

Abstract

The chemical content of eggshells is important for tracking the health of fowl, as the content of their eggshells reflects aspects of their diet, environment, and behaviors. Due to this, eggshells can serve as an indicator for environmental contaminants and the conditions in which the birds are found. Carbonic anhydrase plays a role in the development of eggshells and is affected by many environmental impacts, such as heavy metals. Calcium carbonate makes up a large portion of eggshells, yet heavy metals can replace calcium in eggshells, leading to deformations and contamination to the egg that can affect those consuming it. However, the analysis of calcium content in eggshells has proven difficult. A common instrument used to determine elemental composition is the ICP-MS; however, calcium is difficult to analyze. The argon used to generate the plasma interferes as it has a similar mass to calcium, which leads to artificially high and inconsistent calcium concentrations. A new method for isolating the calcium from eggshell is being developed to analyze the environmental impacts on chicken health. Oxalate is used to precipitate calcium oxalate from the eggshells. Gravimetric analysis is done using STA and IR. This will be done in addition to a full characterization using ICPMS, XRD, and C-N analysis.