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FINANCIAL AND ORGANOLEPTIC ANALYSIS OF THE PROJECT: TORTILLA-TYPE PRODUCT WITH HIGH PROTEIN CONTENT TO IMPROVE THE HEALTH OF THE POPULATION AND CONTRIBUTE TO THE ACHIEVEMENT OF ODS 1, 2 AND 3

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Abstract: The analysis was carried out at the Technological University of Tula - Tepeji in coordination with the Academic Body of Administrative Accounting and Fiscal Models (MACOFI), where it was possible to obtain tortillas fortified with mesquite flour, but there is no organoleptic study to provide us with the degree of acceptance by consumers. Its financial status is also unknown. The study presents 2 stages: I) Organoleptic study where a closed Likert scale questionnaire was used, directed to a representative sample of the population and the Delphi Method was used by means of an open questionnaire, applied to a group of experts and II) Financial study that supported by the flour and tortilla elaboration process, data was obtained for the integration of costs, fixed and variable expenses with data from January - March 2024.
Keywords: Tortillas, orgaoleptic, starvation, fortified

INTRODUCTION

Human beings need nutrients (food) that allow them to subsist, among which the following stand out: meats, dairy products, cereals, vegetables and fruits. And among the most important cereals in the world is corn, which provides nutritional elements and is a basic raw material in the industry and that due to various factors such as: The climatic events that affected the harvests, increased its costs. The Russian invasion of Ukraine at the end of February 2022 brought problems of shortages in the flow of wheat raw materials and other basic foodstuffs such as corn, raising their prices. The change in eating habits by acquiring more industrialized products that are harmful to health.

Mexican food is mainly based on the consumption of corn tortillas, so its acquisition, its quality, its price have been constantly affected by various international factors such as the pandemic of COVID-19, Pan American Health Organization PAHO (2020) was experienced in 2019. Without forgetting climate change, United Nations Organization UN (2023) and national factors such as shortages, crime, health (Acosta, 2017) among others that every day threatens to have a constant food insecurity.

This makes it necessary to identify alternative foods with other natural resources in the region, such as tortillas. A recent study shows that corn, wheat, sorghum, rice and soybean will reduce their yields, affecting the national economy (Estrada et al., 2022).

Climate suitability reductions of between 3.0% to 4.3% are shown in Mexico under climate change scenarios (Monterroso-Rivas et al., 2011). Subsequently, other studies using the RCP8.5 scenario projected rainfed maize yield reductions of 10% nationally with regional decreases of up to 80% (Murray-Tortarolo et al., 2018), 81.6% (Gómez Díaz et al., 2020), 84% (Arce-Romero et al., 2020), 42.6% (Estrada et al., 2022), and decreases between 0.25 or 0.5 t/ha (Ureta et al., 2020). There are authors who suggest that more than temperature, the negative impact is due to water availability and the length of the dry season, especially for rainfed maize, mainly in the northeast and south of the country (Arce-Romero et al., 2020; Murray-Tortarolo et al., 2018).

Tortillas are the basis of the Mexican diet and consequently have an impact on the Mexican economy. As of April 2023, the price paid to white corn producers was $5,210.00 per ton, 1.7% lower compared to the same month in 2022. Tortilla in 2023 was quoted at $22.33 per kilogram, which indicates a 13% increase compared to the previous year (2022). In monthly comparisons, the average rural price and the wholesale price of grain showed reductions of 7% and 1.8%, respectively, while the tortilla increased by 0.9% (2023). For many workers, this increase significantly affects their regular consumption, reducing it to a lower purchase of this complementary food, which has an impact on their health.

The tortilla is a complementary food, which has nutritional deficiencies due to incomplete proteins. Therefore, industrial and food engineering advances have driven the development of fortified tortillas. Such is the case of the tortilla product fortified with mesquite flour, which is even more beneficial to the human body because it has a greater amount of nutrients.

However, it is not known whether the product will be accepted in the market.

Therefore, in this project, an organoleptic analysis will be carried out to determine its acceptability to the population, taking into account the color, smell, flavor, appearance and texture of the tortilla fortified with mesquite flour, a natural resource that is not currently used.

A financial analysis will also be performed to determine how much it costs to produce 1 kg of flour and how much it costs to produce 1 kg of tortilla with data from January - March 2024?

CONTEXT AND PROBLEM STATEMENT

SWOT DIAGNOSIS

Through questionnaires applied to members of the MACOFI Academic Body and collaborators. As well as to other Academic Bodies of the University, Strengths, Opportunities, Weaknesses and Alternatives of the project "Financial and organoleptic analysis of the project: Tortilla type product with high protein content to influence the health of the population and contribute to the achievement of SDG 1, 2 and 3" were detected, which are presented below:

Once the SWOT Diagnosis was carried out, it was analyzed and the conclusion was reached to pay attention to the weaknesses detected in order to:

1.- To have an organoleptic study.

2.- To have a financial study.

METHODOLOGY

The methodology of the project "Financial and organoleptic analysis of the project: Tortilla-type product with high protein content to influence the health of the population and contribute to the achievement of SDGs 1, 2 and 3", **is mixed**, since **quantitative and qualitative variables are analyzed.**

Quantitative variables are mainly applied in the financial study and in the questionnaire to be applied in the organoleptic study. The qualitative variables will be applied in the organoleptic study for which the Delphi method was used.

The methodology of this project according **to the objective** is **descriptive and explanatory.** Research with a **descriptive** scope has the opportunity to specify properties, characteristics or profiles of the study groups, communities or phenomena. It focuses on measuring, quantifying or evidencing the characteristics of the object of study, and is regularly based on an exploratory type of study. Descriptive research is mainly based on techniques such as surveys, interviews, observation and documentary review Hernández (2010).

Research with an **explanatory** scope, also known as causal, is characterized by testing hypotheses and seeking conclusions that lead to the formulation or contrast of laws or principles. In this approach, the researcher seeks to study the reason for the facts, phenomena, situations or things; causes and effects of the relationship between variables are analyzed Hernández (2010).

According to the design (way of collecting information) the research will be **field** research **with quantitative variables** based on numerical measurement and statistical analysis to establish patterns of behavior and test theories, it is sequential and evidential. It makes use of logic and deductive reasoning, collects and analyzes quantitative data. Here the order is rigorous, starting from an idea that

Internal Factors	External Factors
STRENGTHS	**OPPORTUNITIES**
• The project is in progress. • It involves professional training. • The work and support team is interdisciplinary.	• The Tula - Tepeji region is home to the mesquite plant. • The population is aware of the need to eat a healthy diet, considering other alternative natural resources. • In our country we have public research centers such as: • The System of Public Research Centers (CPI) of the National Council of Science and Technology (CONACYT) is a group of 27 Mexican public scientific and technological institutions dedicated to research and teaching at a higher level in various disciplines of knowledge. They provide support to various sustainable projects.
WEAKNESSES	**THREATS**
• Fortified tortilla was obtained, but: • There is no organoleptic study to determine the degree of acceptance by consumers. • Also, its financial status is unknown: how much does it cost to produce 1 kg of flour and how much does it cost to produce 1 kg of tortilla? To consider whether the product (mesquite flour tortilla) is competitive.	• Mesquite trees can be infected by various pests such as motita hay, which damage their growth (foliage, cutting their branches or weakening their root system) causing them to dry up and/or die. • Climate change, although mesquite trees are drought resistant, prolonged periods of drought can weaken the tree and make it more susceptible to diseases and pests. • Environmental unconsciousness due to inadequate logging practices, overgrazing and soil contamination, which negatively affect the health of the mesquite trees.

Table 1. SWOT Diagnosis (Strengths, Opportunities, Weaknesses, Alternatives)

Note: Own elaboration based on data collected from the Academic Bodies of the Universidad Tecnológica de Tula - Tepeji, 2024.

is gradually narrowed down in the research questions and objectives UNAM (2020).

And with **qualitative variables** that focus on investigating the meaning that people give to their actions in social life. Instead of quantifying, it qualifies and makes narrative records of observable phenomena; it seeks the social construction of meanings, it implies the understanding of the social scenario.

It is based on an inductive process and its method is based on the collection of non-standardized data; it does not intend to generalize in a probabilistic manner UNAM (2020).

The project requires a systematized, controlled, empirical and critical methodology in which we will make use of the organoleptic study, as well as the financial study to determine the cost of 1 kg of flour and 1 kg of tortilla.

Figure 1 shows the project methodology diagram, which is carried out in two stages: The Organoleptic Study and the Financial Study. In the Organoleptic Study, the fortified tortilla type product is elaborated, its quality control is performed and 2 types of variables are used: Qualitative Variables where the Delphi Method will be used by means of an open questionnaire applied to a group of experts. And quantitative variables using a closed Likert scale questionnaire, applied to a representative sample of the population. Comparing and analyzing the results obtained to identify coincidences and/or differences.

In the financial study we intend to know the cost of 1 kg of flour and the cost of 1 kg of tortilla. For which the review of the cost and expense is made, for its integration in the Cost of Production, Operating Expenses, Financial Expenses and its obtaining of its Total Cost, to calculate its unit costs.

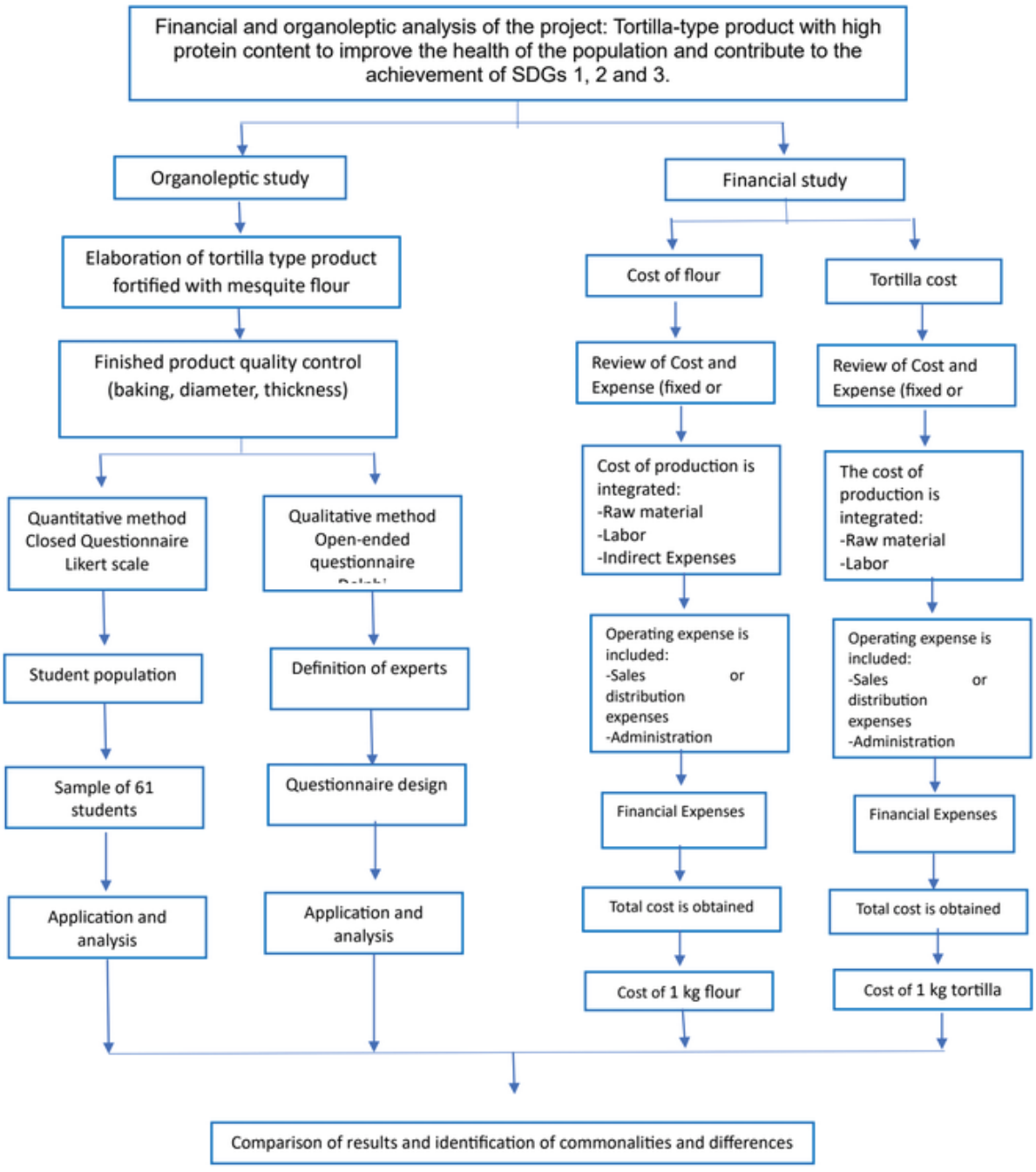

Figure 1. Diagram of the project methodology

Note: Own elaboration based on data collected from Academic Advisor, 2024.

METHODOLOGY OF THE ORGANOLEPTIC STUDY

APPLICATION OF THE QUESTIONNAIRE TO A SAMPLE

For the implementation of the questionnaire, a representative sample of the Educational Program of the Accounting Career of the Technological University of Tula - Tepeji will be carried out.

A) Questionnaire design: Applied to a representative sample of the population of the Educational program of the Accounting Career of the Technological University of Tula - Tepeji. In which they will put into practice their senses regarding the characteristics of the tortilla type product made with mesquite flour, based on its characteristics of smell, taste, color, texture.

B) Determination of the population

The population is the total number of units that meet certain measurable characteristics to which statistical methods will be applied for their study. The size of the population is denoted by the letter N.

C) Sample determination

The sample is a subset of the population whose elements are chosen by means of some sampling methodology; its study will allow inferences to be made regarding the population. The sample size is denoted by the letter n.

D) Pilot test

The **pilot test** is that **experimentation** that will be carried out for the first time with the objective of verifying that the questionnaire is understandable and clear for its completion.

E) Questionnaire application

This will be done through a link **(one-way link within a digital document), which will be provided to the students and will allow them to visit** a specific website on the Internet where they will find the questionnaire to answer, after they have tasted the fortified tortilla type product made with mesquite flour.

F) Concentration of results

Finally, the results obtained will be concentrated and classified in a table or graph.

APPLICATION OF THE DELPHI METHOD

The Delphi method is an information gathering technique that allows obtaining the opinion of a group of experts through repeated consultation. This technique, of a qualitative nature, is recommended when there is insufficient information available for decision making or it is necessary, for our research, to collect consensus and representative opinions of a group of individuals Universitat de Barcelona (2016).

For the implementation of the Delphi methodology we will carry out:

A) Selection of experts

The Delphi method will be used, which is a dynamic, intuitive and predictive system based on the strategic use of the opinions of a group of experts that we have selected based on their knowledge, experience in food and health, who have had direct contact with a large number of people. In which they will put into practice their senses regarding the characteristics of the tortilla type product made with mesquite flour, based on its characteristics of smell, taste, color, texture.

B) Questionnaire script

An open-ended questionnaire will be administered to 5 experts, containing a maximum of 7 questions and 1 additional commentary. In which information will be obtained such as: What is thought of the tortilla? Who can consume it? Will it be acceptable?

C) Finally, the results obtained will be concentrated and classified in a table or graph.

FINANCIAL STUDY METHODOLOGY

The accounting process for determining the unit cost of producing 1 kg of flour and producing 1 kg of tortilla attributes the implementation of a cost accounting system.

OBTAINING THE PRICE OF FLOUR

For the implementation of the Financial Study methodology will be carried out:

A) The process of elaboration of mesquite flour with high nutritional value will be analyzed. Gathering information related to costs including human, technical and material resources used.

B) Once the production process has been analyzed and sufficient data resulting from the research have been gathered, the cost system will be implemented (determining the elements that make up the production cost: raw materials, labor and manufacturing overhead) to determine the total cost of the flour.

C) The process of obtaining flour from the beginning to the finished product and the quantity obtained will be identified.

D) The source documents that establish the internal control of the operations (such as auxiliary documents or reports) will be integrated and will subsequently help to select the accounts where the corresponding accounting records will be made. In order to structure the cost information and relate it to the financial information

E) Determine the unit costs of mesquite flour.

F) Establish the selling price, once the unit cost of mesquite flour has been calculated, in order to obtain a profit margin.

G) Conduct a market analysis to determine if the price of mesquite flour is competitive and if there is sufficient demand for the product.

OBTAINING TORTILLA PRICES

For the implementation of the Financial Study methodology we will carry out:

A) The process of obtaining tortillas with mesquite flour will be analyzed. Gathering information related to the costs that include human, technical and material resources used.

B) Once the manufacturing process has been analyzed and sufficient data resulting from the research has been gathered, the cost system will be implemented (determining the elements that constitute the cost of production: raw material (corn dough mixed with mesquite flour: 20/80), labor and indirect manufacturing expenses), to determine the total cost of the tortilla.

C) The process of obtaining tortillas with mesquite flour will be identified from the beginning to the finished product and the quantity obtained.

D) The source documents that establish the internal control of the operations (such as auxiliary documents or reports) will be integrated and will subsequently help to select the accounts where the corresponding accounting records will be made. In order to structure the cost information and relate it to the financial information

E) Determine the unit costs of the tortilla with mesquite flour.

F) Establish the selling price, once the unit cost of the tortilla with mesquite flour has been calculated, in order to obtain a profit margin.

G) Conduct a market analysis to determine if the price of mesquite flour tortillas is competitive and if there is sufficient demand for the product.

RESULTS

ORGANOLEPTIC STUDY

Elaboration of the Tortilla type product

Figure 2 shows the production of the "tortilla with mesquite flour" and its quality control.

2A Start by weighing the different proportions of Maseca flour and mesquite flour on a balance (80:20).

2B The hydration of the flours (Maseca and mesquite) is prepared.

2C Press and sew on a metal griddle at 230°C for 90 seconds.

2D The tortilla is obtained ready for quality testing: baking, rollability, diameter and thickness measurements with a Vernier 530 Series calibrator and a mini processor. Digimatic Dp-IVP, 264 series.

QUANTITATIVE METHOD, CLOSED-ENDED QUESTIONNAIRE, LIKERT SCALE

Determination of the population: Our population (N) is 662 students who belong to the Educational Program of the Accounting Career of the Technological University of Tula - Tepeji.

Determination of the sample: It contains qualitative variables and will be applied to 61 students who belong to the Educational Program of the Accounting Career of the Technological University of Tula - Tepeji.

Figure 3 shows the tasting and application of the questionnaire to the sample population.

3A Starts with the explanation to people of the nutritional value of the fortified tortilla-type product and the organoleptic test.

3B Proceed with the disinfection of hands with antibacterial gel.

3C Physical sample of the tortilla is provided for tasting.

3D The questionnaire is answered by the sample through a digital platform.

CONCENTRATION OF RESULTS

The Likert test applied to a representative sample of the Educational Program of the Accounting Career at the Technological University of Tula - Tepeji yielded the following results:

Figure 4 shows the people with their age range who took the test.

The following table shows the opinions of the organoleptic test, applied to the representative sample of the population.

Attribute	Odor		Color		Taste		Texture		Appearance	
	Counting	Percentage	Counting	Percentage	Counting	Percentage	Counting	Percentage	Counting	Percentage
I like it very much	11	15.9 %	9	13 %	14	20.3 %	11	15.9 %	13	18.8 %
I like it moderately	32	46.4 %	32	46.4 %	22	31.9 %	23	33.3 %	23	33.3 %
I do not like it, nor do I dislike it	24	34.8 %	22	32 %	16	23.2 %	21	30.5 %	26	37.8 %
I moderately dislike	2	2.9 %	5	7.2 %	10	14.5 %	14	20.3 %	7	10.1 %
I dislike it very much	0	0 %	1	1.4 %	7	10.1 %	0	0 %	0	0 %
TOTALS	**69**	**100 %**	**69**	**100 %**	**69**	**100 %**	**69**	**100 %**	**69**	**100 %**

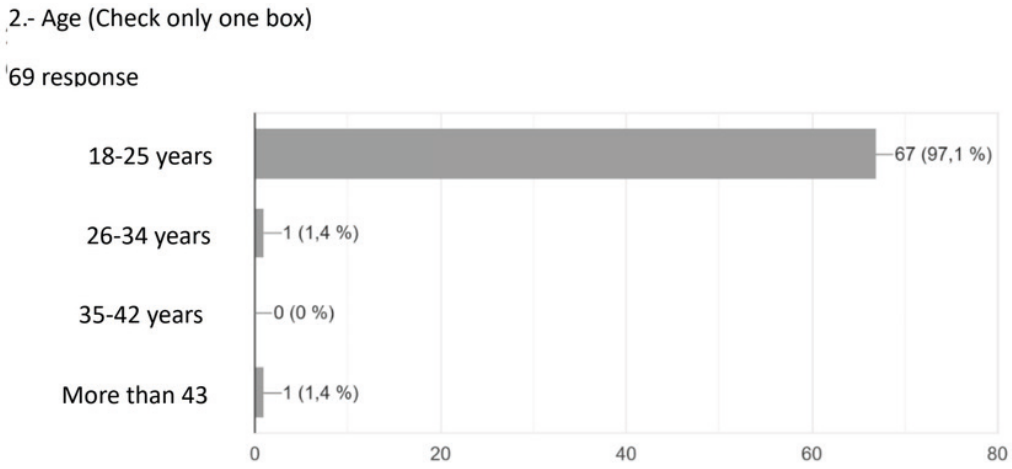

Figure 4. Number of people with their age range

Note: Own elaboration with support from Google Forms tool, 2024.

A		B	
C		D	

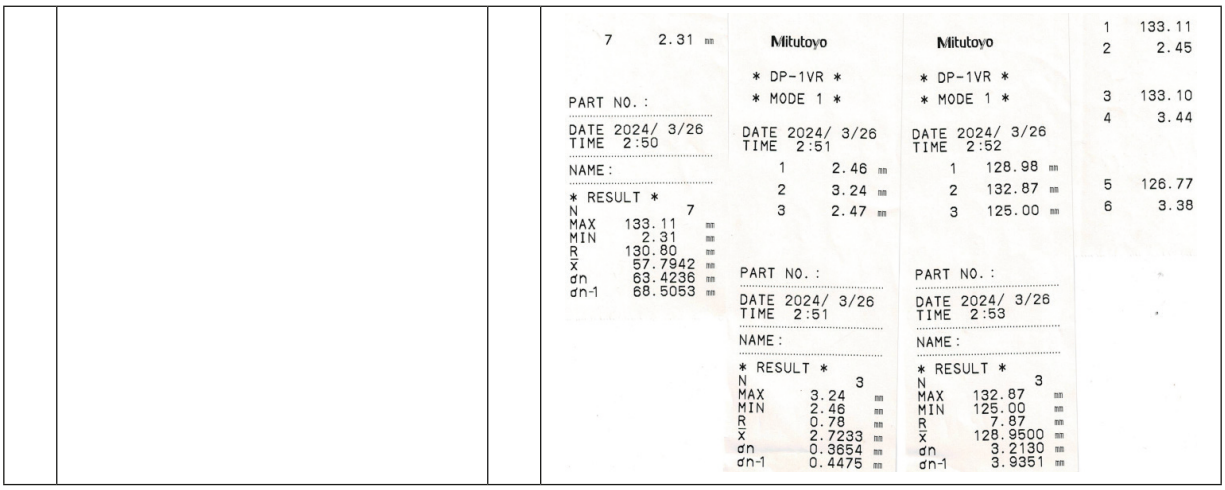

Figure 2. Production and quality control of tortilla with mesquite flour

Note: Own elaboration and data collected (measurements and results) from UTTT Process Laboratory staff, 2024.

Figure 3. Tasting of the mesquite flour tortilla and application of the questionnaire.

Note: Own elaboration, 2024.

Figure 5 shows the percentage of responses for the attributes evaluated (organoleptic test). Once they had the opportunity to perceive the odor, 46.4% liked it moderately, 46.4% liked it moderately in color, 31.9% liked it moderately in flavor, 33.3% liked it moderately in texture and 37.8% did not like or dislike the fortified tortilla-type product in appearance,

Figure 6 shows the degree of acceptance of the fortified tortilla made with mesquite flour. Forty-two percent liked it moderately and 4.3% disliked it very much.

Figure 7 shows the recommendation for consumption of the fortified tortilla made with mesquite flour. Thirty-one point nine percent of the population would recommend it, while 1.4% would recommend it little.

Qualitative Method, Open-ended Questionnaire, Delphi Method

SELECTION OF EXPERTS

Expert 1 Medical Surgeon: L.M.C. Adriana Morales Montúfar

Expert 2 Bachelor of Science in Nursing: L.E. Nahum Tovar Lopez

Expert 3 Chemical Engineer: I.Q. Pablo Cesar Guerrero López

Expert 4 Food Chemist: L.Q. A. Uriel Anaya López

Expert 5 Cook and tortilla maker: C. Remedios López Tovar

The following comparative table shows the coincidences and differences obtained from the experts (Table 2):

FINANCIAL STUDY

FLOUR COST

The investments in assets (machinery and equipment) to be considered are as follows:

Description	Quantity	Unit	Unit Cost
Digitally controlled drying oven with ramps 42.8L TERLAB	1	Part	$ 64, 758.00
2-in-1 Electric Wet and Dry Food Mill (SVM-160)	1	Part	$ 9,500.00
TOTAL			**$ 74,258.00**

The determination of the production cost based on the estimated average market study of 1 kg of flour is: $300.00. While its suggested selling price of 1 kg of flour would be: $350.00.

The price of 1 kg of mesquite flour in the market is between $250.00 and $500.00 on average. Therefore, the suggested selling price would be competitive in the market.

TORTILLA COST

We proceed to determine the criteria used in the production cost of 1 kg of tortilla from a monthly production of 20,000 kgs.

Cost	
Cost Element	Criteria to consider
Direct raw material	- 20 % mesquite flour - 80 % Maseca flour
Direct labor	- Salaries: 1 dyke. - Minimum legal benefits (LFT and IMSS)
Indirect manufacturing overhead	- Minimum legal benefits (LFT and IMSS). - Depreciation of investments in assets. - Other indirect expenses.

The investments in assets (equipment) to be considered are as follows:

Description	Quantity	Unit	Unit Cost
Plastic table	1	Part	$ 750.00
Comal de gas tortilla holder (round)	1	Part	$ 2,500.00
Manual tortilla making machine	1	Part	$ 4,900.00
Gas tank 20 kg.	1	Part	$ 2,100.00
20 Cm Manual Thermal Plastic Bag Sealing Machine.	1	Part	$ 260.00
TOTAL			$10,510.00

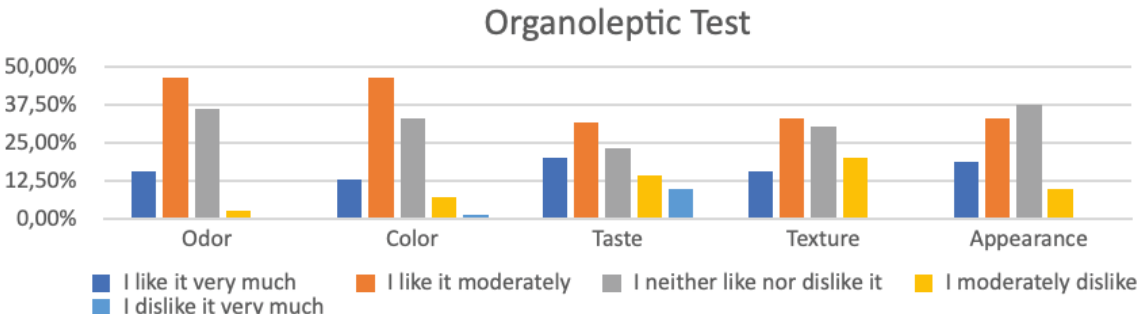

Figure 5, Percentage of attributes evaluated

Note: Own elaboration, 2024.

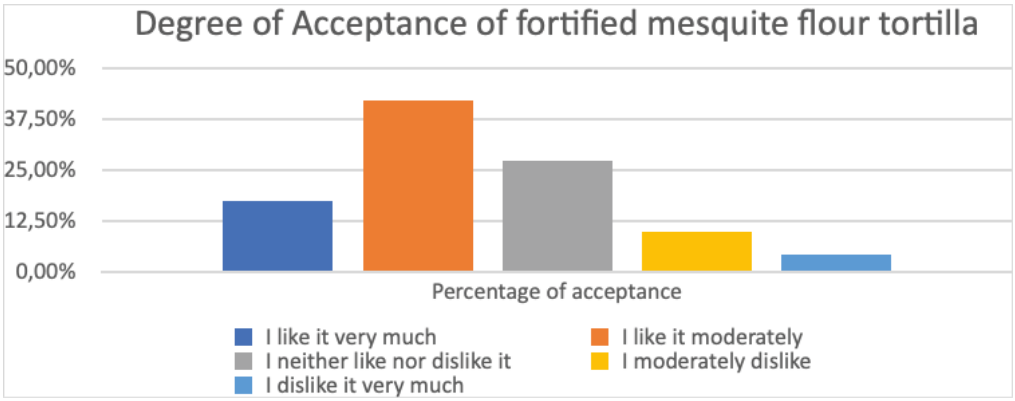

Figure 6. Degree of Acceptance of the fortified mesquite flour tortilla

Note: Own elaboration, 2024.

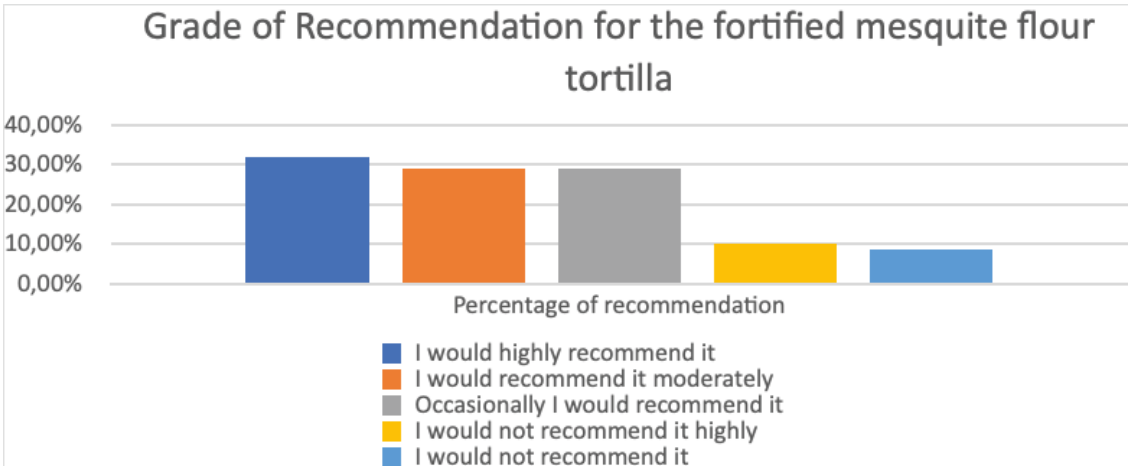

Figure 7. Grade of Recommendation of the fortified mesquite flour tortilla

Note: Own elaboration, 2024.

Questions	Coincidences	Differences
1.- Who can consume the fortified tortilla?	The general population with 80% of	20% suggest it be consumed by children and adults.
2.- Will the tortilla be acceptable according to your perception of its color, smell, taste, appearance and texture?	Yes, it would be acceptable, considering it as an integral product. 100%	40% consider disadvantages in terms of color and flavor perception (improve).
3.- According to the nutritional value of the product, how many times a week do you consider it can be consumed?	On a daily basis with 90%	Adjustment for health condition (alternating with corn tortilla) 10%.
4.- Would it be possible to increase the frequency of tortilla consumption by making its high nutritional value and its tasting known to the population?	Yes with 100	Consideration of price, availability of the product, more diffusion of its nutritional properties and less consumption by the low-income population.
If the cost of a normal tortilla is $30 per kg and the cost of a tortilla fortified with mesquite flour is $35 per kg, what would be your perception of the population's acceptance of the suggested price?	70% believe that the price would be accepted by the population.	While 30% consider that the price should be the same or lower than that of the traditional tortilla (corn), 30% consider that the price should be the same or lower than that of the traditional tortilla (corn).
6.- What is your opinion regarding the tortilla?	General satisfaction with respect to its organoleptic and nutritional properties.	Improvement in terms of flavor, color.
7.- If you were to recommend the tortilla, to whom would you do so?	Especially to people with health problems such as malnutrition, chronic degenerative diseases (diabetics, hypertension, obesity) and later to the general population to improve their health.	
Additional Comments	Good product with nutritional alternatives beneficial to health, which can boost the region with an economic and viable alternative for the natural resource it has (mesquite). And with the option of diversifying the product as tostadas and/or totopos.	

Table 2. Coincidences and differences obtained from experts.
Note: Own elaboration with information collected from 5 experts, 2024.

The determination of the estimated production cost of 1 kg of tortillas is integrated:

Element	Cost
Direct raw material	14.67
Direct labor	2.68
Prime Cost	17.35
Indirect manufacturing expenses	4.72
COST OF PRODUCTION	**22.05**

While its suggested retail price with respect to the average market study of 1 kg of tortilla would be: $35.00

The price of 1 kg of mesquite flour in the market is between $ 28.00 to $ 40.00 on average. Therefore, the suggested selling price would be competitive in the market.

ANALYSIS AND/OR DISCUSSION OF RESULTS

The degree of acceptance of the tortilla fortified with mesquite flour with respect to its organoleptic properties (odor, color, flavor, texture, appearance), which were obtained based on the likert scale questionnaire applied to a representative sample of the population. It showed that 46.40% moderately liked the odor, 46.40% moderately accepted the color, 31.9% moderately liked the flavor, while 33.30% moderately accepted its texture and finally 37.80% were neutral with respect to its appearance. Therefore, 42% of the respondents accepted the product (moderately liked it) and 4.3% did not accept it. It should be noted that 31.9% would recommend its consumption and 8.7% would not recommend it.

Interesting data were also obtained:

1.- The tortilla type product is accepted by 42% of the young population (from 18 to 25 years old), however, it is not enough to be considered to have a general acceptance. By virtue of the fact that the sample was applied to young people who lack information on nutritional values and the increase in chronic degenerative diseases affecting the country.

2.- 26.2% of the sample is neutral in its acceptance. And at the same time they are participants in suggestions such as: change of color, improvement of flavor (avoiding bitter taste), its application in other presentations such as tostadas, totopos, tacos, enchiladas, with a smaller thickness of the tortilla, improvement in its dryness texture.

Awareness to be included as part of the diet, since it is considered a product with high nutritional value, with improvements to health and the natural resource (mesquite) is obtained in our region, considering it as a business opportunity.

4.- Follow-up to the project by expanding lines of research that will allow the tortilla-type product to be improved (organoleptic) and to be more widely accepted by the population.

The result did not obtain the expected degree of acceptance, but reflected the awareness of the young population to be included in their diet, due to its nutritional contribution to health. It showed concern for following up the project in more lines of research that would allow the tortilla-type product to be more acceptable both in its organoleptic properties and in its dissemination and implementation in other products.

Regarding the experts' evaluation, which was obtained based on the questionnaire of open questions by the Delphi method. There is good acceptance regarding its organoleptic properties and even more so if its nutritional value is known.

Interesting data were also obtained:

1.- It would be considered as an integral product due to its nutritional value that contributes to health. But it would not be consumed frequently due to its lack of knowledge by the population.

2.- There would be a disadvantage in the acceptance of the tortilla-type product in terms of flavor and color, since it is a non-common product like corn or wheat tortillas, which are basic products in the Mexican diet.

3.- It is a product that can be included in daily consumption or at least once a week alternated with corn tortilla consumption.

4.- The suggested price of $35 for 1 kg of fortified tortilla is acceptable due to the nutritional values provided, but it is suggested that the price of 1 kg of corn tortilla be adjusted to at least the same or even less than the price of 1 kg of corn tortilla at the beginning of its commercialization.

5.- The consumption of fortified tortillas is recommended for the general population and especially for people with health problems such as: malnutrition, chronic degenerative diseases (diabetics, hypertension, obesity).

The result was as expected, considering the knowledge of the nutritional values it contributes to health, having good acceptance regarding its organoleptic properties, with suggestions for improvements in terms of color and flavor for greater acceptability in the population. It is recommended for general consumption and especially for people with any health condition.

With respect to the elements for the integration of the cost of flour, 3 additional alternatives for the process of obtaining the raw material (flour) were visualized:

A) The direct acquisition of the natural resource (mesquite) in the area and data were obtained for 1 kg of mesquite at a cost of $1.00 to $2.00, representing an alternative for the acquisition of the natural resource.

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B) In the milling process it was a subcontracted service, where data was obtained at $50.00 per 1 kg of mesquite.

C) In the drying process it was an outsourced service.

In relation to the suggested price of $35.00 for 1 kg of tortilla, it did not meet the expectation of acceptance. In spite of its high nutritional value and being a health-improving alternative, it would be consumed by a reduced number of the population with higher incomes. It is interesting to note that the price is similar and even lower than that of corn tortillas, especially in its introduction and being competitive, due to its close relationship with its degree of acceptability in terms of its organoleptic study, it would be well accepted by the population in general.

CONCLUSIONS

1.- The degree of acceptance of the tortilla fortified with mesquite flour to the representative sample of the population (young people) is 42%, which does not reach the expectations of a good acceptance regarding its organoleptic properties (smell, color, flavor, texture, appearance). And 31.9% of the population would recommend its consumption, which also does not meet the expected scenario. With a reflection of awareness to be included in the diet once knowing its nutritional properties contributes to health. And concern for improvement and expansion of product research lines.

2.- The degree of acceptance of the tortilla fortified with mesquite flour by the experts is good because they know its nutritional value contributes to health. With suggestions for improvement in terms of color and flavor, greater dissemination in their beneficial contributions, with the recommendation to the general public and especially to people with any health condition.

3.- The price of obtaining mesquite flour at the beginning of the project was lower considering that several expenses and costs were minimal and even some were not considered in their totality because it was an investment project and there was subsidized support from the University at the time. At present, and with the market study, these costs are increasing and give a guideline to consider other possible lines of research to obtain them.

4.- The production price of the tortilla fortified with mesquite flour is more expensive with a suggested price of $35.00 per 1 kg of tortilla. This cost did not meet the expectation of acceptance to be purchased. It is suggested that the price be adjusted to a similar or even lower price than that of corn tortillas.

5.- The organoleptic study and financial study of the tortilla type product fortified with mesquite flour have provided useful and relevant information, including proposals from the population. Being a business opportunity, a contribution to the health of citizens, a support to the environment, a diversification alternative for the region of Tula - Tepeji, with the continuity of the project in various lines of research to its improvement in the short term.

PROJECT LIMITATIONS

The financial and organoleptic analysis of the project: **Tortilla-type product with high protein content to influence the health of the population and contribute to the achievement of SDGs 1, 2 and 3,** has the following limitations:

- The natural resource (mesquite) is seasonal.
- Its procurement process is subject to specific schedules.
- The time for the development of this project is limited to 13 weeks.

RECOMMENDATIONS AND/OR SUGGESTIONS

1.- Application of another representative sample to a population with an older age range and from more advanced semesters that have a broader knowledge of the problems presented.

2.- Continuity and even more lines of research that will allow the project of the tortilla type product fortified with mesquite flour a greater acceptability regarding its organoleptic properties, a greater diffusion of its nutritional value, diversification in other suggested products such as tostadas, totopos.

Market studies that allow obtaining the raw material and even the process of obtaining mesquite flour at a lower cost and be competitive with other products such as corn tortillas and have greater acceptance in terms of price.

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