

## **Effects of chitosan oligosaccharides prepared by ultrafiltration membrane enzyme reactor on calcium absorption in the ovariectomized rat**

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### **ABSTRACT**

In spite of various bio-functionalities of chitosan, its effects *in vivo* were still ambiguous because of its low absorption on organism and inadequate structure for bioactivities. Therefore, chitosan oligosaccharides (COSs) are necessary to elucidate for an efficient utilization *in vivo*. Chitosan was hydrolyzed and separated into various ranges of molecular weights (>10 kDa, 10-5 kDa, 5-1 kDa and <1 kDa) using ultrafiltration membrane chitosanase reactor in order to develop the calcium chelates as effective calcium absorption accelerator like casein phosphopeptide. COS with the range of molecular weight, <1 kDa had a potent bioavailability *in vitro* (antiprecipitation activity in phosphate solution), and COS were designated for experimental diets *in vivo*. Six-week-old female Sprague-Dawley rats were ovariectomized and fed experimental diets containing a low-calcium diet (0.5% Ca, 0.4% P) for 6 weeks in order to investigate effects on calcium and bone metabolism. The final calcium concentration in serum and urine was significantly higher than that of basal (fed CaCO<sub>3</sub> as calcium source), and the concentration in feces was lower than that of basal. Moreover, bone strength and density in femur is significantly higher than that of basal. These results demonstrated that COS definitely involved in calcium metabolism *in vivo*.