

Vitamin B₆ Level in the Solid State Fermented Lathyrus sativus Seeds

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Introduction

Vitamin B₆ requirement is high in women who take oral contraceptives for birth control. The level of vitamin B₆ have been observed to be significantly lower in the plasma and milk of the long term oral contraceptive users compared to nonusers^{1,2}. There should be cheap and available source of vitamin B₆ containing food for the users of oral pill. On world wide basis, legume foods make an important contribution to human nutrition. Compared to oil seeds, dry legumes have been received less attention in the past. A renewed interest in dry beans as human food is however evident in recent years³. However, the legumes are not very popular due to some toxic and antinutritional factors present in them. Therefore, legumes needs to be processed by some means to remove the undesirable factors.

There is a traditional solid state fermentation process of legume like soyabean in Indonesia, by which Tempeh, a delicious and nutritional food is prepared. By this process, undesirable factors of the seeds can be removed and at the same time nutrients are also increased including vitamin B₆. Similarly, there are other legumes, one of them is Lathyrus sativus available and cheap in Bangladesh which can be cultivated at adverse climatic condition. Though there are some toxic and antinutritive factors present in them, that can be reduced by some

processes and vitamin B₆ content can be increased by the similar process of Tempeh using Rhizopus oligosporus. It can be a added source of vitamin B₆ for the rural people. The purpose of this study was to observe whether this seed can be used as a source of vitamin B₆ by the similar fermentation process by using the inoculum of Rhizopus oligosporus.

Materials and Methods

Lathyrus sativus seeds were brought from market and seeds were cleaned and kept at room temperature. Four portions Lathyrus seed each containing twenty five grams were soaked in water in the proportion of 1.3 for overnight. Soaked seeds were dehulled, cleaned and steamed for 10 minutes. Steamed seeds were inoculated with 0.5% Tempeh inoculum of Rhizopus oligosporus collected from the Nutrition Research Centre at Bogor, Indonesia. One portion was kept at the refrigerator and kept as control. The other portions were packed in plastic petridishes⁴ and incubated at 30°C for different hours. The portions were taken out after 24, 36 and 48 hours incubation and steamed for 10 minutes to stop fermentation. The Tempeh of Lathyrus sativus seeds were then powdered to 100 mesh and stored for microbiological assays. Preparation method is simple, inoculum can be prepared locally and does not require intensive energy input.

Vitamin B₆ estimation: The samples were hydrolysed with 0.5N H₂SO₄ at 120°C for 1 hour, adjusted to pH 5.0 and filtered. The filtrate was used for microbiological assay of vitamin B₆ according to the method of Mislchuddin and Hang,⁵ using *Saccharomyces carlsbergensis* (ATCC 9080) as test organism. The tests were incubated for 20 hours at 30°C. The growth in each tube was estimated at 530 m/u

Results

Vitamin B₆ content of the solid state fermented *Lathyrus sativus* seeds and the control are shown in fig 1. On analysis, the vitamin B₆ level of the control was 0 (0 hour fermentation). The 24 hours fermented sample was 0.1 mg%, 36 hours fermented sample was 0.18% and 48 hours sample was 0.19 mg%.

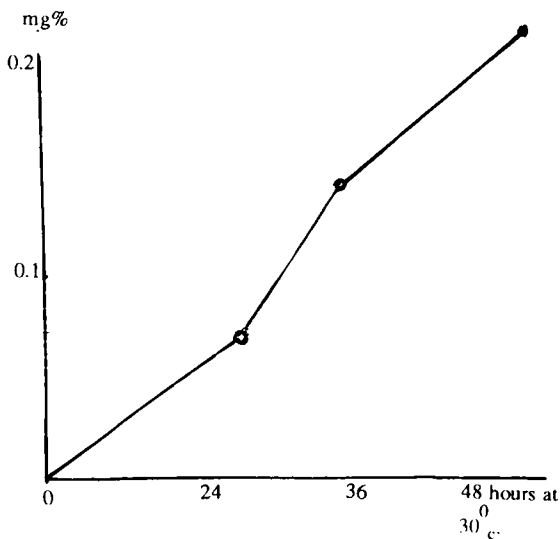


Fig1. Changes in Vitamin B₆ content of solid state fermented *Lathyrus sativus* seeds.

Discussion

The vitamin B₆ level of the control was 0 and 24 hours fermented product was found to increased 0.1 times, 36 hours product increased 1.8 times and 48 hours product increased 1.9 times compared to the control. From the figure, it seems that the vitamin B₆ level increased up to 36 hours and the further increased was slowed down compared to 24 to 36 hours incubation. The optimum increase of the vitamin seemed to be from 36-48 hours, but the 48 hours fermented beans become overfermented⁶. It is significant from the nutritional stand point that the amount of vitamin B₆ was found to be higher in the fermented samples of 24 and 36 hours and if hours are increased more than 36 hours the product's becomes bitter, so 24 to 36 hours fermented samples are acceptable for consumption of the people. Though the vitamin B₆ content of the fermented *Lathyrus sativus* seeds are not sufficient, the product also will be enriched with other nutrients after this process. The nutritional requirement of B₆ of the women can be meet up with the balance diet including the fermented seeds.

Summary

The determination of vitamin B₆ of the solid state fermented *Lathyrus sativus* seeds was done by microbiological assay using *Saccharomyces carlsbergensis* (ATCC 9080). The vitamin was found to increasing during 24 and 36 hours fermentation. The increasing tendency declined from 36 to 48 hours as compared to 24 to 36 hours, but the fermented products become unacceptable after 36 hours fermentation. The products become over fermented and bitter in taste after 48 hours. So, 24 hours to 36 hours fermented products will be suitable of human consumption, and some of vitamin B₆ problem of the women can be meet by this food.

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