Additives are often incorporated into foods and beverages to improve flavor, appearance and nutritional value. They can provide in the production and sensory characteristics of foods, many of these additives have been linked to negative effects on human health. In order to ensure regulatory requirements are met and product quality is preserved, accurate and efficient methods of analysis for food additives are needed. Through the use of mass detection, better selectivity and reduced limits of quantification can be achieved. The ACQUITY QDa offers the advantages of mass detection without the challenges of traditional mass spectrometers. A single quadrupole mass detector the mass analyzer used in this study. Here we present several examples including the analysis of non-nutritive sweeteners, vitamins and food dyes in various food and beverage matrices using the ACQUITY QDa detector. The ACQUITY QDa detector was used to monitor compound concentration while RADAR technology allowed for the simultaneous acquisition of full spectrum data. Vitamin C and a variety of the B vitamins were analyzed from pastes, tablets, and beverages and compared to cataloged concentrations ranged from 10-100 mg/L. A single quadrupole mass detector the ACQUITY QDa pre-optimised to avoid sample specific tuning and user adjustments. Here we present several examples including the analysis of non-nutritive sweeteners, vitamins and food dyes in various food and beverage matrices using the ACQUITY QDa detector. The ACQUITY QDa detector was used to monitor compound concentration while RADAR technology allowed for the simultaneous acquisition of full spectrum data. Vitamin C and a variety of the B vitamins were analyzed from pastes, tablets, and beverages and compared to cataloged concentrations ranged from 10-100 mg/L. A single quadrupole mass detector the ACQUITY QDa pre-optimised to avoid sample specific tuning and user adjustments.

### METHODS

**Sample Preparation**

Uptake: 3 g of water samples were prepared by diluting water and blending through a 0.5 µm PVDF filter. Beverages were blended through a 0.5 µm PVDF filter. Water samples were diluted a 1:200 ratio of water and 400 µl were injected to the SIR detector. Samples were diluted 1:20 with water. Table 1 shows the 12 water soluble vitamins separated in under 10 minutes. The use of mass detection allows for the analysis of a wide range of vitamins present in a single sample and isomers separated in under 10 minutes. The use of mass detection removes the need for sample specific tuning and user adjustments.

**Instrumentation and Separation**

The ACQUITY UPLC HSS T3 column was used and detection was performed using a vacuum electrospray source with a 60:40 ACQUITY QDa detector. The ACQUITY QDa detector was used and detection was performed using a vacuum electrospray source with a 60:40 ACQUITY QDa detector. The ACQUITY QDa detector was used to monitor compound concentration while RADAR technology allowed for the simultaneous acquisition of full spectrum data. Vitamin C and a variety of the B vitamins were analyzed from pastes, tablets, and beverages and compared to cataloged concentrations ranged from 10-100 mg/L. A single quadrupole mass detector the ACQUITY QDa detector was used to monitor compound concentration while RADAR technology allowed for the simultaneous acquisition of full spectrum data. Vitamin C and a variety of the B vitamins were analyzed from pastes, tablets, and beverages and compared to cataloged concentrations ranged from 10-100 mg/L. A single quadrupole mass detector the ACQUITY QDa pre-optimised to avoid sample specific tuning and user adjustments.

### RESULTS & DISCUSSION

**Vitamins**

A chromatogram showing an overlay of all 12 water soluble vitamins separated in eight minutes. Figure 6 shows the vitamin B5 (calcium pantothenate) and detect all of these compounds without compromise.

**Non-Nutritive Sweeteners**

A chromatogram showing an overlay of all 12 water soluble vitamins separated in eight minutes. Figure 6 shows the vitamin B5 (calcium pantothenate) and detect all of these compounds without compromise.

**Nutritive Sweeteners Continued**

A chromatogram showing an overlay of all 12 water soluble vitamins separated in eight minutes. Figure 6 shows the vitamin B5 (calcium pantothenate) and detect all of these compounds without compromise.

### CONCLUSIONS

- The ACQUITY QDa Detector allows users to quantify compounds which have little or no UV response allowing for a multi-analyte method.
- Simultaneously acquiring highly selective SIR channels with full mass spectrum data using RADAR technology provides a powerful tool to assess background interference.
- The ACQUITY QDa Detector has been designed for integration with UPLC and HPLC systems to provide robust, reliable, orthogonal detection.
- The addition of mass detection enhances confidence in compound identification to a higher level of analytic discrimination.
- The ACQUITY QDa detector can be easily added to existing liquid chromatography workflows in order to increase the selectivity that could not previously be obtained with LC detectors.

## References