

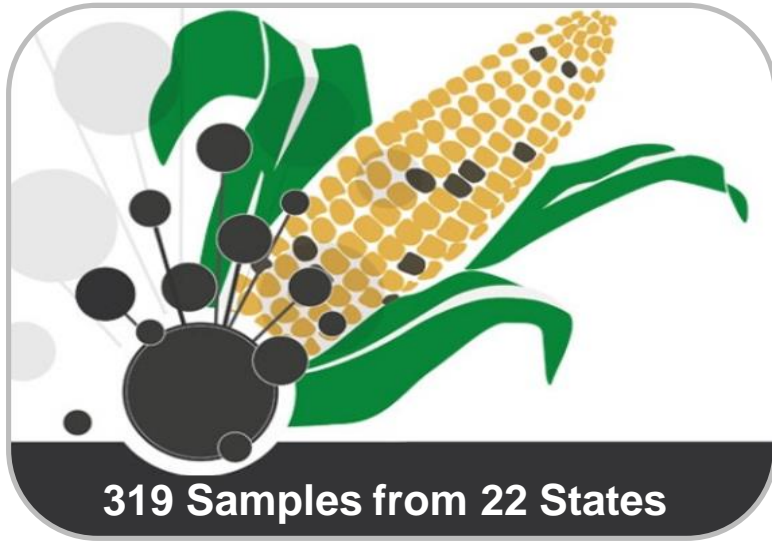


# Mycotoxin Occurrence in 2019

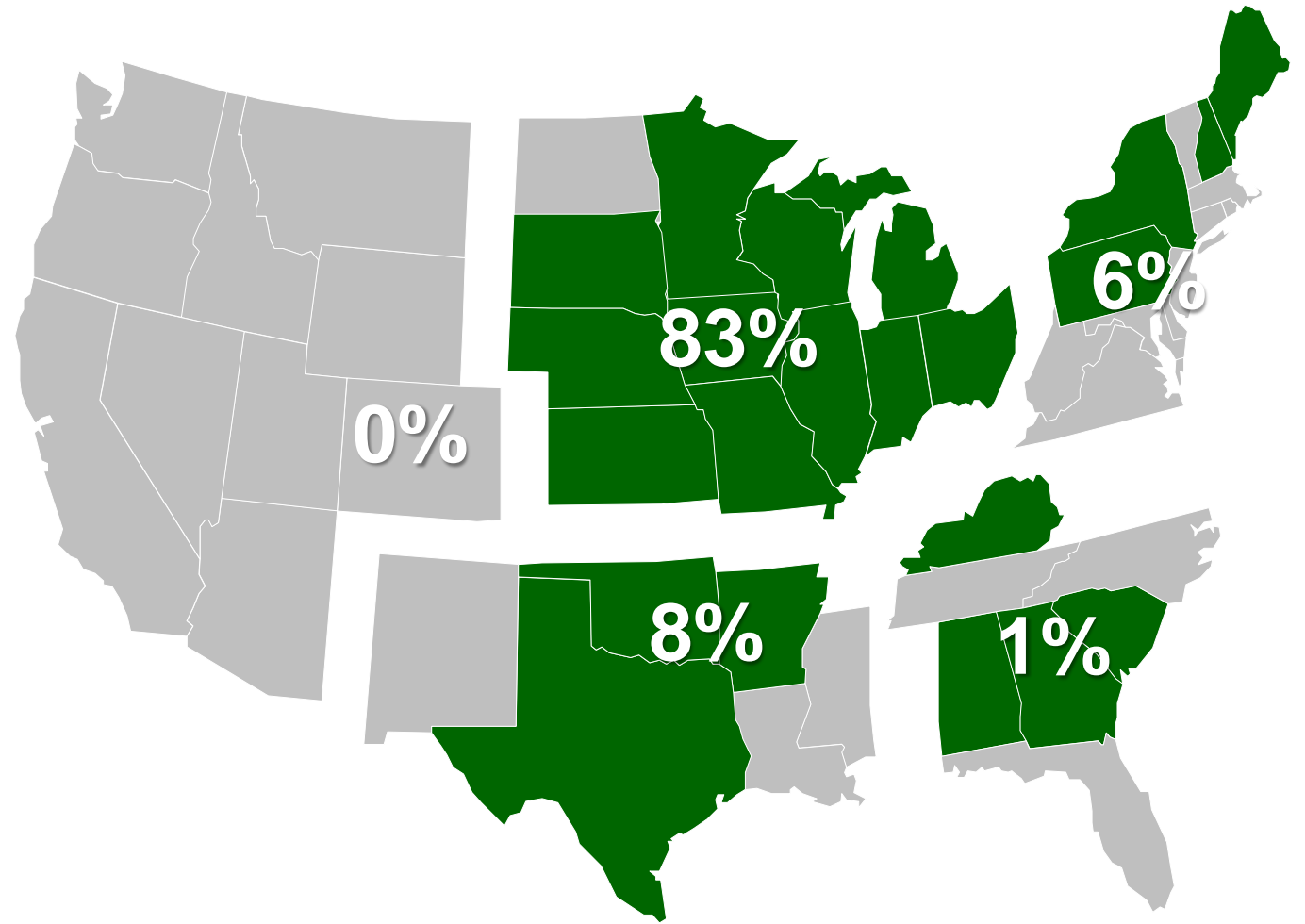
## US Corn, Corn By-products, and Corn Silage

Update Feb 7, 2020

# Sample Overview



92 samples with clinical cases excluded

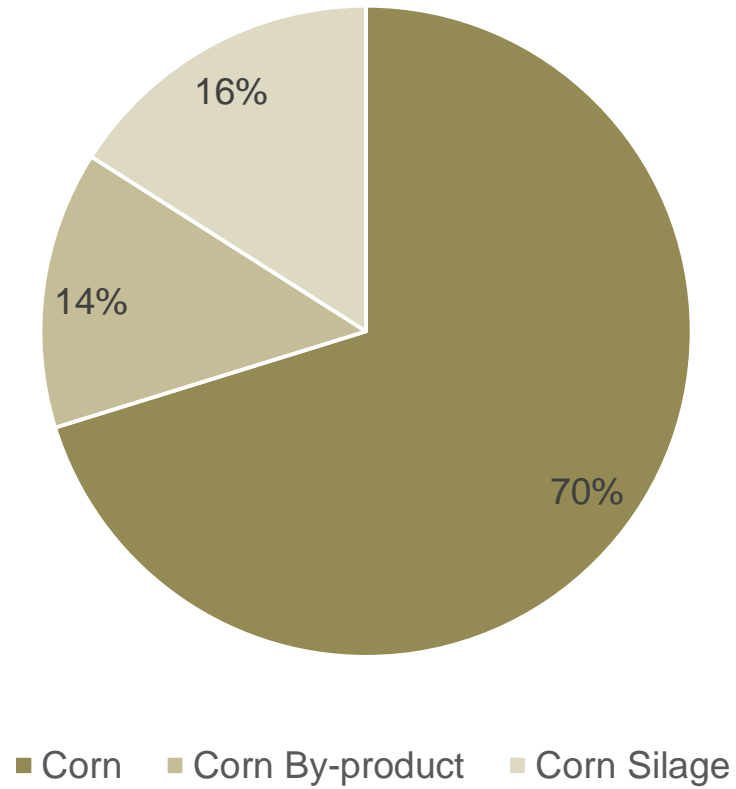


3% Unknown

# Sample Overview



Sample Matrix



# Mycotoxins & Analysis



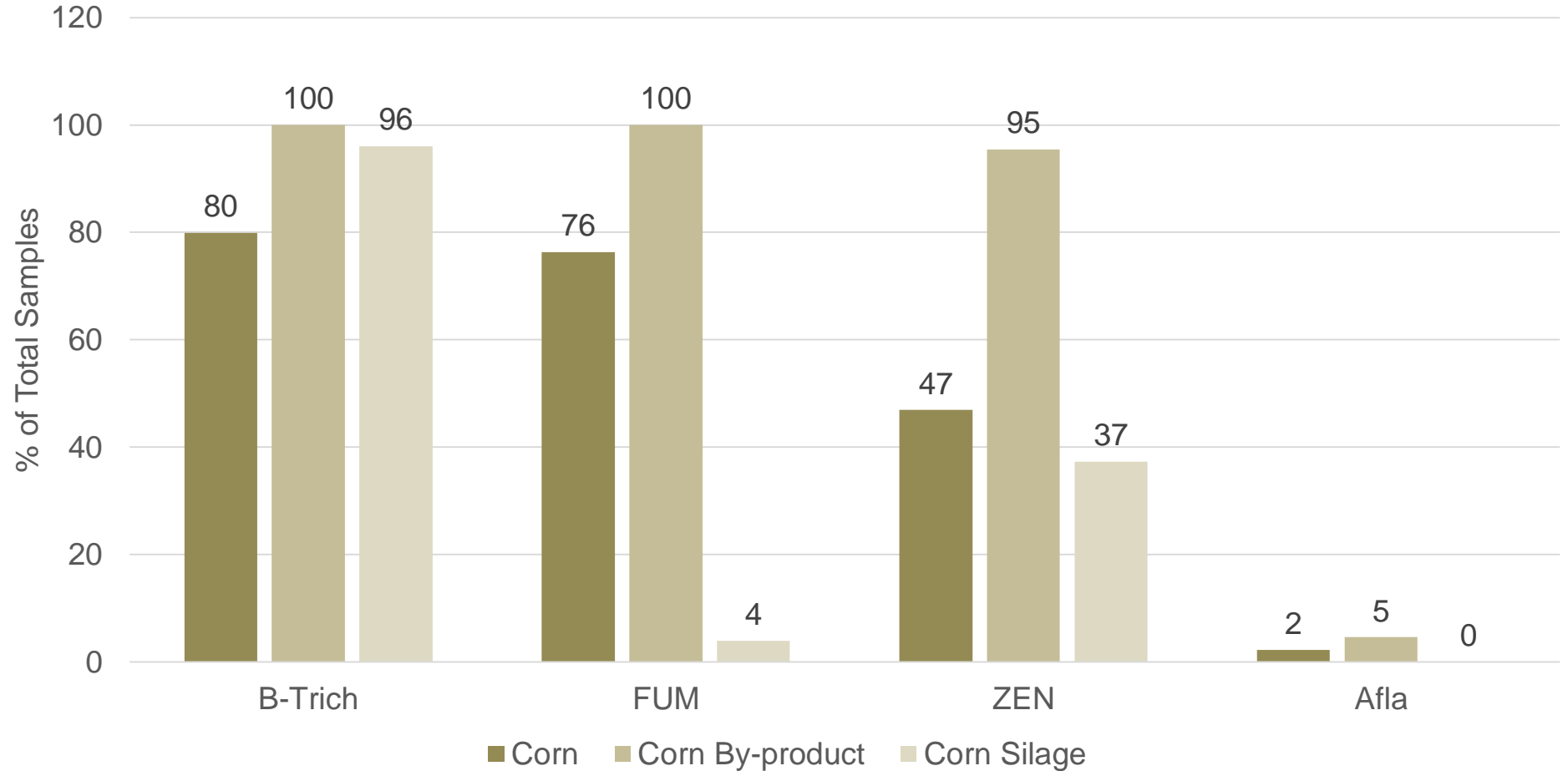
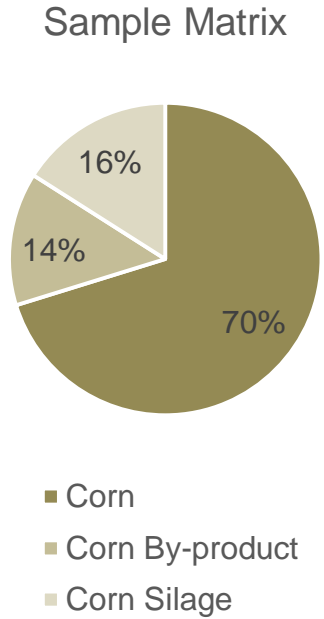
LC-MS/MS



3 Labs

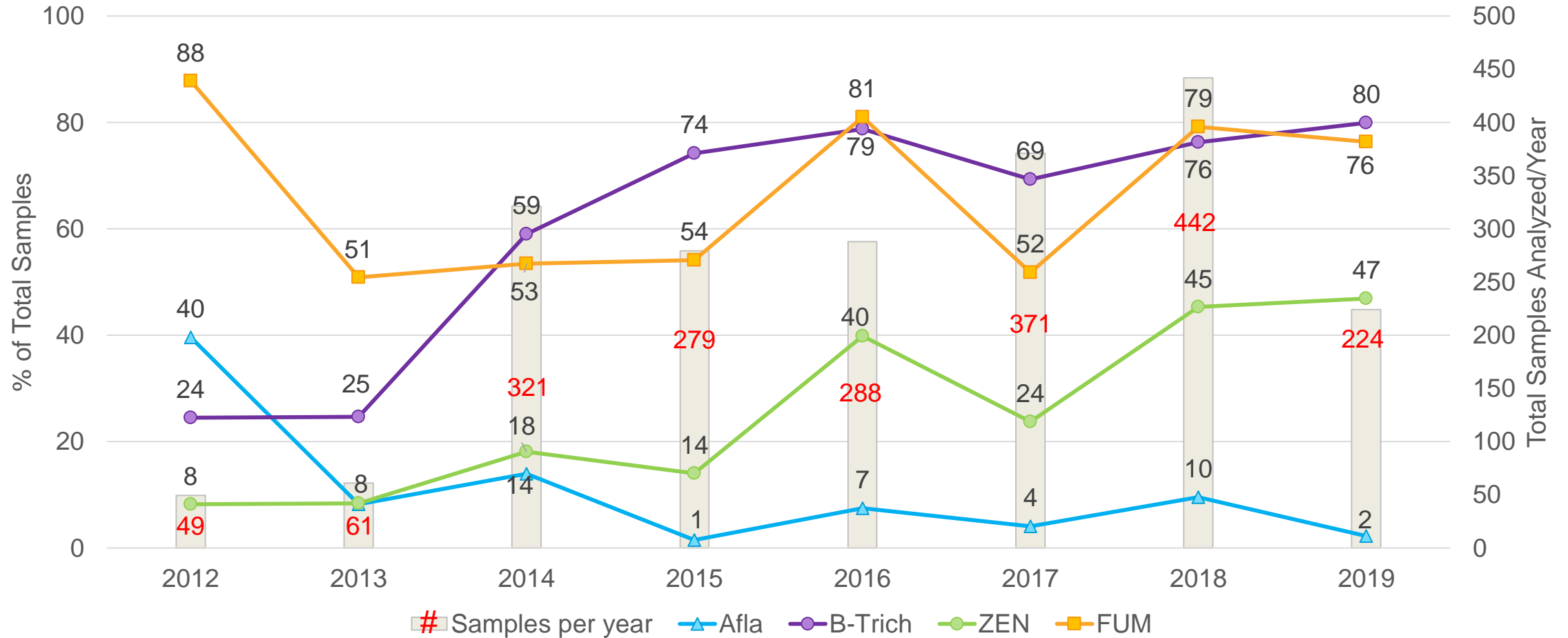
Mycotoxin Group	Mycotoxins	Limit of Detection (ppb)
Aflatoxins (AFLA)	Aflatoxin B1	1.3
	Aflatoxin B2	1.2
	Aflatoxin G1	1.1
	Aflatoxin G2	1.6
A-Trichothecenes (A-Trich)	T-2	100.0
	HT-2	100.0
	Neosolaniol	100.0
	Diacetoxyscirpenol (DAS)	100.0
B-Trichothecenes (B-Trich)	Deoxynivalenol (DON/Vomitoxin)	100.0
	Acetyldeoxynivalenol (A-DON)	100.0
	Nivalenol (NIV)	100.0
Fumonisin (FUM)	Fusarenon X (FUS-X)	100.0
	Fumonisin B1	100.0
	Fumonisin B2	100.0
Zearalenone (ZEN)	Fumonisin B3	100.0
	Zearalenone (ZEN)	51.7
Ocharatoxin A (OTA)	Ocharatoxin A (OTA)	1.1

# Occurrence 2019: Corn, Corn By-Product, Corn Silage



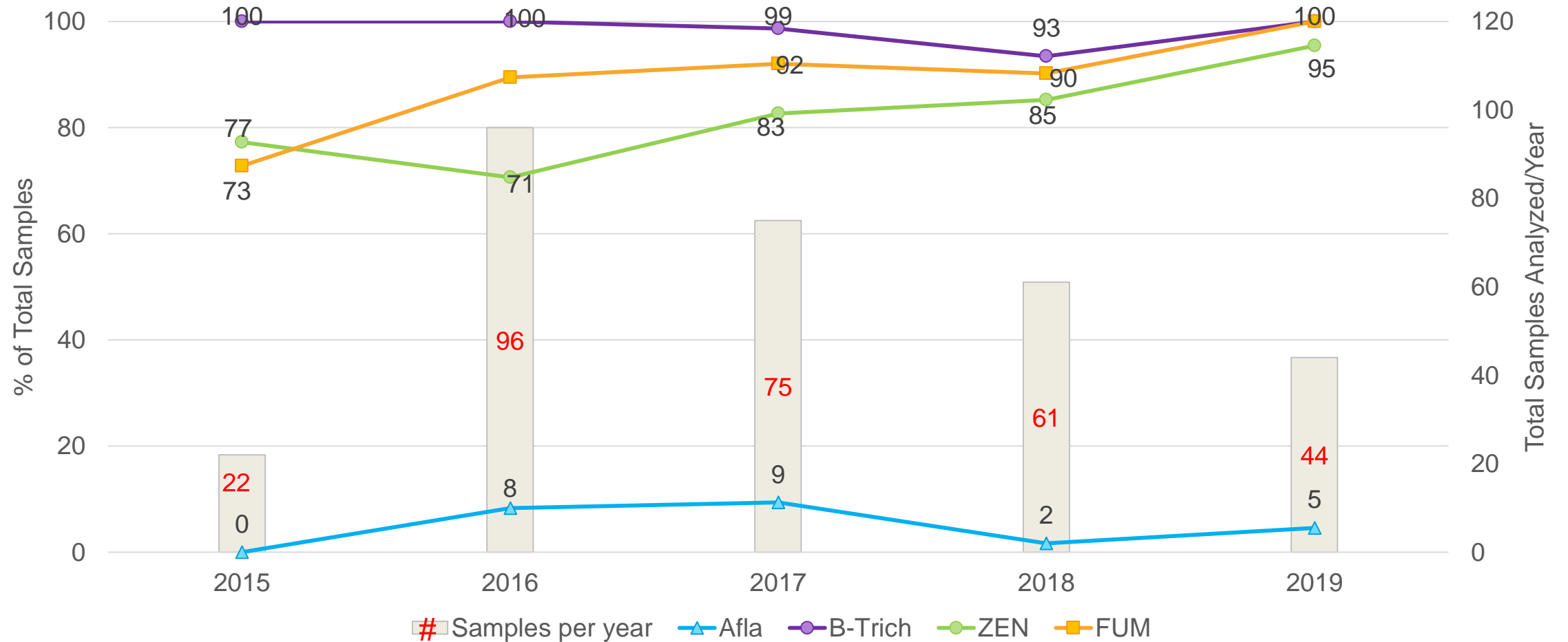
B-Trichothececes include Deoxynivalenol, Nivalenol, Fusarenon-X, Acetyl-Deoxynivalenol  
 A-Trichothececes and Ochratoxin A are not presented due to insignificant positive samples

# Occurrence: Corn



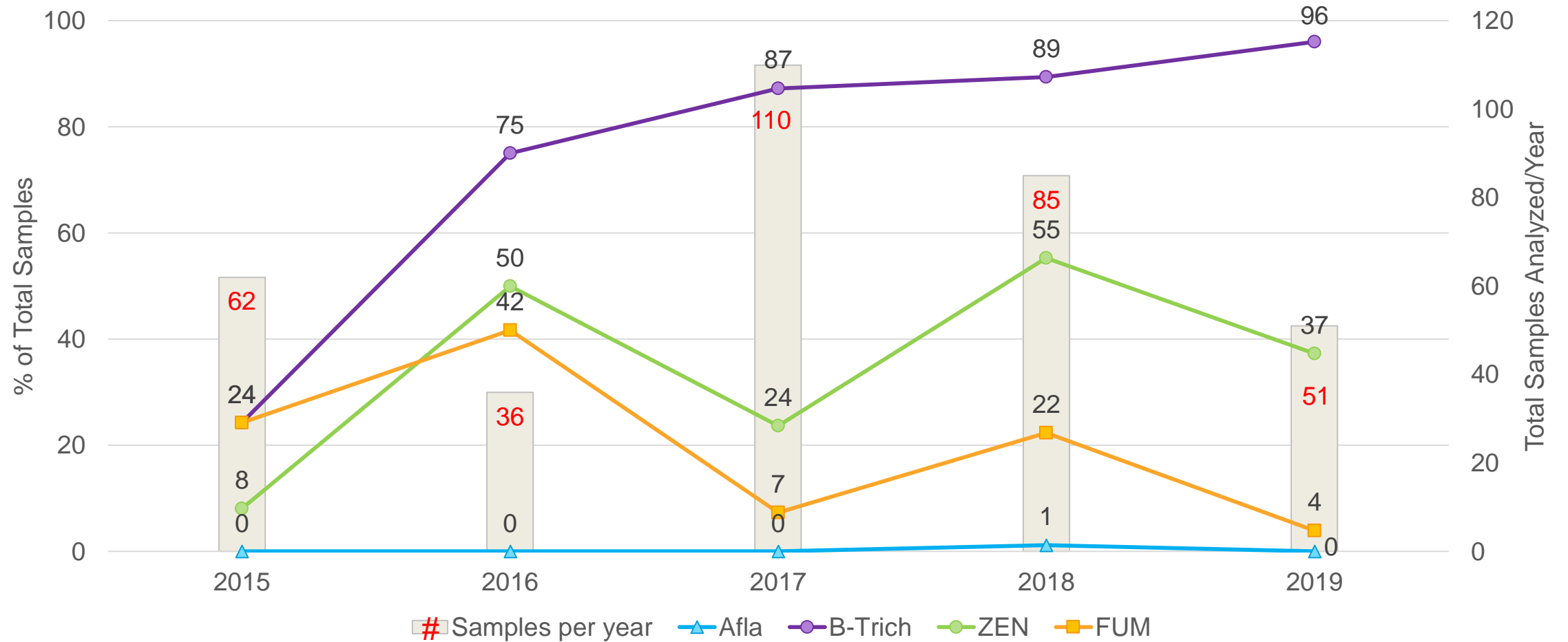
B-Trichothecenes include Deoxynivalenol, Nivalenol, Fusarenon-X, Acetyl-Deoxynivalenol  
 A-Trichothecenes and Ochratoxin A are not presented due to insignificant positive samples

# Occurrence: Corn By-product



B-Trichotheceenes include Deoxynivalenol, Nivalenol, Fusarenon-X, Acetyl-Deoxynivalenol  
 A-Trichotheceenes and Ochratoxin A are not presented due to insignificant positive samples

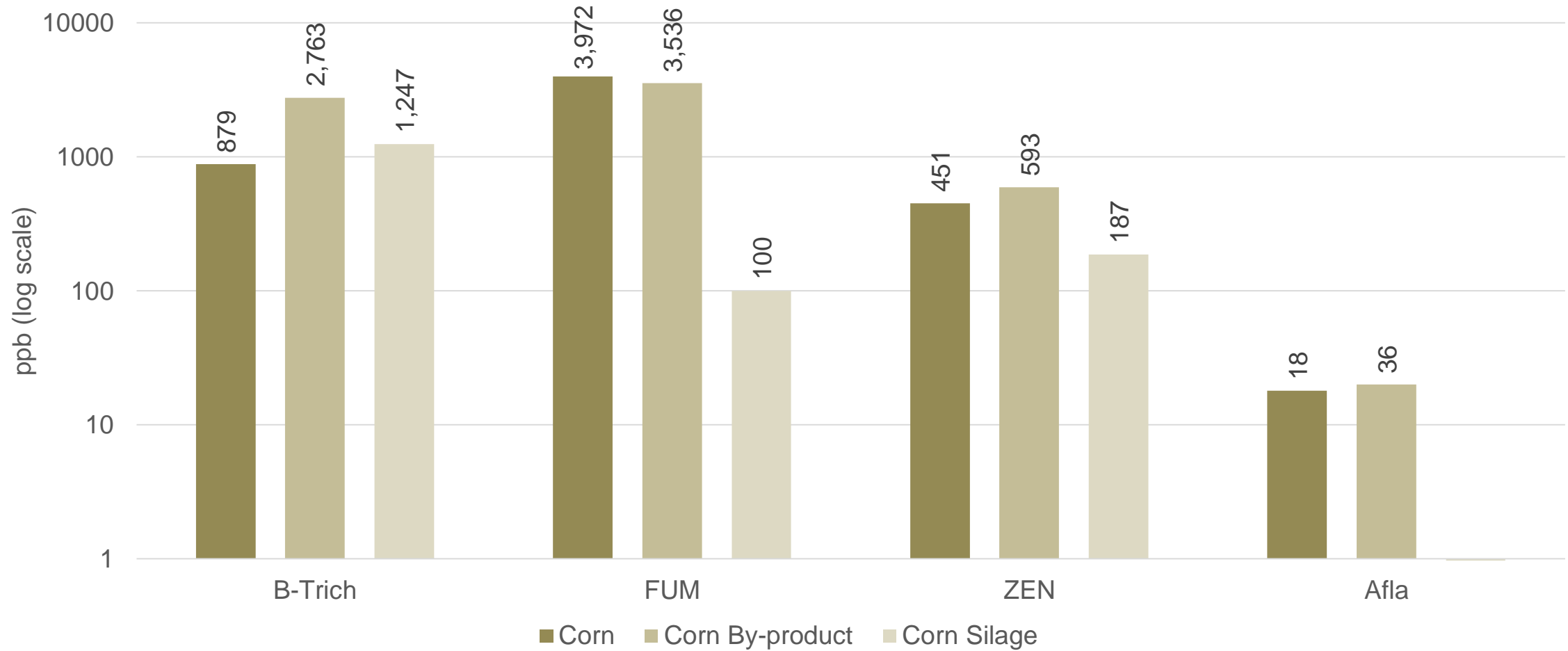
# Occurrence: Corn Silage



B-Trichotheceenes include Deoxynivalenol, Nivalenol, Fusarenon-X, Acetyl-Deoxynivalenol  
 A-Trichotheceenes and Ochratoxin A are not presented due to insignificant positive samples

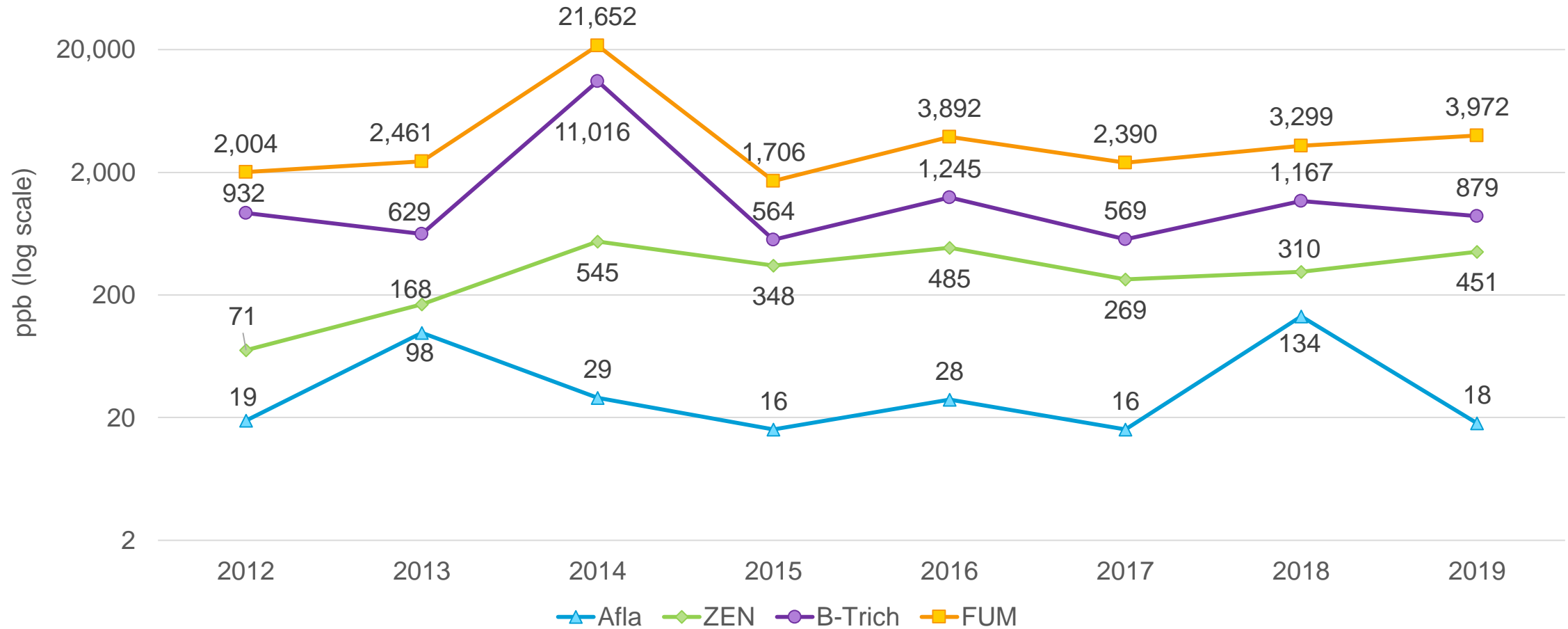


# Mean of Positives 2019: Corn, Corn By-product, Corn Silage



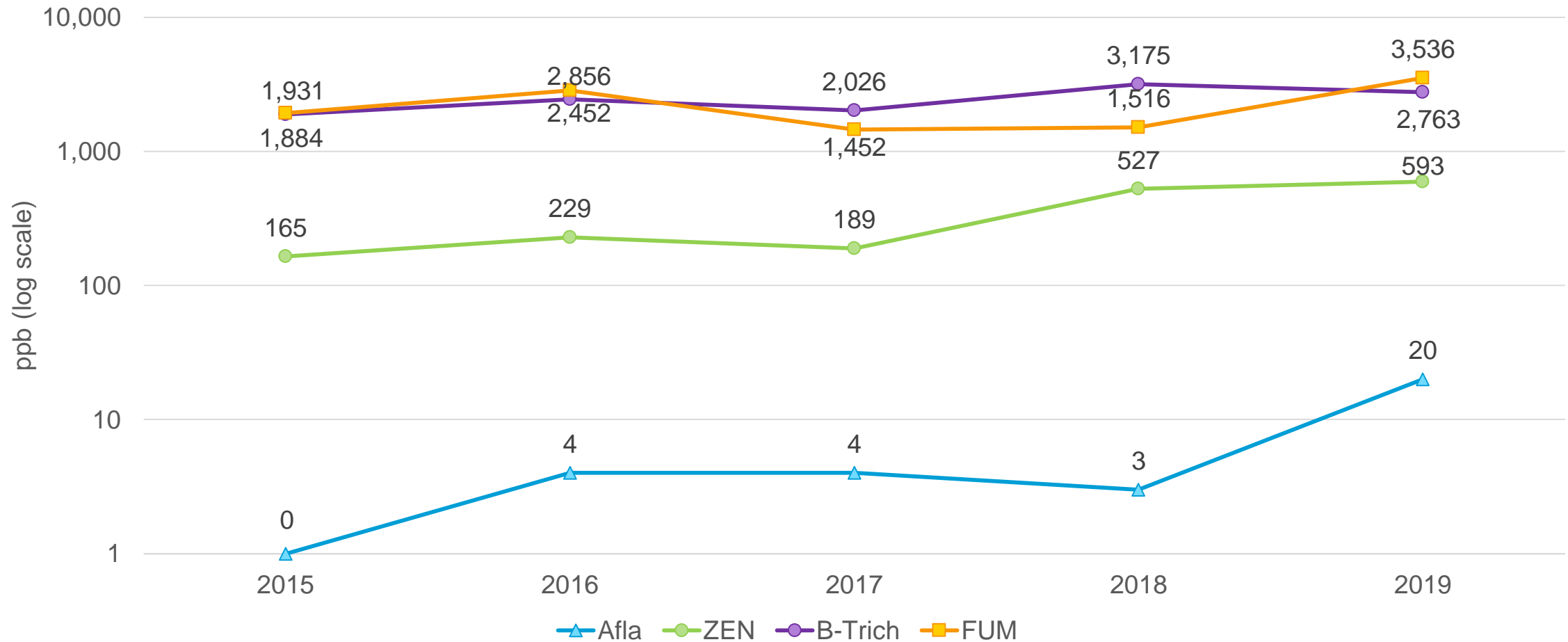
B-Trichothecenes include Deoxynivalenol, Nivalenol, Fusarenon-X, Acetyl-Deoxynivalenol  
 A-Trichothecenes and Ochratoxin A are not presented due to insignificant positive samples

# Mean of Positives: Corn



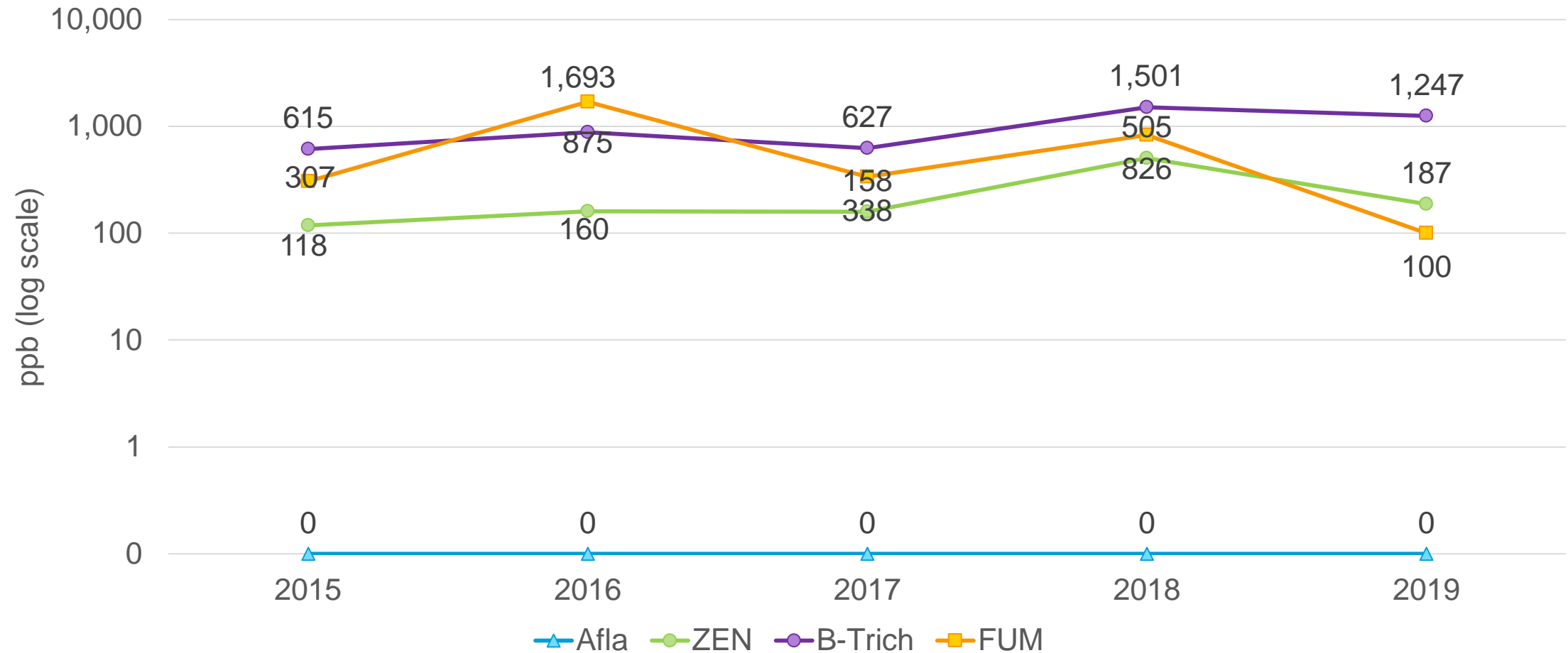
B-Trichothecenes include Deoxynivalenol, Nivalenol, Fusarenon-X, Acetyl-Deoxynivalenol  
 A-Trichothecenes and Ochratoxin A are not presented due to insignificant positive samples

# Mean of Positives: Corn By-product



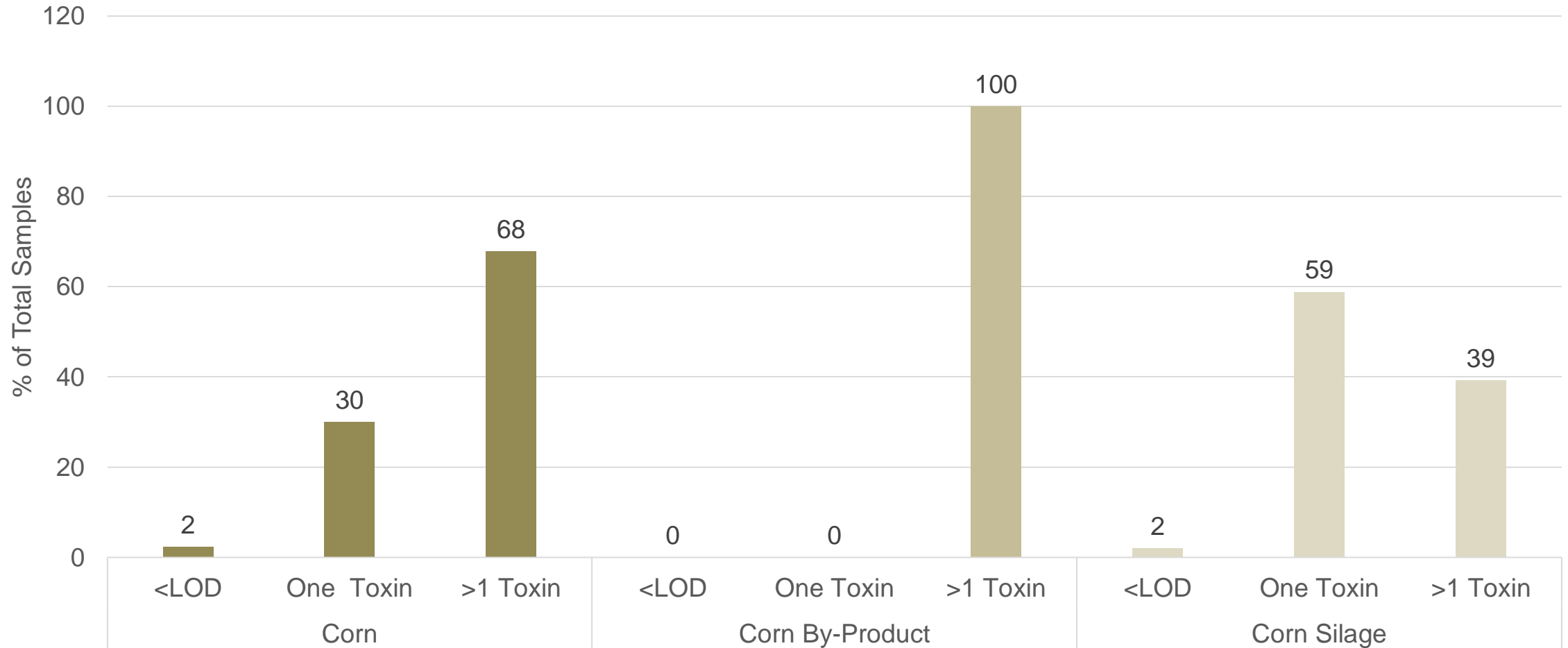
B-Trichotheceenes include Deoxynivalenol, Nivalenol, Fusarenon-X, Acetyl-Deoxynivalenol  
 A-Trichotheceenes and Ochratoxin A are not presented due to insignificant positive samples

# Mean of Positives: Corn Silage

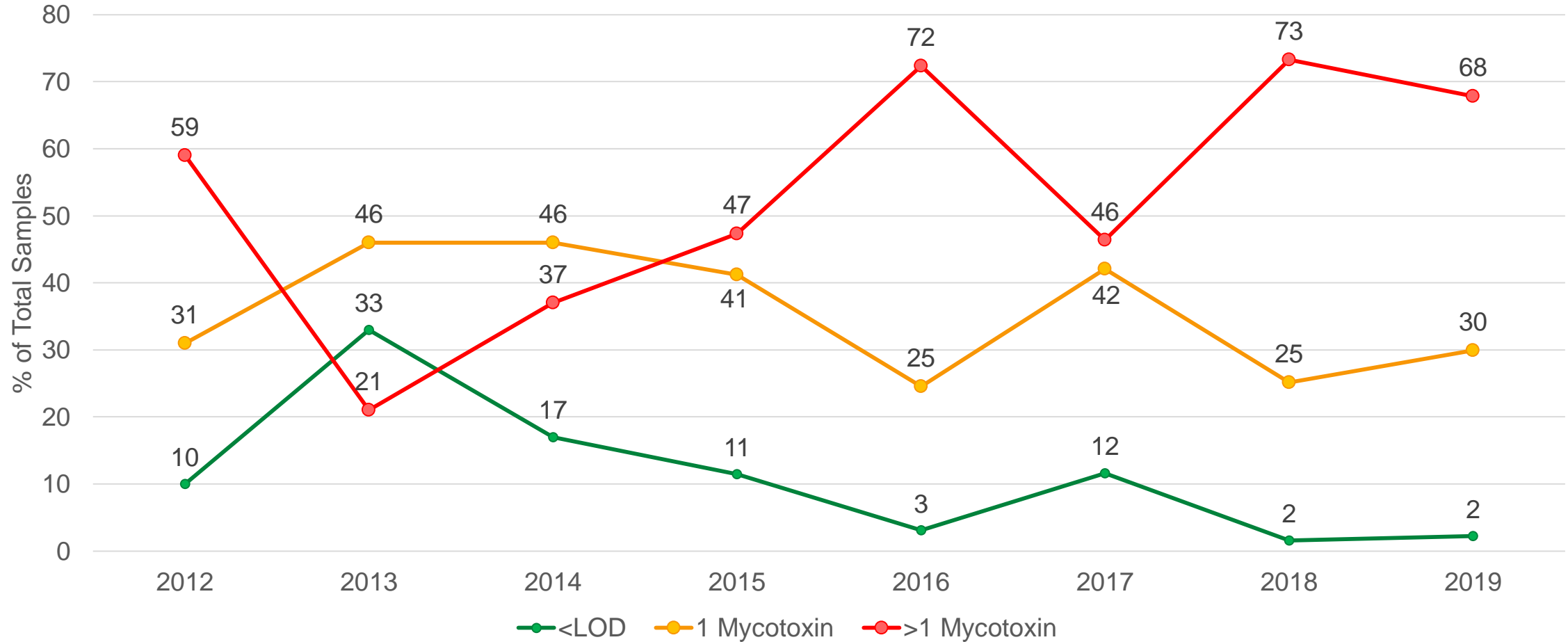


B-Trichothecenes include Deoxynivalenol, Nivalenol, Fusarenon-X, Acetyl-Deoxynivalenol  
 A-Trichothecenes and Ochratoxin A are not presented due to insignificant positive samples

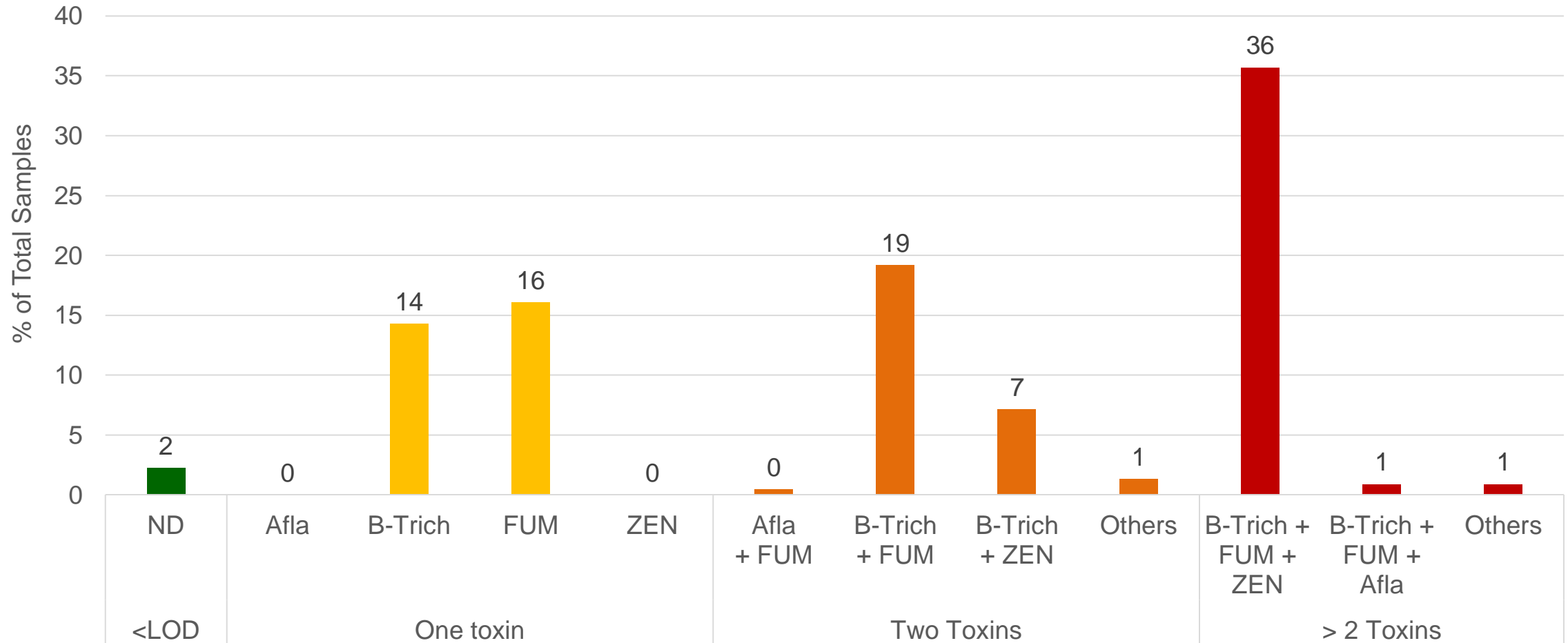
# Co-occurrence 2019: Corn, Corn By-product, Corn Silage



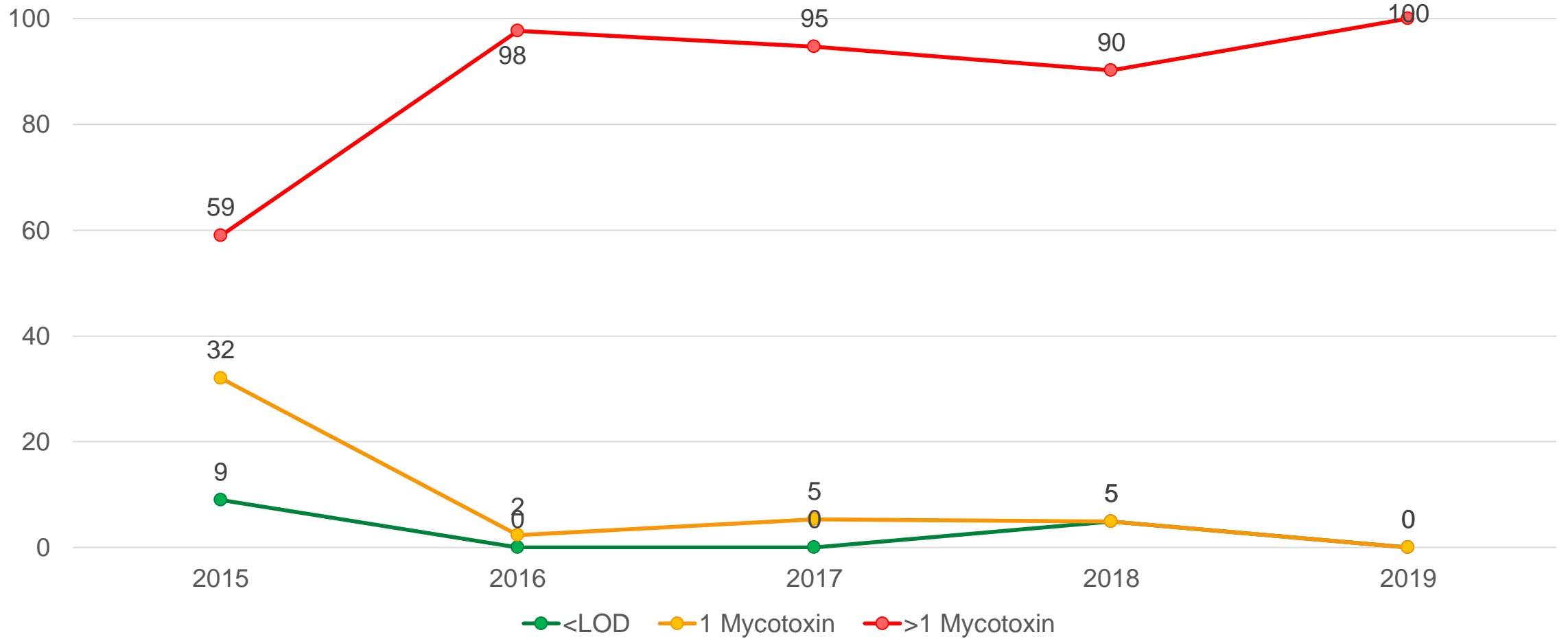
# Co-occurrence: Corn



# Co-occurrence 2019: Corn



# Co-occurrence: Corn By-product

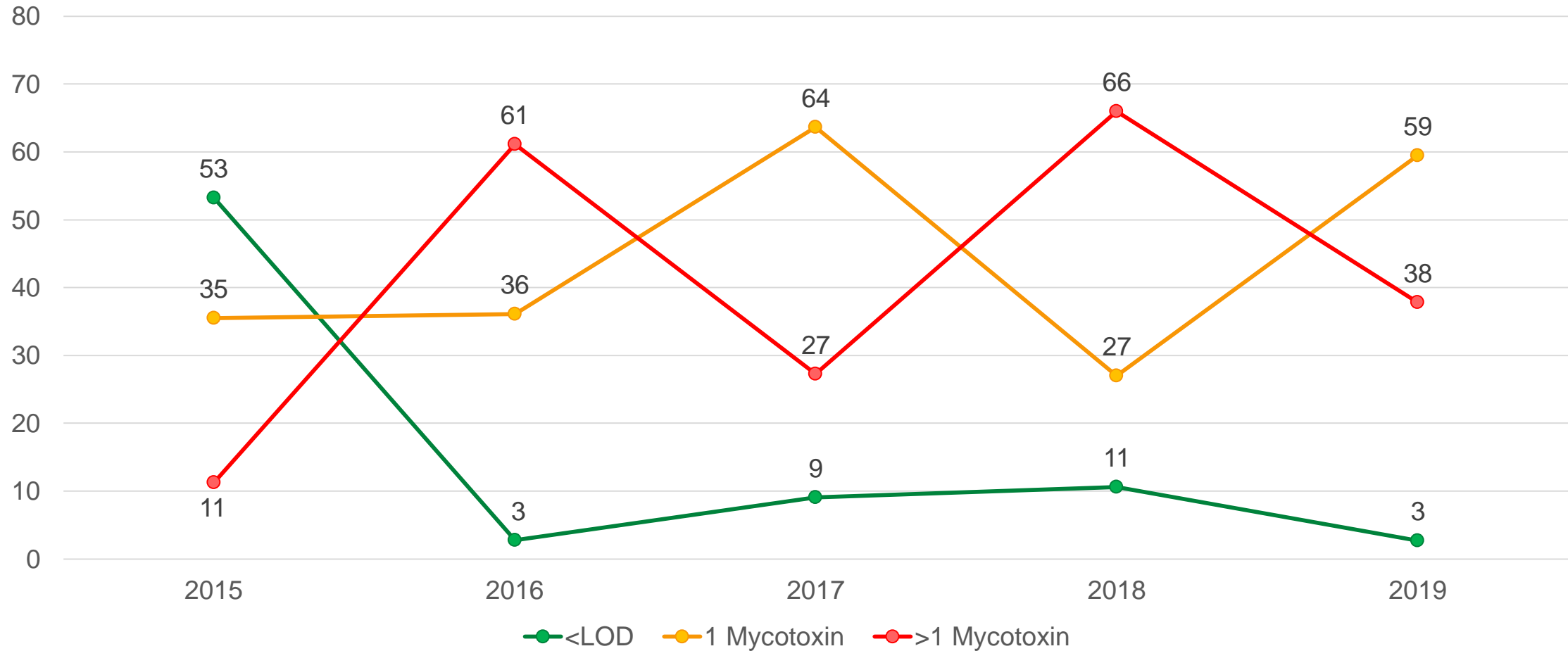




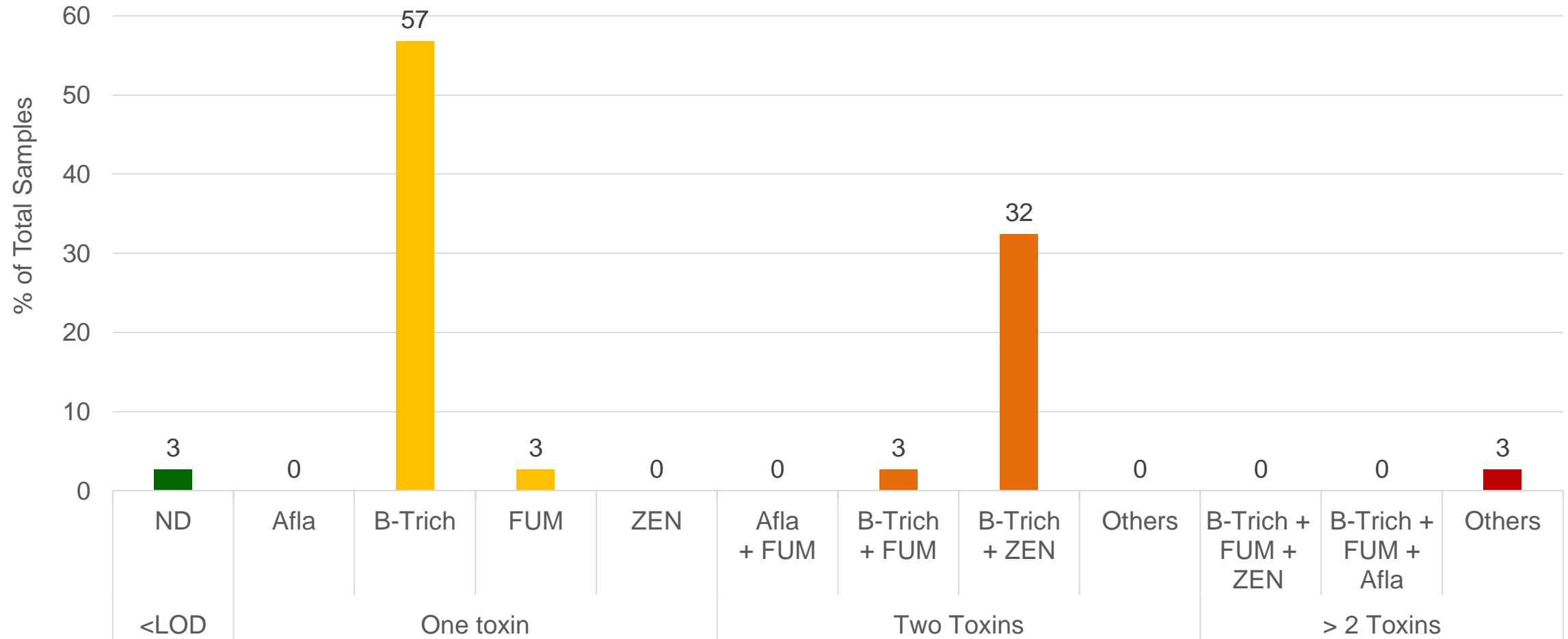
# Co-occurrence 2019: Corn By-product



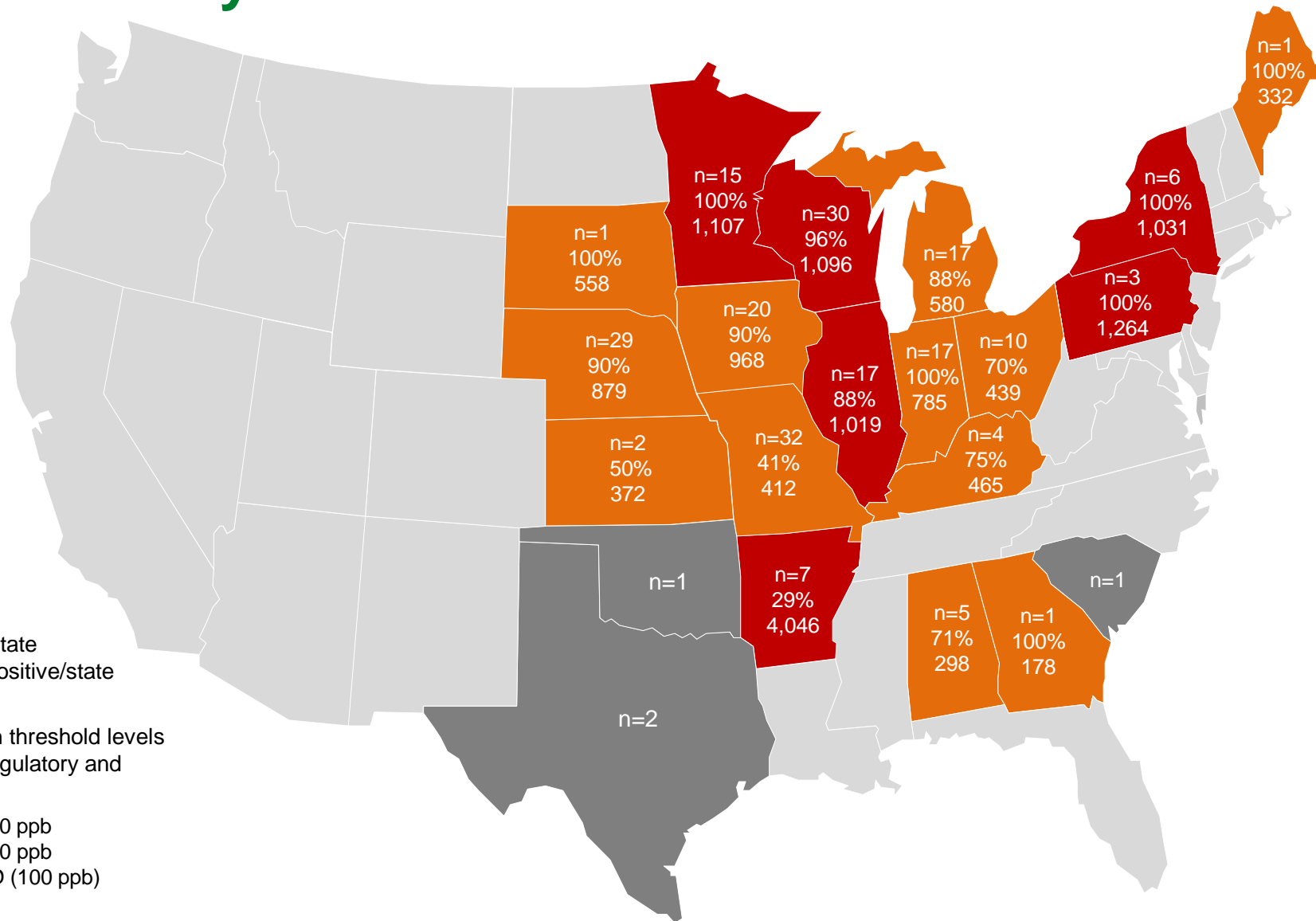
# Co-occurrence: Corn Silage



# Co-occurrence 2019: Corn Silage



# 2019 Corn Risk by State: B-Trich

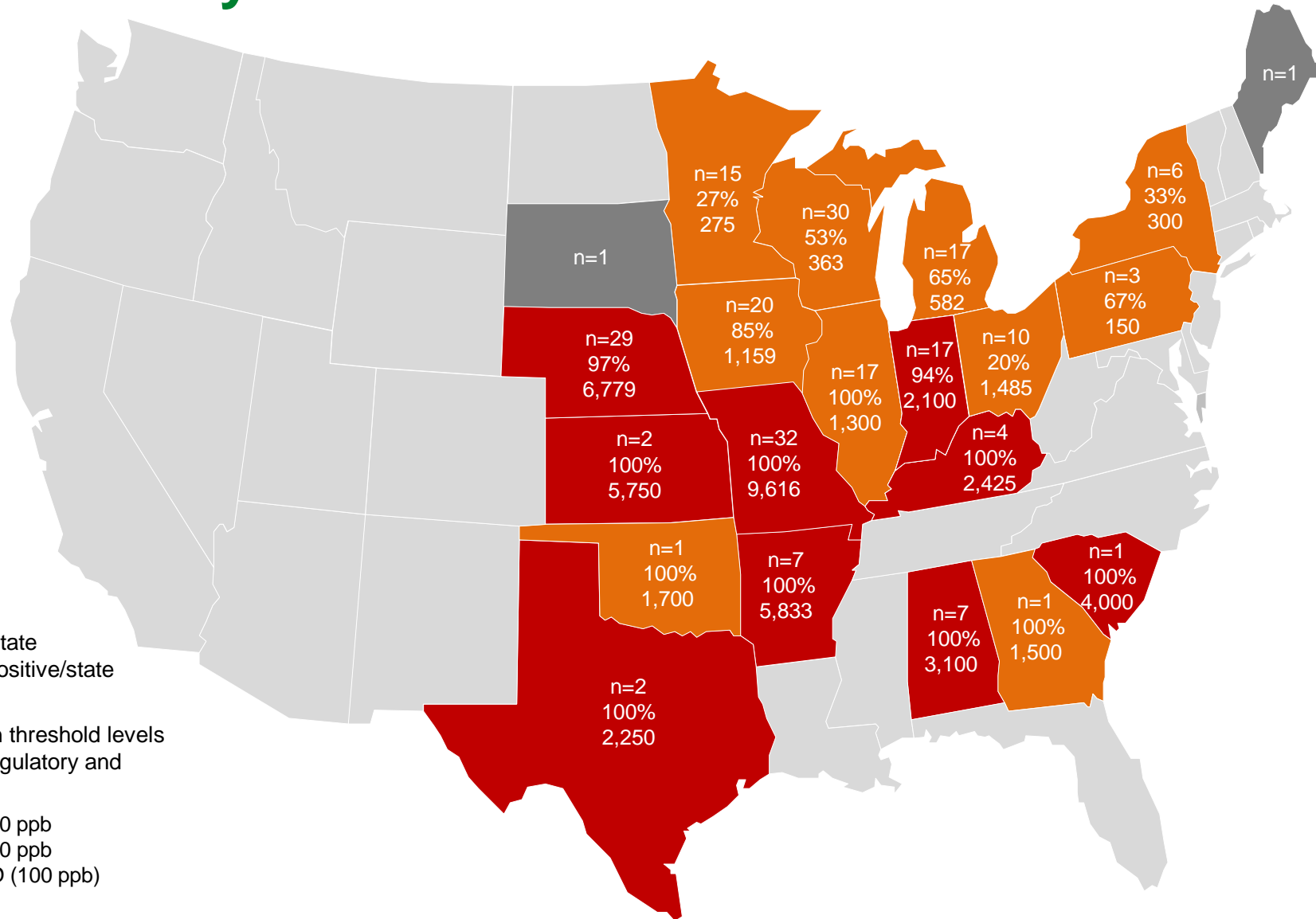


n: # of samples submitted/state  
 N%: % of samples tested positive/state  
 x̄: average in ppb

Risk to livestock based upon threshold levels according to FDA and EU regulatory and guidance values

- State with average > 1,000 ppb
- State with average < 1,000 ppb
- State with samples < LOD (100 ppb)
- No sample submitted

# 2019 Corn Risk by State: FUM

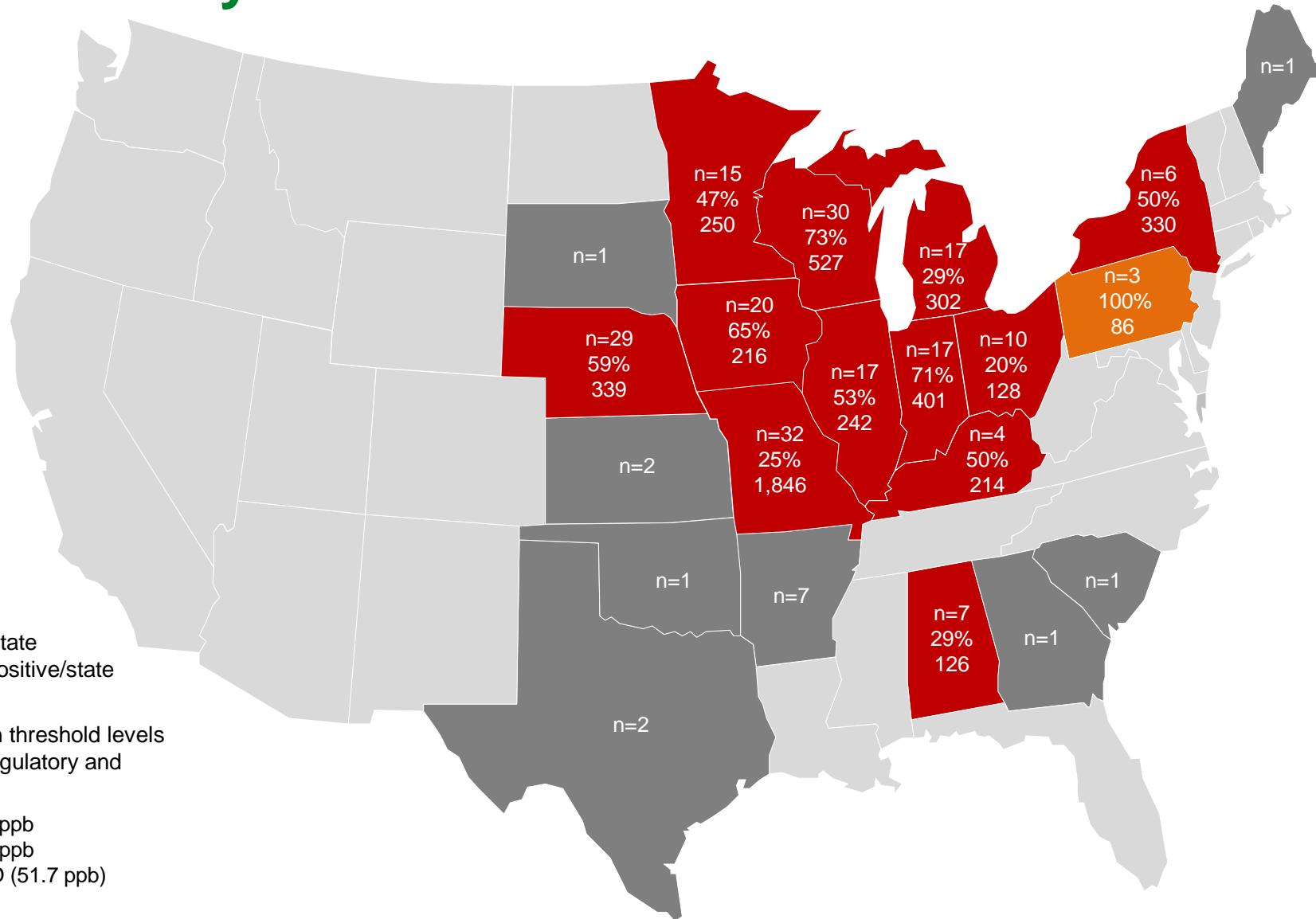


n: # of samples submitted/state  
 N%: % of samples tested positive/state  
 x̄: average in ppb

Risk to livestock based upon threshold levels according to FDA and EU regulatory and guidance values

- State with average > 2,000 ppb
- State with average < 2,000 ppb
- State with samples < LOD (100 ppb)
- No sample submitted

# 2019 Corn Risk by State: ZEN

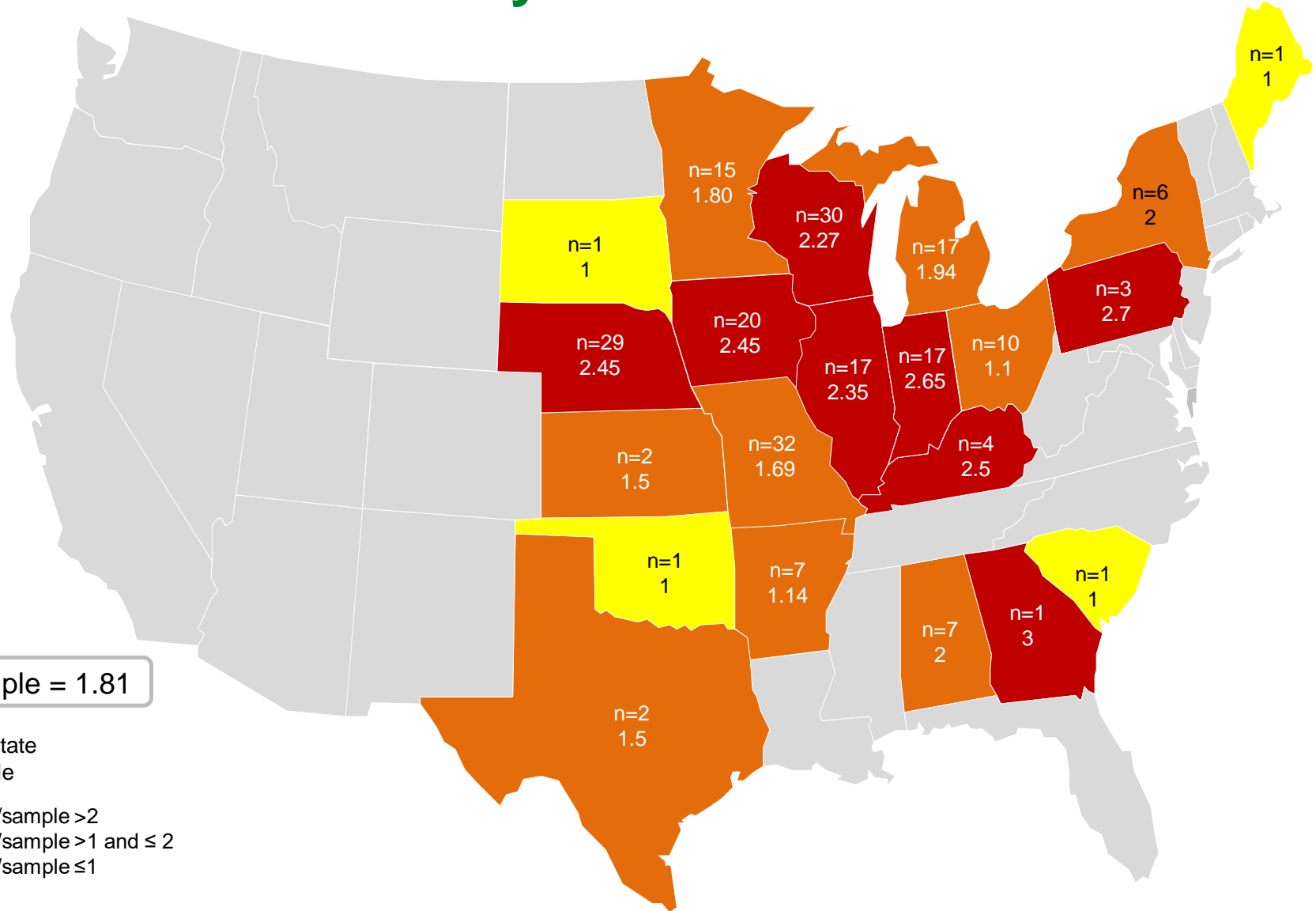


n: # of samples submitted/state  
 N%: % of samples tested positive/state  
 x̄: average in ppb

Risk to livestock based upon threshold levels according to FDA and EU regulatory and guidance values

- State with average > 100 ppb
- State with average < 100 ppb
- State with samples < LOD (51.7 ppb)
- No sample submitted

# 2019 Corn Co-occurrence by State



National Toxin/Sample = 1.81

- n: # of samples submitted/state
- x̄: average toxins per sample
- Red: State with average toxins/sample >2
- Orange: State with average toxins/sample >1 and ≤ 2
- Yellow: State with average toxins/sample ≤1
- Grey: No sample submitted

# 2019 Corn Survey Summary

## Corn



**98%** Positive vs.  
98% in 2018



**68%** >1 MTX vs.  
73% in 2018

B-Trich: **80%** vs 76%

FUM: **76%** vs 79%

ZEN: **47%** vs 45%

## Corn By-products



**100%** Positive vs.  
95% in 2018



**100%** >1 MTX vs.  
90% in 2018

B-Trich: **100%** vs 93%

FUM: **100%** vs 90%

ZEN: **95%** vs 85%

## Corn Silage



**98%** Positive vs.  
93% in 2018

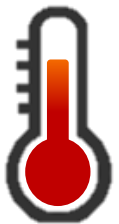


**39%** >1 MTX vs.  
66% in 2018

B-Trich: **96%** vs 89%

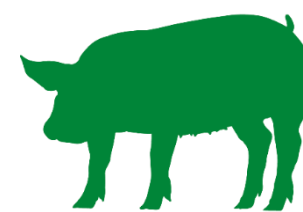
FUM: **4%** vs 22%

ZEN: **37%** vs 55%



## Forecast for livestock production in 2019

**MED to HIGH risk**





# Questions?



[chacity.pender@biomin.net](mailto:chacity.pender@biomin.net)  
[lan.zheng@biomin.net](mailto:lan.zheng@biomin.net)



[erika.hendel@biomin.net](mailto:erika.hendel@biomin.net)



[paige.gott@biomin.net](mailto:paige.gott@biomin.net)



<https://www.biomin.net/us/survey/>

# Thank You