


Short Communication

## **Accessibility to agricultural products: case study in Jaruco municipality, Mayabeque province**

Yamilka Martínez-Rodríguez<sup>1\*</sup> 

Elein Terry-Alfonso<sup>1</sup> 

Bárbara Benítez-Fernández<sup>1</sup> 

Lucia Fernández-Chuairey<sup>2</sup> 

Luis Pérez-Pérez<sup>3</sup> 

Yuneidys González-Espinosa<sup>1</sup> 

<sup>1</sup>Instituto Nacional de Ciencias Agrícolas (INCA), carretera San José-Tapaste km 3 ½, San José de las Lajas, Mayabeque, Cuba. CP 32700

<sup>2</sup>Universidad Agraria de La Habana “Fructuoso Rodríguez Pérez”, carretera a Tapaste y Autopista Nacional, San José de las Lajas, Mayabeque, Cuba

<sup>3</sup>Polo Productivo Porcino. Delegación Municipal de la Agricultura (MINAG), calle 18 e/11 y 13, No. 1101, Jaruco, Mayabeque

\*Author for correspondence: [yamilka@inca.edu.cu](mailto:yamilka@inca.edu.cu)

### **ABSTRACT**

There are many factors that impact the food acquisition: income, prices (which affect availability and affordability), preferences and individual beliefs, cultural traditions and geographical, environmental and socioeconomic factors, which interact in a complex way to configure individual eating habits. In this sense, a study was carried out in the Jaruco municipality, in Mayabeque province, Cuba, with the objective of determining the accessibility level of food, based on offers of different agricultural products that are offered under different commercialization forms. The work was based on the availability on the supply in four popular councils of the municipality. 90 people were surveyed, including producers and consumers. Results of surveys were processed by descriptive statistics, Chi-square ( $\chi^2$ ) of independence. The statistical analysis showed that there is a significant dependence between the variety of products and the access area;

on the other hand, 69.86 % of respondents considered that price is the factor that has the greatest impact on the accessibility of agricultural products in the locality. The supply of products in the municipality is considered deficient in quantity, quality and variety; there is marked dissatisfaction in the popular councils that are located far from the urban center, where the diversity of products is scarce and access to them is less.

**Key words:** food availability, supply, prices, food security

## INTRODUCTION

The concept of Food Security (FS) emerged in the 1970s, based on global food production and availability. In the 1980s, the idea of access was added, both economic and physical, and in the 1990s, the concept that incorporates food safety and cultural preferences, as well as reaffirming FS as a human right <sup>(1)</sup>.

Access refers to the fact that food should be distributed and available locally and be accessible to all, depending on the demand for food, which in turn is determined by food prices, income and demographic factors <sup>(2)</sup>. By analyzing the real access to food of the different sectors of population, it is possible to stratify population groups according to vulnerability, to determine levels of malnutrition and to know its causes in order to guide concrete actions <sup>(3)</sup>. Undoubtedly, access to food is one of the main problems faced by the world population <sup>(4)</sup>.

The aim of this study was to determine the food accessibility from Jaruco municipality population, Mayabeque province, Cuba, based on the offers of different agricultural products present in the locality.

## MATERIALS AND METHODS

The work was carried out in Jaruco municipality, belonging to Mayabeque province of, during August 2019. For the study, four Popular Councils were taken into account: Jaruco, San Antonio de Río Blanco, Tumba Cuatro and Caraballo <sup>(5)</sup>.

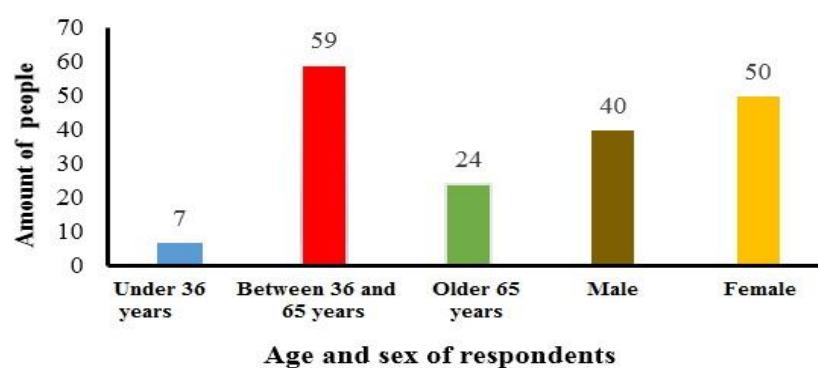
90 people were surveyed, between producers and consumers who were represented, proportionally, in 100 % of popular councils in different commercialization places, such as the so-called street vendor, the State Agricultural Markets (MAE, Mercados Agropecuarios Estatales), the Agricultural Fairs and sale points puntos de venta of the Credit and Service Cooperatives (CCS, Cooperativa de Créditos y Servicios). A survey with open-ended questions was used as an instrument and observation, both methods allowed the collection

of qualitative and quantitative data at a single moment, to know the availability of different products, the frequency of their appearance in the market and the causes of their acquisition or not, according to the consumers' perception <sup>(6)</sup>. Surveys were coded and processed, applying descriptive statistics including univariate and bivariate frequency tables (Chi-square test ( $\chi^2$ ) of independence for contingency tables). The statistical package Statgraphics Centurion (2013) was used under the Windows 7 operating system.

## RESULTS

### Age and gender results

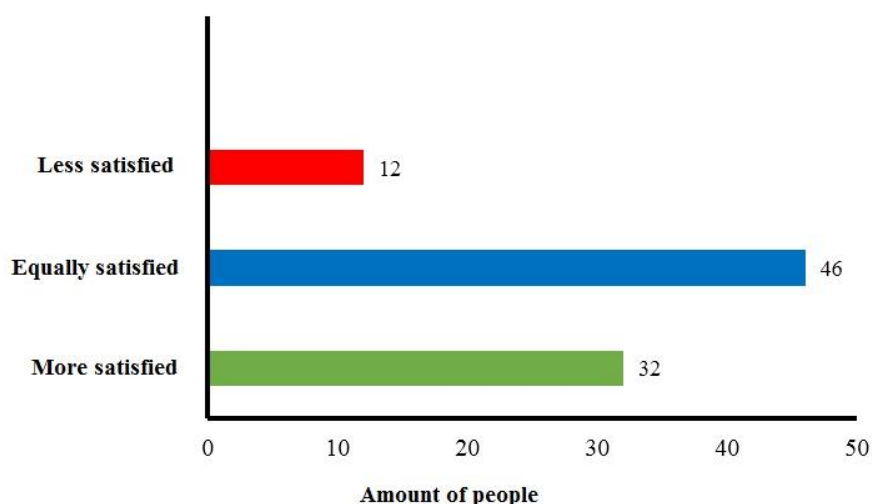
Figure 1 shows that the number of people interviewed (90), the majority (65 %) were between 35 and 65 years of age, highlighting that young people are the least present in the areas where agricultural products are sold (7 %). According to the study, the greatest presence in these spaces is of women (55 %), although the number of men interviewed was not low (44 %).



**Figure 1.** Age and sex of the people interviewed in different agricultural product commercialization places in Jaruco municipality

### Results of consumer satisfaction with respect to the diversity of agricultural products

Figure 2 shows the criteria regarding the supply of agricultural products with respect to the previous year (2018), 51 % (46 people) considered that the supply was the same as the previous year, 35 % considered that they were more satisfied with the diversity of products offered in different marketing scenarios and a smaller number (13 %) considered that the diversity of products offered was less.



**Figure 2.** Satisfaction regarding the diversity of agricultural products in different marketing spaces in Jaruco municipality

When applying the  $\chi^2$  test of independence between variables for satisfaction with the variety of agricultural products offered and different popular councils, it was found that there is significant dependence ( $\chi^2=23.89$ ; p-value =0.0005) between these two variables (Table 1). A detailed analysis allowed observing that in councils that are not the municipality's capital, they consider that the variety of products is less or equal to that of the previous year, but this is not the case in Jaruco council, where the agricultural fairs have increased on weekends (Saturday and Sunday) with a wide variety of products.

**Table 1.** Results of satisfaction with the variety of agricultural products in popular councils of Jaruco municipality

Popular Councils	Major	Equal	Minor	Total
Caraballo	0 0,00 %	7 7,78 %	5 5,56 %	12 13,35 %
Tumba Cuatro	2 2,22 %	7 7,78 %	11 12,22 %	20 22,22 %
San Antonio del Río Blanco	1 1,11 %	6 6,67 %	3 3,33 %	10 11,11 %
Jaruco	20 22,22 %	23 25,56 %	5 5,56 %	48 53,33 %
Column	23	43	24	90
Total	25,56 %	47,78 %	26,67 %	100,00 %
Chi-Square		23,89		
P-Value		0,0005		

## Supply and price results for agricultural products

Among the aspects valued as important for the purchase of agricultural products (Table 2), price was predominant; however, in Caraballo and Tumba Cuatro (councils farther from the urban center), because they have only one point of sale corresponding to a CCS, they considered that the most important aspect was the supply of products, which is limited in these settlements.

**Table 2.** Influence of supply and price on the purchase of agricultural products in the Jaruco municipality

Popular counsils	Offer	Price	Total
Caraballo	7 9,59 %	5 6,85 %	12 16,44 %
Tumba Cuatro	10 13,70 %	6 8,22 %	16 21,92 %
San Antonio del Rfo Blanco	1 1,37 %	8 10,96 %	9 12,33 %
Jaruco	4 5,48 %	32 43,84 %	36 49,32 %
Columna	22	51	73
Total	30,14 %	69,86 %	100,00 %
Chi-Square		20,23	
P-Value		0,0002	

## DISCUSSION

In this study, the main factors affecting accessibility to agricultural food in the Jaruco municipality are identified as availability and sales price; also, access to points of sale, according to the people's council, is identified as an important factor to be highlighted by population.

As for price and availability, both are closely related. Cuban agricultural production is depressed, due to the scarcity of resources to guarantee adequate yields of different agricultural crops; therefore, the technological package becomes more expensive and, thus, at the end of the production chain, the price of the products increases and their availability decreases. However, this last aspect could also be influenced by the time of the research (August), a period in which, above all, sale of vegetables is lower, since their production and marketing, in general, cover the period from September to March.

On the other hand, regarding physical access to food, it is difficult to make a precise characterization of the proximity to food, since this could be influenced by factors such as the transportation availability, conditions of communication routes and the local

management itself, aspects that are accentuated in two of the popular councils distant from the municipal capital.

Similar works refer that accessibility to food is the capacity of a person, a family or a community to be able to acquire at all times, in sufficient quantities, the food necessary for an active and healthy life, and that among the basic determinants that integrate it are: income, employment, food prices and food aid <sup>(7)</sup>.

Similar results were obtained in a study of food accessibility in two municipalities in the Matanzas province <sup>(8)</sup>, which concluded that the supply of food products accessible to the population of Martí and Colón is still poor in quantity, quality and variety. However, production in these municipalities can be solved in two ways: on the one hand, by prioritizing the quantity of food that satisfies demands and, on the other hand, by increasing production, accompanied by variety and quality; therefore, they considered that there is a capacity to respond to risks of food vulnerability in both municipalities <sup>(9)</sup>.

It is evident that the socioeconomic level of a locality influences the availability of products and, therefore, in the greater satisfaction of consumers, an aspect that is reflected in the popular council that is the municipality head (Jaruco), where for this segment of the population there is an adequate satisfaction in the access to agricultural products, since they have other offers such as agricultural fairs, which exhibit a high diversity of products. In this regard, it is suggested that livelihoods may be similar in most areas, but differ according to the activity carried out, which is generally determined by agroecological and socioeconomic conditions and sets the tone for determining their level of income and the way in which they obtain food <sup>(10)</sup>.

There are studies that show that geographic size and spatial access to healthy foods differ significantly according to income and employment, where those with higher incomes have higher accessibility to food; also, as age increases, there is a tendency to increase accessibility to food <sup>(11)</sup>.

Studies carried out in Mexico show the importance of considering access and consumption in an integrated manner, which makes it possible to identify the most vulnerable population in order to improve food security governance <sup>(4)</sup>. On the other hand, understanding these aspects can be a basis for planning social development and food policies, as well as a starting point for evaluating interventions aimed at addressing food insecurity in the population with the lowest welfare profile <sup>(12)</sup>.

## CONCLUSION

Access to agricultural products in Jaruco municipality is fundamentally influenced by the prices of products and dissatisfaction with the supply and diversity of products that are marketed. On the other hand, physical access depends on the popular council and its socioeconomic characteristics.

## BIBLIOGRAPHY

1. FAO. El estado de la inseguridad alimentaria en el mundo 2015. Cumplim. [Internet]. 2015 [cited 27/09/2021]. Available from: <https://www.bivica.org/file/view/id/4744>
2. Organización Mundial de la Salud O. Alimentación sana [Internet]. 2015 [cited 27/09/2021]. Available from: <https://www.who.int/es/news-room/fact-sheets/detail/healthy-diet>
3. Suárez-Castellá M, Hernández-Pérez G, Roche-Hernández C, Freire-Seijo M, Alonso-Amaro O, Campos-Gómez M. Cadenas de valor de productos agropecuarios en seis municipios de Cuba. I. Metodología para su diseño<sup>1</sup>. Pastos y forrajes [Internet]. 2016;39(1):56–63. Available from: [http://scielo.sld.cu/scielo.php?pid=S0864-03942016000100008&script=sci\\_arttext&tlng=en](http://scielo.sld.cu/scielo.php?pid=S0864-03942016000100008&script=sci_arttext&tlng=en)
4. Mundo-Rosas V, Unar-Munguía M, Hernández-F M, Pérez-Escamilla R, Shamah-Levy, Mundo-Rosas V, et al. La seguridad alimentaria en los hogares en pobreza de México: una mirada desde el acceso, la disponibilidad y el consumo. Salud Pública de México [Internet]. 2019 [cited 30/09/2021];61(6):866–75. doi:10.21149/10579
5. ONEI. Oficina Nacional de Estadística e Información, Sitio en Actualización | [Internet]. 2018 [27/09/2021]. Available from: <http://www.onei.gob.cu/>
6. Hernandez-Sampieri R, Fernandez C, Baptista P. Metodología de la Investigación 5ta edición. Editorial McGraw-Hill [Internet]. 2010 [cited 27/09/2021]; Available from: [https://www.academia.edu/20792455/Metodolog%C3%ADa\\_de\\_la\\_Investigaci%C3%B3n\\_5ta\\_edici%C3%B3n\\_Roberto\\_Hern%C3%A1ndez\\_Sampieri](https://www.academia.edu/20792455/Metodolog%C3%ADa_de_la_Investigaci%C3%B3n_5ta_edici%C3%B3n_Roberto_Hern%C3%A1ndez_Sampieri)
7. Peña EGR, Garza GIS, Castañón LNB, Moreno AZ. Reflexiones sobre derecho, acceso y disponibilidad de alimentos. Revista Salud Pública y Nutrición [Internet].

- 2007;8(4):50. Available from:  
<https://www.medigraphic.com/pdfs/revsalpubnut/spn-2007/spn074i.pdf>
8. Machado-Martínez HC, Miranda-Tortoló T, Sánchez-Cárdenas S, Lezcano-Fleires JC. Estudio de la accesibilidad alimentaria en dos municipios rurales de la provincia de Matanzas, Cuba. *Pastos y Forrajes* [Internet]. 2018;41(1):64–72. Available from: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S0864-03942018000100009](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-03942018000100009)
  9. González A. Producción y comercialización agropecuaria: recientes medidas y posibles impactos [Internet]. IPS Cuba. 2016 [cited 27/09/2021]. Available from: <https://www.ipscuba.net/sin-categoria/produccion-y-comercializacion-agropecuaria-recientes-medidas-y-posibles-impactos/>
  10. Guevara GSZ, Espinoza JAM, Juárez JR, Hernández JIO. Análisis de la seguridad alimentaria en los hogares del municipio de Xochiapulco Puebla, México. *Estudios sociales (Hermosillo, Son.)* [Internet]. 2016;25(47):65–84. Available from: <https://www.redalyc.org/journal/417/41744004003/>
  11. Li J, Kim C. Measuring individuals' spatial access to healthy foods by incorporating mobility, time, and mode: Activity space measures. *The Professional Geographer* [Internet]. 2018;70(2):198–208. Available from: [https://www.researchgate.net/profile/Changjoo-Kim/publication/318667492\\_Measuring\\_Individuals'\\_Spatial\\_Access\\_to\\_Healthy\\_Foods\\_by\\_Incorporating\\_Mobility\\_Time\\_and\\_Mode\\_Activity\\_Space\\_Measures/links/5999a1ea45851564432dbda1/Measuring-Individuals-Spatial-Access-to-Healthy-Foods-by-Incorporating-Mobility-Time-and-Mode-Activity-Space-Measures.pdf](https://www.researchgate.net/profile/Changjoo-Kim/publication/318667492_Measuring_Individuals'_Spatial_Access_to_Healthy_Foods_by_Incorporating_Mobility_Time_and_Mode_Activity_Space_Measures/links/5999a1ea45851564432dbda1/Measuring-Individuals-Spatial-Access-to-Healthy-Foods-by-Incorporating-Mobility-Time-and-Mode-Activity-Space-Measures.pdf)
  12. Mundo-Rosas V, Vizuet-Vega NI, Martínez-Domínguez J, Morales-Ruán M del C, Pérez-Escamilla R, Shamah-Levy T. Evolución de la inseguridad alimentaria en los hogares mexicanos: 2012-2016. *Salud Pública de México* [Internet]. 2018 [cited 30/09/2021];60(3, may-jun):309–18. doi:10.21149/8809