

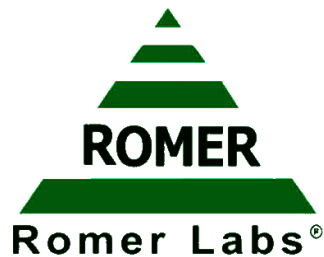
Mycotoxin Occurrence in 2021 US Corn Ingredients



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.

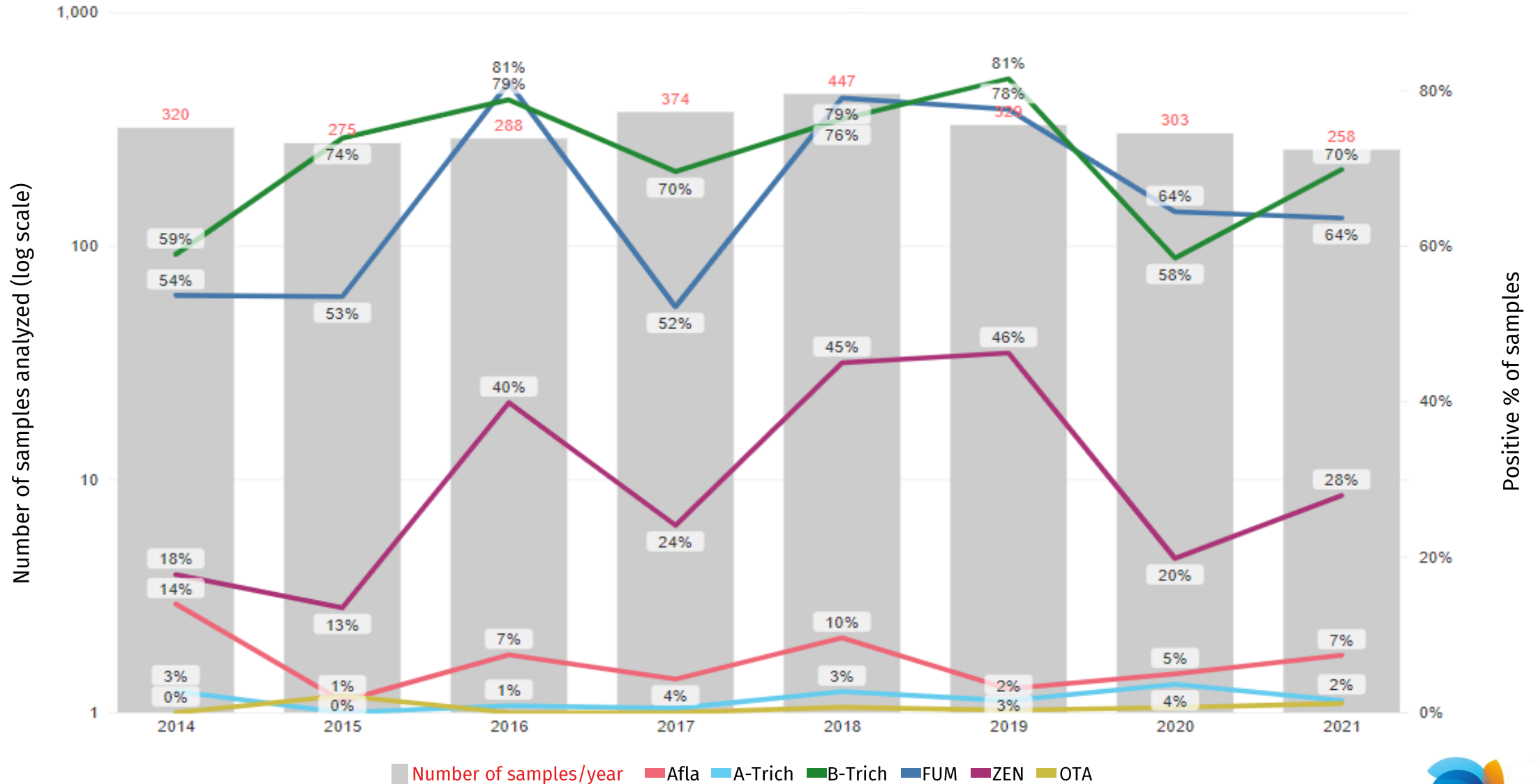
Mycotoxin Group*	Mycotoxins	Limit of Detection (ppb)
Aflatoxins (Afla)	Aflatoxin B1	1.3
	Aflatoxin B2	1.2
	Aflatoxin G1	1.1
	Aflatoxin G2	1.6
A-Trichothecenes (A-Trich)	T-2 Toxin	100.0
	HT-2 Toxin	100.0
	Neosolaniol	100.0
	Diacetoxyscirpenol (DAS)	100.0
B-Trichothecenes (B-Trich)	Deoxynivalenol (DON/Vomitoxin)	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)

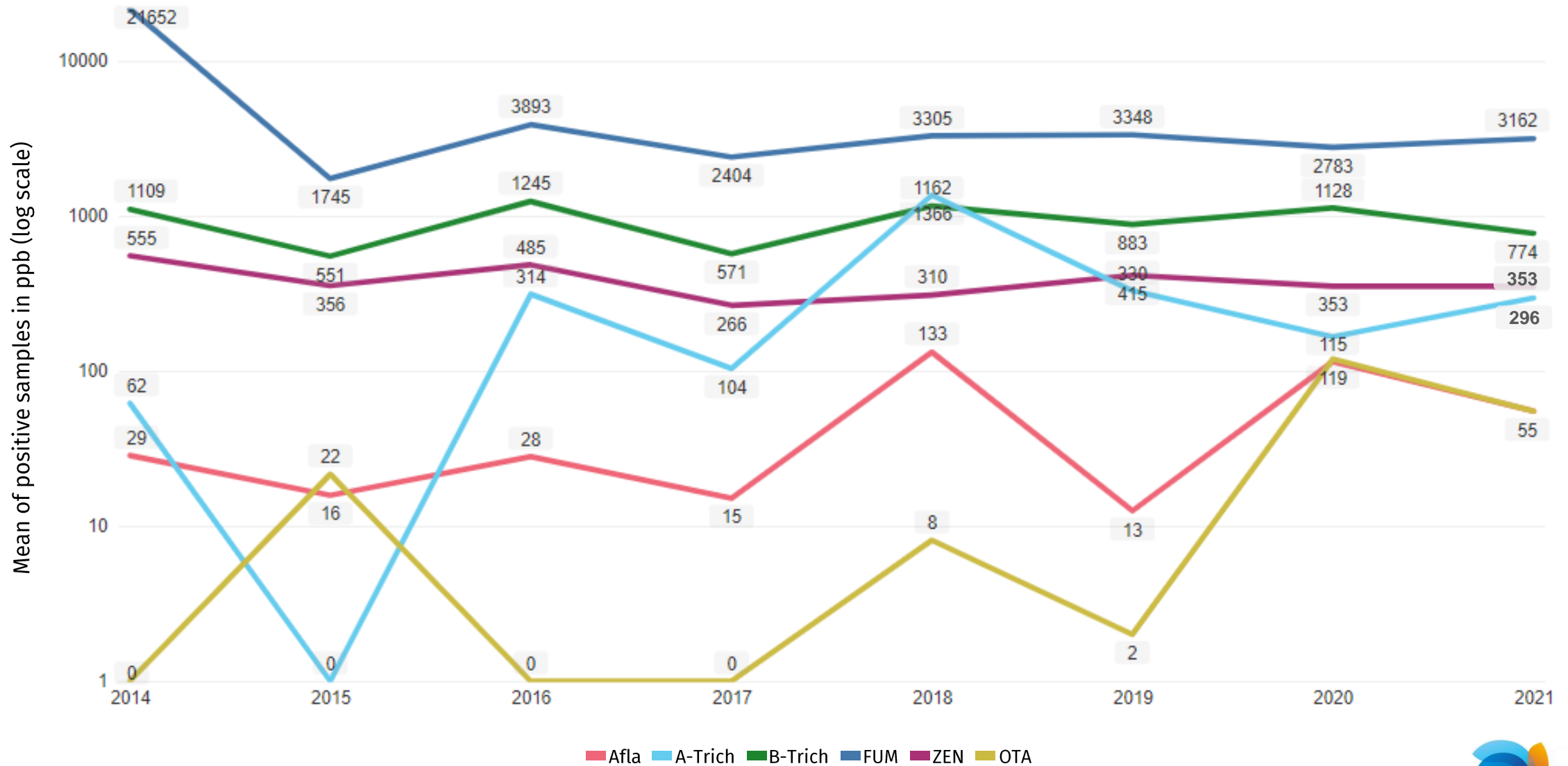
Occurrence Trend in 2021 US Corn



Based on the samples analyzed.



Mean of Positives Trend in 2021 US Corn

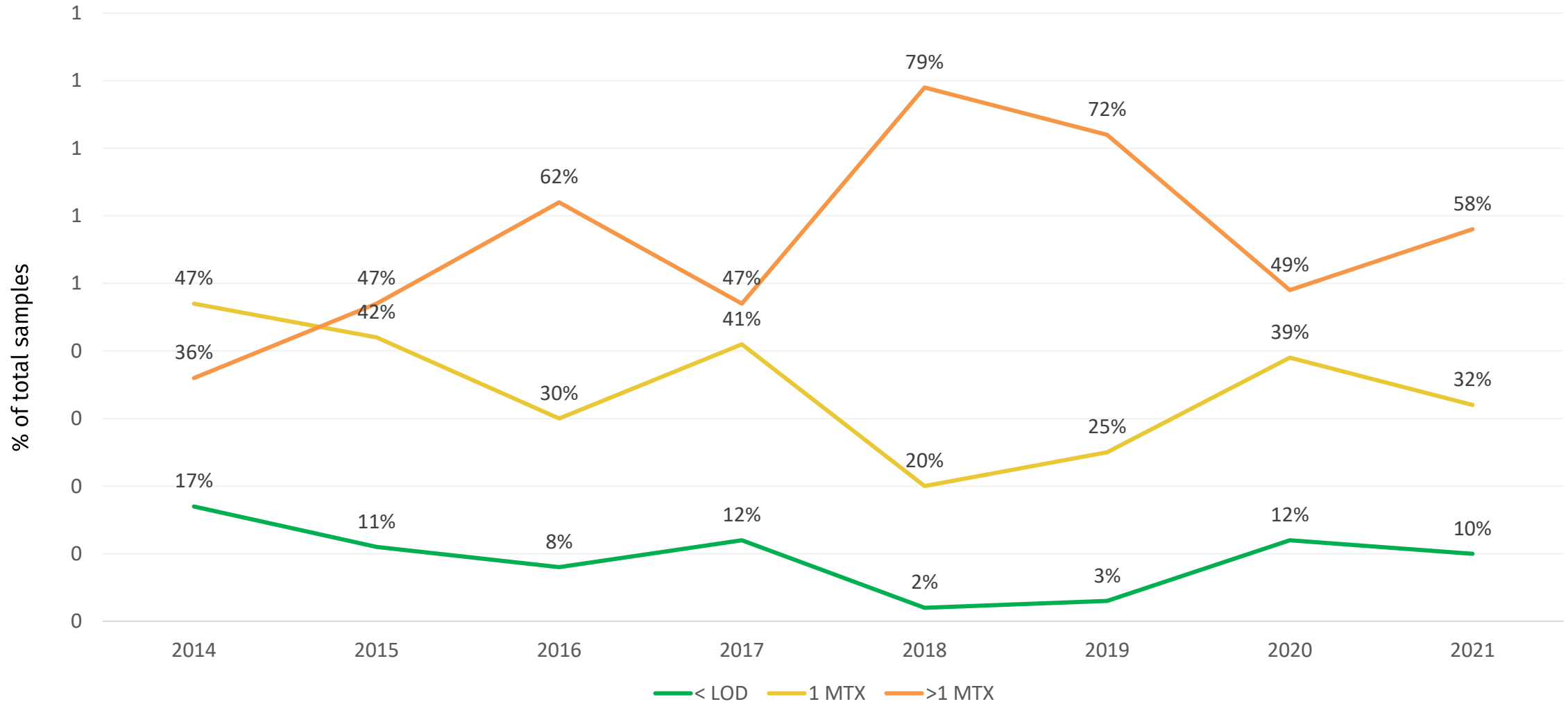


— Afla — A-Trich — B-Trich — FUM — ZEN — OTA

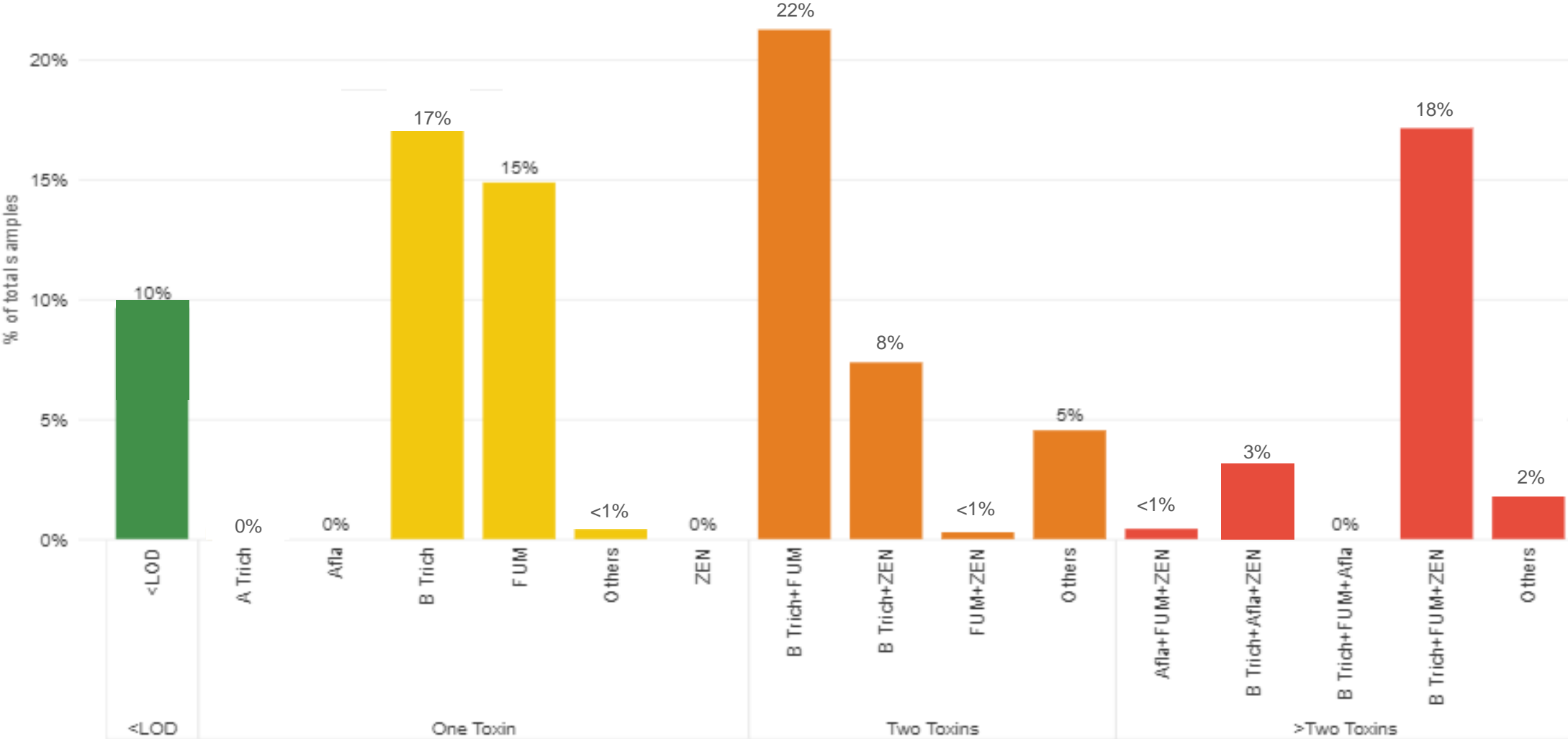
Based on the samples analyzed.



Co-occurrence Trend in 2021 US Corn



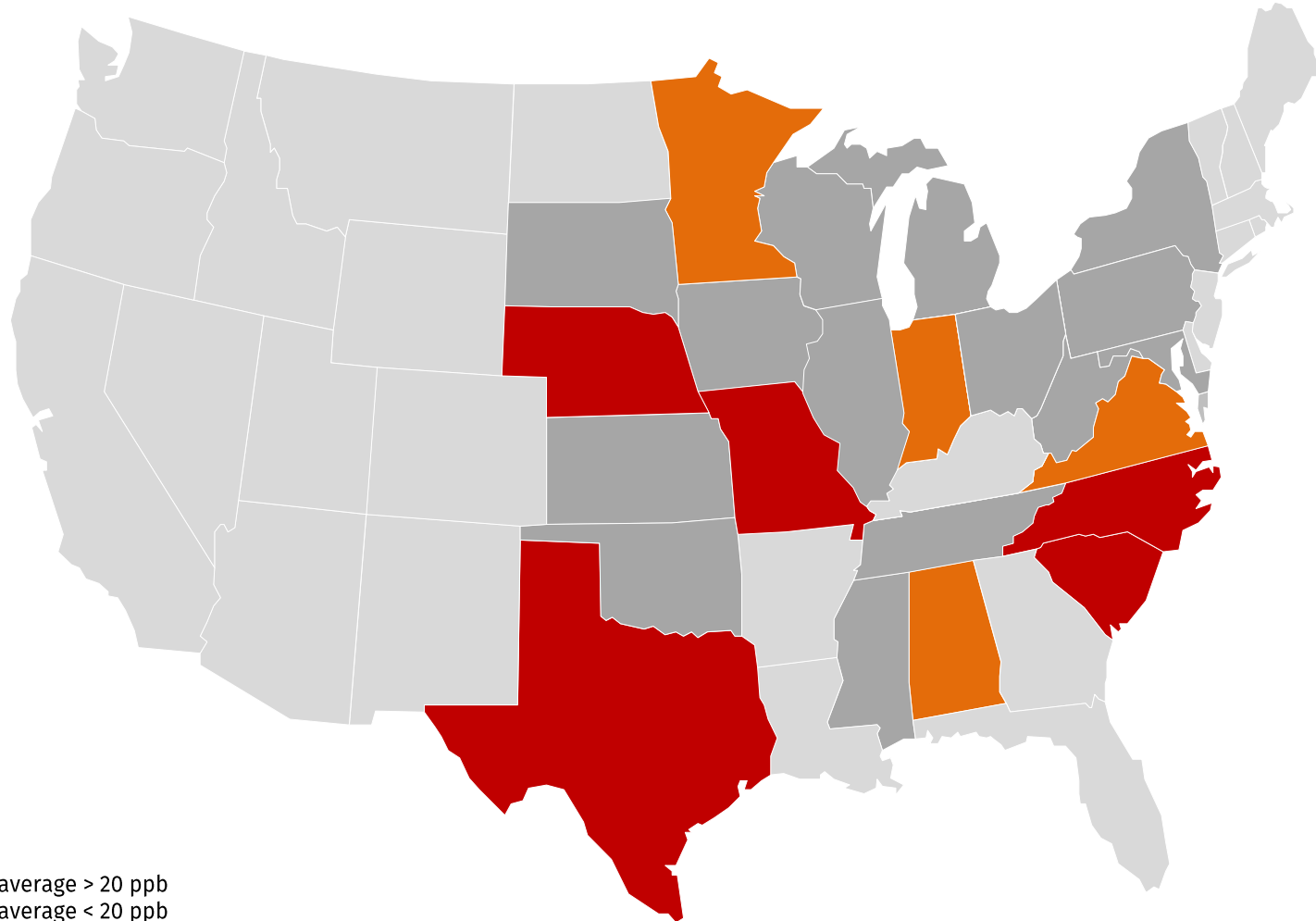
Co-occurrence Profile in 2021 US Corn



Based on the samples analyzed.



2021 Corn Risk by State – Afla

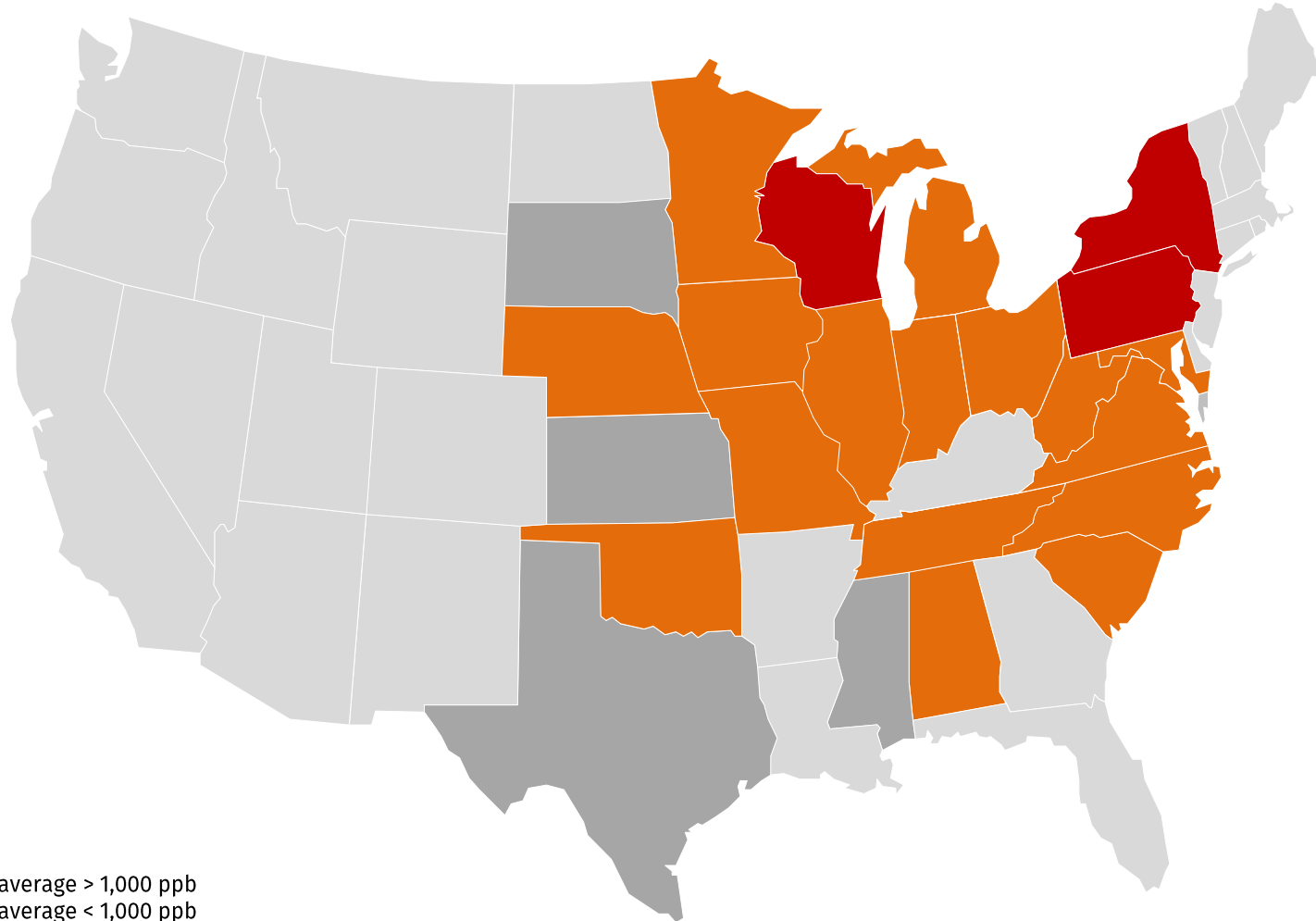


- State with average > 20 ppb
- State with average < 20 ppb
- State with samples < LOD (1 ppb)
- No sample submitted

State	Number of Samples	% Positive Samples	Avg of Positive Samples
NC	23	35	110
NE	13	8	37
SC	6	33	28
MO	20	5	25
TX	4	25	21
AL	18	11	12
IN	13	8	4
VA	8	25	2
MN	23	4	2
IA	18	0	0
IL	21	0	0
KS	3	0	0
MD	1	0	0
MI	15	0	0
MS	3	0	0
NY	1	0	0
OH	20	0	0
OK	3	0	0
PA	2	0	0
SD	4	0	0
TN	5	0	0
WI	33	0	0
WV	1	0	0



2021 Corn Risk by State – B-Trich

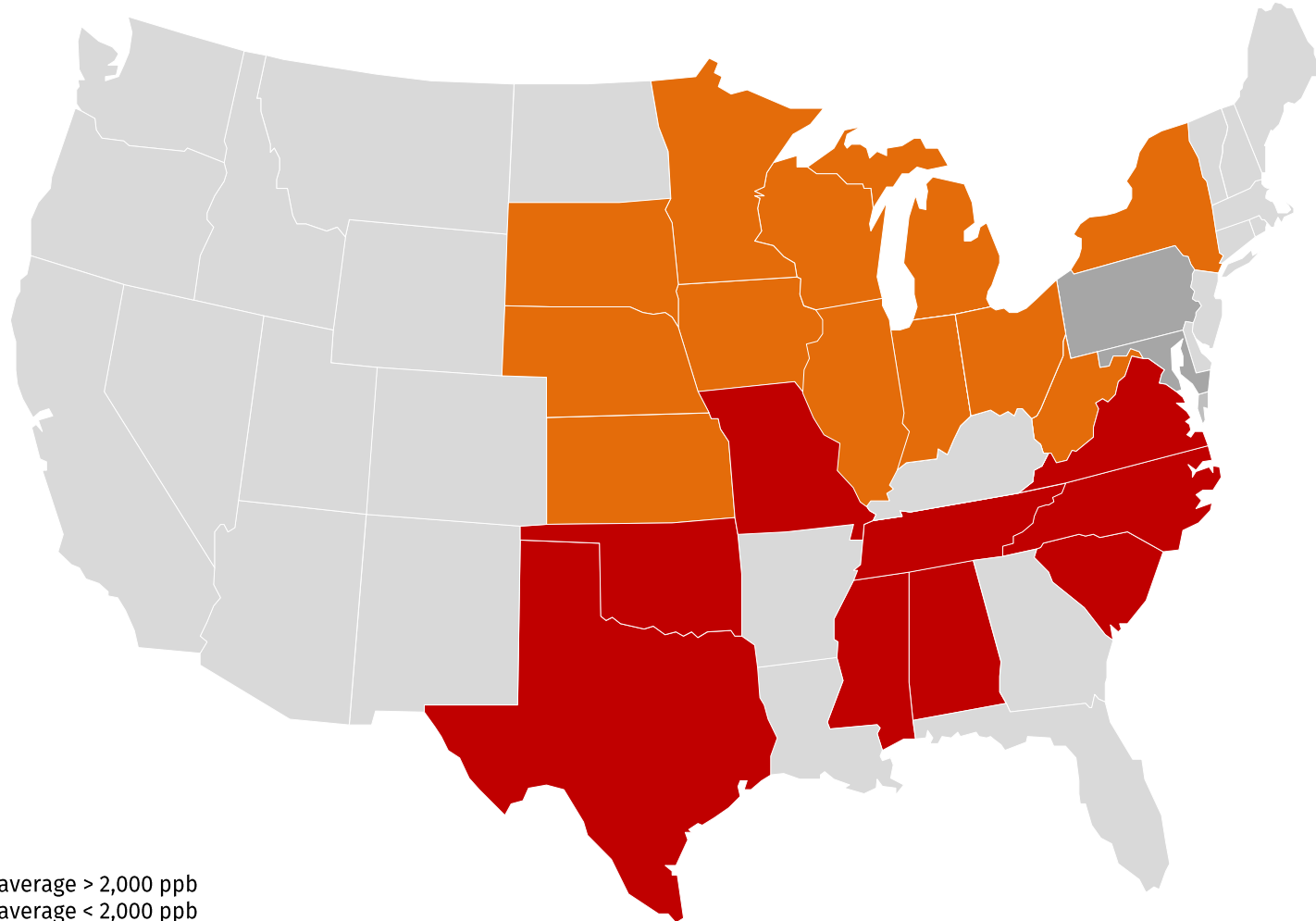


- State with average > 1,000 ppb
- State with average < 1,000 ppb
- State with samples < LOD (100 ppb)
- No sample submitted

State	Number of Samples	% Positive Samples	Avg of Positive Samples
PA	2	56	2824
NY	1	94	1726
WI	33	90	1487
OH	20	85	999
MI	15	0	995
MD	1	100	727
IN	13	100	700
NC	23	22	669
IL	21	60	559
IA	18	0	509
VA	8	48	508
TN	5	85	475
MO	20	100	403
NE	13	85	371
MN	23	33	312
AL	18	100	249
SC	6	50	246
WV	1	0	167
OK	3	100	117
KS	3	0	0
MS	3	100	0
SD	4	91	0
TX	4	100	0



2021 Corn Risk by State – FUM

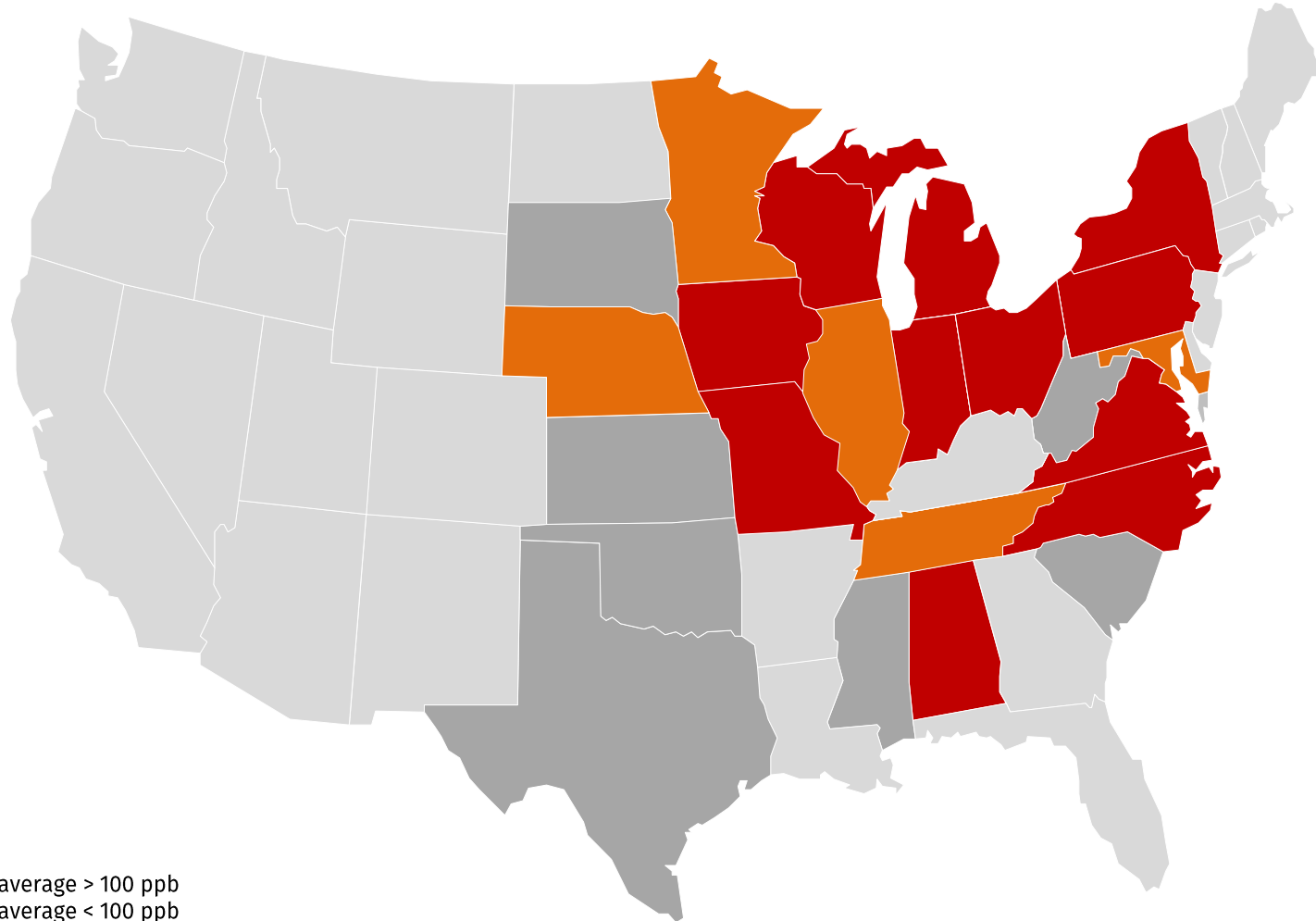


- State with average > 2,000 ppb
- State with average < 2,000 ppb
- State with samples < LOD (100 ppb)
- No sample submitted

State	Number of Samples	% Positive Samples	Avg of Positive Samples
MO	20	89	8558
NC	23	44	7470
TN	5	57	5840
MS	3	62	5667
OK	3	100	4200
VA	8	0	3163
TX	4	47	3000
SC	6	22	2467
AL	18	95	2363
IN	13	100	1525
KS	3	87	1467
NE	13	85	1091
MN	23	100	1060
WV	1	55	700
IL	21	100	633
MI	15	0	629
NY	1	100	600
IA	18	25	425
OH	20	100	364
WI	33	100	258
SD	4	100	100
MD	1	36	0
PA	2	100	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	22	1620
NY	1	39	522
AL	18	24	336
WI	33	38	306
IN	13	0	252
OH	20	100	197
MO	20	53	182
VA	8	4	166
NC	23	5	125
IA	18	0	123
PA	2	30	123
IL	21	23	97
MD	1	100	88
MN	23	45	77
TN	5	0	69
NE	13	50	64
KS	3	0	0
MS	3	0	0
OK	3	60	0
SC	6	0	0
SD	4	38	0
TX	4	39	0
WV	1	0	0



Mycotoxin Survey Summary – 2021 US Corn



90% positive vs.
88% in 2020



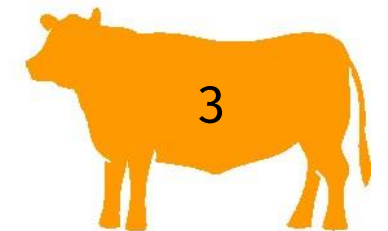
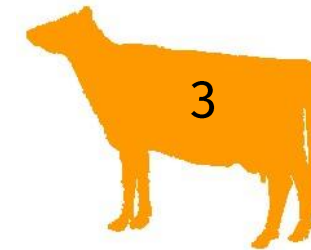
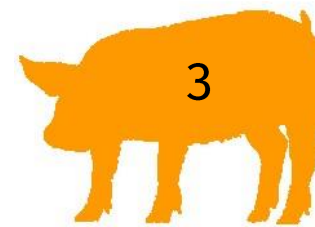
58% >1 MTX vs.
49% in 2020

B-Trich: 70% vs. 58%

FUM: 64% vs. 64%

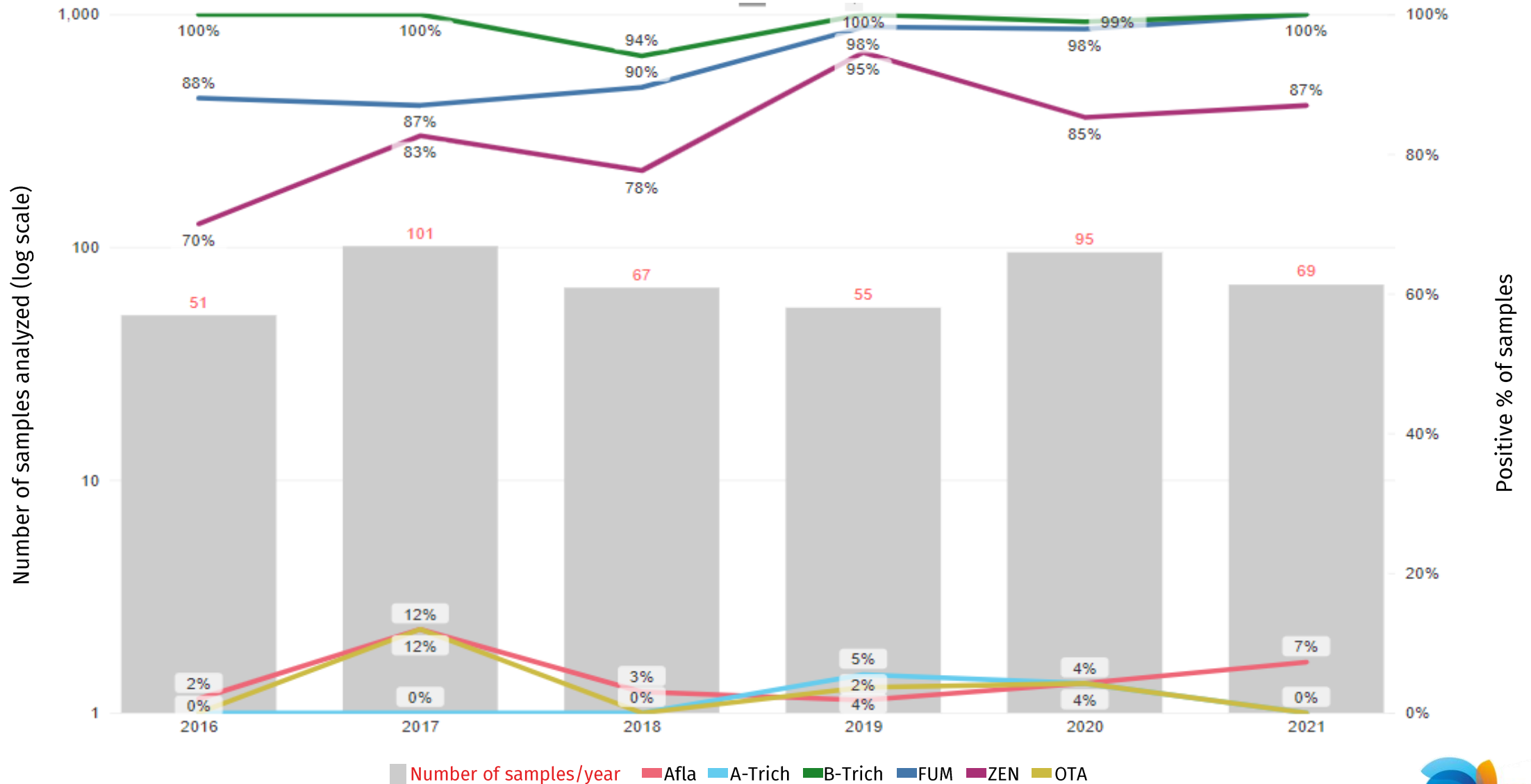
ZEN: 28% vs. 20%

Forecasted potential risk for livestock production*:

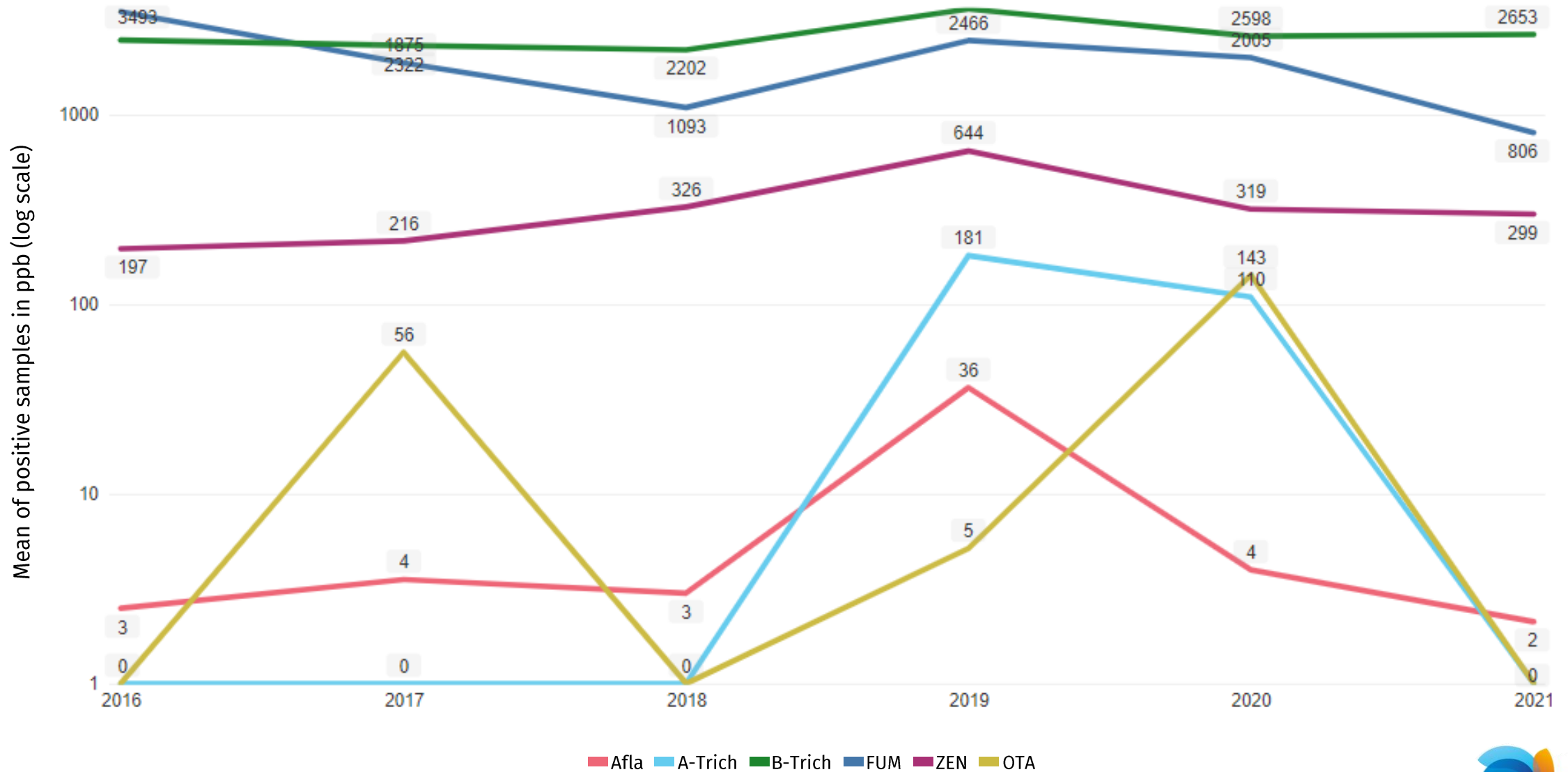


2021 US Corn By-Products (as-fed basis)

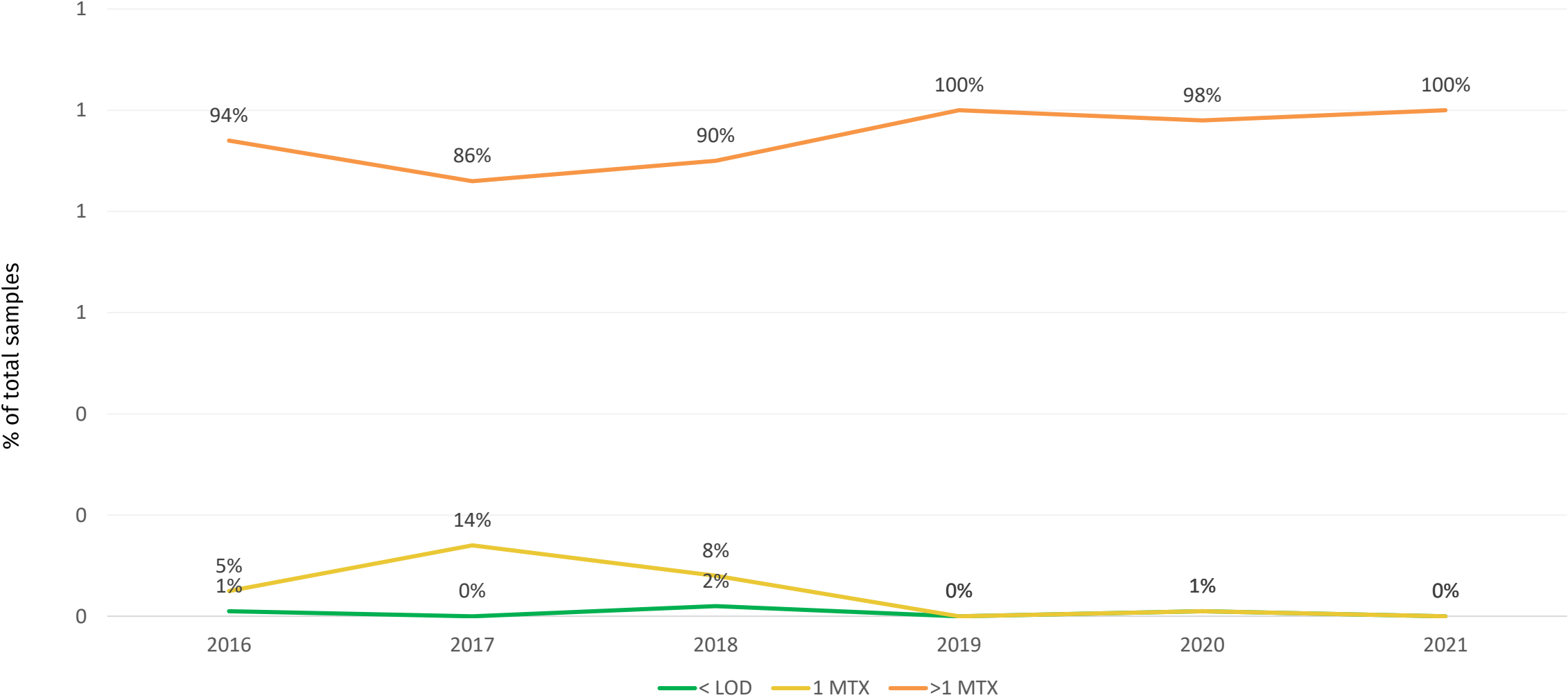
Occurrence Trend in 2021 US Corn By-Products



Mean of Positives Trend in 2021 US Corn By-Products



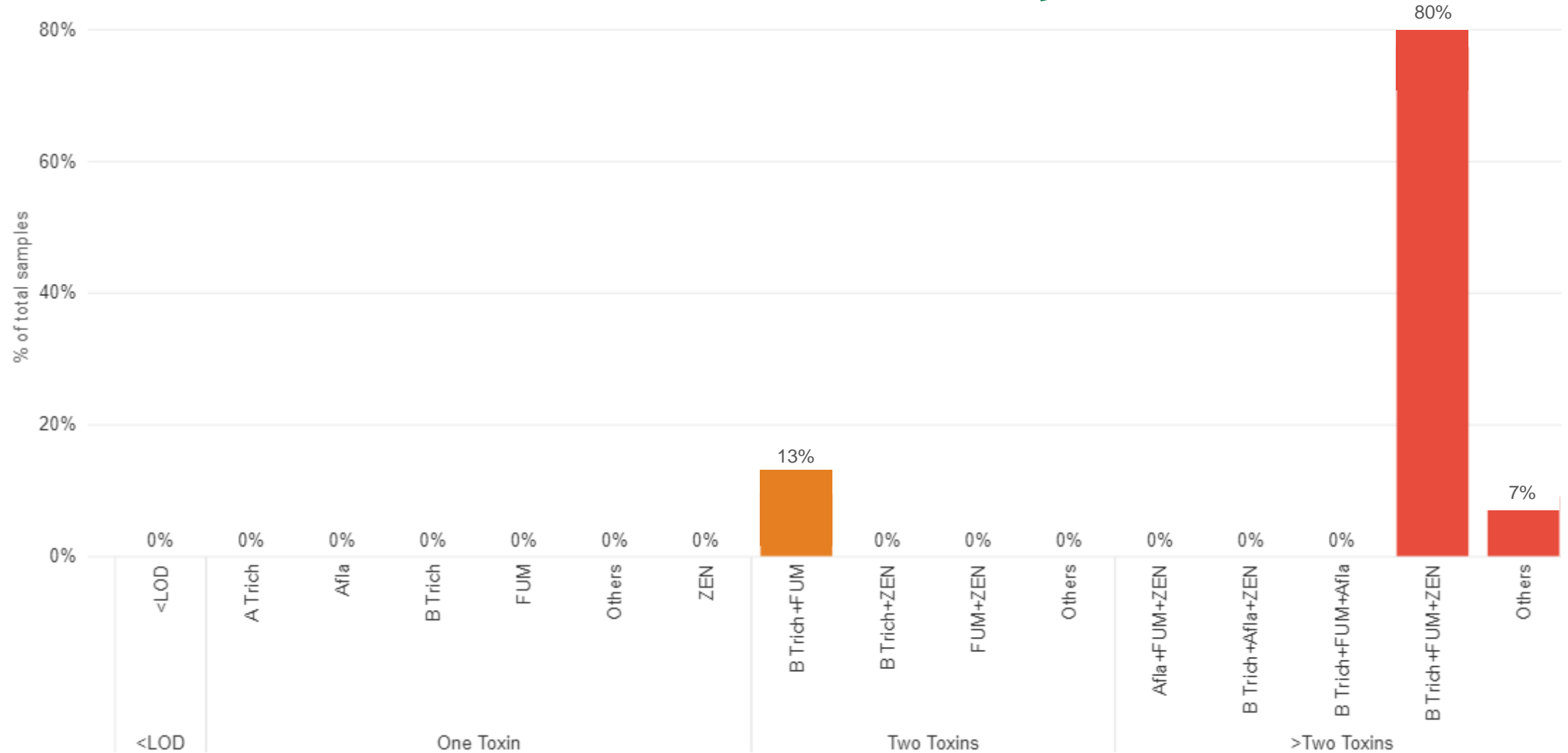
Co-occurrence Trend in 2021 US Corn By-Products



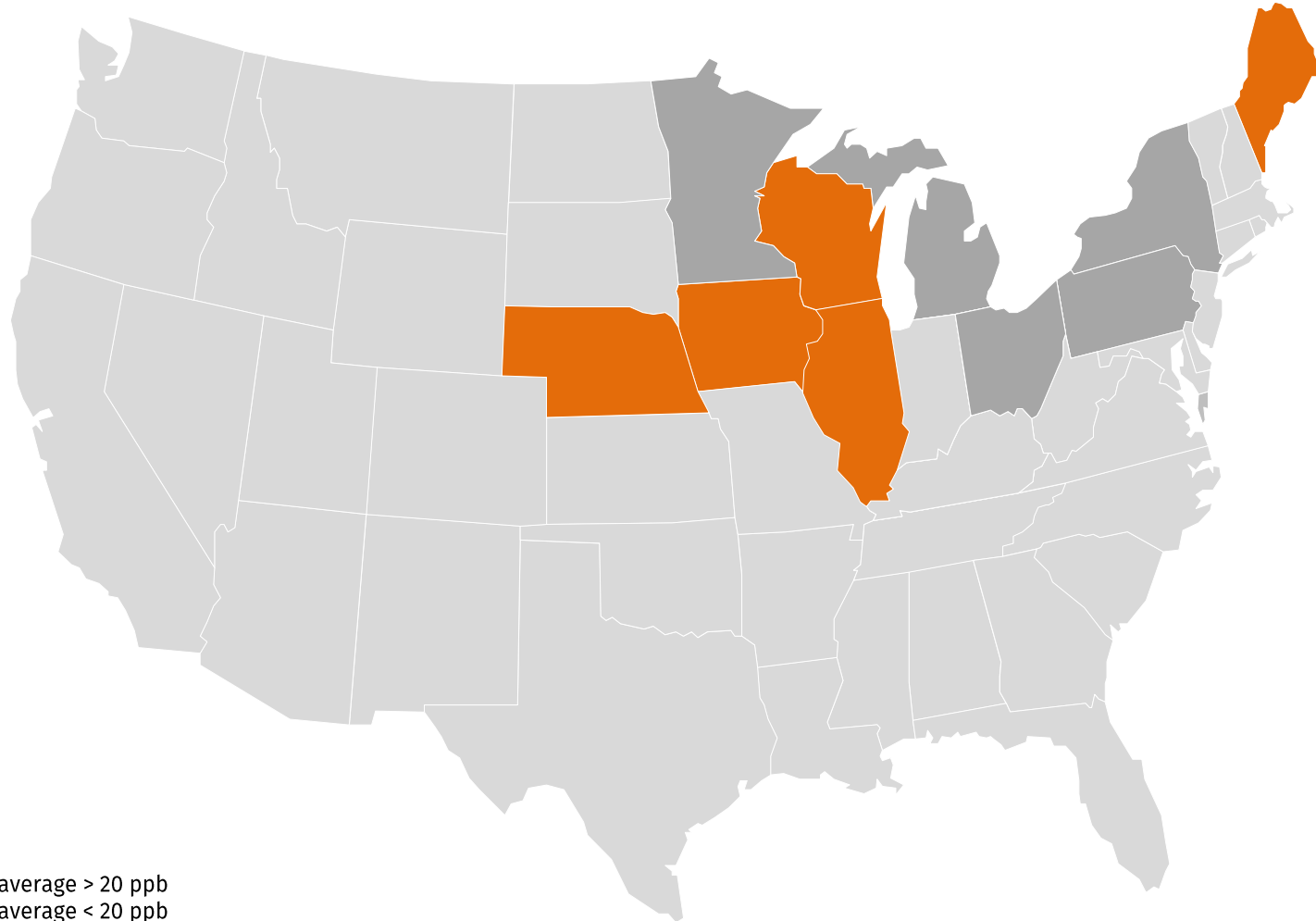
Based on the samples analyzed.



Co-occurrence Profile in 2021 US Corn By-Products



2021 Corn By-Products Risk by State – Afla

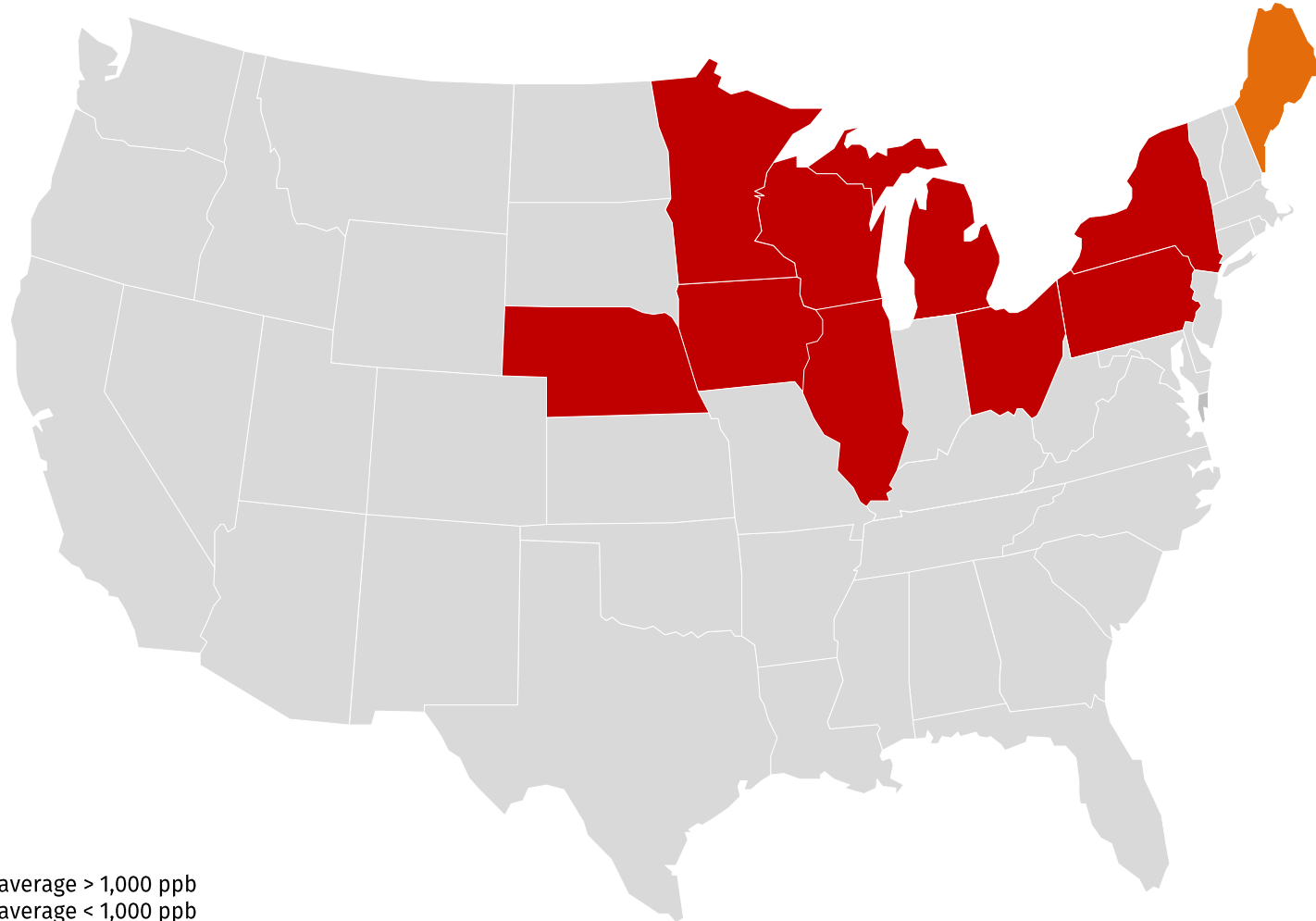


State	Number of Samples	% Positive Samples	Avg of Positive Samples
NE	2	50%	4
IL	12	8%	2
ME	1	100%	2
IA	20	5%	2
WI	21	5%	1
MI	3	0%	0
MN	2	0%	0
NY	2	0%	0
OH	4	0%	0
PA	2	0%	0

- 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

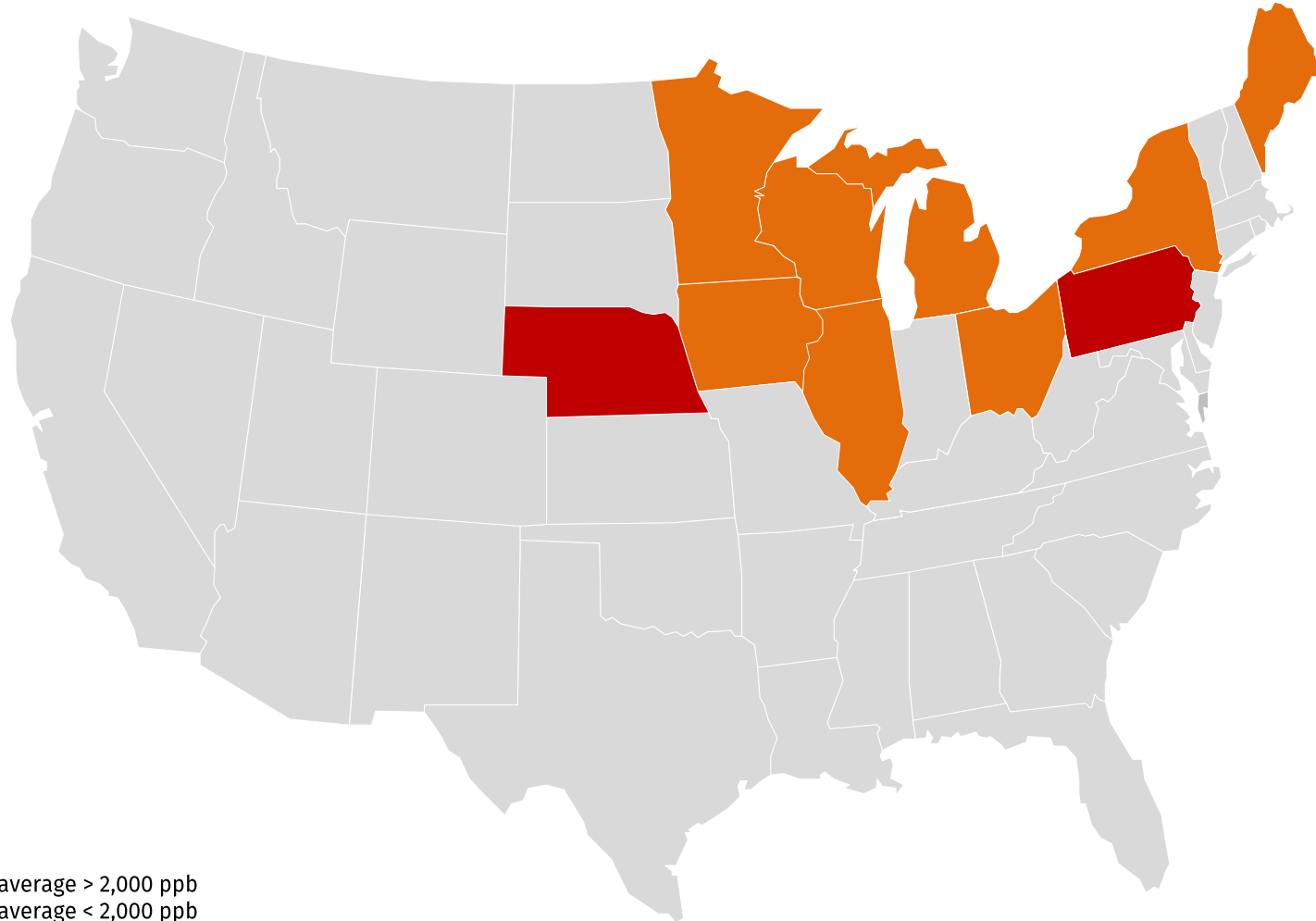


- State with average > 1,000 ppb
- State with average < 1,000 ppb
- State with samples < LOD (100 ppb)
- No sample submitted

State	Number of Samples	% Positive Samples	Avg of Positive Samples
PA	2	100%	8251
OH	4	100%	5365
MI	3	100%	4109
NY	2	100%	3745
WI	21	100%	3254
NE	2	100%	2933
IL	12	100%	1560
IA	20	100%	1447
MN	2	100%	1383
ME	1	100%	662



2021 Corn By-Products Risk by State – FUM

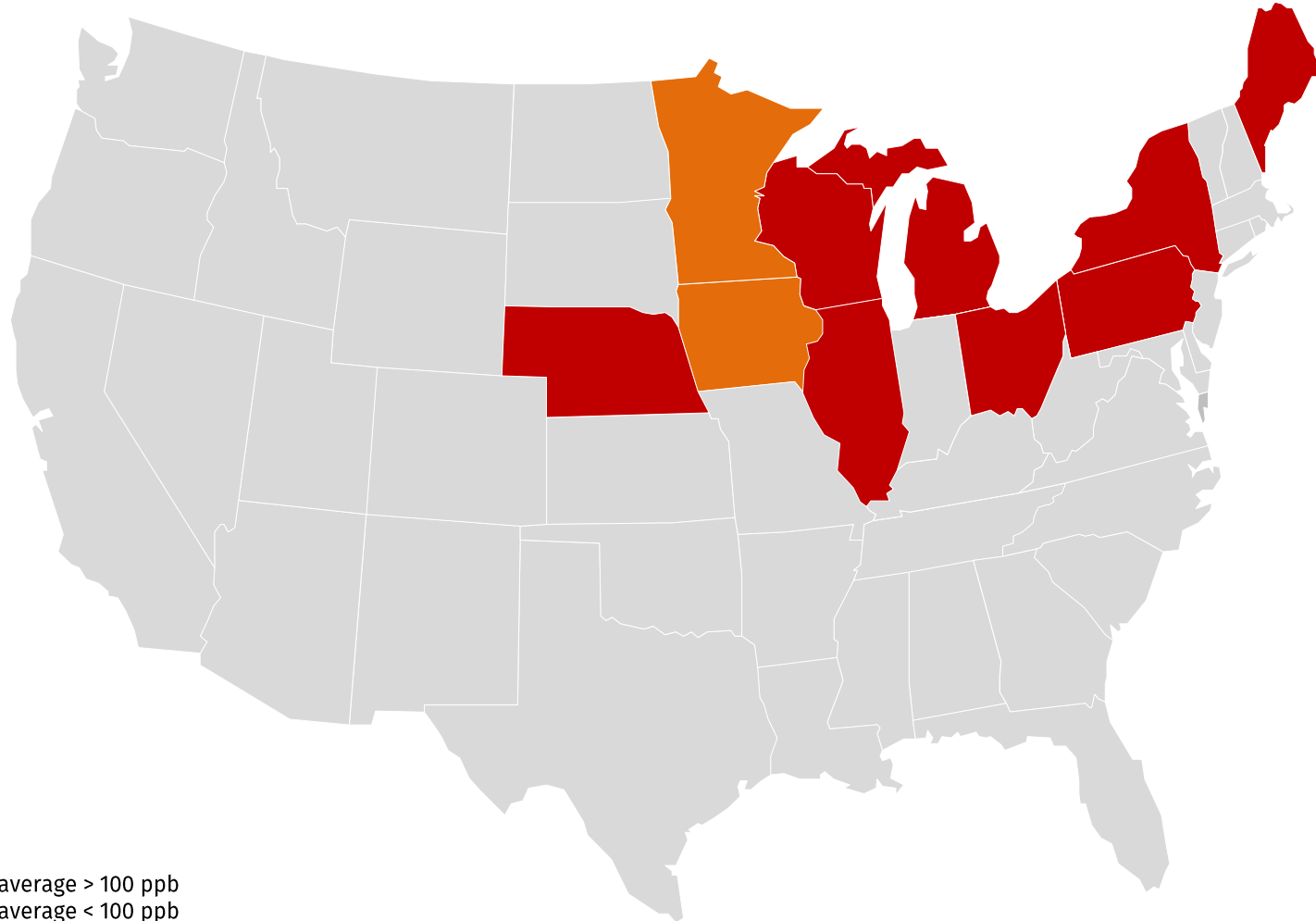


- State with average > 2,000 ppb
- State with average < 2,000 ppb
- State with samples < LOD (100 ppb)
- No sample submitted

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	21	100%	729
IL	12	100%	683
IA	20	100%	435
MN	2	100%	300
NY	2	100%	250
ME	1	100%	100



2021 Corn By-Products Risk by State – ZEN

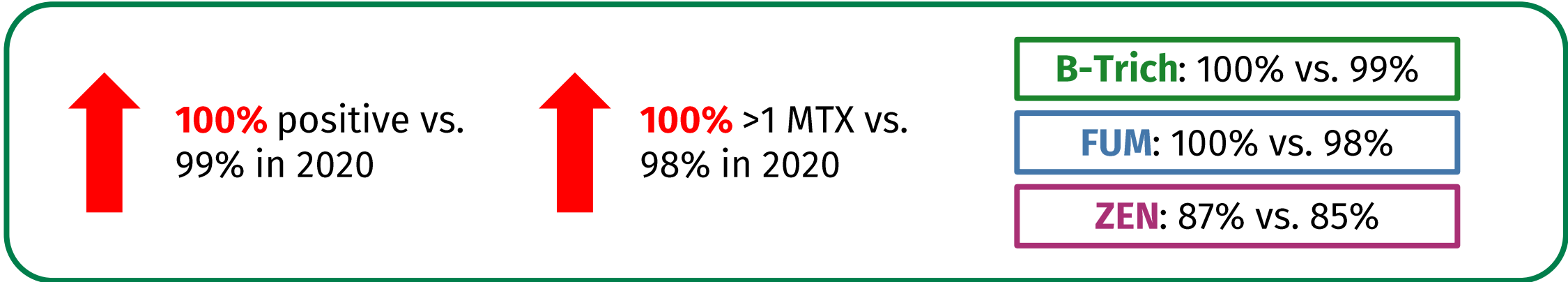


State	Number of Samples	% Positive Samples	Avg of Positive Samples
NY	2	100%	1766
PA	2	100%	1496
MI	3	100%	367
WI	21	90%	322
OH	4	100%	230
NE	2	100%	154
IL	12	92%	119
ME	1	100%	110
IA	20	70%	99
MN	2	100%	90

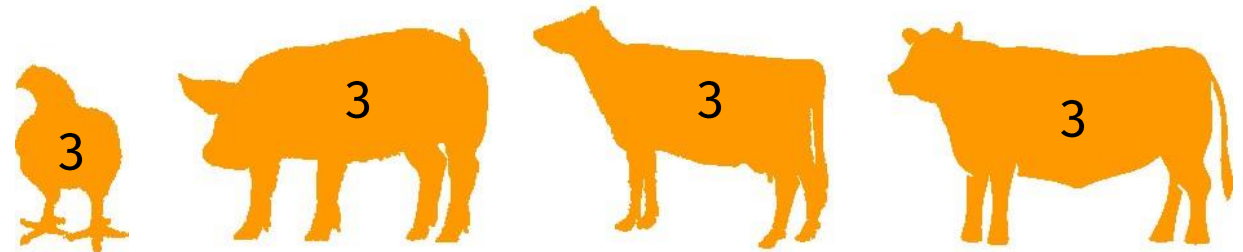
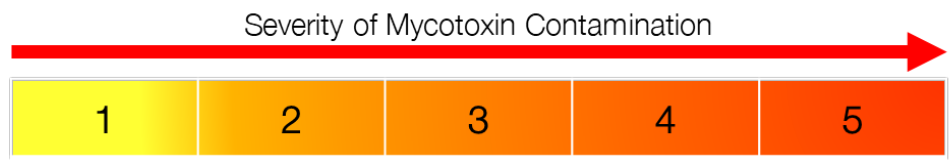
- State with average > 100 ppb
- State with average < 100 ppb
- State with samples < LOD (51.7 ppb)
- No sample submitted



Mycotoxin Survey Summary – 2021 US Corn By-Products



Forecasted potential risk for livestock production*:



*Based on the samples analyzed.

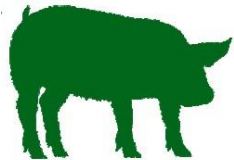
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