

## Nutritional profile of millet tempeh

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Millet tempeh was prepared by supplementation of soybean and horse gram with millets (little, foxtail and finger millet) at different proportions by using *Rhizopus microsporus* var *oligosporus* incubated at 30 and 35°C. Nutritional analysis of millet tempeh indicated that protein content was decreased in millet tempeh with increased proportion of millets. T<sub>1</sub> (100 per cent soybean) recorded highest protein content (43.05 g) followed by the treatments supplemented with 25 per cent of millets (little, foxtail and finger millet) recorded higher protein content. At 35°C, the crude protein content was higher. Carbohydrate content of millet tempeh did not differ significantly for their effect of incubation temperature. Antinutritional factors like trypsin inhibitor was absent in millet tempeh and less tannin content (0.80 g) was recorded in T<sub>13</sub> (100 per cent finger millet).

Key words : Millet tempch, Nutritional profile, *Rhizopus microsporus* var *oligosporus*.

### INTRODUCTION

India is densely populated, however, with respect to nutritional study the availability of protein is below the WHO standards. India is mainly vegetarian country where main protein intake is through pulses. Per-capita availability of pulses has sharply declined from 75 g in 1959 to 40 g in 1991 as against 80 g by FAO/WHO recommendations (Anon., 1992). In order to solve the problem of malnutrition (protein hunger), possible sources of protein production shall have to be exploited to meet the challenge. Exploitation of traditional food resources can make substantial break through to meet protein deficiency. Small millets as a group include several coarse cereals namely finger millet, little millet, foxtail millet, kodo millet, proso millet and barnyard millet grown throughout the length and breadth of the country in diverse soils and climatic conditions. Grains are rich in minerals and fibre content. Recent studies indicate that minor millets are nutritionally superior to conventional food grains and exhibit hypoglycemic effect due to presence of higher proportion of unfavorable complex carbohydrate, resistant starch and release sugars slowly (Malleshi, 1993 and Mani *et al.*, 1993). The flavour and difficulty in processing of millets are the limitations for their use in the routine diets. Hence combination of millets and pulses with suitable processing protocol emerged to overcome the problem of aroma with improvement in nutritional quality. Soybean and horse gram are not edible in raw state, but are processed in number of ways before consumption which may have effect on nutritional quality and digestibility of nutrients (Kalmesh *et al.*, 2002). If soy tempeh is prepared with any minor

millets it increases energy value and the cost gets decreased.

### MATERIALS AND METHODS

Soybean (*Glycine max*) and horse gram (*Dolichos biflorus*) were obtained from Main Agricultural Research Station, University of Agricultural Sciences, Dharwad. Minor millets like foxtail millet (*Setaria italica* var HMT-100-1), little millet (*Panicum milearum* var. TNAU-63) and finger millet (*Eleusine coracana* var GPU-34) were obtained from the A.R.S, Hanumanamatti. Culture organism (*Rhizopus microsporus* var. *oligosporus* MTCC-556) obtained from the culture collection center, IMTECH, Chandigarh. Chemicals used for the research were of analytical grade. Soybean and horse gram were dehulled by soaking in the water for over night and rubbing with hand and hulls removed by flotation method. The fungal culture, *Rhizopus microsporus* var *oligosporus* was maintained on slants of potato dextrose agar at 4°C. Before each experiment, the fungus was transferred to fresh PDA slants and incubated at 25°C for 7 days. Millet tempeh was prepared by using soybean and horse gram at different proportions with millets. The treatments are T1(100% pulses), T2 (75% pulses+25% millets), T3(50% pulses + 0% millets), T4(25% pulses+75% millets), T5 (100% millets). Nutrient analysis was done by slicing fermented product into pieces and dried at 60°C in the oven for one day and then powdered. The protein content of tempeh sample was estimated as the percentage of total nitrogen by Microkjeldhal method (AOAC, 1980). Moisture content, fat, crude fibre, total ash, total minerals

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