



**Dr. Teresa Ngeywa Tumwet** is currently working with the Ministry of Agriculture, Livestock and Fisheries as the Senior Assistant Director in-charge of the Home Economics Programme in the Extension and Training Directorate, Ministry Headquarters. The main goal of the Home Economics programme is to contribute to ensuring food and nutrition security for all households. This done mainly through food diversification and employing appropriate technologies in food production and utilization. Dr. Tumwet graduated with a PhD in Applied Human Nutrition in the Department of Food Science, Nutrition and Technology, Faculty of Agriculture University of Nairobi on 29<sup>th</sup> August, 2014. The title of her thesis was **The Role of African Indigenous Leafy Vegetables in Immune boosting**. She has published several papers in peer reviewed journals. Her interests are livelihood improvements through food and nutrition security. She has an Msc. in Applied Human Nutrition and Bsc. General Agriculture both from the University of Nairobi.

### **The Role of African Indigenous Leafy Vegetables in Immune boosting**

#### **ABSTRACT**

The immune system is a collection of biological processes within an organism that protects against disease. A healthy/strong immune system ensures that one is less susceptible to infections and ill health. Factors affecting the proper functioning of the immune system are many and they include micronutrient deficiencies, infections, illnesses, major burns, medications and emotional and physical stress. Micronutrient deficiencies are of concern worldwide and especially in the developing countries. The main deficiencies of public health importance are Vitamin A, iron, iodine and zinc. African Indigenous Leafy Vegetables are very rich in vitamins, minerals and other nutrients. There have been allegations of immunity boosting of individuals with infections, particularly HIV infection, through consumption of different indigenous vegetables such as spiderplant, African nightshade, stinging nettle and amaranthus. This study investigates the contribution of African Indigenous Leafy Vegetables in immune boosting using immune suppressed white albino laboratory rats.

A structured questionnaire and focused group discussions were used to document the diversity of African Indigenous Leafy Vegetables in the study area, Maseno division of Kisumu West district, and to rank them according to immune boosting and health claims, and popularity in terms of production and consumption in comparison with literature. The three African Indigenous Leafy Vegetables significant in terms of contributing to healthy functioning of the body, immune boosting and good nutrition amaranth (*Amaranthus hybridus*), African nightshade (*Solanum nigrum*) and spiderplant (*Gynandropsis gynandra*) were further studied. They were planted at a plot in the College of Agriculture and Veterinary Sciences, University of Nairobi and nutritional value in terms of beta carotene, ascorbic acid, and minerals iron, zinc, copper, magnesium, manganese and calcium determined at both vegetative and flowering stages. Different vegetable preparation methods standardized from the communities' practices were also employed and the nutrients compared in these different methods across the three AILVs. The preparation methods were boiling for 5 minutes, boiling for 5 minutes and a further 3 minutes with milk, frying for 5 minutes, frying for 10 minutes and raw. The eight nutrients of immune boosting importance mentioned earlier were determined. The contribution of African Indigenous Leafy

Vegetables to immune boosting was investigated using immune suppressed White Albino rats by measuring C-reactive protein, CD3%, T-Killer cells, CD<sup>+</sup>4 counts and CD<sup>+</sup>8 counts. In this, thirty female albino rats were divided into four groups A, B, C and D. The immunity of groups A, B and C was suppressed using Cyclosporine A, thereafter groups A and B were given raw and cooked *A. hybridus* respectively. Group C was the positive control while group D was the negative control.

The results of the survey confirm that there is diversity of AILVs in the study area with nine such vegetables. Three of these were rich in the eight selected micronutrients and were therefore studied further. The vitamin content of the vegetables reduced with flowering while mineral content increased. *Amaranthus hybridus* was in overall of higher nutritional value than *Solanum nigrum* and *Gynandropsis gynandra* and boiling or steaming for five minutes was the best cooking method for nutrient retention. *Amaranthus hybridus* boosted the immunity of White albino rats as was seen in the ratio of CD<sup>+</sup>4/CD<sup>+</sup>8 counts.