

The Effect of Germination on Quality of Protein of Selected Legumes

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Abstract

Legumes are the major source of plant protein. The presence of anti-nutritional factors in legumes, limits the availability of nutrients. The aim of this study is primarily to find the best use of legumes to alleviate the problem of protein energy malnutrition, most prevalent in developing countries and fulfil the protein requirement of the global population.

The quality of protein in cotyledons and radicles (shoot) was separately investigated in selected legumes, namely *Pisum sativum* (Terno, Xantos, Svit, Achat), *Glycine max*, *Lupinus albus* (Amiga), *Pisum sativum* var. *arvense* (Arkta), *Faba vulgaris* (Piestansky) after germinating for 48 hours and compared with the respective raw seeds. All samples were analysed for crude protein, amino acids with ion exchange chromatography with post column ninhydrin-based detection and *in vitro* protein digestibility.

Crude protein content was ranged from 21.5-34.4% in raw seeds. It was increased in all cotyledons ranged from 23.1 to 48.0%, and in radicles 32.9 to 64.9% after germinating raw seeds for 48 hours. The highest content of amino acid in cotyledons and radicles were noted in *P. sativum* (Xantos) and its phenylalanine was the highest increased essential amino acid in radicles 7.4 g/16 g N with respective raw seeds 4.6 g/16 g N. The *in vitro* protein digestibility of cotyledons and radicles increased significantly ($P < 0.05$) of all legumes under study. It is ranged from 79.1% to 86.4% in cotyledons, 86.7% to 93.4% in radicles and 54.1% to 75.0% in respective raw seeds.

Results revealed that all the legumes under study are a rich source of protein. The quality of protein in cotyledons and radicles obtained after germinating raw seeds for 48 hours increases significantly in comparison with their respective raw seeds of legumes under study. Germination is an inexpensive and simplest method of processing of legumes, in comparison with other methods of processing to improve the quality of protein of legumes.

Keywords: *amino acid; cotyledons; germinating; in vitro protein digestibility; legumes; radicles; quality of proteins.*