



ELIMINATION OF MYCOTOXINS FROM THE BODY

A number of national “experts” allege long term injuries from mycotoxins, well after theoretical exposures have ended. One claims that he can detect mycotoxins from an indoor “exposure,” often months to years after the claimant has left the site. Another “treats” alleged “mycotoxin victims” with the drug cholestyramine, which he claims binds the mycotoxins in the intestinal tract and eliminates them from the body. In fact, by the time he begins his odd treatment, there could be no mycotoxins left in the body from the claimed exposure, even if there were any in the first place.

At this point, we recognize that the National Academy of Sciences, Institute of Medicine has agreed with us and numerous other experts that diseases from indoor exposures to mycotoxins have not been established. In fact, they are toxicologically, nearly impossible: the potential dose is simply too low. However, assuming for argument sake, that mycotoxins were to get into the body. They don’t remain there. Like all other foreign substances, such as medications and most other toxins, they are broken down and eliminated. Mycotoxins are metabolized in the liver and excreted in by the kidney in short order. Over a dozen scientific studies have examined the time that it takes for mycotoxins to be eliminated. In toxicology and pharmacology, this is generally represented as a “half life.” This is the time that is required for one half of the absorbed dose to be eliminated. For the most part, the half-lives of studied mycotoxins occur in minutes to a few hours. The longest we have found is approximately 35 days. A list of mycotoxin half lives and references follows.

Some of the Experimentally-defined Half Lives of Certain Mycotoxins

Toxin	Half Life	Reference
Aflatoxin B1	91.8 hr	Coulombe R.A. Jr. and Sharma R.P. (1985) “Clearance and excretion of intratracheally and orally administered aflatoxin B1 in the rat.” <i>Food Chem Toxicol.</i> 23(9):827-830
Deoxynivalenol (DON, vomitoxin)	7.1 hr	Prelusky, D.B., Hartin, K.E., Trenholm, H.L., Miller J.D. (1988) Pharmacokinetic fate of 14C-labeled deoxynivalenol in swine. <i>Fundam Appl Toxicol</i> ; 10(2):276-286
Deoxynivalenol (DON, vomitoxin)	2.08-3.65 hr	Coppock R.W., Swanson S.P., Gelberg, H.B., Koritz, G.D. et al. (1985) “Preliminary study of the pharmacokinetics and toxicopathy of deoxynivalenol (vomitoxin) in swine.” <i>Am J Vet Res</i> 46(1):169-74

Some of the Experimentally-defined Half Lives of Certain Mycotoxins

Toxin	Half Life	Reference
Deoxynivalenol (DON)	3.2 hr	Prelusky, D.B., Veira, D.M., Trenholm, H.L., Hartin, K.E. (1986) "Excretion profiles of the mycotoxin deoxynivalenol, following oral and intravenous administration to sheep." <i>Fund Appl Toxicol</i> 6(2):356-63
Fumonisin B1	3.15 hr	Martinez-Larranaga, M.R., Anadon, A., Diaz, M.J., Fernandez-Cruz, M.L. et al. (1999) "Toxicokinetics and oral bioavailability of fumonisin B1." <i>Vet Hum Toxicol</i> 41(6):357-362
Fumonisin B1	18 min	Shepard, G.S., Thiel, P.G., Sydenham, E.W.. (1992) "Initial studies on the toxicokinetics of fumonisin B1 in rats." <i>Food Chem Toxicol</i> 30(4):277-279
Fumonisin B2	18 min	Shepard, G.S., Snijman, P.W.. (1999) "Elimination and excretion of a single dose of the mycotoxin fumonisin B2 in a non-human primate." <i>Food Chem Toxicol</i> 37(2-3): 111-116
Fumonisin B2	26 min	Shepard, G.S., Thiel, P.G., Sydenham, E.W., Snijman, P.W. (1995) "Toxicokinetics of the mycotoxin fumonisin B2 in rats." <i>Food Chem Toxicol</i> 33(7):591-595
HT-2	73 ± 7 min	Sintov, A., Bialer, M., Yagen, B.. (1988) "Pharmacokinetics and protein binding of trichothecene mycotoxins, T-2 toxin and H-2 toxin, in dogs." <i>Toxicol</i> 26(2):153-160
HT-2	19.6 ± 4.7 min	Sintov, A., Bialer, M., Yagen, B.. (1986) "Pharmacokinetics of T-2 toxin and its metabolite HT-2 toxin, after intravenous administration in dogs." <i>Drug Metab Dispos</i> 14(2):250-254.
Ochratoxin A	230 hr	Zepnik, H., Volkel, W., Dekant, W. (2003) "Toxicokinetics of the mycotoxin ochratoxin A in F344 rats after oral administration." <i>Toxicol Appl Pharmacol</i> 192(1):36-44
Ochratoxin A	103±16 hr	Li, S., Marquardt, R.R., Frohlich, A.A. et al. (1997) "Pharmacokinetic of ochratoxin A and its metabolites in rats." <i>Toxicol Appl Pharmacol</i> 145(1):82-90.
Ochratoxin A	19-21 days	Stander, M.A., Nieuwoudt, T.W., Steyn, P.S. et al. (2001) "Toxicokinetics of ochratoxin A in vervet monkeys (<i>Cercopithecus aethiops</i>)." <i>Arch Toxicol</i> 75(5):262-269.

Some of the Experimentally-defined Half Lives of Certain Mycotoxins

Toxin	Half Life	Reference
Ochratoxin A	35.55 days	Studer-Rohr, I., Schlatter, J., Dietrich, D.R. (2000) "Kinetic parameters and intraindividual fluctuations of ochratoxin A plasma levels in humans." <i>Arch Toxicol</i> 74(9):499-510.
T-2	21 ± 5 min	Sintov, A., Bialer, M., Yagen, B. (1988) "Pharmacokinetics and protein binding of trichothecene mycotoxins, T-2 toxin and HT-2 toxin, in dogs." <i>Toxicol</i> 26(2):153-160
T-2	5.3 ± 2.1 min	Sintov, A., Bialer, M., Yagen, B. (1986) "Pharmacokinetics of T-2 toxin and its metabolite HT-2 toxin, after intravenous administration in dogs." <i>Drug Metab Dispos</i> 14(2):250-254
Verrucarol	1.6 ± 0.5 hr	Barel, S. (1990) "Pharmacokinetics of the trichothecene mycotoxin verrucarol in dogs." <i>J Pharm Sci Jun</i> ; 79(6):548-551

This table can be used to question experts who claim that mycotoxins stick around for prolonged periods and continue to do harm. The basic toxicology of their rates of removal is yet another reason why this argument makes little sense. Those who claim that they can measure mycotoxins in the urine months after exposures-at-issue have ended, are either measuring something else, or mycotoxins from a different source, e.g., foods. The notion that treating a patient with cholestyramine to eliminate mycotoxins also makes no sense. In the first place, inhaled mycotoxins would not enter the intestinal tract. And, even if they did, by the time treatment begins, months after alleged exposure, they are gone anyway.