



## Urban, suburban and family agriculture in Cuba. Consumers' perceptions

### La Agricultura Urbana, Suburbana y Familiar en Cuba. Percepción de los consumidores

 **Gustavo Rodríguez Rollero**<sup>1</sup>,  **Yanet Vallejo Zamora**<sup>2</sup>,  **Elizabeth Peña Turruellas**<sup>3</sup>,  
 **José R. Capó Pérez**<sup>2</sup>,  **Yadira Martínez Pérez**<sup>3</sup>,  
 **Mario Varela Nualles**<sup>4</sup>,  **Elio del Pozo Núñez**<sup>3</sup>

<sup>1</sup>Instituto de Investigaciones de la Caña de Azúcar, INICA, km 1½ carretera a la CUJAE, Boyeros, La Habana, Cuba. C.P. 19390

<sup>2</sup>Universidad Agraria de la Habana (UNAH), carretera Tapaste y Autopista Nacional km 3 ½, San José de las Lajas, Mayabeque, Cuba. CP:32700

<sup>3</sup>Ministerio de la Agricultura (MINAG), edificio Minag, Conil esq. Carlos M. Céspedes, Nuevo Vedado, Plaza de la Revolución, La Habana, Cuba. CP 10400

<sup>4</sup>Instituto Nacional de Ciencias Agrícolas (INCA), carretera San José-Tapaste, km 3½, Gaveta Postal 1, San José de las Lajas, Mayabeque, Cuba. CP 32 700

**ABSTRACT:** This work aims to analyze the role of Urban, Suburban and Familiar Agriculture System in Cuba to satisfy food needs of the Cuban population, from the consumer's perspective. For this, a survey was applied to 207 consumers from six municipalities, in three selected provinces. It was demonstrated that this system represents an important source of food acquisition for the Cuban people, with a satisfaction rate of over 70%, although nearly a quarter of the consumers said to be very little or not satisfied with the products marketed. The fact that the system provides fresh, healthy and varied products, was highly evaluated, and almost 80% of the sample considered that it decreases the community dependence from external, far away markets. Between the reasons to keep and improve the urban agriculture system in the vicinities, the possibility to get products that the people prefers has the highest percentage, although the variety, quality and affordable prices are also highly valued by the participants of this poll.

**Keywords:** needs, farm products, beneficiaries, satisfaction.

**RESUMEN:** Este trabajo tuvo como objetivo analizar el papel que desempeña el sistema de la Agricultura Urbana, Suburbana y Familiar en la satisfacción de las necesidades de alimentos de la población cubana, desde la percepción de los consumidores. Para ello, se aplicó una encuesta a 207 consumidores de seis municipios, en las tres provincias seleccionadas (La Habana, Villa Clara y Santiago de Cuba). Se demostró que este sistema constituye una fuente importante de adquisición de alimentos para la población cubana, con un grado de satisfacción superior al 70%, aunque alrededor de la cuarta parte de los encuestados afirmó estar "muy poco" o "no satisfechos" con los productos comercializados. Se atribuyó un gran valor al hecho de que el sistema provee productos frescos, sanos y muy variados, y cerca de un 80% de los encuestados consideró que se disminuye la dependencia de la comunidad de los mercados externos al lugar de residencia. Entre las razones por las que debe mantenerse y perfeccionarse el sistema de agricultura urbana en las localidades, destaca la posibilidad de adquirir productos de la preferencia de los vecinos de la comunidad, aunque la variedad y calidad de los mismos, así como los precios asequibles a todos, son bien valorados por los encuestados.

**Palabras clave:** necesidades, productos agrícolas, consumidores, satisfacción.

## INTRODUCTION

The increasing population growth in developing countries requires increases in agricultural production, while agroecosystems are being stressed and negatively

impacted by increased use of water and agrochemicals (1). It is estimated that more than 75 % of the world's population will be living in urban areas by 2050 (2).

Cities are increasingly seen as centers for sustainable development and food system innovation. Urban agriculture

Received: 11/10/2023

Accepted: 28/11/2023

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial (BY-NC 4.0). <https://creativecommons.org/licenses/by-nc/4.0/>



(UA) is seen as a multifaceted approach to help achieve urban sustainability goals, as it can provide social, economic, and environmental benefits (3-9). Urban farms are a prime location for the use of urban energy, water, and nutrient wastes, although innovations are needed to use them safely and economically (10). The use of these wastes could cause health risks to consumers, so the entire food production and distribution chain should be monitored to ensure food safety (11,12).

Some studies have revealed that consumers experience high levels of anxiety about food safety. For them, pesticide residues, food preservatives, and hormones in livestock were the three most relevant risks, and therefore, vegetables, fruits, and meat were considered the most "unsafe" foods. In this sense, urban agriculture helps to reduce urban consumers' stress about food safety (13).

Urban, Suburban and Family Agriculture (UA-SUA-FA), as in most countries, has been practiced in Cuba for a long time; However, its development as an organized program has its antecedents in the development of "organoponics" dedicated to vegetables since 1987, but it was not until 1994 that an intensive system of horticultural production was organized, which quickly spread throughout the country, and today constitutes one of the most important programs of the Ministry of Agriculture, whose main mission is to contribute to local food self-sufficiency (14).

Urban Agriculture (UA) is practiced all over the world, and although it is described as a global phenomenon, its manifestations in the different socio-economic and political contexts of the world are highly specific, driven by different trajectories of values, local, scale and history. It is supported and defended by a diversity of actors, from local neighborhood groups to supranational institutions (15). Negative public perceptions can be barriers to successful UA development (16).

UA-SUA-FA system has three key stakeholder groups: producers, decision makers, and consumers. The latter constitute the target group of the system, and in order to satisfy their demands for agricultural products, the production of healthy, safe and affordable food must be achieved. Therefore, the objective of this work was to analyze the role played by the Cuban UA-SUA-FA system in satisfying the agricultural food needs of the Cuban population, from the consumers' perception.

## MATERIALS AND METHODS

The study was conducted in three provinces and six municipalities, representative of the whole country, between 2019-2022. In the western region, Havana province, Playa and Boyeros municipalities were selected; in the center, Villa Clara province, Remedios and Placetás municipalities were selected; and in the east, Santiago de Cuba, Il Frente and Palma Soriano municipalities were selected. A survey of direct and closed, multiple-choice and unipolar questions (17) was applied to a total of 207 consumers in the six municipalities studied (Table 1). The questions analyzed were as follows:

1. Do you use UA-SUA-FA system to source the agricultural products you need?
2. Are your needs for agricultural products satisfied from the productions obtained by UA-SUA-FA system?
3. What are your reasons for consuming the products obtained from UA-SUA-FA system?
4. Do you consider that the development of UA-SUA-FA has contributed to reduce the dependence of the community on agricultural markets outside your area of residence?
5. Reasons why the presence of production and marketing units of UA-SUA-FA system should be maintained in localities.

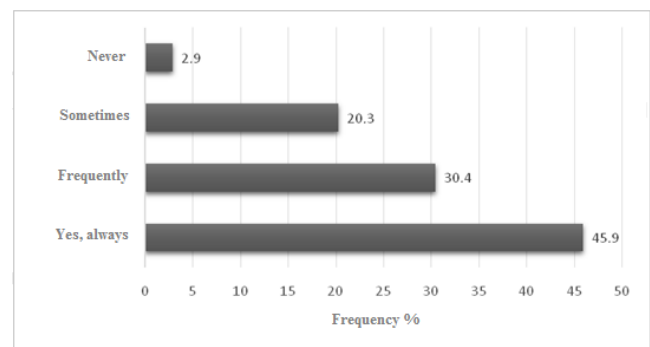
**Table 1.** Sample of consumers by municipality

Province	Municipality	Sample (%)
La Habana	Boyeros	17.3
	Playa	5.3
Villa Clara	Santa Clara	10.1
	Placetás	12.0
Santiago de Cuba	Segundo Frente	28.5
	Palma Soriano	26.5

The information obtained was processed using the SPSS Statistical Package, version 22.0 of 2013, with which a descriptive statistical analysis of frequencies was performed, showing the results through graphs.

## RESULTS AND DISCUSSION

When analyzing the use of UA-SUA-FA system by the population for the supply of agricultural products (Figure 1), it is observed that 45.9 % of those surveyed stated that they always use it and 30.4 % frequently, while only 2.9 % stated that they never use it, which indicates that this system constitutes an important source of food acquisition for the Cuban population. These results corroborate what has been expressed by various authors (4,14), regarding its scope and its contribution to local food self-sufficiency.



**Figure 1.** Utilization of UA-SUA-FA system by consumers for the supply of agricultural products

Figure 2 shows the perception of consumers on the satisfaction of their needs for agricultural products from what is obtained through the system, showing a high degree of satisfaction, with 44 and 30 % of consumers being satisfied or very satisfied, respectively, while about a quarter of those surveyed stated that they were very little or not satisfied with the products offered by the system, which should be taken into account by producers when establishing production plans.

Regarding the reasons why the products obtained in the system are consumed (Figure 3), it can be seen that 75 % do so because they are fresh products, 60.4 % because they are healthy and 44.4 % because of the variety of products offered, which contributes to the increase in the diversity of dishes on the table for consumption, most of them of vegetable origin. These products, since they are obtained and marketed within the area of residence, do not suffer quality losses due to transportation (14).

On the other hand, although with lower values, consumers stated as reasons the proximity to their homes (25.1 %), the non-use of pesticides (25.1 %), and the lower prices than in other markets (19.8 %), that is to say that the accessibility of the sales sites and the safety of the products obtained are given equal importance, while the affordability of such products is given the lowest value. A notable experience in UA-SUA-FA system is the direct marketing, without intermediaries, of the products generated in the different production units (4). The distance from the consumer to the production unit seems to be of maximum importance, since transportation costs are minimized (18). In addition, it shows the awareness that consumers are becoming aware of the importance of a diet based on healthy and safe products, less harmful to health (13,19). In general, consumers associate healthier products with low chemical use and better quality (20). Access to agricultural products with these attributes can be secured through UA (21).

When analyzing the influence that UA-SUA-FA system has had in reducing the community's dependence on markets outside the place of residence (Figure 4), it was found that 48.8 % of the consumers surveyed said that this has been achieved and 28.0 % that it has been partially achieved, that is, almost 80% have a positive perception of this aspect. In this regard, it has been stated that consumers prefer locally produced food products (22). Likewise, only 15.5 and 3.9 % stated that they do not see any change and "I do not know", respectively, which may depend on the presence and development of the system in the different communities due to the availability of areas for its development, substrate, water and other components necessary for its implementation.

As for the reasons why the development of the urban agriculture system should be maintained in the localities (Figure 5), it can be seen that almost 70 % of the consumers allude to the fact that the products that can be acquired are preferred by the inhabitants of these localities, in accordance with the culture of consumption of these products by the community, which corroborates that UA can provide families with greater access to specific foods (23).

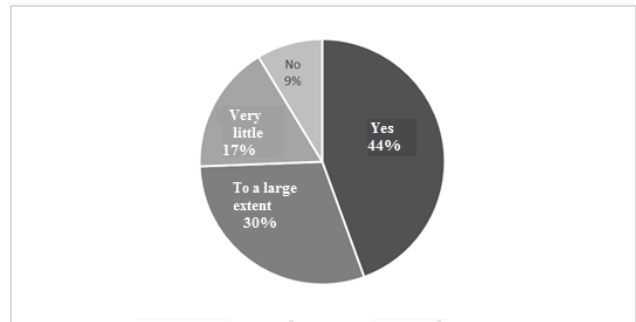


Figure 2. Satisfaction of agricultural product needs from production obtained in the system

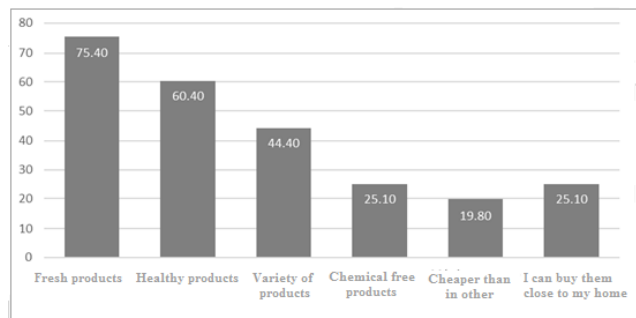


Figure 3. Reasons for consuming UA-SUA-FA system products

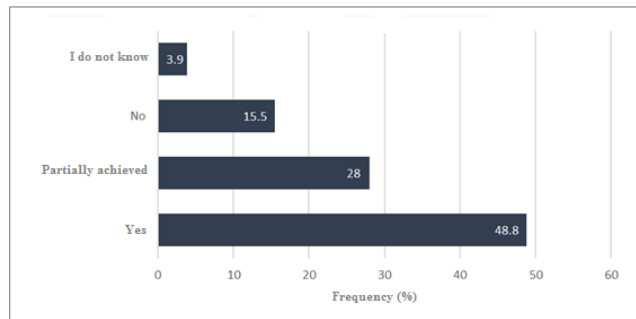


Figure 4. Decrease in the community's dependence on agricultural markets outside their area of residence

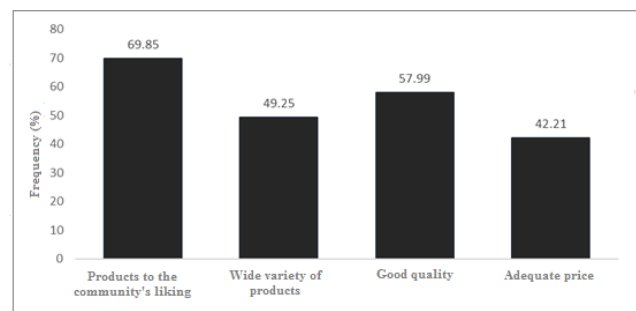


Figure 5. Reasons for maintaining the presence of production and marketing units of the AU-ASU-AF system in the localities

In addition, the great variety and quality of the offer, as well as the affordable prices for all types of public, are also well valued by the respondents.

## CONCLUSIONS

- The Urban, Suburban and Family Agriculture System in Cuba constitutes an important source of food acquisition for the Cuban population, which, in addition, showed a high degree of satisfaction with the products marketed in it, mainly for providing the community with fresh, healthy and varied products.
- It was demonstrated that the system allows the reduction of the community's dependence on markets outside the place of residence, thus contributing to local food self-sufficiency and food sovereignty.
- The system should be maintained and improved in the localities, due to the possibility of acquiring products that are preferred by the community's neighbors, as well as the variety, quality and affordable prices of these products.

## BIBLIOGRAFÍA

1. Ascough, J. ; Ahuja, L. ; McMaster, G. ; Ma, L. y Andales, A. "Agriculture Models" [en línea], *Encyclopedia of Ecology*, 2.ª ed., Oxford: Elsevier, 2019, Disponible en: <https://doi.org/10.1016/B978-0-12-409548-9.11173-X>.
2. Nguyen, B.K. y Haubruge, E. "Chapter 9.1 - VERDIR (Enhancement of the Environment Through Sustainable Rehabilitation and Responsible Innovation)" [en línea], eds. Anpo, M., Fukuda, H., y Wada, T., *Plant Factory Using Artificial Light*, edit. Elsevier, 1 de enero de 2019, pp. 329-337, ISBN 978-0-12-813973-8, [Consultado: 9 de noviembre de 2023], Disponible en: <https://www.sciencedirect.com/science/article/pii/B9780128139738000294>.
3. Hernández, L. "La Agricultura Urbana Y Caracterización De Sus Sistemas Productivos Y Sociales, Como Vía Para La Seguridad Alimentaria En Nuestras Ciudades", *Cultivos Tropicales*, vol. 27, no. 2, 2006, pp. 13-25, ISSN 1819-4087, [Consultado: 9 de noviembre de 2023], Disponible en: <https://www.redalyc.org/articulo.oa?id=193215872002>.
4. Companioni, N. ; Rodríguez-Nodals, A. y Sardiñas, J. "AVANCES DE LA AGRICULTURA URBANA, SUBURBANA Y FAMILIAR", *Agroecología*, vol. 12, no. 1, 2017, pp. 91-98, ISSN 1989-4686, [Consultado: 9 de noviembre de 2023], Disponible en: <https://revistas.um.es/agroecologia/article/view/330401>.
5. Rich, K.M. ; Rich, M. y Dizyee, K. "Participatory systems approaches for urban and peri-urban agriculture planning: The role of system dynamics and spatial group model building", *Agricultural Systems*, vol. 160, 1 de febrero de 2018, pp. 110-123, ISSN 0308-521X, DOI 10.1016/j.agsy.2016.09.022, [Consultado: 9 de noviembre de 2023], Disponible en: <https://www.sciencedirect.com/science/article/pii/S0308521X16305959>.
6. Azunre, G.A. ; Amponsah, O. ; Peprah, C. ; Takyi, S.A. y Braimah, I. "A review of the role of urban agriculture in the sustainable city discourse", *Cities*, vol. 93, 1 de octubre de 2019, pp. 104-119, ISSN 0264-2751, DOI 10.1016/j.cities.2019.04.006, [Consultado: 9 de noviembre de 2023], Disponible en: <https://www.sciencedirect.com/science/article/pii/S0264275118303044>.
7. Filippini, R. ; Mazzocchi, C. y Corsi, S. "The contribution of Urban Food Policies toward food security in developing and developed countries: A network analysis approach", *Sustainable Cities and Society*, vol. 47, 1 de mayo de 2019, p. 101506, ISSN 2210-6707, DOI 10.1016/j.scs.2019.101506, [Consultado: 9 de noviembre de 2023], Disponible en: <https://www.sciencedirect.com/science/article/pii/S2210670718323576>.
8. Wielemaker, R. ; Oenema, O. ; Zeeman, G. y Weijma, J. "Fertile cities: Nutrient management practices in urban agriculture", *Science of The Total Environment*, vol. 668, 10 de junio de 2019, pp. 1277-1288, ISSN 0048-9697, DOI 10.1016/j.scitotenv.2019.02.424, [Consultado: 9 de noviembre de 2023], Disponible en: <https://www.sciencedirect.com/science/article/pii/S0048969719309362>.
9. Krikser, T. ; Zasada, I. y Piorr, A. "Socio-Economic Viability of Urban Agriculture-A Comparative Analysis of Success Factors in Germany", *Sustainability*, vol. 11, no. 7, 2019, pp. 1-12, [Consultado: 9 de noviembre de 2023], Disponible en: <https://ideas.repec.org/a/gam/jjsusta/v11y2019i7p1999-d219908.html>.
10. O'Sullivan, C.A. ; Bonnett, G.D. ; McIntyre, C.L. ; Hochman, Z. y Wasson, A.P. "Strategies to improve the productivity, product diversity and profitability of urban agriculture", *Agricultural Systems*, vol. 174, 1 de agosto de 2019, pp. 133-144, ISSN 0308-521X, DOI 10.1016/j.agsy.2019.05.007, [Consultado: 9 de noviembre de 2023], Disponible en: <https://www.sciencedirect.com/science/article/pii/S0308521X18314343>.
11. Njuguna, S.M. ; Makokha, V.A. ; Yan, X. ; Gituru, R.W. ; Wang, Q. y Wang, J. "Health risk assessment by consumption of vegetables irrigated with reclaimed waste water: A case study in Thika (Kenya)", *Journal of Environmental Management*, vol. 231, 1 de febrero de 2019, pp. 576-581, ISSN 0301-4797, DOI 10.1016/j.jenvman.2018.10.088, [Consultado: 9 de noviembre de 2023], Disponible en: <https://www.sciencedirect.com/science/article/pii/S0301479718312283>.
12. Duvert, C. ; Priadi, C. ; Rose, A. ; Abdillah, A. ; Marthanty, D. y Gibb, K. "Sources and drivers of contamination along an urban tropical river (Ciliung, Indonesia): Insights from microbial DNA, isotopes and water chemistry", *Science of The Total Environment*, vol. 682, pp. 382-393, Disponible en: <https://doi.org/10.1016/j.scitotenv.2019.05.189>.
13. Mai Ha, T. ; Shakur, S. y Pham Do, K.H. "Consumer concern about food safety in Hanoi, Vietnam", vol. 98, abril de 2019, pp. 238-244, Disponible en: <https://www.sciencedirect.com/science/article/abs/pii/S0956713518305760>.
14. Funes Aguilar, F. "RESEÑA SOBRE EL ESTADO ACTUAL DE LA AGROECOLOGÍA EN CUBA", *Agroecología*, vol. 12, no. 1, 2017, pp. 7-18, Disponible en: <https://revistas.um.es/agroecologia/article/view/330301/229261>.
15. Schwab, E. ; Caputo, S. y Hernández-García, J. "Urban Agriculture: Models-in-Circulation from a Critical

- Transnational Perspective”, *Landscape and Urban Planning*, vol. 170, 2018, pp. 15-23, Disponible en: <<https://www.sciencedirect.com/science/article/abs/pii/S016920461730213X?via%3Dihub>>.
16. Sroka, W. ; Pölling, B. y Mergenthaler, M. “City adjustments as the main factor of success of urban and peri-urban farms-empirical evidence from the Ruhr metropolis”, *NJAS - Wageningen Journal of Life Sciences*, vol. 89, 2019, pp. 100-299, Disponible en: <<https://www.sciencedirect.com/science/article/pii/S1573521419300880>>.
  17. Hernández, R. ; Fernández, C. y Baptista, M. *Metodología de la investigación Quinta edición* [en línea], edit. McGraw-Hill/Interamericana Editores, 2010, Disponible en: <<http://repositorio.uasb.edu.bo:8080/bitstream/54000/1210/1/Sampieri-Metdolog%c3%ada%20de%20la%20investigaci%c3%b3n%20ta%20ed.pdf>>.
  18. Ding, D. ; Liu, P. y Ravenscroft, N. “The new urban agricultural geography of Shanghai”, *Geoforum*, vol. 90, 2018, pp. 74-83, Disponible en: <<https://www.sciencedirect.com/science/article/abs/pii/S0016718518300460>>.
  19. Sánchez-Bravo, P. ; Chambers V, E. ; Noguera-Artiaga, L. ; Sendra, E. ; Chambers IV, E. y Carbonell-Barrachina, Á.A. “Consumer understanding of sustainability concept in agricultural products”, *Food Quality and Preference*, vol. 89, 2021, pp. 104-136, Disponible en: <<https://www.sciencedirect.com/science/article/abs/pii/S0950329320304055>>.
  20. Grebitus, C. ; Printezis, I. y Printezis, A. “Relationship between Consumer Behavior and Success of Urban Agriculture”, *Ecological Economics*, vol. 136, 2017, pp. 189-200, Disponible en: <<https://www.sciencedirect.com/science/article/abs/pii/S0921800916308692>>.
  21. N. Poulsen, M. ; R. McNab, P. ; L. Clayton, M. y A. Neff, R. “A systematic review of urban agriculture and food security impacts in low-income countries”, *Food Policy*, vol. 55, 2015, pp. 131-146, Disponible en: <<https://www.sciencedirect.com/science/article/abs/pii/S0306919215000809?via%3Dihub>>.
  22. Fricano, R. y Davis, C. “How Well Is Urban Agriculture Growing in the Southern United States?”, *Journal of Agriculture, Food Systems, and Community Development.*, vol. 9, no. 2, 2020, Disponible en: <<https://www.foodsystemsjournal.org/index.php/fsj/article/view/769>>.
  23. Gasparatos, A. y Gasparatos, H. “Ecosystem Services Provision from Urban Farms in a Secondary City of Myanmar, Pyin Oo Lwin”, *Agriculture*, vol. 10, no. 5, 2020, p. 140, Disponible en: <<https://doi.org/10.3390/agriculture10050140>>.