

ASSESSMENT OF THE PROTEIN QUALITY OF SOYABEAN PRODUCTS

By

NIRMALA SELVARATNAM

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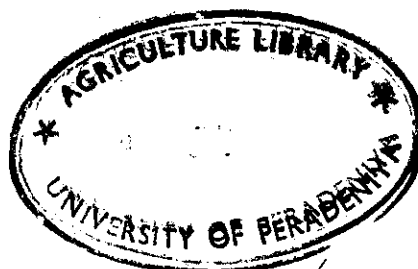


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**ABSTRACT**

Soy flour, tempeh, soymeat, thriposha, soy sausage, soy milk, soy ice cream and soy cutlet are the commonly consumed soy products in Sri Lanka. The effect of the processing techniques on the protein quality of these products is not known. Hence a systematic evaluation on the protein quality of these products was carried out using standard techniques.

The protein content of the products ranged from 8.51% to 58.73% for dried products and from 2.57% to 46.88% for fresh products. Soy flour had the highest protein content (58.73%) and soy ice cream had the lowest protein content (8.51%) under dried conditions.

The amino acids aspartic acid and glutamic acid were found in highest amounts in all soy products (soy flour, thriposha, Nutra, soymeat, soy cutlet, soy sausage, tempeh and soy ice cream etc). The sulfur containing amino acids, methionine and cystine were in least amounts in these soy products. Soy cutlet had the highest chemical score of 30% whereas tempeh and soy ice cream had the lowest chemical score of 14%. The amino acid composition of soy cutlet resembled that of soy flour. Regarding amino acid scores, all the soy products supply threonine at 100% or more of the requirement for adults. Lysine is supplied by soy flour at 100% or more of the requirement for adults. The sulfur amino acid requirement of pre-school children, school-age children and adults is poorly satisfied by all the soy products.

The in vitro digestibility values for thriposha and Nutra were higher compared to the other soy products. Tempeh which is a fermented product had a digestibility value of 88.81%.

The trypsin inhibitor content is high in soy sausage (3.072 mg TI/g sample) and low in Nutra (0.223 mg TI/g sample) among the eight soy products.

The results of the regression analysis showed that there was a negative correlation (correlation coefficient = 0.85) between trypsin inhibitor content in a soy product and its in vitro digestibility value.

Feeding experiments with rats indicated that the replacement of the control diet (Prima feed:wheat flour::1:5) with defatted soy flour (prima feed:defatted soy flour:wheat flour::1:1:28) improved the weight gains of rats. From this experiment, the Protein efficiency ratios of 2.04 and 1.33 were obtained for soy diet and control diet respectively.

The factors determining protein quality showed variation among the soy products. The chemical scores and amino acid scores were low in soy products compared to soybean. Therefore, the processing conditions must be reassessed to obtain soy products of good protein quality.