

Original Paper

Effect of diet with soybean on histology and histomorphometry of small intestine villi and serum level of Calcium, Phosphorus and Glucose in mice

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Abstract

Background and Objective: Soybean as a cheap protein and without side effects has been introduced to food industry. This study carried out to determine the effect of diet containing soybean on histology and histomorphometry of duodenal villi and serum levels of Calcium, Phosphorus and Glucose in mice.

Methods: In this experimental study, 30 female immature BALB/c mice with 3 weeks of age were randomly allocated into control, and experimental 1 and 2. The control group was fed a diet with complete protein. Animals in the experimental 1 and 2 were received a diet of complete protein with 40% soybean and 20% soybean, respectively. After 3 months the mice were anesthetized and blood samples were taken from the heart for determining serum level of Calcium, Phosphorus and glucose. Duodenum specimens from were prepared and stained with hematoxylin and eosin.

Results: Tissue structure of duodenum in experimental groups in compare to control group was not significantly changed, except for some scant specimens who showed some degrees of destruction in villi apicase. In histomorphometrical evaluation, the thickness of sub - mucosa and musculature were significantly increased in experimental groups compared to the controls group ($P<0.05$). The height of villi, depth of crypts and serum Glucose level were significantly reduced in experimental groups compared to the controls group ($P<0.05$), whereas the level of Calcium was significantly increased in experimental with the control group ($P<0.05$), but the level of Phosphorus did not show any significant changes in experimental groups compared to the controls.

Conclusion: Long term consumption of soybean can induce significant alteration in serum Calcium and glucose level, thickness of sub mucosa and musculature, the height of villi and depth of crypt in duodenum.

Keywords: Soybean, Histomorphometric, Villi, Duodenum, Calcium, Glucose, Rat

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