FACTS
- 4.5 billion people face uncontrolled risk of AF exposure and PCRSF found widespread chronic dietary exposure in Africa.
- Peanuts and many staple foods are contaminated with AF at levels above those allowable for trade.
- Maize is one of the greatest sources of AF exposure.
- Strategies addressing AF and other mycotoxins generally occur only after large scale extreme contamination events.
- Mycotoxin exposure is not visible or easily tested, and thus remains a silent threat to most Africans.
- Research supported by PCRSF has found significant links between health, immunity, HIV, and these mycotoxins.

High Afflatoxin levels cause:
- Suppressed immunity
- Decreased vitamin A, E
- Increased malaria infection
- Modified immunity in HIV suggesting rapid progression and higher transmission
- Increased TB in HIV patients
- Increased maternal anemia
- Increased poor pregnancy outcomes
- More underweight children under 5 years old

MYCOTOXINS
What are mycotoxins?
They are contaminants of food produced by molds. There are at least two common mycotoxins connected to the HIV epidemic, Afflatoxin (AF) and Fumonisin (FN).

Where are they found and who is exposed?
These toxins occur in many foods but are particularly important for peanuts (AF) and corn (AF and FN). People in areas with high consumption of these two foods are at greatest risk for mycotoxin exposure.

What do they do to people?
FN promotes esophageal cancer and makes membranes porous. AF promotes liver cancer and suppresses immunity and nutritional status. Therefore both of these toxins influence the occurrence of infections and the course of diseases.

APLATOXIN: AN INVISIBLE FACTOR IN HEALTH
AF is clearly an immune suppressing agent, and HIV positive people who have been exposed to higher levels have significantly lower immunity than their peers with less AF. Effectively, AF accelerates progression of the disease. Associated with this double immune suppression is a greater risk of active TB. Perhaps because of economic stress, HIV+ Ghanaians have greater exposure than their unaffected peers. AF is rarely tested for, but does visibly obstructs symptoms appear when individuals are exposed to pre-vailing levels. Exposure is reflected in higher rates of deadly diagnosed infectious diseases, like malaria.

Example of Afflatoxin levels

<table>
<thead>
<tr>
<th>Afflatoxin Levels</th>
<th>US (Texas)</th>
<th>Ghana (Ejura)</th>
<th>China (Guangxi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Number</td>
<td>151</td>
<td>795</td>
<td>136</td>
</tr>
<tr>
<td>Detection Rate (%)</td>
<td>17.2%</td>
<td>90.7%</td>
<td>97.1%</td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>0.99 ± 2.06</td>
<td>10.95 ± 19.01</td>
<td>7.34 ± 16.50</td>
</tr>
<tr>
<td>Range</td>
<td>0.05 - 16.01</td>
<td>0.44 - 266.73</td>
<td>0.08 - 179.58</td>
</tr>
</tbody>
</table>

* Detection rate (%) represents the percent of the sample testing positive for Afflatoxin.

CORN AND HIV IN AFRICA
PCRSF studies show a linear relationship between HIV death rates and corn consumption in Africa. We believe mycotoxins is likely to be playing a role in this relationship. The link between HIV and corn consumption, or other AF prone foods like peanuts, is particularly critical in Africa where AIDS rates are high and food is limited. Quality food security is essential in countries where health risks are high.

When food is scarce, all food is consumed, even contaminated food.

PEANUT CRSP FIXING THE PROBLEM
- Early Detection
  - Managing pests during production to reduce mycotoxins
  - Testing and monitoring levels of toxins
- Storage
  - Using industry partners to develop low moisture and unpalatable storage facilities
- Food Processing
  - Separating contaminated food from healthy food
- Market Based Approaches
  - Creating incentives to price differentiated poor quality foods with un-contaminated foods
- Education and Awareness
  - Working with Women Associations to let them lead communities in mycotoxin management
- Innovative Solutions
  - Cutting edge work—PCRSF researchers find the use of a mineral additive to foods can reduce contamination by binding the toxins making it inert and harmless to humans.