

Determination of Nitrate and Nitrite in Pepper by High Performance Liquid Chromatography/Ultra Violet Method

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Determination of nitrate and nitrite in food stuffs emerged as a promising factor to be considered in human health after discovering the increased risk of carcinogenicity and blue baby syndrome. Therefore, it is considered as a necessary factor to be determined in edible vegetables, meat products and fruits which are considered as the major dietary sources of nitrate and nitrite. Among them, *Piper nigrum*, also known as pepper, cultivated for its fruits, usually dried and used as a spicing and seasoning agent which is relatively lies in the low category under the classification of edible vegetables according to the nitrite and nitrate content. Hence, this study is focused on determining nitrate and nitrite in homemade and commercially available pepper samples by High performance liquid chromatography equipped with diode array detector. The commercially available pepper samples were collected from supermarkets including three different brands and the homemade samples were selected from randomly selected pepper cultivated villagers around the Mulleriyawa area. Nitrate and nitrite in 12 different test samples of black pepper from fully matured unripe berries which are commercially available and homemade were extracted using a modified method from existing Nordic Committee of Food Analysis (NMKL). Nitrate and nitrite in test samples were simultaneously determined using High Performance Liquid Chromatography / Ultra Violet (HPLC/UV) method which includes a reversed phase zorbax eclipse plus C18 column, passed through an optimized mobile phase of 25% acetonitrile and phosphate buffer pH=3.5 in an isocratic elution, under the detection at 222 nm wavelength with a flow rate of 0.7 ml min⁻¹. The statistically analyzed results emphasize that the average nitrate and nitrite content in analyzed homemade samples were 781.3 mg kg⁻¹ and 309.8 mg kg⁻¹, respectively as well as in commercially available samples it was 1837.8 mg kg⁻¹ and 165.4 mg kg⁻¹, respectively. The nitrate and nitrite content in majority of the analyzed pepper samples were higher than the level indicated under the classification in the publication of Council of Europe on nitrate and nitrite content in food stuffs (nitrate >250 mg kg⁻¹, nitrite <1 mg kg⁻¹). The analyzed level of nitrate and nitrite in commercially available pepper samples were greater than in homemade pepper samples.

Keywords: Carcinogenicity, Nitrite, Chromatography, Nitrate, Isocratic