

Research Article

Ethnic Origin Influence on Urban Households Potato Purchase: Evidence from Yaoundé, Cameroon

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ARTICLE INFO

Article History

Received: June 19, 2020

Accepted: July 25, 2020

Volume: 2

Issue: 4

KEYWORDS

Potato purchase, urban households, ethnic origin, food security, Cameroon

ABSTRACT

Potato is suggested as a food security crop due to its nutritional value, relative less vulnerability to international food price volatility, suitable capacity to various farming systems, ease of cultivation and employment and income opportunity. Moreover, potato yields more food more quickly and on less land than other staples. A great attention has been then given on agricultural research to increase potato production and processing, especially in developing countries. Yet, despite increasing trends in production, potato intake levels in Sub-Saharan Africa are still low. Besides, there is limited knowledge on households' food consumption patterns in this region. This study aimed at investigating the associations between potato purchase patterns of urban households and their cultural background. A survey was conducted in Yaoundé, the capital city of Cameroon and as well a cosmopolitan metropolis. Using a structured questionnaire, 180 respondents from ethnic groups in potato producing areas and non-producing regions were interviewed on household potato purchase patterns including the quantity purchased, frequency and place of purchase, preferences and perceptions. Descriptive statistics and multiple linear regression were used to analyse data. Results showed higher quantities of potato purchased by households originated from potato producing areas as compared to their counterparts from non-producing regions. Besides, a significant positive relation was found between the extent of potato purchase and origin from the main producing areas, namely North West and West regions. However, household size and the purchase of potato at urban markets or at neighbouring shops had a strong significant positive relation with the quantities purchased. Taste and habit were acknowledged as main reasons for potato consumption by households with no traditional ties with potato; they also indicated perceived nutritional value of potato. On the other hand, potato-based traditional meals and perceived nutritional value of potato were important in potato purchase decisions of households from producing areas. This suggested that potato is a familiar item in urban diets. Thus, promoting the supply of nutritious and tasty potato products in urban areas could add on the range of potato-based food accessible to urban households and then increase the contribution of potato to national food security.

Introduction

Food security remains a major development issue in most developing countries. Statistics report a rise of the number of undernourished in almost all sub regions of Africa. About 676.1 millions of people in Africa do not have regular access to safe, nutritious and sufficient food (FAO *et al.*, 2019). Cameroon is no exception with an estimate of 17.1 million of people suffering from hunger or experiencing moderate food insecurity (FAO *et al.*, 2019). Further, the exponential demographic growth underscores the need for sustainable food systems, to feed the expanding population while addressing social and environmental issues (Foley *et al.*, 2011; Wu *et al.*, 2018; FAO *et al.*, 2019).

In this context, potato is referred as a food security crop (FAO, 2009; Bamberg *et al.*, 2019; Devaux *et al.*, 2020). Potato is the world's third main food crop after wheat and rice. It is grown in most developing countries and it is a source of food and income for millions of farm households (Lutaladio *et al.*, 2009). Potato represents almost half of the root crops consumed worldwide (Drewnowski, 2013). It is a major source of key nutrients including vitamins, minerals and dietary fiber and produces more calories per hectare than other staples (FAO, 2009; McGill *et al.*, 2013; Devaux *et al.*, 2020). Furthermore, due to its perishable nature, potato is scantily present in global markets. It is mostly sold in local markets and thus is less vulnerable to price volatility in international food markets, unlike major cereals namely rice, wheat and maize. Therefore, there is an increasing interest in potato as an alternative to costly cereal imports (FAO, 2009).

The potential of potato as critical for food security has been largely acknowledged, and considerable attention has been given in research to develop sustainable production systems (Thiele *et al.*, 2010; Birch *et al.*, 2012; Devaux *et al.*, 2020). However, despite an increasing production in developing countries, there is a limited knowledge on consumers' preferences, perceptions and purchase and consumption patterns as regard potato in those countries. Investigating the drivers of potato consumption by households and specific individuals categories, is of considerable importance for informed-based policies to increase the contribution of potato to local food systems and thus to food security.

Cultural factors' influence on food preferences

Culture, religion and traditional knowledge are largely argued as key elements that shape diets and food preferences and determine intra-household food distribution and culinary uses (Atkins *et al.*, 2001; Alonso, 2015). Traditional food systems and preferences can lead to low consumption of nutritious food when this food is not traditionally known or culturally accepted. Though, the impact of socio-cultural food environment is likely to be affected by urbanization.

In a multicultural context as it is the case in cities, it is expected a lesser influence of ethnic origins on diets as a consequence of acculturation (Carrus *et al.*, 2018). Urban dwellers are indeed exposed to a rich variety of food and culture, and that exposure is argued to lead to a change from their traditional diets to adopt new ones (Huang *et al.*, 2001; Regmi *et al.*, 2001; Cockx *et al.*, 2019). Using data from a survey of housewives in Yaoundé and Douala, the two largest cities in Cameroon, Dury *et al.* (2002) reported that plantain was the most preferred starchy food across ethnic groups but it was less frequently consumed due to its high price. Cockx *et al.* (2019) showed that rural-urban migrants in Tanzania had a diet less dominated by traditional staples. Rather, convenience was an important criterion in their food purchase decisions.

Previously literature also showed that when purchasing food, consumers' choices are influenced by their expectations on food quality. Food quality as perceived by consumers relies on various product attributes including colour, texture, shape, and retail channels (van 't Riet *et al.*, 2011; Morris *et al.*, 2019). As regard potato, nutrition knowledge, convenience, texture, taste, size, shape, skin color, familiarity, habits, perceptions and beliefs were cited as contributing factors in consumer food choices (Fernqvist *et al.*, 2015; Dukeshire *et al.*, 2016; Wood *et al.*, 2017). Texture, shape, size and skin colour were cited as the most important criteria considered by Malaysian consumers in their decision to purchase fresh potatoes (Chamhuri *et al.*, 2015).

Consumer studies acknowledged that perception of potato as an important item of a healthy diet was indicated by a majority of consumers (Jemison Jr *et al.*, 2008; Fernqvist *et al.*, 2015; Dukeshire *et al.*, 2016; Sharma *et al.*, 2020). However, the relevance of these factors on consumers' food decisions is contextual. Though, studies on consumer preferences in developing countries are scarce; there is then a limited knowledge on factors that influence consumer food preferences in these countries while informed-based policies are needed to address food security and nutrition issues. This study aimed at examining the influence of ethnic origin on potato purchase patterns of urban households in Cameroon.

Methodology

Study area

In Cameroon, to push on potato production, research was carried out on the adaptability of various potato varieties to different agro-ecological zones. As well, within development projects, seeds were selected and distributed to seed multipliers in the main production basins. Therefore, about ten potato varieties can be produced all year-round in the country, reducing the risks of seasonal shortages and price volatility. The main production basins are the North West, West, Adamawa, and Far North regions. Urban Cameroon like most African cities are undergoing a nutrition transition in which people tend to consume food that originates from other places.

Sampling design

A multistage sampling technique was used to select urban households. The first stage was the purposive selection of Yaoundé, for its cosmopolitan nature. Yaoundé as the Capital city of Cameroon, attracts migrants from different regions of the country, and therefore exhibits a relatively high level of cultural diversity. We further identified ethnic-based associations located in Yaoundé, as people originated from a particular region, especially internal migrants, usually group themselves into community associations. We selected 12 village associations that were at least 10 years old since their creation. In each association, 15 members were randomly selected among those who have stayed in the association for at least two years assuming that they had experience with urban life and had stabilized their livelihoods and especially food procurement patterns. At whole we selected 180 households. We classified them in two groups: origins from potato producing areas and origins from non-producing areas. We assumed that households from producing areas will naturally be consumers of Irish potato following traditional food habits and food availability concepts, whereas those from non-producing areas might be new consumers and might be adopting potato dishes into their diets through the impact of acculturation and exposure.

Using a structured questionnaire, data was collected on household characteristics (ethnic group, size, income, number of years of urban residency, potato farm ownership) and on their potato preferences and procurement patterns (sources, quantity purchased, frequency, constraints). Data collection was carried out by researchers of the Institute of Agricultural Research for Development (IRAD) – Cameroon, within the Program of Accompanying Research for Agricultural Innovation (PARI) 2017 activities. The PARI project is coordinated at the global level by the Center for Development Studies (ZEF), University of Bonn in Germany, and in Africa by the Forum for Agricultural Research in Africa (FARA). It supports research activities to generate knowledge that informs the direction of investment and other action for innovation.

Multiple linear regression

Multiple linear regression models are generally used in food consumption studies to assess statistical relationship between the consumption or the purchase extent of a particular food item and potential explanatory variables. We therefore assessed the relation between the quantity of potato purchased and household characteristics, preferences and potato procurements patterns. We modelled the relationship as follow:

$$Y = \beta X + \varepsilon$$

where

Y is a vector of the quantity of potato purchased by households,

β is a vector of coefficients to estimate,

X is a set of variables that are hypothesized to influence the extent of potato purchase,

ε is the error term that captures all other factors other than those included in the model that influence the quantity of potato purchased.

We prior used descriptive statistics to compare potato purchase patterns and perceptions of households from producing areas to those of their counterparts from non-producing areas.

Results

Households' characteristics

There was the same proportion in the sample of origins from potato producing areas and origins from non-producing regions. Households from producing areas had on average 5 members while households from non-producing areas are relatively larger with an average size of 6 members. Half of the respondents had been resident in Yaoundé for at least a decade with the average resident period being 13.4 years for households from producing zones and 13.5 years for households from non-producing zones. This indicates that the households have similar backgrounds of living in the city and differences in their potato purchase behaviour might be related to cultural factors.

Table 1: Socio-economic variables of the households

Variables		Origins from producing areas	Origins from non-producing areas
Quantitative data (means \pm standard deviation)	Age of the respondent	37.2 \pm 13.4	35.7 \pm 10.2
	Household size	5 \pm 3	6 \pm 4
	Number of years resident in the urban centre	13.4 \pm 11.6	13.5 \pm 9.2
	Monthly revenue (FCFA)	157777.8 \pm 93663.5	187944.4 \pm 108537.9

Potato procurement patterns

In general, households from producing areas procured more potato than those from non-producing areas. The average quantity purchased by households from producing areas is 31.8 kg per month against 10.8 kg per month for origins from non-producing areas. Most households acknowledged that they purchase potato from the urban market. Besides, some households (12.2%) from non-producing areas purchased potato at small shops at their vicinity. The frequency of purchase generally varied from weekly to annually. The majority of households bought potato monthly; 42.2% for origins from non-producing areas and 51.1% for origins from producing areas. More households from non-producing areas bought potato weekly compared to those from producing areas. As regard the scale of purchase, most households bought on retail. However, a higher proportion of households from producing areas (26.7%) bought potato from whole sales compared to their counterparts from non-producing areas (8.9%). Price was cited as a constraint to potato purchase by a higher proportion of origins from non-producing areas. Though, only 41.1% from these areas were willing to increase household potato intake if income rises. We further found no statistical association between Intention to consume more potato and Origins. As well, there was no significant relation with price constraint.

During buying operations, people from producing areas were more versed with distinguishing better varieties of potato; using attributes like colour and flesh texture or simply had special customers from whom they bought potato. These methods assured them that the product being purchased was of good quality. Up to 91.1% of households from producing areas noted that they bought only varieties that they knew against 62.2% of households from non-producing areas.

Majority of households did not possess a potato farm. Nevertheless, of those who possessed one, 7.8% came from producing areas as against 2.2% from non-producing areas. This indicated that even in urban areas some households from producing areas have continued to maintain their culture of potato farming. This also pointed out that some households from non-producing areas were getting engaged in potato cultivation. Another means of acquisition was through gifts in which majority

(91.1%) of households from non-producing areas did not receive potato as gift while 31% of households from producing areas acknowledged to have received potato as gifts.

Main reason for purchasing potato for household consumption was also investigated. Respondents mentioned traditional meal, eating habits, source of vitamins, easy digestion, texture and taste. Different households perceived these characteristics differently. Perceived nutritional value of potato and its use to prepare traditional meals were very important to households from producing areas while eating habits and taste appeared more important to people from non-producing areas, suggesting that potato is a familiar item of their diet. The dry and floury texture of potato was cited by almost the same proportion of both households. As well, there is no origins difference in the percentage of households that cited the fiber feature of potato as a reason for purchasing. Furthermore, most respondents for both categories of households indicated that potato was consumed by everybody in the house. However, 12.2% of respondents from producing areas stated that potato was primarily used to prepare meals for children. This is in line with an old practice in these regions of using potato as an infant food.

Regression analysis

The value of the coefficient of determination (R^2) indicates the percentage of variability of the dependent variable which is explained by the explanatory variables. The closer to 1 the R^2 is, the better the goodness-of-fit of the model. As regard our regression analysis output, the R^2 value of 0.514 suggested that the model fits well the data. The explanatory variables included in the analysis explained 51% of the variability of the quantity of potato purchased. The Fisher's F test was used as well. The probability corresponding to the F value was lower than 0.0001, suggesting that the null hypothesis of no effect of the explanatory variables could be rejected. We concluded then that the explanatory variables included in the model do bring a significant amount of information on the variability of the dependent variable.

Three variables were found to have a statistically significant relationship (p -value \leq 0.01) with the quantity of potato purchased. There were household size, place of purchase and origins from main production basins. Household size and purchase at urban markets or at neighboring shops had a strong positive relation (p -values $<$ 0,0001) with the extent of potato purchase, indicating that when household size increases, the mean of the quantity of potato purchased tends to increase. Also, purchasing potato at urban markets or at neighboring shops tends to increase the average amount of potato purchased.

Table 2: Standardized regression coefficients

Observations	R^2	Adjusted R^2	F	Pr > F
180	0.514	0.445	7.535	<0,0001

Source	Value	Standard error	t	Pr > t
Household size	0.310	0.069	4.521	<0,0001
Number of urban residency	-0.038	0.064	-0.596	0.552
Monthly income	0.094	0.066	1.431	0.155
Frequence of purchase	-0.064	0.063	-1.016	0.311
Received potato as gifts	0.031	0.070	0.439	0.661
Potato farm	0.063	0.061	1.041	0.299
Origins from producing areas	0.151	0.149	1.011	0.314
Ethnic origins				
Bamileke	0.347	0.115	3.023	0.003
Bamoun	0.216	0.119	1.816	0.071
Nso	0.534	0.148	3.614	0.000
Foufouldé	0.217	0.120	1.812	0.072

Mafa	0.128	0.074	1.727	0.086
Toupouri	0.132	0.103	1.283	0.201
Béti	0.014	0.090	0.160	0.873
Maka	0.017	0.088	0.192	0.848
Bakossi	0.083	0.079	1.051	0.295
Douala	0.000	0.000		
Reasons for purchase				
Nutritional value	-0.076	0.074	-1.032	0.304
Taste	-0.118	0.090	-1.314	0.191
Potato distribution in the household				
Every member	-0.006	0.071	-0.089	0.929
Children	0.043	0.059	0.726	0.469
Wholesale purchase	-0.078	0.067	-1.166	0.245
Purchase at urban markets or neighboring shops	0.391	0.068	5.766	<0,0001

Discussion

We showed a significant relation between origins and the extent of potato purchase. Nso and Bamiléké ethnic groups from North West and West regions, respectively, were found to have a positive significant association with the extent of potato purchase. This might result from the fact that North West and West regions are the major potato production areas. Besides, potato is a traditional staple for Nso and Bamiléké (Woin *et al.*, 2019). Our results suggested that urban households with traditional ties with potato tend to purchase more quantities of potato. This is in line with Horton (1987) who reported in Indonesian cities different levels of potato consumption among ethnic groups of the same socio-economic level. On the other hand, Cockx *et al.* (2019) acknowledged that rural-urban migrants in Tanzania experienced a substantial decrease in their consumption of basic staple foods including sweet potato at the benefit of more easily prepared rice and processed cereal products.

Majority of origins from non-producing areas indicated habit and taste as the main reason for purchasing potato. This suggested that as a consequence of living in a multicultural context, exposure to other cultures and availability of potato on markets and shops at their vicinity, urban households from non-producing areas adopted potato dishes into their diets. This is in line with previously literature. van 't Riet *et al.* (2011) highlighted a growing interest in habit as a critical predictor of eating behavior. The influence of habit is increasingly investigated in studies on behavioral and psychosocial determinants of food choice. Fernqvist *et al.* (2015) showed that familiarity and habit were factors affecting consumer choice of fresh potatoes. Origins from producing areas cited the perceived nutritional value of potato as the main reason for purchasing. Likewise, Rodríguez *et al.* (2012) showed that households in urban Argentina considering potato as an important component of a balanced diet were likely to consume fresh potatoes more frequently. In the same line, Jemison Jr *et al.* (2008) reported a high proportion (96%) of respondents in a potato production area in USA, who perceived potato as a healthy food, while in a non-producing area, Sharma *et al.* (2020) indicated lesser proportion (73%). As well, Dukeshire *et al.* (2016) highlighted that the perceived importance of potatoes for daily diet was a strong predictor of the frequency of potato consumption in eastern Canada.

Potato skin color and flesh texture were stated as indicators of quality. Majority of households from producing areas indicated those characteristics as relevant in their purchasing operations. It has been shown that consumers' perceptions on the quality of a product are grounded on product attributes, experience and familiarity with the product (Jemison Jr *et al.*, 2008; Chamhuri & Batt, 2015). In line with Jemison Jr *et al.* (2008), we noted that households from producing areas were likely to be more proficient in evaluating perceived quality due to their experience in potato preparation and their familiarity with potato farming.

We also found a strong positive association with household size. This is similar to findings of Rodríguez *et al.* (2012) in urban Argentina where households with many members were having a higher probability to consume fresh potato more frequently than smaller households. Furthermore, the availability of potato at urban markets or at shops at the vicinity of households was likely to positively influence on potato purchase. The physical availability of food products in the neighborhood environment was indicated as strongly influencing individual and household food choices (Geurts *et al.*, 2017; Cockx *et al.*, 2019).

Conclusion

Traditional food habits grounded in origins have been acknowledged as key determinants of food purchase. The results from this study have confirmed that the predisposition of tradition food systems and knowledge about food influence food acquisition mechanisms. Urban households from ethnic groups where potato is a traditional staple were likely to purchase more quantity of potato than their counterparts from others origins. They were also more attentive to skin color and flesh texture as indicators of perceived quality. This study also confirmed the relevance of the physical availability of food products in the neighborhood environment on household's food consumption. The purchase of potato at urban markets or at neighbouring shops was found to have a strong significant positive relation with the quantities purchased. Taste and habit were acknowledged as main reasons for potato consumption by households with no traditional ties with potato; they also indicated perceived nutritional value of potato. On the other hand, potato-based traditional meals and perceived nutritional value of potato were important in potato purchase decisions of households from producing areas. This suggested that for one reason or another, potato is a familiar item in the diet of urban households. Thus, promoting the supply of nutritious and tasty potato products in urban areas could add on the range of potato-based food accessible to urban households and then increase the contribution of potato to national food security. Further research could be done on consumer preferences for processed food products in order to find out product attributes that are more valued for household consumption and thus provide insights to design potato processed products that meet the expectations of urban households.

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