

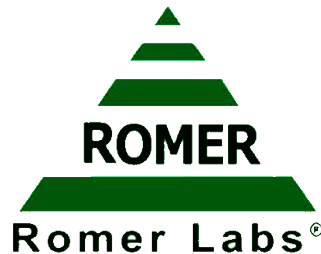
# Mycotoxin Occurrence in 2021 US Corn Ingredients



# Mycotoxins & Analysis



**LC-MS/MS**



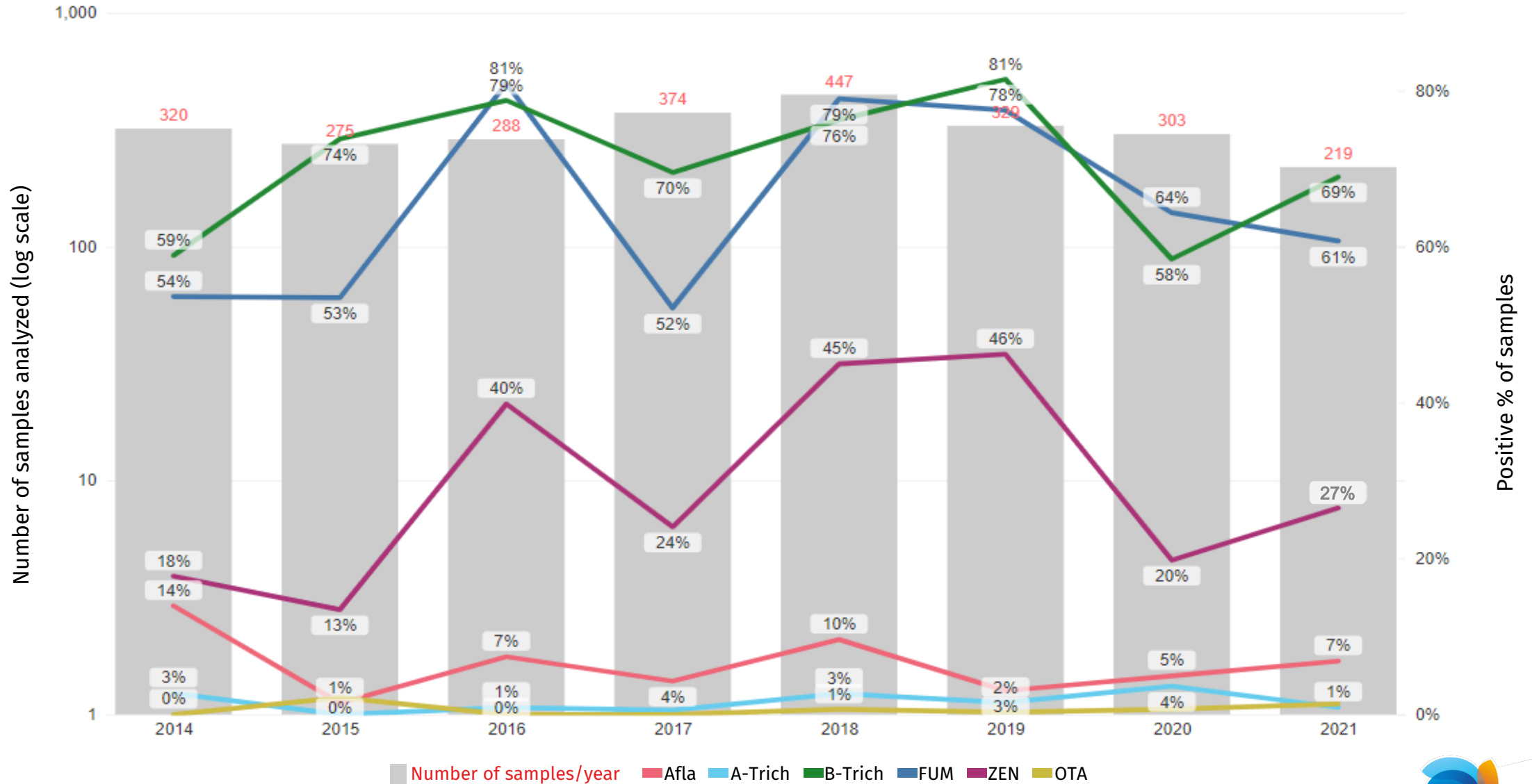
The survey results represent samples sent in for surveillance testing only and does not include any sample submitted following clinical signs.

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 Toxin	100.0
	HT-2 Toxin	100.0
	Neosolaniol	100.0
	Diacetoxyscirpenol (DAS)	100.0
B-Trichothecenes (B-Trich)	Deoxynivalenol (DON/Vomitoxin)	100.0
	Acetyldeoxynivalenol (AcDON)	100.0
	Nivalenol (NIV)	100.0
	Fusarenon X (FusX)	100.0
Fumonisin (FUM)	Fumonisin B1	100.0
	Fumonisin B2	100.0
	Fumonisin B3	100.0
Zearalenone (ZEN)	Zearalenone (ZEN)	51.7
Ochratoxin A (OTA)	Ochratoxin A (OTA)	1.1

\*Results are reported as the summation of mycotoxin levels detected per Mycotoxin Group. (For example, B-Trich represents total contamination detected for DON + AcDON + NIV + FusX)

# 2021 US Corn (as-fed basis)

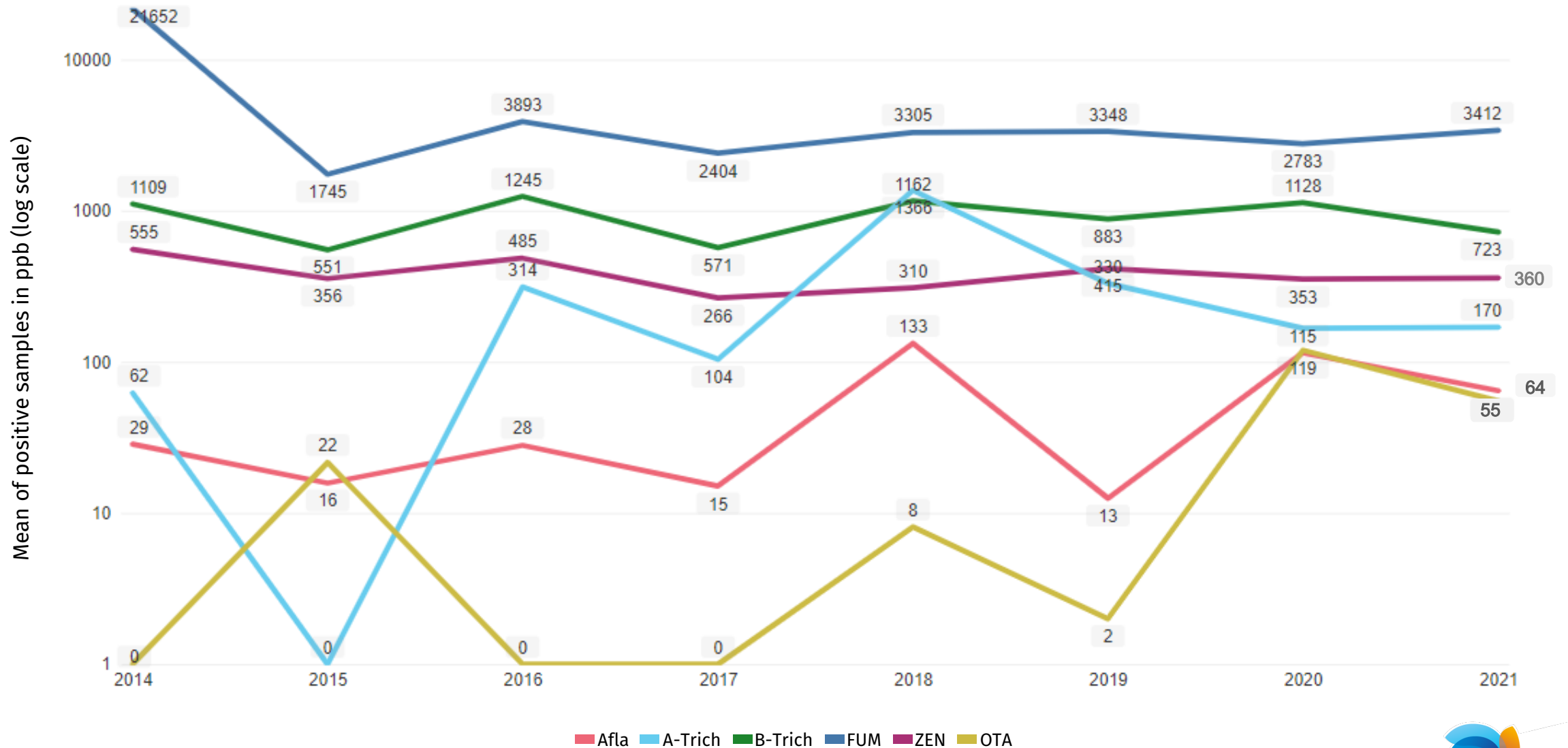
# Occurrence Trend in 2021 US Corn



Based on the samples analyzed.



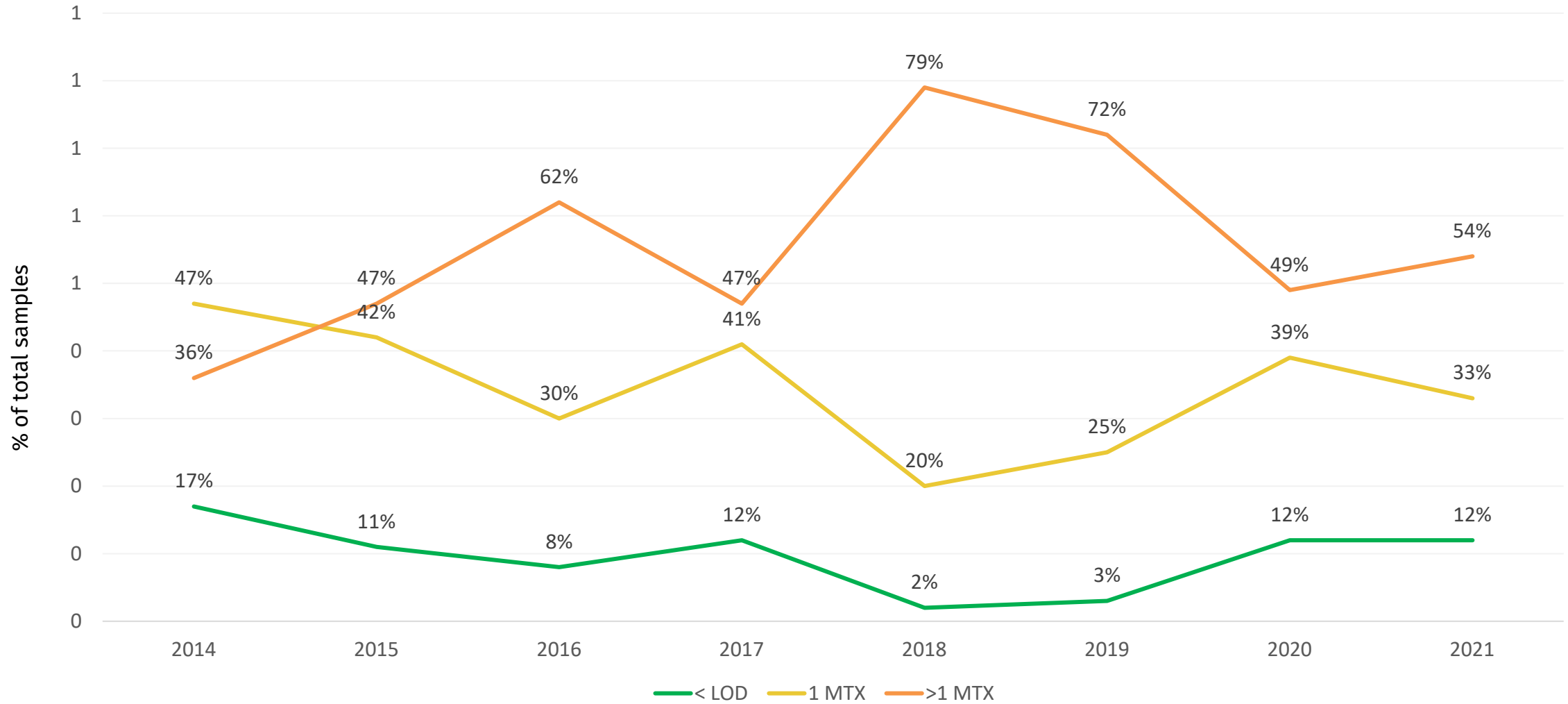
# Mean of Positives Trend in 2021 US Corn



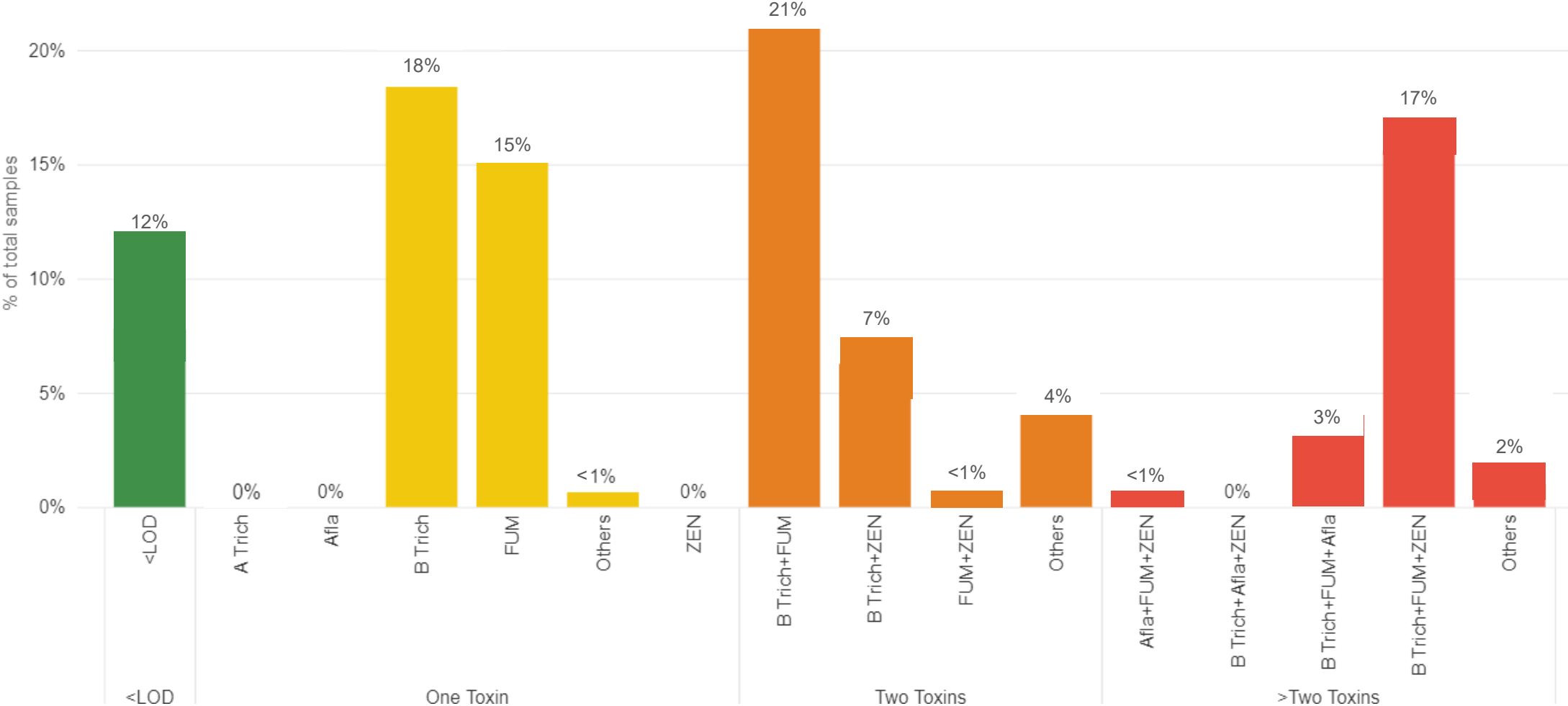
Based on the samples analyzed.



# Co-occurrence Trend in 2021 US Corn



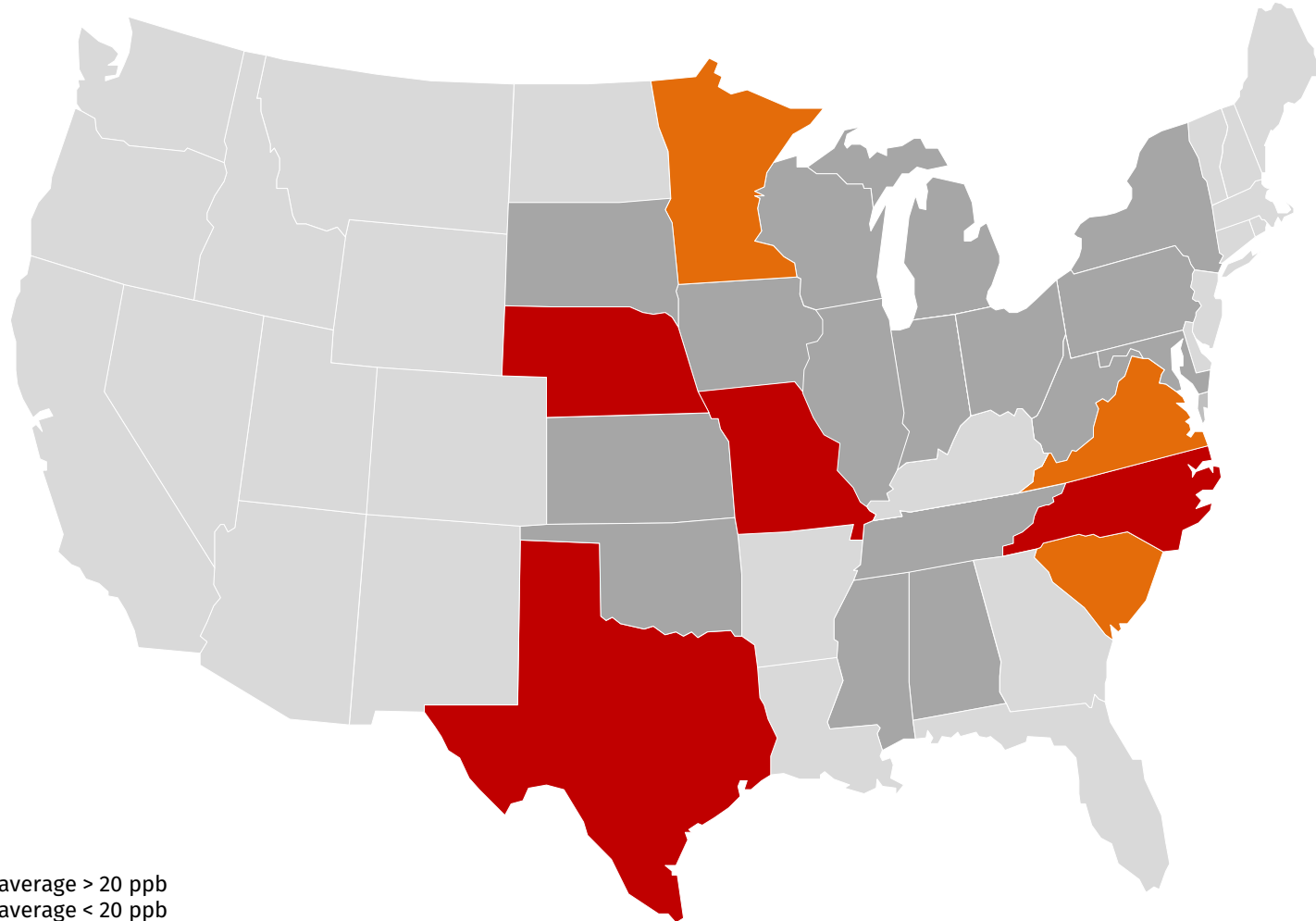
# Co-occurrence Profile in 2021 US Corn



Based on the samples analyzed.



# 2021 Corn Risk by State – Afla

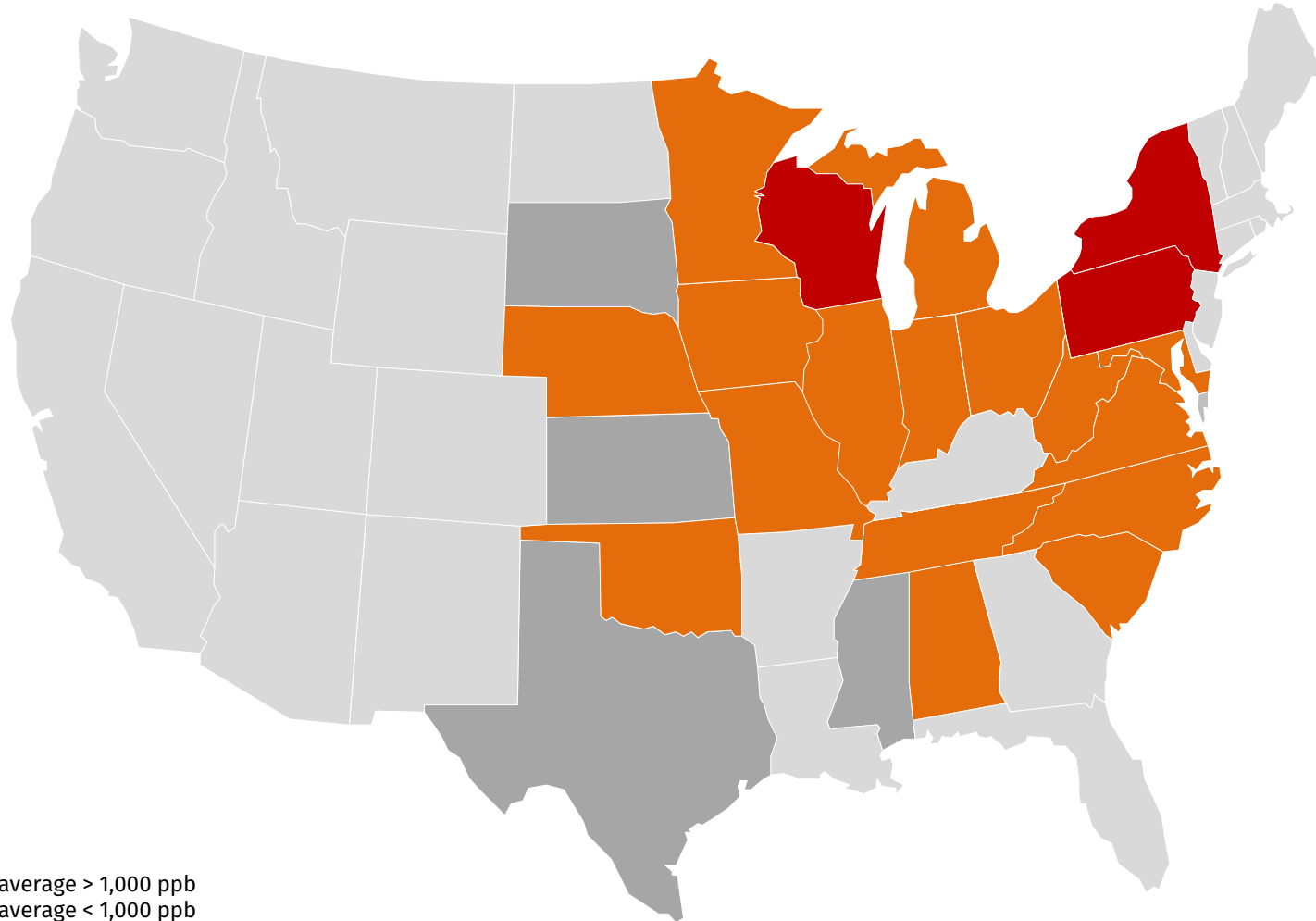


- State with average > 20 ppb
- State with average < 20 ppb
- State with samples < LOD (1 ppb)
- No sample submitted

State	Number of Samples	% Positive Samples	Avg of Positive Samples
NC	23	35	110
NE	13	8	37
MO	18	6	25
TX	4	25	21
SC	1	100	3
VA	5	40	2
MN	23	8	2
AL	14	0	0
IA	18	0	0
IL	17	0	0
IN	11	0	0
KS	3	0	0
MD	1	0	0
MI	15	0	0
MS	1	0	0
NY	1	0	0
OH	17	0	0
OK	3	0	0
PA	2	0	0
SD	3	0	0
TN	3	0	0
WI	22	0	0
WV	1	0	0



# 2021 Corn Risk by State – B-Trich

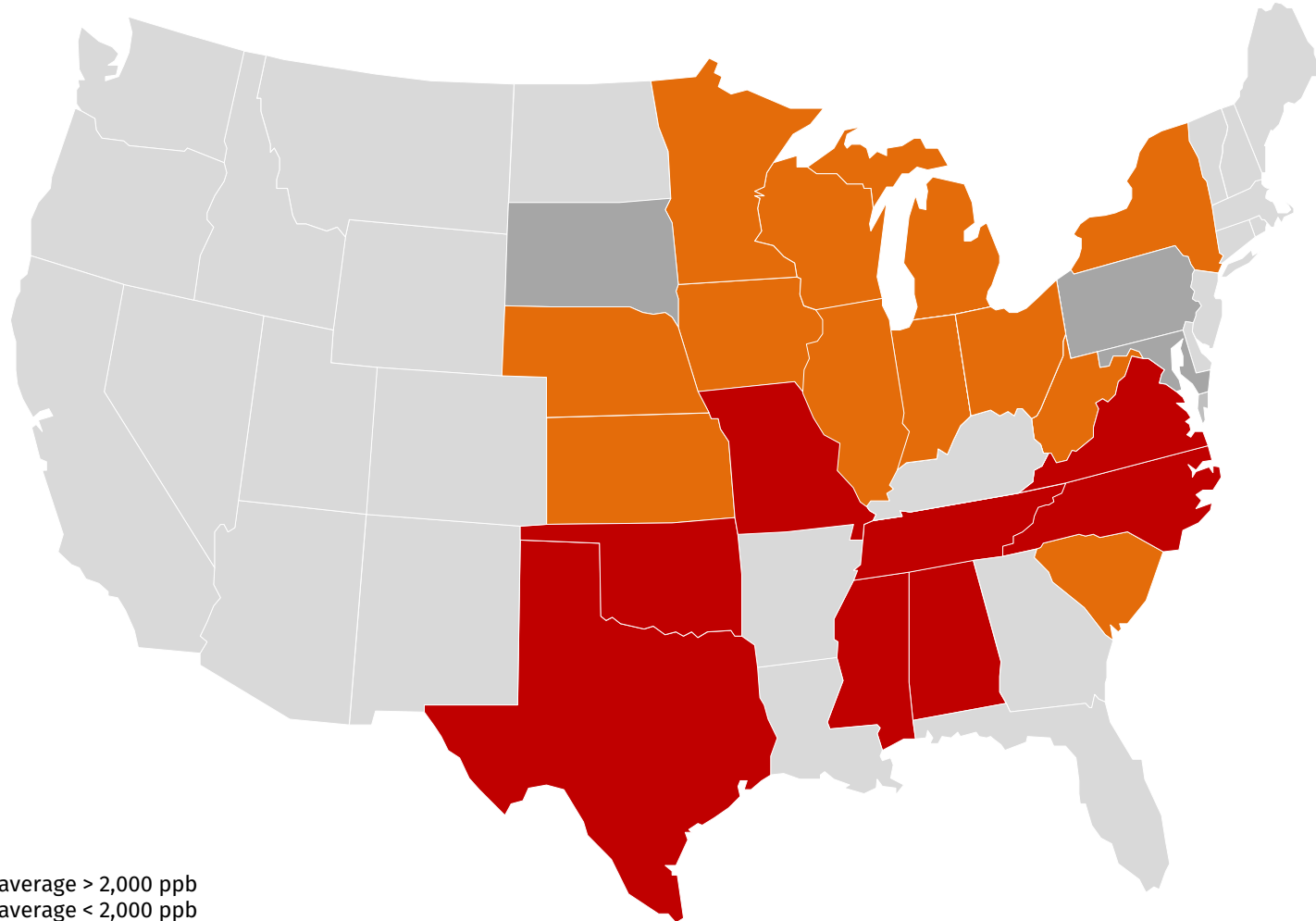


- State with average > 1,000 ppb
- State with average < 1,000 ppb
- State with samples < LOD (100 ppb)
- No sample submitted

State	Number of Samples	% Positive Samples	Avg of Positive Samples
PA	2	100	2824
NY	1	100	1726
WI	22	86	1171
MI	15	100	995
OH	17	82	973
VA	5	100	732
MD	1	100	727
IN	11	91	711
NC	23	48	669
IL	17	88	600
TN	3	100	531
IA	18	94	509
MO	18	56	437
NE	13	85	371
MN	23	22	312
SC	1	100	307
AL	14	64	254
WV	1	100	167
OK	3	33	117
KS	3	0	0
MS	1	0	0
SD	3	0	0
TX	4	0	0



# 2021 Corn Risk by State – FUM

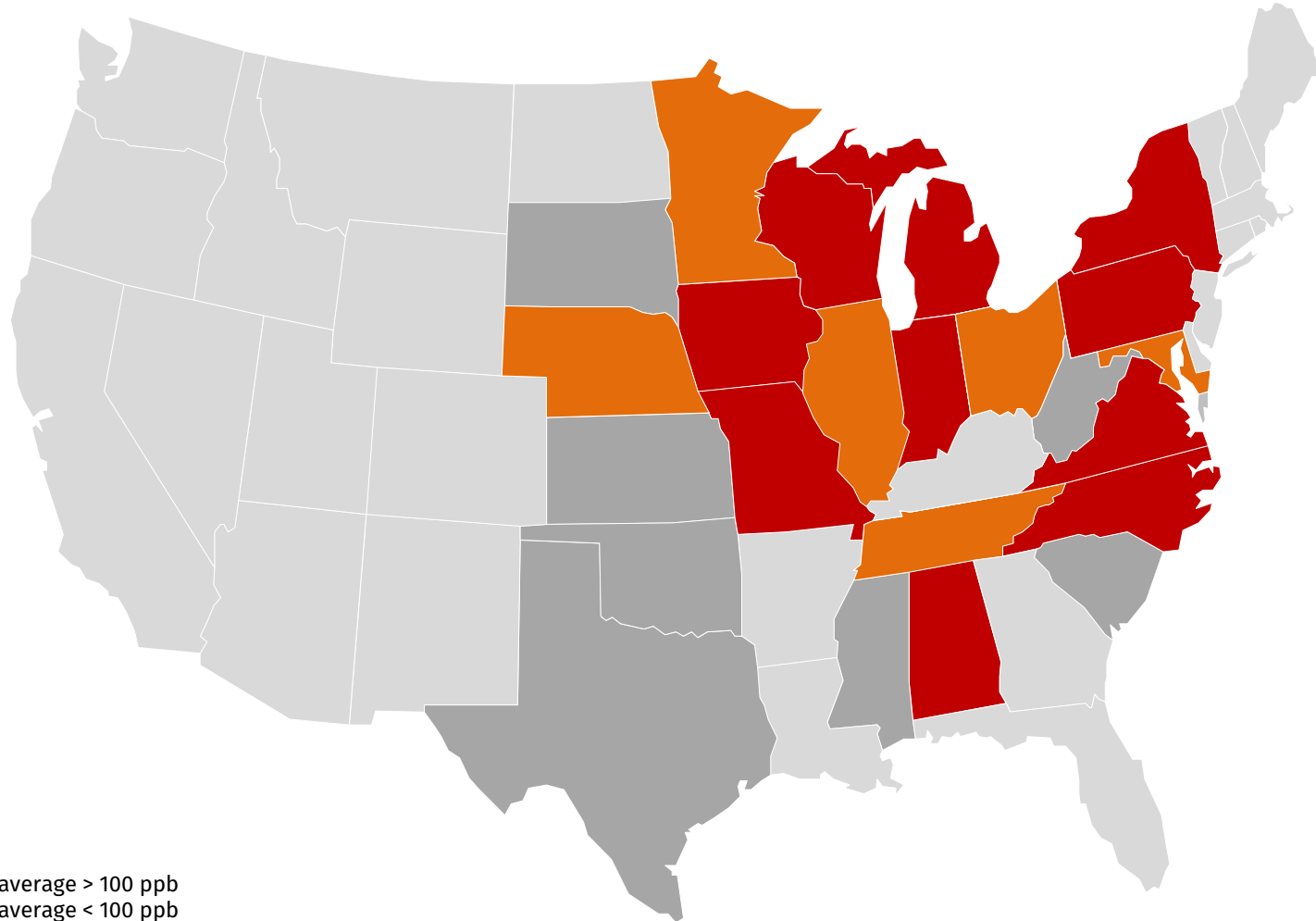


- State with average > 2,000 ppb
- State with average < 2,000 ppb
- State with samples < LOD (100 ppb)
- No sample submitted

State	Number of Samples	% Positive Samples	Avg of Positive Samples
MS	1	100	9900
MO	18	94	8988
NC	23	87	7470
OK	3	100	4200
VA	5	100	4100
TN	3	100	3533
TX	4	100	3000
AL	14	86	2408
IN	11	55	1950
SC	1	100	1800
KS	3	100	1467
NE	13	85	1091
MN	23	22	1060
IL	17	53	789
WV	1	100	700
MI	15	47	629
NY	1	100	600
IA	18	44	425
OH	17	53	378
WI	22	32	329
MD	1	0	0
PA	2	0	0
SD	3	0	0



# 2021 Corn Risk by State – ZEN



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

State	Number of Samples	% Positive Samples	Avg of Positive Samples
MI	15	53	1620
NY	1	100	522
AL	14	29	336
IN	11	36	290
VA	5	40	222
MO	18	6	182
WI	22	23	171
NC	23	30	125
IA	18	39	123
PA	2	50	123
IL	17	29	97
OH	17	35	97
MD	1	100	88
MN	23	4	77
NE	13	23	64
TN	3	67	61
KS	3	0	0
MS	1	0	0
OK	3	0	0
SC	1	0	0
SD	3	0	0
TX	4	0	0
WV	1	0	0



# Mycotoxin Survey Summary – 2021 US Corn



**87%** positive vs.  
88% in 2020



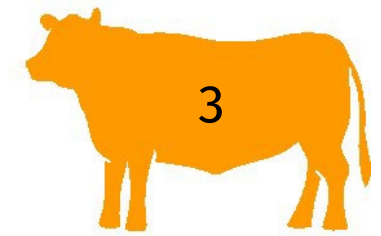
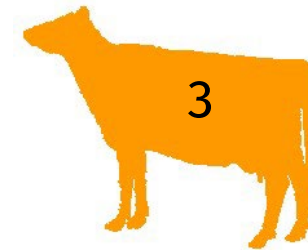
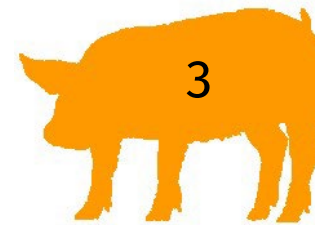
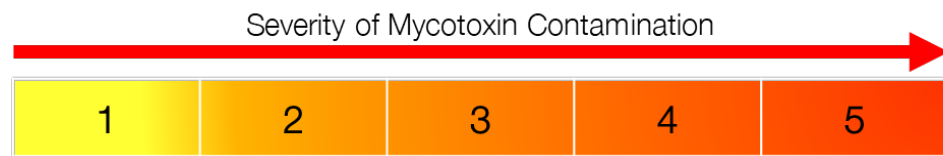
**54%** >1 MTX vs.  
49% in 2020

**B-Trich:** 69% vs. 58%

**FUM:** 61% vs. 64%

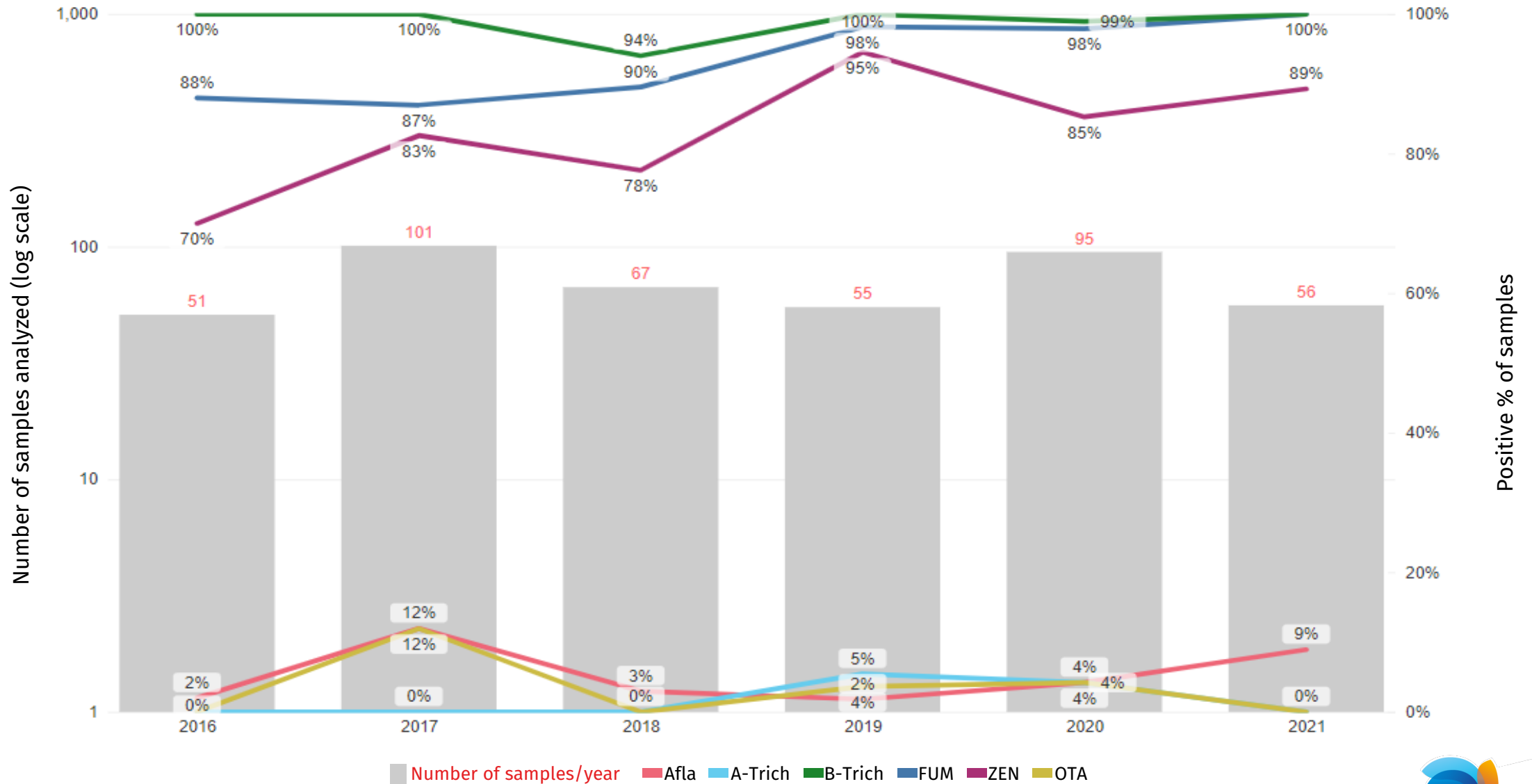
**ZEN:** 27% vs. 20%

## Forecasted potential risk for livestock production\*:

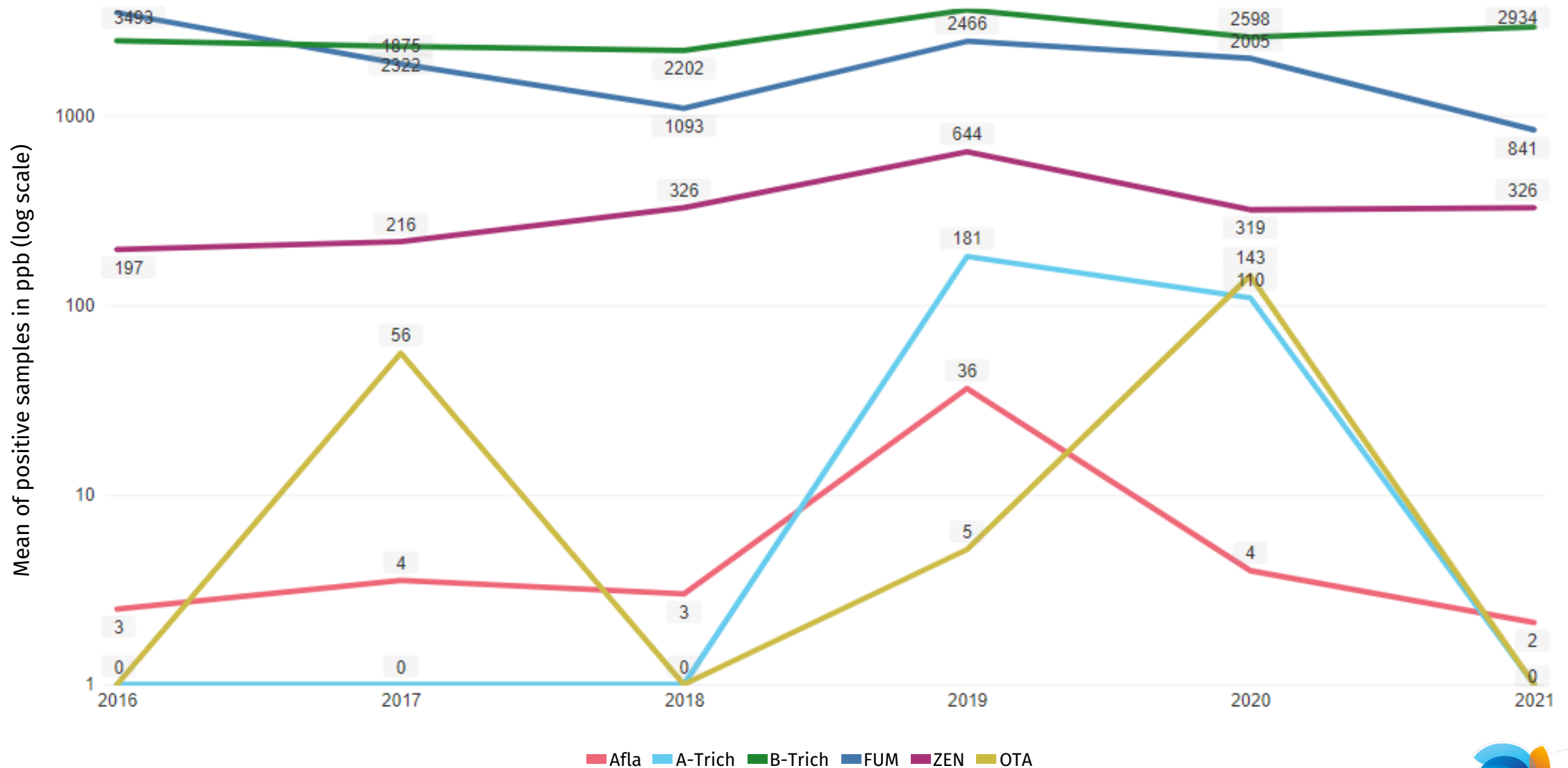


# 2021 US Corn By-Products (as-fed basis)

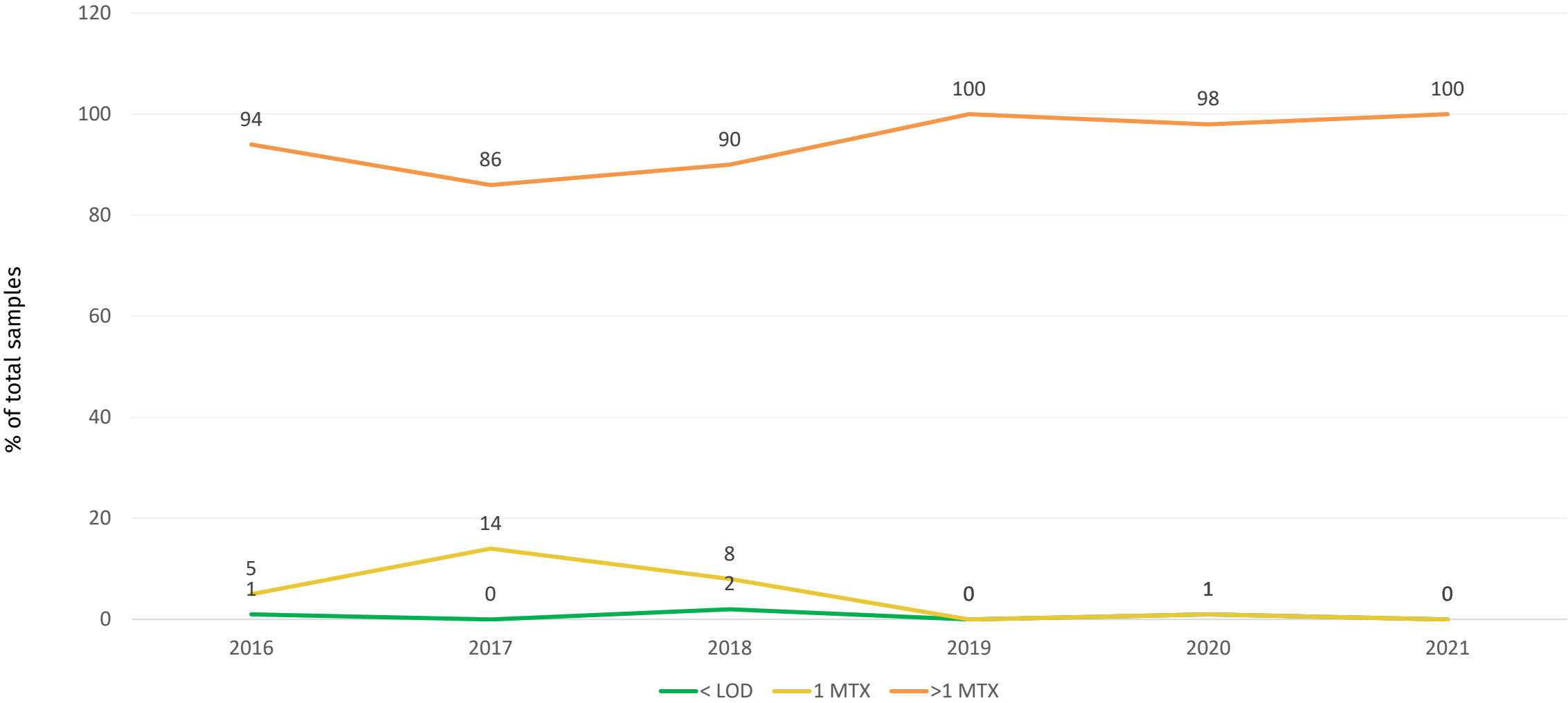
# Occurrence Trend in 2021 US Corn By-Products



# Mean of Positives Trend in 2021 US Corn By-Products



# Co-occurrence Trend in 2021 US Corn By-Products

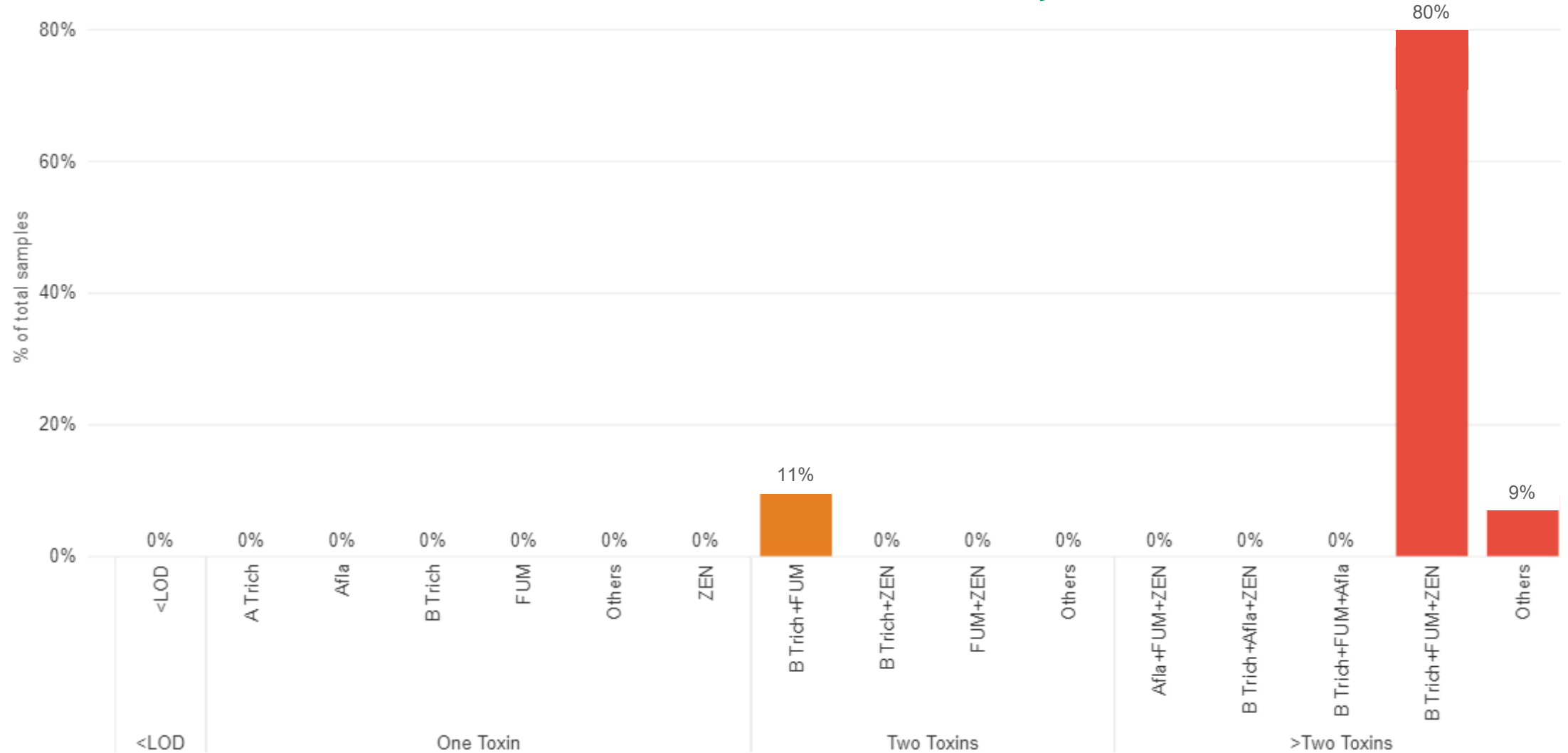


Based on the samples analyzed.

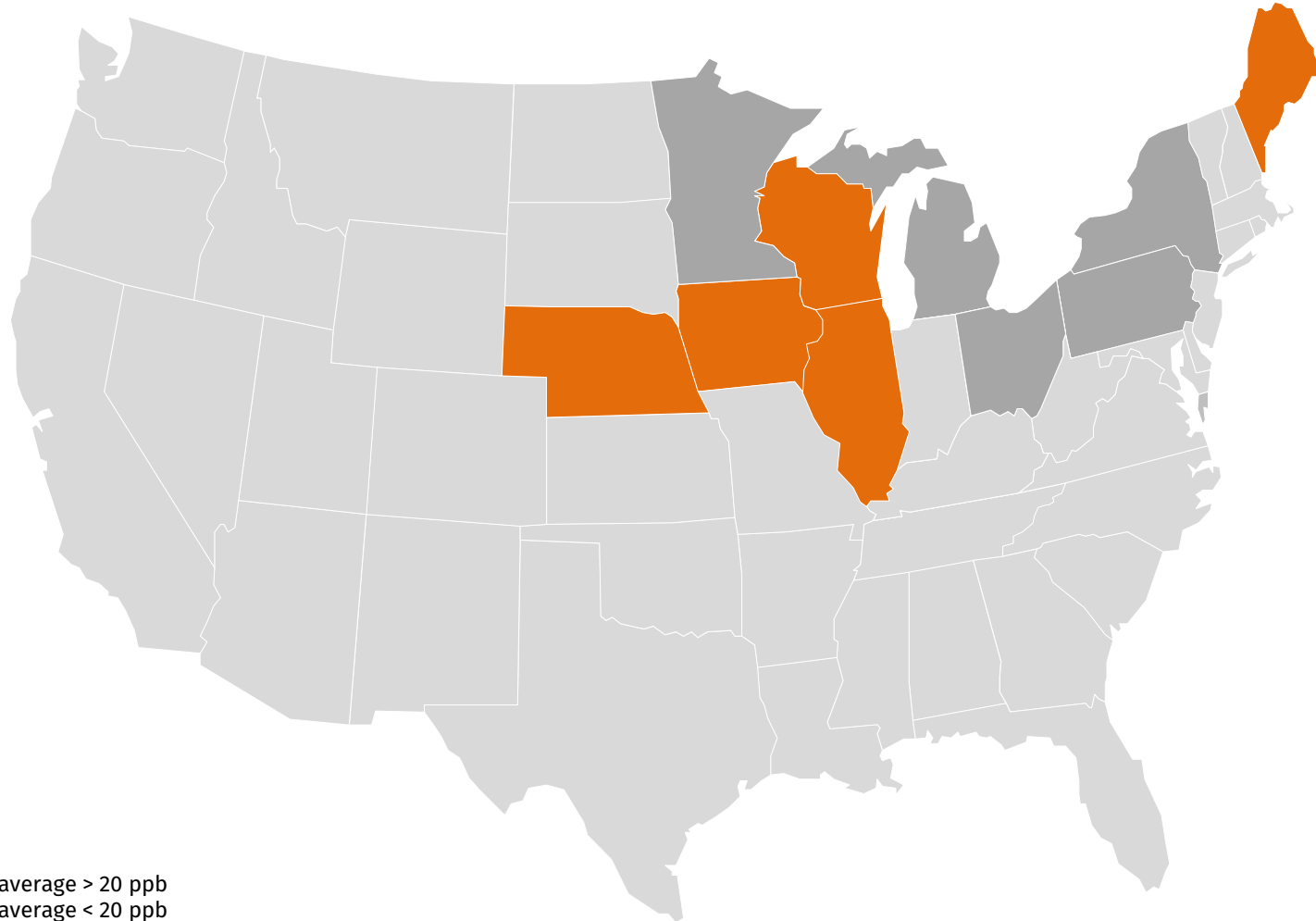




# Co-occurrence Profile in 2021 US Corn By-Products



# 2021 Corn By-Products Risk by State – Afla

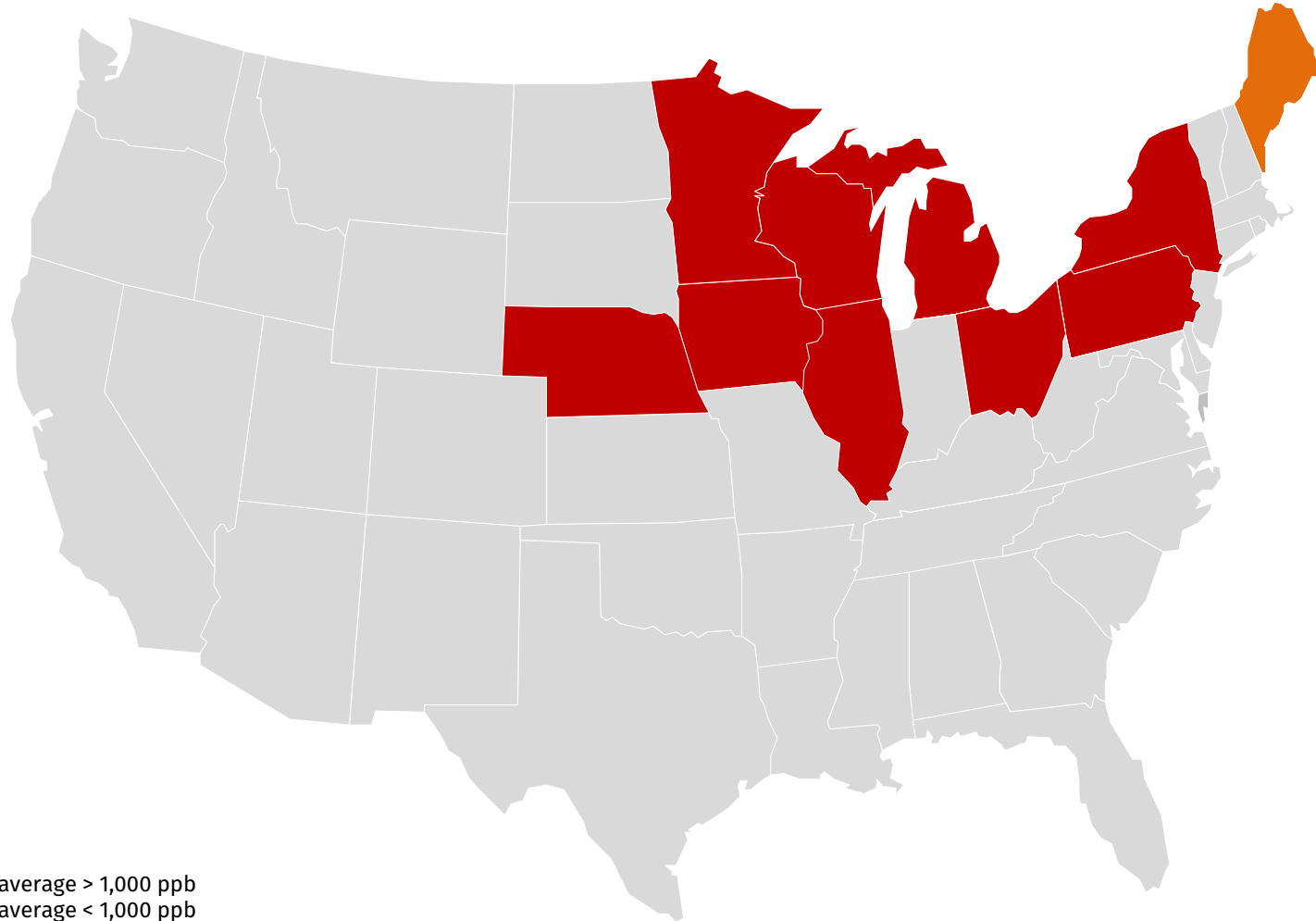


State	Number of Samples	% Positive Samples	Avg of Positive Samples
NE	2	50%	4
IL	7	14%	2
ME	1	100%	2
IA	17	6%	2
WI	16	6%	1
MI	3	0%	0
MN	2	0%	0
NY	2	0%	0
OH	4	0%	0
PA	2	0%	0

- State with average > 20 ppb
- State with average < 20 ppb
- State with samples < LOD (1 ppb)
- No sample submitted



# 2021 Corn By-Products Risk by State – B-Trich

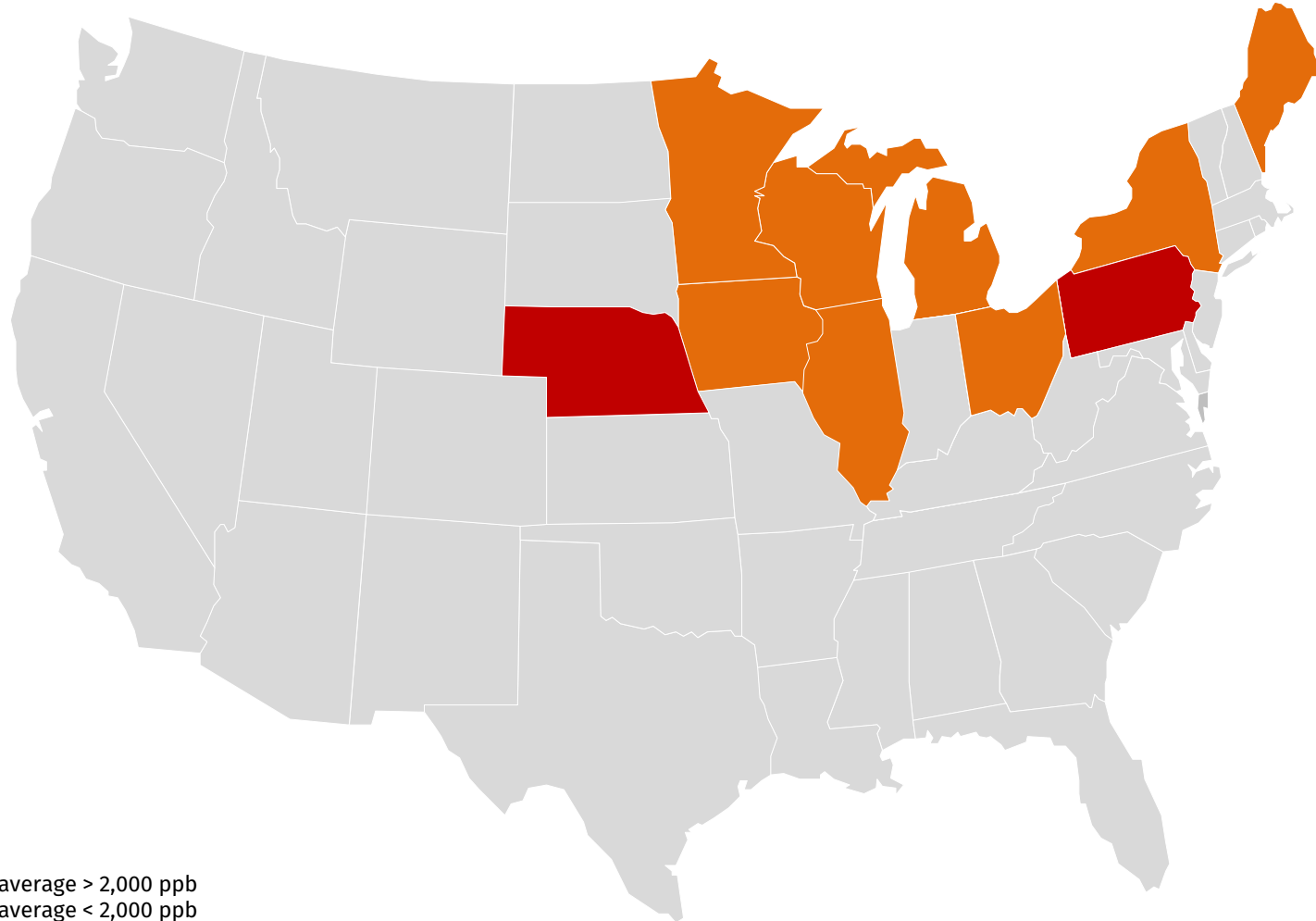


State	Number of Samples	% Positive Samples	Avg of Positive Samples
PA	2	100%	8251
OH	4	100%	5365
MI	3	100%	4109
NY	2	100%	3745
WI	16	100%	3694
NE	2	100%	2933
IL	7	100%	1613
IA	17	100%	1579
MN	2	100%	1383
ME	1	100%	662

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



# 2021 Corn By-Products Risk by State – FUM

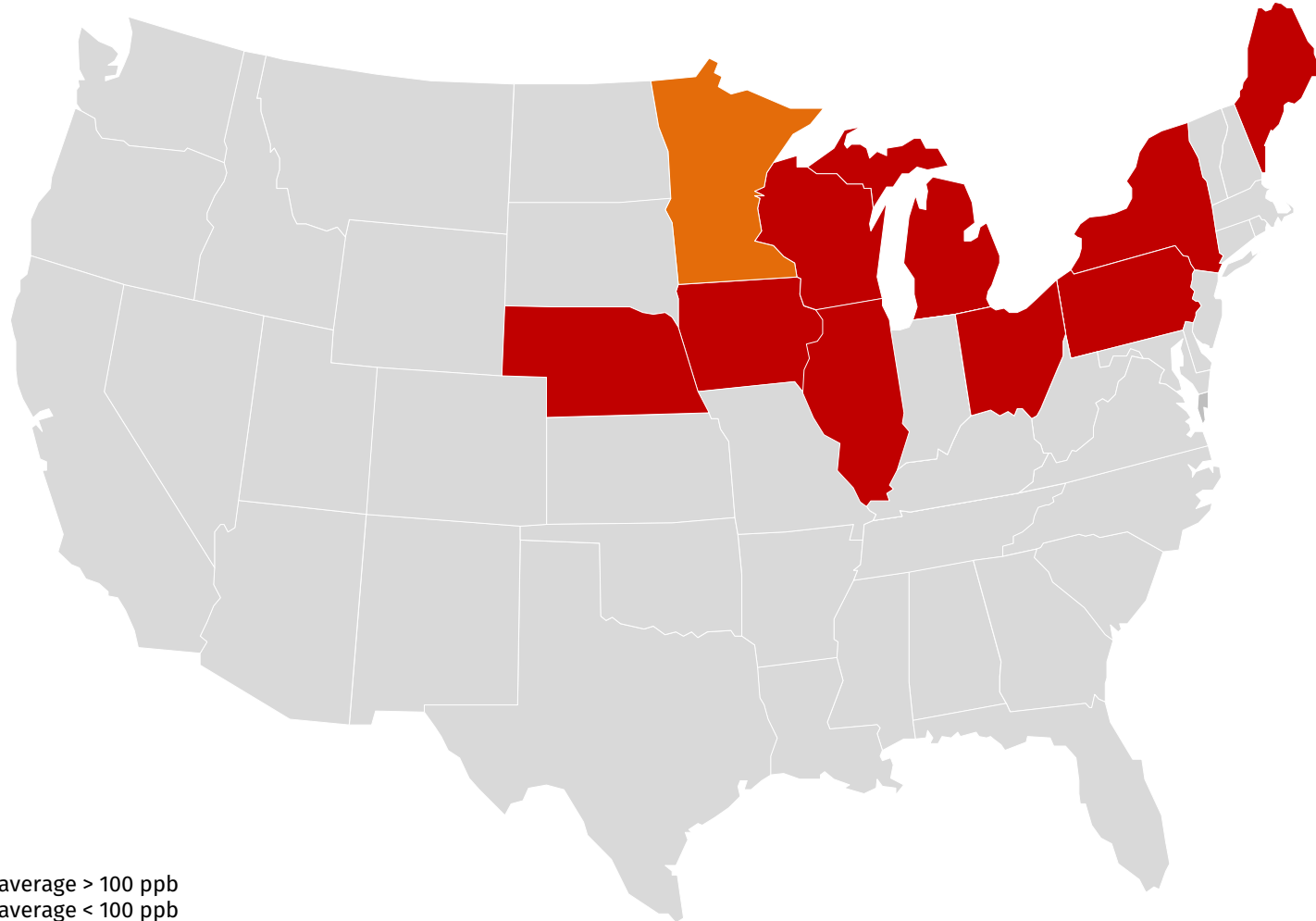


- State with average > 2,000 ppb
- State with average < 2,000 ppb
- State with samples < LOD (100 ppb)
- No sample submitted

State	Number of Samples	% Positive Samples	Avg of Positive Samples
PA	2	100%	4600
NE	2	100%	2650
MI	3	100%	1167
OH	4	100%	1050
WI	16	100%	713
IL	7	100%	686
IA	17	100%	441
MN	2	100%	300
NY	2	100%	250
ME	1	100%	100



# 2021 Corn By-Products Risk by State – ZEN



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

State	Number of Samples	% Positive Samples	Avg of Positive Samples
NY	2	100%	1766
PA	2	100%	1496
MI	3	100%	367
WI	16	100%	324
OH	4	100%	230
NE	2	100%	154
IL	7	100%	120
ME	1	100%	110
IA	17	65%	105
MN	2	100%	90



# Mycotoxin Survey Summary – 2021 US Corn By-Products



**100%** positive vs.  
99% in 2020



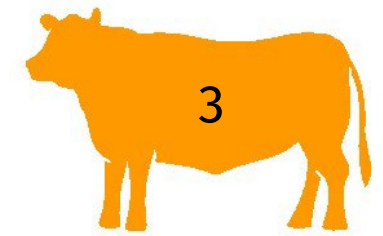
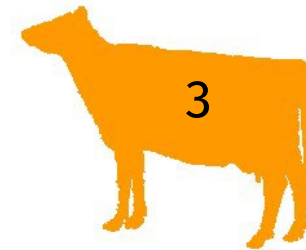
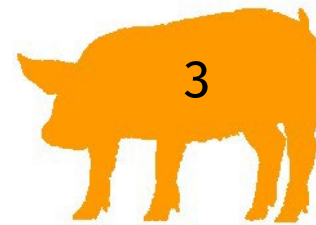
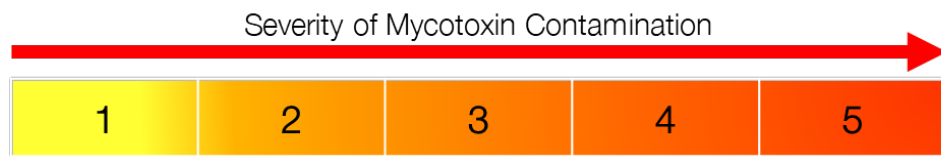
**100%** >1 MTX vs.  
98% in 2020

**B-Trich:** 100% vs. 99%

**FUM:** 100% vs. 98%

**ZEN:** 89% vs. 85%

## Forecasted potential risk for livestock production\*:



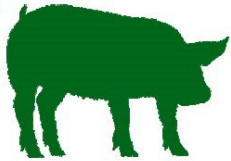
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