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High-throughput analysis of N-adulterants in feed by direct analysis in real time ionization–high resolution mass spectrometry (DART–HRMS) technique

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Abstract The introduction of novel ambient desorption ionization techniques, such as direct analysis in real time (DART) have led to development of numerous application in various branches of analytical chemistry, including food and feed analysis. Ambient mass spectrometry enables non-contact, high throughput sampling of both liquid and solid matrices typically requiring minimal sample pre-treatment. In this study, a DART–HRMS based method was developed for rapid analysis of compounds that can be used for fraudulent increase of apparent protein level in feed (melamine and urea). Following simple sonication-assisted extraction with the use of methanol-formic acid mixture, sample extracts were subjected to instrumental analysis (run time less than 1 min). For (semi)quantitation of melamine, internal standard method (with the use of $^{13}\text{C}_3$ -melamine) was used. The performance characteristics of the method, obtained based on analysis of pre-fortified soya meal samples, were as follows: (i) melamine: LCL (lowest calibration level) - 0.5 ppm, repeatability (at spiking level 5 ppm) - 6%, recovery (at spiking level 5 ppm, n=6) - 102%; (ii) urea: LCL - 15 ppm.



Keywords DART-MS;melamine;urea;feed;adulteration

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