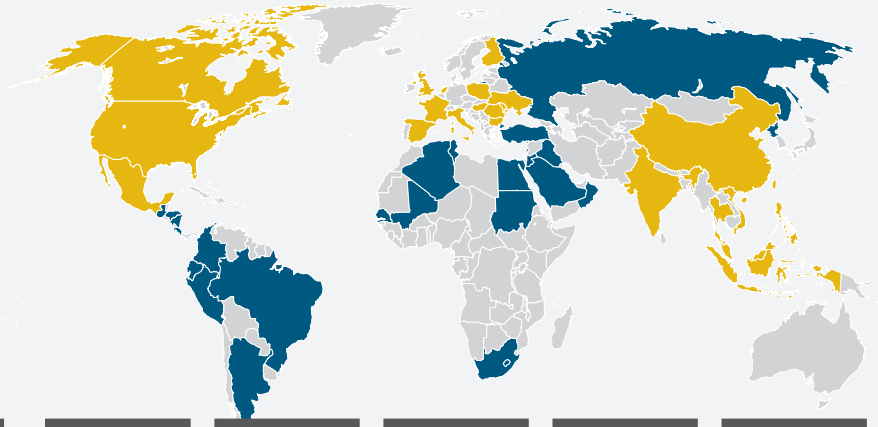
Swine Global and Regional Mycotoxin Risk



% Analyses Above Cargill Performance Risk Threshold for Swine (Nursery)	
Severe Risk	75-100%
High Risk	50-74%
Moderate Risk	25-49%
Slight Risk	0-24%

Asia	
AFL	45%
FUM	34%
OTA	1%
T2	7%
DON	33%
ZEN	12%

China	
AFL	3%
FUM	20%
OTA	2%
T2	3%
DON	72%
ZEN	12%

Central & S. America	
AFL	7%
FUM	35%
OTA	0%
T2	6%
DON	41%
ZEN	9%

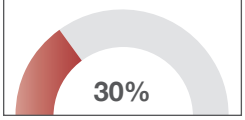
Europe	
AFL	0%
FUM	24%
OTA	0%
T2	10%
DON	65%
ZEN	5%

N. America	
AFL	1%
FUM	30%
OTA	0%
T2	17%
DON	63%
ZEN	6%

Middle East & Africa	
AFL	2%
FUM	30%
OTA	1%
T2	34%
DON	29%
ZEN	10%

Russia	
AFL	0%
FUM	11%
OTA	0%
T2	27%
DON	26%
ZEN	3%

% Analyses Contaminated Above Swine Performance Risk Thresholds (Nursery)



Performance Risk Thresholds

Toxin	Sow	Hog	Nursery
AFL	20	20	15
FUM	3,000	1,000	750
OTA	25	40	25
T2	50	100	50
DON	750	500	200
ZEN	100	300	200

Toxin	Total Analyses	% Analyses Contaminated Above Sow Performance Threshold	% Analyses Contaminated Above Hog Performance Threshold	% Analyses Contaminated Above Nursery Performance Threshold
AFL	94,526	7%	7%	8%
FUM	44,812	6%	25%	31%
OTA	9,660	1%	0%	1%
T2	11,674	15%	7%	15%
DON	103,521	26%	38%	62%
ZEN	46,816	25%	4%	10%
Total	**311,009**	**16%**	**19%**	**30%**

Mycotoxin	Mycotoxin Impact on Swine
AFL	• Low AFL doses result in lower feed intake, growth rate, and vaccination response which can affect liver function and immunity. Nursery pigs are most susceptible as AFL passes through milk. • Acute aflatoxicosis can lead to hemorrhages, jaundice, and sudden death.
FUM	• FUM impacts the lungs, heart, and liver tissues. Acute toxicity causes porcine pulmonary edema resulting in respiratory symptoms, cyanosis, and often, death. • Chronic toxicity causes lower feed intake, growth rate, vaccination response, and muscle bleeding.
OTA	• OTA A is toxic for kidneys and liver and undermines immunity. Significant poisoning results in higher mortality. • OTA can cause low growth rate, poor feed efficiency, and altered urine.
T2	• T2 is a strong immunosuppressive toxin with effects at low doses. Acute exposure causes liver/intestinal bleeds and chronic toxicity causes lower feed intake and weight loss. • T2 can cause reproductive issues, abnormalities, or birth defects.
DON	• DON impacts protein synthesis and immunity and disrupts neurotransmitter activity. Low dose exposure leads to feed consumption and growth performance decreases. • Severe exposure causes vomiting, diarrhea, digestive lesions, and sudden death.
ZEN	• ZEN impacts reproduction and can cause vulva swelling/redness and rectal/vaginal prolapses. False pregnancy and early embryo loss may occur. ZEN passes through milk and impacts newborns. • ZEN lowers growth performance severely when combined with other toxins.

Region	Swine Mycotoxins of Concern
Asia	Main swine performance risk is with AFL: 45% of analyses were positive above Cargill nursery performance risk levels. Also, significant swine performance risk in Asia with FUM (34%) and DON (33%).
China	DON represents the biggest swine performance risk: 72% of analyses were positive above nursery performance risk levels, with FUM in second position with 20% of analyses above Cargill swine performance risk thresholds.
Central & South America	Main swine performance risk is DON and FUM with 41% and 35% of analyses above nursery performance risk levels respectively.
Europe	DON represents the biggest swine performance risk with 65% of analyses above nursery performance risk levels and FUM follows with 24% above nursery performance risk levels.
Middle East & Africa	Main swine performance risk with T2, FUM and DON with 34%, 30% and 34% analyses above nursery performance risk levels respectively.
North America	DON represents the biggest swine performance risk with 63% above nursery performance risk levels and FUM follows with 30% above nursery performance risk levels.
Russia	Main swine performance risk with T2 and DON with 27% and 26% analyses above nursery performance risk levels respectively. FUM is also a mycotoxin of concern with 11% of analyses above nursery performance risk thresholds.