



Effects of Traditional Processing Techniques on the Nutritional Value and Quality of Three Edible Insects from East Africa

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Abstract

Introduction: The edible insects *R. differens* (longhorn grasshopper), *G. bimaculatus* (African field cricket) and *B. alcinoe* (Emperor caterpillar) are a food resource in most rural communities in East Africa. They are highly perishable in their fresh state hence only available during seasons of abundance. This study investigated the effect of traditional drying methods (sun drying, solar cabinet drying, boiling prior to sun drying or solar cabinet drying) compared to conventional drying methods (freeze drying and oven drying) on the nutrient content and nutrient quality indices these edible insects from Kenya and Uganda.

Methodology: The proximate composition, amino acid profile, fatty acid profile, reactive lysine, protein digestibility corrected amino acid score (PDCAAS), atherogenicity index and thrombogenicity index were determined using standard analytical methods.

Results and Discussion: The protein (36 – 62%) and fat (23.5 – 54.9%) contents accounted for at least 80% dry matter of all species. The amino acid contents varied with insect species while the variation in fatty acid proportions was dependent on both insect species and drying methods. The amino acid score indicated that sulphur containing amino acid (0.92 – 1.07) in grasshopper, threonine (0.2 – 0.47) in cricket and leucine (0.37 – 0.72) in caterpillar were the limiting amino acids. Boiled and dried insects had lower proportions of linoleate, α -linolenate and higher proportions of palmitate, laurate and pentadecylate than the dried forms of insect because of possible lipid oxidation initiated by boiling. The thrombogenic (0.36 – 1.93) and atherogenic (0.44 – 0.9) indices were higher in boiled dried insects but within acceptable values of 1 – 1.2 for human nutrition.

Conclusion: These edible insects are nutritious with a potential to be used in food supplementation and fortification programmes. Sun drying and solar cabinet drying on their own or with prior boiling could be cost-effective and affordable alternatives to freeze drying and oven drying for preserving edible insects.

Biography: Kieran Yisa Njowe

Njowe K. Yisa is a Cameroonian PhD student in Food Science at the University of Pretoria. He holds MSc in Biochemistry from the University of Younde. His research interest is in the use of edible insect nutrients as ingredients in food for human consumption with the aim of reducing the neophobia.