

[P3.25]

Accelerated solvent extraction and hplc quantification of folic acid in fortified wheat flours

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Folic acid belongs to the family of folates. Folates are attracting considerable interest in the nutrition field because of inadequate folate intake can cause severe health disorders such as neural tube defects, cardiovascular disease, neuropsychiatric conditions and some types of cancer. Folic acid represents only a small percentage of the naturally occurring folates, but its stability, availability and low price account for its widespread use in fortification of foods and the preparation of vitamin supplement. Because of the increasing number of fortified foods in the market and its significance in the health of the general population, reliable and fast methods need to be developed to measure the added folic acid in fortified foods. Folate in foods is commonly measured by microbiological assays or HPLC methods. HPLC can separate and quantify different forms of folates and is less time consuming than microbiological assays. Accelerated solvent extraction (ASE) uses a combination of high temperature and high pressure which increases the efficiency of the extraction process. Benefits compared to traditional solid-liquid extraction are a reduction in the extraction time and volume of solvent used. The use of solvents at elevated temperature and pressure helps to achieve better extractions by improving analyte solubility, reducing matrix effects and solvent viscosity and enhancing penetration and distribution of solvent in the matrix. The aim of this study was to establish an ASE of folic acid from fortified wheat flours and to quantify folic acid by HPLC. Excellent results were obtained by using these two techniques together. Due to the very simple extraction procedure, folic acid extraction from wheat flours samples was completed in around 1 hour followed by HPLC quantification.

Keywords: accelerated solvent extraction, HPLC, folic acid, fortified wheat flour