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Effect of pressure cooking on trypsin inhibitor activity of locally grown legume varieties in Sri Lanka

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Abstract

Trypsin is an enzyme involved in protein digestion in humans. Trypsin inhibitors, one of the major anti nutritional factors present in legumes, bind with trypsin enzyme and reduce the protein digestibility and absorption of dietary protein. The objective of present study was to determine the effect of pressure cooking on Trypsin Inhibitor Activity (TIA) of selected (12) legumes including Cowpea (*Vigna unguiculata*) varieties of Bombay, Dhawala, Waruni, MICP 1, ANKCP 1, ANKCP 2, Mung bean (*Vigna radiata*) varieties of MI 5, MI 6, soy bean (*Glycine max*) varieties of Pb 1, MISB 1 and horse gram (*Macrotyloma uniflorum*) varieties of ANK-Black, ANK-Brown. The dried seeds were milled to pass through a 0.5 mm sieve for raw seed analysis. Pressure cooking treatment was performed by soaking seeds overnight followed by autoclaving for 10 min at 120°C. Cooked samples were freeze dried and ground to pass through 0.5 mm sieve. In determining TIA, Benzoyl -DL- Arginine - P-nitroanalide hydrochloride (BAPA) is used as a synthetic substrate for trypsin enzyme and rate of hydrolysis was measured by intensity of colour released by p-nitroaniline at absorbance 410 nm. Samples with high trypsin inhibitor contents release low amount of p-nitroaniline. According to the results, TIA in raw legumes ranged from 0.65±0.02 mg/g (ANK- Brown) to 1.52±0.01 mg/g (ANKCP1) while TIA in cooked legumes ranged from -0.11±0.1 mg/g (ANK-Black) to 0.61±0.02 mg/g (MI5) on dry weight basis. A significant difference ($p < 0.05$) in TIA among the raw as well as cooked varieties were observed. Further a significant difference ($p < 0.05$) in TIA was observed in comparison between cooked and raw form in each legume variety. The process of pressure cooking reduced TIA in legume varieties from 53.74% (MI6) to 100% (ANK-Black, Bombay).

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