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Market study for the introduction of a nutraceutical product with anti-metabolic syndrome properties derived from an orchid in Mexico City

Estudio de mercado para la introducción de un producto nutracéutico con propiedades anti-síndrome metabólico a partir de una orquídea en la Ciudad de México

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Market study for the introduction of a nutraceutical product with anti-metabolic syndrome properties derived from an orchid in Mexico City

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Abstract

The Mexican population, especially in Mexico City, has high rates of cardiovascular disease due to excessive consumption of unhealthy products, particularly among adults. Therefore, this research aimed to conduct a market study to introduce a nutraceutical product with anti-metabolic syndrome properties, derived from an orchid, in Mexico City. A descriptive and analytical method was used, employing questionnaires administered to 138 people with cardiovascular disease who were treated at both public and private health centers. The results show that housewives, largely unintentionally or through ignorance, contribute to the increase in these pathologies by prioritizing dairy products over functional foods in the family diet. Consequently, awareness-raising measures aimed at caregivers are recommended to highlight the benefits of functional foods, along with improvements in product characteristics, such as labels with relevant information, better taste, and varied presentations, taking advantage of their lower price compared to traditional foods.

Keywords: cardiovascular diseases, care, government, patients, health

Resumen

La población mexicana, especialmente la de la Ciudad de México, presenta altos índices de enfermedades cardiovasculares debido al consumo excesivo de productos perjudiciales para la salud, sobre todo entre adultos. Por ello, esta investigación tuvo como objetivo realizar un estudio de mercado para introducir un producto nutracéutico con propiedades antisíndrome metabólico, derivado de una orquídea, en la Ciudad de México. Se empleó un método descriptivo y analítico mediante cuestionarios aplicados a 138 personas con enfermedades cardiovasculares, atendidas tanto en centros públicos como privados de salud. Los resultados muestran que las amas de casa, en gran medida de forma involuntaria o por desconocimiento, contribuyen al incremento de estas patologías al priorizar productos lácteos sobre alimentos funcionales en la alimentación familiar. En consecuencia, se recomiendan medidas de sensibilización dirigidas a las cuidadoras para destacar las bondades de los alimentos funcionales, junto con mejoras en las características del producto, como etiquetas con información relevante, mejor sabor y presentaciones variadas, aprovechando su precio inferior al de los alimentos tradicionales.

Palabras clave: enfermedades cardiovasculares, cuidado, gobierno, pacientes, salud

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1. Introduction

The 21st century has been marked by the prevalence of conditions that cause cardiovascular disease (CVD), such as obesity, hypertension, and diabetes mellitus, among others. According to the World Health Organization (OMS, 2025), one in eight people is obese. Consequently, 2.5 billion adults (aged 18 and older) were overweight, of whom 890 million were obese. In 2015, Montenegro Herrera et al. (2024) reported that, in Colombia, the prevalence of overweight adults aged 18 to 64 was 37.7% and that of obesity was 18.7%. Regarding hypertension, it was estimated that this condition had a prevalence of 24% in the general population and that it increased with age, standing at 4.6% among adults aged 18 to 24, 22.3% among those under 50, and rising to 51.6% among those aged 50 and older.

In Mexico, Arreola-Ornelas et al. (2023) found that overweight and obesity pose significant health challenges for the population, caused by both internal and external factors. In 2021, 77% of deaths were attributed to diseases caused by obesity and overweight, with 118,000 deaths linked to a high body mass index (BMI). To address and counteract the excessive rise in these diseases, Palacio Vásquez (2014) proposed strict diets to maintain a healthy weight and lose weight. However, the results have not met expectations. Another proposal was the introduction of *nutraceuticals.* These are gaining greater prominence in other societies, such as the United States of America. In this regard, the food-medicine interaction is increasingly accepted due to the non-nutritive compounds included in the formulations of certain foods that serve to prevent or delay chronic diseases in the adult population (González Aldrete, 2003).

Given the above, there is an urgent need to conduct a market study to determine the level of market penetration or acceptance of a *nutraceutical* product derived from an orchid and possessing anti-metabolic syndrome properties in Mexico City. Following the introduction, a literature review was conducted on *nutraceuticals* and their importance in preventing or delaying chronic diseases in the adult population.

1.1. Nutraceutical products with anti-metabolic syndrome properties

CVD remains the leading cause of death worldwide, including in Mexico. These conditions involve changes in the heart and blood vessels, affecting the brain, kidneys, and lower limbs. They also include hypertension, atherosclerosis, coronary heart disease, and cerebrovascular events (Gobierno de México, 2016). According to the National Institute of Statistics and Geography ([INEGI] 2025), heart disease, diabetes mellitus, malignant tumors, influenza combined with pneumonia, and liver disease were the top five causes of death in Mexico. Given this, it can be inferred that heart disease is the leading cause of death in the country.

In 2023, CVD caused the deaths of 97,328 people, of whom 177,000 died from myocardial infarction. In 2025, 121,427 deaths were attributed to CVD, accounting for approximately 19% of all deaths nationwide. In

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Mexico, evidence accumulated over the past two decades has shown that obesity-related diseases have had a significant impact on mortality rates, disability, and premature deaths. This epidemiological trend has led to obesity no longer being viewed solely as an individual clinical condition but rather as one of the most pressing structural challenges to national public health.

In this context, Fajardo Dolci et al. (2023) noted that cerebrovascular diseases not only top the mortality statistics but also represent a significant economic burden on the healthcare system. Among the leading causes are hypertensive heart disease, ischemic heart disease, intracerebral and subarachnoid hemorrhages, as well as ischemic stroke. The authors identified changes in trends by sex, a higher concentration of deaths among people aged 80 and older, and a particularly high incidence in regions in the northern part of the country.

Given this situation, it is necessary to rethink public policy regarding the prevention and control of risk factors. Government investment must be directed toward strategies that promote healthy aging and reduce premature mortality associated with CVD. Although there are programs promoted by public and private entities, these have prioritized reactive interventions. Despite the rhetoric emphasizing the importance of prevention, the adoption of a comprehensive and systemic approach that addresses the root causes remains limited, which explains the lack of significant results achieved so far (González Aldrete, 2003). In a survey conducted by González Aldrete (2003), significant interest in nutraceutical products was identified in the Guadalajara metropolitan area, Mexico, particularly among housewives from different socioeconomic levels. This interest is linked to their concern for their own health and well-being and that of their families.

In this regard, healthy eating has taken center stage due to its link to well-being and the prevention of various diseases (Rico & Martín Diana, 2023). Regarding diseases, Dama et al. (2024) noted the growing prevalence of cardiovascular and metabolic disorders, which are often characterized by oxidative stress and chronic inflammation. This poses significant challenges to global health. Advances in understanding the pathophysiology of chronic noncommunicable diseases have positioned diet, healthy lifestyles, and self-care as key preventive measures. This reflects, in part, the search for therapeutic alternatives that are safer and less invasive than conventional pharmacotherapy (Rojas Jiménez et al., 2015).

Given that traditional therapeutic approaches are sometimes insufficient for managing these conditions, nutraceuticals are receiving increasing attention worldwide. These supplements have beneficial effects on physiological functions and disease treatment. Based on the above analysis, it is a priority to develop innovative strategies to address overweight, obesity, and their comorbidities. In this context, nutraceuticals have gained prominence as a dietary alternative due to their contribution of bioactive compounds with potential health benefits (García Cordero et al., 2020).

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Consequently, Bumrungpert et al. (2020) stated that *nutraceuticals* can improve glycemic control, insulin resistance, lipid profiles, and markers of oxidative stress in hyperglycemic subjects. Therefore, they have the potential to reduce risk factors for cardiovascular disease. However, the increasing consumption of these supplements has raised questions within the medical community regarding their actual composition, as well as the physiological and adverse effects these products may have on the general population. In this regard, Dama et al. (2024) noted that various *nutraceuticals* widely available in Mexico have demonstrated efficacy in preventing cardiovascular complications, particularly in the management of dyslipidemia. Their dissemination and informed incorporation into the diet could contribute to improving quality of life and reducing cardiovascular risk.

On the other hand, Vera Guerrero et al. (2019) noted that nutrigenomics, as a subdiscipline of genomics, studies the mechanisms by which *nutraceuticals* interact with gene expression and modulate biological processes. This approach supports the development of personalized nutrition strategies aimed at preventing chronic diseases, including cardiovascular diseases. Regarding the composition of the products, Dama et al. (2024) noted that compounds derived from natural sources can complement and, in some cases, replace pharmacological treatments, especially in individuals who do not meet the criteria for conventional pharmacological treatments. This review explored the field of *nutraceuticals*-based pharmacological modulation as a promising strategy for mitigating oxidative stress and inflammation in cardiometabolic disorders.

Building on the above, Vignesh et al. (2024) noted that, in recent years, functional foods have gained prominence due to their potential health benefits, as they go beyond basic nutrition and serve as a rich source of protein, carbohydrates, vitamins, and dietary fiber. Enriched with bioactive compounds such as polyphenols, tannins, flavonoids, and alkaloids, these foods have shown promise in inhibiting cellular signaling pathways related to proliferation, communication, and apoptosis; key components of functional foods offer health benefits.

According to Nichols and Brown (2002), patients with cardiovascular disease incur more than twice the medical costs compared to patients of the same age and sex without cardiovascular disease. Therefore, cardiovascular care is expensive. As a result, policymakers must implement radical changes, as the Indian government did when it introduced sweeping policy reforms in the delivery of health care services (Kumar et al. 2022).

2. Method of research

The study employed a quantitative approach with a descriptive scope, as the respondents' answers were presented graphically using basic statistics. Finally, a questionnaire with screening questions and a survey technique were

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used. The population consisted of a group of individuals with CVD, aged 18 to 80, located in various parts of the country's capital, including health centers and clinics in both the public and private sectors.

Given that it is impossible to precisely define a population, we opted for snowball sampling, which involves contacting potential participants who, in turn, invited others to join the study until a sample of 138 participants was reached. The research was conducted in two stages. The first stage involved developing the research instrument, which included formulating the questions and operationalizing the variables and their dimensions to be studied. In the second stage, the validity of the instrument was evaluated.

2.1. Development of the data collection tool

After defining the sample, items were selected from various measurement tools and options related to anti-metabolic syndrome properties based on a sample of individuals with CVD. The instrument included six questions to identify the subjects of analysis and 18 items on a Likert scale, all regarding the ability to introduce a *nutraceutical* product with anti-metabolic syndrome properties derived from an orchid for a population with CVD. Specifically, seven items were part of the existing products dimension, and eleven items were part of the new product dimension (product that is planned/wished to be introduced). (Table 1).

Table 1
Description of variables and items

Variables	Items
General information	1, 2, 3, 4, 5 y 6
Existing products	7, 8, 9, 10, 11, 12 y 13
Possible new product	14, 15, 16, 17, 18, 19, 20, 21, 22, 23 y 24

The final version of the instrument was based on the instrument validated by González Aldrete (2003), with certain questions modified. The survey was administered both in person and electronically via the *SurveyMonkey Online Google Forms* platform. The survey was administered to individuals who met the inclusion criteria for this study at the designated study sites.

2.2. Judge-based validation format

The validity results include the validity index and the most important observations made by the judges. On the one hand, content validity measured the consistency of the questions with the stated objective. The final value was found to be 91.6% (Table 2).

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Table 2
Content validity (consistency)

Item	Judge 1	Judge 2	Judge 3	Concurrence
1	1	1	1	1
2	1	1	1	1
3	1	1	1	1
4	1	1	1	1
5	1	1	1	1
6	1	1	1	1
7	1	1	1	1
8	1	1	1	1
9	1	0	1	1
10	1	1	1	1
11	0	0	1	0
12	0	0	1	0
13	1	1	1	1
14	1	1	1	1
15	1	1	1	1
16	1	1	1	1
17	1	1	1	1
18	1	1	1	1
19	1	1	1	1
20	1	1	1	1
21	1	1	1	1
22	1	1	1	1
23	1	1	1	1
24	1	1	1	1

On the other hand, the analysis of the essays and the judges' scores yielded a score of 83.3% (Table 3). The overall validity index is 87%, indicating that the instrument is optimal for measuring social science events (Hurtado Barrera, 2012). It is important to note that the analysis was conducted in *r* language and all the data used (*Comma-Separated Values* [CSV] files) were synthesized.

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Table 3
Editing of the items

Item	Judge 1	Judge 2	Judge 3	Concurrence
1	1	1	1	1
2	1	1	1	1
3	1	1	1	1
4	1	1	1	1
5	1	1	1	1
6	1	1	1	1
7	1	1	1	1
8	1	1	1	1
9	0	0	1	0
10	1	1	1	1
11	1	0	0	0
12	1	0	0	0
13	0	0	1	0
14	1	1	1	1
15	1	1	1	1
16	1	1	1	1
17	1	1	1	1
18	1	1	1	1
19	1	1	1	1
20	1	1	1	1
21	1	1	1	1
22	1	1	1	1
23	1	1	1	1
24	1	1	1	1

3. Results

3.1. General information

The general data outline the key characteristics of the respondents. This section is divided into two parts.

3.1.1. Illness-Gender-Hospital

It was found that diabetes was the most commonly reported condition at 15.21%, followed by hypertension at 11.59% and high cholesterol at 9.42% (Figure 1). Additionally, 57.7% of the respondents were men and 40.9% were women (Figure 2). Finally, it was observed that 38.5% of respondents receive care at a private specialty clinic and 22.9% at a public clinic specializing in comprehensive diabetes management (Figure 3).

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Figure 1
Cardiovascular disease

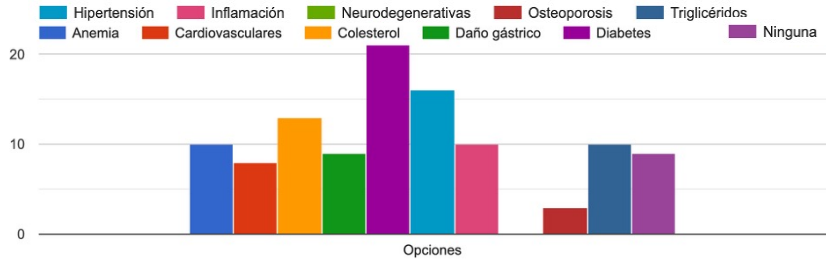


Figure 2
Gender of participants

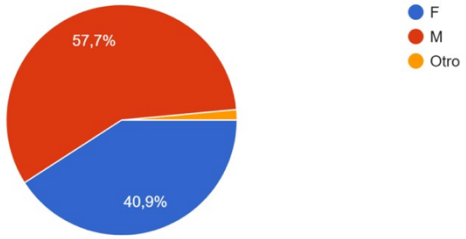
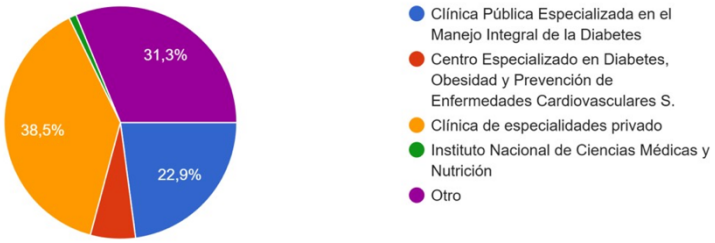


Figure 3
Hospital where the patient receives treatment



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3.1.2. Age-Occupation-Income

It was found that 50% of the respondents were at least 56 years old. This indicates that NCDs have economic implications for the healthcare system, as they affect older adults (Figure 4). In addition, it was found that 50% of the respondents were professionals or self-employed (Figure 5). As a result, 63.2% of participants earn more than 3,001 Mexican pesos per month (Figure 6).

Figure 4
Age of participants

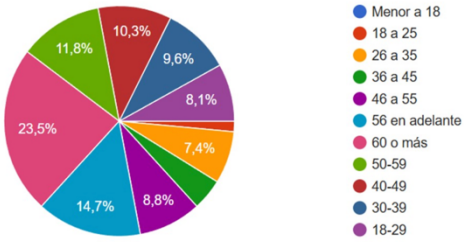


Figure 5
Participants' current occupation

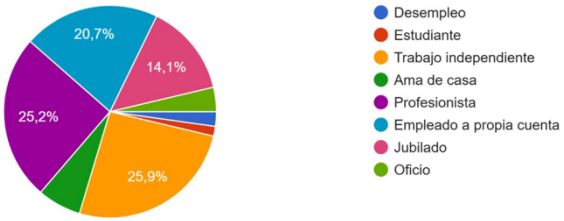
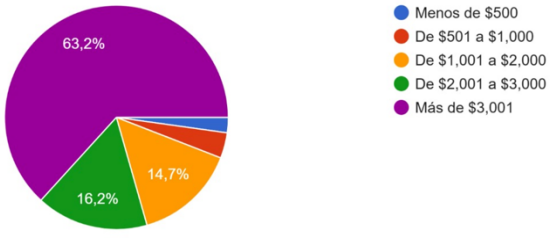


Figure 6
Participants' income



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3.2. Food consumption

In the second subsection, it was found that more than 50% of respondents stated that the homemaker is responsible for the patient's diet, while only 20.6% are responsible for what they consume (Figure 7). In this regard, 56.9% do not consume any branded foods to prevent or cure an illness (Figure 8). On the other hand, 67.1% consume dairy products such as *Yakult*, milk, and *Greek yogurt* (Figure 9).

Figure 7
Responsible for preparing meals

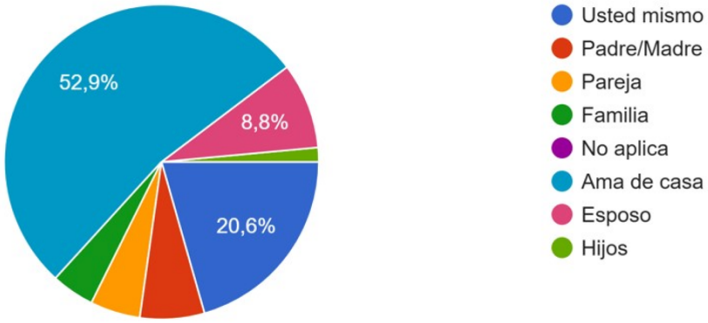

Figure 8
Eating certain foods to prevent or cure a disease

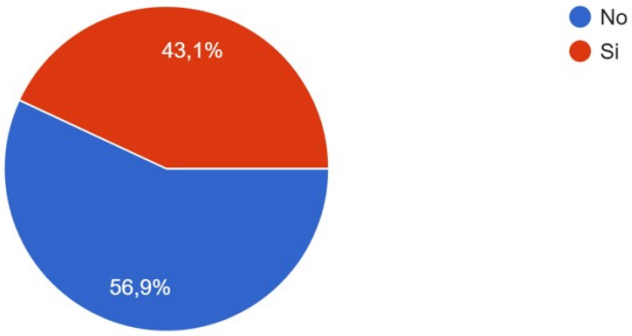

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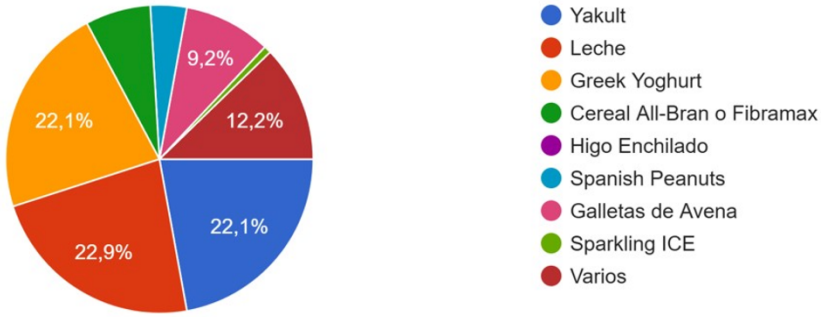
Figure 9
Products consumed to prevent or cure a disease



3.3. Food quality

The survey found that nearly 50% of the sample spends one-sixth of their monthly income on food to improve their health (Figure 10). Of this amount, 67.7% are willing to pay up to $80 for a product that benefits their health (Figure 11).

Figure 10
Monthly expenses

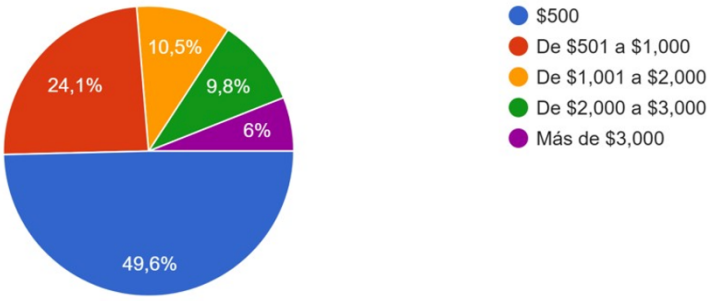


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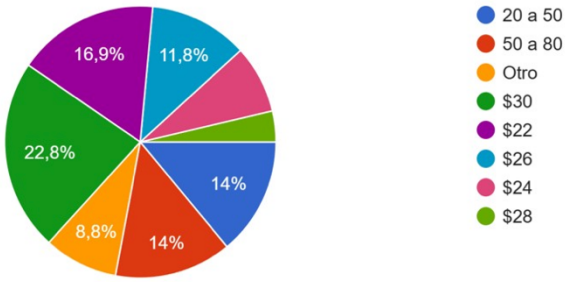
Figure 11
The price respondents are willing to pay for a product that benefits their health



3.4. Food availability

On the other hand, the survey found that nearly 50% of respondents would prefer to purchase the product at supermarkets and self-service stores (Figure 12). It also found that nearly 50% of participants are willing to buy the products on a regular basis (Figure 13).

Figure 12
Place where participants purchase these types of products

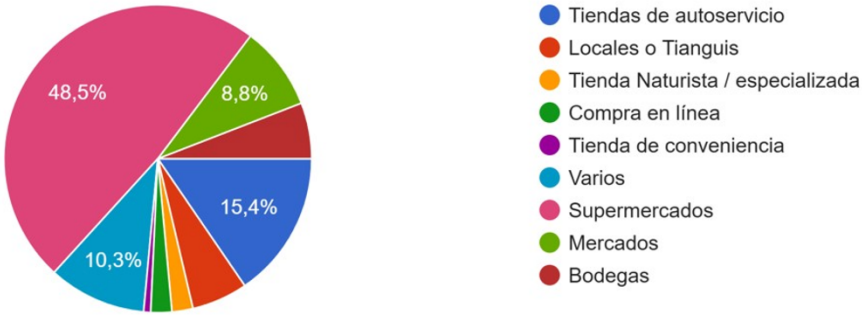


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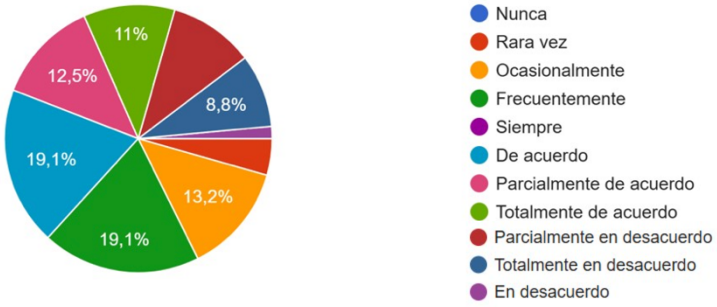
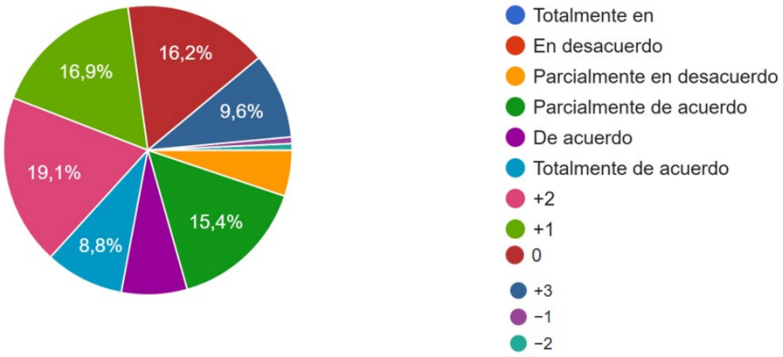
Figure 13
Willingness of respondents to purchase nutraceutical foods



3.5. Promotion of nutraceutical products

Regarding the ability of *nutraceuticals* to prevent or cure CVD, nearly 31% *disagree*. On the other hand, 32% *agree* (Figure 14).

Figure 14
Respondents' views on whether nutraceutical foods prevent or cure CVD



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In addition, it was found that 72.8% of participants believe that *nutraceutical* foods do not have pleasant flavors or come in a variety of forms (Figure 15). It was also found that 74.1% believe that nutraceutical foods are not suitable for people of all ages (Figure 16). Furthermore, it was found that 74.2% believe that nutraceutical foods are not easy to prepare and consume (Figure 17).

Figure 15

Participants' opinions on the taste and presentation of nutraceutical foods

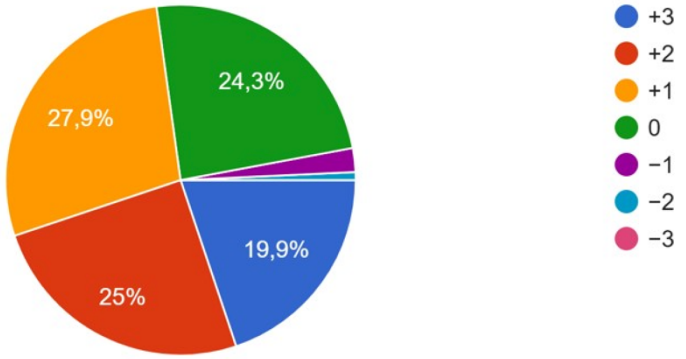

Figure 16

Participants' views on the age at which nutraceutical foods are consumed

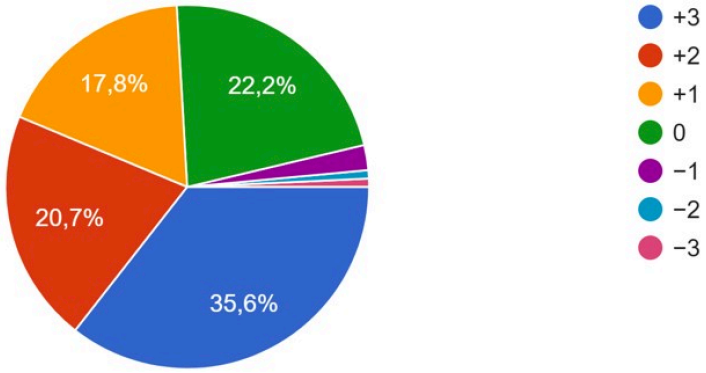

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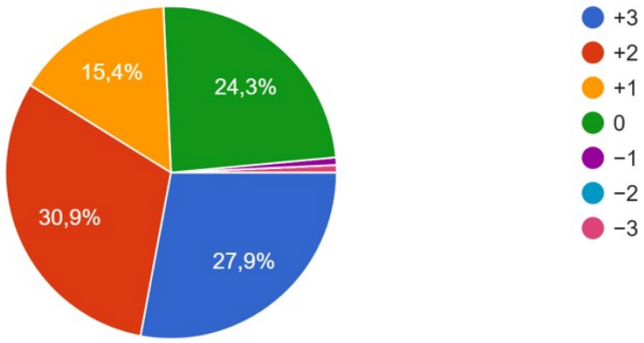
Figure 17
Ease of preparation and consumption of nutraceutical foods



72.8% felt that the labels on *nutraceutical* foods do not provide clear information about benefits, nutrition, and usage instructions (Figure 18). On the other hand, most participants noted that *nutraceutical* foods are less expensive than conventional foods (Figure 19). Although respondents stated that they wanted to purchase products at self-service stores (15.4%), the reality is that 77.7% mentioned that *nutraceutical* foods cannot be purchased at self-service stores. This highlighted a problem with product availability for customers (Figure 20).

Figure 18
Nutrition Facts

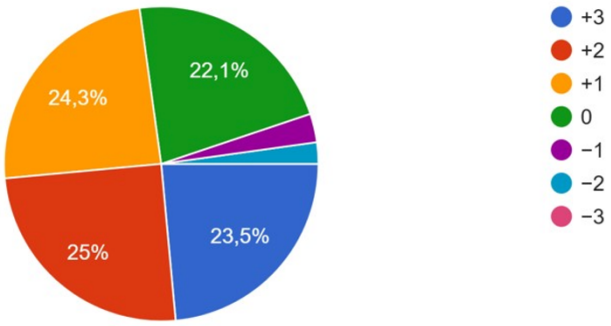


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Figure 19

Price Comparison Between Nutraceutical Foods and Conventional Foods

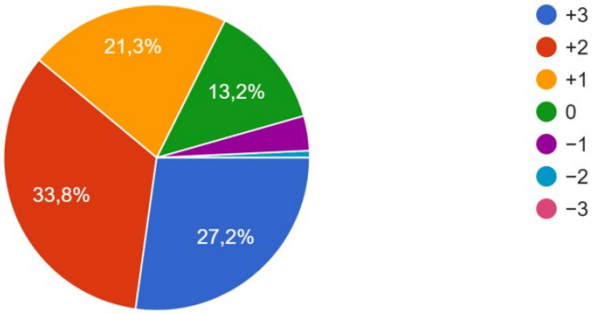
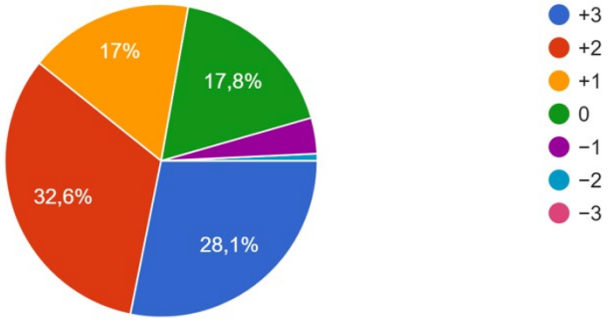


Figure 20

Thoughts on purchasing nutraceutical foods at supermarkets



On the other hand, the survey found that 63.6% of participants disagree that *nutraceutical* foods require refrigeration (Figure 21). Similarly, 76.5% felt that the packaging of *nutraceutical* foods is impractical (Figure 22). Furthermore, it was found that 79.6% disagree that nutraceutical foods should be fresh and easily accessible (Figure 23).

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Figure 21
Refrigeration of nutraceutical foods

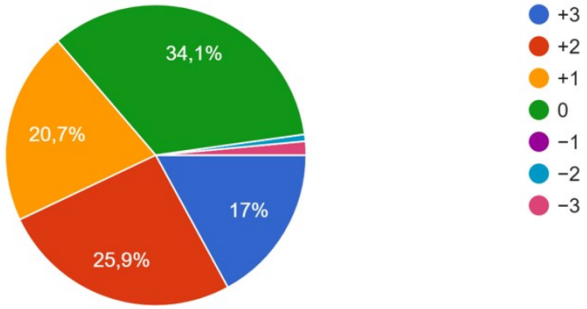


Figure 22
Ergonomics of nutraceutical food packaging

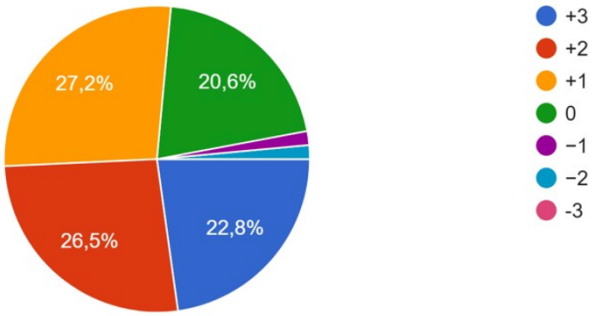
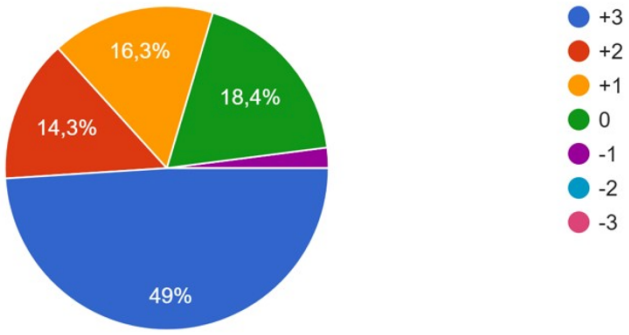


Figure 23
The importance of nutraceutical foods being fresh and easily accessible



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4. Discussion

The study's overall data showed that diabetes, as a CVD, is the most commonly reported condition nationwide. Most patients receive care at a public clinic specializing in comprehensive diabetes management. These findings are consistent with those of Fajardo Dolci et al. (2023), who argue that CVDs are the leading cause of death among people over 80 years of age. In Mexico, one of the many causes of CVD is attributed to homemakers, specifically their lack of experience and training in caregiving. This leads them to make poor food choices for their sick family members. According to INEGI (2025), heart disease, diabetes mellitus, malignant tumors, influenza in conjunction with pneumonia, and liver disease were the top five causes of death in Mexico.

With regard to the foods consumed by the patients, dairy products such as *Yakult*, milk, and *Greek yogurt* are consumed by 67.1% of the participants and are considered healthy foods. This contrasts with the findings of Vignesh et al. (2024), who stated that, in recent years, *nutraceuticals* have gained significant importance due to their potential health benefits, as they are a rich source of protein, carbohydrates, vitamins, and dietary fiber. These foods have shown promise in inhibiting cellular signaling pathways related to proliferation, communication, and apoptosis.

Subsequently, the ability of nutraceutical foods to prevent and treat various CVDs was identified. This finding contradicts the findings of García Cordero et al. (2020), who noted that *nutraceuticals* have become a dietary tool of great importance due to their composition of bioactive compounds that promote the well-being of the general population.

5. Conclusions

The rationale for this study stems from concerns about the rise in noncommunicable diseases in Mexico, particularly in Mexico City. The aim is to investigate the level of acceptance of nutraceutical foods with anti-metabolic syndrome properties, derived from a local orchid, in an area with high rates of noncommunicable diseases such as obesity and diabetes.

The results reveal that these foods lack appealing flavors and varied presentations; they are not suitable for all age groups, are difficult to prepare and consume, and their labels do not provide clear information on nutritional benefits or required care. Furthermore, they are difficult to find or unavailable in supermarkets, require refrigeration, and their packaging lacks practical ergonomics. However, respondents disagree on whether they should be fresh and free of preservatives.

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For their introduction in the capital—at least in the sample studied—it is recommended to step up marketing efforts to raise awareness and familiarize consumers with these products, as well as to expand their distribution, given their affordable price compared to conventional foods. This would make them more accessible to households with varying or similar incomes, thereby promoting the health and well-being of entire families. It is essential to increase the number of retail outlets—such as supermarkets, shopping malls, small stores, pharmacies, and others—given the emerging growth of the market driven by products imported from the United States. A major limitation lies in the sample size (138 people), which is insufficient to generalize conclusions; therefore, future studies should expand it..

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