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Nestlé Quality Assurance Center
Dublin

Technical Datasheet

Analysis Name: Mycotoxins in Foodstuffs by LC-MS/MS

Method Number: LI-00.185

Scope of Application: This method is applicable to a wide range of food matrices. Common food matrices and known incompatible food matrices are listed in Table 2 at the end of this document. Limit of Quantitation is defined separately for each matrix and varies accordingly.

Description: This in-house adaptation of the LI-00.185 method provides a quantitative determination of 15 mycotoxins in foods by liquid chromatography-tandem mass spectrometry (LC-MS/MS). There are three variations of this method. In both, composited samples undergo extraction and an initial QuEChERS-style cleanup.

- The first variation (designated **LI-00.185-1**) employs a second, immunoaffinity column cleanup stage to provide **higher sensitivity** for Aflatoxins B&G and Ochratoxin A and allow analysis of Aflatoxin M1.
- The second variation (designated **LI-00.185-2**) has no further clean-up steps but provides a **screen** of all listed mycotoxins except Aflatoxin M1 and DON-3-Glucoside.
- The third variation (designated **LI-00.185-3**) is the same as the second, with the inclusion of the additional metabolite DON-3-Glucoside.

Sample Weight Required: 1 kg for most, 10 lbs. required for nuts

Analytical Platform: LC-MS/MS



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- Special Information:**
1. Limit of Quantification (QL) differs significantly between food matrices and method variations. Contact Customer Service to verify specific QL requirements prior to sample submission.
 2. Certain foodstuffs (complex matrices) interfere with the analysis of Aflatoxins (B&G) and Ochratoxin A at target QL levels when only the QuEChERS-style cleanup is used. To provide results for Aflatoxins (B&G) or Ochratoxin A in complex matrices, LI-00.185-1 is required. Typical examples of complex matrices include Nuts, Cocoa, Herbs and Spices, Milk Protein Powder, Juices, Raisins, Coffee and Tea.
 3. Suggestion: Package samples to limit fungal growth. For dry samples, limit moisture condensation by using breathable packaging. Freeze wet samples.

Reproducibility [CV(iR)] is limited by the method at 33%. Individual matrices perform uniquely. Rice and Infant Formula in Table 1 illustrate actual method performance.



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TABLE 1

LI-00.185-1				
Analyte Reported	Alias	Unit of Measure	Limit of Quantification^{S.I.1} **	Reproducibility^{S.I.4} (CV(iR) – Infant Formula)
Aflatoxin B1	Afla B1, B1	ppb (µg/kg)	0.025 to 1	6.40%
Aflatoxin B2	Afla B2, B2	ppb (µg/kg)	0.025 to 1	10.84%
Aflatoxin G1	Afla G1, G1	ppb (µg/kg)	0.025 to 1	9.66%
Aflatoxin G2	Afla G2, G2	ppb (µg/kg)	0.025 to 1	3.81%
Total Aflatoxins B&G	Afla B&G	ppb (µg/kg)	0.025 to 1	N/A (sum, not measured directly)
Aflatoxin M1	Afla M1, M1	ppb (µg/kg)	0.025 to 1	7.789%
Ochratoxin A	OTA	ppb (µg/kg)	0.25 to 0.5	4.746%
LI-00.185-2 and LI-00.185-3 (Mycotoxin Screen)				
Analyte Reported	Alias	Unit of Measure	Limit of Quantification^{S.I.1}	Reproducibility^{S.I.3} (CV(iR) – Rice)
Nivalenol	NIV	ppb (µg/kg)	100	17.95%
Deoxynivalenol	DON, Vomitoxin	ppb (µg/kg)	25 to 50	7.42%
3-Acetyldeoxynivalenol + 15-Acetyldeoxynivalenol	3+15-ACDon	ppb (µg/kg)	100	19.38%
Aflatoxin B1	Afla B1, B1	ppb (µg/kg)	1*	7.67%
Aflatoxin B2	Afla B2, B2	ppb (µg/kg)	1*	5.10%



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LI-00.185-2 and LI-00.185-3 (Mycotoxin Screen, continued)				
Aflatoxin G1	Afla G1, G1	ppb (µg/kg)	1*	8.81%
Aflatoxin G2	Afla G2, G2	ppb (µg/kg)	1*	9.78%
Total Aflatoxins B&G	Afla B&G	ppb (µg/kg)	1*	N/A (sum, not measured directly)
Fumonisin B1	FB1	ppb (µg/kg)	25 to 50	9.70%
Fumonisin B2	FB2	ppb (µg/kg)	25 to 50	6.69%
Total Fumonisins	FB1 + FB2	ppb (µg/kg)	25 to 50	N/A (sum, not measured directly)
T-2 Toxin	T-2, T2	ppb (µg/kg)	5 to 25	11.74%
HT-2 Toxin	HT-2, HT2	ppb (µg/kg)	5 to 25	13.53%
Total T-2 and HT-2	T2 + HT2	ppb (µg/kg)	5 to 25	N/A (sum, not measured directly)
Ochratoxin A	OTA	ppb (µg/kg)	0.5 to 1*	3.23%
Zearalenone	ZON, ZEN	ppb (µg/kg)	1 to 20	4.63%
LI-00.185-3 additional analyte (Don-3- Glucoside)				
Analyte Reported	Alias	Unit of Measure	Limit of Quantification <small>S.I.1</small>	Reproducibility <small>S.I.3 (CV(iR) – TBD)</small>
DON-3- Glucoside	Don-3-Glu, D3G	ppb (µg/kg)	50	TBD

* Not available for complex matrices. Refer to Special Information #2 on the previous page.

** QL varies by matrix type. The lowest QLs are not available to all matrices. Contact Customer Service regarding specific QL requirements.



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TABLE 2

Common Matrices	Matrix / Sample Type [‡]	Recommended Test Selections
Common Matrices Complex Matrices	Cereals (grains, infant cereal, soy, legumes)	Choose “Mycotoxin Screen for Food Products” for all analytes excluding Aflatoxin M1. For infant products: “higher sensitivity” methods or “Aflatoxin M1 only” are appropriate choices for the lower quantitation limits required for Aflatoxins and Ochratoxin A. “Higher sensitivity” methods or “Aflatoxin M1 only” may also be selected if lower quantitation limits are desired on other matrices.
	Simple Dairy (milk, milk powder, infant formula)	
	Baby Meals	
	Prepared Foods (frozen or ready-to-eat meals)	
	Nutritional Drinks (Diet shakes, added nutrients)	
	Milk protein powder and meat proteins	
	Oils, Sugars, Honey, Grain Proteins, Gummies**	
	Cheese / Yogurt (processed dairy)	
Fruits and Vegetables		
Complex Matrices	Dried Fruits, Cocoa Butter	Choose “Complex Matrix Mycotoxin Screen” for all analytes excluding Aflatoxins (B1, B2, G1, G2, & M1) and Ochratoxin A. Choose from the appropriate “higher sensitivity” methods and/or “Aflatoxin M1 Only” as needed for other analytes
	Juices and Juice Concentrates	
	Milk Protein Powder or Meat Proteins	
	Cocoa or Nuts	
	Tea or Coffee (dry or liquid)	



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Special Matrices	Pet Food, Soy Sauce, Vinegar	<p>Choose "Mycotoxin Screen for Food Products" for all analytes excluding Aflatoxin M1.</p> <p>These matrices have not been evaluated for use with "Higher sensitivity" methods or "Aflatoxin M1 only". Please contact customer service if desired.</p>
Incompatible Matrices	<p>Green Coffee Extract Emulsificante Addigerm 5% Distilled Monoglycerides Splenda® / Sucralose Acesulfame Sweetener Vanillin Flavor Powder Strong Oxidizers (e.g. Bleach, Sodium Hydroxide)</p>	<p>These food matrices cannot be analyzed by Mycotoxin Screen methods (LI-00.185-2)</p>
	<p>**Gummies Strong Oxidizers (e.g. Bleach, Sodium Hydroxide)</p>	<p>These food matrices cannot be analyzed by Mycotoxin IAC methods (LI-00.185-1)</p>

‡ This is not an exhaustive list of all food matrices. Contact Customer Service for further information on method applicability to specific samples.