

Contaminated Crops have Uses and Can be Valuable

Markets are needed to provide value to crops unsafe for human consumption

| US FDA Action Level | Permitted Use (Examples) | Aflatoxin | Market |
|---------------------------|---|-----------|------------------|
| 500 ppb | Middleman (Blender) | 20 ppb ≤ | Detoxification |
| 300 ppb | Finishing Beef | 500 ppb > | Blender |
| 200 ppb | Finishing Swine | 300 ppb > | Beef feedlot |
| 100 ppb | Breeding beef and swine; mature poultry | 200 ppb > | Feed producer |
| 20 ppb | Human Food, Feed | 100 ppb > | Feed Markets |
| 0.5 ppb (M ₁) | Milk | 20 ppb > | Human Food; Feed |
| | | 15 ppb > | Corn Flour Mill |
| | | 10 ppb > | Corn Processor |
| | | 1 ppb > | Nuts for Export |
| | | 0.5 ppb > | Discounted Milk |
| | | 0.3 ppb > | Full Value Milk |

Alternative uses of contaminated crops

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Maximum Aflatoxin Level Accepted



| | Aflatoxin | Market |
|-----------------------|---------------|------------------|
| Least Value | 20 ppb \geq | Detoxification |
| | 500 ppb $>$ | Blender |
| | 300 ppb $>$ | Beef feedlot |
| | 200 ppb $>$ | Feed producer |
| | 100 ppb $>$ | Feed Markets |
| | 20 ppb $>$ | Human Food; Feed |
| | 15 ppb $>$ | Corn Flour Mill |
| Greatest Value | 10 ppb $>$ | Corn Processor |

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Crop Value in the Target Market



Maximum Aflatoxin Level Accepted



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Location 1

| Aflatoxin | Market |
|-----------|------------------|
| 20 ppb ≤ | Detoxification |
| 500 ppb > | Blender |
| 300 ppb > | Beef feedlot |
| 200 ppb > | Feed producer |
| 100 ppb > | Feed Markets |
| 20 ppb > | Human Food; Feed |
| 15 ppb > | Corn Flour Mill |
| 10 ppb > | Corn Processor |

Location 2

| Aflatoxin | Market |
|-----------|------------------|
| 20 ppb ≤ | Detoxification |
| 500 ppb > | Blender |
| 300 ppb > | Beef feedlot |
| 200 ppb > | Feed producer |
| 100 ppb > | Feed Markets |
| 20 ppb > | Human Food; Feed |
| 15 ppb > | Corn Flour Mill |
| 10 ppb > | Corn Processor |

Testing (sampling; diagnostics)

Aflatoxin Contamination is Highly Heterogeneous

Severe variation at every level: Ear, Bag, Field, District, etc.

Analyses are Estimates

Many accurate analytical methods for measuring aflatoxins.
Precision of the estimate is limited by sampling.

Regions Differ in Aflatoxin Incidence and Severity

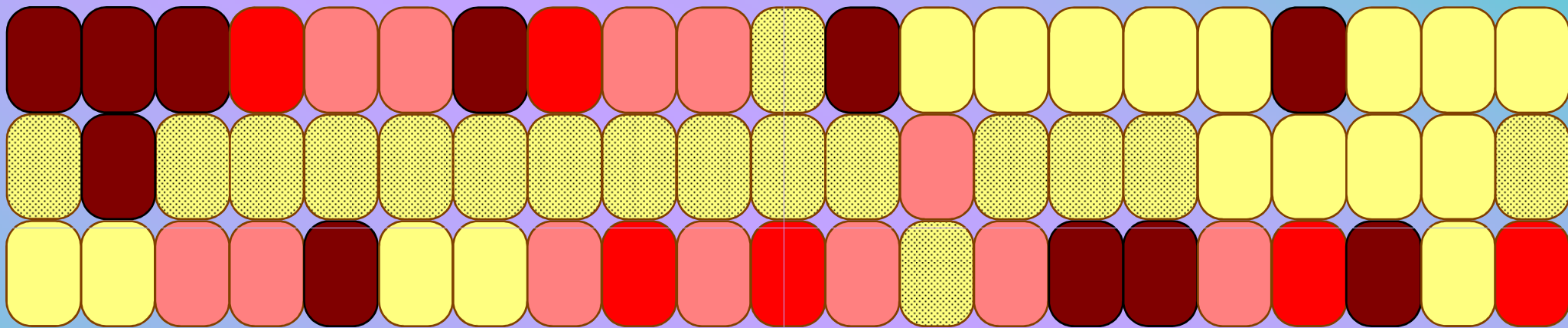
We can readily identify areas with reduced frequency & severity.

Aflatoxin Levels Change over Time





Some years have much higher aflatoxins than others.
Aflatoxins can increase during transport, storage, and use.

Need to Develop Systems to Sample Crops in a Manner
Useful for Delivering Safe Food in Target Areas

Aflatoxin Variability Among Kernels in a Single Ear



Lee, et al., 1980.
Cereal Chemistry 57:340-343.

-  = less than 2,500 ppb
-  = 2,500 to 15,000 ppb
-  = over 15,000 ppb
-  = infected and no toxin

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African Union Common Repository

<http://archives.au.int>

Agriculture and Food Security

Partnership for Aflatoxin Control in Africa (PACA) collection

2011

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<http://archives.au.int/handle/123456789/41>

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