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Characterization and qualitative evaluation of the vegetarian diet in Venezuelan adults

Caracterización y evaluación cualitativa de la dieta vegetariana en adultos venezolanos

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Abstract

Introduction: The vegetarianism is in a historical moment of expansion, proposing other ways of eating and a new type of gastronomy on the rise that require technical monitoring to evaluate its nutritional impact. **Objective:** to characterize the structure and qualitatively evaluate the quality of the vegetarian diet of Venezuelan adults. **Material and methods**: the consumption of 224 people (vegans n = 29, vegetarians n = 74, flexitarians n = 121) was evaluated using the combined technique of R24H and QFFC, in order to qualitatively compare their dietary pattern with the food official guide for the Venezuelan population. **Results**: only the group of vegetarians managed to adequately adjust to the guide in terms of the harmony and proportionality necessary to achieve a balanced diet. **Conclusion**: a well-oriented vegetarian diet can offer the real possibility of accessing all the food groups necessary to structure a balanced diet.

Keyword: diet, vegan, vegetarian, flexitarian, nutritional adequacy.

Resumen

Introducción: el vegetarianismo se encuentra en un momento histórico de expansión, proponiendo otras formas de alimentarse y un nuevo tipo de gastronomía en auge que requieren un monitoreo técnico para evaluar su impacto nutricional. **Objetivo**: caracterizar la estructura y evaluar cualitativamente la calidad de la dieta vegetariana de adultos venezolanos. **Material y métodos**: se evaluó el consumo de 224 personas (veganos n=29, vegetarianos n=74, flexitarianos n=121) usando la técnica combinada de R24H y FCCA, con el fin de comparar cualitativamente su patrón dietético con la guía de alimentación oficial para la población venezolana. **Resultados**: solo el grupo de vegetarianos logró ajustarse adecuadamente a la guía en cuanto a la armonía y proporcionalidad necesaria para alcanzar una alimentación equilibrada. **Conclusión**: una dieta vegetariana bien orientada puede brindar la posibilidad real de acceder a todos los grupos de alimentos necesarios para estructurar una dieta balanceada.

Palabras clave: dieta, vegano, vegetariano, flexitariano, adecuación nutricional.

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Introduction

The Vegetarianism, understood from its origin as a meat-free dietary proposal (1) today it can be considered more broadly as a lifestyle or identity (2,3) that proposes other ways of seeing the world and organizing the way of eating. Historically it has been structured through important philosophical, spiritual, moral and emotional foundations (4.5); although today it is particularly associated with the search for a more ecological vision of economic and consumption systems, generating a new type of gastronomy on boom (6).

The Vegetarian diets are more environmentally sustainable than diets rich in animal products, because they use fewer natural resources (7) and help reduce the ecological footprint by producing significantly lower greenhouse gas emissions compared to omnivorous diets (8, 9).

Similarly, the lifestyle that contextualizes vegetarianism is epidemiologically linked to a positive impact on health (10). Diets low in meat and derivatives, but especially vegetarian diets that completely exclude them, are associated with a lower predisposition to suffer from type 2 diabetes mellitus, cardiovascular diseases, obesity, hypertension, hyperlipidemia and cancer; in addition to reporting benefits on autoimmune diseases such as rheumatoid arthritis. While in the opposite case, diets with a reduced intake of plant-based foods considerably increase all these risks (11, 12, 13,14).

However, as in any other proposed eating pattern, if an adequate dietary formulation is not available, duly calculated by a nutritionist, its users expose themselves to significant risks in terms of the adequate bioavailability of some nutrients; that in the case of vegetarian diets are especially focused on the quality of protein and its essential amino acids, omega 3 (n-3) polyunsaturated fatty acids (AGP) and certain micronutrients such as iron, zinc and selenium, or the possible vitamin B12 deficiency (13, 15, 16, 17); Therefore, an adequate professional supervision and continuous nutritional education are essential for this important population group.

They are considered very important because vegetarians as a population group are expanding rapidly; in Europe today it represents 5.6% of the weighted average in four of the most populous countries and 20% of its population is currently defined as flexitarian (18), while 3.3% in the United States and up to 14 % of the Brazilian population is classified as vegetarian (19, 20, 21, 22).Cultural reasons make Israel the country with the highest percentage of

vegans worldwide, they are 5.2% of the population, and up to 13% are considered vegetarian; mainly due to the fact that two thirds of its population is Jewish and governs its “kosher” dietary practice in the Old Testament laws that regulate the consumption of meats (23). However, it is India that has the lowest rate of meat consumption in the world, research reports more than 400 million vegetarians, whose plant-based diet is deeply rooted in three of the country's prominent religions: Hinduism, Jainism and Buddhism; All these religions believe in the concept of "ahimsa", which means goodness and non-violence towards all living beings (24, 25).

In Venezuela, as in much of Latin America, not enough information has been referenced on this topic, even though many vegetarian practices are not only common, but are also part of ancestral dietary patterns and agricultural productive systems. Therefore, the objective of this research was to identify and characterize the vegetarian population in the metropolitan area of Puerto La Cruz, Venezuela, to know the qualitative structure of their diet and evaluate whether if tit can provide the possibility of accessing all the food groups necessary to achieve a balanced diet; thus generating technical elements that contribute to the systematization of this sector of the population that is also a very active part of our food culture.

Material and methods

It is a descriptive, cross-sectional and semi-quantitative study; with the approval of the bioethics and research committee and where all the participants signed the term of free consent. The sampling was probabilistic, convened among volunteers who participated in conferences on vegetarian food held in the metropolitan area of Puerto La Cruz, Venezuela, and where information was provided on the nature of this research and the need to have a participating volunteer. The inclusion criteria in the research were: individuals of both sexes, over 18 years of age and considered vegetarian; in addition, they had to be in good health and have time for interviews to collect the information.

The people who applied to participate were summoned individually for an initial interview that would allow knowing not only their eating habits, and defining so your incorporation or not within any of the study groups, but also collect some data general and basic socioeconomic through the modified Graffar method (26).

The dietary pattern of each selected person was characterized by applying a combined survey, which included the multiple 24-hour recall method (R24H) plus the qualitative frequency of food consumption method (FCCA). The R24H collected semi-quantitative data from two different days of consumption in the same week, while the FCCA allowed obtaining the usual frequency of ingestion of a food, or food group, under the criteria of high (daily consumption), medium (consumption weekly) and low (monthly consumption).

All the information was collected in an open or predetermined questionnaire (in paper or digital format) through a face-to-face interview previously handled by dietitian nutritionists. trained and following the multi-step methodology (27).

The pattern was developed based on the frequency of consumption for each food and by food groups according to the structure proposed by the Venezuelan Food Composition Table (28) excluding only those consumed by less than 10% of the sample. The consumption proportion (PC) was calculated to identify the twenty most frequently consumed foods in each type of diet studied. Similarly, the qualitative assessment of the diet was obtained by comparing the consumption patterns by food groups with the diet guide " El Trompo de los Alimentos " current for the Venezuelan population (29); thus, evaluating the degree of harmony between the different groups of the population studied. The SPSS version 20 statistical package was used to tabulate the information and graph the results obtained.

Results

Of the 248 people who applied for the research, the 90.32% (n = 224) were accepted after the initial interview, while 9.67% (n = 24) were rejected mainly for not having habits adjusted to the different vegetarian practices under study (despite their self-definition as such) or later not having time to complete consumer surveys.

From the sample consisting of 224 participants (Table 1), 84 subjects were male (37.5%) and 140 were female (62.5%); whose socioeconomic profile was distributed among modified Graffar strata I, II and III, with 36.16% (n = 81) corresponding to the medium-low stratum, 52.67% (n = 118) to the medium-high stratum and 11, 16% (n = 25) to the upper stratum.

The 12.94% (n = 29) of the total selected sample corresponded to vegans, who do not consume any type of meat or animal products, 33.03% (n = 74) were defined as vegetarian properly , whose diets exclude meats but not those products of animal origin (eggs, milk, honey) that do not involve animal sacrifice, and finally 54.01% (n = 121) corresponded to the flexitarian population, who base their diet mainly on products of vegetable origin but which may include some products of animal origin and eventually small amounts of meat, especially marine animals.

In the Figure 1, the meal times are represented for each study group, which includes both the main meals (breakfast, lunch, dinner) and the snacks (before breakfast, morning, afternoon and evening) according to the R24H. All the participants eat at least 4 meals a day, lunch being the main meal.

The group of vegans was the one that ate the most meals a day, all its participants (n = 29) had lunch and dinner daily; only the 6.89% (n = 2) do not eat breakfast for reasons of working hours (long night shifts) and the entire group reports no less than 3 daily snacks. Among vegetarians, 13.51% (n = 10) did not eat breakfast and

8.10% (n = 6) did not eat dinner, but the entire group ate lunch and 51.35% (n = 38) had a regular afternoon snack or nocturnal. Flexitarians were the ones who ate the least breakfast with 41.32% (n = 50) of their participants, although they all ate lunch and up to 90.08% (n = 109) reported having dinner regularly, as well as 81.81% (n = 99) make up to two snacks a day, particularly in the evening and at night.

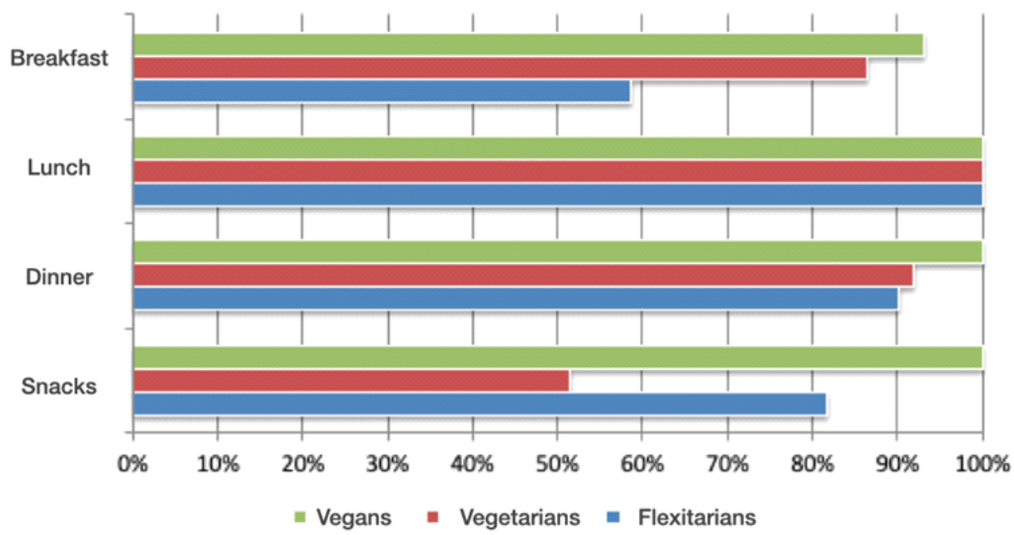
Tab.1: Sample characteristics: number and sex according to type of diet

Diet Type	Sex (n)		Total
	Male	Female	
Vegans	12	17	29
	(41,3%)	(58,6%)	(12,9%)
Vegetarians	28	46	74
	(37,8%)	(62,1%)	(33%)
Flexitarians	44	77	121
	(36,3%)	(63,6%)	(54%)
Total	84	140	224
	(37,5%)	(62,5%)	(100%)

Regarding the frequency of consumption by food groups, vegans, represented in the Figure 2, reported structuring their diets on a daily basis, mainly with the groups of legumes 100% (n = 29), legumes 100% (n = 29) and cereals 72.41% (n = 21); in addition to the group of various foods with 100% (n = 29) for the daily frequency reported for the consumption of oil and salt. All the participants consumed fruits, at a rate of 65.51% (n = 19) daily and up to 34.48% (n = 10) weekly, as well as 79.3% (n = 23) daily or weekly They consume foods from the root and tuber group. 48.27% (n = 14) habitually consume seeds. There is no regular consumption of industrial beverages, although 27.58% (n = 8) of the participants report their consumption as occasional. The meat, fish, egg and dairy groups did not report consumption.

The Vegetarians showed, as can be seen in the Figure 3, their most important daily consumption frequencies for the groups of legumes 100% (n = 74), cereals 83.78% (n = 62) and milk and dairy 35.13% (n = 26); in addition to the group of various foods with 100% (n =74) by the daily frequency reported for the consumption of coffee, oil and salt. The 64.86% (n = 48) frequently consume tubers and roots, as well as 59.45% (n = 44) legumes and 52.69% (n

Fig.1. Daily meal times according to types of diets



= 39) eggs. Seed consumption is reported as occasional or weekly in 60.81% (n = 45) of the participants. 14.86% (n = 11) consume industrial beverages, particularly soft drinks, daily, and up to 35.13% (n = 26) with weekly frequency. The meat and fish groups do not report consumption.

The flexitarians' diet proved to be the most diverse, reporting consumption in all the food groups studied. The most important daily consumption frequencies can be observed in the Figure 4 and are those of legumes in 100% (n = 121) of the participants, cereals with 69.42% (n = 84) and 39.66% (n = 48) for milk and dairy; in addition to the group of various foods with 100% (n = 121) for the daily frequency reported for the consumption of coffee, oil and salt. The consumption of fish was important among 56.19% (n = 68) of the participants in this group, as well as of eggs in 62.8% (n = 76) with a frequency between weekly and daily. The 63.63% (n = 77) of flexitarians do not consume seeds or legumes in 28.09% (n = 34); in addition, 46.28% (n = 56) report fruit consumption as occasional. Also, occasionally, 21.48% (n = 26) report the use of meat or meat in their diets, as well as frequent consumption of soft drinks: 26.44% (n = 32) drink it daily and 47.1 % (n = 57) weekly.

When comparing these structures obtained for the diets studied by food groups, with the one proposed by the Venezuelan Food Guide "El Trompo de los Alimentos", in the Figure 5, the group of vegetarians is the only one adjusted to the recommendations of the same by presenting coincidence in all the food groups suggested by the standard in terms of the harmony and proportionality necessary to achieve a balanced diet. Compared to this reference, the group of vegans studied showed a diet with

Fig. 2. Vegans: frequency of consumption by food groups

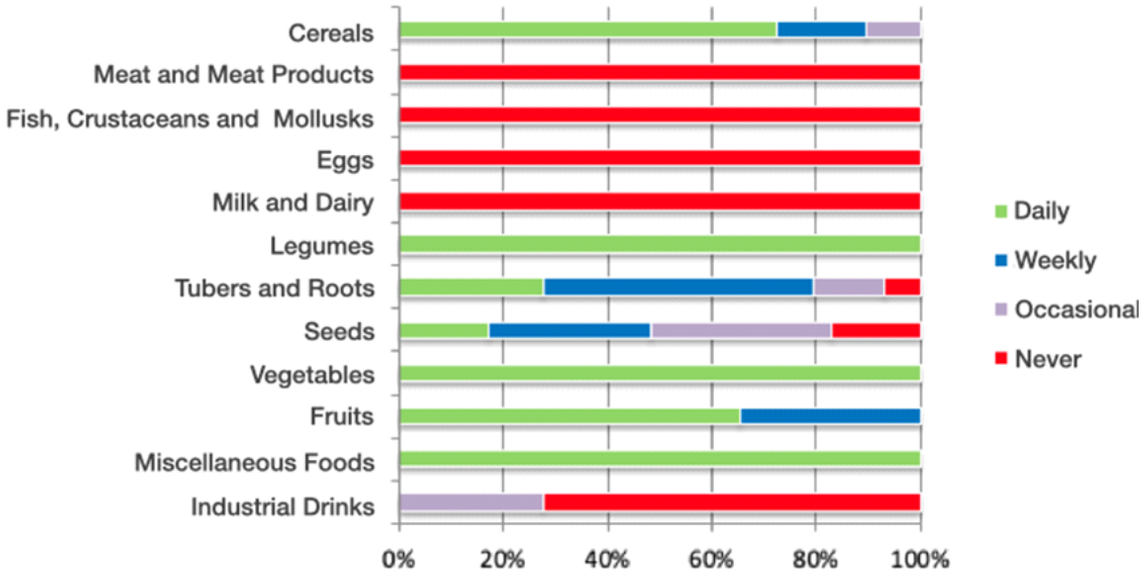
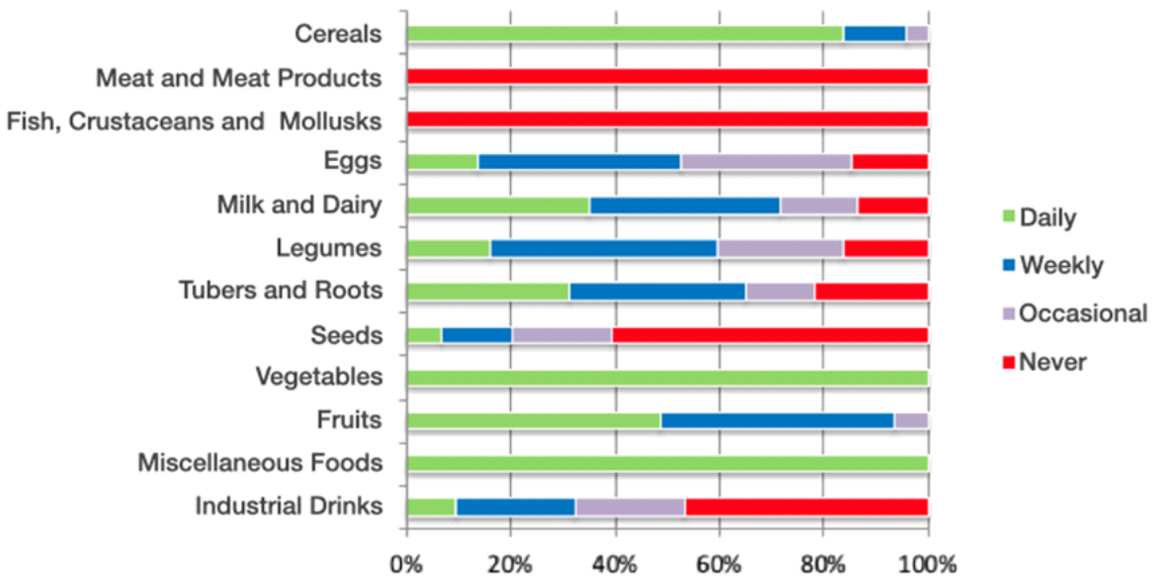


Fig. 3. Vegetarians: frequency of consumption by food groups



poor proportionality in the protein food groups, and excessive in carbohydrates. On the contrary, the group of flexitarians reported an excessive formula in proteins, fats and sugars, but deficient in carbohydrates.

Regarding the foods most consumed by the participants, the Table 2 presents the twenty most important for each type of diet studied. In the group of vegans, a CP of 1.00 (n = 29) for the daily consumption of legumes, as well as high CP for rice 0.96 (n = 28), precooked cornmeal 0.96 (n = 28), cassava 0.90 (n = 26) and aubergine 0.90 (n = 26). Among the twenty most consumed foods are six legumes (aubergine, tomato, squash, spinach, carrot, beet) and four fruits (guava, milky, lemon, banana). 20% (n = 4) of the most consumed foods are of agro-industrial origin.

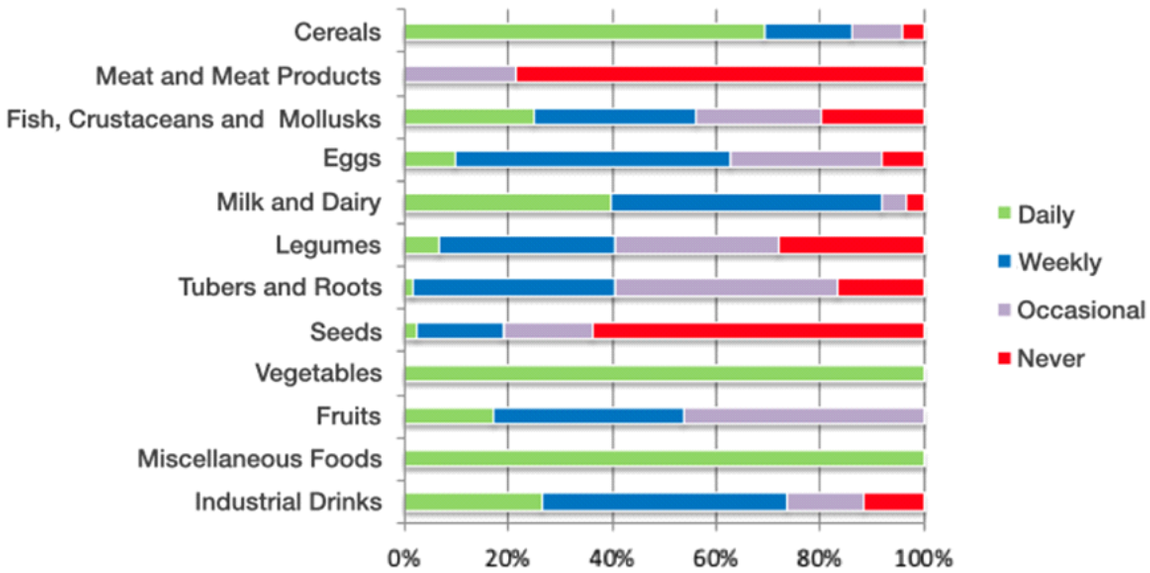
In the group of vegetarians, CP of 1.00 (n = 74) for daily consumption of coffee and precooked corn flour, as well as high CP for rice 0.97 (n = 72), white cheese 0.95 (n = 70) and legumes 0.92 (n = 68). Among the twenty most consumed foods, four legumes (tomato, pumpkin, aubergine, carrot) and three fruits (guava, milky, banana) were reported. 45% (n = 9) of the most consumed foods are of agro-industrial origin.

For the group of flexitarians, CP of 1.00 (n = 121) for the daily consumption of both coffee and precooked corn flour, although white cheese also had high CP 0.96 (n = 116), rice 0.92 (n = 111) and sugar 0.92 (n = 111). Among the twenty most consumed foods are two legumes (tomato, squash) and no fruit. 65% (n = 13) of the most consumed foods are of agro-industrial origin.

Discussion

Although vegetarians do not represent a majority population in the context of Ibero-American countries, it

Fig. 4. Flexitarians: frequency of consumption by food groups



has also been demonstrated that it is a segment that grows rapidly, particularly among the non-poor social strata, with medium and high levels of education (18, 30, 31) , but especially among young people who are widely connected to social networks, many studies have viralized that evaluate the impact on the environment and on water resources of the intensive production of food of animal origin (15), as well as the inefficiency of production of meat and its link with global warming (30,31).

However, the vegetarian cultural panorama is still incipient, and we evidence it in this research when selecting the sample. With the exception of vegans, whose militancy regarding the principles that govern their diet and

Table. 2: Most consumed foods according to type of diet

Position	Vegans (n= 29)		Vegetarians (n= 74)		Flexitarians (n= 121)	
	Food	Proportion	Food	Proportion	Food	Proportion
1	Legumes	1.00	Coffee	1	Coffee	1.00
2	Rice	0.96	Corn flour	1	Corn flour	1.00
3	Corn flour	0.96	Rice	0.97	White cheese	0.96
4	Yucca	0.9	White cheese	0.95	Rice	0.92
5	Eggplant	0.9	Legumes	0.92	Sugar	0.92
6	Potato	0.83	Sugar	0.89	Tomato	0.81
7	Sesame	0.83	Tomato	0.89	Eggs	0.79
8	Guava	0.83	Potato	0.86	Soda	0.79
9	Casabe	0.79	Auyama	0.85	Potato	0.77
10	Tomato	0.79	Guava	0.82	Fish	0.76
11	Milky	0.79	Eggplant	0.81	Banana	0.74
12	Auyama	0.76	Eggs	0.77	Legumes	0.72
13	Spinach	0.72	Milky	0.76	Auyama	0.72
14	Coffee	0.72	Yucca	0.72	Bread	0.69
15	Banana	0.69	Banana	0.68	Pasta	0.67
16	Carrot	0.69	Bread	0.68	Yucca	0.67
17	Lemon	0.66	Carrot	0.65	Industrial Bakery	0.67
18	Cambur	0.66	Cambur	0.62	Cubes	0.63
19	Wheat flour	0.62	Pasta	0.62	Soy sauce	0.62
20	Beetroot	0.62	Milk	0.58	Milk	0.62

Excludes: salt, oil and legumes used as dressings.

lifestyle in general proved to be absolutely consolidated, most of the people could not adequately define themselves within the different movements of vegetarianism; thus many flexitarians already considered themselves vegetarians although they consumed canned tuna or turkey ham (they did not consider these products as "animals"), or some vegetarians presented themselves as vegans thinking that both terms were synonymous. However, these situations, although apparently contradictory, can be seen as a natural part of a group that grows rapidly, configures itself and seeks to consolidate.

One of the common characteristics found among the participants is that, regardless of the type of diet, they all eat a large number of meals a day in general; many more than was reported for the Venezuelan population in general (32). Apparently, the less foods of animal origin are included in the diet, the number of meals increases and especially the number of snacks, probably as a dietary strategy to ensure greater and better nutrient inputs. Vegans and vegetarians were characterized by the daytime snacks, as well as the flexitarians by their frequent overs or evening snacks.

When qualitatively comparing the structure of their diets by food groups with the food guide for Venezuela, it was observed that within the three groups studied only vegetarians they manage to structure a food combination that they manage to adjust quite adequately to the established recommendations; making visible as in other many studies at the international level that represent an absolutely valid alternative in the context of achieving adequate nutritional health (3,33). The potential of vegan and flexitarian diets could also be reviewed, since probably a more technical handling of food selection could eventually provide the same nutritional guarantees. Like omnivorous diets, if consumers do not receive adequate technical guidance, decisions regarding food consumption often tend to deviate from the dietary recommendations established for the population.

There are also no dietary guidelines or recommendations for energy and specific nutrients for the vegetarian population, which could make the approach to this issue much more focused; so, for now we must continue to reference vegetarians nutritionally with the same guidelines as the general population.

This may be particularly important in the case of vegans, who through the Venezuelan guide obtained a very low qualitative participation of foods and protein food groups. According to some studies, it is not surprising that people who do not consume or consume very little food of animal origin can achieve protein adequacy based on their individual requirements (1), minimum sufficiency achieved that is frequently concealed within the population recommendations calculated with much wider safety margins.

This research found, as expected, a wide range of foods rich in vitamins, minerals and dietary fiber in the three types of diets considered, although it was observed that vegans more frequently consume a greater variety of legumes per day than vegetarians , but above all they markedly outnumber flexitarians. The case of fruits was stronger; Vegans consume a greater variety of fruits more frequently than vegetarians, but flexitarians failed to report any fruit among their most consumed foods.

The Vegans, since they do not consume meat or animal products, certainly require a greater variety of plant-based foods to satisfy their demands, but it was also remarkable that flexitarians satisfy still much of their demands with industrialized foods instead of legumes and, above all, more fruits.

Although the vegan diet was widely rich in food sources of vitamins and minerals, represented by fruits and legumes, as well as foods that provide protein, in the case of legumes and sesame; the group of foods sources of fats seems to be diminished in participation and this may be particularly questionable due to the extensive literature that exposes the need to review the consumption of polyunsaturated fatty acids in vegans (34, 35). Although the oil was reported as a product of daily consumption, other vegetable sources of AGP such as flaxseed, frequent in other consumption studies (34, 36), do not appear in the present research as an important part of the diet.

The vegetarians showed a fairly balanced structure, but perhaps the discussion of it should be oriented to the quality of the foods used. An important group of its members report low frequencies of consumption for seeds, legumes and fruits, half regularly consume soft drinks and sugar is among the main most consumed foods. The use of other sweeteners, natural or non-nutritive, does not seem to be an option for this group, unlike vegans who eventually report the use of natural stevia or panela leaves. In the same way as for vegans, the quality of fats with respect to the sources of AGP does not seem to be resolved in the consumption structure obtained.

Although the group of flexitarians includes all the food groups considered within the structure of their diet, this broader offer has not allowed them to achieve a more harmonious consumption and closer to the guide for the Venezuelan population. The fish-vegetarian model developed by most of its participants, manages to guarantee not only the quantity but the best biological quality in terms of proteins and fatty acids. But this contrasts with the low presence of important food groups, especially seeds, legumes, and fruits, which are diet quality problems that are also characteristic of omnivorous diets at the local and national level (32). In the same way, it is comparable to the food consumption pattern of the general Venezuelan population due to the large share of industrialized food, soft drinks, dehydrated cubes, sauces and industrial pastries (32).

The heterogeneity is very great regarding the use of the same food among each group studied according to their diet. Although the most consumed cereal is rice for all the diets studied, the presence of wheat is also important in all these groups. However, its utilitarian sense represents very different, even antagonistic, dietary concepts. While flexitarians consume it ultra-refined in the form of bread,

pastries and pasta; Vegans use wheat flour almost exclusively to prepare the "gluten meat", extracted from it, in an artisanal way.

This research contributes to making visible those differences, numerous and significant, that exist within a related food group but that are not homogeneous. For this reason, considering these differences is circumstantial for these groups to intervene, either with a food offer or nutritional education; adapting the plans to the multiple differentiated groups would be a more successful strategy than starting from the assumption that all "vegetarians" are equal. In the same way, this characterization described, heterogeneous but inclusive at the same time in the ways of “being” vegetarian, has implications for food producers and sellers, who have an enormous challenge to adapt their strategies to new trends in food and consumption (37).

Conclusion

In general, the sample evaluated and categorized into vegans, vegetarians and flexitarians, allowed to show that qualitatively it is possible to adequately structure the diet according to the feeding guidelines for the Venezuelan population without the use of meat.

The vegetarian proposal, without meat but which included animal derived foods such as eggs, dairy products and honey, was the most adjusted to the guidelines; far exceeding the structures of the vegan and flexitarian diets.

The enormous variety of plant foods that make up the diets studied would eventually guarantee a very adequate supply of both macronutrients, as well as vitamins, minerals and dietary fiber to its users. However, since they come mainly or only from plant sources, the bioavailability and quality of some of these nutrients may require special attention.

Although the participants in this study belong to middle and high socioeconomic strata, with a good educational level and facilities to access information; In a significant proportion, they are still unaware of foods and fundamental strategic combinations to better adapt their eating style. Particularly in the case of legumes, fruits and especially seeds, they show very infrequent consumption, becoming the axis of the challenge of any focused nutritional education program.

These results can also be the basis for promoting the nutritional advantages of a greater and better consumption of foods of plant origin aimed at the general population, by dispelling doubts about the real possibility of accessing all the groups of nutrients necessary for an adequate diet of through a vegetarian diet.

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Authors contribution

Both authors have participated in all the research and writing of the manuscript.

Interest conflict

The authors declare no conflict of interest in the writing of this manuscript.

References

1. Puiggròs Llop C. Dieta Vegetariana. En: J. Salas-Salvadó (Ed.), Nutrición y dietética clínica. España: Elsevier Masson; 2008, 465-477 pp.
2. Brignardello GJ, Heredia PL, Ocharán SMP, Durán AS. Food knowledge of chilean vegetarians and vegans. Revista Chilena de Nutrición.2013; 40(2): 129-34. Disponible en: http://dx.doi.org/10.4067/S0717-75182013000200006
3. Parker HW, Vadiveloo MK. Diet quality of vegetarian diets compared with nonvegetarian diets: A systematic review. Nutrition Reviews. 2019; 77(3): 144-60. Disponible en: https://doi.org/10.1093/nutrit/nuy067
4. Orellana LM, Sepúlveda JA, Denegri M. Significado psicológico de comer carne, vegetarianismo y alimentación saludable en estudiantes universitarios a partir de redes semánticas naturales. Revista mexicana de trastornos alimentarios. 2013; 4(1): 15-22. Disponible en: http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S2007-15232013000100002&lng=es&tlng=es
5. González Saura, V. Análisis de los efectos, beneficios y perjuicios de una dieta vegetariana en deportistas (Trabajo final de máster);2018. Universitat de les Illes Balears, España.
6. Labbé Yáñez, D. El auge del veganismo en Chile. El Ciudadano; 2016 [citado 26 de febrero de 2021]. Disponible en: https://www.elciudadano.com/reportaje-investigacion/el-auge-del-veganismo-en-chile/01/09/
7. Melina V, Craig W, Levin S. Position of the Academy of Nutrition and Dietetics: Vegetarian Diets. Journal of the Academy of Nutrition and Dietetics. 2016; 116 (12): 1970-1980. Disponible en: https://doi.org/10.1016/j.jand.2016.09.025
8. Rosi A, Mena P, Pellegrini N, Turroni S, Neviani E, Ferrocino I, et al. Environmental impact of omnivorous, ovo-lacto-vegetarian, and vegan diet. Scientific Reports. 2017; 7(1): 6105. Disponible en: https://doi.org/10.1038/s41598-017-06466-8
9. Chai BC, Van der Voort JR, Grofelnik K, Eliasdottir HG, Klöss I, Pérez-Cueto FJA.Which Diet Has the Least Environmental Impact on Our Planet? A Systematic Review of Vegan, Vegetarian and Omnivorous Diets. Sustainability. 2019; 11(15): 4110. Disponible en: https://doi.org/10.3390/su11154110
10. Le LT, Sabaté J, Singh PN, Jaceldo-Siegl K. The Design, Development and Evaluation of the Vegetarian Lifestyle Index on Dietary Patterns among Vegetarians and Non-Vegetarians. Nutrients. 2018; 10(5): 542. Disponible en: https://doi.org/10.3390/nu10050542
11. Kahleova H, Levin S, Barnard N. Cardio-metabolic benefits of Plant-based diets. Nutrients. 2017; 9(8): 848. Disponible en: https://doi.org/10.3390/nu9080848

12. Rojas Allende D, Figueras Díaz F, Durán Agüero S. Ventajas y desventajas nutricionales de ser vegano o vegetariano. Revista Chilena de Nutrición. 2017; 44(3): 218-225. Disponible en: http://dx.doi.org/10.4067/s0717-75182017000300218
13. Dinu M, Abbate R, Gensini GF, Casini A, Sofi F. Vegetarian, vegan diets and multiple health outcomes: A systematic review with meta-analysis of observational studies. Critical Reviews in Food Science and Nutrition. 2017; 57(17): 3640-3649. Disponible en: https://doi.org/10.1080/10408398.2016.1138447
14. Menzel J, Jabakhanji A, Biemann R, Mai K, Abraham K, Weikert C. Systematic review and meta-analysis of the associations of vegan and vegetarian diets with inflammatory biomarkers. Scientific Reports. 2020; 10: 21736. Disponible en: https://doi.org/10.1038/s41598-020-78426-8
15. Pilis W, Stec K, Zych M, Pilis A. Health benefits and risk associated with adopting a vegetarian diet. Rocz Państwowego Zakładu Hig. 2014; 65(1): 9-14. Disponible en: https://pubmed.ncbi.nlm.nih.gov/24964573/
16. Sebastiani G, Herranz Barbero A, Borrás Novell C, Alsina Casanova M, Aldecoa Bilbao V, Andreu Fernández V, et al. The Effects of Vegetarian and Vegan Diet during Pregnancy on the Health of Mothers and Offspring. Nutrients. 2019; 11(3): 557. Disponible en: https://doi.org/10.3390/nu11030557
17. Martínez Biarge, M. Niños vegetarianos, ¿niños sanos?. En: AEPap (ed.). Congreso de Actualización Pediatría 2019. España: Lúa Ediciones; 2019, 65-77 pp.
18. Centre de recherche pour l'étude et l'observation des conditions de vie. Combien de végétariens en Europe? Synthèse des résultats à partir de l'étude “Panorama de la consommation végétarienne en Europe”;2019[citado 21 de diciembre de 2020].Disponible en: https://www.franceagrimer.fr/Actualite/Filieres/Viandes-rouges/2019/Conference-au-Sommet-de-l-Elevage-evolution-de-la-consommation-de-viande-et-panorama-du-vegetarisme-en-Europe
19. Oregon State University. Why do people become vegans/vegetarians? Survey says: all of the above; 2011 [citado 9 de enero de 2021]. Disponible en: https://today.oregonstate.edu/archives/2011/aug/why-do-people-become-vegans-and-vegetarians-survey-says-%E2%80%93-all-above
20. Ruby M. Vegetarianism. A blossoming field of study. Appetite. 2012; 58 (1): 141–150. Disponible en: https://doi.org/10.1016/j.appet.2011.09.019
21. Hrynowski Z. What Percentage of Americans Are Vegetarian?; 2019 [citado 11 de enero de 2021]. Disponible en: https://news.gallup.com/poll/267074/percentage-americans-vegetarian.aspx
22. Hargreaves SM, Araújo WMC, Nakano EY, Zandonadi RP. Brazilian vegetarians diet quality markers and comparison with the general population: A nationwide cross-sectional study. Plos One. 2020; 15(7): e0235991. Disponible en: https://doi.org/10.1371/journal.pone.0235991
23. Gross K. Israel: vegan capital of the world. Kedma: Penn´s Journal on Jewish Thought, Jewish culture, and Israel. 2018; 2 (4): 6-25. Disponible en: https://repository.upenn.edu/cgi/viewcontent.cgi?article=1043&context=kedma
24. OCDE/FAO. OCDE-FAO Perspectivas Agrícolas 2013-2022; 2013 [citado 15 de mayo de 2021]. Disponible en: http://dx.doi.org/10.1787/agr_outlook-2013-es
25. Tesfamarian T. 4 world cultures and religions that embrace plant-based eating; 2020 [citado 13 de mayo de 2021]. Disponible en: https://www.greenpeace.org.uk/news/world-cultures-and-religions-plant-based-vegetarian-vegan-diet/
26. Méndez H. Método de Graffar Modificado. Manual de Procedimientos. Proyecto Venezuela. Venezuela: FUNDACREDESA; 1979, 126 p.
27. United States Department of Agriculture. (2014). USDA Automated Multiple Pass Method. USDA. Agricultural Research Service. Features of AMPM; 2014 [citado 4 de diciembre de 2020].Disponible en: http://www.ars.usda.gov/News/docs.htm?docid=7710
28. Instituto Nacional de Nutrición. Tabla de composición de los alimentos (Revisión 2012). Venezuela: Gente de Maíz; 2015, 187 p.
29. Trompo de los Alimentos, del Instituto Nacional de Nutrición. Serie Nutriendo Conciencias para Vivir Bien. Venezuela: Gente de Maíz; 2014, 98 p.
30. Bravo JP, Ibarra CJ, Paredes MM. Compromiso neurológico y hematológico por déficit de vitamina B12 en lactante hijo de madre vegetariana. Caso Clínico. Revista Chilena de Pediatría. 2014; 85(3): 337-43. Disponible en: https://scielo.conicyt.cl/pdf/rcp/v85n3/art10.pdf
31. Sánchez Mendoza B, Flores Villalba S, Rodríguez Hernández E, Anaya Escalera AM, Contreras Contreras EA. Causas y consecuencias del cambio climático en la producción pecuaria y salud animal. Revisión. Revista mexicana de ciencias pecuarias. 2020; 11(Supl. 2): 126-145.Disponible en: https://doi.org/10.22319/rmcp.v11s2.4742
32. Ekmeiro Salvador J, Moreno Rojas R, García Lorenzo M, Cámara Martos F. Patrón de consumo de alimentos a nivel familiar en zonas urbanas de Anzoátegui, Venezuela. Nutrición Hospitalaria. 2015; 32(4):1758-1765. Disponible en: https://doi.org/10.3305/nh.2015.32.4.9404
33. Bakaloudi DR, Hallora A, Rippin HL, Oikonomidou AC, Dardavesis TI, Williams J, Wickramasinghe, K, Breda J, Chourdakis M. Intake and adequacy of the vegan diet. A systematic review of the evidence. Clinical Nutrition. 2020; Article in Press. Disponible en: https://doi.org/10.1016/j.clnu.2020.11.035
34. Burns-Whitmore B, Froyen E, Heskey C, Parker T, San Pablo G. Alpha-Linolenic and Linoleic Fatty Acids in the Vegan Diet: Do They Require Dietary Reference Intake/Adequate Intake Special Consideration?. Nutrients. 2019; 11(10):2365. Disponible en: https://doi.org/10.3390/nu11102365
35. Rose SD, Strombom AJ.Ensuring Adequate Essential Fatty Acid Status in Vegetarians and Vegans. Advanced Research in Gastroenterology Hepatology. 2020; 15(1): 555897. Disponible en: 10.19080/ARGH.2020.15.555897
36. Molina-Peralta A, Mach N. Alimentos ricos en ácidos grasos v-3 libres de contaminantes y aptos para vegetarianos, y su importancia en el desarrollo neurológico normal. Revista Española de Nutrición

Humana y Dietética. 2014; 18 (2):89-99.Disponible en:https://doi.org/10.14306/renhyd.18.2.26
37. Ion RA. Reasons why people turn to vegetarian diet. AgEcon Search. 2007; 54 (3): 353-358. Disponible en: https://ageconsearch.umn.edu/record/245701