Using Food Grade Lye “omushelekha” in the Formulation of Health Products from Commonly Consumed African Indigenous Vegetables and Vegetable Combinations

Mary K Walingo and Florence O Habwe

1School of Public Health and Community, Maseno University, Box 333, Maseno Kenya

Corresponding author: Mary K Walingo, PhD, Maseno University, Box 333, Maseno, Kenya

Submission date: March 30, 2011; Acceptance date: May 23, 2011; Publication date: May 24, 2011

Abstract:

Background: Lye, sodium hydroxide and potassium hydroxide has been used over the years in food preparation including the preparation of vegetables and dried meat products, washing or chemical peeling of fruits and vegetables, cocoa processing, caramel production, poultry scalding and cooking among others. Lye is believed to improve the organoleptic properties and also enhances the nutritional value to the products.

Objective: To assess the effect of food grade lye on the levels of copper and iron in the raw, boiled and boiled-fried single vegetables and vegetable combinations treated with and without food grade lye.

Methods: Single vegetables, Crotalaria occroleuca, Solanum scabrum, Vigna unguiculata and Amaranthus blitum and their combinations were cooled and kept in the fridge at 4°Cs. Elemental analysis was done for the raw, boiled and boiled-fried samples using Atomic Absorption Spectrophotometry (AAS) under standard conditions using wavelengths of 248.3nm for iron and 324.2nm for copper. Paired t-test was used to compare the iron and copper levels of the boiled and boiled-fried vegetables while the independent t-test was done to assess the levels of iron and copper in the raw, boiled and boiled fried samples.

Results: Boiled-fried samples recorded higher content of iron and copper than the boiled ones. A combination of Amaranthus blitum-Crotalaria occroleuca boiled without lye boiled-fried with lye, and boiled-fried without lye had the highest copper contents of 1.66mg/100gram, 4.56mg/100gram, and 4.56mg/100gram respectively, compared to Amaranthus blitum alone.
(3.48mg/100gram) and *Crotolaria occloreuca* (0.42mg/100gram). A combination of *Amaranthus blitum-Crotolaria occloreuca* boiled in non-lye water, and those boiled-fried with and without lye had the highest extractable iron of 557mg/100g, 859.2mg/100g, and 859.2mg/100g respectively. Iron content was high in the *Solanum scabrum* (281.1mg/100g), and *Crotolaria occloreuca* (110/100g), *Amaranthus blitum* (108mg/100g) boiled-fried with lye. It was possible that iron was leached from the cooking utensils and absorbed by the vegetables.

**Conclusion:** The results of this study clearly demonstrated that vegetable combinations of *Amaranthus blitum-Crotolaria occloreuca* had a higher content of copper. Vegetable combinations exposed to different treatments had higher levels of iron and copper. This could be attributed different nutrient-nutrient interactions between different vegetables combinations.

**Key Words:** Food grade lye, *Crotalaria occroleuca*, *Solanum scabrum*, *Vigna unguiculata*, *Amaranthus blitum*, iron, copper.