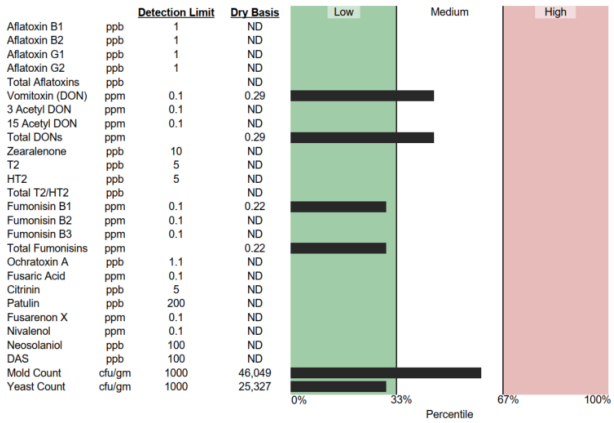
Mycotoxin Percentiles Explained

DAIRYLAND
Laboratories, Inc.

Dairyland's PDF reports for mold and mycotoxins include a graphical representation of how your sample compares to the database of all positive samples Dairyland has analyzed.

Why?
To give an "at a glance" impression of which mycotoxins are high and low within your sample.



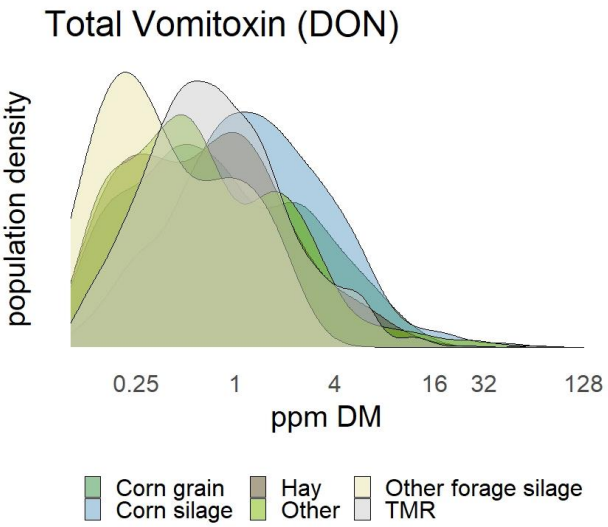
What do contamination percentiles mean?
The percentile tells us "What percentage of contaminated samples have lower levels of mycotoxin than this sample". For example, if your sample is at the 70th percentile, that means it has a higher level of mycotoxin than 70% of all the samples that were tested and found to have mycotoxin contamination.

Why compare my sample against the entire database and not just against feeds of the same type (corn silage vs corn silage)?

For most toxins, there isn't much difference in the distribution across feed types.

16 ppm DON is high for corn grain, corn silage, hay, other forages, and TMR samples. Across all these categories, the median positive sample is between 0.25 and 1 ppm.

Changing the percentiles to be feed type specific wouldn't change the graphs much. Keeping the percentile graphs the same across feed types makes interpretation easier. If high = 0.5 on one feed type, 5 on another, and 50 on another, it's very hard to look at the 3 reports and make any generalized conclusion.



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P (608) 323-2123 • F (608) 323-2184
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Why compare to only positive samples and not all samples?
For many mycotoxins, including Aflatoxin, Fumonisin, and T2, more than 50% of samples have no detectable amount of toxin present. If non-detectable samples were included in the percentile calculations, nearly every positive sample would be in the "high category", even though low levels of mycotoxins are tolerable to most classes of livestock.

Why not graph safety interpretations like Safe, Caution, and Dangerous?

1) We don't know what type of livestock you are feeding. 20 ppb Aflatoxin has a completely different interpretation for lactating dairy cattle than feed lot steers.
2) We don't know what portion of the diet your sample represents. A corn grain sample with 1 ppm DON contributes different risk if its 5% or 30% of the diet.
3) Mycotoxin safety is more complicated than simple thresholds. Some mycotoxins have synergistic effects, meaning they are more harmful when also in the presence of other mycotoxins. Also, livestock that have no other stressors can handle higher levels of mycotoxins than livestock with additional stressors like temperature, stage of lactation, and plane of nutrition.

My sample is in the high percentiles, is it dangerous to feed?
It's not good. In the high percentiles your sample has more mycotoxin than 2/3rds of samples Dairyland has tested. How much of a negative impact the toxin will have depends on many factors like how many other toxins are present, what proportion of the diet this feed represents, and what type of livestock its being fed to.

My sample is in the low percentiles, is it safe to feed?
The mycotoxin level of a sample cannot tell you whether its safe to feed without also considering the type of livestock being fed and what portion of their diet the sample represents. If your sample is in the low percentiles, the amount of toxin in the sample is not uncommon, but its also not zero.

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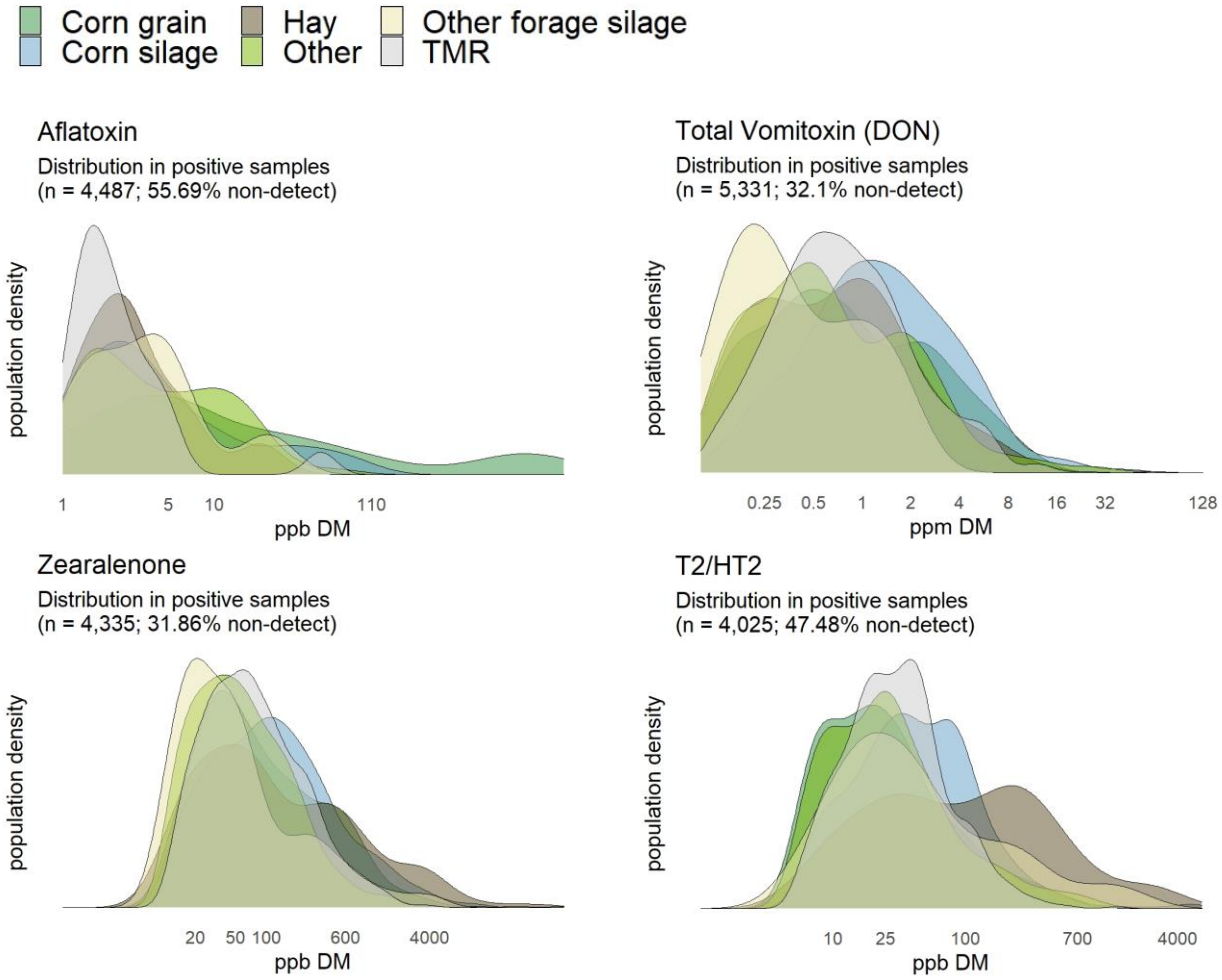
Appendix A – Distribution of toxins by feed type



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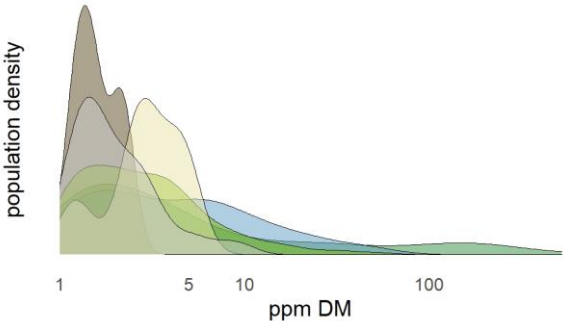
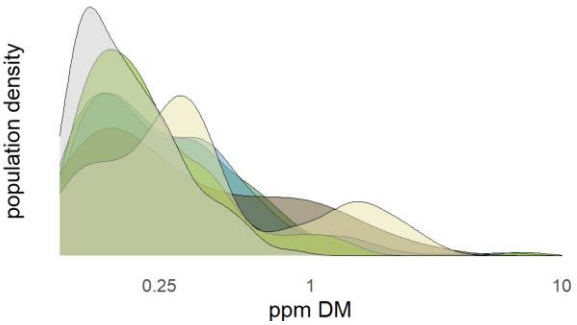
Fumonisin

Distribution in positive samples
(n = 3,697; 55.69% non-detect)



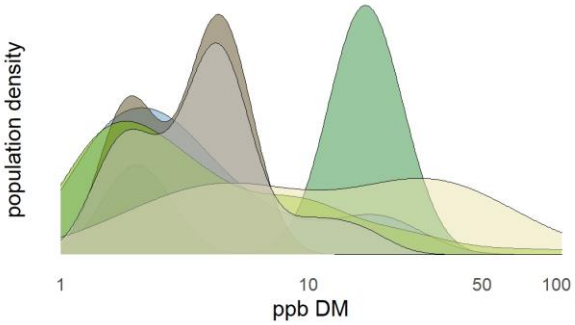
Fusaric Acid

Distribution in positive samples
(n = 2,535; 69.86% non-detect)



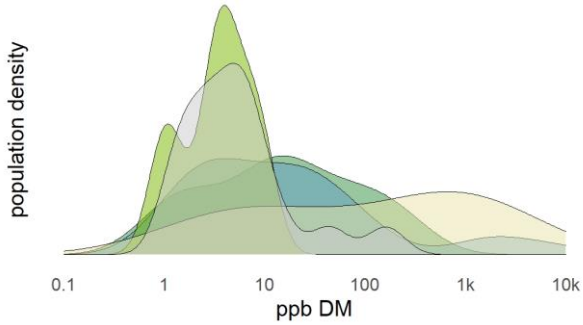
Ochratoxin A

Distribution in positive samples
(n = 3,663; 95.9% non-detect)



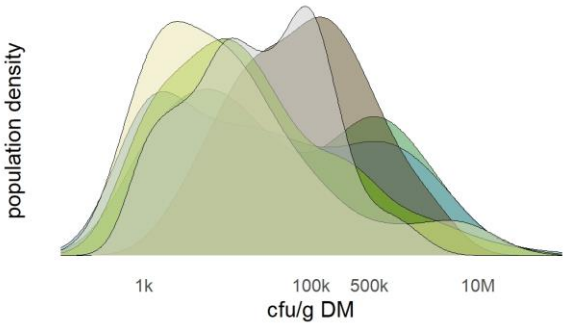
Roquefortine C

Distribution in positive samples
(n = 2,535; 92.14% non-detect)



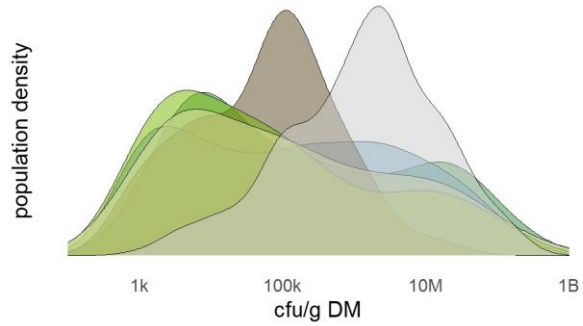
Mold

Distribution in positive samples
(n = 855; 31.81% non-detect)



Yeast

Distribution in positive samples
(n = 855; 31.81% non-detect)



Corn grain
Corn silage
Hay
Other
Other forage silage
TMR

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Appendix B – Percentile table

		Low			Medium	High	
	Unit	**0%**	10%	33%	67%	90%	100%
Aflatoxin B1	ppb	1.05	1.26	2.14	6.34	28.4	1,992
Aflatoxin B2	ppb	1.07	1.29	1.76	3.44	61.6	85.0
Aflatoxin G1	ppb	1.05	1.33	2.25	3.96	6.49	22.0
Aflatoxin G2	ppb	1.14	1.22	1.88	3.59	9.89	21.3
Total Aflatoxins	ppb	1.05	1.27	2.14	6.12	28.4	2,059
Fumonisin B1	ppm	0.10	0.13	0.22	0.60	2.37	385
Fumonisin B2	ppm	0.10	0.12	0.18	0.47	1.58	110
Fumonisin B3	ppm	0.10	0.13	0.20	0.41	1.19	26.3
Total Fumonisins	ppm	0.10	0.13	0.22	0.72	3.15	522
Zearalenone	ppb	10.2	17.5	40.0	133	502	83,055
T2	ppb	5.12	6.34	10.5	26.6	128	2,454
HT2	ppb	5.14	8.44	18.0	45.3	121	5,060
Total T2 HT2	ppb	5.16	8.64	19.6	49.5	151	6,061
Vomitoxin	ppm	0.10	0.20	0.49	1.39	3.72	333
3 Acetyl	ppm	0.11	0.11	0.12	0.15	0.21	0.29
15 Acetyl	ppm	0.11	0.13	0.21	0.34	0.56	18.4
Total DONs	ppm	0.10	0.20	0.49	1.39	3.77	333
Nivalenol	ppm	0.11	0.13	0.18	0.42	0.48	0.52
Ochratoxin A	ppb	1.15	1.39	2.10	4.82	17.3	105.11
Citrinin	ppb	5.18	7.08	14.4	203	854	2,806
Fusaric Acid	ppm	0.10	0.12	0.16	0.30	0.62	6.98
Roquefortine C	ppb	1.06	1.40	3.39	15.6	164	7,225
Mold count	cfu/g	1K	1K	9K	90K	700K	45M
Yeast count	cfu/g	1k	2k	50k	1.7M	22M	288M