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Hesperidin, a citrus flavonoid, inhibits bone loss and decreases serum and hepatic lipids in ovariectomized mice.

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The purpose of this study was to examine whether hesperidin inhibits bone loss in ovariectomized mice (OVX), an animal model of postmenopausal osteoporosis. Forty 8-wk-old female ddY mice were assigned to five groups: a sham-operated group fed the control diet (AIN-93G), an OVX group fed the control diet, an OVX+HesA group fed the control diet containing 0.5 g/100 g hesperidin, and an OVX+HesB group fed the control diet containing 0.7 g/100 g γ -glucosylhesperidin and an OVX+17 β -estradiol (E2) group fed the control diet and administered 0.03 μ g E2/d with a mini-osmotic pump. After 4 wk, the mice were killed and blood, femoral, uterine and liver were sampled immediately. Hesperidin administration did not affect the uterine weight. In OVX mice, the bone mineral density of the femur was lower than in the sham group ($P < 0.05$) and this bone loss was significantly prevented by dietary hesperidin or γ -glucosylhesperidin. The Ca, P and Zn concentrations in the femur were significantly higher in the hesperidin-fed and E2 groups than in the OVX group. Histomorphometric analyses showed that the trabecular bone volume and trabecular thickness in the femoral distal metaphysis were markedly decreased ($P < 0.05$) by OVX, and γ -glucosylhesperidin significantly prevented this bone loss. Furthermore, hesperidin decreased the osteoclast number of the femoral metaphysis in OVX mice, as did E2. Serum and hepatic lipids were lower in mice that consumed the hesperidin-containing diets ($P < 0.05$) than in the OVX group fed the control diet.

These results suggest a possible role for citrus flavonoids in the prevention of lifestyle-related diseases because of their beneficial effects on bone and lipids.