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RESEARCH ARTICLE

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Standarisation, acceptability and digestibility of tempeh with cowpea and greengram

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ABSTRACT

A variety of indigenous fermented foods exist today, however, tempeh has been one of the most widely accepted and researched mold-modified fermented products. Tempeh is a traditional fermented food made from soaked and cooked soybean inoculated with a mould, *Rhizopus oligosporus*. After fermentation, the soybean is bound together into a compact cake by dense cottony mycelium. In this study, tempeh was prepared using different types of legumes such as soybean, greengram and cowpea in different proportions. The acceptability study of the tempeh was done by preparing chips and roast and it was found that all the treatments were highly acceptable. *In vitro,* starch and protein digestibility scores of the different treatments were also found to be high. Tempeh made with 100 % greengram gave the best result with the highest acceptability and digestibility scores.

Key words : Tempeh, Fermentation, Pulses, *In vitro* Starch and protein digestibilities

INTRODUCTION

Pulses are important foodstuffs in the dietaries of populations in the tropics and subtropics. In the technically underdeveloped areas of the tropics and subtropics where more than half of the world's population is concentrated, the scarcity of animal foods makes the use of comparatively low cost protein rich legumes to balance their diet (Schneider, 2002). In legumes, presence of antinutritional factors is a main drawback limiting their use.

Wide range of processing techniques could improve the protein and starch digestibilities of legumes(Alonso *et al* ., 1998). However, it is known that certain treatments, such as heat processing, could produce, in some conditions, physico-chemical changes in proteins, starch and in the other components of legume seeds affecting their final nutritional properties (Della, 1994). Fermentation is one of the household food technologies reviewed extensively as means by which the nutritive value of plant foods could be improved (Obadina *et al*., 2008). According to Tabera *et al.* (1995), the fermentation is associated with many chemical changes that enhance organoleptic response, contents of free sugars and vitamins, as well as digestibility. Generally, a significant increase in the soluble fraction of a food is observed during the fermentation and is known to improve nutrition, palatability and digestibility (Lin, 2007). Fermentation also preserves foods in a wide variety of flavours, aroma and texture.

Indigenous fermented foods were known before the recorded history but only recently, the world has taken a closer look to it as these are not only low cost and nutritious, but survived for centuries and time tested to be safe and wholesome. Tempeh or *tempe* in Indonesia, is made by a natural culturing and controlled fermentation process that binds soybean into a cake form (Hachmeister and Fung, 1993). It forms an important part of the diet of many poor people and supplies much of their protein (Djien and Hesseltine, 1990). Tempeh is one of the fastest growing categories in the Western food industry even as dairy to meat alternatives (Golbitz, 2000). Tempeh is very nutritious and serves as one of the best plant protein source containing over 40% protein. In Indian situation where a variety of pulses are used, tempeh could be prepared with pulses other than soybean thereby increasing the acceptability

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