April 2018
EAC Policy Brief on Aflatoxin Prevention and Control | Policy Brief No. 1, 2018

Harmful Effects of Aflatoxin and its Impact on Human Health

EXECUTIVE SUMMARY

Aflatoxin is highly toxic to human and causes liver cancer, slowed growth in children, weakens the body immune system to fight diseases and exacerbates infectious diseases such as hepatitis, human immunodefiency virus syndrome (HIV) and tuberculosis.

The EAC region experiences high temperatures and humidity which favors growth of aflatoxin producing fungi normally found in the soil. Contamination of food crops and food products occurs in all stages of food value chain from pre and post harvesting period, processing and storage stage.

The EAC population is prone to aflatoxin exposure through consumption of contaminated food and food products which leads to harmful health effects. Exposure to aflatoxin leads to acute aflatoxicosis that may lead to death. In 2016, about 14 deaths resulting from aflatoxicosis were reported in Dodoma and Manyara regions of the United Republic of Tanzania. In 2004, 125 deaths associated with aflatoxin contamination were reported in the Makueni County, Republic of Kenya.

THE PROBLEM

Aflatoxin contaminates a quarter of the world's food supply[1] and approximately 4.5 billion people are exposed to aflatoxin contamination worldwide[2]. In the East African Community (EAC), aflatoxin contaminates staple food such as maize, peanuts and some animal products.

Aflatoxin is harmful substances produced by certain types of fungi that exist in the environment and is not appropriately controlled or regulated within the region. Testing for aflatoxin is only done for products that are being exported to the global market but not for food and food products consumed locally. This result in millions of East Africans consuming high, unsafe levels of aflatoxin through their daily diets.

Maize Infected with Fungi which may produce Aflatoxin

SIZE OF THE PROBLEM

Aflatoxin contamination is widely spread in EAC region. It is responsible for causing acute and chronic poisoning of the human body and sudden deaths. In addition it causes cancer of the liver, which kills about 600,000 people each year worldwide, and slows growth in children, reduces ability to fight infections among others.

The region adopted the maximum limits of aflatoxin in foods to be 5 parts per billion (ppb) for Aflatoxin B1 and 10 ppb for total aflatoxin. Existing evidence in the Republic of Uganda indicated the levels of toxins in maize, soybeans, cassava chips, groundnuts and formulated baby foods contained more than 20 ppb[3], which is above the EAC harmonized standards of 2013[4]. In Kenya, 38% of peanut samples were contaminated at levels exceeding the maximum permissible levels of 10ppb[5] and maize were found to have as high as 5400ppb[6].

Additionally, the countrywide Aflatoxin assessment in the United Republic of Tanzania reported 43% of the maize samples were above 5ppb for Eastern zone, 40% for Western zone, 9% for Northern zone and 4% in Southern highlands.

References:

1. CAST 2003
2. Williams et al 2004
3. Kaaya and Warren 2005
4. EAC Harmonized Standards 2013
5. Mutegi et al 2010
6. Shepard 2008 & Lewis et al 2005
7. Kaaya and Warren 2005
8. Williams et al 2004

Table 1:

Cases of deaths due to Aflatoxin Poisoning in Kenya

Year	Number of Deaths	District/Place
1981	12	Machakos
1988	3	Meru
2001	16	Maua Methodist Hospital
2001	3	Meru North
2003	6	Thika
2004	125	Eastern & Central Makueni Kitui
2005	32	Machakos
2006	10	Makueni Kitui
2007	2	Makueni Kitui

Source: FAO (2011)

CAUSE OF THE PROBLEM

Low awareness by EAC households of aflatoxin occurrence in foods and its negative health effects[7] lead to consumption of toxic contaminated foods. Fungi that produce aflatoxin occur naturally and its growth is favored by tropical climate condition of the temperatures between 24°C and 35°C with 7-10 percent relative humidity[8].

Contamination of the food crops by the fungi occurs in the field, before and after harvest especially during storage and processing. Animal products, especially milk, may contain aflatoxin when feeds are also contaminated. Unfortunately, food insecurity and weak monitoring systems and infrastructure for food products put the EAC population at high risk of consuming aflatoxin contaminated foods.

POLICY OPTIONS

Policy Option 1: Partner States Ministries to Develop and Implement Aflatoxin Prevention and Control Policies, legislation, Strategies and Guidelines to Promote Public Health.

The region has weak policies and legal framework to address aflatoxin prevention and control. Acute and chronic aflatoxicosis and its associated complications is a major public health problem in East Africa. The region lacks measures to address aflatoxicosis, which significantly contributes to non-communicable diseases burden. In this regard, there is need for targeted interventions through the design and implementation of regional and national aflatoxin prevention and control policies, legislation, strategies and guidelines to protect the public. There is need to enhance levels of awareness on aflatoxin prevention and control through various ways including reduction of exposure through dietary diversification.

Policy Option 2: Partner States Ministries to put in place infrastructure for Management of Aflatoxicosis and related Complications in all Health Care Facilities.

EAC Partner States have weak health care infrastructure and institutional capacity to prevent exposure, control and manage cases of aflatoxicosis and its related complications. This calls for concerted efforts to strengthen infrastructure and institutional capacity to address the gap.

REFERENCES

1. Council for Agricultural Science and Technology (CAST) 2003. Potential economic costs of mycotoxins in the United States in: Mycotoxinx: Risks in Plant, Animal and Human Systems, Task Force Report. 139: 136-142.
2. Williams JH, Phillips TD, Jolly PE, Stiles JK, Jolly CM and Aggarwal D 2004. Human aflatoxicosis in developing countries: a review of toxicology, exposure, potential health consequences and interventions. American Journal of Clinical Nutrition 80: 1106-1122
3. Kaaya NA and Warren HL 2005. A review of past and present research on aflatoxin in Uganda. African Journal of Food, Agriculture, Nutrition and Development 5:1
4. EAC Harmonized Standards 2013
5. Mutegi C, Kimani J, Otieno G, Wanyama R, Christie ME, Mallikarjunan K and Kaaya A 2010. Market attributes and their effect on levels of aflatoxin in peanuts (ArachisHypogeae L.) from Nairobi and Western Kenya. East African Agriculture and Forestry Journal 77: 95-103.
6. Shepard GS. 2008. Risk assessment of aflatoxins in food in Africa. Food additives and Contaminants 25: 1246-1256.
7. Lewis L, Onsongo M, Njapau H, Schurz-Rogers H, Luber G, Kieszak S, Nyamongo J, Backer L, Dahiye AM, Misore A, DeCock K, Rubin C. Kenya aflatoxicosis investigation group 2005. Aflatoxin contamination of commercial maize products during an outbreak of acute aflatoxicosis in eastern and central Kenya. Environmental Health Perspectives 113 (12): 1763-7.
8. Kaaya NA and Warren HL. 2005. A review of past and present research on aflatoxin in Uganda. African Journal of Food, Agriculture, Nutrition and Developments 5:1
9. Williams JH, Phillips TD, Jolly PE, Stiles JK, Jolly CM and Aggarwal D 2004. Human aflatoxicosis in developing countries: a review of toxicology, exposure, potential health consequences and interventions. American Journal of Clinical Nutrition 80: 1106-1122

This policy brief was produced by the East African Community based on Technical Papers Developed under the EAC Aflatoxin Prevention and Control Project funded by USAID East Africa Regional Economic Integration Office with technical backstopping from the International Institute of Tropical Agriculture (IITA).

USAID FROM THE AMERICAN PEOPLE

IITA Transforming African Agriculture