

Prospera and the food security of rural families in the center of Veracruz

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Abstract

The objective of this study was to analyze the socioeconomic and nutritional characteristics of beneficiary families of the Prospera program in comparison with non-beneficiary families, to identify differences in the nutritional approach. A sample of 34 women from beneficiary families and 37 non-beneficiaries of the Prospera program was used in four communities of two municipalities in the center of Veracruz, Mexico. The results show significant differences ($p < 0.05$) in socioeconomic variables such as age, education, number of family members and sources of income. In the variables related to food, there are differences in the consumption of vegetables per week ($p < 0.05$); however, there are no differences ($p < 0.05$) in the number of meals per day, neither in the place of purchase of the food, and the consumption of food groups. It is concluded that the food groups they consume and their periodicity are similar in the two types of families analyzed. Average food consumption is less than 50% and the products that families in both groups consume the least are cereals, meats and legumes.

Keywords: food diversity, social policy, women.

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Introduction

Currently around 793 million people suffer from chronic hunger and the proportion of people affected by micronutrient deficiencies is shocking: one in four. It is estimated that there are almost 1.9 billion people who are overweight and 600 million obese and, therefore, with an increased risk of suffering from non-communicable diseases related to food (FAO, 2017). It is recognized that more than 820 million people habitually go to bed hungry (FAO 2019). Women, children and indigenous groups remain particularly vulnerable to hunger (ONU, 2020). Lefever *et al.* (2013) point out that 'extreme poverty is usually linked to the lack of access to healthy and nutritious food, regularly and sufficiently. In several countries, this problem has a greater incidence in rural areas. The public sector has proposed strategies to guarantee the right to food in vulnerable rural households'.

In this regard, it is recognized that Mexico has been a pioneer in creating social development programs that have become a worldwide benchmark, for example, the Progres-Oportunidades-Prospera conditional transfer program (Yaschine, 2015). However, in the Mexican Republic, around 80% of federal interventions aimed at combating poverty serve less than 40% of the population that suffers from the problem (Cejudo *et al.*, 2018).

The Education, Health and Food Program (PROGRESA) began in August 1997 with a coverage of 300 thousand families in rural areas (CONEVAL, 2019), in this regard Davila (2016) carries out an analysis of the evolution of said program: Progres-Oportunidades. Prospera. Twenty years later, the active registry of beneficiaries of the Prospera program in Mexico was 6 680 368 families, distributed in 111 844 localities (SE, 2018), being Veracruz the state with the highest national representation (92%) of this active registry.

It is important to note that the Prospera program was in force until November 2018; however, due to its national and international importance, evaluations of it continue to be carried out. The general objective of the Prospera program was to 'contribute to strengthening the effective fulfillment of social rights that enhance the capacities of people living in poverty, through actions that expand their capacities in food, health and education and improve their access to other dimensions of well-being' (SE, 2018).

The Prospera program at the national level, provided direct economic support in food and education, as well as complementary support, support for children and for older adults. In this way, the monthly financial support that a family with scholarship recipients in primary and secondary school would receive would be \$1 825.00 and those families that also had children in upper secondary education the support would increase to \$2 945.00 (Fiszbein *et al.*, 2009).

Of the economic resource provided directly as support by the program, the monetary income for families who had children in primary and secondary education represented 26% of the economic support provided monthly and for those who also have children in upper secondary education, it only represented 16% despite these efforts, according to CONEVAL (2020a) in 2018 in Mexico there are 25.5 million people who have deficiencies due to access to food.

In addition to the lack of sufficient income to have access to adequate food, women linked to the Prospera program in rural areas have an additional workload. According to a study carried out on the Progresa program, Angulo and Moryant (2019) identified that the program implied many more obligations than rights for the participating women, since to be beneficiaries of the Prospera program, they were asked to participate widely in talks and additional work within the community, this was added to the daily work at home and in the rural production unit, where many women act as those responsible.

The dietary diversity of people in a region is determined by several factors, including the diversity of production (Sibhatu, 2015), the levels of household income and expenditure (Drescher *et al.*, 2009), as well as demographic characteristics and socioeconomic status of their homes. Therefore, the present study aims to analyze the socioeconomic and nutritional characteristics of beneficiary families of the Prospera program in comparison with non-beneficiary families, to identify differences in the nutritional approach.

Materials and methods

Location of the study area

The study was carried out in four communities belonging to two municipalities in the High Mountains Region of the state of Veracruz. Information from the communities of ‘El Crucero’ and ‘Guzmantla’ of the municipality of Ixhuatlán del Café and in the municipality of Huatusco de Chicuellar, hereinafter referred to as Huatusco, was obtained information from the communities of ‘Tlamatoca’ and ‘Ixpila’ (Figure 1).

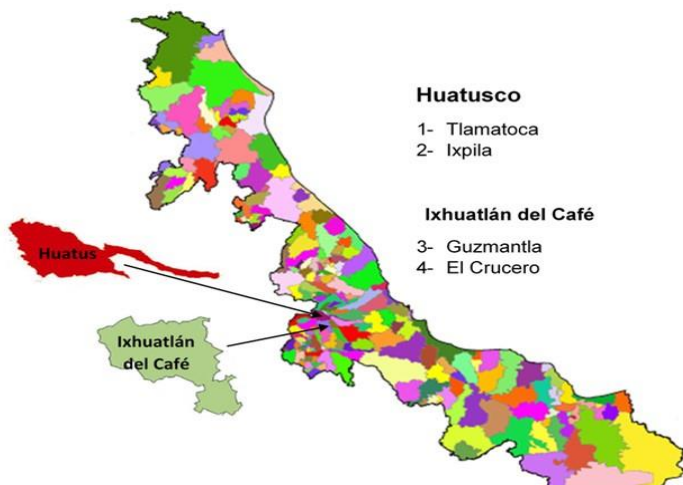


Figure 1. Location of the study area of the four communities analyzed.

The municipality of Huatusco is located in the central zone of the state of Veracruz, at coordinates 19° 09' north latitude and 96° 58' west longitude, at an altitude of 1 300 meters above sea level. To the north it borders the municipalities of Tlatetela and Sochiapa; to the northeast with Comapa; to the southeast with Zentla and Tepatlaxco; to the south with Ixhuatlán del Café and Coscomatepec, to the west with Calchahuaco and to the northwest with the state of Puebla.

Its climate is warm-humid with an average temperature of 19.1 °C; its average annual rainfall is 1 825.5 millimeters. Meanwhile, the municipality of Ixhuatlan del Cafe is located at coordinates 19° 03' of north latitude and 96° 59' of west longitude, at an altitude of 1 350 meters above sea level, bordered to the north by Huatusco, to the east by Tepatlaxco, to the southeast by Atoyac, to the south with Cordoba, to the southwest with Fortin, to the west with Tomatlan, to the northwest with Coscomatepec. The climate is temperate-humid-regular with an average temperature of 19 °C, its average annual rainfall is 1 699.5 millimeters (SECTUR, 2020).

Sample selection

In the two selected municipalities, the Prospera program was in operation during 2018. The criteria for selecting the municipalities were that both had rural families benefiting from the Prospera program, and they were also chosen for their marginalization rates. The municipality of Ixhuatlan del Cafe is a municipality classified as highly marginalized while the municipality of Huatusco is classified as moderately marginalized (CONAPO, 2010).

The selection of the sample was non-probabilistic and directed (Abascal and Grande, 2005). Housewives who were beneficiaries of the Prospera program were selected. The selection of the interviewed women was carried out with the help of a Professional Service Provider who worked in the study area and a master's thesis in rural development sciences. The criteria for selecting the women interviewed were that they participate as beneficiaries of the strategic project on food security, the crusade against hunger and the Synergies to empower them (which was a project funded by CONACYT led by the Autonomous University Chapingo), key ANP 2015.01.732.

The technician and the thesis student were part of said project for which they had frequent work meetings in the study communities. Thus, 80% of the women interviewed belonged to this project and the remaining 20% were randomly selected from the same communities. In total, 71 surveys were conducted. The study has the limitation of not having been carried out by means of a random sampling; however, it presents information applicable to the analyzed sample, but it may allow the generation of hypotheses in future works related to the issue of nutrition in the rural sector.

The women surveyed were distributed as follows: in the municipality of Huatusco, 40 women were interviewed (16 women from 'Tlamatoca' and 24 in the community of 'Ixpila') and in the municipality of Ixhuatlan del Cafe, 31 women were interviewed (9 women from the community of 'El Crucero' and 22 from the community of 'Guzmantla'). Of the total sample, 34 rural women were beneficiaries of Prospera and 37 women were not beneficiaries.

Instrument used and sources of information

The instrument used to collect the information was a survey. The selection of participating women, the tours of the study area and the data collection was carried out between the months of February to March 2018. Scheduled visits were made, first the women who were beneficiaries of the Prospera program were cited and then the women who did not have Prospera. To organize the data collection in each of the four communities, we had the support

of a 'leader' person from the group of beneficiaries who had previously received support from the recognition visits to the localities. The survey applied was structured in five sections: 1) personal information on the woman's profile; 2) composition of the household; 3) sources of income; 4) family eating habits; and 5) views of the interviewee regarding the implementation of the Prospera program in their community.

To know the food consumed between beneficiary and non-beneficiary families, the average food consumption per week was obtained; in this indicator, the total number of times that the interviewees indicated that a type of food was consumed was counted. In addition, the diversity of consumption by food group (DCGA) was measured, this indicator was estimated as follows: the number of foods consumed in each of the seven food groups was counted: 1) fruits; 2) vegetables; 3) meats; 4) dairy; 5) legumes; 6) cereals; and 7) breads and cookies) and later it was divided by the total elements of the group. $DCGA = [\text{no. of items consumed} / \text{total group food}] * 100$.

Statistical analysis of the information

The information obtained was captured and organized in the Excel program and its statistical analysis was carried out with the SPSS program (version 21). The normality test was performed on the quantitative variables, and it was found that these complied with the Kolmogorov-Smirnov test and the Shapiro-Wilk test of normality of the data ($p < 0.05$). Therefore, the statistical analysis of the variables was carried out through analysis of variance for independent samples in the case of ordinal variables and the Chi-square test was also applied for categorical variables.

Results and discussion

Characterization of beneficiary and non-beneficiary women of the Prospera program

47.9% of the women interviewed indicated that they were linked to the Prospera program. Of these, 52.9% belong to the municipality of Huatusco and 47.1% to the municipality of Ixhuatlan del Cafe. The women who were enrolled in the program are older (47 years) than those who do not participate (38 years), this difference being significant ($p < 0.05$) in age. The women who do not participate in the program are almost 10 years younger than the women who do. Women enrolled in the Prospera program were older than those who are not beneficiaries.

Significant differences ($p < 0.05$) were found in the age (47.59 years) of the women who had the support of Prospera compared to the age (38 years) of the women who were not beneficiaries of the program. The women who did not participate in the program are younger and are almost 10 years younger than the beneficiary women.

The average level of schooling in Veracruz is 8.3 years, which is equivalent to just over the second year of secondary school, an average below the national average of 9.3 years, which means a little more than secondary school completed. In the present study, a significant difference ($p < 0.05$) was identified in the variable level of education between women who have benefits from the Prospera program and those who are not beneficiaries. The women who did not participate in the program have a higher level of education than the women who did participate.

In this regard, it is observed that 32.4% of women participating in Prospera do not have some level of education, while the group of women who are not in the program reaches only 8.1% (Table 1). In this regard, Harris *et al.* (2015), found that in rural communities in Bangladesh schooling improves food and nutrition security by increasing access to and understanding of media campaigns that promote health.

Table 1. Level of education of groups of beneficiary and non-beneficiary women of Prospera.

Scholarship (%)	With Prospera program	Without Prospera program	X ² value
No study	32.4 a	8.1 b	8.356*
Primary	38.2 a	40.5 b	
High school	26.5 a	37.8 b	
Upper secondary education	2.9 a	13.5 b	

* = significant variable ($p < 0.05$).

The number of members of the beneficiary and non-beneficiary families of Prospera presented significant differences ($p < 0.05$). Families that are supported by the program have five children and those that are not beneficiaries have four children on average. The families that are enrolled in the Prospera program have more members, which is possibly explained because this program focuses support for the number of children who remain in the educational component. In this regard, Dávila (2016) points out that Prospera beneficiary families must comply with actions in education and health.

Rural families and their sources of economic income

The origin of income in the families analyzed showed significant differences ($p < 0.05$). Income from the father was higher (62.2%) in the group of families that do not have the support of the Prospera program, in contrast, only 55.9% of the income for beneficiary families comes from the father (Table 2).

Table 2. Number of members and sources of income of beneficiary and non-beneficiary families.

Variables	With Prospera	Without Prospera	F-value	X ² value
Number of members	5 ± 2 a	4 ± 1 b	0.826*	
Source of income (%)				
Father	55.9 a	62.2 b		13.011*
Mother	0 a	16.2 b		
Father and son	29.4 a	5.4 b		
Mother and son	2.9 a	0 b		
Others (remittances, other programs, etc.)	11.8 a	16.2 b		

* = significant variable ($p < 0.05$).

In general, the families interviewed depend on more than one actor to supplement the family income. Which may imply, according to Angulo and Morvant (2019), the existence of high multiple activity (temporary jobs, migration, planting for self-consumption and for sale in the local

market) and multiplicity of their sources of income (remittances, monetary transfers of other programs, payment such as wages, temporary employment, sale of small agricultural surpluses). In this sense, De cock *et al.* (2013) mention that policies should focus on policies to promote rural education and the creation of an environment conducive to the rural labor market.

Economic income is relevant for the food and nutritional security of rural families. Greater income diversification can lead to greater access to different food groups. However, the source of income in both was similar, and significant differences ($p < 0.05$) were only found in income from other programs. In the group of families that are enrolled in Prospera, they indicated that they obtain 11.76% of their income from other programs (Program 65 and more, mainly), in contrast, families that do not participate in the program only obtain 1.76% from other programs (Table 3).

Table 3. Source of income of beneficiary and non-beneficiary families of Prospera.

Variable	With Prospera (n= 34)	Without Prospera (n=37)	F-value
Salary (wage)	86.5 ±15.7 a	93.1 ±22 a	1.633
Remittances	1.8 ±10.3 a	0 ±0 a	4.635
Programs (Prospera, Program 65 and more)	11.8 ±6.3 a	1.8 ±8.3 b	0.056*
Others (sale of agricultural surpluses)	0 ±0 a	5.1 ±20.8 a	8.904
Percentage of income allocated to food	65.6 ±19.5 a	66.9 ±23.6 a	3.845

* = significant variable ($p < 0.01$).

Feeding of rural families: frequency and type of food consumed

The number of meals made in both groups of families was three per day. It was found that approximately half of the women interviewed from both groups buy their food in the municipality to which they belong and in Diconsa stores in the communities. Regarding the type of meals made in the families interviewed, one of the women interviewed pointed out that: 'she sows radish, cucumber and coriander before there was a lot of blackberry-quelites, now there is no more because everything has coffee, his family consumes very little meat because it that you can buy with \$100.00 pesos is very little' (Woman beneficiary of the Prospera program, Tlamatoca community in Huatusco, Veracruz, age 36 years).

The foods consumed per week in both groups of families are generally similar, only significant differences were found in the consumption of vegetables ($p < 0.1$), eggs ($p < 0.05$) and potatoes ($p < 0.05$) (Table 4). In other words, the families that are beneficiaries of the program consume a greater quantity of these foods. Women who participate in Prospera indicated that their family consumes an average of 27 times a week a product from the vegetable group compared to 25 times that of women who are not beneficiaries of the program.

In this sense, possibly due to the monitoring, evaluation and control meetings that the women of the Prospera program have, it increases their consumption of this group of foods, which are very important for human nutrition due to their content of vitamins, minerals, fiber and for adding a variety of colors and flavors to the diet (Álvarez and Zapata, 2002).

The consumption of eggs as a source of protein is especially important; in this study, a difference ($p < 0.05$) in egg consumption per week was identified. Prospera beneficiary families consume eggs on a regular basis, around five times a week, in contrast, non-beneficiary families consume eggs four times a week. This contrasts with the study carried out by Álvarez *et al.* (2004) in rural and urban households in Colombia, where 20% of households did not have eggs for their food during a week, in this study rural diet was less diversified than that carried out in urban areas; food availability was 23% in rural areas versus 29% in urban areas.

Significant differences ($p < 0.1$) were also found in the number of times they consume potatoes per week; families participating in Prospera consumed potatoes twice a week, while families not participating in this program consumed potatoes only once a week. In general, the main foods consumed by both beneficiary and non-beneficiary families are in the first place, the group of vegetables, fruits and bread and cookies. On the other hand, very little fish (less than once a week), meat (2 times a week) and dairy (between 6 and 7 times a week) are consumed (Table 4).

Table 4. Average number of times a week that you consume a product from the food group.

Food group	With Prospera	Without Prospera	F-value
Fruits	17.1 ±8.1 a	16.2 ±10.9 a	0.164
Vegetables	27.2 ±5.4	24.7 ±6.7	2.839**
Meat	2.2 ±0.9	2.1 ±1.4	0.021
Fish	0.11 ±0.3	0.1 ±0.3	0.016
Egg	4.8 ±2.2	3.6 ±2.2	5.087*
Dairy products	7.5 ±4.9	6.1 ±4.5	1.662
Legumes	7.8 ±2.1	8.2 ±1.6	1.026
Cereals	4.9 ±3.2	4.2 ±2.3	0.923
Potato	1.5 ±1.3	0.9 ±0.7	6.183*
Bread and cookies	20.5 ±4.4	19.7 ±4.04	0.688

* = significant variable ($p < 0.05$); ** = significant variable ($p < 0.10$).

Fruits includes 16 fruits: banana, pear, grapes, apple, melon, mango, tangerine, lemon, orange, avocado, guava, tuna, papaya, strawberry, peach, pineapple. Vegetables includes 14 products: tomato, carrot, pumpkin, peas, chili peppers, chayote, onion, cucumber, lettuce, nopal, radishes, broccoli, cauliflower, quelites. Meat includes 4 types of meat: pork, chicken, and beef. Dairy includes consumption of 4 products: cheese, butter, milk and yogurt. Legumes include four foods: beans, lentils, chickpeas and soybeans. Cereals includes 4 types of grains: corn, wheat, amaranth and rice. Bread and cookies includes 9 products: bread, cookies, wheat dough, maseca, white bread, sweet bread, toast, tortillas, toasts.

Dietary diversity is a qualitative measure of food consumption that reflects household access to a variety of foods, as well as an indirect measure of the nutrient adequacy of the individual diet (Kennedy *et al.*, 2012). When analyzing the variability of product consumption with respect to the total food of the group, significant differences ($p < 0.1$) were identified only in the vegetable group, in which there are 14 foods and the group of beneficiary women consumed 64.5% of that total of food, in contrast, non-beneficiary women consume 57% of food from this same group.

The results obtained show a low consumption of foods from the following groups: cereals, meat and legumes. A low diversity of food consumption (less than 50% of the seven food groups analyzed). In this regard, there is empirical evidence that suggests that dietary diversity is an indicator of food quality and is also a precondition for adequate intake of essential nutrients (Arimond and Ruel, 2004; Frison *et al.*, 2006; Kennedy *et al.*, 2007; Moursi *et al.*, 2008; Kennedy *et al.*, 2012).

Therefore, given the results obtained, it is induced that both study groups may present a diet with inadequate food quality represented by a low intake of essential nutrients. In this regard, from 2008 to 2018, poverty in Veracruz increased 10.6% (from 51.2 to 61.8%). This translates into about 1 209 600 more people in this situation in a period of ten years in this entity (CONEVAL, 2020b).

In this way, of the four elements that constitute food security: availability, stability, access, consumption and biological use, the one related to biological use is low according to the level of food consumption (ingestion, absorption and use) of the families. rural interviewees. According to the FAO (2011), this can lead, in general, to malnutrition and malnutrition with a greater nutritional impact on boys and girls. In 2018, the state of Veracruz ranked 4th nationally for its percentage of minors in poverty in age, in addition the percentage of the population with lack of access to food in Veracruz was 6.6% higher than the national percentage. That same year, the state ranked 5th among the 32 states for its levels of this deficiency (CONEVAL, 2020b).

The consumption of foods confirmed by the established groups is generally low (only vegetables and dairy products exceed 50% of the frequency of food groups consumed per week). Despite this, of the seven food groups evaluated, only 60% consumption was reached in the vegetable group. This result could be explained in the training and follow-up courses that the program conducts for the participating women. This contrasts with what was found by Del Ángel-Pérez and Villagomez-Cortez (2014) in a study carried out in marginalized urban areas of Veracruz, who identified that 19% of households indicated that they did not consume fruits and 9.4% did not include vegetables in their regular diet. However, the daily consumption of vegetables and fruits is associated with a lower risk of overweight, obesity and other chronic diseases, including cardiovascular diseases (Dávila *et al.*, 2015).

Despite the fact that from the institutional perspective there are important advances in the implementation of the Prospera program (SE, 2018), the data obtained in the study show us a possible social lag in the food aspect, which is why not only monetary transfers are required direct, but to insist on policies with a social focus (conditional transfers, as was the case in the Prospera program) and productive development programs aimed at rural women and their families. Since, as Gómez and Tacuba (2017) point out, 'it does not seem relevant that a single program is responsible for all the objectives, which will normally require policy actions of a very diverse nature, as well as specialized equipment and technical personnel'.

A possible way to diversify and increase the consumption of food groups in rural areas of Veracruz could be through the establishment of family gardens with technical support, training and direct monitoring in the field; in this regard Rammohan *et al.* (2019), mention that home gardens improve

food and nutritional security in a wide range of environments, by generating greater food diversity and reducing spending on the purchase of food produced. In this regard, the Strategic Project on Food Security, the Crusade against hunger and Synergies to enhance them, of which this research is part, generated information on the establishment of family gardens, which includes an acceptance of women when they are trained in their own communities and with food that they can easily produce.

Conclusions

The food groups that the families of the women in the study consume, as well as their periodicity, is similar for the beneficiaries and non-beneficiaries of the Prospera program. Only significant differences ($p < 0.10$) were identified in the consumption of vegetables carried out by families belonging to the Prospera program. In general, the foods that are consumed the least by both groups analyzed belong to the group of cereals, meat and legumes.

The results found in the present study show a low diversity in food consumption (both groups have less than 50% consumption of the food groups analyzed) in rural families. Given the results obtained, it is very possible that both groups of families present an inadequate food quality, represented by a low intake of essential nutrients and therefore, it is possible that the Prospera program did not have an impact on the improvement of food and nutritional security of participating rural families.

Therefore, the impact of a promotion policy on the strategy of productive diversification and income generation, among which is the establishment of family gardens, the breeding of minor livestock species, such as birds, rabbits or pigs, among others. It is possible that these strategies of productive diversification of family production units could favor a greater impact on food security in rural areas of Veracruz.

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