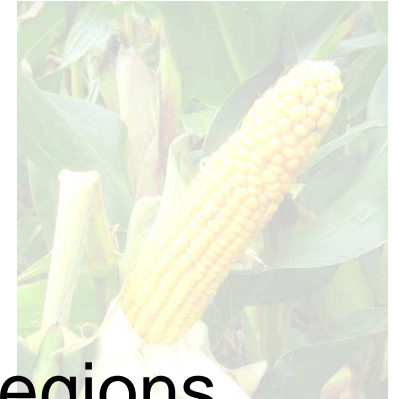


REGIONAL DIFFERENCES ON THE WORLDWIDE MYCOTOXIN OCCURRENCE



Mycotoxin Survey Program 2010

- Occurrence of Mycotoxins in different regions
- Occurrence of Mycotoxins in different feedstuffs



Method of analyses

- 1234 samples worldwide (until June 2010)
- Analyzed for Afla, ZON, DON, FUM and OTA
- Samples were analyzed via HPLC or ELISA (USA and Europe only).

- Non-detect levels for HPLC: AFB1 <0.5 µg/kg, ZON <10 µg/kg, DON <150 µg/kg, FUM <25 µg/kg and OTA <1µg/kg

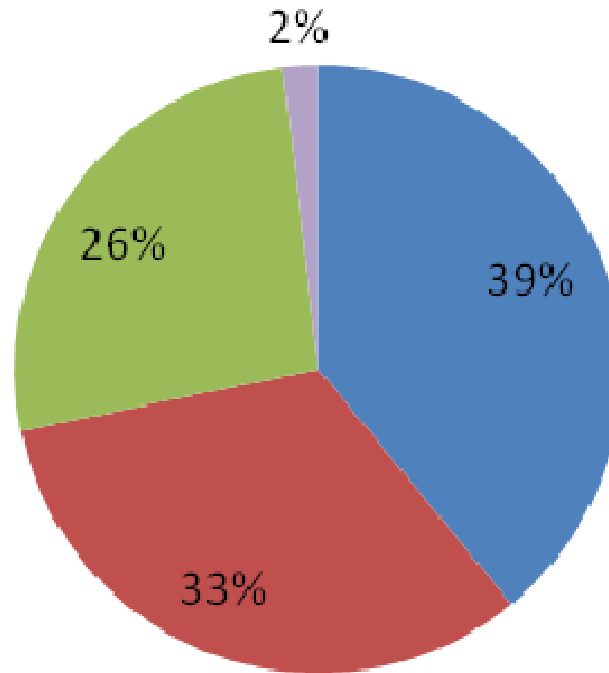
- Non-detect levels for ELISA: AFB1 <1µg/kg, ZON <40µg/kg, DON <250 µg/kg, FUM <250 µg/kg and OTA <2µg/kg

- Analysis done at Romer Labs Singapore
 - Romer Labs Austria
 - Romer Labs US
 - Samitec, Brazil

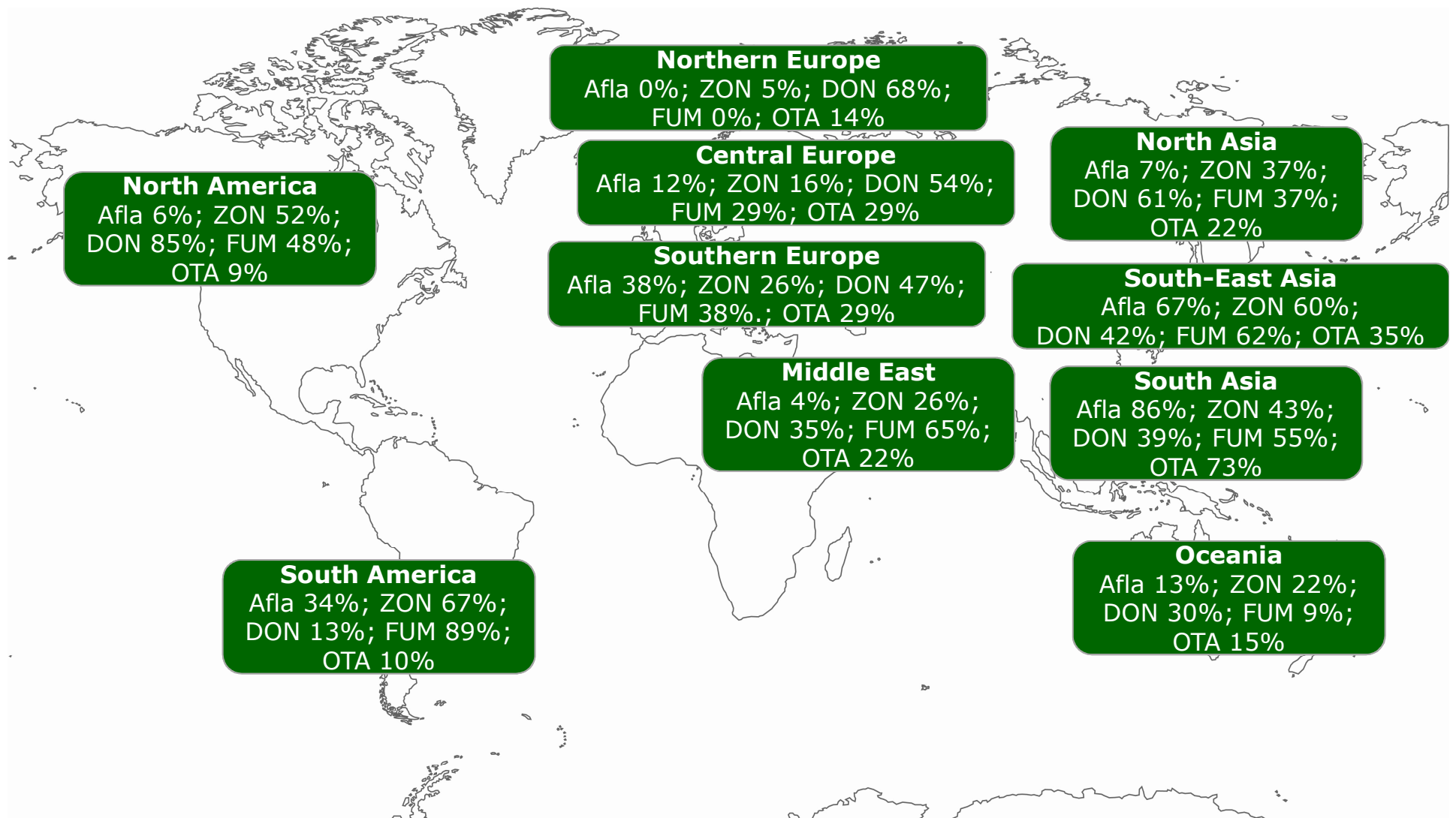
Analysed feedstuffs

- Corn
- Soybean Meal
 - Wheat/bran
- Corn Gluten Meal
 - Rice/bran
 - DDGS
 - Feed
- Straw/silage

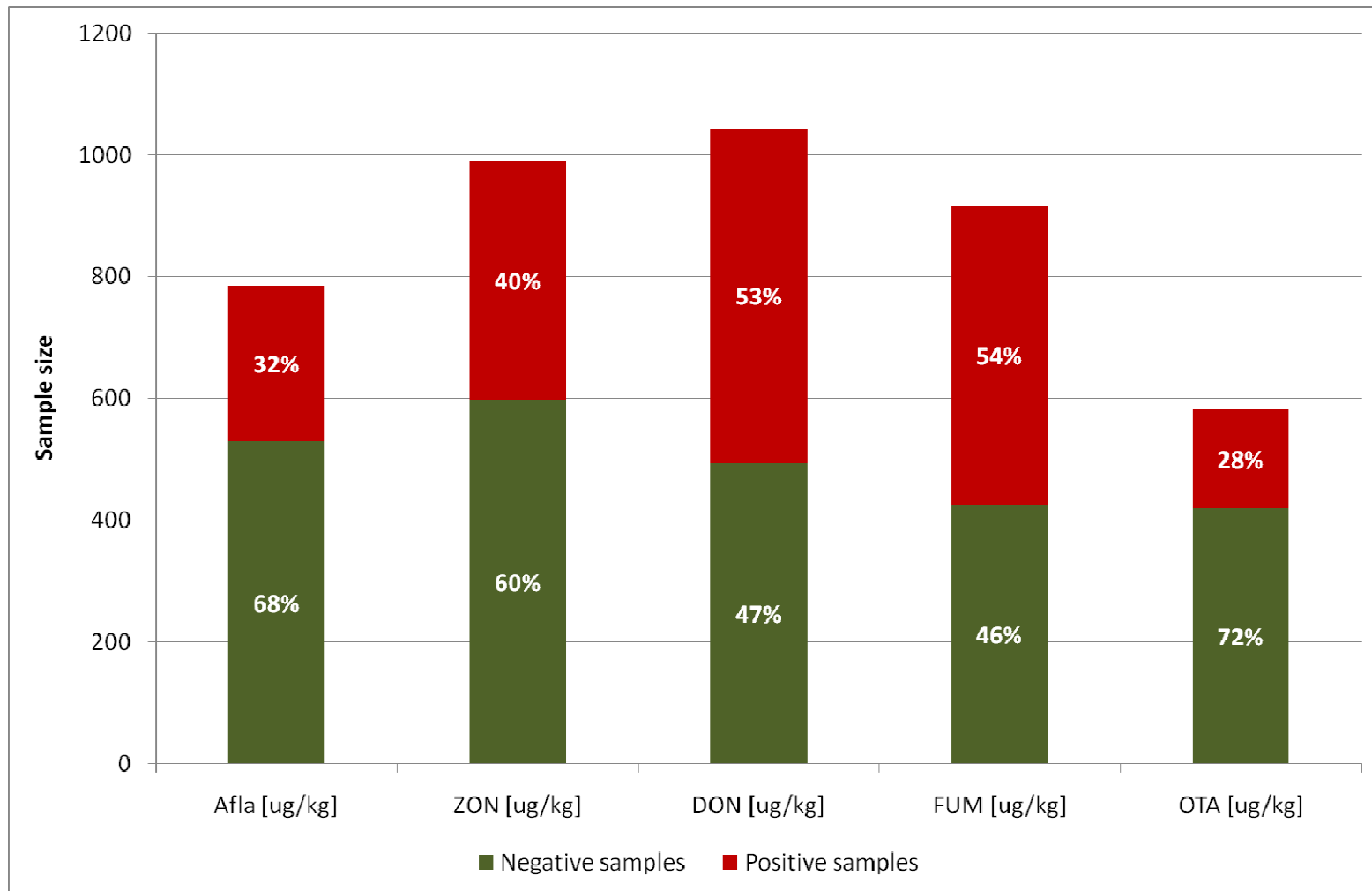
Origin of the data



■ Asia ■ America ■ Europe ■ Middle East & Africa

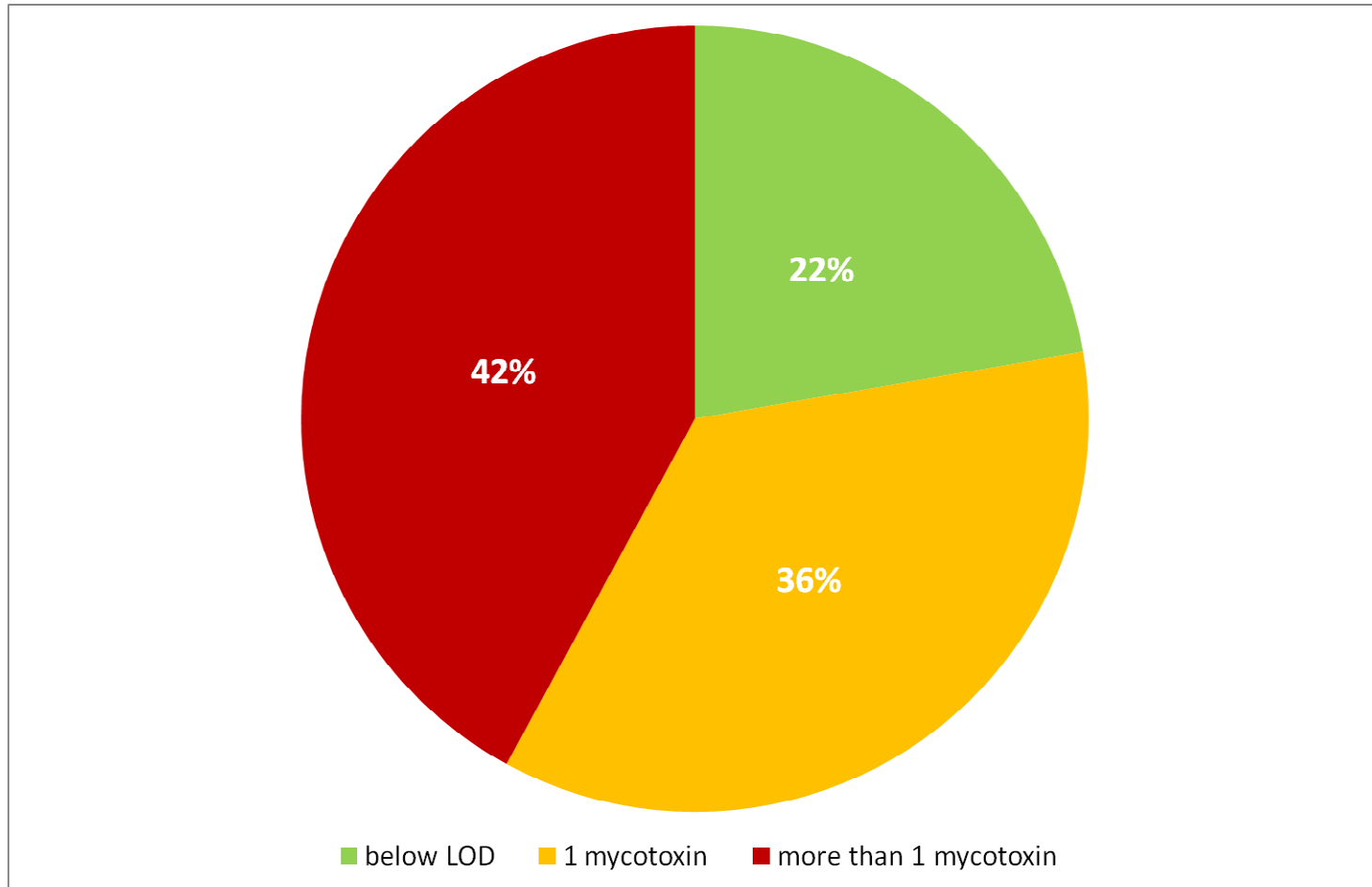


Overview (Jan – June 2010)

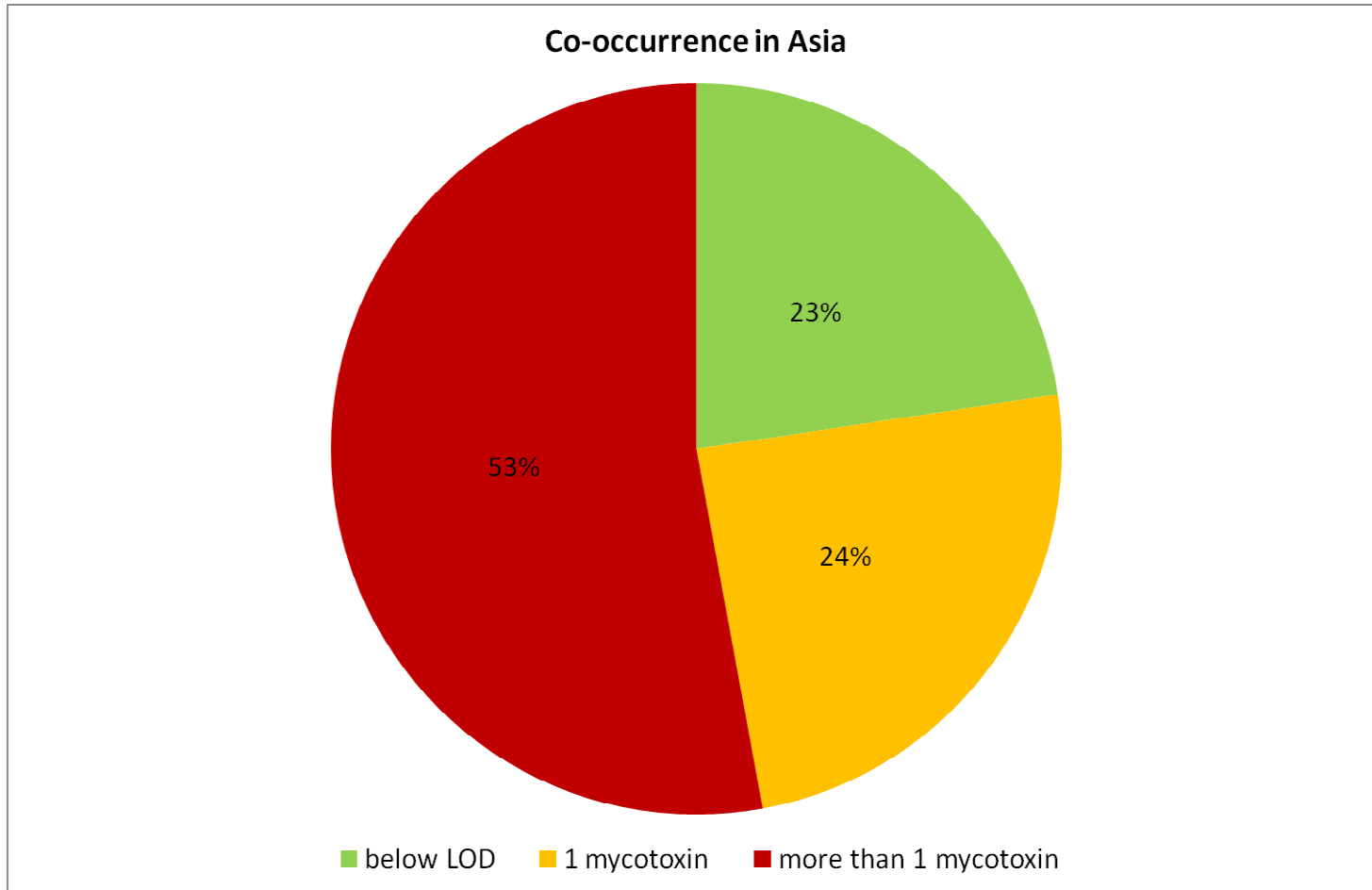


Results 2010	Afla	ZON	DON	FUM	OTA
No. samples tested	785	990	1043	917	582
% Positive	32%	40%	53%	54%	28%
Average (µg/kg)	37	249	896	2394	10
Maximum (µg/kg)	726	16712	26121	53700	331
Commodity found	Maize	Corn gluten meal	Maize	Maize	Wheat
Country of origin	Philippines	China	Austria	Brazil	Austria

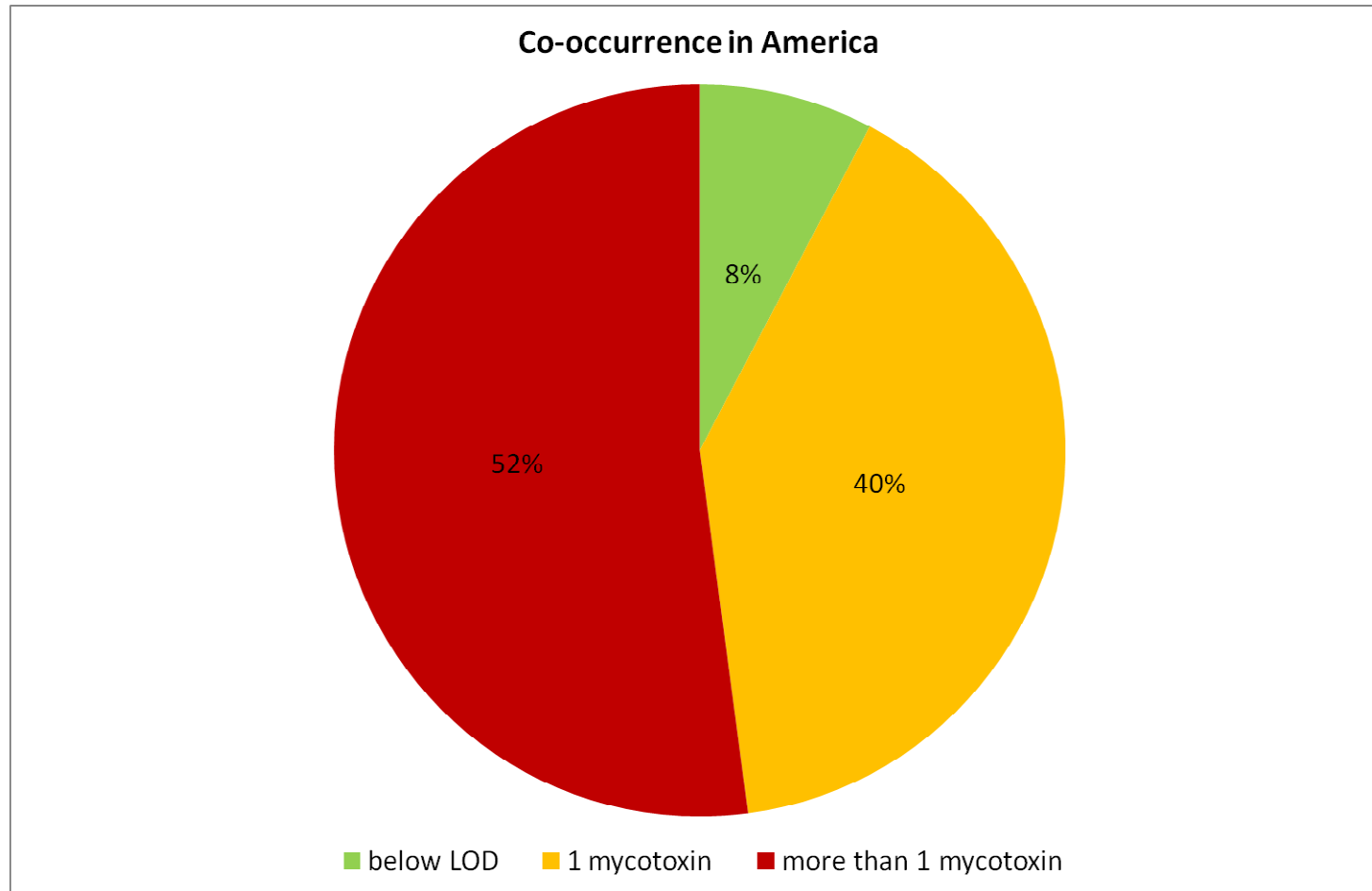
Co-occurrence of mycotoxins



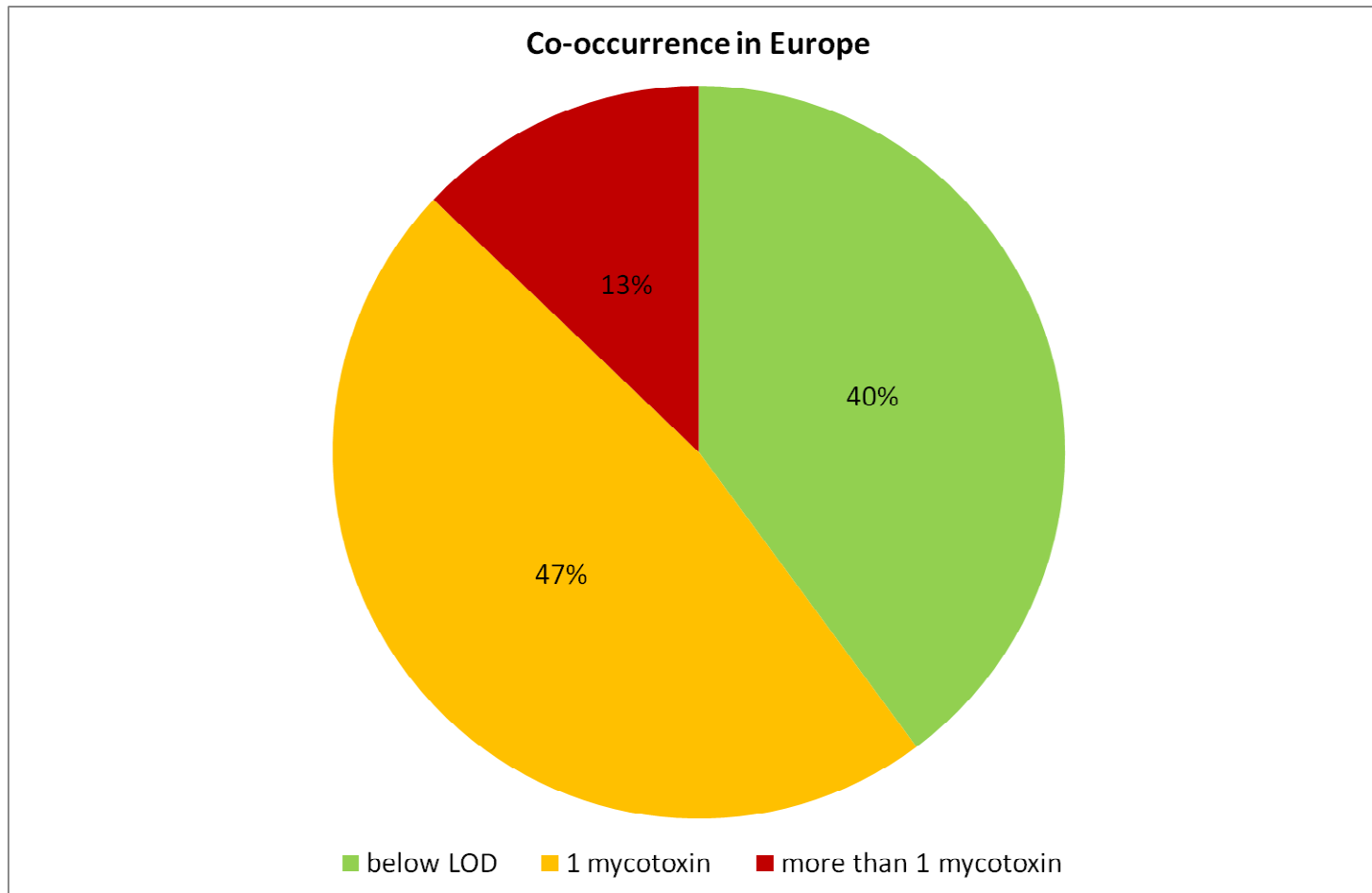
Co-occurrence of mycotoxins in Asia



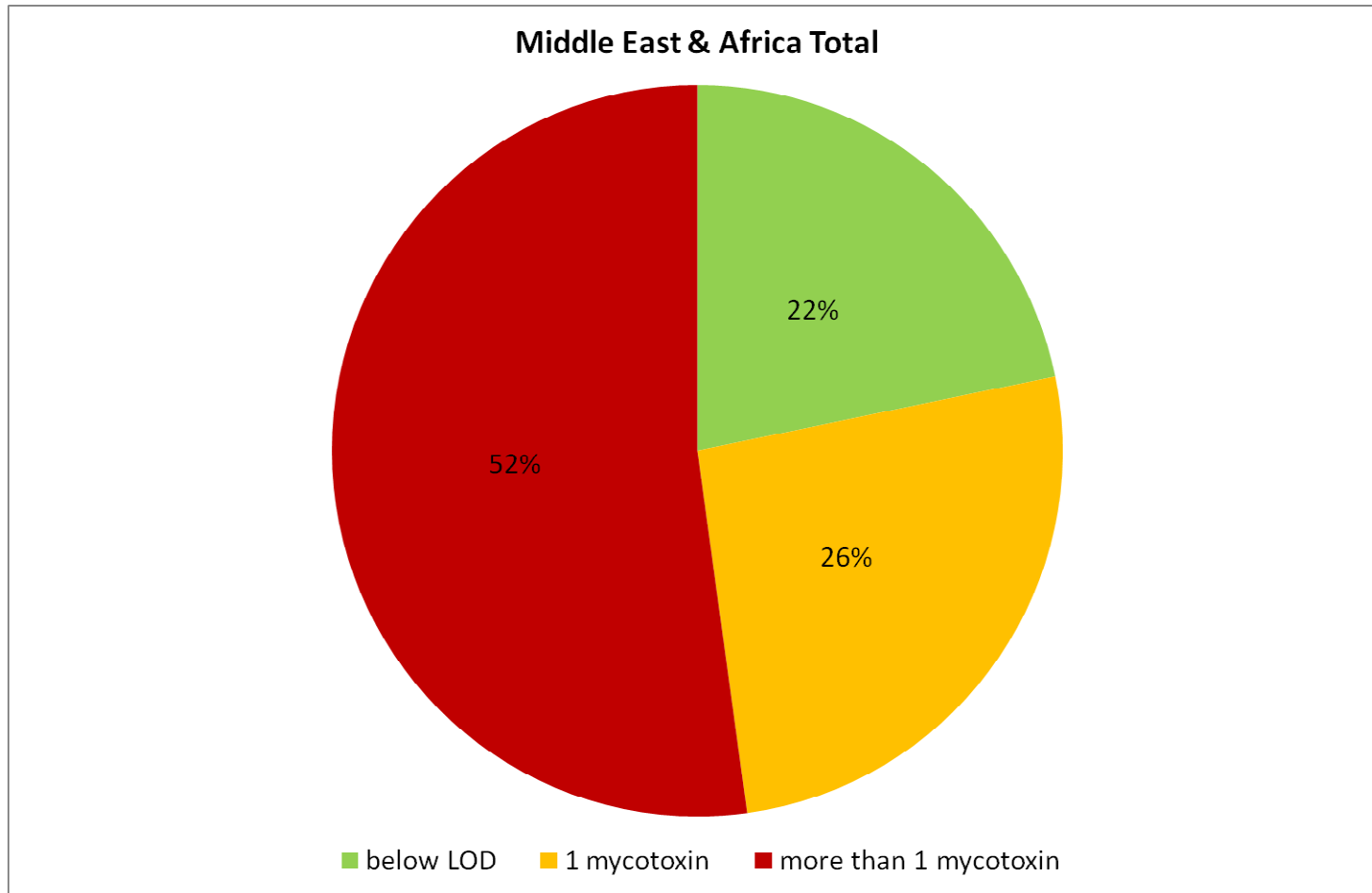
Co-occurrence of mycotoxins in Americas



Co-occurrence of mycotoxins in Europe



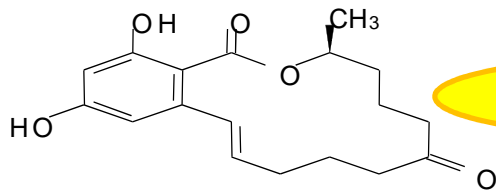
Co-occurrence of mycotoxins in Middle East



The co-occurrence of mycotoxins leads to synergistic effects.

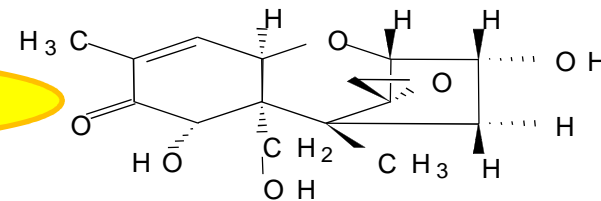
Severity of one mycotoxin is increased by other mycotoxins =
SYNERGISM

Zearalenone (ZON)



1 ZON + 1 DON > 2

Deoxynivalenol (DON)



(Trenholm *et al.*, 1988)

North Asia	Afla	ZON	DON	FUM	OTA
number samples tested	176	148	148	176	149
% Positive	7	37	61	37	22
average of positive (ppb)	9	730	953	2728	6
maximum (ppb)	51	16712	6965	13862	53

Medium levels Broilers	80 - 300	50 - 250	250 - 1 000	10 000 - 20 000	80 - 500
Medium levels Pigs	50 - 200	50 - 250	250 - 1 000	2 000 - 5 000	80 - 500
Medium levels Dairy	5 - 20	100 - 300	500 - 2 000	2 000 - 5 000	200 - 500

** North Asia includes China, Japan, Korea & Taiwan*

South-East Asia	Afla	ZON	DON	FUM	OTA
number samples tested	164	164	164	164	164
% Positive	67	60	42	62	35
average of positive (ppb)	39	90	402	953	4
maximum (ppb)	726	2601	4805	6196	30

Medium levels Broilers	80 - 300	50 - 250	250 - 1 000	10 000 - 20 000	80 - 500
Medium levels Pigs	50 - 200	50 - 250	250 - 1 000	2 000 - 5 000	80 - 500
Medium levels Dairy	5 - 20	100 - 300	500 - 2 000	2 000 - 5 000	200 - 500

*** South East Asia includes Indonesia, Malaysia, Philippines, Thailand & Vietnam**

South Asia	Afla	ZON	DON	FUM	OTA
number samples tested	49	49	49	49	49
% Positive	86	43	39	55	73
average of positive (ppb)	110	52	156	541	17
maximum (ppb)	593	297	556	1476	174

Medium levels Broilers	80 - 300	50 - 250	250 - 1 000	10 000 - 20 000	80 - 500
Medium levels Pigs	50 - 200	50 - 250	250 - 1 000	2 000 - 5 000	80 - 500
Medium levels Dairy	5 - 20	100 - 300	500 - 2 000	2 000 - 5 000	200 - 500

*** South Asia refers mainly to India**

Oceania	Afla	ZON	DON	FUM	OTA
number samples tested	93	93	93	89	91
% Positive	13	22	30	9	15
average of positive (ppb)	19	237	328	1306	17
maximum (ppb)	51	926	1360	3229	111,2

Medium levels Broilers	80 - 300	50 - 250	250 - 1 000	10 000 - 20 000	80 - 500
Medium levels Pigs	50 - 200	50 - 250	250 - 1 000	2 000 - 5 000	80 - 500
Medium levels Dairy	5 - 20	100 - 300	500 - 2 000	2 000 - 5 000	200 - 500

*** Oceania refers mainly to Australia.**

North America	Afla	ZON	DON	FUM	OTA
number samples tested	49	178	178	166	44
% Positive	6	52	85	48	9
average of positive (ppb)	2	213	1271	1352	5
maximum (ppb)	2	2593	10100	22260	14

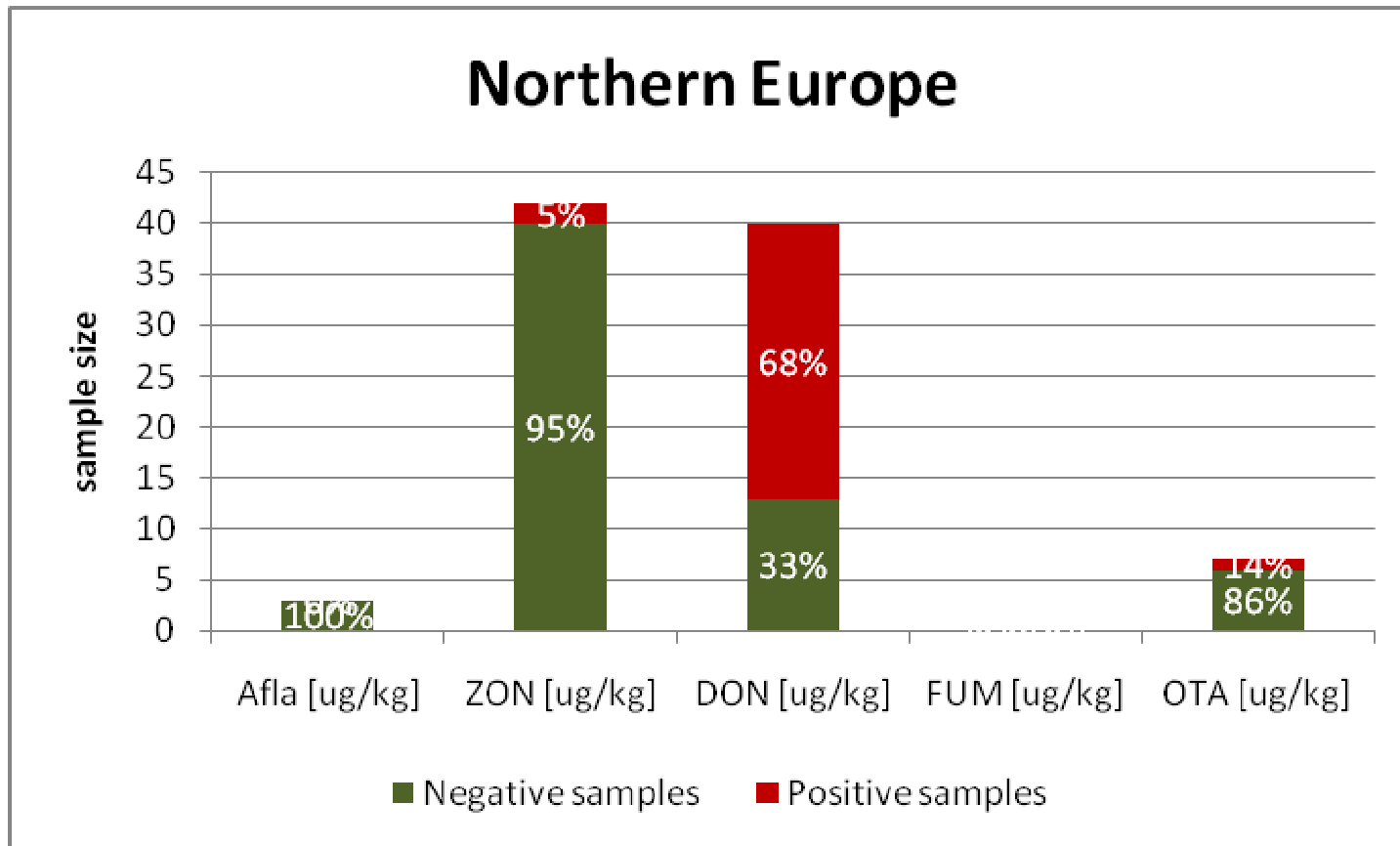
Medium levels Broilers	80 - 300	50 - 250	250 - 1 000	10 000 - 20 000	80 - 500
Medium levels Pigs	50 - 200	50 - 250	250 - 1 000	2 000 - 5 000	80 - 500
Medium levels Dairy	5 - 20	100 - 300	500 - 2 000	2 000 - 5 000	200 - 500

South America	Afla	ZON	DON	FUM	OTA
number samples tested	203	94	75	208	20
% Positive	34	67	13	89	10
average of positive (ppb)	3	300	480	3952	1
maximum (ppb)	23	5930	2520	53700	1

Medium levels Broilers	80 - 300	50 - 250	250 - 1 000	10 000 - 20 000	80 - 500
Medium levels Pigs	50 - 200	50 - 250	250 - 1 000	2 000 - 5 000	80 - 500
Medium levels Dairy	5 - 20	100 - 300	500 - 2 000	2 000 - 5 000	200 - 500

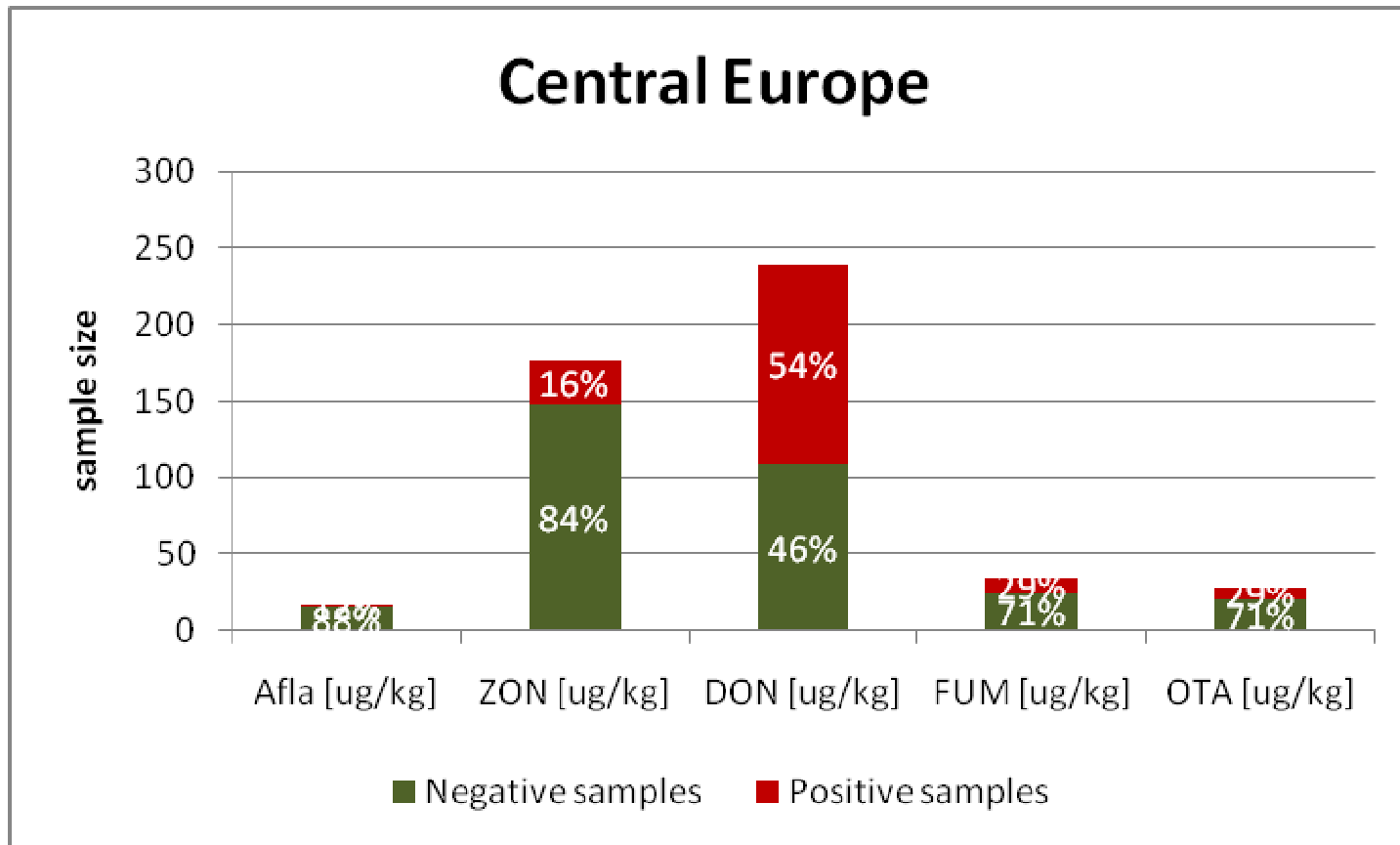
Northern Europe	Afla	ZON	DON	FUM	OTA
number samples tested	3	42	40	0	7
% Positive	0	5	68	-	14
average of positive (ppb)	-	50	704	-	6
maximum (ppb)	0	65	3474	0	6

Medium levels Broilers	80 - 300	50 - 250	250 - 1 000	10 000 - 20 000	80 - 500
Medium levels Pigs	50 - 200	50 - 250	250 - 1 000	2 000 - 5 000	80 - 500
Medium levels Dairy	5 - 20	100 - 300	500 - 2 000	2 000 - 5 000	200 - 500



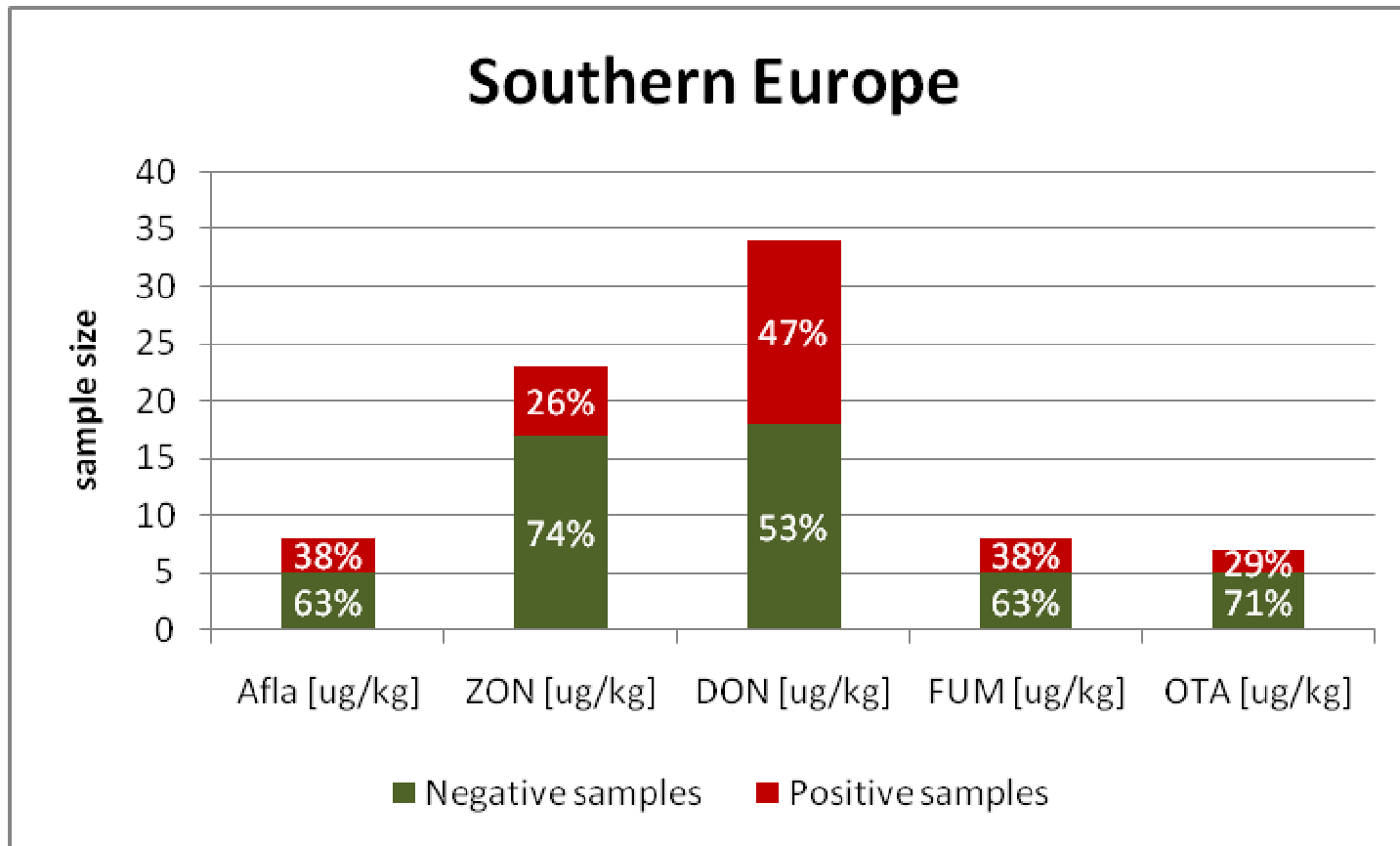
Central Europe	Afla	ZON	DON	FUM	OTA
number samples tested	17	176	239	34	28
% Positive	12	16	54	29	29
average of positive (ppb)	1	120	1049	2449	45
maximum (ppb)	1	655	26121	6770	331

Medium levels Broilers	80 - 300	50 - 250	250 - 1 000	10 000 - 20 000	80 - 500
Medium levels Pigs	50 - 200	50 - 250	250 - 1 000	2 000 - 5 000	80 - 500
Medium levels Dairy	5 - 20	100 - 300	500 - 2 000	2 000 - 5 000	200 - 500



Southern Europe	Afla	ZON	DON	FUM	OTA
number samples tested	8	23	34	8	7
% Positive	38	26	47	38	29
average of positive (ppb)	11	80	687	4379	1
maximum (ppb)	18	112	2160	7260	1

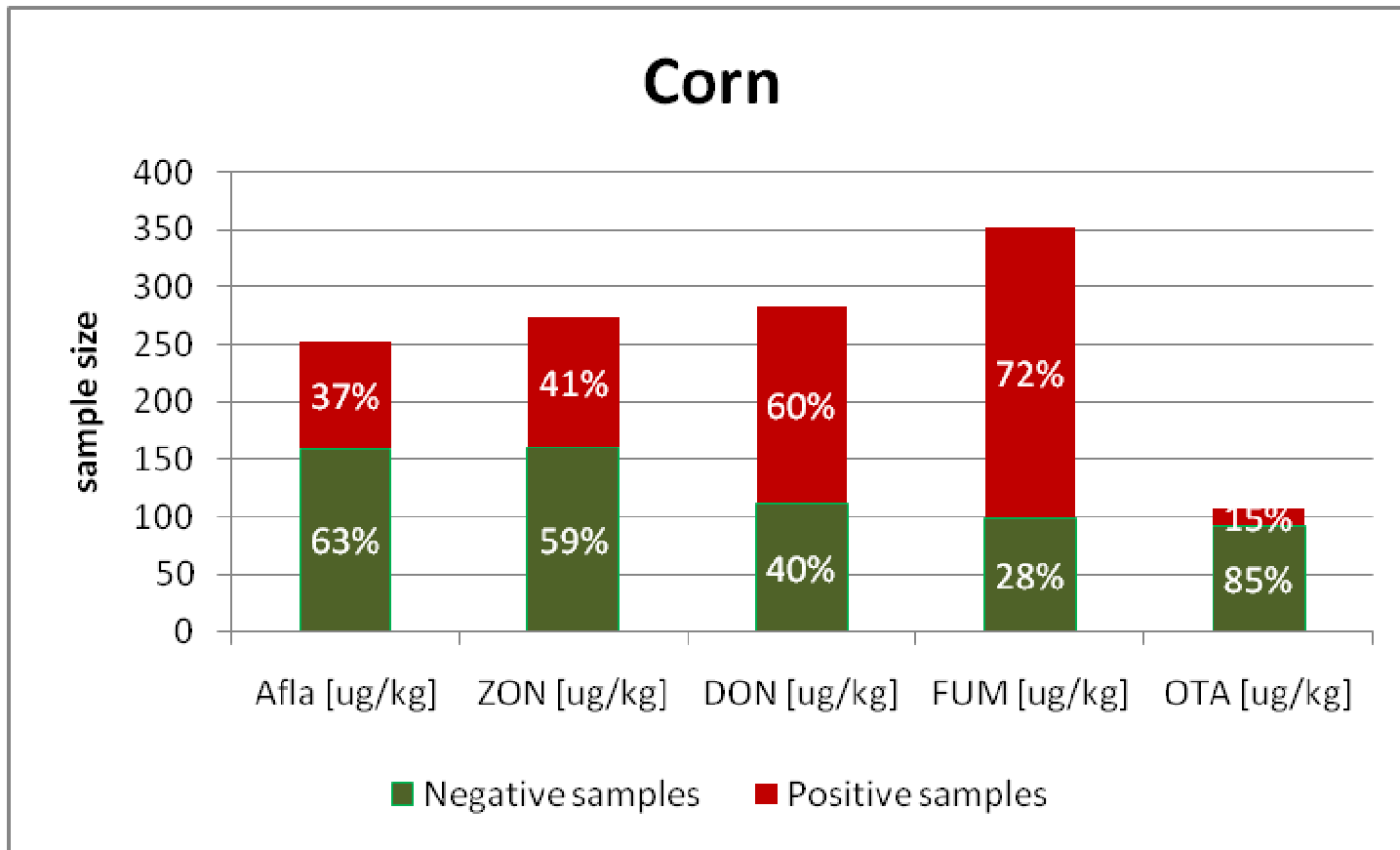
Medium levels Broilers	80 - 300	50 - 250	250 - 1 000	10 000 - 20 000	80 - 500
Medium levels Pigs	50 - 200	50 - 250	250 - 1 000	2 000 - 5 000	80 - 500
Medium levels Dairy	5 - 20	100 - 300	500 - 2 000	2 000 - 5 000	200 - 500



Importing concerns?

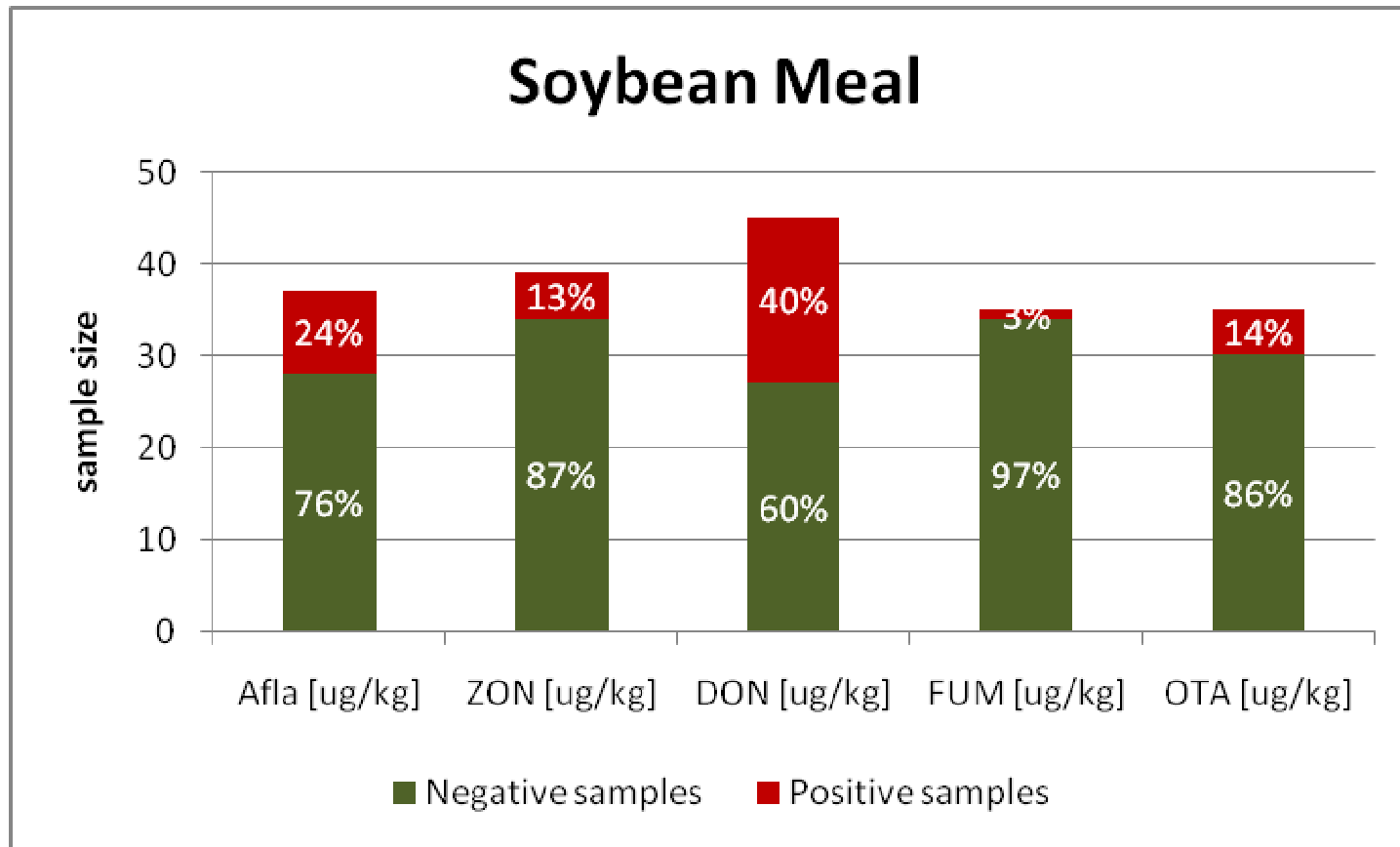
Different geographic regions present different climates therefore different mycotoxins will be present.

Importing commodities also means importing mycotoxins!



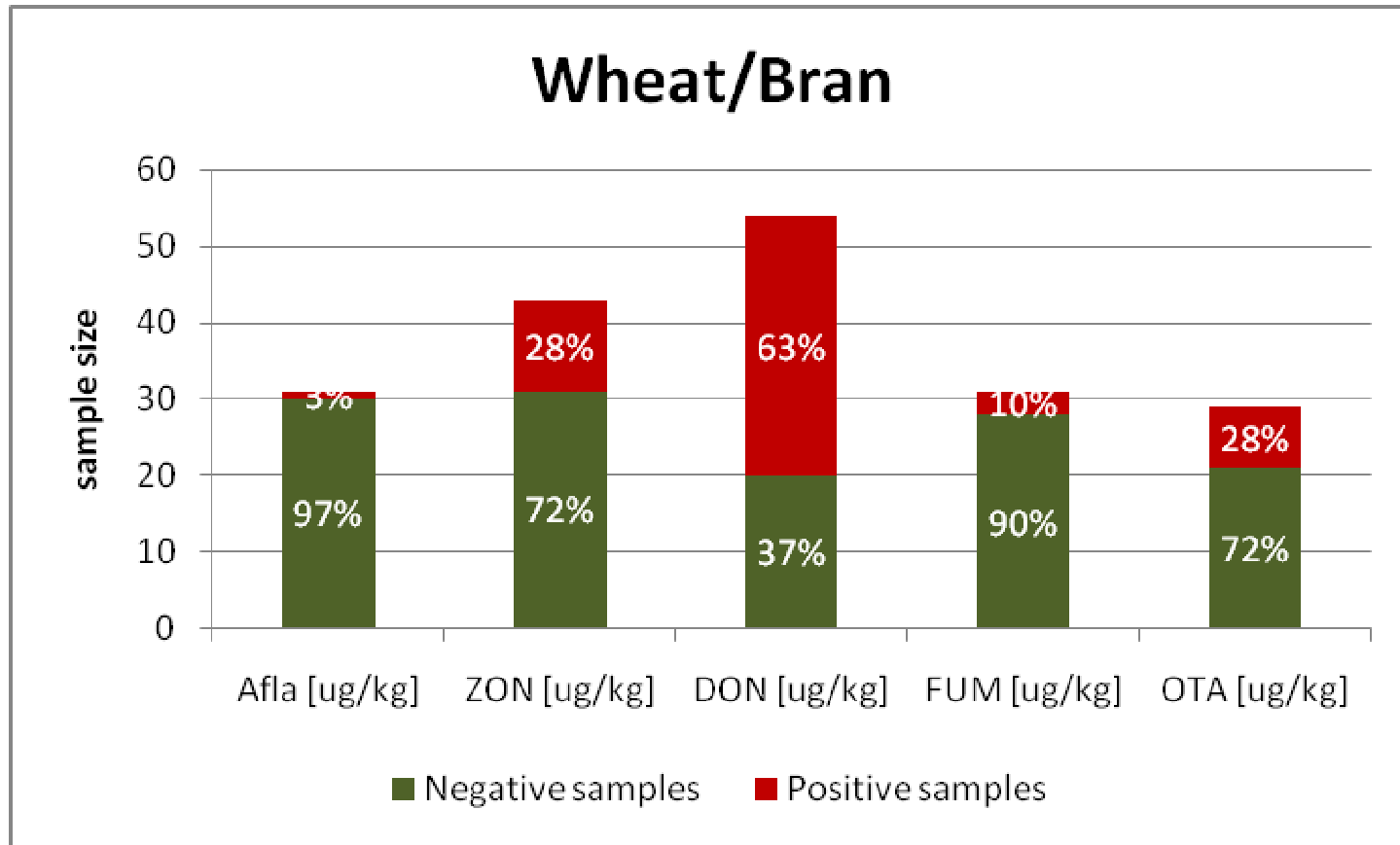
average of positive (ppb)	36	168	1268	3344	13
maximum (ppb)	726	1735	26121	53700	89

Soybean Meal



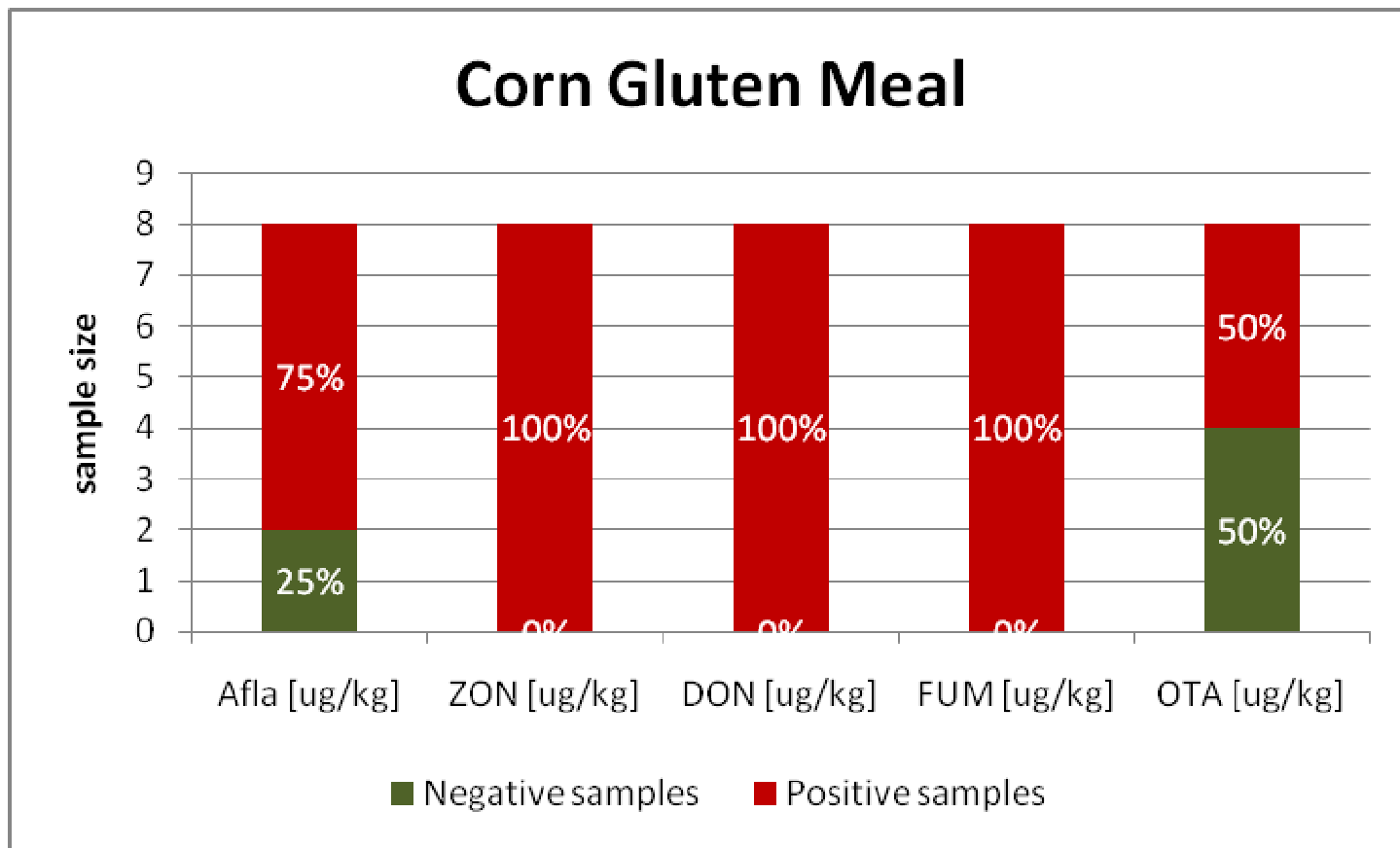
average of positive (ppb)	2	43	220	315	10
maximum (ppb)	6	75	545	315	23

Wheat/Wheat bran



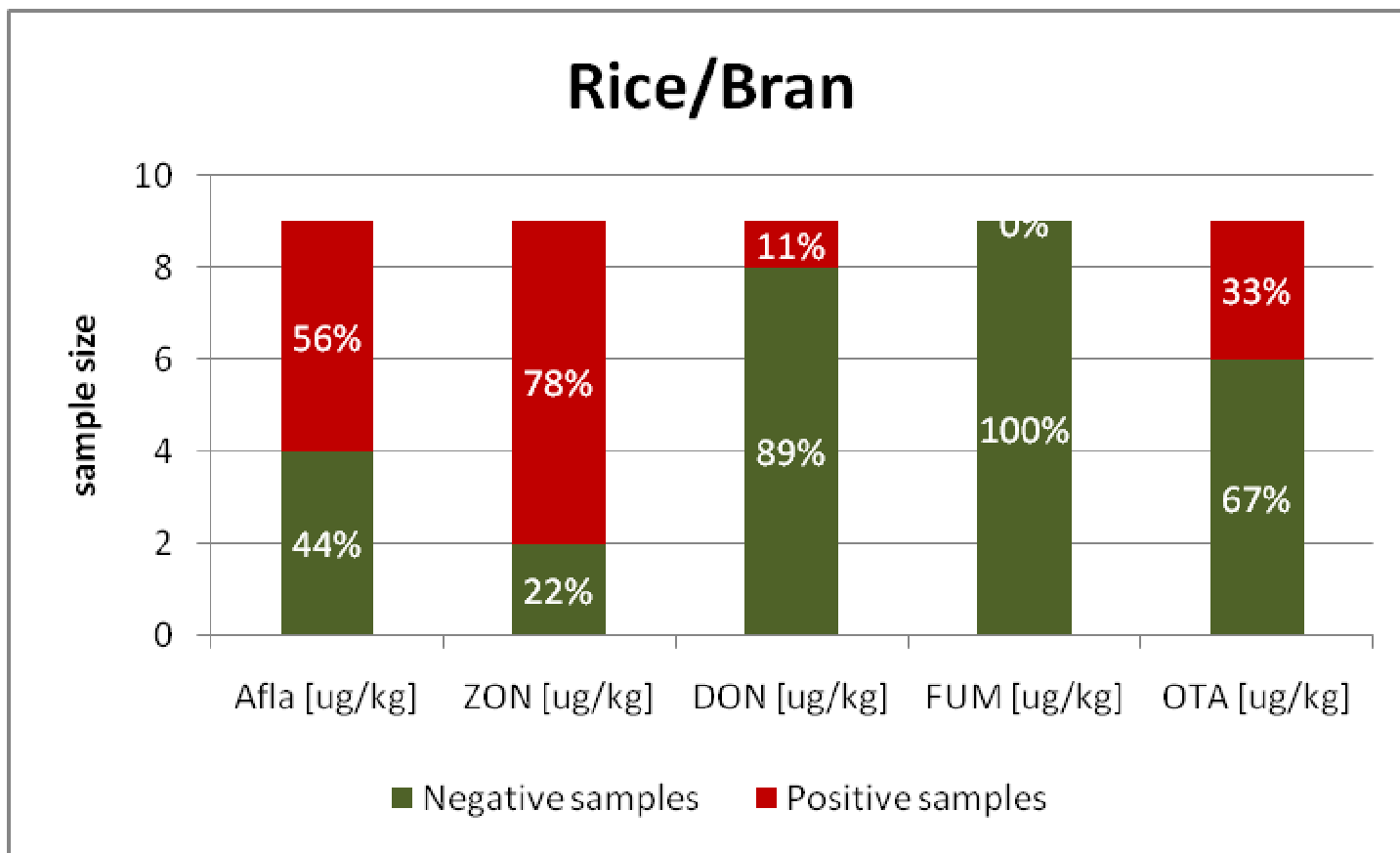
average of positive (ppb)	3	145	670	426	46
maximum (ppb)	3	393	2729	634	331

Corn Gluten Meal

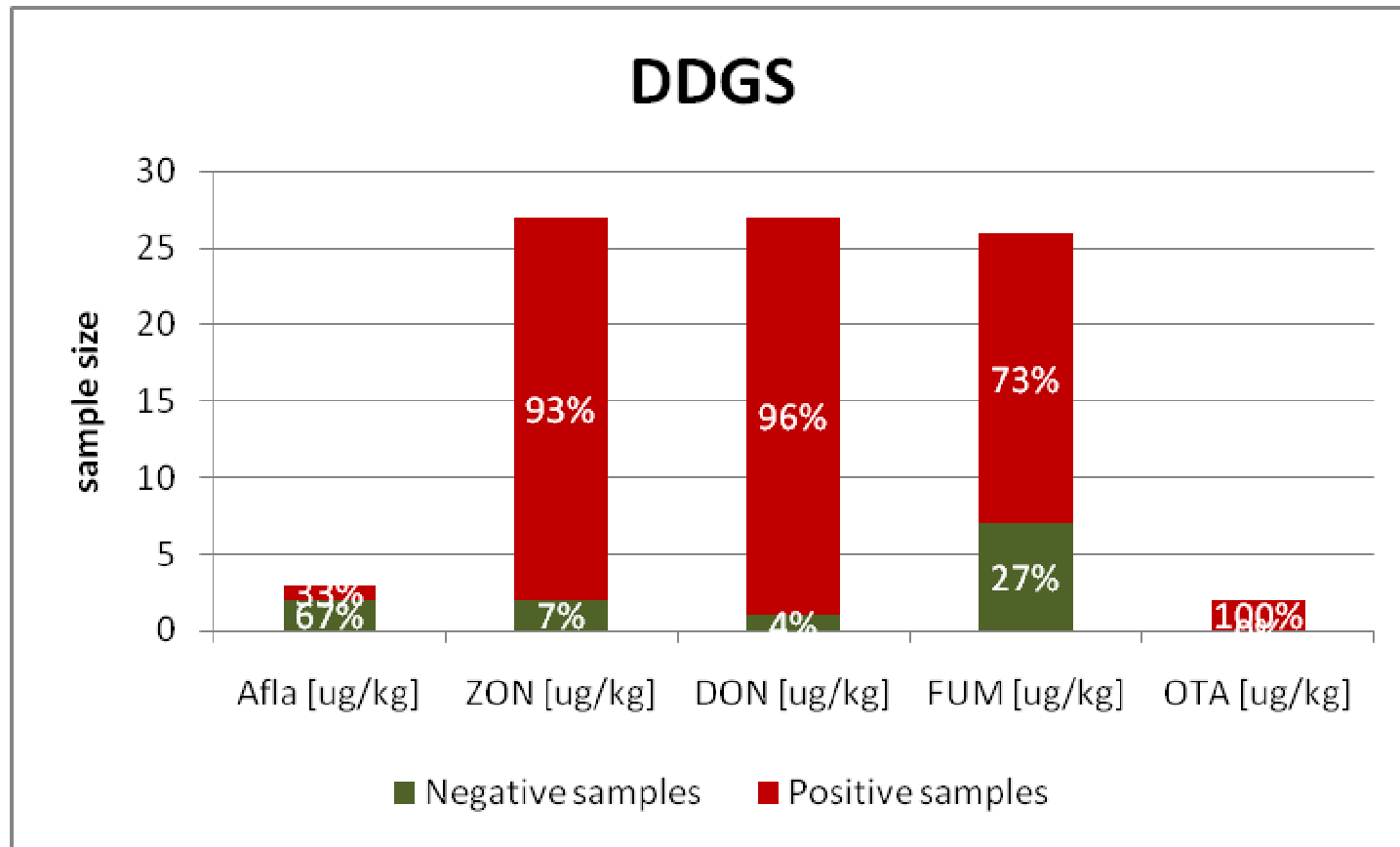


average of positive (ppb)	13	4133	3026	6282	2
maximum (ppb)	51	16712	6965	12612	4,8

Rice/Rice bran

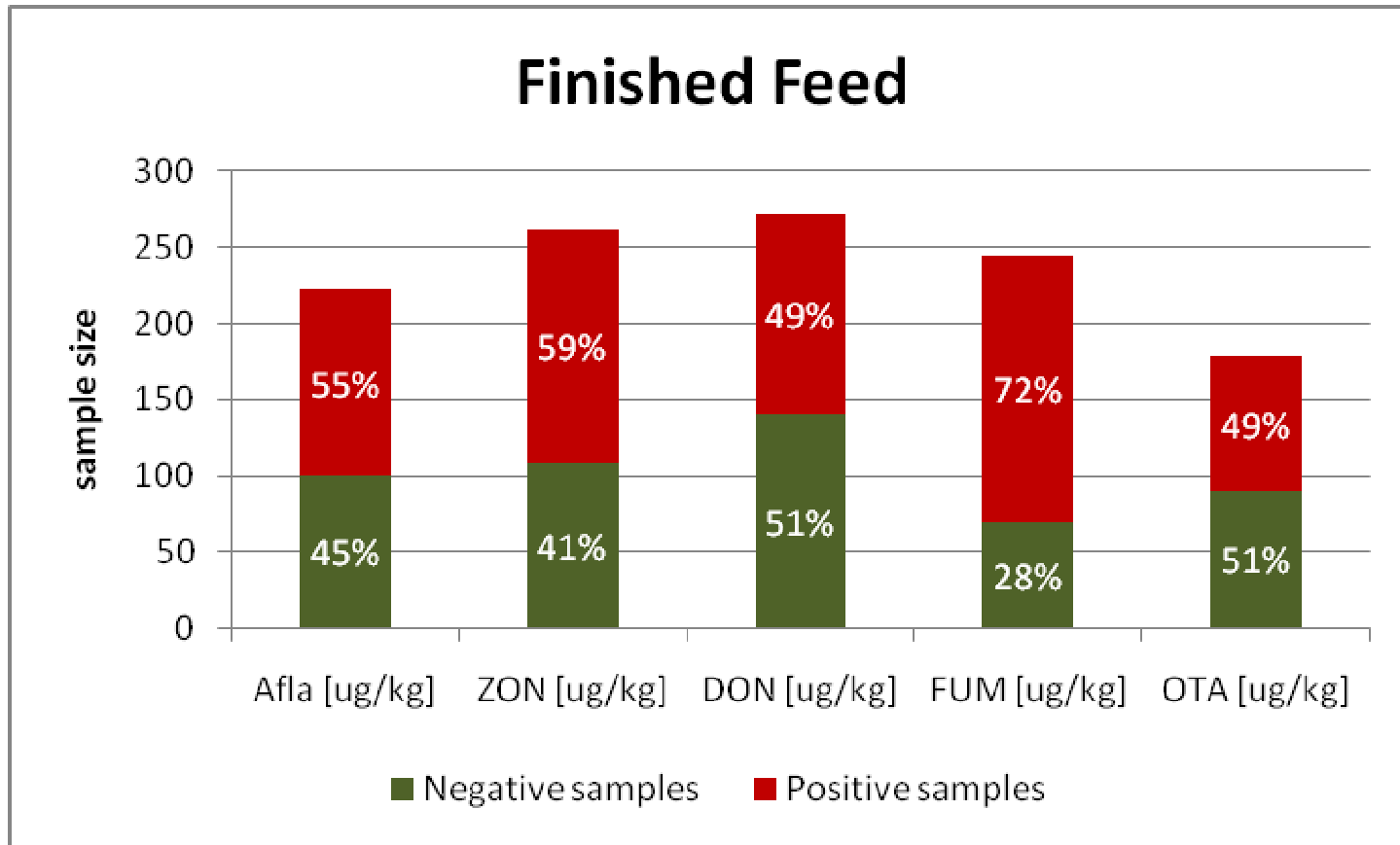


average of positive (ppb)	2	117	69	-	7
maximum (ppb)	5	297	69	0	14



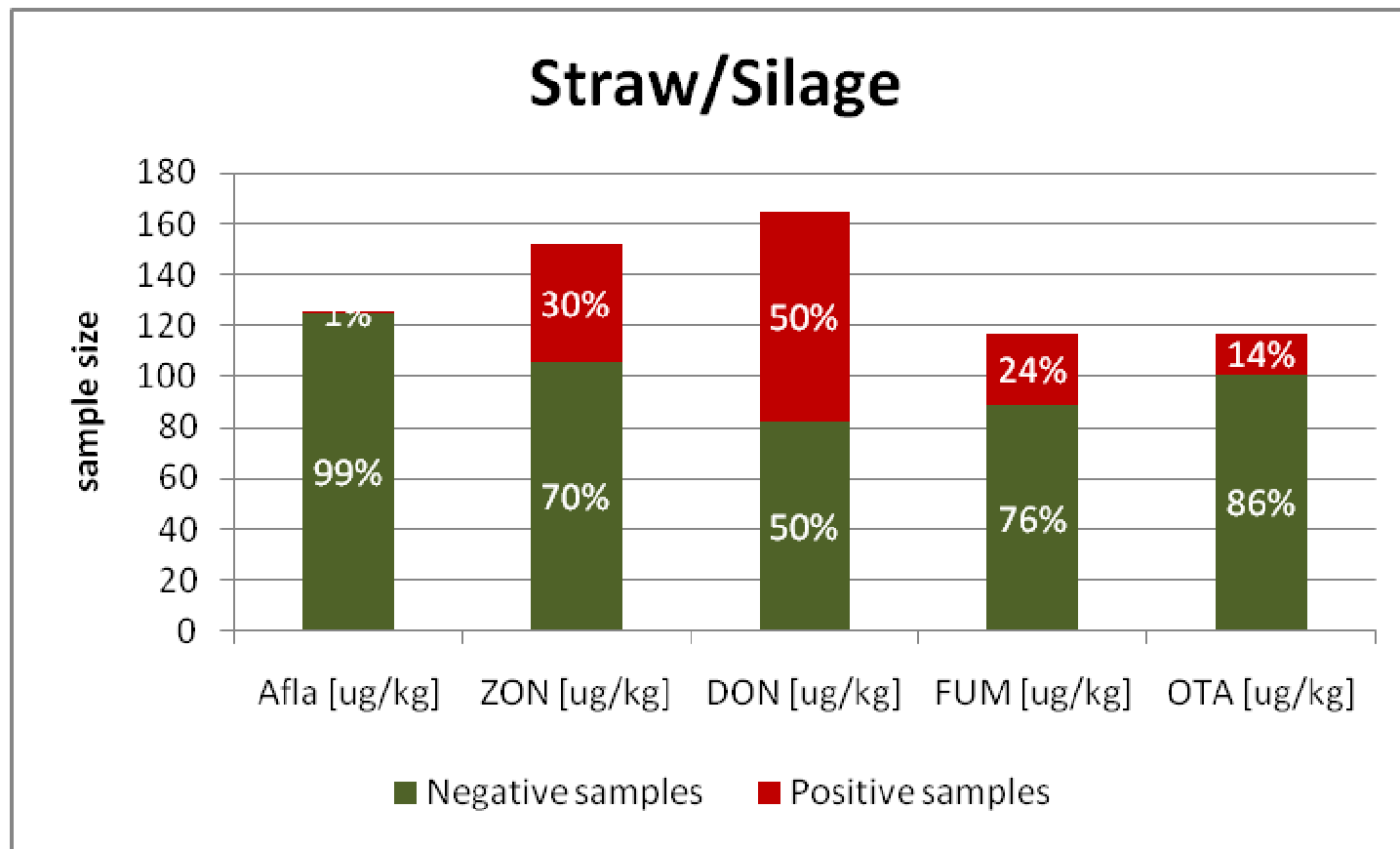
average of positive (ppb)	6	190	2277	804	3
maximum (ppb)	6	693	10100	2470	4

Finished feed



average of positive (ppb)	42	139	597	1347	7
maximum (ppb)	353	3570	6100	10380	174

Straw/Silage



average of positive (ppb)	9	194	537	1162	7
maximum (ppb)	9	804	3370	3134	35

Mycotoxin Risk Management

**DIFFERENT COMMODITIES,
SAME CONCERN!**

Although some commodities are more contaminated than others, none of them escapes the threat of mycotoxins.

≡Biomim[®]≡

Thank you!

Questions?



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