INTRODUCTION

Food can be contaminated by chlorate and perchlorate during different stages of production. Perchlorate can be present in food via the use of fertilisers, while chlorate can be present due to the use of chlorinated water during irrigation, crop washing or disinfection of surfaces during food production. In 2008, chlorate was banned for use as a pesticide and the maximum residue limit (MRL) for chlorate was set at 0.01 mg/kg (under revision)\(^2\). There are currently no regulatory maximum limits for perchlorate in food in Europe. The European Commission introduced reference levels for perchlorate\(^3\) (0.1 to 1.0 mg/kg depending upon commodity), to support trade, but is looking at setting maximum levels to replace the current levels.

RESULTS AND DISCUSSION

Samples of various food commodities were extracted using the QuPPe method as shown in Figure 1. Filtered extracts were then analysed using the liquid chromatography, mass spectrometry method highlighted below.

CONCLUSIONS

- The TORUS DEA stationary phase, provided excellent retention, retention time stability and separation for the analysis of chlorate and perchlorate, in the commodities tested by LC-MS/MS.
- Excellent linearity obtained from 0.002 mg/kg to 0.200 mg/kg in the tested commodities.
- Acceptable repeatability at 0.010 mg/kg for all three commodities, with %RSD below 8% without the use of labelled standards.
- An incurred residue of perchlorate in infant food was quantified using standard addition in the absence of labelled standards.
- Limits of quantification and detection below 0.001 mg/kg for each compound are likely to be achieved based on peak to peak signal to noise of the 0.002 mg/kg matrix matched standards.

MORE INFORMATION

MORE INFORMATION

Footnotes:

©2018 Waters Corporation