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Original Research Article

12th IFDC 2017 Special Issue—Seasonal variations in nutrient composition of plant-based foods produced at the Southern highlands of Ecuador ☆

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Highlights

- Nutrient composition of plant foods from Ecuadorian highlands differed by season.
- Moisture depletion accompanied by fat increase was observed during the dry season.
- In the rainy season, significant dilution effect of Fe, Ca, Mg and Zn was evidenced.

Abstract

Changes in environmental conditions may influence the biosynthesis of several food nutrients. This study aimed to compare macronutrient and mineral composition over different seasons in 25 fresh plant-based foods that are highly consumed and locally produced in the southern Ecuadorian highlands. Samples were collected during the rainy season (October 2015–March 2016) and dry season (April–September 2016) from main local markets and supermarkets. Analyses of composite samples were carried out in triplicate following AOAC methods, determining moisture by desiccation, ash by calcination, total fat by Weibull, total nitrogen by Kjeldahl, total carbohydrates by difference, phosphorus by colorimetry, and minerals (Na, K, Mg, Ca, Fe, Se, Cu and Zn) by atomic absorption spectroscopy. Overall, during the rainy season, significantly higher moisture content was observed ($86.7 \pm 9.0\%$ vs. $85.9 \pm 8.9\%$, $p < 0.001$), whereas fat ($0.21 \pm 0.21\%$ vs. $0.31 \pm 0.24\%$, $p = 0.001$), Fe (0.79 ± 1.31 vs. 0.61 ± 0.98 mg/100 g, $p < 0.001$), Ca (50.4 ± 68.0 vs. 23.0 ± 37.3 mg/100 g, $p < 0.001$), Mg (18.0 ± 11.4 vs. 15.2 ± 10.8 mg/100 g, $p < 0.001$) and Zn (0.35 ± 0.69 vs. 0.2 ± 0.16 mg/100 g, $p = 0.026$) were significantly lower. This study demonstrates the influence of the season in the composition of vegetables cultivated in Ecuador. This factor, along with other sources of variability, should be defined, so as to be included in the quality assessments of representative food composition data.

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Keywords

Seasonal variation; Food composition; Food analysis; Macronutrients; Minerals; Plant-based foods; Ecuadorian highlands

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