RED LAKE EARTH™ Effect on Bone Mineralization

97 Effect of diatomaceous earth on bone mineralization in free-range organic laying hens.

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Previously we showed that free-range hens fed diets supplemented with diatomaceous earth (DE) were significantly heavier, laid more eggs, and consumed more feed than hens fed the control diet, with no differences in feed efficiency. In the present study, we compared plasma calcium concentrations, and bone mineralization of the hens from our previous study to test the effect of DE on these parameters. Day old pullets of 2 commercial brown egg laying lines (Bovan Brown, Lohmann Brown) were reared indoors until 11 weeks of age, and then transferred to hen-houses with access to outdoor range. Birds were initially fed a certified organic grower mash, which was replaced with a certified organic layer mash at 18 weeks of age. Starting at 16 weeks of age, half the hens of each line began receiving these diets supplemented with 2% DE. Forty hens (10 hens/line/treatment) were sacrificed between 33 and 38 weeks of age, and one radius from each bird was analyzed for bone mineral density and cross-sectional area by quantitative CT. Laying status was assessed by inspection of the ovaries. The density, area and mineralization of the trabecular bone of the radius did not differ between the 2 lines and was unaffected by DE. However, density and mineralization of the cortical bone of the radius was significantly greater in hens consuming the DE diet. Trabecular bone density and mineralization was greater in layers than in non-layers, likely as a consequence of medullary bone inclusion in the trabecular space, while the reverse was true for cortical bone. Plasma calcium concentration did not differ between the treatments, but was greater in layers. The results of this experiment indicated DE increased mineralization of cortical structural bone.