



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 2992

Type: Oral (Non-Student) / Orale (non-étudiant(e))

The Effects of Dietary Ingestion of Nickel Recovery Slag as a Grit Source on Avian Bone

Monday, 6 June 2022 13:45 (15 minutes)

The ubiquity of the nickel recovery slag deposited in the environment of the Sudbury, Ontario basin gives merit to the study of the impact this foreign material could potentially have on wildlife in the area. In this work, the effects of ingestion of this largely metallic grit source on the bone health of *Columbia Livia Domestica* pigeons was measured. This was accomplished by controlling the diets of two groups of birds, one given an exclusively limestone grit source, the second given exclusively slag as grit source. After one year of this controlled diet, the subjects were euthanized, their tibiotarsi were subsequently harvested for testing. Tests performed include breaking strength, Young's modulus, cortical thickness, density, bone mineral density, and mass spectrometry with focus on iron and calcium concentrations. Additionally, conventional micrographs and scanning electron micrographs with accompanying energy dispersive spectrometry were collected. Our analysis of the results are consistent with degraded bone physiology in the slag-fed group.

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Session Classification: M2-3 Functional Biophysics (DPMB) | Biophysique fonctionnelle (DPMB)

Track Classification: Technical Sessions / Sessions techniques: Physics in Medicine and Biology / Physique en médecine et en biologie (DPMB-DPMB)