



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

This presentation is part of the

## **Agriculture and Nutrition Global Learning and Evidence Exchange (AgN-GLEE)**

held in Guatemala City, Guatemala from March 5-7, 2013.

For additional presentations and related event materials, visit: <http://spring-nutrition.org/agnglee-lac>



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# Aflatoxin in Guatemalan Maize: First exposure estimate, 2012

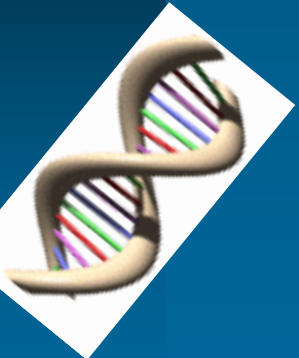


Olga Torres, LDM

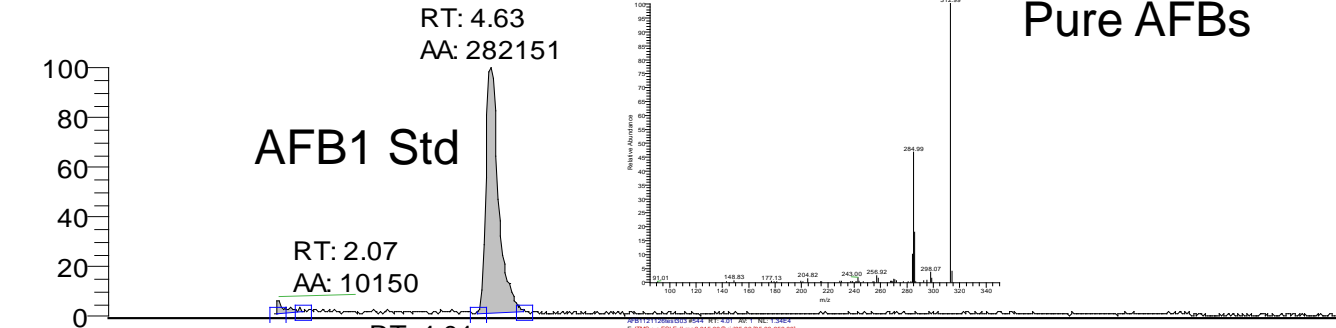
Ronald T. Riley, USDA

Jorge Matute, CIENSA

*Spring Meeting, March 5-7 2013*

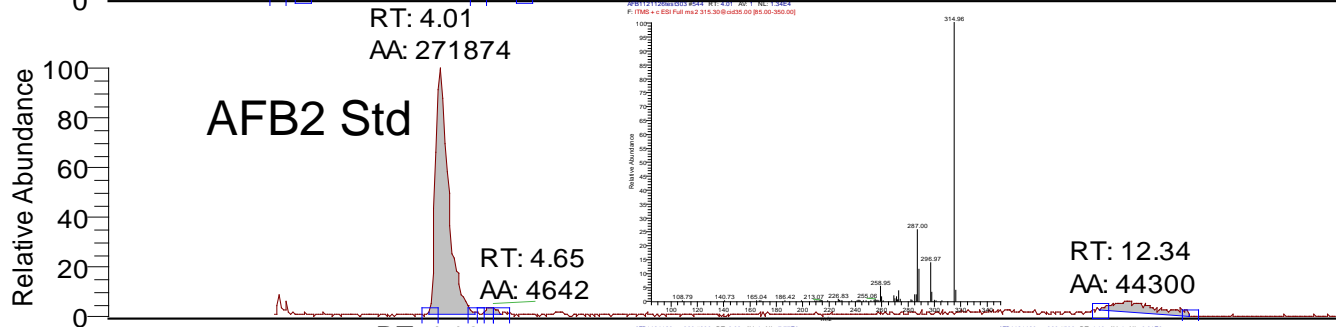


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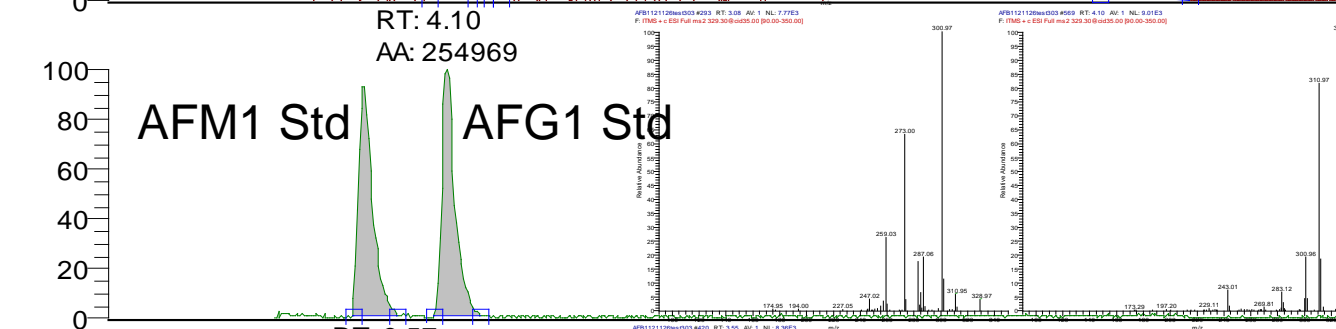


Pure AFBs

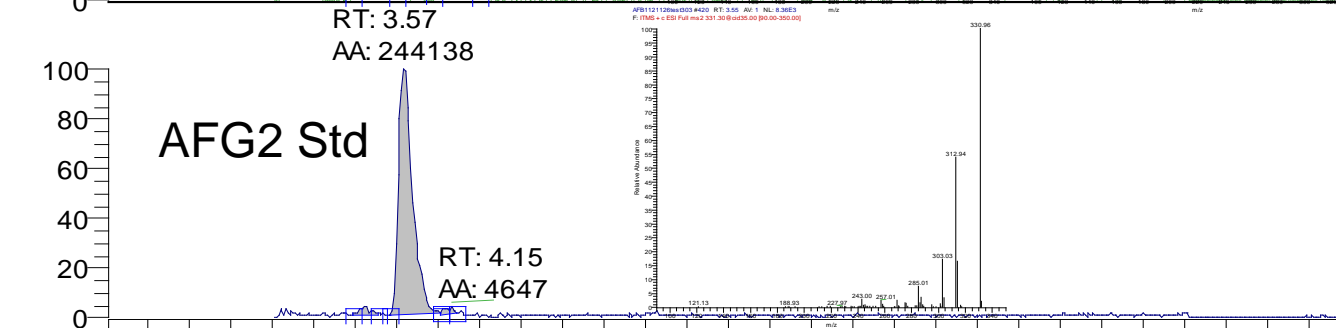
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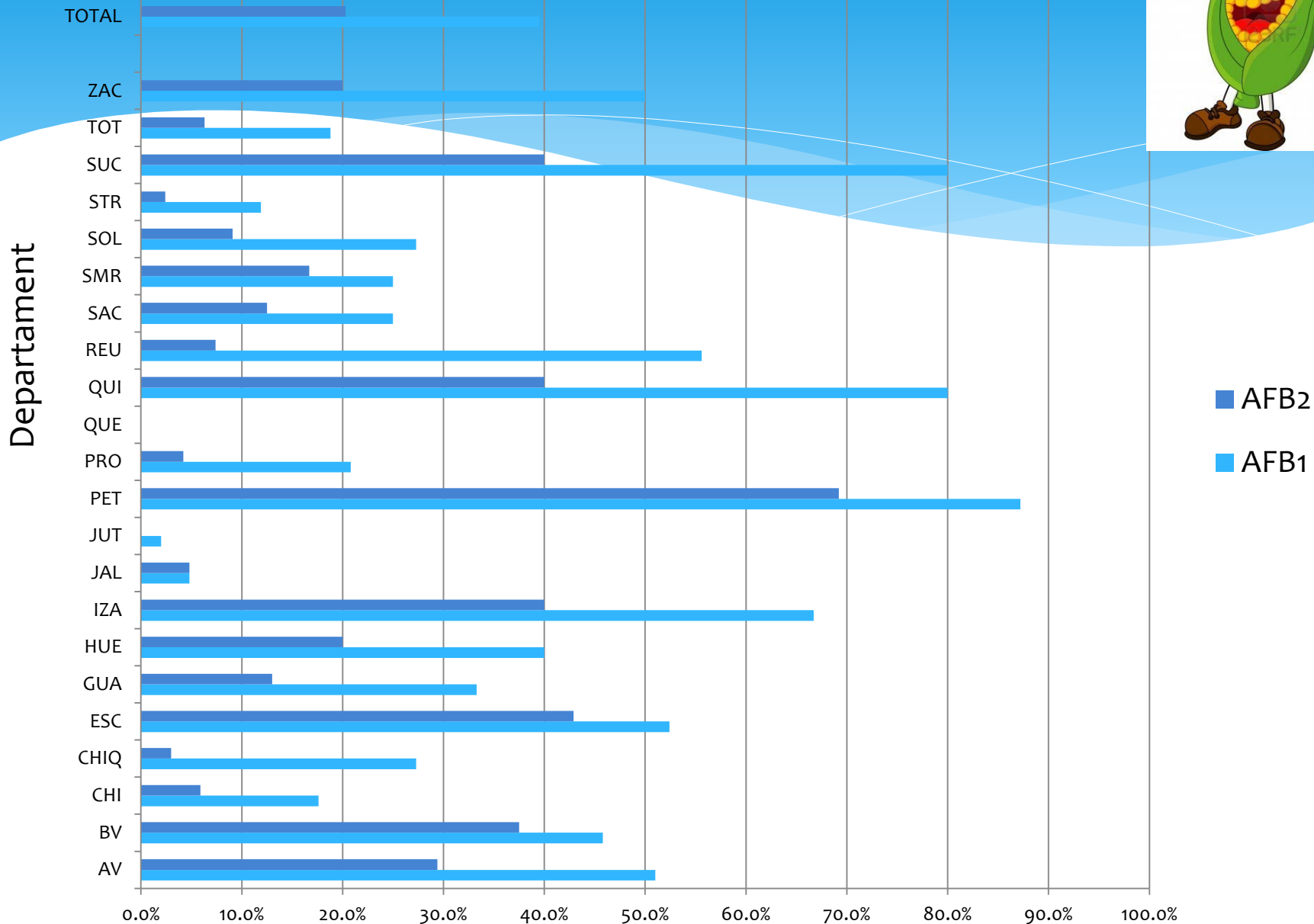


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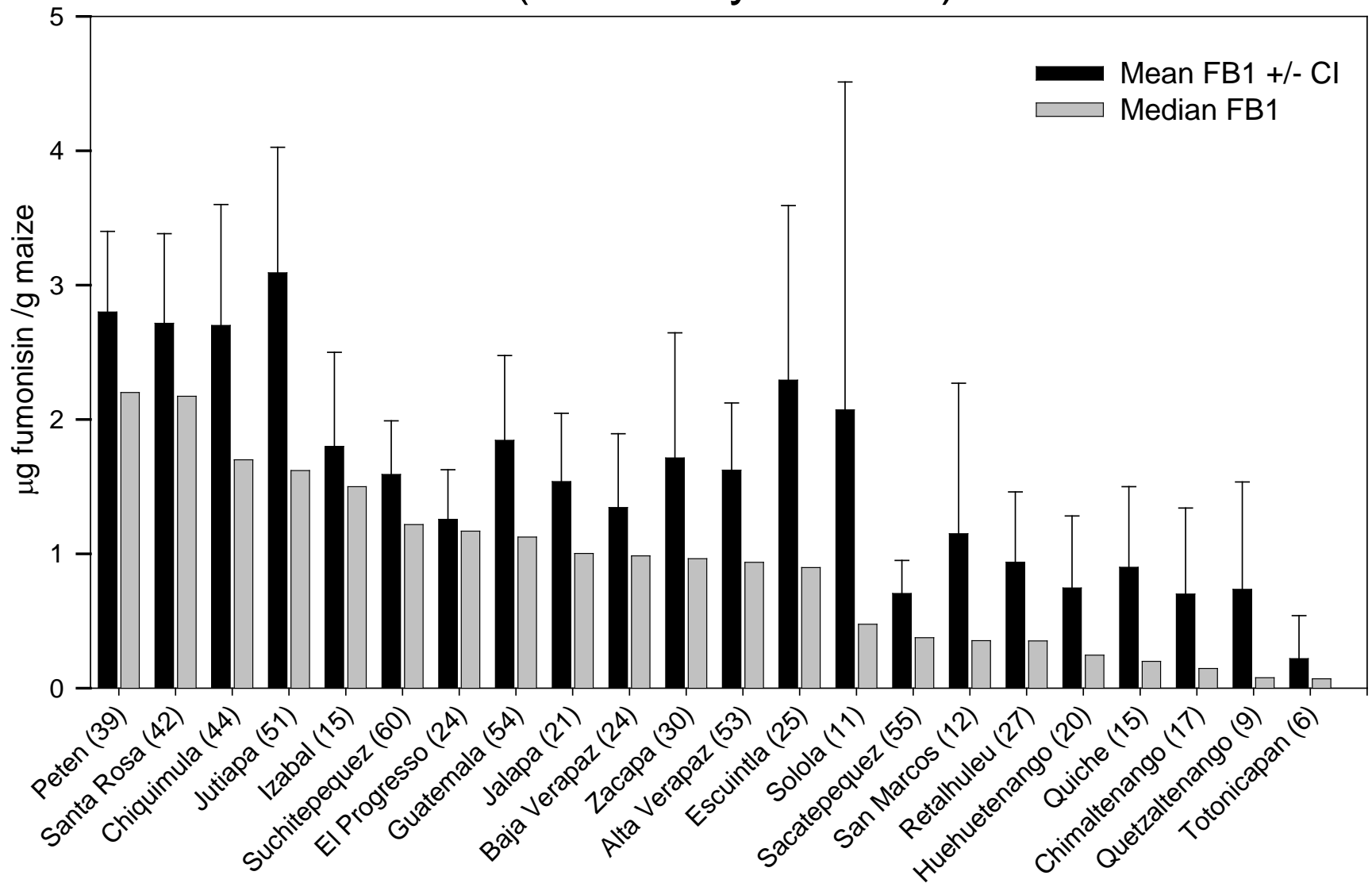


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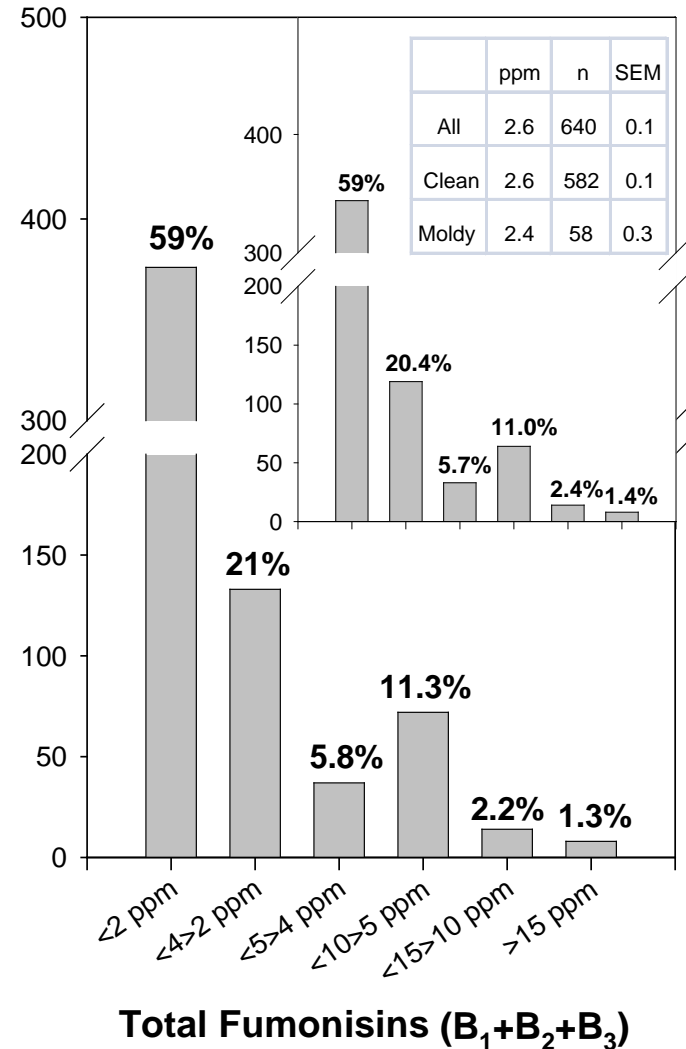
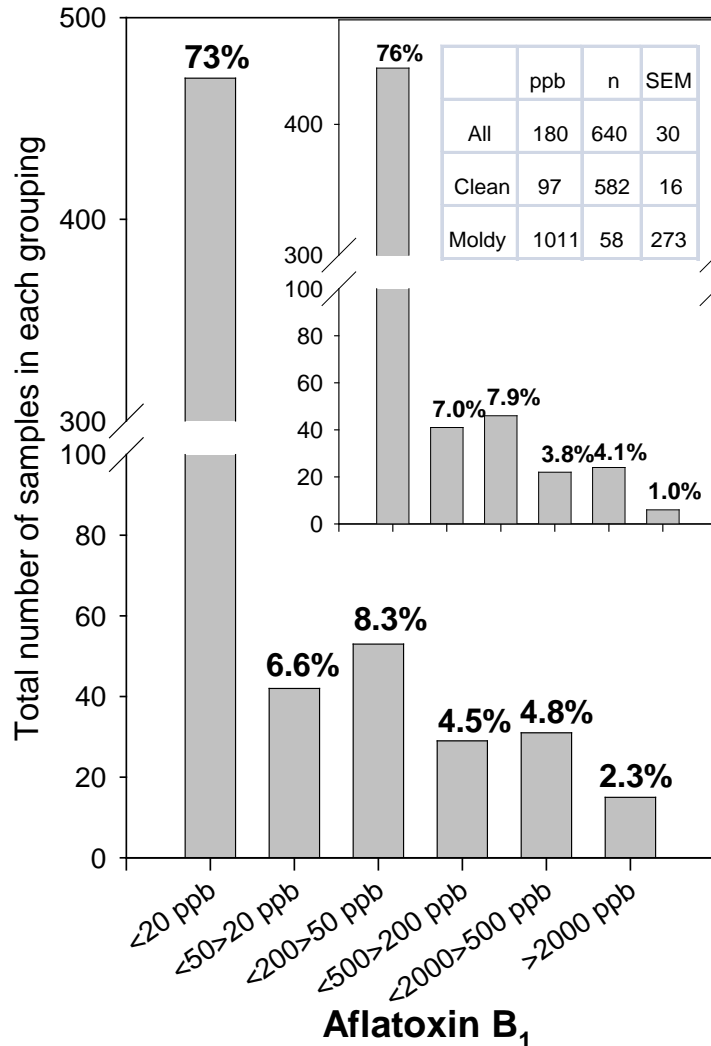
# Aflatoxins B1 and B2 in Maize samples purchased at local markets in 22 Depts. Of Guatemala, July-Oct 2012



# Fumonisin levels in maize by Department 2012 (Sorted by median)



# Frequency and Distribution of Aflatoxina B<sub>1</sub> & Total Fumonisin in corn (640 samples collected in the 22 departamentos of Guatemala, 2012)



# The 8 municipios with higher rates of stunting in Guatemala

- 1 San Mateo Ixtatán, Huehuetenango
- 2 San Rafael Independencia, Huehuetenango
- 3 San Miguel Acatán, Huehuetenango
- 4 San Juan Atitán, Huehuetenango
- 5 Santiago Chimaltenango, Huehuetenango
- 6 Concepción Tutuapa, San Marcos
- 7 Comitancillo, San Marcos
- 8 Nebaj, Quiché

# Estimate of total aflatoxin exposure

Indicator	% > 20 ppb  n=155	Number of cases with high levels of aflatoxin (%)/ Average of Concentration of Total aflatoxins (ppb)							
		Municipios							
		1 (n=20)	2 (n=20)	3 (n=20)	4 (n=19)	5 (n=19)	6 (n=19)	7 (n=19)	8 (n=19)
% homes exceeding 20ppb (>= 20ppb)	14.0% (4.5, 23.4)	0	0	0	3 cases (9.6%)	0	4 cases (16.%)	5 cases (26.%)	1 cases (9.5%)
Average Aflatoxin (ppb)	11.5 ppb (2.0, 20.9) (min= 0, max=134)	2.4 ppb	1.4 ppb	1.6 ppb	7.7 ppb	0.8 ppb	13.1 ppb	40.7 ppb	2.9 ppb
Exposure to Aflatoxins by Kg body w child per day		86.8	23.9	89.1	312	41.7	2116	6641	405.5



## Fumonisin B<sub>1</sub> Promotes Aflatoxin B<sub>1</sub> and *N*-Methyl-*N'*-nitro-nitrosoguanidine-Initiated Liver Tumors in Rainbow Trout

David B. Carlson,\* David E. Williams,†<sup>1</sup> Jan M. Spitsbergen,† P. Frank Ross,‡  
Charles W. Bacon,§ Filmore I. Meredith,§ and Ronald T. Riley§<sup>1</sup>

1992- present - Disruption of sphingolipid metabolism as the mechanism of action for fumonisin-induced diseases in-----

- Humans
- Horse
- Pig
- Goat
- Rabbit
- Mink
- Rat
- Mouse
- Turkey
- Chicken
- Duck
- Catfish
- Trout
- Carp
- Corn seedlings
- Tomato

TABLE 1  
Liver Tumor Incidence in Trout Fed FB<sub>1</sub> Alone  
or Following AFB<sub>1</sub> Initiation<sup>a</sup>

FB <sub>1</sub> (ppm)	FB <sub>1</sub> only <sup>b</sup> (%)	AFB <sub>1</sub> initiation <sup>c</sup> (%)
0	0 ( <i>n</i> = 68)	35% ( <i>n</i> = 94)
3	0 ( <i>n</i> = 73)	39% ( <i>n</i> = 87)
23	0 ( <i>n</i> = 21)	61% ( <i>n</i> = 62)*
104	0 ( <i>n</i> = 50)	74% ( <i>n</i> = 81)*