



ASSESSMENT OF PROCESSING METHODS AND PRESERVATION OF AFRICAN LEAFY VEGETABLES IN SIAYA COUNTY, KENYA

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Abstract

The aim of the study was to assess the processing and preservation methods of African Indigenous vegetables (ALV) in Siaya County. A cross sectional survey was performed where semi structured questionnaires were used to gather information. The data generated was analyzed by SPSS version 16.0. Amaranthus, nightshade and cow peas were grown by 6%, 12% and 57% of the farmers. The main preservation techniques were traditional sun drying (45%), and fermentation (32%). The key tribulations to ALV utilization were poor infrastructure (35%) and Perishability (40%). It was recommended that Solar drying and credit facilities be availed to farmers to tackle the problems of ALV production.

Key Words: African Leafy vegetables, processing, preservation.

Introduction

African leafy vegetables (ALVs) are outstanding sources of micronutrients in the world. This makes them helpful in alleviating micronutrient deficiencies common in sub Saharan Africa (Abukutsa Onyango, 2010). The increasing consumption of ALV across East Africa is because people have recently become aware of health protecting attributes of the bioactive compounds they have. Among the micronutrients these vegetables have include Vitamin A, calcium, manganese, magnesium and iron (Keding *et al*, 2009).

African leafy vegetables are under utilized in Kenya because the farmers are deficient in the strategies on processing excess produce they harvest during the rainy seasons (Government of Kenya, 2009; Government of Kenya, 2003). This makes them unable to access external markets because the ALVs are perishable. During dry seasons the production of vegetables is lower. Over 90% of vegetables produced in Kenya are consumed locally among the households. In addition, the vegetables are not sufficient to meet the increasing demands witnessed in Kenya. In Siaya county, there are a lot of ALVs which are not fully taken advantage of (ICRAF, 2004). This is because the farmers have laid less emphasis on marketing, production consumption and processing of ALVs. Poor rains and inefficient preservation practices have also dwarfed ALVs utilization (Government of Kenya, 2009). The aims of the study were: to find out the ALVs consumed, ALVs processing and preservation methods and the challenges experienced in the production of ALVs. The study attempted to answer a hypothesis lack of efficient preservation methods is the hindrance behind exploitation and utilization of ALVs in Siaya.

Methods

The Study Design and Region

The study was conducted in Siaya ALVs are widely grown there. A cross sectional study was carried out to obtain information about ALVs consumed. In addition information concerning ALV processing, marketing and distribution was also captured. In Siaya County, Sauri was purposively targeted because ALVs are abundant there. ALV farmers of ALVs were chosen to participate in the study because they are directly involved in ALV production, consumption and marketing of ALVs.

Sampling Procedures

All small scale ALV farmers that also sell their produce were invited to participate in the study. Systematic sampling was done to obtain a sample size of 80 farmers. A sampling frame of 600 farmers was obtained from Local agricultural office.

$K = N/n$, where

K = skip term, N = population size, n = sample size

$600/80 = 8$, every 8th farmer was chosen from the sampling frame

Data collection

Interviews were conducted to the farmers and information congregated using semi structured questionnaires. Participant observations were also done to complement questionnaire information. Secondary information was assembled from literature and journals. The questionnaires were pre tested in a neighboring county before the study began. The questionnaire was also reviewed by experts from the Department of family and consumer sciences, University

of Eldoret. During the questionnaires were checked to ensure that all the questions were answered before the farmers were left.

Data analysis

Statistical Package of social sciences (SPSS version 16.0) employed during data analysis. This generated descriptive statistics. ALVs being produced, processing methods in addition to challenges to ALV production were presented in form of tables, charts and bar graphs.

Research ethics

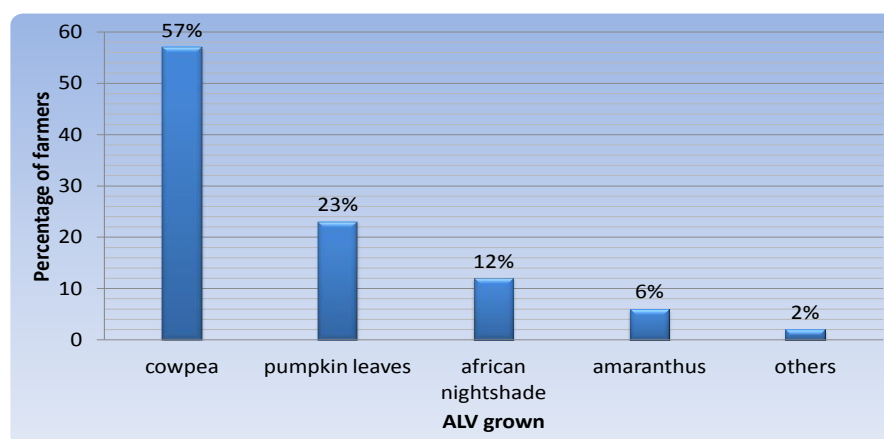
All the farmers were invited to participate in the study on a voluntary basis. The aim of the study was made clear to them and all the information they gave was handled with a high degree of confidentiality. The outcome of the study was communicated to the ministry of agriculture for appropriate policy to be taken.

Results and Discussion

ALV Farmer's Ages

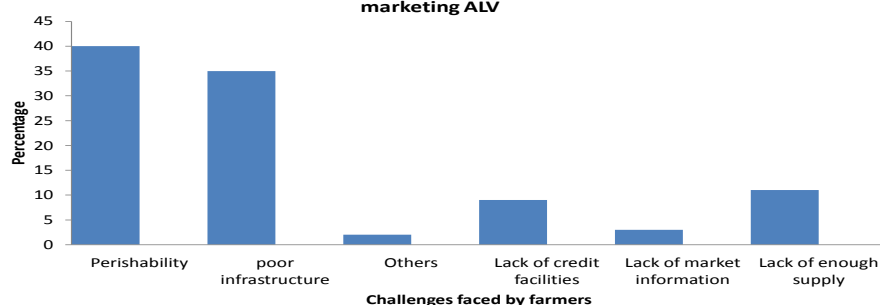
Most (60%) of the farmers were male. The average age of the farmers was 35 years. The oldest and youngest farmers were 68 and 15 years respectively. At least 50% of those who participated in the study were people of Middle Ages who are enthusiastic to take up innovations in farming of ALVs.

Figure 1: ALV of major significance



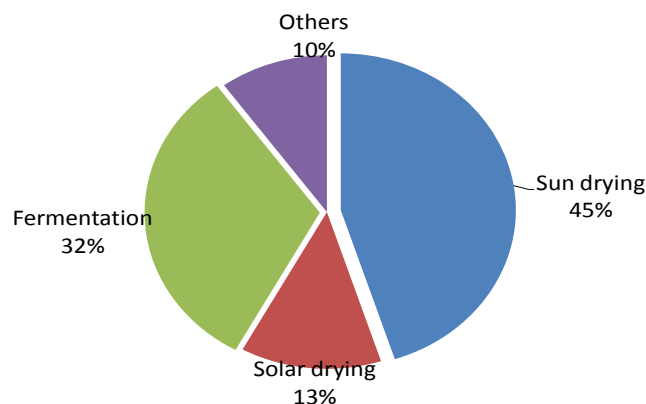
About 57% of the farmers cultivated cow peas without the knowledge that it was an ALV. Pumpkin leaves was grown by 23% of the farmers. African nightshade and amaranths was grown by 12% and 6% respectively. Jute mallow grew appeared in the farms as a weed after cultivation but cooked along with cow pea. According to ICRAF (2004), cow peas, nightshade, spider plant, sweet potatoes vines encompass the vegetables that are grown in Siaya County. Low production cost and ease of access of cow pea seeds is the reason given by the farmers why they preferred it compared to other vegetables such as African nightshade whose seeds are not only expensive but also need a lot of time during meal preparation.

Figure 2: Challenges faced by farmers in growing, processing and marketing ALV



The key challenge cited by the growers of ALV was perishability (40 %) and limited storage facilities. Poor infrastructure, credit facilities shortages and farmers lacking information about markets were 35%, 9% and 3% respectively. Other problems (2%) proposed by the farmers municipal levies, diseases and pests. These findings are in line with those by Shiundu and Oniango (2007) where limited transport facilities hindered traders from accessing vegetable markets. Subsequently, losses of vegetables were attributed to perishability. According to xxx; vegetables that are poor quality are sold at lower prices. There is need to devise ways and measures that can ensure that vegetables get to the markets when they are fresh.

Figure3:Methods used to preserve



Drying vegetables in the sun traditionally (45%) and fermentation (35%) were the most practiced methods for preserving the vegetables. According to Kiremire (2010), traditional sun drying exposes vegetables to the heat/sun ultimately leading to higher nutrient losses. From my observations, traditional sun drying was done by the farmers who ages were above 40 years. The farmers attributed that they had learnt the art of fermentation and drying vegetables in the sun from their grandparents. Solar drying (13%) was practiced by women who had formed some groups and were trained by Nongovernmental organizations. Other means that were employed by the farmers to prolong the shelf lives of the vegetables included sprinkling water on top of the vegetables while at the market place. No criteria were put in place in choosing the preservation technique for the vegetables except African night shade which was bitter hence fermented. According to the farmers, fermentation reduced the bitter taste of nightshade.

Conclusion and Recommendations

Traditional sun drying used by most of the farmers takes a lot of time and cannot be used to prolong the shelf lives of the vegetables for sale. Credit facilities should be given to the farmers to explore other techniques such as solar drying which is faster and can preserve more vegetables. Credit can also be used by the farmers to provide transport solutions besides developing infrastructure.

Farmers should also form groups so that they can mobilize funds for securing solar dryers that can be used to in ALV preservation. Nightshade and amaranth should be disseminated to other farmers for adoption

References

- Abukutsa, M.O. (2010). African Indigenous Vegetables in Kenya: Strategic Repositioning in the Horticultural Sector. Inaugural Lecture, Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya. 30 April.
<http://www.jkuat.ac.ke/article.php?id=177>
- ICRAF (2004). Agroforestry Database, a tree species reference and selection guide. Nairobi: ICRAF
- Kiremire, B; Musinguzi, E & Lukwago, F (2010). Effects of vegetables drying techniques on Nutrient Content: A case study of South Western Uganda. African Journal for Food Agriculture, Nutrition and Development, 10(5): 2587-2600
- Keding, G.B. Krawinkel, M.B. Virchow, D. Maass, B.L. Msuya, J.M. (2009). Consumption of traditional and exotic vegetables and their perceived and real contributions to nutritional health in Tanzania. Acta Horticulture. 806: 209-216.
- Kenya Government, (2009). Effective management for sustainable economic growth and poverty reduction. Nairobi: Ministry of Finance and Planning Government of Kenya.
- Republic of Kenya (2004). Strategy for Revitalizing Agriculture 2004 - 2014, Government Printers, Nairobi.
- Shiundu, K.M.; Oniang'o, R. (2007). Marketing African leafy vegetables, challenges and opportunities in the Kenyan context. African Journal of Food Agriculture Nutrition and Development 17: 4-12.
- Smith, I.F.; Eyzaguirre, P. (2007). African leafy vegetables: Their role in the World Health Organization's Global Fruit and Vegetable Initiative. African Journal of Food Agriculture Nutrition and Development 7: 1684-5374.