Tempeh's Contribution to the Intake Vitamins B12, Folates and Essential Amino Acids

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Objectives: Tempeh is a plant-based fermented food consumed as an alternative source of protein. This study aims to compare the nutritional contents of some cooked tempeh and understand which way tempeh contributes to daily needs regarding its protein composition, B12 (cobalamins) and B9 (folates) vitamin contents.

Methods: Amino acid profile was determined by UPLC-PDA. Protein scores to access protein quality were calculated especially for methionine. Folate vitamers (folic acid, 5- methyltetrahydrofolate, tetrahydrofolate, 5–10-formyltetrahydrofolate, 5-formyltetrahydrofolate and 10- formyltetrahydrofolate) and the different B12 vitamers (hydroxocobalamin, methylcobalamin, and cyanocobalamin) were determined by UPLC-MS/MS. Tempeh was analyzed "raw" and after two different cooking methods (sautéed and stewed). Samples were purchased in commercial surfaces from different brands and production sets. Sampling was performed in accordance with the requirements of the Food Composition Databases in compliance with available Data Quality Evaluation Systems.

Results: The sautéed sample is the one which most contribute for the population needs, with 34,7% and 27,3% of total amino acids (to woman with 55 kg and a man with 70 kg, respectively), 7% of folates and 32% of B12 vitamin (particularly, hydroxocobalamin), following the "raw" sample and, finally, the marinated sample. In this way, the culinary method chosen for cooking the tempeh reveals to be an essential aspect in order to obtain higher nutritional value from it. All tempeh samples present limiting amino acids, with methionine being one of them, whose contribution to daily needs, in the sautéed sample, is 26.4% for women and 20.7% for men, whose weight is 55 kg and 70 kg, respectively.

Conclusions: This study reveals that tempeh is a source of B12 vitamin but should be consumed in combination with other foods as buckwheat (methionine rich source) to avoid the confining of the methylation cycle. The production of hydroxocobalamin during the process of fermentation of soy for tempeh manufacturing constitutes ongoing research.

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