Protein quality of foods made incorporating *Cycas circinalis* seed flour

S P A S Senadheera and Sagarika Ekanayake*

Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayewardenepura, Nugegoda, Sri Lanka

**Corresponding author: sagarikae@hotmail.com*

Received on: 07-04-2013
Accepted on: 27-06-2013

Abstract

Among the cycad species *Cycas circinalis* and *Cycas zeylanica* are native to Sri Lanka. Foods such as *pittu* and *roti* made by incorporating *Cycas circinalis* seed flour are consumed by Sri Lankans living in areas where the plant grows. Although previously reported data indicate that the content of protein in *C. circinalis* seeds is comparable to that of wheat flour, no data is available on the quality of cycad seed proteins. The present study was aimed at evaluating the quality of proteins in *C. circinalis* seed flour, *pittu* and *roti* made by incorporating cycas seed flour.

The moisture, insoluble (IDF) and soluble dietary fibres (SDF), crude protein and digestible carbohydrate contents were measured by AOAC official methods (1984), method of Asp *et al*, Lowry's method/ Folin Ceocalteau method and Holm's method respectively. Quality of proteins was estimated by AOAC Official method 960.48, using an animal bioassay.

Digestible carbohydrate content was highest in soaked seed flour (50.0±2.03). Among the cycad foods, highest protein content (10.3±0.01) and total dietary fibre content (7.7) were in *roti* and this could be due to the addition of wheat flour to *roti* instead of rice flour in *pittu.* Highest weight gain was observed in reference group fed with casein containing diet. The significantly high weight gain in the seed flour fed group compared to *roti* and *pittu* fed groups may be due to the high feed intake. No significant weight gain difference was observed between *roti* and *pittu* fed groups. Protein quality of *C. circinalis* seeds was comparable with that of common maize but all protein quality parameters [Protein Efficiency Ratio (PER), Food Efficiency Ratio (FER), Net Protein Retention (NPR) and Protein Retention Efficiency (PRE)] were significantly low compared to the reference protein diet. Although not significant, NPR and PRE values in *roti* (1.4±0.6 and 8.5±3.7) were higher than test food made with *pittu* or raw seed flour.

Key words: protein quality, Protein Efficiency Ratio (PER), Food Efficiency Ratio (FER), Net Protein Retention (NPR) and Protein Retention Efficiency (PRE)