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**Regulatory Mechanism of Food Factors in Bone Metabolism
and Its Prevention in Osteoporosis**

Masayoshi Yamaguchi

(University of Shizuoka Graduate School of Nutritional Sciences)

Aging induces a decrease in bone mass. Osteoporosis with its accompanying decrease in bone mass is widely recognized as a major public health problem. The most dramatic expression of the disease is represented by fractures of the proximal femurs. A decrease in bone mass may be due to decreased bone formation and increased bone resorption. Food factors may prevent bone loss with increasing age. This, however, are poorly understood so far.

We have recently demonstrated that isoflavones (including genistein and daidzen), which are contained in soybean, have stimulatory effects on osteoblastic bone formation and inhibitory effects on osteoclastic bone resorption, thereby increasing bone mass. Also, menaquinone-7, an analogue of vitamin K₂, is abundant in fermented soybean. Menaquinon-7 has been demonstrated to stimulate osteoblastic bone formation and to inhibit osteoclastic bone resorption in vitro. Of the various carotenoids (including β -cryptoxanthin, lutein, lycopene, and β -carotene), β -cryptoxanthin has been found to have unique anabolic effects on bone metabolism. The supplementation of isoflavones, vitamin K₂, and β -cryptoxanthin has preventive effects on bone loss induced in ovariectomized rats of animal model of osteoporosis. Anabolic effects of these factors are also demonstrated in individuals. As other food factors, Sargassum horneri extract among various marine algae has preventive effects on bone loss in streptozotocin-diabetic rats in vivo. Moreover, the intake of wasabi leafstalk (*Wasabia japonica* MATSUM.) extract has preventive effects on bone loss with aging.

Thus food chemical factors play a role in bone health and may be important in the prevention of bone loss with increasing age.