Agrarian® SOLUTIONS

Mycotoxin Report 2019 & 4TH Quarter

Welcome

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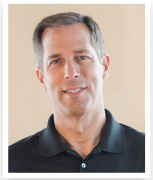
Letter From Our Vice President of Operations

For many years Agrarian Solutions® has been a leader in the distribution of information pertaining to environmental challenges present in livestock feed. We are now very pleased to offer you precise data that can provide even greater insight to guide your decisions and improve the health and performance of your livestock. Activation Laboratories, a global leader in analytical lab services, is providing us with independent and state of the art results. In the pages ahead, you will find extremely helpful information to assist in discerning the best course of action to optimize your animals' performance.



Mark Lantz
Vice President Operations
Agrarian Solutions®

Actlabs
41 Bittern Street,
Ancaster, ON, L9G 4V5

actlabs.com

Actlabs, in Ancaster, Ontario, Canada, is our partner in providing technologically advanced mycotoxin analyses. Actlabs is a global enterprise certified under ISO 9001 and 9002 specifications. They are credentialed under various Canadian agencies and are FDA approved. Analyses are done with high-performance liquid chromatography/tandem mass spectroscopy (LC-MS/MS). And no result is released until a trained technician carefully reviews each chromatogram for various parameters. This method gives excellent sensitivity and accuracy and permits determination of chemically related toxins within the sample. In each sample, 17 mycotoxins are analyzed and reports are optimized for best use by the client, including estimates of the degree of severity of the concentration(s) found.

We're a go for launch

For many years, Agrarian Solutions has been logging results from our mycotoxin testing service, and now we're very excited to begin providing reports drawn from that database. This mail is the debut of our reporting, and the accompanying graphics show averages for major mycotoxins across the US by state for 4th quarter 2019 and for the entire year. You may find 4th quarter of particular significance for its relevance to assessing the quality of new crop corn silage. However, the averages given are for all samples, whether TMR, silage, haylage, or individual ration ingredients. But the possibilities for future reports showing only one or two such ration fractions are good. If you're not familiar with Agrarian's testing service...at no cost to producers, more will be said on that below.

Let's look at some of the highlights of 2019: Agrarian supported 1,343 tests in the US. As you scan the states table, note the number of submissions. Three clusters of states accounted for 96.5% of all samples; their results demonstrate why they do so well at monitoring feed quality. One of the areas taking few samples (3.4% of the total) still posted a high DON average. Some years ago, Dr. Lon Whitlow showed data for large numbers of Holsteins indicating at 300 ppb DON, producers begin experiencing reductions in milk production! What, then, can dairies expect with an average of 2,000 ppb DON and 385 ppb zearalenone? Forget milk, now we're well into major reproductive failures. The Midwest states sampled the most...57% for year and 67% for 4th quarter. That's an area that is highly aware of the impact of *Fusarium* toxins. But look at the aflatoxin report. PA and IN had it in the 4th quarter; VA was positive during the year. How many of you believe for one minute that US corn only had three positive aflatoxin tests during 2019? Yet some of the states at greatest risk for this toxin did not submit a single sample for analysis. With a ration containing 25 ppb aflatoxin, a producer can expect his Holsteins to pass violative levels of aflatoxin M1 in the milk. You'd think they'd want to have regular checks on this toxin.

Our data became digitally searchable in 2018, and we've chosen to launch our reporting with the first full searchable year. Can this kind of report help you with your decision-making? Would other formats or distribution patterns be more helpful? Your feedback would be highly appreciated and you can send that at office@agrsol.com. As for Agrarian, our intent is to provide three reports during 2020 and then, perhaps, go to quarterly reporting. Are you familiar with our testing service? Ask us about it office@agrsol.com. Agrarian Solutions and its US dairy partner, Select Sires, look forward to your comments and questions.

John Doerr, Ph.D., PAS, Dpl. ACAP
Vice President, Science and Technology
Agrarian Solutions®

2019 Q4 State Averages

State	OchratoxinA2	Zearalenone	Combined AFL Average	Combined DON Average	Combined FUM Average	Combined T2 Average	No. of Samples
FL	5	1190	nd	115	1800	90	3
GA	nd	nd	nd	nd	nd	nd	2
ID	nd	40	nd	680	1800	nd	1
IL	nd	94	nd	1123	492	nd	17
IN	nd	58	2	998	700	nd	7
IA	nd	156	nd	1697	367	nd	11
KS	nd	83	nd	475	1529	nd	8
KY	nd	102	nd	663	1533	100	7
MD	nd	105	nd	700	200	nd	6
MI	nd	229	nd	1851	288	147	21
MN	nd	174	nd	1275	189	188	86
MS	nd	60	nd	140	600	nd	1
MO	nd	43	nd	346	1360	nd	6
NE	nd	70	nd	585	200	nd	2
NH	nd	60	nd	3185	nd	nd	2
NJ	nd	nd	nd	150	nd	nd	1
NY	nd	583	nd	2273	nd	nd	3
NC	nd	392	nd	1901	933	nd	15
ND	nd	nd	nd	nd	nd	nd	0
OH	nd	141	nd	1290	423	nd	48
PA	nd	313	21	1329	762	nd	53
SC	nd	nd	nd	140	200	nd	1
SD	nd	80	nd	750	nd	nd	3
TN	nd	55	nd	588	280	nd	6
VA	nd	106	nd	1594	335	nd	20
WA	nd	nd	nd	180	nd	nd	1
WI	nd	249	nd	2013	394	132	79

nd = none detected
= low
= medium
= high

START DATE **October 1, 2019** | END DATE **December 31, 2019**

NO. OF SAMPLES **410**

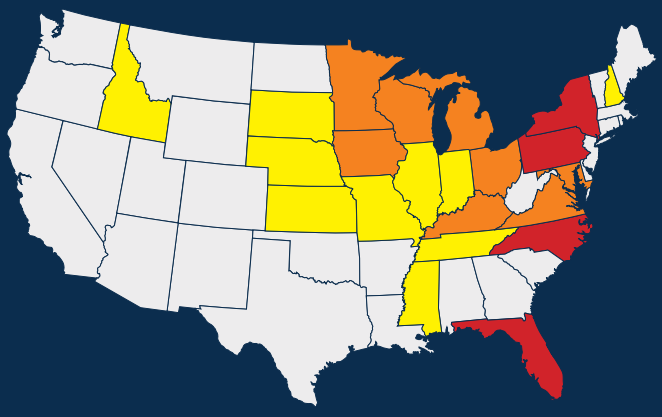
State Averages Q4 2019

OchratoxinA2

PPB (Parts per billion)

nd <10

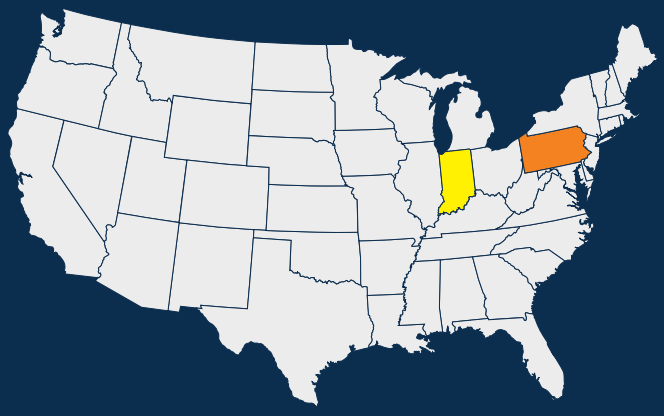
Zearalenone



PPB (Parts per billion)

nd <100 100-299 300+

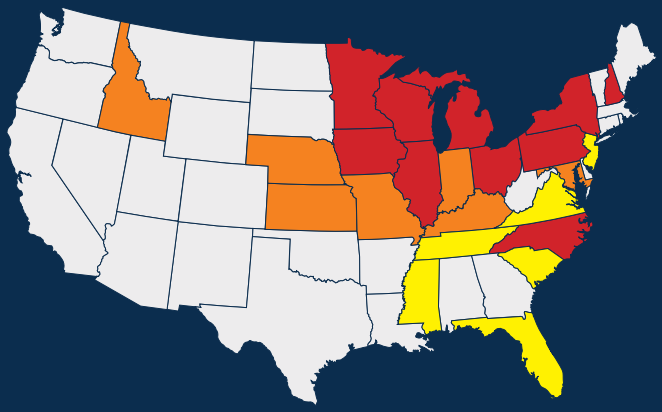
Combined AFL Average



PPB (Parts per billion)

nd <10 10-29 30+

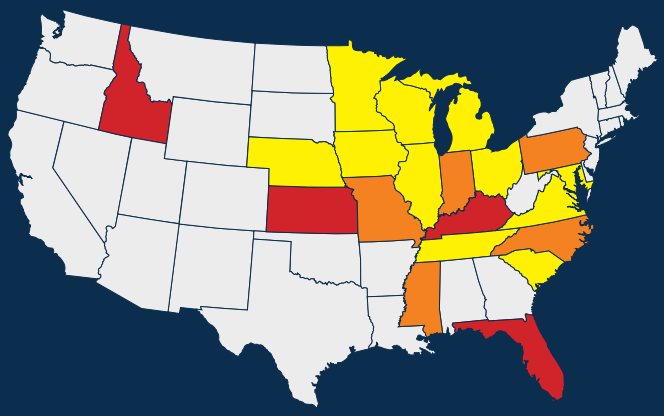
Combined DON Average



PPB (Parts per billion)

nd <300 300-999 1000+

Combined FUM Average



PPB (Parts per billion)

nd <500 501-1499 1500+

Combined T2 Average

PPB (Parts per billion)

nd <75 75-199 200+

2019 YEAR State Averages

State	OchratoxinA2	Zearalenone	Combined AFL Average	Combined DON Average	Combined FUM Average	Combined T2 Average	No. of Samples
AL	nd	nd	nd	420	300	nd	1
FL	5	1190	nd	115	1000	90	5
GA	nd	nd	nd	nd	nd	nd	2
ID	nd	40	nd	680	1800	nd	3
IL	nd	140	nd	1438	589	nd	38
IN	nd	103	2	1449	446	220	25
IA	nd	188	nd	1623	492	nd	52
KS	nd	95	nd	1005	1228	nd	21
KY	nd	323	nd	815	1545	100	14
LA	nd	nd	nd	290	900	nd	1
MD	nd	79	nd	844	253	nd	29
MI	nd	240	nd	2599	446	168	58
MN	nd	169	nd	1225	247	168	156
MS	nd	60	nd	140	600	nd	1
MO	nd	77	nd	367	2009	nd	12
NE	nd	168	nd	1115	1283	nd	6
NH	nd	60	nd	3185	nd	nd	2
NJ	nd	255	nd	1457	900	nd	3
NY	nd	238	nd	1258	475	151	40
NC	nd	164	20	1048	1028	245	68
OH	nd	189	nd	1938	656	352	147
PA	nd	336	21	1622	622	277	272
SC	nd	50	nd	350	200	nd	3
SD	nd	128	nd	1345	825	nd	11
TN	nd	78	nd	720	819	750	17
TX	9	195	nd	530	1900	nd	4
UT	nd	nd	nd	150	nd	nd	1
VA	nd	225	nd	2247	1457	153	71
WA	nd	nd	nd	180	nd	nd	1
WV	nd	560	nd	2530	850	nd	2
WI	nd	380	nd	2130	231	124	277

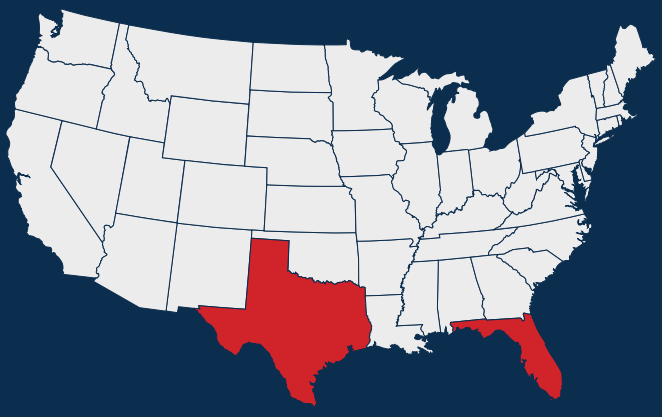
nd = none detected
= low
= medium
= high

START DATE **January 1, 2019** | END DATE **December 31, 2019**

NO. OF SAMPLES **1343**

State Averages YEAR 2019

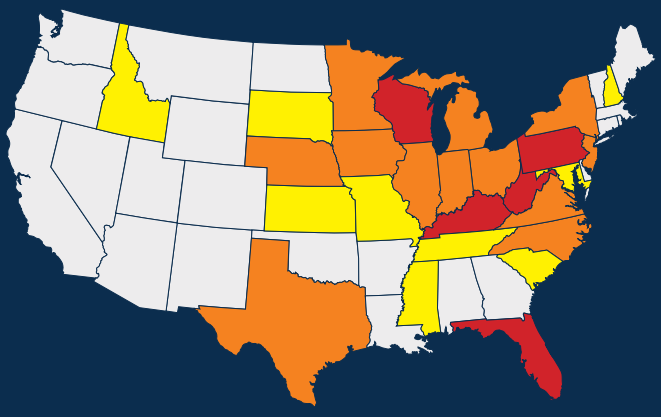
OchratoxinA2



PPB (Parts per billion)

nd <10

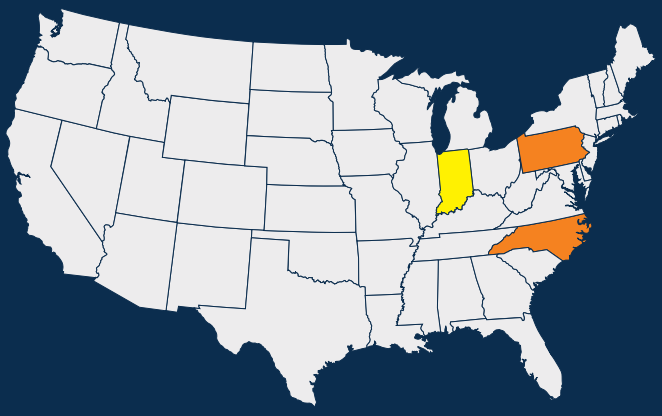
Zearalenone



PPB (Parts per billion)

nd <100 100-299 300+

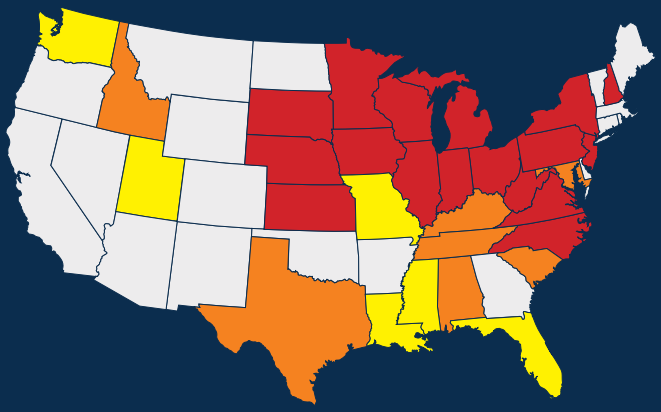
Combined AFL Average



PPB (Parts per billion)

nd <10 10-29 30+

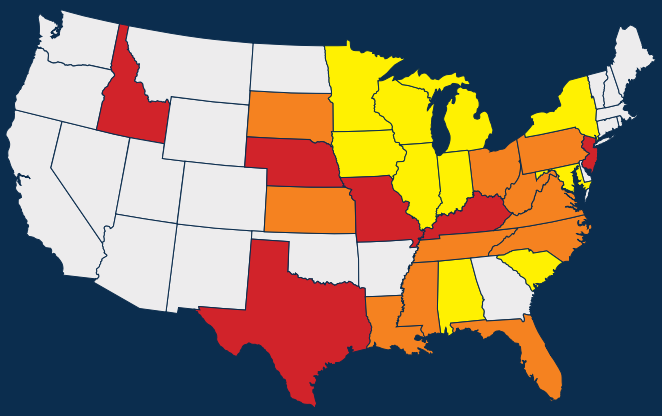
Combined DON Average



PPB (Parts per billion)

nd <300 300-999 1000+

Combined FUM Average



PPB (Parts per billion)

nd <500 501-1499 1500+

Combined T2 Average

PPB (Parts per billion)

nd <75 75-199 200+

Guide for Mycotoxins in Dairy

APPROXIMATE RANGE FOR POTENTIAL REACTION			
MYCOTOXINS	**LOW**	**MEDIUM**	**HIGH**
DON (vomitoxin)	< 300 ppb	300-1,000 ppb	> 1,000 ppb
Zearalenone	< 100 ppb	100-300 ppb	> 300 ppb
Aflatoxin	< 10 ppb	10-30 ppb	> 30 ppb
T-2 toxin	< 75 ppb	75-150 ppb	> 150 ppb
Fumonisin	< 600 ppb	600-1,500 ppb	> 1,500 ppb

Revised 01/2019

QUALIFIERS

- Multiple mycotoxins will compound potential effects.
- Toxic effect may be increased by body condition, health challenges, or stress.
- Mycotoxins are not uniformly distributed in feedstuffs.
- Small samples yield high test errors and underestimate mycotoxin contamination rate.
- Low-level test results may still be cause for pro-active response.

REPRESENTATIVE SYMPTOMS

DON (vomitoxin)

Reduced feed intake / feed refusal

Reduced milk production; reduced milk fat

Poor reproductive performances

Elevated SCC

Impaired immune function

Loose, inconsistent manure

Zearalenone

Hyper-estrogenism

Poor reproductive performance

- Short cycle heats
- Cystic cows; follicular cysts
- Twinning cows; multiple ovulations
- Vaginitis
- Enlarged mammary glands in virgin heifers

Aflatoxin

Liver damage; altered protein synthesis

Decreased appetite/off feed

Lower milk protein

Impaired immune function

Increased disease rates

Highly interactive

Rough hair coat

T-2 toxin

Reduced feed intake

Intestinal hemorrhages

Frequent defecation

Bloody diarrhea

Absence of estrous

Impaired immune function

Increased disease rates

Fumonisin

Reduced feed intake

Reduced milk production

GI tract ulceration

Impaired immune function

The Agrarian Solutions Team

Front Row (left to right): John Doerr, Ph.D., PAS, Dpl. ACAP - Vice President, Science & Technology and **Ruth Carlson** - Office Manager
Back Row (left to right): Dan Hoying - Regional Sales Manager Midwest Region, **Chad Christensen** - Regional Sales Manager Midwest Plains Region,
Rob Hamaker - Vice President, Sales & Marketing, **Mark Lantz** - Vice President Operations, **Greg Muchmore** - Regional Sales Representative Eastern Region, **Nic Bradley** - Director of Operations

The Agrarian Advantage
Are You Making the Right Choice?

1 Unique Technology

The Agrarian proprietary technology works within the intestinal cell wall to improve immune function, reduce the burden of pathogens, and combat feed-borne toxins that effect the performance and health of the animal.

2 State-Of-The-Art Testing Program

Agrarian Solutions is committed to offering mycotoxin testing at no charge as a service. Mycotoxins can wreak havoc on the dairy. We believe mycotoxin testing should be implemented on every dairy. Ask your local Agrarian Solutions representative how to take advantage of this special offer.

3 Professional Product Support System

Agrarian Solutions has a team ready to serve you. Our Agrarian Representatives are equipped to help provide outstanding product support. Whatever questions you may have we are here to help. Passion, Integrity, and Industry Expertise are all a part of what you will get from your local Agrarian Representative.

4 Customer's Economic Advantages

If your dairy is experiencing any environmental challenges it can have a huge impact on the overall herd health as well as the farms bottom line. Having sick cows, reproduction problems, and even death will ultimately place a big strain on the farm's bottom line. Our products will help prevent many of these common issues from happening, helping drive the dairies profits.

Agrarian®
SOLUTIONS

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