

VEGETABLE CONSUMPTION PATTERNS IN YAOUNDÉ, CAMEROON**Kamga R^{1*}, Kouamé C², and E Akyeampong³****Regine Tchientche Kamga**

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ABSTRACT

A survey was conducted in August and September 2008 in Yaoundé, Cameroon to assess vegetable consumption attitudes, constraints and factors that stimulate households' consumption. Stratified sample based on district size, socioeconomic status and ethnics groups were used. Three hundred households were interviewed using a questionnaire and there were four times as many women as men in the sample. Data were analyzed using SNAP. More than 80% of the respondents were educated at the secondary (54%) and tertiary (30%) levels. The respondents were generally the wife (35%) or children (30%), and sometimes the husband (20%). More than 50% of the respondents were landlords living in their own homes and the rest were tenants. On average, the population of Yaoundé consumed vegetables frequently (2 to 4 times per week). Tomato, onion, carrot, and chili pepper were the most preferred exotic vegetables while bitter leaf (>80%) and okra (>70%), were the most preferred traditional vegetables. Attitudes towards vegetables varied according to socioeconomic and ethnic group. Main constraints to vegetable consumption were preparation time for respondents in the upper class (30%) and social taboos (amaranth is an ominous crop and can cause impotency in men; okra can inhibit the traditional treatment of some diseases) for the middle and lower classes. Freshness, wholesomeness, and color of the fruit or leaves determined the decision to purchase vegetables. Diversification of diet which is good for health, the preference of family members, and taste were the main reasons for consuming vegetables. Taste, degree of sliminess (okra), and smell after cooking were factors that increased satisfaction during consumption. Two-thirds of the respondents knew the benefits of vegetable consumption but their knowledge was not specific and is influenced by social taboos. Willingness to pay for processed traditional vegetables was higher among respondents in the upper income class (56.9%) than the lower (45.8%) and middle (37.1%) classes. The study revealed a need to further promote the consumption vegetables and inform consumers of their nutritional benefits.

Key words: vegetables, consumption, nutrition, vitamins, minerals

RESUME

Des facteurs qui affectent la consommation des légumes dans la ville de Yaoundé, Cameroun, ont été évalués dans une enquête de 300 ménages choisis sur la base d'un échantillonnage stratifié et analysés en utilisant le logiciel Snap survey. L'échantillon est 4 fois plus constitué de femme que d'homme. Plus de 80 % de l'échantillon est instruit avec un niveau d'éducation secondaire (54 %) et tertiaire (30 %). Les répondants étaient le plus souvent des épouses (35 %) ou des enfants (30 %) et parfois des chefs de famille (20 %). Plus de 50 % des répondants étaient propriétaires de leurs maisons et le reste était des locataires. En moyenne, les légumes sont consommés deux à quatre fois par semaine. La tomate, l'oignon, la carotte et le poivron étaient les légumes exotiques les plus préférés alors que le ndolé (> 80 %) et le gombo (> 70 %) étaient les légumes traditionnels les plus appréciés. Les attitudes des consommateurs envers des légumes changeaient selon le groupe ethnique et socio-économique. Les contraintes principales à la consommation des légumes étaient le temps de préparation pour les répondants de la haute classe (30 %) et pour les répondants de la classe moyenne et la basse classe, ce sont les tabous tels que l'amarante serait un légume de mauvais augure pouvant causer l'impuissance chez les hommes, tout comme le gombo qui peut empêcher le traitement traditionnel d'un certain nombre de maladies. La fraîcheur, l'état sanitaire et la couleur du fruit ou des feuilles sont les critères influençant la décision d'achat des légumes. La santé, les préférences des membres de la famille, et le goût étaient les raisons principales pour consommer les légumes. Le goût, le degré de viscosité (gombo) et l'odeur après cuisson étaient les facteurs qui augmentent la satisfaction du consommateur. Deux-tiers des répondants ont affirmé qu'ils connaissent les avantages de la consommation des légumes mais leur connaissance était vague. Le consentement à payer les légumes traditionnels transformés était plus élevé chez des répondants de la classe aristocratique (56.9 %) que la basse classe (37.1 %) et la classe moyenne (45.8 %). L'étude a révélé un besoin de promouvoir la consommation et les avantages nutritionnels des légumes.

Mots clés : Légumes, consommation, nutrition humaine, vitamines et minéraux.

INTRODUCTION

Vegetables are important sources of vitamins and minerals for the human diet. The World Health Organization (WHO) reported in 2002 that a diet lacking in fruits and vegetables is a major independent risk factor for non-communicable diseases such as cardiovascular disease and cancer [1]. In sub-Saharan Africa, it is estimated that by 2020 non-communicable diseases will outstrip communicable diseases as a cause of death [2]. Worldwide, mortality attributable to insufficient fruit and vegetable intake was estimated at 2.7 million deaths yearly. The consultation of FAO/WHO on Diet, Nutrition, and the Prevention of Diseases recommends a minimum daily intake of 200 g of vegetables or about 73 kg/year/person [3].

The production of vegetables in Africa is far behind the global average: annual per capita production is approximately 50 kg, which is less than half of the production in all other regions of the world. The vegetable production area in sub-Saharan Africa (about 2.5 million ha) has not changed since 1990, while global vegetable area is increasing (more than 50 million ha in 2005, with about 20 million ha in India alone) [4]. Per capita vegetable consumption in sub-Saharan Africa is lower than the rest of the world, and is declining. In sub-Saharan Africa, Nigeria had the highest vegetable consumption at 61.3 kg/capita/year [5].

Malnutrition is a serious health problem in Cameroon. Most clinical forms are protein-calorie malnutrition (PCM), nutritional anemia, and vitamin A deficiency [6, 7, 8]. Protein-calorie malnutrition affects all groups, particularly infants and young children. One out of every four children (24.4 %) under 5 years suffered from chronic malnutrition [6]; a more recent report indicated that 35.4 % children under 5 years are stunted and 15 % are underweight because of chronic malnutrition [9]. To tackle the challenge of nutritional insecurity, new nutritional sources, including vegetables and diet diversification opportunities must be explored. This study examined the factors that determine vegetable consumption behavior in Cameroon by socio-economic and ethnic group. Using a representative household survey, this study analyzed vegetable consumption patterns in Yaoundé, assessed respondents' knowledge of the importance of vegetables and determined consumers' Willingness To Pay (WTP) for processed leafy vegetables.

METHODOLOGY

Study site

Yaoundé was chosen as study site because of its cosmopolitan population, the high purchase power of this population and existence of a peri urban and urban vegetable production. Yaoundé is located in Southern Cameroon specifically in the center region between latitude 3°47'- 3°56'N and longitude 11°10'- 11°45 E at an altitude of 750 m covering a total area of 256 km². The annual rainfall pattern is bimodal, with an average of 1600 mm and an average annual temperature of 24°C. The population of Yaoundé is approximately 2 million.

Data collection and sampling procedure

Three hundred households were selected by stratified sampling based on district size, socio-economic status, and ethnic groups. They were interviewed from August-September 2008 using a pre-tested questionnaire that included socio-demographic information, education level of the respondent, nature of occupation of household head, frequency of vegetable consumption, Willingness to pay processed vegetable and knowledge on the benefit of vegetable nutrition as major components. The tools used to establish the socio economic subdivision were the total household size, the family income and wealth, the type of housing and the area of residence. Low income class are people with income less or equal to the official basic salary, living on less than US\$1 per day in vulnerable conditions while high income class are people leaving in residential towns, mostly involved in business and enjoying high comfort and security.

Data analysis

Information from interviews was entered and analyzed using Snap 9 survey software [10]. Snap survey software is powerful, intuitive software for questionnaire design, publishing, data collection and analysis. Parameters were defined following the sequence of the questions in the questionnaire. Frequencies of similar answers were grouped and compared between socio economic and ethnic groups by cross-tabulation. Tables and graphics could therefore be drawn using Excel.

RESULTS

Socio demographic information

The households had four times as many women than men (Fig. 1). More than 50% of the respondents were landlords and the rest were tenants. About 44.4% of the respondents were married while 49.2% were single. More than 80% of the respondents were educated up to the secondary (54%) and tertiary (30%) levels. The respondents were generally composed of; wife (35%) or children (30%), and sometimes the husband (20%).

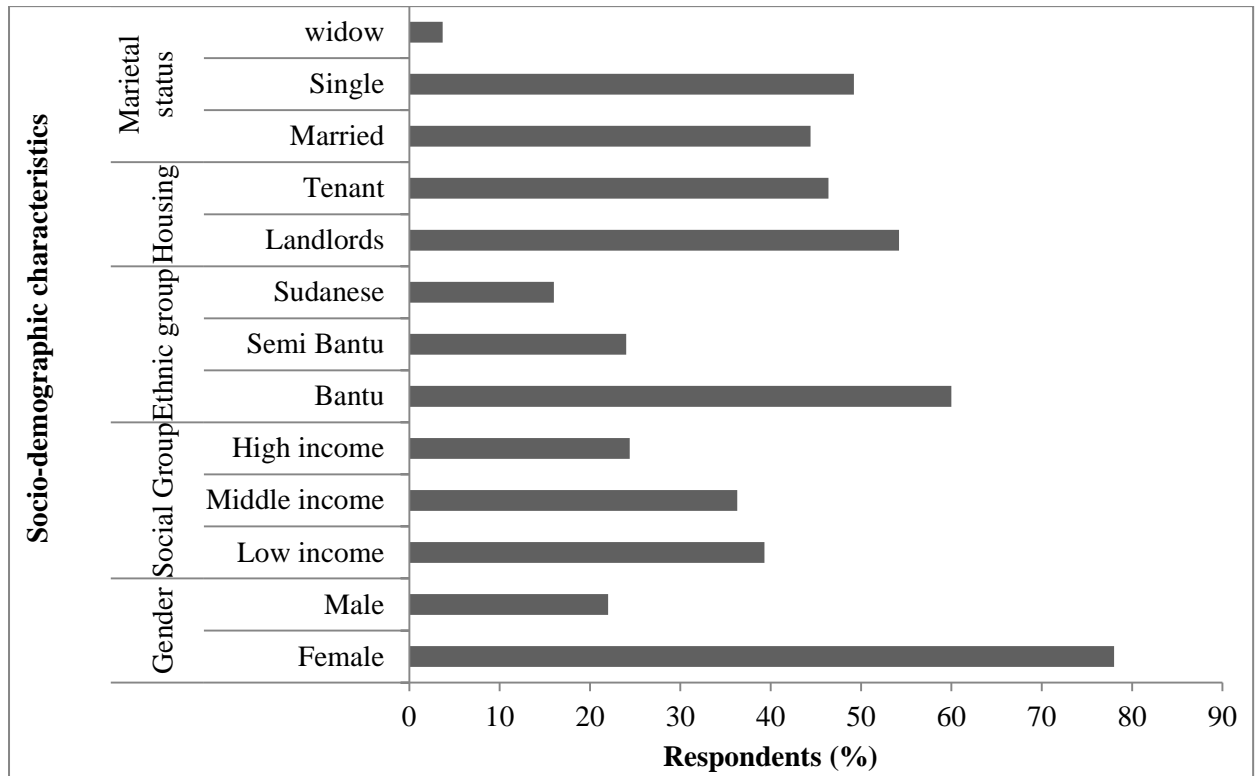


Figure 1: Socio-demographic characteristics of the respondents

Consumption characteristics

Frequency of vegetable consumption

More than half of the households consume vegetables more than once a week. Semi Bantu (64%) consume vegetables more than the other ethnic groups (Table 1). Respondents were composed of 60% Semi Bantu, 24% Bantu and 16% Sudanese.

The percentage of high and low income people who consume vegetables 2-4 times/week is approximately equal (Table 1). Respondents were composed of 24.4% of high income class, 36.3% of Middle income class and 39.3% of low income class.

Preferences by socio economic and ethnic group

For exotic vegetables, all socio-economic groups preferred tomato, onion, carrot, and hot pepper. Okra and bitter leaf were the most preferred indigenous vegetable across all socio-economic groups (Table 2).

By ethnic group, nightshade was the second most preferred indigenous vegetable for the Bantu and Semi Bantu, while amaranth and jute mallow were the second most preferred indigenous vegetables for the Sudanese (Table 3).

Other indigenous vegetables consumed were African eggplant, cassava leaves, and melon leaves.

Motivations and barriers to vegetable consumption

Factors cited by consumers for purchasing vegetables included; freshness, wholesomeness, and color of the fruit or leaves. Diversifying diets to ensure good health, preferences of different family members, cultural preferences, and the taste of different vegetables are the main reasons that motivated vegetable consumption. The study shows that taste, degree of sliminess (okra), and smell after cooking are factors that increase consumers' satisfaction.

The obstacles to vegetable consumption are social taboos and the time spent to prepare and cook vegetables. High income class viewed vegetable preparation and cooking as a waste of time. Some of the often-mentioned taboos and beliefs include: amaranth is an ominous crop and can cause impotency in men; okra can inhibit the traditional treatment of some diseases (asthma and epilepsy) and inhibit the protection effect of the traditional body scarification; nightshade can cause skin allergies; and roselle can cause loss of male virility.

Knowledge of the value of vegetables

The majority 78.3% of respondents stated that they are aware of the benefits of vegetable consumption, but their knowledge is empirical and not specific. However, as regards to problems of not consuming enough vegetables, respondents were almost evenly split.

The data indicate that the importance of vegetable consumption is not gender-specific. More than 90% of the respondents agree that vegetables are important for women, children, and men. The results showed that more than 80% of respondents think vegetables are not inferior food and are good for everyone irrespective of the social class (Table 4). People believe that processing decreases the value of the food; about 80% of respondents affirmed that fresh vegetables contain more nutrients than dry vegetables. Respondents were split almost evenly on the idea that cooking vegetables for a long time can cause the loss of nutrients (Table. 4).

Willingness to Pay (WTP)

The majority of the respondents in all socio-economic groups buy their vegetables in the nearest market. Approximately half of the higher income class surveyed buys their vegetables in a covered market, compared to 12.9% of low income class (Fig. 2).

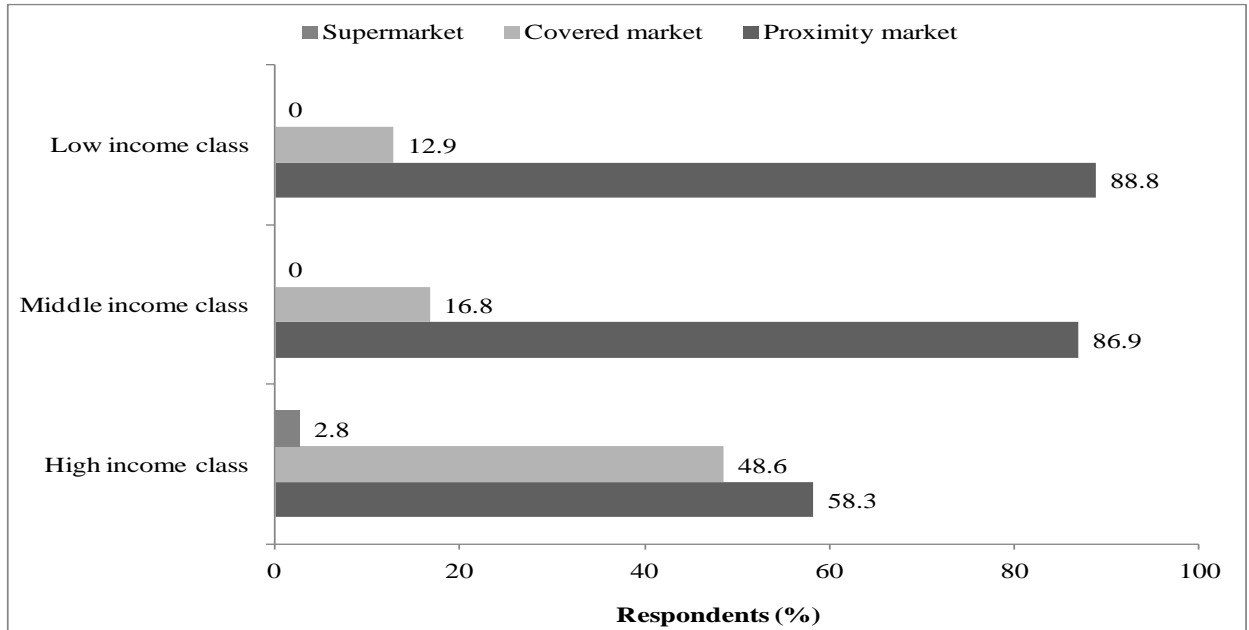


Figure 2: Market where respondents buy vegetables

Low income class is more willing to purchase processed indigenous vegetables, while the high income and middle class are not (Fig. 3).

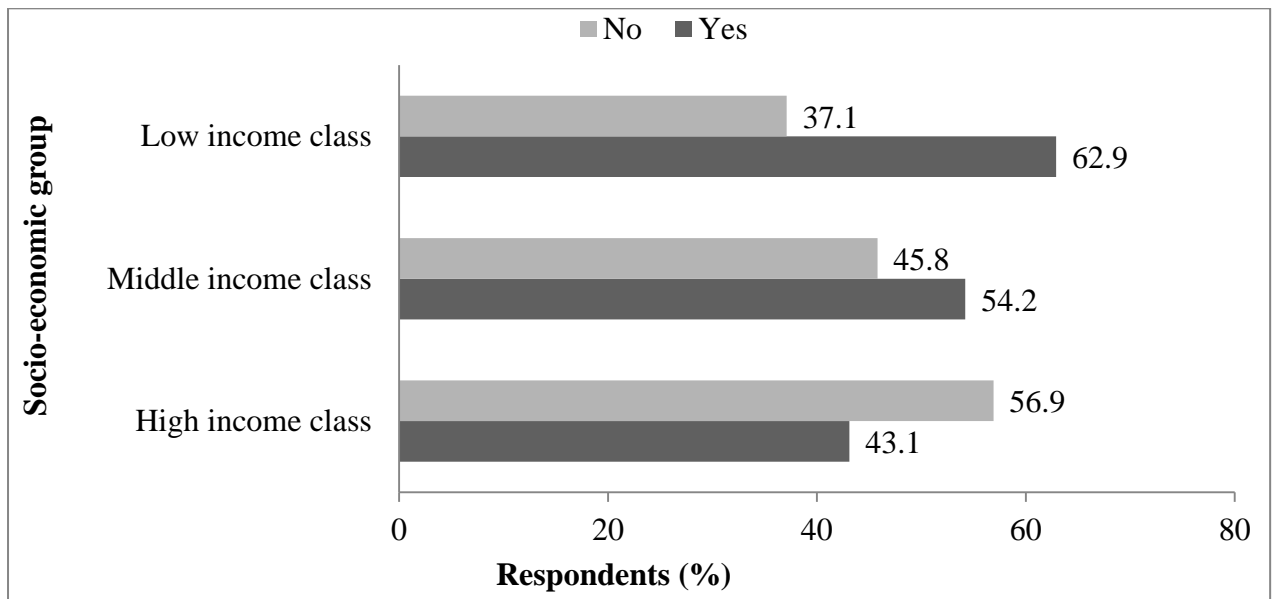


Figure 3: Willingness to Pay (WTP) for processed indigenous vegetables

DISCUSSION

Price can influence vegetable consumption if supplies are limited, as sometimes occurs with transportation constraints [11]. In Yaoundé, however, leafy vegetables are produced in urban and peri-urban areas to supply the markets [12]. Peri-urban vegetables are considered to be fresher by consumers [13]. The urban and peri urban production of leafy vegetables year-round can thus satisfy consumer demand for fresh vegetables. However, this study revealed that consumers do not care about the origin of the products; they feel this is the seller's responsibility. Consumer preferences also explain the variation of consumption frequency among socio-economic and ethnic groups, because preferences may be household specific, cultural or specific to individuals [14]. This study shows the Semi Bantu do not consume much jute mallow, while this vegetable is one of the top species preferred by Sudanese and Bantu.

Willingness to pay for processed vegetables is also low in Vietnam, although frozen vegetables are available in a few supermarkets; they are not widely consumed [15]. People preferred to buy their vegetables mainly at street markets. The low credibility of quality claims on packaging and the higher prices of supermarkets may hinder sales of processed vegetables; consumers give little credibility to the "clean vegetables" labels used by supermarkets [13].

Despite the reasonable frequency of vegetable intake found in this study, the quantities consumed remain low and cooking methods are less efficient, causing the loss of nutrients. Anemia is one form of malnutrition that affects all groups in Cameroon, mostly infants and women of childbearing age. A study in Cameroon, found that men consumed more vegetables than women [16]. Irrespective of sex, the authors showed that infants (0-4 year) and adolescents consumed fewer vegetables than recommended. The national prevalence of anemia was reported to be almost 57 % among children under 5 year old with rates as high as 67 % in certain regions including the study site [17]. Anemia is also a major contributor to maternal mortality, anemia rate among pregnant women exceed 52% [17]. Vegetables are the most affordable and sustainable dietary source of vitamins, trace elements, and other bioactive compounds. Improved vegetable production and consumption is thus regarded as the most direct, low-cost method for urban and rural poor to increase micronutrients in their diets [18].

CONCLUSION

In conclusion, the results have shown that majority of respondents consumed vegetables two to four times per week. Tomato, onion, and pepper are consumed every day. Price and availability did not significantly affect vegetable consumption. From the trend seen in this study, freshness, consumer preferences, and taste determines the choices consumers make about which vegetables to purchase and consume. Appropriate postharvest technologies should be applied to satisfy the willingness to pay for processed indigenous vegetables. Promoting the nutritional

importance of vegetables in Cameroon could increase consumption and improve the nutritional status of all income groups. Promotion of home production could also be another potential strategy to increase consumption at household level. The influence of social taboos that hinder increased consumption of vegetables will need to be addressed through nutrition education and extension communication programs. Such programs will also improve nutritional knowledge—awareness of which was rated low by respondents in this study—to further enhance the consumption of vegetables.

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Table 1: Frequency of vegetable consumption by socio economic and ethnic groups

	Rarely (< 1 time a week)	Occasionally (1-3 times a month)	Infrequently (once a week)	Frequently (2-4 times a week)	Very frequently (almost every day)
A. Ethnic group					
Sudanese	2.2	0	15.2	54.9	28.3
Semi bantu	5.8	2.9	23.2	63.8	4.3
Bantu	5.6	6.2	24.7	51.7	11.8
B. Socio –economic group					
Low income revenue	5.2	2.6	22.4	56.9	12.9
Middle income revenue	5.6	5.6	24.3	51.4	13.1
High income revenue	4.2	5.6	20.8	56.9	12.5

Table 2: Indigenous vegetables preferences by socio-economic group

Vegetables	Respondents by socio-economic group (%)		
	High income class	Middle income class	Low income class
Eggplant	36.1	15.9	18.1
Okra	70.8	70.2	85.3
Amaranth	72.2	67.3	71.6
Nightshade	68.1	70	74.1
Bitterleaf	81.9	51.4	58.6
Jute mallow	61.1	53.3	56
Egusi	66.7	45.8	56
Others	34.7	24.3	31

Table 3: Indigenous vegetables preferences by ethnic group

Vegetables	Respondents by Ethnic group (%)		
	Bantu	Semi Bantu	Sudanese
Eggplant	25.8	13	15.2
Okra	74.2	78.3	80.4
Amaranth	71.9	60.9	76.1
Nightshade	73	73.9	60.9
Bitterleaf	61.8	59.4	65.2
Jute mallow	59.6	34.8	76.1
Egusi	53.4	68.1	43.5
Others	30.9	26.1	26.1

Table 4: Some opinions concerning vegetable consumption

	<i>Agree perfectly (%)</i>	<i>Agree (%)</i>	<i>Not sure (%)</i>	<i>Disagree (%)</i>	<i>Disagree Absolutely (%)</i>
Consumption of vegetable is also important for women, children and men	62.7	34.2	2	1	0
Vegetable is an inferior food that are only good for people who don't have money or enough food	5.8	11.2	1.7	41.4	40
Fresh vegetable contain more nutrients than dry vegetable	26.8	52.9	17.3	1.7	1.4
Cooking vegetable for a long time can cause the loss of nutrients	9.8	45.1	30.5	12.9	1.4

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