ABSTRACT

Cyanoglucoside Levels in Twelve Local Cultivars of Yam Tubers (Dioscorea Spp.): Effect of Storage and food processing.

Cyanoglucosides or cyanogenic glucosides are commonly found in cassava and a number of other foods. The purpose of this study was to determine the type of cyanoglucoside found in Yam (Dioscorea spp.) and to quantify the levels present in twelve cultivars grown for food in Jamaica. The effects of storage and processing were also investigated. These compounds, during digestion release cyanide, which has been implicated as a factor in malnutrition related diabetes. This trend has been observed mainly in tropical countries where cyanide rich foods are a staple within a low protein diet.

A new method is employed herein for quantitation of cyanoglucoside levels, and was developed by modification of two previously existing ones (Nambisan and Sundaresan, 1984 and Ikediobi et al. 1980). It involves extraction and enzymatic degradation of cyanoglucoside, followed by alkaline picrate assay of cyanide. High performance liquid chromatography studies were used to identify the type of cyanoglucosides present, and the alkaline picrate assay was used to determine the levels of cyanoglucosides present. Linamarin was identified as the principal cyanoglucoside present in the Jamaican edible yams studied.

The cyanoglucoside levels in the cultivars studied are as follows:

D.alata Cultivars: highest levels were found in St. Vincent 572.5 ± 161µg/g, followed by Renta 513.0± 138.6µg/g , Sweet yam 369.8± 97µg/g, White yam 366.6 ± 27.3µg/g and Hard yam 281.3 ± 90.7µg/g.

D.cayenensis cultivars: highest level was found in Roundleaf 537.7 ± 193.6µg/g, followed by Blackwiss 104.2± 24.8µg/g.

D.esculenta cultivar Chinese yam measured 212.6±3.7µg/g. *D.rotundata* cultivars were as follows: highest levels were found in Mozella 385.9 ± 50.2µg/g followed by Negro 248.0 ± 46.9µg/g, Tau 178.05 ± 11.41µg/g and Lucea 165.7 ± 17.5µ g/g. Highest overall levels were found in St. Vincent 572.5 ± 161µ g/g, while Blackwiss contained the lowest overall, 104.2 ± 24.8µg/g.

Storage led to a general decline in linamarin levels with time. Processing did not significantly affect cyanoglucoside levels except for roasting where a marked decrease was seen. For normal individuals, the levels of cyanide generated from linamarin breakdown fall within limits safe from toxicity. However, where yam is a staple, malnourished individuals on low protein diets are liable to cyanide toxicity.

Keywords: cyanogenic glucoside, linamarin.