

VITAMIN C: QUANTIFICATION AND BROWNING REACTIONS IN YOGURTS

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OBJECTIVE

The objective of this work is to develop a method to quantify vitamin C in yogurts added with this vitamin. Moreover, it is also to identify possible relations between its presence and the Maillard reaction, quantifying the hydroxymethylfurfural (HMF) marker.

METHODS

The methods for the determination of vitamin C and HMF content in yogurt were developed using a High Performance Liquid Chromatography (HPLC), Waters brand equipment, model 1525 UV-Vis detector (PDA - Photodiode Array Detector). To determine vitamin C, the method was developed from adaptations of the AOAC Official Method 2012.22, analysis time was 8 minutes and the injection volume was 20 µL. The quantification of HMF was performed in isocratic mode, mobile phase composed of water and acetonitrile (95.5:4.5), flow rate of 1 mL.min⁻¹. Water spherisorb column (150 mm x4.6 mm; 3µm; ODS2), kept at 30°C, was used. The injection volume was 20µL and the wavelength of 284 nm. Parameters of selectivity, linearity, precision (repeatability and intermediate precision), accuracy, limit of detection (LOD) and quantification (LOQ) and recovery were evaluated.

RESULTS

The analytical curves were constructed over a concentration range of 0.32 to 5.00 µg/mL for HMF and 0.25 to 10.00 µg/mL for vitamin C, the R² values were >0.999. The methods meet the acceptance criteria for a 95% confidence interval, with DPR less than or equal to 5 for precision and a range of 90 to 110% for accuracy. The following LOD and LOQ were obtained: Vitamin C (0.011 µg/mL and 0.034 µg/mL) and HMF (0.037 µg/mL and 0.11 µg/mL).

CONCLUSIONS

The statistical treatment demonstrated that the method can be considered accurate, selective, linear over a wide working range, precise and sensitive, presenting detection and quantification limits compatible with the analytical curves and samples analyzed.