

Abstract

Calcium carbonate naturally occurs and is a key component in animalia structural physiology, land egg laying amniotes, fossil deposits, pharmaceuticals, organic deposits in soil, and is the main chemical component in limestone. Calcium carbonate is theoretically found to make up ~94% of the chemical composition in chicken eggs with variations among different avian species, which translates to an approximate 40% Ca composition in eggshells in commercial chickens. Eggshell formation is dependent on carbonic anhydrase in the shell glands of egg-laying species and can be affected by environmental dietary factors. If the diet of the avian species contains contaminants, such as strontium or other heavy metals, the calcium can be displaced by the contaminant and cause malformations in eggshell structure. The contaminant can further leach into the albumen and yolk of the egg. This is harmful to any organism consuming the egg or the embryo developing in the egg. The eggshells of various East Texas land fowl and waterfowl are being analyzed to determine calcium, strontium, carbonate, carbon, nitrogen, and chloride composition of the shells. The shells are divided into the sharp and dull ends to determine if there is any difference in chemical composition. Analysis is done using ICP-OES, IP-MS, LECO carbon nitrogen detection, STA, IR, and IC.