

Abstract Submitted
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X-ray fluorescence measurements of strontium concentration in a lamb bone sample¹ MICHELLE BERRIOS², MIHAI GHERASE³, California State University, Fresno — Strontium (Sr) is an essential element residing in bone in concentrations of 0.1 to 0.3 mg per gram of calcium. Low doses of dietary Sr were shown to reduce bone demineralization due to osteoporosis in animal studies. Bone Sr measurement was also demonstrated to improve the accuracy of human bone mineral content in dual x-ray absorptiometry (DXA) studies. *In vivo* bone Sr measurements can be performed using x-ray fluorescence (XRF) methods. Human bone Sr detectability at low radiation doses was demonstrated in past XRF studies, but accurate Sr concentration determination from measurement remains elusive. The Sr content of superficial cortical bone from a lamb leg was probed using an optimal grazing-incidence XRF method developed in our lab. The lamb bone Sr concentration of 0.33 mg/g was determined using the XRF data from plaster-of-Paris samples doped with Sr. Further, the lamb bone and three overlying leather samples of 1.8-, 2.3-, and 2.5-mm thickness mimicked *in vivo* human bone measurements. Analysis of XRF data indicated that Sr $K\beta/K\alpha$ ratio is a metric of soft tissue x-ray attenuation, a key ingredient in establishing a methodology for accurate bone Sr concentration measurements.

¹X-ray fluorescence measurements of strontium concentration in a lamb bone sample

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