

ASSESSMENT OF THE LEVEL OF CONSUMPTION OF MORINGA OLEIFERA AMONG HOUSEHOLDS IN LAFIA LOCAL GOVERNMENT AREA OF NASARAWA STATE, NIGERIA

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ABSTRACT

This study analysed moringa consumption among households in Lafia Local government area of Nasarawa state. The objectives were to ascertain the various uses, the willingness to pay, and constraints to moringa consumption in the area. A two-stage sampling technique was adopted to randomly select one hundred (100) respondents for the study. Data were collected with the use of a well structured questionnaire. Descriptive, sensitivity and regression analyses were used to analyse the data. The results indicate that most moringa consumers were female between 21-30 years of age. Most households had been consuming moringa for at least 20 years. Leaves and seeds were the most utilised parts of the plant. Moringa had uses as food, domestic cleansing agent and medicinal purpose. Results show also that WTP for moringa decreases as price increases, while factors influencing consumption include, age, household size, WTP and income. The major constraints to moringa consumption include lack of awareness and poor availability. It is therefore recommended that more awareness be created on its multiple benefits and development programmes be put in place to increase availability and stimulate more of the consumption.

Keywords: Moringa, consumption, willingness to pay, price variation, regression

1.0 INTRODUCTION

Moringa oleifera Lam (also known as Moringa pterygosperma Gaertn), is a perennial angiosperm plant of the Moringaceae family Ramachandran et al., 1980). It is the most widely cultivated species of the family Moringaceae (Fahey, 2005; Azeez et al., 2013). As a softwood tree, it has been used for centuries for medicinal and industrial purposes (Azeez et al., 2013). The roots, bark, leaves, flowers, fruits and seeds of moringa are known for their nutritional and medicinal values (Anwar et al., 2007). As an important plant in the tropics, Moringa is a fast-growing tree that adapts well to hot, semi-arid regions with annual rainfall as low as 500 mm (Bosch, 2004). It tolerates occasional wet or waterlogged conditions on short period of time (Polprasid, 1996), as prolonged flooding can hinder its development (Patricio et al., 2012). Moringa tree grows best in lowland, but it also adapts to high altitudes, and has potential in fighting hunger and malnutrition in the developing world. It provides nutrition and health benefits to the rural and urban poor, while increasing incomes among smallholder farmers. It also enhances environmental protection through its ability to control

soil and wind erosion. Given its multiple uses and wide range of adaptability, moringa is seen as the ideal crop for sustainable food production, with ability to thrive under the current changing climate (Ebert, 2014).

Moringa is rich in many essential micronutrients and vitamins as well as antioxidants and bio-available iron. It is easy to grow, has excellent processing properties, and pleasant taste (Yang et al., 2006b). Drying moringa leaves at 50°C for 16 hours maintained most nutrients and phyto-chemicals, except vitamin C, while boiling fresh moringa leaves and dried powder in water enhances aqueous AOA and bio-available iron by 3.5 and 3 folds, respectively (Yang et al., 2006a). Moringa is capable of increasing yields by 25-30% in several crops like maize, soya, sorghum, tea, and melon (Rehman and Basra, 2010). According to Foidl et al. (2001) the seed has about 40% oil with excellent quality for cooking, and contains approximately 13% saturated fatty acids. The average yield in wet leaves per Moringa Tree is given as 4.5kg per annum, equivalent to 1kg dry leaf powder. Moringa Plant can produce for as long as seven years or more, saving the labour of fresh establishments and input costs while it continues to yield revenue for the farmer. It is also a good alternative to sugar beets leaves for biogas production (Omotosho et al., 2013).

2.0 ECONOMIC IMPORTANCE OF MORINGA OLEIFERA

Moringa oleifera, is a multipurpose tree species. It is used in agricultural production as manure, pesticide, foliar fertilizer (Fuglie, 1999) and plant growth hormone (Foidl et al., 2001). Its use in domestic water purification (Anwar et al., 2007) and as a source of food and medicine are also well acclaimed (Fuglie, 1999). Thurber and Fahey (2009) highlighted its potential to addressing global undernourishment problems. Apart from their use as food, Africans are well accustomed to the utilization of plants for medicinal purposes. In South Africa, a significant proportion of the population has recourse to traditional medicine which essentially relies on indigenous plant species and in Durban for instance, 40% of the black population patronize indigenous medicinal services (Mander, 1998). In West Africa, traditional medicine is a key component of the healthcare delivery system and in Nigeria, over 90% of the rural people and 40% of urban dwellers depend on traditional medicine (FAO, 2011). Apart from the medicinal benefits there is enhancement of family incomes and national economies.

According to Radovich (2010) almost all parts of the moringa tree are used and the most important products are pods and leaves and the leaves can be eaten in many forms including soups, stews, etc.

Knowledge of Moringa and Consumption/Utilization of the various Parts

Moringa Tree is edible and consumed by humans. Different parts of Moringa Tree are coming into limelight as a result of scientific proof that moringa is an important source of naturally occurring phyto-chemicals that provides basis for future developments (Anwar and Bahanger, 2003). Moringa Tree has been canvassed recently to be an indigenous source of highly digestible protein, Ca, Fe, Vitamin C, and carotenoids suitable for utilization in many developing countries and it can be used to combat malnutrition because it is a readily available and promising food source. While under-nutrition/malnutrition has been fingered in

most deaths particularly of infants, various studies confirm the high nutritive and medicinal value of all parts of the *Moringa oleifera* plant. A lot of researchers have worked on Moringa Tree and provided evidence on the multiple uses of Moringa plant, and show that the plant is a tool for poverty alleviation, while serving as channel for increasing awareness about the inherent benefits of the plant (Omotesho et al., 2013).

Moringa Tree, also known as Horseradish tree, drumstick tree, sujuna benzolive tree and ben oil tree is widely cultivated in the tropics, which are world mostly hit by malnutrition (United Nation Reports, 2004). The Hausa tribe of Northern Nigeria called Moringa Tree Zogali, Bagaruwa or Barambo, the Fulani of the same region named it Garawa, or Rimimaka, the Yoruba in the south western region called it Igi igbale or Igi Iyanu (Miracle Tree) and its leave 'Ewe Igbale', while the Ibo tribe of the Eastern region called it "okwe oyibo", or "odudu oyibo" (Omotesho et al., 2013).

Moringa fruit when eaten as vegetable contains cytokinins (Makkah and Becker, 1997), and according to Mehta et al. (2003) the fruit has ability to lower the serum cholesterol. It also has ability to increase the fecal cholesterol and reduce the lipid profile in hypercholesteromic rabbit.

Moringa seed can be consumed fresh as peas, pounded, roasted, or pressed into sweet non-desiccating oil, commercially known as 'Ben oil' (Toma and Deyno, 2014). Obioma and Adikwu (1997) reported that Moringa seed can be use as an antiseptic to treat drinkable water and has antimicrobial properties. Moringa seed contains 19 to 47% oil (Ahamad et al., 1989). Several compounds of proven medicinal value have been isolated from the roots and root bark and it has been reported that the roots possess anti-spasmodic activity (Caceres et al., 1992). Moringa root extracts is commonly applied externally to cure inflammatory swellings (Rollof et al., 2009) and it contains pterogosperrin, an antibiotic that is highly effective in the treatment of cholera (Lizzy et al., 1968), while Ruckmani et al. (1998) reported that it has a heap protective activity, while the juice from the root bark can relieve earache and toothache.

3.0 PROBLEM STATEMENT

Odeyinka et al. (2008) found that about 62% of farmers in southwestern Nigeria were not aware of the *Moringa Oleifera* plant, though rural communities rely on natural and forest products as a mean of economic empowerment and poverty alleviation (Omotosho et al., 2013) and Moringa Tree is rarely mentioned despite its food, medicinal, industrial attributes and its importance for human consumption. This study therefore seeks to assess the level of consumption of *Moringa oleifera* among households in Lafia Local Government Area of Nasarawa State. The specific objectives are to: (i) describe the socio-economic characteristics of the respondents; (ii) identify the various parts of the Moringa utilized by the respondents; (iii) determine the factors responsible for the consumption of Moringa; (iv) investigate the respondents' uses of Moringa; (v) analyse respondents' willingness to pay for Moringa and (vi) identify constraints to moringa consumption in the area.

4.0 METHODOLOGY

4.1 The Study Area

The study was conducted in Lafia Local Government Area of Nasarawa State, Nigeria. The population of the area was about 330,713 people (NPC, 2006). The climate of the study area is tropical climate with two major seasons, namely; rainy and dry seasons with an average annual rainfall of approximately 1,288mm. Lafia is located on latitude 07°09'N and longitude 07°09'E and an annual mean temperature of between 23-33°C around June-July with an altitude of 18.5m above sea level (Akwe, 2008). The Local Government Area is bordered by Obi Local Government Area to the South, Nasarawa-Eggon to the North, Doma Local Government Area to the West. The soil texture is predominantly sandy-loam. Major crops grown in the study area include yam, maize, rice, millet, soybean, beniseed, cassava, sweet potatoes and cocoyam. Others include, amaranthus, pepper and Moringa. It is made up of various ethnic groups which include, Kanuri, Eggon, Migili, Mada, Gwandara, Tiv, Yoruba, and Igbo.

4.2 Sampling and Sample Size

A two-stage sampling technique was adopted to select the respondents. The first stage was the purposive selection of five (5) districts known for the production, marketing and consumption of Moringa. The second stage was the random selection of twenty (20) households from each of the selected districts making a total of one hundred (100) respondents for the study.

5.0 DATA COLLECTION

Primary data were used for this study. Data were collected with the aid of a structured questionnaire. Data collected include the socio-economic characteristics of the respondents, the respondents' knowledge of Moringa, consumers' perception of the uses of moringa, level of consumption, and factors responsible for the consumption of moringa.

5.1 Data Analysis

Descriptive analysis (mean, frequency and percentage) were used to address objectives i, ii and iv. Multiple regression analysis was used to address objective iii of the study. The regression equation is specified as follows.

$$Y = f(X_1, \dots, X_n, e_i)$$

Where Y = Consumption of Moringa (kg)

$X_1 - X_n$ = vector inputs

e_i = randomly distributed error term

The vector inputs include the following:

X_1 = Reason for moringa consumption (1 = medicinal, 0 = others)

X_2 = Sex (1 = male, 0 = female)

X_3 = Age (years)

X_4 = Frequency of use (1 = daily, 2 = weekly, 3 = monthly)

X_5 = Education (1 = formal, 0 = no)

X_6 = Household size (number)

X₇ = Willingness to pay (1 = yes, 0 = no)

6.0 RESULTS AND DISCUSSION

6.1 Socio-economic characteristics of respondents

Age: Fifty-one percent (51.0%) of the respondent falls between the age range of 21-30 years, 23.0% of the respondent falls between 41-50 years and 13% of the respondents were between the age range of 31- 40 years. Mean age of the respondents was 32.5 years. This implies that most of the respondents are in their young ages.

Gender: Majority (71.0%) of the respondents were female while 29.0% of the respondents were males. This suggests that consumption of moringa was higher among females. Females are generally more attractive to vegetables than the male counterparts especially in the study area.

Marital Status: The majority (58.0%) of the respondents was married, while 25.0% of the respondents were single, 13.0% and 4.0% were widowed and divorced respectively. This revealed the cultural and religious believes in the study area were a person is regarded as adult if he or she was married and this constituted the consumption of the household.

Occupation: Thirty six percent (36.0%) of the respondents were traders, 29.0% of the respondents were farmers and 27.0% civil servants. This suggests that most of the females in the study area engaged in trade as a means of sustenance.

Educational qualification: Results in Table 1 show that 54% of the respondents had tertiary education, 16% of the respondents had secondary education, 14% had no formal education and 7.0% had primary education. This implies that most of the respondents are educated enough to understand the importance of moringa consumption. Furthermore, the higher educational status of the respondents was due to the proximity of the study area to tertiary institutions.

Household Size: Table 1 indicates that 56.0% of the respondents had household size of 1-5, 40% of the respondents had household size of 6-10 while 4.0% had household size of 10 and above people. This implies that most (96.0%) of the respondents had household size of about 1-10 persons. Higher household size would likely influences consumption of moringa.

Personal income: Table 1 also revealed that 47% of the respondents had income of N21,000-40,000, 22% of the respondents had personal income of N41,000-60,000, 18% of the respondents had personal income of above N 60,000 while 13% had personal income of below N 20,000. This suggests that the respondents had enough personal income to purchase moringa.

7.0 CONCLUSION AND RECOMMENDATION

Moringa tree is a well known and utilized tree the study area. Majority of consumers were young and of female sex, with educational level between tertiary and secondary, and most

households had size below 10 people. Households have been consuming moringa for the past twenty years at least. The most consumed parts of the plant are the leaves and the seeds. Household willingness to pay for moringa decreases as price increase, while moringa has various uses as food, domestic cleansing agent and medicinal product. Its consumption is influenced by household age and size, income and willingness to pay. Lack of awareness and poor availability are the major constraints to moringa consumption in the area.

Following the high WTP for moringa, and its various benefits for households, it is recommended that more awareness be created about the tree, and its development promoted at community level, for wider consumption.

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