Nature’s Solution to Bone Health
Bahram H. Arjmandi1*, Marcus L. Elam1 and Shirin Hooshmand1

Osteoporosis remains as a distressing condition that frequently affects postmenopausal women because of the abrupt cessation of ovarian hormones. The postmenopausal period typically occupies one-third of a woman’s life, with more than 45 million women in the U.S. alone, now in the postmenopausal phase [1]. In the U.S., a conservative estimate is that, nearly half of all women over the age of 50 will suffer an osteoporosis-related fracture, resulting in at least 2 million fractures a year, including painful vertebral fractures. Hence, osteoporosis-related fractures are an enormous public health concern, with immense socioeconomic implications. The loss of bone begins to decline during the perimenopausal years [2]. Animal studies as well as randomized controlled trials have indicated that, estrogen administration prevents bone loss, caused by ovarian hormone deficiency. Although the exact mechanisms by which estrogen deficiency deleteriously affects bone remains unclear, this damaging condition is directly associated with elevated levels of pro-inflammatory cytokines [3]. Age-associated increases in oxidative stress play an important role in the regulation of bone metabolism. Isohuma and colleagues [4] demonstrated that oxidative stress is involved in the pathogenesis of osteoporosis, in iron-overloaded ovariectomized (Ovx) rats. This was evidenced by higher urinary levels of 8-hydroxy-2’-deoxyguanosine, an oxidative stress biomarker, and urinary deoxypyridinoline, a bone resorption biomarker, but lower concentrations of serum bone-specific alkaline phosphatase, a marker of bone formation, when compared to young Sham-operated rats. The estrogen-deficient and chronic inflammatory states, such as macrophage colony-stimulating factor and receptor activator of nuclear factor-xB ligand, to increase bone resorption [3].

Despite the availability of drug therapies, a considerable number of women still prefer safe and feasible alternatives, such as functional foods and dietary supplements to conventional therapeutics. Compounds in fruits and vegetables that are protective against bone loss, have not been extensively investigated. Indeed, there is a need for further research on the impact of phenolic compounds found in such foods, on bone metabolism. Of these compounds, Rutin, a flavonoid found commonly in plums and various berries, has been found in such foods, on bone metabolism. Though the consumption of fruits and vegetables, for general well-being is encouraged; in terms of bone health, not all fruits high in phytochemicals are likely to offer the same benefits. For instance, while dried plum and perhaps blueberry exert bone protective effects [16] in our observations [9], the same statement may not be true for other fruits rich in polyphenols such as raisins and dates. We are combining fructooligosaccharide and dried plum has the greatest favorable effect on an acid/base balance, as is the case with consuming plum on bone cannot be solely attributed to their ability, of creating a damaging condition is directly associated with elevated levels of pro-inflammatory cytokines [3]. The question still remains as to, what component of the anti-inflammatory cytokines [3]. Age-associated increases in oxidative stress play an important role in the regulation of bone metabolism. Isohuma and colleagues [4] demonstrated that oxidative stress is involved in the pathogenesis of osteoporosis, in iron-overloaded ovariectomized (Ovx) rats. This was evidenced by higher urinary levels of 8-hydroxy-2’-deoxyguanosine, an oxidative stress biomarker, and urinary deoxypyridinoline, a bone resorption biomarker, but lower concentrations of serum bone-specific alkaline phosphatase, a marker of bone formation, when compared to young Sham-operated rats. The estrogen-deficient and chronic inflammatory states, such as macrophage colony-stimulating factor and receptor activator of nuclear factor-xB ligand, to increase bone resorption [3].

Due to the high flavonoid content in the edible part of the plum fruit, as well as its high content in dietary fiber, the fruit has been considered beneficial for cardiovascular health and other related health benefits. Our findings suggested that the consumption of dried plum, with its polyphenolic content, could have beneficial effects on bone metabolism [5].

Also, a study by Franklin et al. [6] showed that consuming dried plum prevents bone loss in a male osteoporosis model via IGF-I and the RANK pathway. Bone 39: 1311-1342.

References

*Corresponding author: Bahram H. Arjmandi, Director for the Center for Advancing Exercise and Nutrition Research on Aging, Department of Nutrition, Food and Exercise Sciences, The Florida State University, 436 Sandels Building, Tallahassee, FL 32306, USA, Tel: (850) 645-1517; Fax: (850) 645-5000; E-mail: barjmandi@fsu.edu

Received: August 07, 2012 Accepted: August 07, 2012 Published: August 10, 2012


Author Affiliation

1Department of Nutrition, Food and Exercise Sciences, Florida State University, Tallahassee, FL, USA
2School of Exercise and Nutritional Sciences, San Diego State University, San Diego, CA, USA

Submit your next manuscript and get advantages of SciTechno! submissions

- 50 Journals
- 21 Day rapid review process
- 1000 Editorial team
- 2 Million readers
- More than 5000 readers
- Publication immediately after acceptance
- Quality and quick editorial review processing

Submit your next manuscript at www.scitechnol.com/submission