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)
500 ppb	Middleman (Blender)
300 ppb	Finishing Beef
200 ppb	Finishing Swine
100 ppb	Breeding beef and swine; mature poultry
20 ppb	Human Food, Feed
0.5 ppb (M_1)	Milk

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
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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	Aflatoxin	Market
Least Value	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
Greatest Value	10 ppb>	Corn Processor

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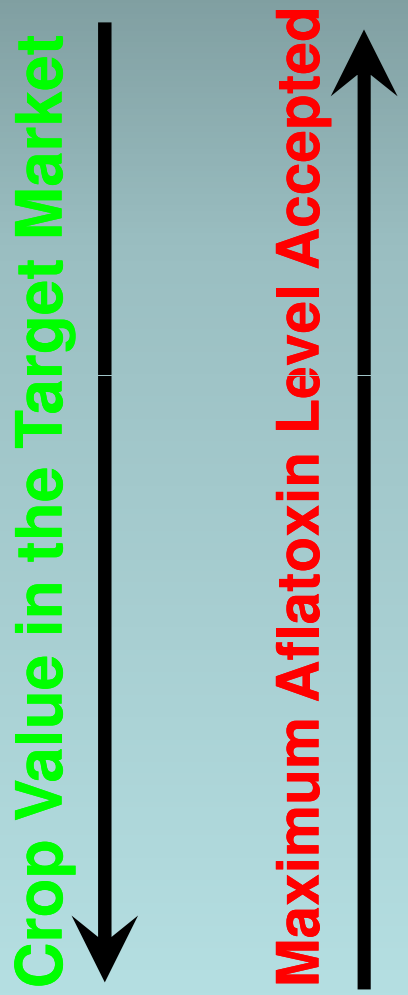

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Location 1

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

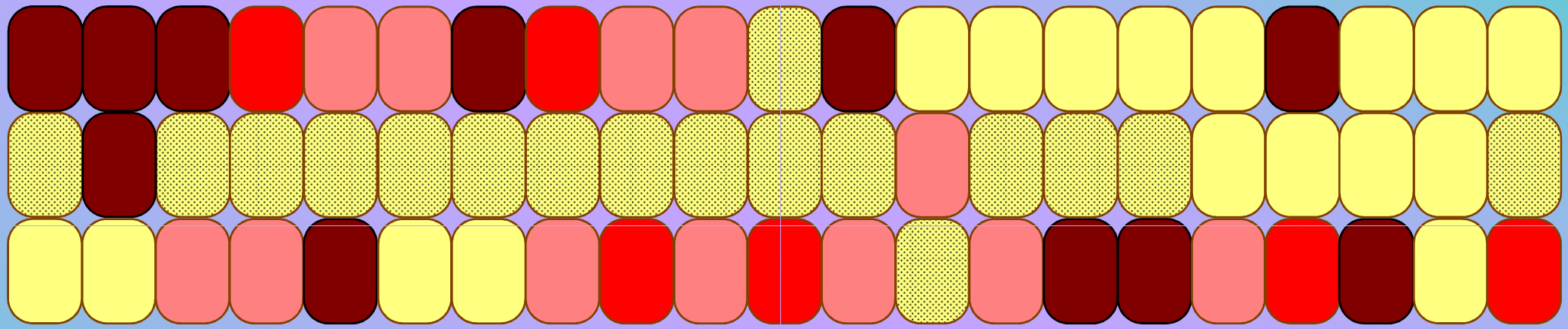
We can readily identify areas with reduced frequency & severity.

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

2011

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