TRILOGY
Analytical Laboratory

Mycotoxin Testing on Modec Decon Formula

Trilogy Analytical Laboratory has performed analytical testing on Modec Decon Formula [1)] at the request of Modec, Inc. Denver, Colorado. The purpose of this research was to determine the effectiveness of this particular formulation on some common mycotoxins. Mycotoxins are chemicals that are naturally produced by molds. Some of these toxins have serious human and animal health implications. The mycotoxins that were chosen for this study were a group of toxins known as the Aflatoxins (Aflatoxin B1, B2, G1 and G2) and Deoxynivalenol (commonly known as DON or Vomitoxin). These toxins were chosen because they are very commonly found both in the US and around the world.

The United States Food and Drug Administration regulates aflatoxin, which is a potent known liver carcinogen. These regulations vary by commodity but are generally enforced at a 20 ppb action level for food destined for human consumption. The other mycotoxin, Deoxynivalenol, is found routinely in wheat and wheat products. Deoxynivalenol has an advisory level of 1 ppm for wheat flour products. This toxin causes both human and animal health problems. Gastrointestinal problems, feed refusal, vomiting as well as potential immune system complications are some of the implications of DON. An advisory level has been in place for several years. Wheat flour millers and manufacturers utilizing wheat products are routinely audited by inspectors to insure that products confirm to the advisory level.

This series of evaluations was designed to determine the effectiveness of Modec Decon Formula against Aflatoxin and DON. Modec Decon Formula was introduced in small amounts into vials containing pure toxin. The vials were then processed and evaluated by HPLC (High Pressure Liquid Chromatography) to determine the amount of remaining toxin. Controls at each level were also analyzed to document the parameters of the method.

The following tables summarize the results of this experimentation:

AFLATOXIN EVALUATION					
Modec Decon Formula [2)] Inclusion Amount in uL's **(1000 uL = 1 mL)**	**Toxin Inclusion Amount in ng's** **(1000 ng = 1 ug)**	**Reaction Time in minutes**	**% toxin remaining in picograms**	**HPLC Analysis performed**	**Outcome**
5 uL	50 ng	5 minutes	Less than 10 picograms	Triplicate determinations	Complete degradation of toxin
10 uL	50 ng	5 minutes	Less than 10 picograms	Triplicate Determinations	Complete degradation of toxin
25 uL	50 ng	5 minutes	Less than 10 picograms	Triplicate Determinations	Complete degradation of toxin
CONTROL DATA					
Inclusion of Part C only of Modec Decon Formula	**Toxin Inclusion Amount in ng's** **(1000 ng = 1 ug)**	**Reaction Time in minutes**	**% toxin remaining**	**HPLC Analysis performed**	**Outcome**
5 uL	50 ng	5 minutes	95.3%	Duplicate determinations	No statistical change in toxin concentration
10 uL	50 ng	5 minutes	99.0%	Duplicate Determinations	No statistical change in toxin concentration
25 uL	50 ng	5 minutes	103.7%	Duplicate Determinations	No statistical change in toxin concentration

Trilogy Analytical Laboratory
111 West Fourth Street
Washington, MO 63090
FAX: 636-239-1531
PHONE: 636-239-1521

DEOXYNIVALENOL (VOMITOXIN) EVALUATION					
Modec Decon Formula[2] Inclusion Amount in uL's (1000 uL = 1 mL)	**Toxin Inclusion Amount in mg's (1000 mg = 1 g)**	**Reaction Time in minutes**	**% toxin remaining in ng**	**HPLC Analysis performed**	**Outcome**
25 uL	6.6 mg	15 minutes	Less than 10 ng	Triplicate determinations	Complete degradation of toxin
50 uL	6.6 mg	15 minutes	Less than 10 ng	Triplicate Determinations	Complete degradation of toxin
75 uL	6.6 mg	15 minutes	Less than 10 ng	Triplicate Determinations	Complete degradation of toxin
CONTROL DATA					
Inclusion of Part A only of Modec Decon Formula	**Toxin Inclusion Amount in ng's (1000 ng = 1 mg)**	**Reaction Time in minutes**	**% toxin remaining**	**HPLC Analysis performed**	**Outcome**
25 uL	6.6 mg	15 minutes	104.3%	Triplicate determinations	No statistical change in toxin concentration
50 uL	6.6 mg	15 minutes	104.2%	Triplicate Determinations	No statistical change in toxin concentration
75 uL	6.6 mg	15 minutes	99.0%	Triplicate Determinations	No statistical change in toxin concentration

As the tables indicate, the Modec Decon Formula degraded Aflatoxin B1, B2, G1 and G2 as well as Deoxynivalenol. The control samples show that the toxins are present when the complete Modec Decon Formula is not present. The control samples were prepared by utilizing only one component of the 3 component Modec Decon Formula. Additionally, the tables show that the decontamination takes place rapidly.

A very small liquid volume of the Modec Decon Formula reduced the toxin level to levels below the detection limit of the analytical testing procedures. Because of this, a metric chart is listed below to assist in the conversion of the small metric weights and volumes.

Metric Equivalence Table			
Units of mass			
Units		Units	Abbreviation
1 gram	=	1000 milligram	mg (milligram)
1 miligram	=	1000 micrograms	ug (microgram)
1 microgram	=	1000 nanagrams	ng (nanogram)
1 nanagram	=	1000 picograms	pg (picogram)
Units of Liquid Measure			
Units	=	Units	Abbreviation
1 liter (L)	=	1000 milliters	mL (milliters)
1 mililiter (ml)	=	1000 microliter	uL (microliter)

1) Modec Provided Trilogy Analytical Laboratory with Modec Decon Formulation 3
2) The three part formulation of Modec Decon Formula (Parts A, B and C) was mixed per instructions on the bottle and used immediately

Trilogy Analytical Laboratory
111 West Fourth Street
Washington, MO 63090
FAX: 636-239-1531
PHONE: 636-239-1521