

BIOMIN

World Mycotoxin Survey

The Global Threat 2017 Q1



Biomin® Mycotoxin Survey



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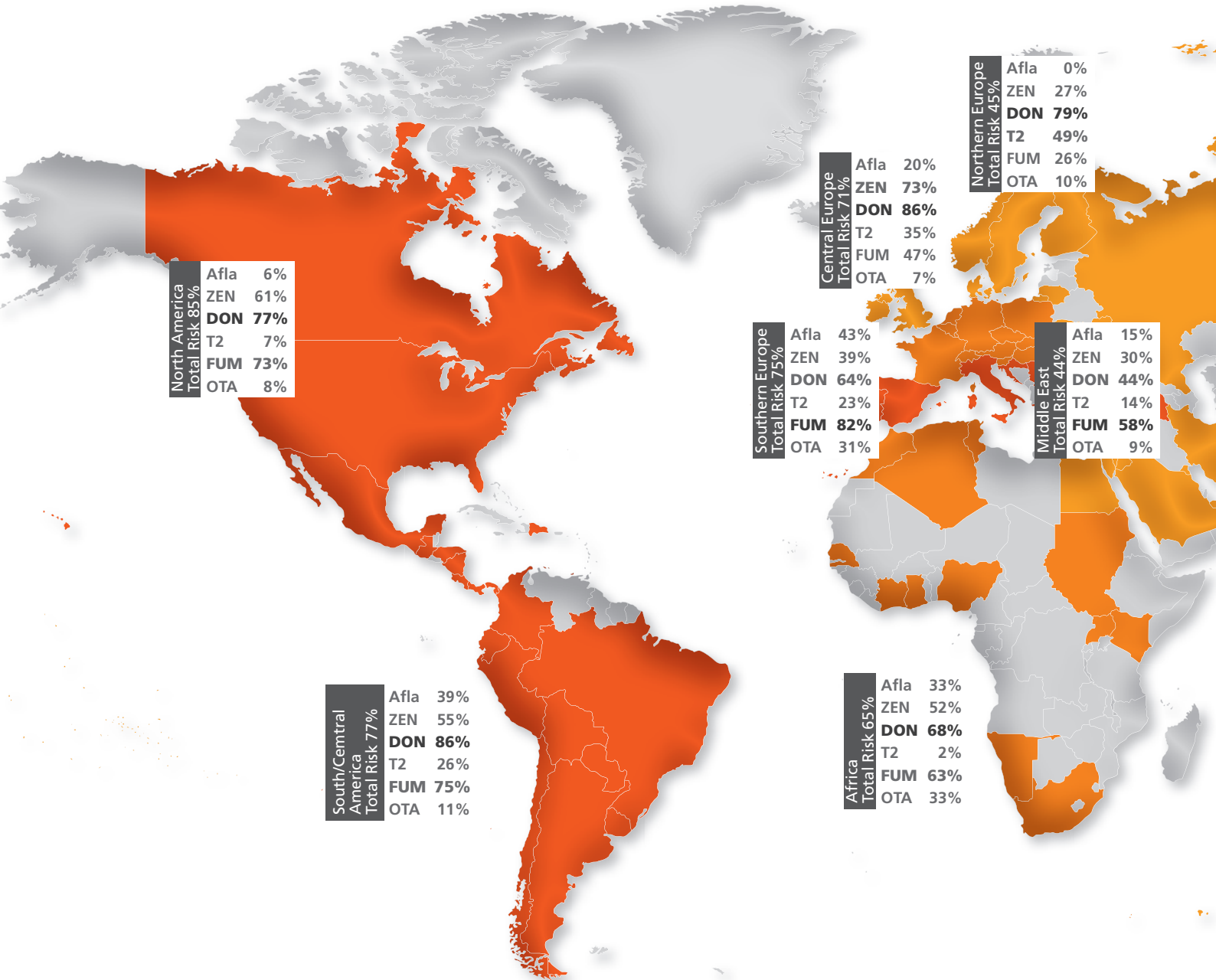
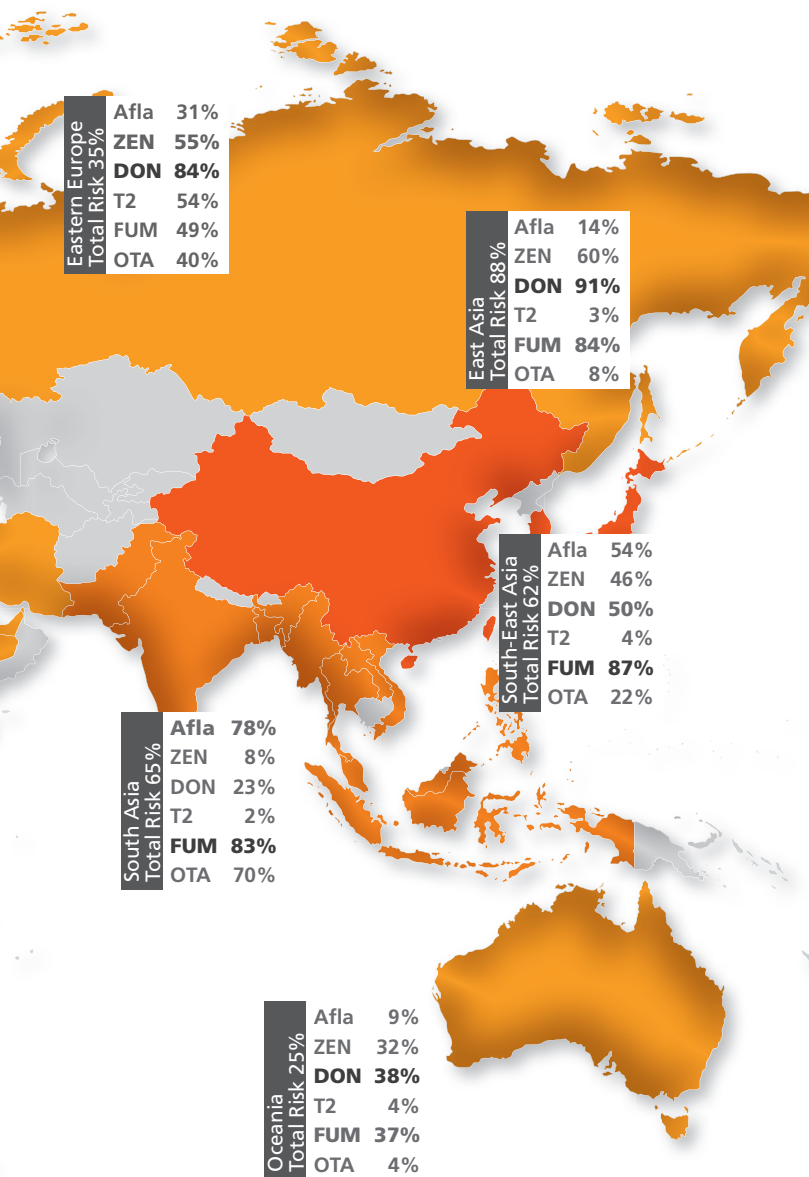


Figure 1. Global map of mycotoxin occurrence and risk in different regions.

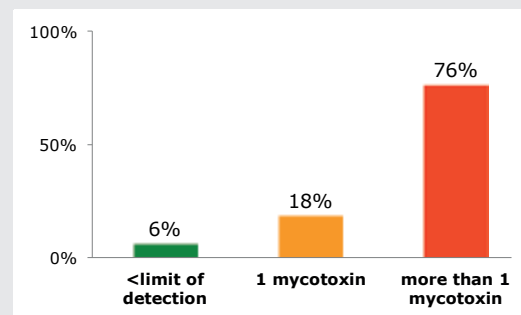
Legend

- Moderate risk: 0-25% of samples above risk threshold
- High risk: 26-50% of samples above risk threshold
- Severe risk: 51-75% of samples above risk threshold
- Extreme risk: 76-100% of samples above risk threshold
- No samples tested



Samples **Analyses** **Countries**

Co-contamination



Number of mycotoxins per sample based on samples tested for 3 or more mycotoxins.

Risk Level

The risk level expresses the percentage of samples testing positive for at least one mycotoxin above the threshold level in parts per billion (ppb).

Afla	ZEN	DON	T-2	FUM	OTA
2	50	150	50	500	10

DISCLAIMER

BIOMIN GmbH and the authors had no influence on the sampling process of the investigated samples. Therefore, the contamination levels found in the samples do not necessarily reflect the actual contamination level of these regions/commodities. However, the samples provide more insight into the range and levels of mycotoxins which can be found in diverse commodities of various regions.

Mycofix® is not available in the US and Canada.

ACKNOWLEDGEMENTS

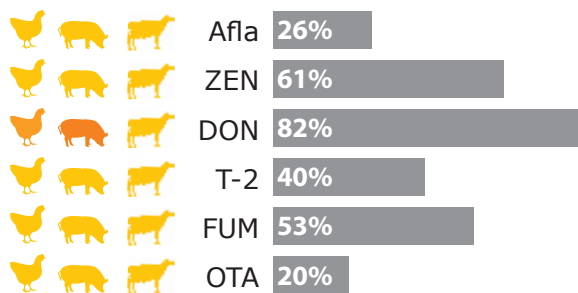
Special thanks go to Biofarma Feedlab, Argentina, Labocea, France, LAMIC, Brazil and Dr. Anika Steinhoff- Ooster, Tiergesundheitsdienst Bayern e.V. for sharing their mycotoxin analysis results as part of this survey. Mycotoxin Report is published by BIOMIN Holding GmbH, Erber Campus, 3131 Getzersdorf, Austria, Tel: +43 2782 8030, www.biomin.net

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Europe



species risk assessment according to legend on page 2 and % positive samples

Total samples: 819	Afla	ZEN	DON	T-2	FUM	OTA
Number of samples tested	391	740	783	555	461	395
% Contaminated samples	26%	61%	82%	40%	53%	20%
% Above risk threshold	9%	14%	55%	7%	19%	1%
Average of positives (ppb)	5	57	519	35	599	4
Median of positives (ppb)	1	22	257	10	222	2
Maximum (ppb)	121	1725	28470	914	8446	16

Middle East

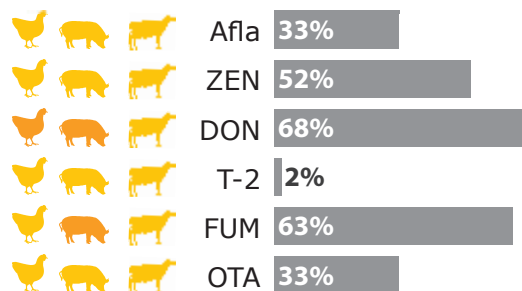
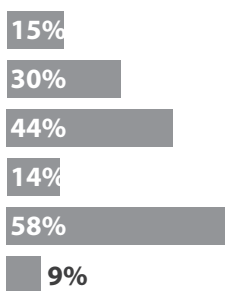


species risk assessment according to legend on page 2 and % positive samples

Total samples: 50	Afla
Number of samples tested	33
% Contaminated samples	15%
% Above risk threshold	9%
Average of positives (ppb)	3
Median of positives (ppb)	2
Maximum (ppb)	9



Africa



according to legend
samples

species risk assessment according to legend
on page 2 and % positive samples

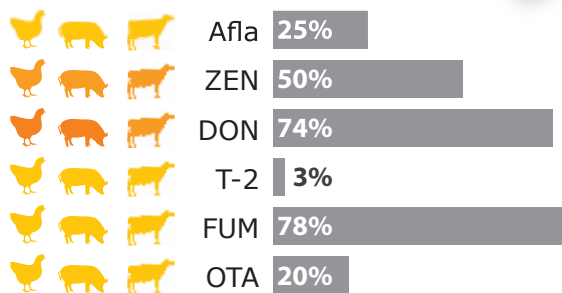
ZEN	DON	T-2	FUM	OTA
50	50	50	50	33
30%	44%	14%	58%	9%
10%	20%	0%	28%	0%
87	555	16	1336	2
32	137	15	258	1
410	4801	24	8841	3

Total samples: 60	Afla	ZEN	DON	T-2	FUM	OTA
Number of samples tested	60	60	60	60	60	60
% Contaminated samples	33%	52%	68%	2%	63%	33%
% Above risk threshold	15%	17%	40%	0%	33%	2%
Average of positives (ppb)	49	60	360	13	2302	4
Median of positives (ppb)	1	21	178	13	629	1
Maximum (ppb)	232	538	1436	13	14630	10

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Asia



species risk assessment according to legend on page 2 and % positive samples

Total samples: 727	Afla	ZEN	DON	T-2	FUM	OTA
Number of samples tested	675	693	727	407	498	407
% Contaminated samples	25%	50%	74%	3%	78%	20%
% Above risk threshold	18%	36%	56%	0%	32%	4%
Average of positives (ppb)	56	360	727	34	1020	12
Median of positives (ppb)	5	101	430	17	334	2
Maximum (ppb)	2692	8113	11533	163	41022	129

North America

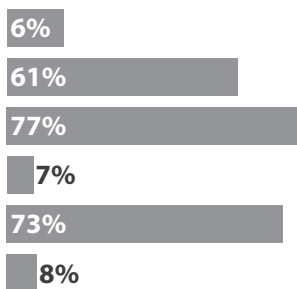


species risk assessment according to legend on page 2 and % positive samples

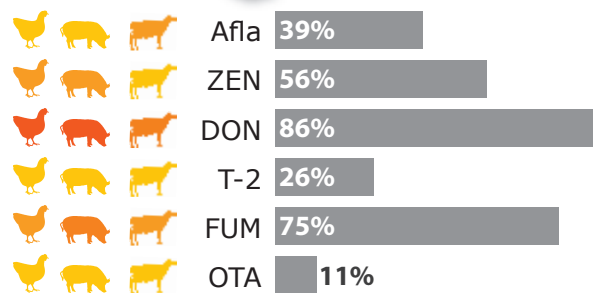
Total samples: 274	Afla
Number of samples tested	274
% Contaminated samples	6%
% Above risk threshold	5%
Average of positives (ppb)	26
Median of positives (ppb)	8
Maximum (ppb)	139



South America



according to legend
samples



species risk assessment according to legend
on page 2 and % positive samples

ZEN	DON	T-2	FUM	OTA
274	274	274	274	274
61%	77%	7%	73%	8%
55%	74%	0%	50%	1%
217	1314	19	2720	5
132	798	15	830	2
2776	11274	115	28605	39

Total samples: 1 785	Afla	ZEN	DON	T-2	FUM	OTA
Number of samples tested	1412	1315	975	359	1100	63
% Contaminated samples	39%	56%	86%	26%	75%	11%
% Above risk threshold	30%	26%	85%	6%	66%	2%
Average of positives (ppb)	8	103	1064	50	2696	4
Median of positives (ppb)	4	47	900	34	1943	2
Maximum (ppb)	1336	1120	5250	976	34860	14

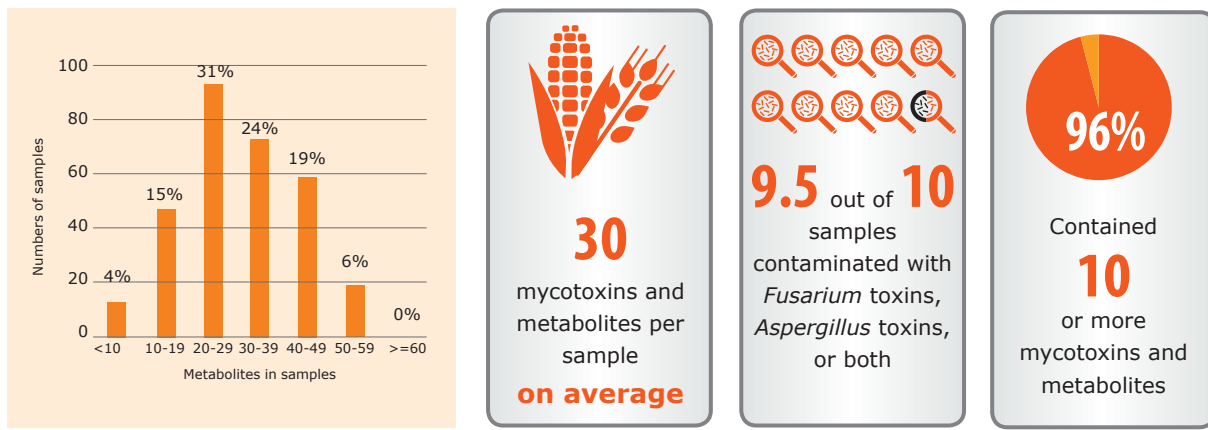
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Multiple Mycotoxin Overview




Multiple mycotoxin occurrence

Spectrum 380® results 2016: the most comprehensive mycotoxin analysis available*




304 samples

In which raw materials are emerging mycotoxins most commonly found?



Wheat:
Enniatins 83%



Corn:
Culmorin 61%
Moniliformin 93%
Beauvericin 80%

Mycotoxins & metabolites

	Average	Maximum
cyclo(L-Pro-L-Val)	92%	1669
cyclo(L-Pro-L-Tyr)	90%	532
Aurofusarin	76%	396
Moniliformin	74%	127
Beauvericin	72%	28
Brevianamid F	71%	58
Asperglaucide	71%	147
Deoxynivalenol	70%	390
Enniatin B1	70%	42
Zearalenone	69%	63
Equisetin	69%	41
Culmorin	67%	281
Tryptophol	67%	454
Asperphenamate	64%	41
Enniatin B	63%	47
Flavoglucin	60%	37
Rugulosovin	59%	80
Neoechinulin A	57%	56
3-Nitropropionic acid	56%	42
Enniatin A1	56%	17
15-Hydroxyculmorin	54%	353
Emodin	53%	39
Fumonisin B1	52%	822
Infectopyron	51%	1235

Positive Samples [%] for metabolites present in more than 50% of samples (orange bars indicate regulated or guideline mycotoxins)
Cut off for all metabolites 1 ppb (except for aflatoxins 0.5 ppb)

*Spectrum 380® is developed and conducted by the world's leading independent mycotoxin research lab at the Department of Agrobiotechnology (IFA-Tulln) at the University of Natural Resources and Life Sciences Vienna and offered through cooperation with BIOMIN.