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REPOA Brief

The health effects of Aflatoxin and their impact on food security among smallholder farmers in Tanzania

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Key Messages

- Aflatoxin contamination poses a significant threat to food security
- Low levels of awareness on the adverse contamination effects of aflatoxin among smallholder farmers.
- Most farmers are often informed on the causes of aflatoxin during storage, but not as much during the other stages of the farming process.
- Aflatoxin awareness improved food quality and therefore food security.

Introduction

Aflatoxin contamination poses a significant threat to food security, as highlighted by Mahato et al. (2019). In Africa, grain economic losses due to aflatoxin contamination exceed $750 million annually (Kana et al., 2013), with contamination levels surpassing European regulatory limits (Meijer et al., 2021). In Tanzania, studies such as Boni et al. (2021) have revealed that aflatoxin contamination often exceeds both European and East African regulatory standards. To address this issue, the government, through the Tanzania Bureau of Standards (TBS), has established maximum allowable limits of 5 ppb for aflatoxin B1 and 10 ppb for total aflatoxins in food for human consumption (PACA, 2020). Despite these efforts, aflatoxin awareness remains a significant challenge in the country. For instance, research findings demonstrate low levels of awareness: In Dar es Salaam, 96.7% of respondents were unaware of contamination in spices during storage and its health effects (Fundikira et al., 2021). In Kilosa, 97% of participants did not recognize aflatoxin contamination in stored maize and groundnuts (Magembe et al., 2016). In Babati, while 62% were aware of aflatoxins, 98% lacked knowledge about associated health risks (Nyangi et al., 2016). The relationship between aflatoxin awareness and food security among smallholder farmers remains underexplored. This policy brief seeks to bridge that gap by examining the extent of aflatoxin awareness and its impact on food security.

The findings presented are part of a research conducted in Kishapu and Mvomero Districts, which involved 384 smallholder farmers.

Findings

Awareness of the economic and health effects of aflatoxins

Many farmers acknowledged that aflatoxins reduce harvest yieldsand that the affected crops fetch significantly lower prices compared to unaffected crops. However, unlike the economicimpacts, the health effects of aflatoxins were less commonly understood among smallholder farmers.

Table 1: The percentage of farmers informed about the effects of aflatoxin

Ward/ Effect	Reduce Price	Reduce Harvest	Stunted Growth	Liver Cancer	Death
Dakawa	91.03	89.74	21.79	17.95	16.67
Kishapu	91.53	92.37	8.47	4.24	2.54
Mvomero	94.00	92.00	23.00	16.00	18.00
Mwakipoya	89.77	89.77	9.09	4.55	2.27

Source: Field Data

Many farmers were unaware of the health effects of aflatoxin contamination. As a result, some farmers used contaminated crops to make alcohol (3.85% in Dakawa). Others fed contaminated crops to animals, with 2.56%, 2.00%, 0.85%, and 3.41% of farmers in Dakawa, Mvomero, Kishapu, and Mwakipoya wards, respectively, doing so. Even more concerning, a significant proportion of farmers—about 10.23% in Mwakipoya ward—mixed contaminated crops with uncontaminated ones in an attempt to increase food quantity.

Awareness on the causes of aflatoxin

Many farmers were aware that mono-cropping could lead to aflatoxin contamination, especially in Dakawa and Mvomero wards. But very few farmers recognised that soil type could also contribute to aflatoxin contamination.

Table 2: Percentage of farmers aware of aflatoxin causes

(a) Farm preparation stage					
Ward	Soil type	Climate	Drought	Soil Fertility	Monoculture
Dakawa	7.69	12.82	16.67	15.38	35.90
Kishapu	0.00	2.54	0.85	0.85	3.39
Mvomero	11.00	12.00	17.00	20.00	57.00
Mwakipoya	1.14	5.68	3.41	5.68	21.59
(b) Planting and growing					
Ward	Quality of Seeds	Plant Population	Insects		
Dakawa	20.51	35.90	44.87		
Kishapu	2.54	5.93	3.39		
Mvomero	22.00	56.00	70.00		
Mwakipoya	27.27	30.68	31.82		
(c) Harvesting Period					
Ward	Immaturity	Over maturity	Damage		
Dakawa	64.10	56.41	39.74		
Kishapu	4.24	0.85	5.93		
Mvomero	88.00	74.00	63.00		
Mwakipoya	18.18	10.23	15.91		
(d) During Storage					
Ward	Fast drying	Separation	Custody Cleanness	Air Circulation	Moisture
Dakawa	93.59	89.74	82.05	89.74	97.44
Kishapu	94.07	88.98	92.37	100.00	99.15
Mvomero	98.00	99.00	100.00	100.00	100.00
Mwakipoya	82.95	85.23	96.59	98.86	98.86

Source: Field data

Contrary to Kishapu and Mwakipoya, Dakawa and Mvomero wards had higher percentages of farmers informed about the causes of aflatoxin during harvest. Humidity differences influenced the maize drying methods. In Kishapu, most farmers left maize to dry in the field, while in Mvomero maize was harvested earlier and dried at home. During storage, nearly all farmers knew the causes of aflatoxin.

Conclusion and policy recommendations

This policy brief aimed to examine the levels of aflatoxin awareness among smallholder farmers in Tanzania. The findings revealed varying degrees of awareness regarding the economic and health effects of aflatoxin, as well as its occurrence during plant growth, harvesting, and storage. Most farmers were more aware of the economic effects of aflatoxin than the health risks, which is reflected in their handling of affected crops. Some farmers fed contaminated crops to animals without realizing that the fungus could be consumed through milk, eggs, or meat. However, farmers were generally informed about the causes of aflatoxin contamination during storage, primarily due to moisture and poor ventilation. Yet, they were not aware that factors such as drought, plant population, and over- or under-maturity of crops could also contribute to aflatoxin contamination.

Based on these findings, the study recommends the following policy actions and interventions by the government and other development stakeholders:

First, the government should organize awareness seminars to village leaders or community groups to raise awareness on the health effects of aflatoxins. From the civil society organization's perspective, there should be special segments on TVs, radios, and newspapers to educate the public about aflatoxins as a way of raising awareness from the national level to the ward and village levels.

Second, capacity building should be extended to all extension officers on the effects of aflatoxin, its occurrence and its prevention. Extension officers should, in turn, conduct regular seminars to the farmers in their respective areas.

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