. The WFP ranks both commodities as "risky" due to the safety threat posed by aflatoxin contamination. Maize products are deemed less risky than other commodities such as groundnut-based ready-to-eat foods, which in addition to presenting microbiological risks also target the most vulnerable. But given that maize products are widely used commodities within WFP programs, the organization gives the threat of aflatoxins in maize particular attention.

In 2012, 77 percent of the WFP's food procurement came from developing countries (OECD 2013). In order to guarantee that food goods are fit for human consumption, WFP uses independent inspection services to perform end-product testing prior to taking ownership. In 2012, over 388,000 metric tons of maize and 33,000 metric tons of maize meal purchased in Africa had an aflatoxin content that did not exceed the WFP's specification of 20 parts per billion (ppb). With WFP increasingly sourcing locally the food that it distributes, the organization is focusing on addressing food safety and food quality issues upstream. Proper supplier management and support lead to a drastic reduction in the rejection of food by ensuring that the product is up to general safety standards and, particularly, is below tolerated aflatoxin levels.

Purchase for Progress

Purchase for Progress (P4P) is a pilot program that integrates WFP's food purchasing power with the technical expertise of other partners and uses farmer organizations to help connect smallholder/low-income farmers to markets to help raise their incomes. Under P4P over 64,000 metric tons of maize were purchased in 2012 from smallholder farmers from regions in Africa prone to high aflatoxin levels. Yet in 2010 WFP rejected two sets of consignments in Kenya as well as large quantities of India-sourced maize due to high levels of aflatoxins (with levels reaching up to 110 ppb). Following those outbreaks, WFP issued a guidance note that emphasized mandatory aflatoxin testing and introduced a Standard Operating Procedure for sampling and testing maize grain at the farm gate.

Since then WFP has actively worked to reduce aflatoxin levels through the promotion of good practices. It has offered, through various partners, training across 12 P4P countries, covering practical aspects of postharvest handling (drying, sorting, storage, transport, etc.) and quality control (inspection and testing), thereby building a preventive approach to food quality and safety, particularly in regard to aflatoxins. The WFP, in collaboration with the Natural Resources Institute of the University of Greenwich, published a standardized manual, the *P4P Training Manual for Improving Grain Postharvest Handling and Storage*, which sets out the best training

materials and methods. Available in both English and French, this user-friendly manual addresses the specific needs of smallholder farmers and provides instructions for trainers.

Blue Box

WFP is also committed to playing a greater role in terms of pre-inspection with the development of cost-effective solutions for food testing in the field. The Blue Box—a portable 18-gallon aluminium box containing grain-testing tools—allows for on-the-spot screening of food quality parameters and grading at any stage of the supply chain, be it at the farmer, processor, or inspection and procurement levels. The Blue Box was first developed for farmers in Guatemala at a time when WFP was purchasing locally produced fortified blended foods that used ingredients, including maize, sourced locally from smallholder farmers. A first inspection of maize in 2007 led to the rejection of cargos due to non-compliant kernel size. With the rollout of P4P, limiting food rejection became an important focus combining early detection (via Blue Box) and early prevention (via postharvest training). Early detection of suitable lots results in a reduction of rejected consignments and leads to significant savings for the farmers, who do not have to bear unnecessary transport costs. Various parameters can lead to the rejection of an entire lot, and not just for aflatoxin contamination. Parameters controlled for include moisture, defective grains (such as for broken or discolored kernels, mold or insect damage, or extraneous material), and aflatoxin levels.

In areas lacking basic infrastructure, such as in conflict zones, the Blue Box can provide an interim solution that permits WFP to continue operating and procuring locally. In South Sudan, for instance, the absence of inspection services and analytical capacity has resulted in maize samples being shipped to other countries with appropriate equipment for aflatoxin control. On top of the extra cost incurred, the extended lead time for receiving analysis results was also counterproductive, keeping local suppliers from completing transactions in a day. To overcome this situation, WFP's Sudan Country Office provided the government with Blue Boxes to assist them in grading and performing safety controls.

By boosting quality control practices, the Blue Box can help private operators enter markets with more rigorous standards. In Mali, where no legislation regarding aflatoxins exists, WFP's market was targeted by Moulins du Sahel (MdS), a well-established local private processor. High aflatoxin levels, up to 400 ppb, prohibited the procurement of maize by WFP in 2011. The next year MdS decided to use the Blue Box for verifying aflatoxin levels in incoming maize and identifying lots below 20 ppb, which allowed sales to WFP to finally proceed.

The Blue Box is also widely used by WFP procurement officers. In Burkina-Faso for example, joint WFP missions with P4P and procurement officers aim at minimizing food rejection by screening farmer organizations. Commodity quality controls are integrated

into the market research phase, and the selection of grain suppliers is not solely based on price. The Blue Box is used to determine the level of aflatoxins in harvested grains and to identify those meeting WFP contractual specifications. Training of WFP officers provided by the Blue Box supplier also provides the opportunity to bring other key players, such as food inspectors and food suppliers, to the table, thereby contributing to the mutual acceptance of WFP requirements regarding aflatoxin levels and detection means.

Initially developed for farmers, the Blue Box has surprisingly found many applications and users along the supply chain. One reason behind its success is that the Blue Box offers a set of tools that controls parameters directly influencing the price paid to the farmer or even if the consignment is accepted or rejected. However, aflatoxin testing has not been embraced by all. Farmer organizations often find the absence of electricity, the cost per test, and the inconsistent availability of batteries and other consumable Blue Box components to be inhibiting. In response, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has developed a fast, simple, and affordable test kit—a solution that can reduce costs from US\$6 down to \$1 per sample tested. Receiving the most praise has been the moisture meter, as moisture is often a key price-determining criterion. This portable battery-run device also provides an excellent precautionary check for aflatoxins.

Concluding thoughts

WFP's presence in local markets provides a platform to raise awareness about aflatoxins and food quality. Working with

governments, farmers' organizations, and suppliers, WFP can stimulate and support improvements in food quality. The above efforts, combined with WFP's procurement standards, have helped create a spill-over effect of practices enhancing food quality in the markets where WFP operates. Many traders made investments in quality assurance equipment, such as drying and cleaning equipment, in order to meet WFP standards, thereby opening up additional export opportunities (WFP 2013; Wagacha and Muthhomi 2008).

As a major purchaser, WFP plays a leading role in piloting innovative approaches. Its one-two approach of pre-inspection coupled with preventive measures has led to positive results, as shown by local procurement figures for maize products. Switching from end-product testing to preventive measures, not only for aflatoxins but for quality and safety parameters in general, is one area in which WFP can increase cooperation with local authorities and influence policy design and execution. This is already occurring. WFP supports appropriate entities in setting up laboratories and works closely with inspection bodies. In parallel, cooperation with the Food and Agriculture Organization (FAO) is leading to guidance for the design of mycotoxin sampling plans and the interpretation of results. WFP, with its extensive presence in the field and its growing involvement at various levels of the supply chain, is thus an interface that transmits innovative approaches and tools developed for the management of aflatoxins. In the field, WFP provides technical support and rigorous follow up, helping to ensure that preventive approaches are adopted to secure food quality.

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