ORIGINAL RESEARCH

Analysis of Brown and White Chicken Eggshells for Content of Calcium Carbonate

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To cite this article: Ogah CO, Nwaeze KU and Adetifa OO. Analysis of Brown and White Chicken Eggshells for Content of Calcium Carbonate. Journal of Basic and Social Pharmacy Research, 2021;2(2):27-34
ISSN: 2705-3245

ABSTRACT

Background: An eggshell is the hard outer covering of an egg that serves to protect it from damage, microbial contamination and desiccation. The major component of the eggshell is calcium carbonate, which provides it with hardness and strength. Calcium carbonate content of eggshells contributes to the overall quality of the egg and eggs are an essential component of human and animal nutrition. Eggshells containing high calcium carbonate can also be processed and used as calcium supplement for bone and teeth health in vulnerable populations.
Objectives: This study determined the calcium carbonate content of brown and white chicken eggshells sourced from Lagos markets and the effect of boiling on same.
Materials and method: Eggs were sourced randomly from three markets in Lagos metropolis and the shells were washed and dried. The dry shells were pulverized and analyzed for calcium carbonate using the back titration method. Each sample (0.5 g) was reacted with excess 1.0 M HCl and the excess acid titrated with 0.1 M NaOH. The calcium carbonate content of each sample was calculated from the difference between the total number of moles of HCl used and that titrated as excess.
Results: The results show that the eggshells studied have high calcium carbonate content and brown eggshells contained higher levels of calcium carbonate (95%) than white eggshells (91%). Boiling did not significantly reduce the calcium carbonate content of both brown and white eggshells. Eggshells from the three markets were similar in their content of calcium carbonate.
Conclusion: This study shows that brown eggshells have a higher calcium carbonate content than white eggshells and boiling of eggs does not significantly reduce the calcium carbonate content of the shells.

Keywords: Eggshells, Calcium Carbonate, Back titration