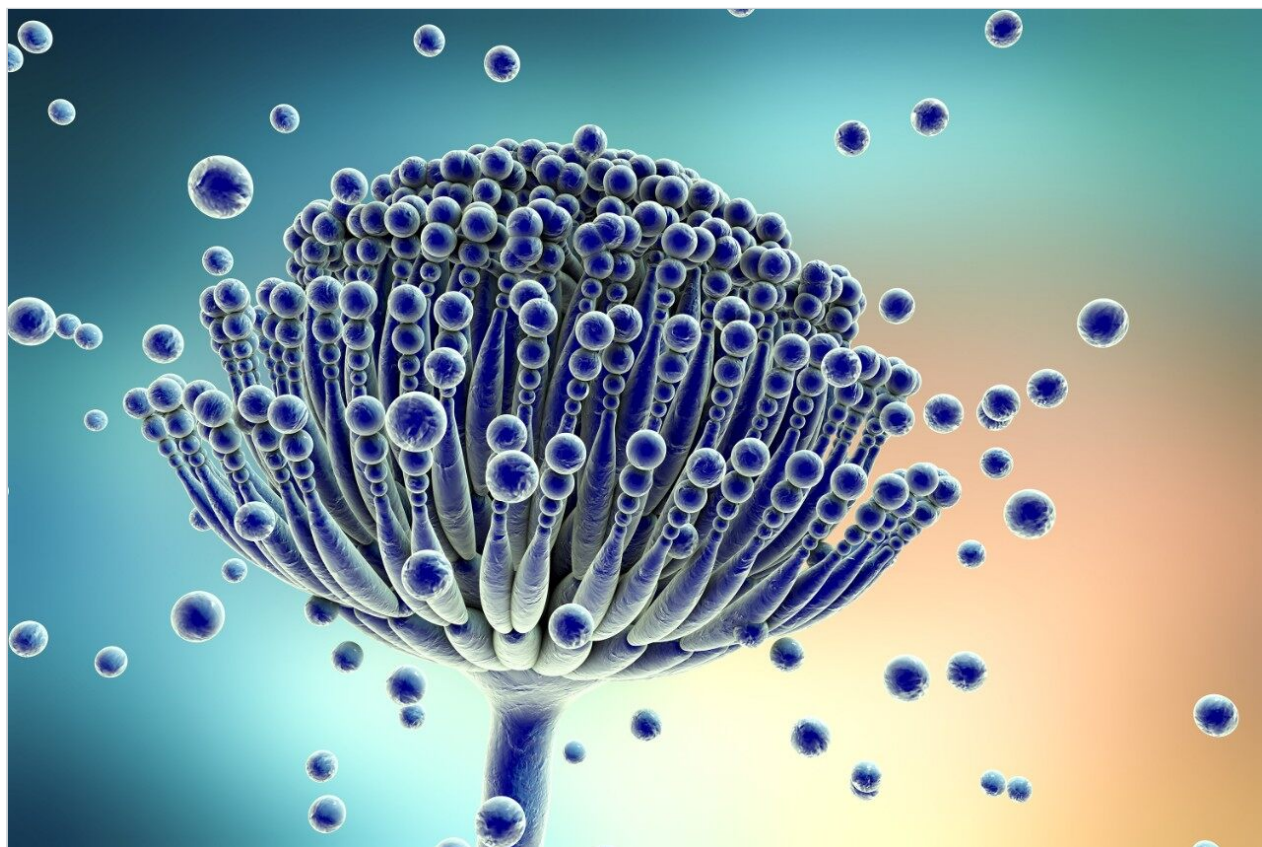




Illustrating Benefits Other Than Increased Sensitivity for Mycotoxin Analysis Using Xevo TQ-S

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This is an Application Brief and does not contain a detailed Experimental section.

Abstract

This application brief shows that Waters Xevo TQ-S reduces ion suppression and makes peak integration easier at sub-legislation concentrations for mycotoxin analysis.

Benefits

Ion suppression is lowered with smaller injection volumes, but this can only be achieved with the sensitivity increases obtained with Xevo TQ-S.

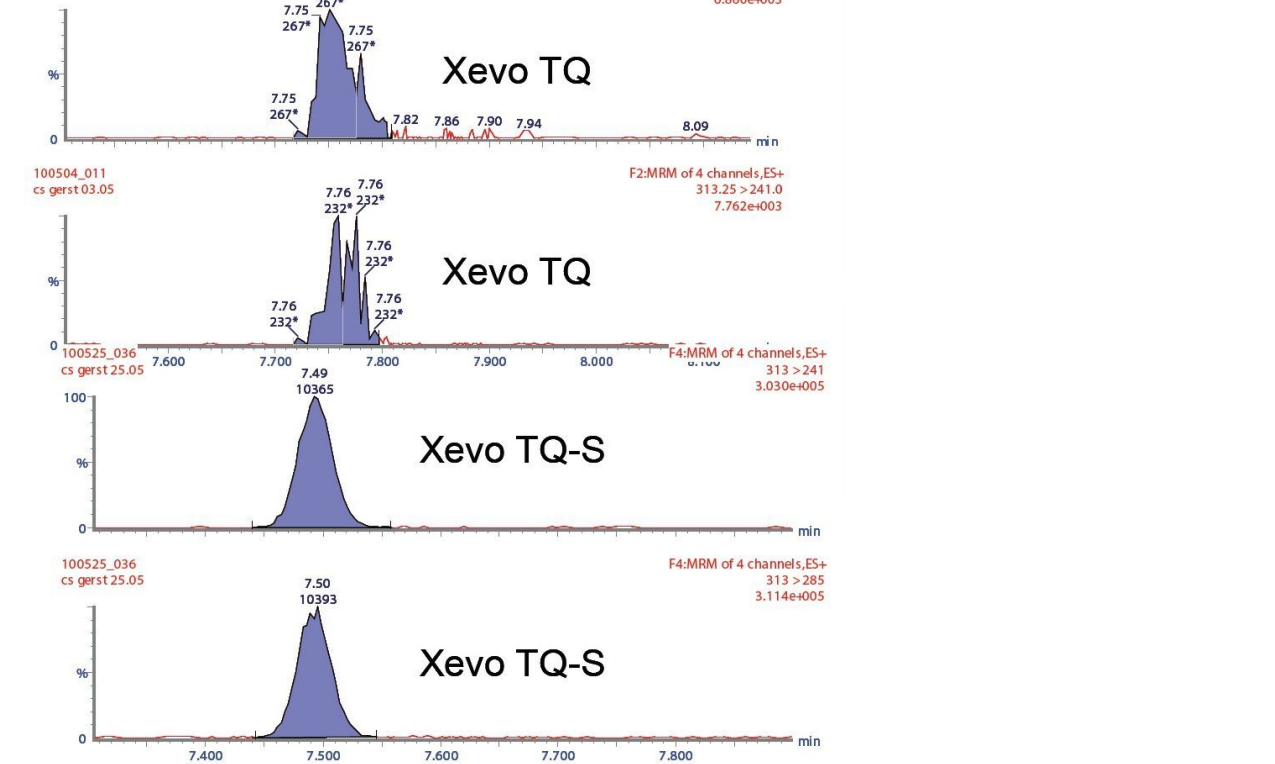
Introduction

Mycotoxins are a class of chemical compounds produced by fungi growing on food. These chemicals are subject to legislation around the world as they are a concern to human health. They are known to cause problems associated with the digestive system and liver.

Using the most sensitive mass spectrometers, such as Xevo TQ-S for analysis of these compounds makes compliance with legislative limits easier, but there are other benefits to be attained as well.

Results and Discussion

The increased sensitivity achieved by Xevo TQ-S improves peak shapes at sub-legislation concentration, levels already achieved by Xevo TQ MS. The relative intensities of any imperfections in peak shape created by poor chromatography are reduced because the peak is larger. The start and finish of the peaks are more clearly defined, so processing software such as TargetLynx can achieve baseline to baseline integration more routinely. This is shown in Figure 1; the injection is spiked barley matrix at a pre-extraction concentration of 0.1 µg/kg. This concentration is 20 times below EU legislation levels for aflatoxin B1. The Xevo TQ chromatography has been manually changed but the Xevo TQ-S chromatography was automatically integrated. The increased sensitivity at low levels helps to reduce the number of manual integrations in a sample batch. This in turn reduces operator variability and the results from processed data sets become more consistent.



The ability to inject a smaller amount on column can help reduce the effects of ion suppression because a

volume, with the majority of results between 70% and 120% (shown in light blue).

	10 μ L injection	5 μ L injection	2.5 μ L injection
Nivalenol	88%	89%	86%
DON	81%	83%	88%
3-ac-DON	75%	78%	84%
Aflatoxin G2	64%	71%	112%
Aflatoxin G1	60%	68%	103%
Aflatoxin B2	52%	57%	89%
Aflatoxin B1	47%	50%	77%
Fumonisin B1	92%	93%	89%
HT2 toxin	44%	41%	62%
Beta zea	67%	71%	80%
Alpha zea	76%	81%	93%
T2 toxin	44%	49%	66%
T2-C13	76%	86%	104%
Zearealone	20%	24%	37%
Ochratoxin A	76%	80%	82%
Cytochalasin E	108%	102%	90%
Key	70% to 120%	50% to 69%	0% to 49%

Table 1. Ion suppression data using different injection volumes.

Conclusion

Improved peak shapes have been achieved due to the increase in sensitivity provided by Xevo TQ-S.

Data processing becomes quicker as baseline to baseline integrations are more common, reducing the time that analysts require when reviewing and editing processed data.

Ion suppression is lowered with smaller injection volumes, but this can only be achieved with the sensitivity increases obtained by Xevo TQ-S.

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Xevo TQ-S <<https://www.waters.com/10160596>>

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