

Title Nutritional quality of legume seeds as affected by some physical treatments, Part 1: Protein quality evaluation

Author R.Y. Khattab, S.D. Arntfield and C.M. Nyachoti

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Abstract

The effect of water soaking, boiling, roasting, microwave cooking, autoclaving, fermentation and micronization on the nutritional quality of cowpea, pea and kidney bean was investigated. Pea seeds showed the highest crude fat, crude fiber and the lowest moisture contents while kidney bean had the lowest crude fat and the highest crude protein and ash contents. Glu and Asp were the main amino acids in all legumes while Cys and Met contents were the lowest. The protein efficiency ratio (PER), protein chemical score (CS) and the essential amino acid index (EAAI) of raw seeds ranged from 2.15 to 2.95, 39.07 to 68.30, and 55.49 to 62.84, respectively. Soaking, boiling, microwave cooking and autoclaving increased the total essential amino acids in all samples. Furthermore, raw and treated samples showed higher Lys content than the reference protein. Autoclaving was the most effective in improving protein quality followed by micronization, microwave cooking and fermentation. In addition, *in vitro* protein digestibility was improved after soaking, boiling, microwave cooking, autoclaving and fermentation but was reduced after roasting and micronization.