Volume 4, Issue 6 — January — June — 2020

# Journal-Microeconomics

ISSN-On line: 2531-2987

RINOE®

**RINOE Journal-Microeconomics**, Volume 4, Issue 6, January – June 2020, is a journal edited semestral by RINOE. 38 Matacerquillas street, Postcode: 28411. Moralzarzal –Madrid: www.rinoe.org/,journal@rinoe.org. Editor in Chief: OLIVES-MALDONADO, Carlos. MsC. PhD. ISSN: 2531-2987. Responsible for the latest update of this number RINOE Computer Unit. ESCAMILLA-BOUCHÁN, Imelda, LUNA SOTO, Vladimir 38 Matacerquillas street, Postcode: 28411. Moralzarzal –Madrid last updated June 30, 2020.

# RINOE Journal-Microeconomics

## Definition of the Journal

## Scientific Objectives

Support the international scientific community in its written production Science, Technology and Innovation in the Field of Social Sciences, in Subdisciplines of Household behavior: Consumer economics, Household production and intrahouse allocation, Personal finance, Consumer protection; Production and organizations: Firm behavior, Organizational behavior, Transaction costs, Property rights, Production, Capital and total factor productivity, Capacity; Distribution: General, Personal income and wealth distribution, Factor income distribution; Market structure and pricing, Perfect competition, Monopoly, Oligopoly and other forms of market imperfection, Auctions, Rationing; Licensing, Value theory; General equilibrium and disequilibrium: Exchange and production economies, Incomplete markets, Input-Output analysis, Computable and other applied general equilibrium models; Welfare economics: Allocative efficiency, Cost-Benefit analysis, Externalities, Equity, Justice, Inequality, and other normative criteria and measurement, Altruism; Analysis of collective Decision-Making: Social choice, Clubs, Committees, Economic models of political processes, Bureaucracy, Administrative processes in public organizations, Conflict, Conflict resolution, Alliances, Positive analysis of Policy-Making and implementation; Information and uncertainty, Criteria for Decision-Making under risk and uncertainty, Asymmetric and private information, Search, Learning, and Information, Expectations, Speculations; Intertemporal choice and growth: Intertemporal consumer choice, Life cycle models and saving, Intertemporal firm choice and growth, Investment, or Financing.

RINOE® is a Scientific and Technological Company in contribution to the Human Resource training focused on the continuity in the critical analysis of International Research and is attached to CONACYT-RENIECYT number 1702902, its commitment is to disseminate research and contributions of the International Scientific Community, academic institutions, agencies and entities of the public and private sectors and contribute to the linking of researchers who carry out scientific activities, technological developments and training of specialized human resources with governments, companies and social organizations.

Encourage the interlocution of the International Scientific Community with other Study Centers in Mexico and abroad and promote a wide incorporation of academics, specialists and researchers to the publication in Science Structures of Autonomous Universities - State Public Universities - Federal IES - Polytechnic Universities - Technological Universities - Federal Technological Institutes - Normal Schools - Decentralized Technological Institutes - Intercultural Universities - S & T Councils - CONACYT Research Centers.

## Scope, Coverage and Audience

RINOE Journal-Microeconomics is a Journal edited by RINOE® in its Holding with repository in Spain, is a scientific publication arbitrated and indexed with semester periods. It supports a wide range of contents that are evaluated by academic peers by the Double-Blind method, around subjects related to the theory and practice of Household behavior: Consumer economics, Consumer economics, Household production and intrahouse allocation, Personal finance, Consumer protection; Production and organizations: Firm behavior, Organizational behavior, Transaction costs, Property rights, Production, Capital and total factor productivity, Capacity; Distribution: General, Personal income and wealth distribution, Factor income distribution; Market structure and pricing, Perfect competition, Monopoly, Oligopoly and other forms of market imperfection, Auctions, Rationing; Licensing, Value theory; General equilibrium and disequilibrium: Exchange and production economies, Incomplete markets, Input-Output analysis, Computable and other applied general equilibrium models; Welfare economics: Allocative efficiency, Cost-Benefit analysis, Externalities, Equity, Justice, Inequality, and other normative criteria and measurement, Altruism; Analysis of collective Decision-Making: Social choice, Clubs, Committees, Economic models of political processes, Bureaucracy, Administrative processes in public organizations, Conflict, Conflict resolution, Alliances, Positive analysis of Policy-Making and implementation; Information and uncertainty, Criteria for Decision-Making under risk and uncertainty, Asymmetric and private information, Search, Learning, and Information, Expectations, Speculations.

Intertemporal choice and growth: Intertemporal consumer choice, Life cycle models and saving, Intertemporal firm choice and growth, Investment, or Financing with diverse approaches and perspectives, That contribute to the diffusion of the development of Science Technology and Innovation that allow the arguments related to the decision making and influence in the formulation of international policies in the Field of Social Sciences. The editorial horizon of RINOE® extends beyond the academy and integrates other segments of research and analysis outside the scope, as long as they meet the requirements of rigorous argumentative and scientific, as well as addressing issues of general and current interest of the International Scientific Society.

## Editorial Board

## Arbitration Committee

**Assignment of Rights**

The sending of an Article to RINOE Journal-Microeconomics emanates the commitment of the author not to submit it simultaneously to the consideration of other series publications for it must complement the Originality Format for its Article.

The authors sign the Format of Authorization for their Article to be disseminated by means that RINOE® In its Holding Spain considers pertinent for disclosure and diffusion of its Article its Rights of Work.

**Declaration of Authorship**

Indicate the Name of Author and Coauthors at most in the participation of the Article and indicate in extensive the Institutional Affiliation indicating the Department.

Identify the Name of Author and Coauthors at most with the CVU Scholarship Number-PNPC or SNI-CONACYT- Indicating the Researcher Level and their Google Scholar Profile to verify their Citation Level and H index.

Identify the Name of Author and Coauthors at most in the Science and Technology Profiles widely accepted by the International Scientific Community ORC ID - Researcher ID Thomson - arXiv Author ID - PubMed Author ID - Open ID respectively.

Indicate the contact for correspondence to the Author (Mail and Telephone) and indicate the Researcher who contributes as the first Author of the Article.

**Plagiarism Detection**

All Articles will be tested by plagiarism software PLAGSCAN if a plagiarism level is detected Positive will not be sent to arbitration and will be rescinded of the reception of the Article notifying the Authors responsible, claiming that academic plagiarism is criminalized in the Penal Code.

**Arbitration Process**

All Articles will be evaluated by academic peers by the Double Blind method, the Arbitration Approval is a requirement for the Editorial Board to make a final decision that will be final in all cases. MARVID® is a derivative brand of ECORFAN® specialized in providing the expert evaluators all of them with Doctorate degree and distinction of International Researchers in the respective Councils of Science and Technology the counterpart of CONACYT for the chapters of America-Europe-Asia- Africa and Oceania. The identification of the authorship should only appear on a first removable page, in order to ensure that the Arbitration process is anonymous and covers the following stages: Identification of the Journal with its author occupation rate - Identification of Authors and Coauthors - Detection of plagiarism PLAGSCAN - Review of Formats of Authorization and Originality-Allocation to the Editorial Board-Allocation of the pair of Expert Arbitrators-Notification of Arbitration -Declaration of observations to the Author-Verification of Article Modified for Editing-Publication.

**Instructions for Scientific, Technological and Innovation Publication**

**Knowledge Area**

The works must be unpublished and refer to topics of Household behavior: Consumer economics, Consumer economics, Household production and intrahouse allocation, Personal finance, Consumer protection; Production and organizations: Firm behavior, Organizational behavior, Transaction costs, Property rights, Production, Capital and total factor productivity, Capacity; Distribution: General, Personal income and wealth distribution, Factor income distribution; Market structure and pricing, Perfect competition, Monopoly, Oligopoly and other forms of market imperfection, Auctions, Rationing; Licensing, Value theory; General equilibrium and disequilibrium: Exchange and production economies, Incomplete markets, Input-Output analysis, Computable and other applied general equilibrium models; Welfare economics: Allocative efficiency, Cost-Benefit analysis, Externalities, Equity, Justice, Inequality, and other normative criteria and measurement, Altruism; Analysis of collective Decision-Making: Social choice, Clubs, Committees, Economic models of political processes, Bureaucracy, Administrative processes in public organizations, Conflict, Conflict resolution, Alliances, Positive analysis of Policy-Making and implementation; Information and uncertainty, Criteria for Decision-Making under risk and uncertainty, Asymmetric and private information, Search, Learning, and Information, Expectations, Speculations; Intertemporal choice and growth: Intertemporal consumer choice, Life cycle models and saving, Intertemporal firm choice and growth, Investment, or Financing and other topics related to Social Sciences.

## Presentation of Content

In the first issue we present, *Consumer profile and purchase preference of Farmacias G I in San Mateo Atenco, State of Mexico*, by ORDOÑEZ-HERNÁNDEZ, Lucía, CALDERÓN-RÍOS, Norma Otilia, PALOMAR-FUENTES, María del Pilar and DOMINGUEZ-VILLA, Elide Ana Korac, with secondment in the Tecnológico Nacional de México/Campus Toluca, as a second issue we present *Identification of the consumer profile for the industrialization of Chihuahua type cheese*, by MIRELES-MEDINA, Antonia, MIRELES-MEDINA, Manuel Patricio, PAREDES-BERUMEN, Luis Enrique, DE ÁVILA-MARQUEZ, Francisco, with secondment in the Instituto Tecnológico Superior Zacatecas Norte and Universidad Autónoma de Zacatecas, as the third article we present, *Application of the AIDS model in hass avocado consumption in Mexico*, by GÓMEZ-GÓMEZ, Alma Alicia, LUQUEZ-GAITAN, Carlos Ernesto and LÓPEZ-VELÁZQUEZ, Lessly Gabriela, as the last article we present, *Cost analysis in reverse logistics of grade 2 asparagus*, by QUINTERO RAMÍREZ, Juan Manuel, with secondment at the Consejo Nacional de Ciencia y Tecnología.

## Content


| Article | Page |
|---|---|
| **Consumer profile and purchase preference of Farmacias G I in San Mateo Atenco, State of Mexico**<br>ORDOÑEZ-HERNÁNDEZ, Lucía, CALDERÓN-RÍOS, Norma Otilia, PALOMAR-FUENTES, María del Pilar and DOMINGUEZ-VILLA, Elide Ana Korac<br>*Tecnológico Nacional de México/Campus Toluca* | 1-13 |
| **Identification of the consumer profile for the industrialization of Chihuahua type cheese**<br>MIRELES-MEDINA, Antonia, MIRELES-MEDINA, Manuel Patricio, PAREDES-BERUMEN, Luis Enrique, DE ÁVILA-MARQUEZ, Francisco<br>*Instituto Tecnológico Superior Zacatecas Norte*<br>*Universidad Autónoma de Zacatecas* | 14-23 |
| **Application of the AIDS model in hass avocado consumption in Mexico**<br>GÓMEZ-GÓMEZ, Alma Alicia, LUQUEZ-GAITAN, Carlos Ernesto and LÓPEZ-VELÁZQUEZ, Lessly Gabriela | 24-30 |
| **Cost analysis in reverse logistics of grade 2 asparagus**<br>QUINTERO RAMÍREZ, Juan Manuel<br>*Consejo Nacional de Ciencia y Tecnología* | 31-37 |

Article **Journal-Microeconomics**
June 2020 Vol.4 No.6 1-13

# Consumer profile and purchase preference of GI Pharmacies in San Mateo Atenco, State of Mexico

# Perfil del consumidor y preferencia de compra de Farmacias G I en San Mateo Atenco, Estado de México

ORDOÑEZ-HERNÁNDEZ, Lucía†*, CALDERÓN-RÍOS, Norma Otilia, PALOMAR-FUENTES, María del Pilar and DOMÍNGUEZ-VILLA, Elide Ana Korac

*Tecnológico Nacional de México/Campus Toluca, Mexico.*

ID 1st Author: *Lucía, Ordoñez-Hernández* / **ORC ID:** 0000-0003-4357-7355, **CVU CONACYT ID:** IT16B526 - 998179

ID 1st Coauthor: *Norma Otilia, Calderón-Ríos* / **ORC ID:** 0000-0002-6292-4140, **CVU CONACYT ID:** IT16A893 - 528227

ID 2nd Coauthor: *María Pilar, Palomar-Fuentes* / **ORCID:** 0000-0003-0809-2635, **CVU CONACYT ID:** IT19D807 - 662249

ID 3rd Coauthor: *Elide Ana Korac, Domínguez-Villa* / **ORC ID:** 0000-0002-3047-9628

**DOI:** 10.35429/JM.2020.6.4.1.13 Received January 10, 2020; Accepted June 2020, 2020

**Abstract**

The pharmaceutical industry is currently one of the most viable businesses nationally and internationally. There is a growth in investment for the creation and expansion of pharmacies, as well as in research and development of treatments; The expansion of large patent medicine pharmacies, similar pharmacies, and interchangeable generic pharmacies has led Mexico to occupy second place in Latin America in this sector. This research studies the business model of GI pharmacies, a growing concept, which has made it position itself in the market in any region of the country. The research is descriptive, and the objective is to know the profile of the consumer, which helps to understand the purchasing behavior, to increase the degree of satisfaction and thus achieve a better position in this widely competitive market. The variables considered for this study are: demographic, geographic, psychographic and behavioral. All of them make up the consumer profile, where a description of the selected client is established as an objective that will help us determine the purchase preference.

**Profile, Preferences, G.I. Pharmacies**

**Resumen**

La industria farmacéutica en la actualidad es uno de los negocios más viables a nivel nacional e internacional. Existe un crecimiento de la inversión para la creación y expansión de farmacias, así como también en la investigación y desarrollo de tratamientos; la expansión de las grandes farmacéuticas de medicina de patente, farmacias de similares y de farmacias de genéricos intercambiables, lleva a México a ocupar en este sector el segundo lugar de América Latina. En esta investigación se estudió el modelo de negocio de las farmacias GI, un concepto en crecimiento, lo que ha hecho que se posicione en el mercado de cualquier región del país. La investigación fue descriptiva, y el objetivo fue conocer el perfil del consumidor, que ayudó a entender el comportamiento de compra, para incrementar el grado de satisfacción y lograr así un mejor posicionamiento en este mercado ampliamente competitivo. Las variables consideradas para este estudio fueron: demográficas, geográficas, psicográficas y de conducta. Todas ellas conforman el perfil del consumidor, donde se estableció una descripción del cliente seleccionado como objetivo, que ayudó a determinar la preferencia de compra.

**Perfil, Preferencias, Farmacias G.I.**

**Citation:** ORDOÑEZ-HERNÁNDEZ, Lucía, CALDERÓN-RÍOS, Norma Otilia, PALOMAR-FUENTES, María del Pilar and DOMÍNGUEZ-VILLA, Elide Ana Korac. Consumer profile and purchase preference of G I Pharmacies in San Mateo Atenco, State of Mexico. RINOE Journal-Microeconomics. 2020. 4-6:1-13.

* Correspondence to Author (Email: lordonezh@toluca.tecnm.mx)
† Researcher contributing first author.

## Introduction

It is considered convenient to propose some definitions regarding the subject that was investigated, Philp kotler… "defines marketing as the science and art of exploring, creating and delivering value to satisfy the needs of a target market for a benefit. (Kotler & Armstrong, 2013).

William Stanton says, "that marketing is a global system of business activities designed to plan, price, promote and distribute goods and services that satisfy the wishes of current and potential customers (Stanton, 2007)".

Marketing recognizes the unmet requirements and wishes of customers. Define, measure and quantify the size of the market considered and the profit potential. It indicates which segments the company is able to serve better, designs and promotes the appropriate products or services.

Idalberto Chiavenato, defines a company as a…. "Social organization that uses a great variety of resources to achieve certain objectives" (Chiavenato, 2005).

Lourdes Münch defines company as "Social group in which, through the administration of capital and work, goods and / or services are produced to satisfy the needs of the community. (Münch Galindo & García Martínez, 2017).

These company definitions imply the conjunction of human and technical material resources to achieve the objectives.

A successful company is a company that, after going through the "crossing of the desert" reaches the stage of optimal operation, because it does things well. For this, it applies continuous improvement, innovation practices and a learning culture. A successful company manages innovation in products / services and processes. This allows you to discover, for example, new markets. Also, it improves every day (with small actions), supported by the continuous and autonomous learning of its collaborators, who learn-by doing. (Polo Moya, 2019).

One of the keys to the success of any type of company is to know the profile of the consumer. This is described as the group of all those characteristics that represent the customer that you want to have in your business. However, many companies maintain an undifferentiated segmentation strategy, ignoring the purchase preference of the segment to which they are directed. Therefore, marketing efforts are not potentiated.

The objective of this study was to know the consumer profile and purchase preference of interchangeable generic pharmacies in the municipality of Metepec, state of Mexico, considering the geographic, demographic, psychographic and behavioral variables. In the frame of reference, the antecedents, theoretical foundations and an approach to the object of study were addressed. Afterwards, the problem statement is described, which consists of not identifying purchase preferences, nor the profile of the local consumer of GI pharmacies.

It was determined to use the questionnaire as a data collection tool, their analysis was carried out using Excel and the SPSS ® software, for cross tables.

In the results, the data that make up the profile are presented, the conclusions and recommendations are presented.

## Framework

### Pharmaceutical Industry today

The pharmaceutical industry in the world has become a mixture of various sciences, encompassing biology, biochemistry, engineering, microbiology, pharmacy and pharmacology, medicine, nursing, physics, mathematics among many other sciences, which together create drugs that fight The diseases.
The market has given way to the pharmaceutical industry, which is responsible for the production and marketing of drugs, the economic sector it covers is considered one of the most important in the world.

(Ministry of Economy- Pro-México, 2015) The pharmaceutical industry sector is one of the most viable and feasible businesses at an international level.

ISSN-On line: 2531-2987

This industry has large transnational companies, which invest very generous amounts, not only in the creation and expansion of pharmacies, but also in research and development for new products and treatments. The pharmaceutical industry at the national and international level, has been growing notably, every day we observe more branches of pharmacies, whether specialties, large pharmaceutical chains of patent medicine, pharmacies of similar and interchangeable generic pharmacies that They see a business opportunity in this branch, which has led Mexico to occupy the second largest market in Latin America, according to a study carried out by the Ministry of Economy, 2009 census, not only in the demand in the market, but also in the production of high-tech drugs. Of the 15 main international companies, 14 are located in our country, concentrating the manufacturing of this sector worldwide, which represents 7.2% of Mexico's manufacturing GDP.

A considerable expansion of the interchangeable generic pharmacy groups took place in Mexico, when in 2012 COFEPRIS authorized the sale of 190 interchangeable generic drugs for the treatment of chronic diseases. With this, an attempt was made to counteract the increase in sales of similar drugs and the positioning of generic drugs. According to PROFECO, when developing a new drug is innovated, a permit is processed to carry out research and produce it, which is how much a patent is obtained that has an exclusivity period with the laboratory that obtained it, therefore the cost of a patent drug is high because it seeks to recover the investment (research), when this exclusivity ends, the formula is released so that the rest of the laboratories can manufacture the product, these drugs no longer have the name of the laboratory I develop it therefore they are called generic drugs. These generic drugs are equal to the active substance, time of action, efficacy and safety, which guarantees that the drug. (COFEPRIS, 2012)

## GI pharmacies

He was born with a new era of health. Since its inception in 1999, it has identified a fundamental element for its brand promise: to bring the benefits of medicine to the neediest population, through a more humane service, attentive to the health of both the patient and the economy of Mexican families.

At first, the population distrusted these drugs because they were cheaper and because of some aspects related to their quality.

Over time, the population began to accept the product and understand that generic drugs are exactly the same as innovative ones, but you don't pay for the brand, but for the active substance. Today the picture is totally different, since 8.4 out of every 10 drugs sold in Mexico are generic.

Years after starting its project, Farmacias GI identified that it needed to become professional, and in 2009 it joined the Mexican Franchise Association. The business model consists of a pharmacy located next to an office planned to provide general medical care to outpatients. The target market is a medium, low medium and low socioeconomic level. Always adhering to COFEPRIS guidelines, there is a Regulatory Affairs area that is dedicated to training personnel at the national level. (Farmacias G I, s.f.)

After this report on the antecedents and events that have impacted the Pharmaceutical industry, the object of study is described.

## Consumer profile

They define a market segment as ... "a group of customers with different desires, purchasing preferences or ethics of product uses." (Stanton, 2007). The characteristics resulting from the detailed analysis of a set of market variables make up the consumer profile, where a description of the target customer is established. It is important to mention that this is a tool that allows the company:

– Know and understand your customers.

– Offer suitable products and services to your customers.

– Develop sales strategies, focused on a certain profile.

– Establish specific communication channels with your customers.

– Identify your competitors more effectively.

ISSN-On line: 2531-2987

– Detect opportunities, reduce risks and evaluate the impact caused by the market.

(Santamaria, 2014), in his study "Influence of Cultural and Demographic Factors on the Profile of the Consumer of Private Labels", through multivariate analysis, determined the influence existing between demographic and cultural factors in the purchase of private label products. He identified that the level of education (bachelor or higher), of a medium socioeconomic level and that they have made purchases in the brand's stores is very important. Regarding own brands, the knowledge and use of these products is a little more than 3 out of 4 people. 60% consider Supermaxi a suitable place to buy, and a little less than half, 46%, show affection for the brand. Only one in 5 rejects the brand. The author finds that the private label consumer is married, under 35 years of age, who makes his fortnightly purchases and the person in charge of doing so will be women. It is important to consider cultural and demographic factors in determining purchase preference.

(Martinez & Montaner, 2007), verified, considering psychographic traits such as utilitarian, hedonistic and cost benefits, that consumers modify their behavior in the face of promotions developed within their own points of sale, they present psychographic profiles different from the consumers who respond to some kind of promotion with encouragement outside the establishment itself. They distinguished three types of propensity for promotions: 1. Propensity for internal promotions, characterized by being concerned about prices and giving less importance to product quality; These consumers buy products impulsively, they like to plan their purchases and enjoy making them, they like to change brands with some frequency and new products attract their attention. In addition, they consider that they have enough space to store extra purchases. 2. Consumers who use the brochures are also concerned about product prices; These consumers consider themselves market experts, they plan their shopping sessions and they enjoy doing this task. In addition, they give less importance to the quality of the products purchased. Finally, 3. Consumers who use promotional vouchers or coupons are concerned about the price of the products and often regard themselves as market experts and innovators.

Therefore, it is important to know the psychographic profile because not all consumers respond to sales promotions in the same way.

(Gómez, 2017) Considering the variables sex, age, educational level and net salary, he found that the profile of the Fair Trade consumer is usually a person between 25 and 45 years old, with higher education and a salary that exceeds € 2,400 net per month. On the contrary, people over 65 years of age, with primary or no studies and with a salary that ranges between € 0 and € 600, generally do not consume fair trade products. In addition, another important aspect that Gómez finds is that the consumer who changes his consumption habits, due to ethical, political or environmental issues, considering the consumption of organic products and the verification of the ingredients and origin of the products, increases to As the educational level and income of the individual are higher and the age segment of the people who carry out these behaviors ranges between 25 and 44 years. This leads us to consider these aspects to determine the purchase preference.

Regarding the consumer profile, it can be said ... “consumer behavior is the starting point to understand the stimulus-response model. Environmental and marketing stimuli enter the consumer's awareness and characteristics and the decision-making process lead to certain purchasing choices”. (Kotler & Armstrong, 2013).

A market segment is defined as "a group of consumers who respond in a similar way to a given set of marketing efforts." (Kotler & Armstrong, 2013). Another definition says… “market segmentation can be defined as the division of a heterogeneous universe into groups with at least one homogeneous characteristic. (Valiñas, 2009).

It is important to return to the factors that are considered for market segmentation and thus be able to determine the consumer profile of a specific portion.

ISSN-On line: 2531-2987

| Factor | Variables |
|---|---|
| Geographic variables. | The market can be structured based on geographic location. There are several units to limit this division, from states, countries, communities, regions, provinces or counties, cities or neighborhoods. Geographic variables can in turn be classified according to the size of the cities or the climate. |
| Demographic variables. | It is one of the most common and easy to identify variables. It consists of classifying market segments based on factors such as age, sex, marital status, occupation, income, education, religion, race, generation or nationality. |
| Psychographic variables. | It consists of the division of the market based on characteristics such as social class, lifestyle or the personality of consumers. |
| Behavioral variables. | This segmentation is based on the way in which the consumer uses the product and on consumer habits. This type of segmentation can be based on the moment, the benefits, the level of use, the frequency of use or the level of fidelity. |

**Table 1** Segmentation variables
*Source: Own elaboration based on (Fernández Valiñas, 2009)*

## Problem Statement

What is the profile of the GI pharmacy consumer and their buying preference in San Mateo Atenco, Mexico?

It has been observed that currently there are companies that do not give sufficient relevance to the knowledge of the local consumer profile. Since it is influenced by demographic, psychographic and conductive factors specific to the region.

Diagnosis of the situation: Today GI pharmacies seek continuous improvement focusing on meeting the needs of their real and potential customers, but they do not know how to do it, they do not have customer service indicators that provide them with a measurement scale at the moment To seek improvements in a timely manner, the objective is to know the profile of these customers and their purchase preference.These activities are necessary to maintain market share and achieve future growth.

## Method

The type of research that was approached was with a quantitative approach and a descriptive scope, which is used to detail the most characteristic, distinctive and particular aspects of the object of study, defining its properties. "... focuses on the questions who, what, when, where and how" according to (Zikmund & Babin, 2008). For this particular case, the aim is to systematically refer to the characteristics of the consumers of Farmacias G.I. in San Mateo Atenco, State of Mexico.

It was determined to collect primary data. The instrument that was applied was the questionnaire that "consists of a set of questions, usually of various types, prepared systematically and carefully, about the facts and aspects that are of interest in an investigation or evaluation, and that can be applied in various ways, among which its administration to groups or its sending by mail stand out "(Pérez, 2010).

The first stage of the methodology was the design of a set of reagents that ensure the validity of the determination of the consumer profile, taking into account the following definition (UNID, 2012) "It is the series of characteristics that differentiates one consumer from another , either because of their lifestyle, socio-economic level, culture, consumer experience, etc. ". The consumer profile is obtained through research, describing the characteristics of the users of a specific service or product. To do this, the demographic, geographic, cultural, psychographic and behavioral factors listed in table 1 were taken into account; For each of these factors, a certain number of items or questions were developed.

The questionnaire consists of 2 sections: the first with 7 questions that correspond to the collection of geographic and demographic data, the second section contains questions corresponding to determining the psychographic and behavioral factors that affect the consumer preference of Farmacias G.I. See Appendix 1.

The 5-level Likert scale was used, the levels used are: totally disagree; partially disagree; neutral; partially agree and totally agree.

ISSN-On line: 2531-2987

Once the questionnaire had been prepared, it was validated, for which it was applied to 20 people on the outskirts of the G.I. This questionnaire test allowed correcting the syntax of the items for a better understanding of the items, modifying some terms that were not clear to the respondent, and estimating the duration of the survey application. The information collected, added to the cross-review made by the researchers of this project, ensure the validity of the instrument.

**Determination of the sample**

Since the population of San Mateo Atenco, State of Mexico, is known, the formula was used to determine the sample size of a finite population. (Munch & Angeles, 1998).

$$n = \frac{k^2 * p * q * N}{(e^2(N-1)) + k^2 * p * q} \quad (1)$$

Where:

N = 72,579 (Atenco, 2016) Total Population

k = 1.96 Z value for a 95% confidence level

p = 0.5 probability of success (define the profile)

q = 0.5 probability of failure (do not define the profile)

e = 0.05 maximum permissible error

$$n = \frac{(1.96)^2 * (0.5) * (0.5) * (72579)}{((0-05)^2(72579-1)) + (1.96)^2 * (0.5) * (0.5)} = 383.79 \approx 384 \quad (2)$$

The number of surveys to be applied in each branch was established proportionally, according to the population of the neighborhood where each branch is located (INEGI, 2015). Table 2 shows the contribution of each neighborhood, as well as the surveys that were applied (n) in each branch.

| Neighborhood | Population | Percentage | *n* |
|---|---|---|---|
| Guadalupe neighborhood | 10,210 | 37.77 | 145 |
| San Miguel neighborhood | 9,218 | 34 | 130 |
| San Lucas neighborhood | 7,602 | 28.13 | 107 |
| Total | 27,030 | 100 | 384 |

**Table 2** Determination of the sample size by Branch
*Source: Own elaboration*

"GI pharmacies have a strategic location. The entrepreneurs who started this project decided to offer customers a combination of a good location, a great product and service, at the right price, in addition to detecting the needs of the population. That is why they are in a visible and easily accessible area for the consumer" (Méndez, 2014)

Starting from the previous premise, it was decided to apply the instrument (questionnaire) in front of pharmacies, since it is the place where most people circulate. It is worth mentioning that this was done with the authorization of the personnel in charge and the clients.

For the selection of the elements to be sampled, the systematic method was used. This "is a random sampling technique, where the researcher first randomly chooses the first piece or subject from the population and then will select each nth subject from the list" (Behar, 2014). After choosing the first item, 5 were allowed to pass and the next was chosen to be surveyed; 5 other people were allowed to pass and the next one was surveyed. Thus, until the full application of the assigned questionnaires.

Once the number of questionnaires had been completed, the responses were coded, setting a unique code for missing data. The data thus edited were entered into a spreadsheet.

The source of information due to its origin is primary, since the data collection was exclusively for the present investigation.

**Results**

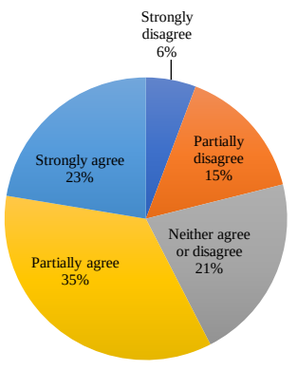
Once the information was collected, the responses were coded, setting a unique code for missing data. The data were tabulated and graphed for which Excel and SPSS ® software were used.

For the analysis of the results obtained, it is important to mention that the answers in complete agreement and partially in agreement are considered as acceptance of the item and the responses completely in disagreement and partially in disagreement as non-acceptance of the item.

A first analysis was carried out using the Excel program; The responses of the respondents to each of the items included in the questionnaire were graphed, the most relevant results are shown in Figures 1 to 8.

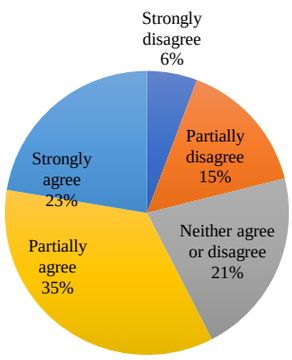
As a second analysis, in order to have a clearer picture of the consumer's profile and their purchasing preferences, it was decided to use the crosstab function. With the help of SPSS ® software, in order to determine the relationship between the different variables considered in the survey. The results of the cross tables are presented in graphs 9 to 15.

**Question 7. The products are of good quality**



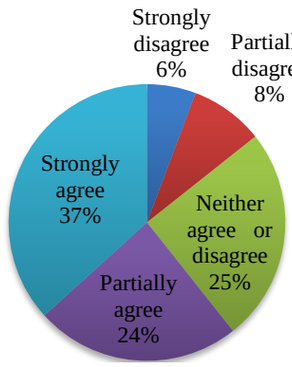

**Graphic 1** Quality of the products of Farmacias G.I.
*Source: Own elaboration*

**Question 7. The products are of good quality**



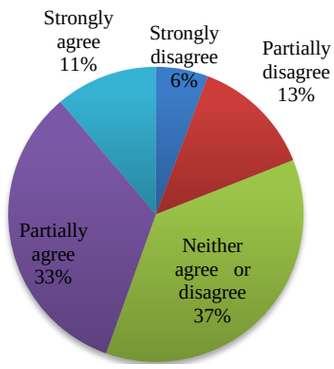

**Graphic 2** Adequate price of the products of Farmacias G.I.
*Source: Own elaboration*

**Question 9. Requieres further promotion**



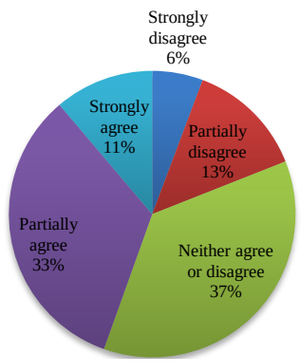

**Graphic 3** G.I. requires further promotion
*Source: Own elaboration*

**Question 11. It is requiered to open more branches**

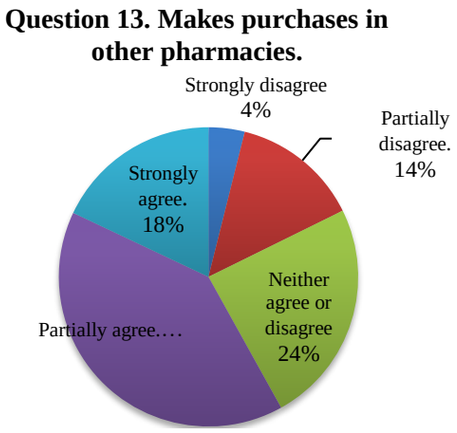



**Graphic 4** Need to open more branches of Farmacias G.I.
*Source: Own elaboration*

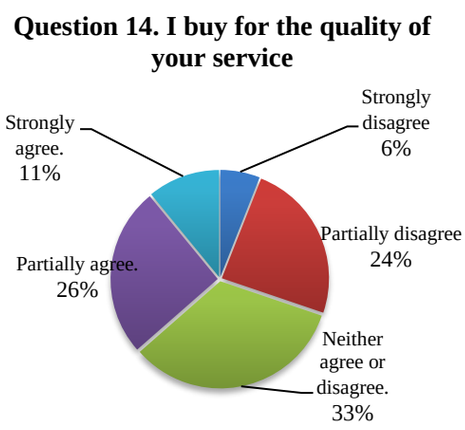
**Question 12. Use the service of Medical Office**




**Graphic 5** Demand for the service of the G.I.
*Source: Own elaboration*



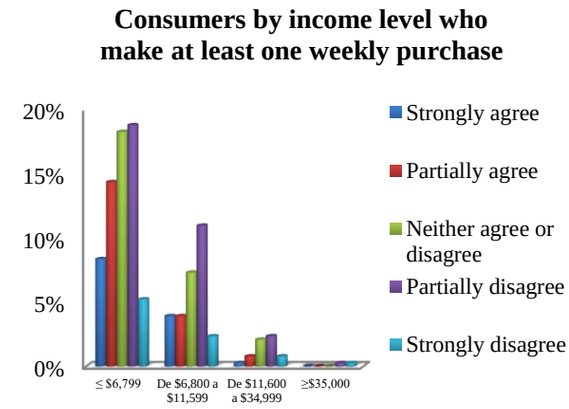

**Graphic 6** The consumer makes purchases at other pharmacies
*Source: Own elaboration*



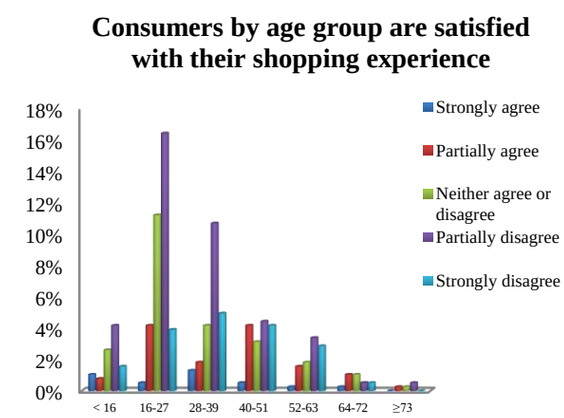

**Graphic 7** The consumer makes purchases for the quality of the service
*Source: Own elaboration*


**Graphic 8** The consumer is satisfied with their shopping experience
*Source: Own elaboration*

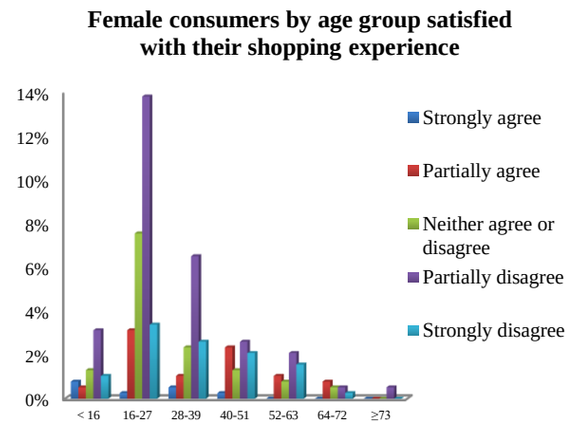
The main results found are presented below according to the crossed tables prepared.




**Graphic 9** Consumers by income level who make at least one weekly purchase at G.I.
*Source: Own elaboration*

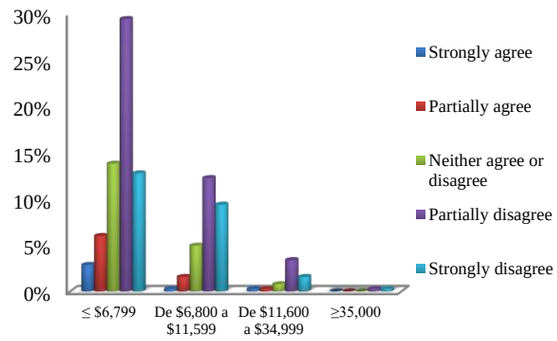



**Graphic 10** Consumers by age group who are satisfied with their shopping experience at G.I.
*Source: Own elaboration*




**Graphic 11** Female consumers by age group satisfied with their shopping experience at G.I.
*Source: Own elaboration*

**Consumer by income level who will buy again**

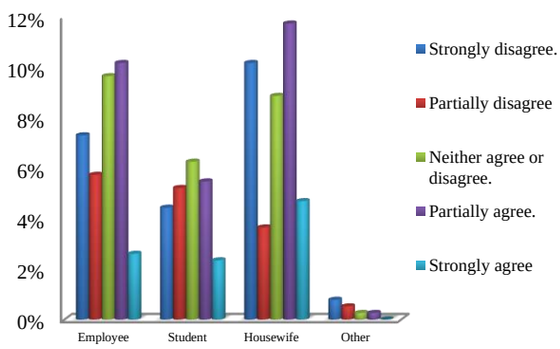



**Graphic 12** Consumers by income level who will definitely buy at G.I.
*Source: Own elaboration*

**Male consumer by occupation who buys in other pharmacies**

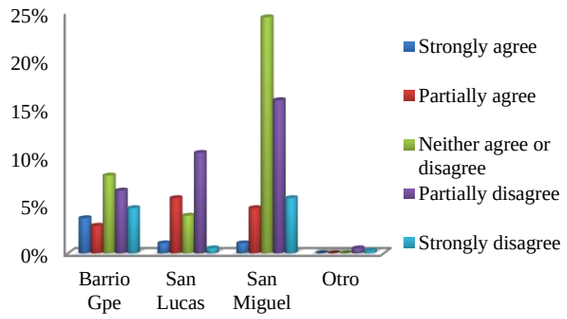

**Graphic 13** Male consumer by occupation who buys in other pharmacies
*Source: Own elaboration*

**Consumer by occupation who heard about Farmacias G.I. by friends**




**Graphic 14** Consumer by occupation who heard about Farmacias G.I. by friends and / or family
*Source: Own elaboration*

**Consumer by residens who considers residence the opening of new branches appropriate**




**Graphic 15** Consumers by place of residence who consider it appropriate to open new branches of G.I.
*Source: Own elaboration*

## Conclusions

### Consumer profile of Farmacias G.I.

Based on the results obtained, the consumer profile of Farmacias G.I. of San Mateo Atenco, State of Mexico.

Demographic variables:

– Gender: Primarily Female 65% with 35% male participation.

– Age: 59% focuses on people aged 16 to 39 years.

– Marital status: Centered on married people with 73%.

– Occupation: This area is distributed almost evenly between housewives (39%), worker (35%) and student (24%).

Geographic variables:

– Place of residence: San Mateo Atenco, in the neighborhoods of: San Miguel (52%) Guadalupe (26%) and San Lucas (21%).

– Location: 56% of respondents say that the location of the branches is adequate, however, 44% say that they should open more branches.

ISSN-On line: 2531-2987

Psychographic variables:

Social class: The consumers of Farmacias G.I. According to the classification established by the Ministry of Economy (2014) they belong to the Low High and Medium Low social classes, considering the educational level and the income level.

- Family monthly income level: corresponds to people with incomes of ≤ $ 6,799 to 11,599 by 93%.
- Educational level: People with secondary and high school education by 72%.

- Personality: Physical and mental well-being: The consumer of Farmacias G.I. that does not practice any sport is 52%.

Behavioral variables:

- Expected benefit: Quality at low prices. 58% of those surveyed state that the products of Farmacias G.I. They are of quality and 50% consider that the prices of the products are adequate.
- Self-medication. 45% say that they self-medicate and 44% make use of the medical office of the G.I.
- Purchase frequency. People who buy at least once a week is 41%.
- Attention to recommendations: Only 37% of consumers attend recommendations from friends and / or family.
- Need for recognition: 37% of those surveyed buy at G.I. for the quality of the service they receive and 50% consider that the attention time is adequate.
- Perception: 58% of respondents are satisfied with the shopping experience.
- Learning: 69% will make a buyback in G.I.

Other relevant aspects of Consumer Preferences.

- Variety of products: 40% of those interviewed consider that the variety of products in G.I. is adequate.
- Promotion: 61% agree that it requires further promotion.
- They buy in other pharmacies. 58% of those surveyed state that they make purchases in other pharmacies.

As complementary information, the analysis of the crossed tables was carried out, (relationship of two or more variables), the main conclusions are presented below:

Regarding the frequency of purchases vs. income level (Graphic 9).

It is very important to know the interaction of these two variables, it is desirable that consumers with income between © are those who make a purchase at least once a week. Of the people surveyed, 47% of the people who shop at least once a week correspond to consumers who have an income level between ≤ $ 6,799 to 11,599. This indicates that consumers in this income range buy in GI pharmacies due to various factors, among which we find a good price, excellent service and quality of products.

Regarding satisfaction in the shopping experience by income level (Graphic 10).

59% of those surveyed correspond to the group 16 to 39 years old and of these, 36% are satisfied with their shopping experience at GI Pharmacies, it is worth mentioning that the people of this age group who claim to be neutral with respect to this question reach 15%, which represents an area of opportunity for GI Pharmacies.

With respect to female consumers by age group satisfied with their shopping experience at G.I. (Graphic 11).

The total of female respondents represent 65% of the population; Of this population, those women who say they are satisfied with their shopping experience are 27% and 10% say they are neutral, this indicator shows that Farmacias GI should pay more attention to the female consumer to raise the level of satisfaction whenever women are the main consumers.

ISSN-On line: 2531-2987

In relation to Consumers by income level who will make a buyback at G.I. (Graphic 12). The buyback is very important for all companies because that is where you see loyal customers to the brand, or customers who are not so frequent, but are loyal. The people surveyed with the lowest income ≤ $ 6,799 to 11,599, which represent 93% of the respondents, are manifested in 63% that they made a buyback in G.I. Pharmacies, this represents a strength of G.I. however, you should not neglect aspects such as the quality and variety of the product, as well as the care provided at the time of purchase. Good quality customer service is essential for companies, since 89% of the population declares that customer service influences their purchase or buyback decision and 80% considers that a good experience with the service of Customer service encourages their loyalty to the brand or company.

Considering the acquisition of products in another pharmacy of male consumers vs. occupation (Graphic 13). Of the 136 men surveyed, 91 are workers and 30 students; together they represent 74% of the male population. As mentioned above, the group of male consumers represents 35% of all consumers, of this percentage of this group 15% say they make purchases in other pharmacies and 11% are neutral. Workers on the one hand have quite long and changing working hours; on the other hand, students do not have much time to perform. What plays a very important role for them to make the purchase decision in another pharmacy is the proximity of other pharmacies or the urgency towards the purchase of a product.

Regarding how they found out about GI pharmacies through friends and / or family vs. Occupation. (Graphic 14).

Based on the workers and housewives who represent 74% of respondents by occupation; In this segment, 30% say they know about Farmacias G.I. by family and / or friends and 19% are neutral to this question. The percentage is relatively low, so it represents an area of opportunity for Farmacias G.I., since the best advertising is by word of mouth, where there is no direct cost for the company, which generates broad benefits. They consider that the shopping experience is what makes the company competent.

In relation to the opening of new branches of Farmacias G.I. vs Place of Residence. (Graph 15). In the 3 surveyed neighborhoods there is a GI pharmacy branch, in the San Miguel neighborhood there is the highest demographic index and in the same way, it is in this same place where most of the respondents state that it is necessary to open another branch.

Thus, the residents of Barrio San Miguel represent 52% of those surveyed and of these 22% declare the need to open another branch; However, in this same segment, 24% say they are neutral when faced with this question, in such a way that there is no decisive answer that influences the opening of new branches, a situation that should continue to be monitored by the company.

The variables of significant incidence in determining the consumer profile of Farmacias G.I. were the following: age, sex, and income level of consumers, rating on product quality, place of purchase of the product, variety of products offered, rating on product price, knowledge of product promotions and counting with a medical office service attached to the Pharmacy.

With the data obtained, it is concluded that the expectations of customers with the services and products offered by the company are good since satisfaction is reflected when customers return to Farmacias GI, the important thing here is to continue working to increase customer satisfaction attending the areas of opportunity found.

## Annexes

**Annex 1.** Applied Questionnaire

**INSTITUTO TECNOLÓGICO DE TOLUCA**

Please answer the following questionnaire, the information you provide is confidential and will be used for statistical purposes in a research project on consumer characteristics. We thank you in advance for your cooperation.

**Instructions: Mark your answer with an "X".**

**Gender:** M __ F__

**Age:** Less than 16 years ___ 16-27 years ___ 28-39 years ___ 40-51 years ___ 52-63 years ___ 64-72 years ___ 73 or more ___

**Occupation:** Worker ___ Student ___ Housekeeper ___ Other ___
Specify:
_____

**Civil status:** Married ___ Single ___

**Education level:** Educational level Primary ___ Secondary ___ High School __ Technical ___ Other___ Specify: _____

**My place of residence is:**
Guadalupe neighborhood ___
Saint Luke ___ Saint Michael ___ Other_____
Specify: _____

**Select the range in which your monthly household income is.**

Less than $ 6,799 ___ $ 6,800 to $ 11,599 ___ $ 11,600 to $ 34,999 ___ More than $ 35,000 ___

**Please answer based on this scale:**

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Strongly disagree | Partially disagree | Neutral | Partially agree | Totally agree |

| | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| **1.** | I practice a sport | | | | | |
| **2.** | I self-medicate | | | | | |
| **3.** | I found out about Farmacias G.I. through friends and / or family | | | | | |
| **4.** | Made purchases at least once a week at Farmacias G.I. | | | | | |
| **5.** | I consider that the variety of products of the G.I. meets my needs. | | | | | |
| **6.** | I consider that the attention time at Farmacias G.I. It's appropriate. | | | | | |
| **7.** | I believe that the quality of the products of the G.I. is good. | | | | | |
| **8.** | I consider that the price of the products of the G.I. It's appropriate. | | | | | |
| **9.** | I would like Pharmacies G.I. make more promotions of their products. | | | | | |
| **10.** | I believe that the location of Farmacias G.I. is adequate | | | | | |
| **11.** | I would like there to be more branches of Farmacias G.I. | | | | | |
| **12.** | He used the medical office service of Farmacias G.I. | | | | | |
| **13.** | I buy products in another pharmacy | | | | | |
| **14.** | I buy products at Farmacias G.I. for the quality of your service | | | | | |
| **15.** | I am satisfied with my shopping experience at Farmacias G.I. | | | | | |
| **16.** | I will definitely make a purchase again at Farmacias G.I. | | | | | |

**Thank you very much for your cooperation**

## References

Behar, D. S. (2014). *Metodología de la Investigación.* Shalom.

Chiavenato, I. (2005). *Iniciación a la Organización y Técnica Comercial.* Mexico: Mc Graw Hill.

COFEPRIS. (28 de Noviembre de 2012). *Reglamentros - Transpariencia COFEPRIS*. Recuperado el 20 de Abril de 2020, de Reglamentros - Transpariencia COFEPRIS: http://transparencia.cofepris.gob.mx/index.php/e

Farmacias G I. (s.f.). *Farmacias G I*. Recuperado el 28 de marzo de 2020, de Farmacias G I: https://farmaciasgi.com.mx/quienes-somos/

Fernández Valiñas, R. (2009). *Segmentacion de Mercados.* Mexico: McGRAW-HILL.

Ferrel. (2016). *Marketing.* Boston, New York: Houlighton Mifflin.

Garnica&Maubert. (2017). *Fundamentos de Marketing.* México: Pearson.

Godínez Reséndiz, , R., & Aceves Pastrana, P. (2014). El surgimiento de la industria farmacéutica en México (1917-1940). *Revista mexicana de ciencias farmaceuticas*. Recuperado el 20 de Abril de 2020, de http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1870-01952014000200007

ISSN-On line: 2531-2987

Gómez, A. (2017 de septiembre de 2017). *UNIVERSIDAD DE PAIS VASCO, FACULTAD DE ECONOMIA Y COMERCIO*. Recuperado el 19 de abril de 2020, de UNIVERSIDAD DE PAIS VASCO, FACULTAD DE ECONOMIA Y COMERCIO: https://addi.ehu.es/bitstream/handle/10810/24832/TFG_Gomez.pdf?sequence=1&isAllowed=y

Houston, L. V. (2012). *Segmentación demográfica*. Recuperado el 20 de Febrero de 2017, de http://pyme.lavoztx.com/ejemplos-de-segmentacin-demogrfica-5311.html

*Industria Farmaceuitaca*. (Agosto de 2014). Obtenido de Industria Farmaceuitaca: https://www.gob.mx/cms/uploads/attachment/file/76324/111115_DS_Farmaceutico.pdf

Kern Pharma. (25 de septiembre de 2017). *Los farmacéuticos, ayer y hoy*. Obtenido de Los farmacéuticos, ayer y hoy: https://www.kernpharma.com/es/blog/los-farmaceuticos-ayer-y-hoy

Kotler, P., & Armstrong, G. (2013). *Fundamentos de Marketing.* Mexico: Pearson.

Lamb, H. M. (2019). *Marketing.* México: CENGAGE.

León, L. A. (2015). *Análisis Económico de la Población*. Recuperado el 20 de Febrero de 2017, de https://web.ua.es/es/giecryal/documentos/demografia-peru.pdf?noCache=1424676080482

Martinez, E., & Montaner, T. (2007). Análisis del perfil psicográfico de los consumidores propensos a las promociones de productos de compra frecuente. *Cuadernos de Economía y Dirección de la Empresa*, 63-92.

Méndez, I. G. (2014). Franquicias GI. Puntos Estratégicos. *Entrepreneur*, 15.

Munch, L., & Ángeles, E. (1998). *Métodos y Técnicas de Investigación.* México: Trillas.
Munch, & Garcia M. (2017) Fundamentos de Administración México: Trillas.

Pérez, R. (2010). *Pedagogía Experimental.*Madrid: UNED.

Polo Moya, D. (27 de junio de 2019). *Gestionar Facil. com*. Recuperado el 3 de 08 de 2020, de Gestionar Facil. com: https://www.gestionar-facil.com/que-es-una-empresa-exitosa/

Santamaria, E. J. (2014). Influencia de los Factores Culturales y Demográficos en el Perfil del Consumidor de Marcas Propias en Ecuador. *Revista Politecnica* .

Secretaría de Economía- Pro-México. (Agosto de 2015). *Industria Farmacéutica*. Obtenido de Industria Farmaceuitica: https://www.gob.mx/cms/uploads/attachment/file/76324/111115_DS_Farmaceutico.pdf

Stanton, E. &. (2007). *Fundamentos de Marketing.* México: Mc. Graw Hill.

UNID. (2012). *Univerdidad Interamericana para el Desarrollo*. (UNID) Obtenido de Análisis de Consumidor: https://moodle2.unid.edu.mx/dts_cursos_mdl/ejec/ME/AC/S08/AC08_Lectura.pdf

Valiñas, R. F. (2009). *Segmentacion de Mercados* . México: Mc. Graw Hill.

Zikmund, W., & Babin, B. (2008). *Investigación de Mercados* (9a ed.). Cengage Learning.

Article **Journal-Microeconomics**
June 2020 Vol.4 No.6 14-23

# Identification of the consumer profile for the industrialization of Chihuahua type cheese

# Identificación del perfil del consumidor para la industrialización de queso tipo Chihuahua

MIRELES-MEDINA, Antonia†*, MIRELES-MEDINA, Manuel Patricio, PAREDES-BERUMEN, Luis Enrique and DE ÁVILA-MARQUEZ, Francisco

*Tecnológico Nacional de México, Campus Zacatecas Norte (Instituto Tecnológico Superior Zacatecas Norte), Zacatecas, México.*
*Universidad Autónoma de Zacatecas, Academic Unit of Accounting and Administration, Division of Postgraduate Studies (Master of Administration), Zacatecas, México.*

ID 1st Author: *Antonia, Mireles-Medina* / **ORC ID:** 0000-0001-9773-9108, **CVU CONACYT ID:** 299436

ID 1st Coauthor: *Manuel Patricio, Mireles-Medina* / **ORC ID:** 0000-0002-8179-9752, **CVU CONACYT ID:** 1064500

ID 2nd Coauthor: *Luis Enrique, Paredes-Berumen* / **ORC ID:** 0000-0002-8010-0153, **CVU CONACYT ID**: 1091563

ID 3rd Coauthor: *Francisco, De Ávila-Marquez* / **ORC ID:** 0000-0003-0862-9914, **CVU CONACYT ID**: 1091436

**DOI:** 10.35429/JM.2020.6.4.14.23 Received January 15, 2020; Accepted June 30, 2020

**Abstract**

It is of great importance that family businesses when deciding to launch a new brand in the dairy market know the characteristics of the consumer, so that they can identify the tastes, needs and preferences of potential customers, who can later become regular customers That is why the objective of this article is to present the results of a market research focused on identifying the consumer profile for the industrialization of Chihuahua-type cheese. In such a way that market niches can be established where quality products are offered according to the needs and possibilities of customers. While it is true today, there are different brands of dairy products on the market, it is also true that day by day consumers have greater demands regarding this type of product. On the other hand, in the state of Zacatecas, properly in the municipality of Río Grande there are small companies that are dedicated to the production of bovine milk, which have the possibility of giving added value to their product, industrializing it to transform it into cheese Chihuahua type.

**Marketing, market research, consumer profile**

**Resumen**

Es de gran importancia que las empresas familiares al decidir el lanzamiento de una nueva marca en el mercado de lácteos conozcan las características del consumidor, de modo que logren identificar los gustos, necesidades y preferencias de los clientes potenciales, que posteriormente pueden convertirse en clientes habituales, es por ello que el objetivo de este artículo consiste presentar los resultados de una investigación de mercados enfocada a la identificación del perfil del consumidor para la industrialización de queso tipo Chihuahua. De tal forma que se puedan establecer nichos de mercado donde se oferten productos de calidad de acuerdo a las necesidades y las posibilidades de los clientes. Si bien es cierto hoy en día, existen diferentes marcas de productos lácteos en el mercado, también es cierto que día con día los consumidores tienen mayores exigencias con respecto de este tipo de productos. Por otro lado, en el estado de Zacatecas, propiamente en el municipio de Río Grande existen pequeñas empresas que se dedican a la producción de leche de bovino, el cual tienen la posibilidad de darle el valor agregado a su producto, industrializándolo para transformarlo en queso tipo Chihuahua

**Marketing, investigación de mercados, perfil del consumidor**

**Citation:** MIRELES-MEDINA, Antonia, MIRELES-MEDINA, Manuel Patricio, PAREDES-BERUMEN, Luis Enrique and DE ÁVILA-MARQUEZ, Francisco. Identification of the consumer profile for the industrialization of Chihuahua type cheese. RINOE Journal-Microeconomics. 2020. 4-6:14-23.

* Correspondence to Author (Email: mirelesmed_7@hotmail.com)
† Researcher contributing first author.

## Introduction

Today's markets are more challenging and demanding, this leads companies or organizations to seek strategies that allow them to generate competitive advantages over others. (Vazquez, 2012) says that "today the most successful organizations in the world have reached a level of consumer satisfaction, transforming the entire organization to serve them and remain close to them.

To achieve this objective, these companies have generated an approach to the consumer, where they have first determined what they want in order to design, produce and market products or services with the highest quality and at reasonable prices".

In family businesses in the municipality of Río Grande, Zac., Dairy products are made without having knowledge of the consumer profile, which means that they are less competitive.

(Corona, Paz Gómez, & Camacho Gómez, 2016) mention that in México there are 3, 724, 019 family businesses throughout the country, of which 49.9% (they are concentrated in commerce 1 858 550), services 36.7% (1 367 287) and manufacturing industries 11.7% (436 851) this according to information from (INEGI, 2014). A family business is one that has been founded by a family member and has been passed on, or is expected to be passed on, to their descendants.

The descendants of the original founder or founders will have ownership and control of the company. They also work and participate in the company and family members benefit from it (Mucci, 2008).

On the other hand, the dairy product agroindustry in México takes on great importance not only because it produces products with nutritional and taste benefits for consumers, but also because of the economic value that the processing activity represents, its ability to generate and maintain employment (Ghent & Cervantes Escoto, 2011).

For this study, the family business "Villa Guadalupe de Río Grande, Zac." Has been considered, which is a company that is dedicated to the production of bovine milk and that, due to its fixed assets, has the capacity to produce enough fodder for feeding cattle, these assets are such as irrigated land, rainfed, agricultural implements, transport equipment and infrastructure (warehouses, milking parlor, corrals, transport equipment, hydraulic installation system, among others), however Due to lack of investment, drive and innovation, product diversification and ignorance of the profile of consumers, it does not achieve successful economic growth year after year.

That is why the company "Villa Guadalupe" has made the decision to carry out a market investigation to identify the profiles of the Chihuahua-type cheese consumer and thus offer a new brand in the market that meets customer satisfaction and the standards of quality. This study is focused on housewives who are the ones who regularly make the decision when supplying the basic basket that supplies the food needs of their home. Cheese is one of the products that can be made with bovine milk and it constitutes an important part of the basic nutritional diet of humanity, this gives the guideline to think about a company capable of producing cheese with an artisan flavor , exquisite and original without losing its organoleptic properties.

## Referential framework

### Marketing

(Kotler, Marketing Management, General Concepts, 2002) considers marketing to be a process through which individuals and groups obtain what they need and what they want by creating, offering and freely exchanging valuable products and services with others. However, he mentions that Peter Drucker says that "the goal of marketing is to make selling superfluous. The purpose of marketing is to know and understand the customer so well that the product or service fits him perfectly and sells itself. Ideally, the marketing result should be a customer who is ready to buy".

ISSN-On line: 2531-2987

**Market research**

In the state of Zacatecas one of the priorities is precisely the agroindustrial field, likewise, it is considered as a strategic state sector for development (Inadem, 2013), this is a great opportunity that exists to give it more boom, since it will bring with it benefits to society with the generation of jobs and the offer of safe, quality products and good prices that satisfy their needs. Market research is the core of success in launching a new brand, since it is possible to identify supply, demand, price analysis and the study of marketing (Urbina, 2013). Similarly, the author Urbina is very emphatic when he says that the general objective of market research is properly to verify the real possibility of penetration of a product in a given market. Hence the question that the same author proposes, is there a viable market for the product to be produced?

Market research according to (Ríos, 2018) is the "formal link between the organization and its environment" thanks to this, important information can be collected to know the characteristics of the consumer. On the other hand, according to (Herrera, 2013) he says that it serves to provide accurate information that allows reducing uncertainty in marketing decision-making, since it goes from an intuitive approach to a systematic, analytical and objective approach. (Pelayo & Cavazos Arroyo, 2015) consider that market research acts in a set of three functions, such functions have been taken into account in the process of conducting market research in this article:

- Descriptive function: It is the compilation and presentation of the facts.
- Diagnostic function: It is based on the exploration of data or actions.
- Predictive function: It is the specification of how you use the collection and presentation of facts and data exploration to predict the results of a planned decision.

Other concepts underlying the variables in this study are supply and demand. "Supply and demand are market drivers, which in ideal conditions should govern this" (Gutiérrez, 2018), for this reason it is of the utmost importance to carry out a market research that allows the identification of the suppliers and their demanders, so In the latter, the identification of their needs, preferences and tastes regarding the consumption of Chihuahua type cheese is of central importance. "In the purchase decision process, the consumer weighs the benefits that can be obtained from a promotion" (Martínez & Montaner, 2007), however, the authors of this article consider that the consumer weighs not only on the basis of promotions the benefits but also when deciding to purchase a new product or a product of a new brand in the market.

**Consumer profile**

According to (Kotler & Gary, 2001) the consumer profile "is the starting point to understand the buyer, it is the stimulus-response model. Environmental and marketing stimuli enter the buyer's consciousness, buyer characteristics and the decision process lead to certain purchasing decisions. The role of the marketing specialist is to understand what happens in the buyer's awareness between the arrival of the external stimulus and the purchasing decisions of the same".

According to (Kotler & Gary, Fundamentos de Marketing, 2003) the factors that influence consumer behavior are: cultural (culture, subculture, social class); social (reference groups, family, roles and status); personal (age, stage of the life cycle, occupation, economic situation, lifestyle and personality) psychological (motivation, perception, learning, beliefs and attitudes), topics that have been taken into account for the elaboration of the data collection instrument for the identification of the profile of the Chihuahua-type cheese consumer.

ISSN-On line: 2531-2987

**Definition of Chihuahua type cheese**

According to the Mexican Standard NMX-F-209-1985, the Chihuahua type cheese "It is the product that is obtained from whole pasteurized cow's milk subjected to coagulation processes, cut, dewatered, fermented, salted, pressed and matured during a minimum period of 7 days at controlled temperature and humidity; without having been used in its elaboration fats or proteins not coming from milk ". It is important to mention that according to the investigation in Mexico, only such a standard has been identified for the production of Chihuahua-type cheese, however, it has been canceled by NMX-F-738-COFOCALEC-2011, it should be mentioned that said standard only reference to Chihuahua cheese, not Chihuahua-type cheese as such. For this reason, the Mexican Standard NMX-F-209-1985 is taken as a reference for the elaboration of the cheese object of this study. Cheese is a product of great importance in the Mexican dish, it is preferred by consumers with exquisite palates as expressed (Medina, Zúñiga Hernández, Mireles Medina, & Mancillas Medina, 2017).

**Per capita cheese consumption**

Regarding the per capita consumption of cheese, in México it is 2.1 kg of cheese per year, less than the global consumption, which is 2.5 kg, however, there are countries, such as Greece and France, in which an average inhabitant eats more of 20 kg per year, as stated (Cesín-Vargas, 2014), in the same way said author also makes reference that "according to INEGI data, in México an average household spends 29.4% of its expenditure on the acquisition of food, beverages and tobacco; Of that total, 9.52% corresponds to the purchase of dairy products, equivalent to 2.8% of global spending. In the purchase of different types of milk, 64% of the expenditure is spent on dairy products and 24% for the acquisition of cheeses; the remaining 12% is used for the consumption of other dairy products ".

**Characteristics to consider for the industrialization of Chihuahua type cheese**

Regarding the Mexican Standard NMX-F-209-1985, the following characteristics that Chihuahua type cheese must have are identified.

Among the sensory characteristics, the color is considered, which must be white or slightly yellow; the flavor, characteristic free of strange flavors; the smell, free of strange odors and the consistency, semi-hard and slicable.

And as physical, chemical and microbiological characteristics it is said that it must not contain pathogenic microorganisms, microbial toxins, and microbial inhibitors or other toxic substances that may affect the health of the consumer or cause deterioration of the product, therefore it must comply with the following physical and chemicals as indicated in Table 1:

| Specs | Minimum | Maximum |
|---|---|---|
| Humidity in% | | 45.0 |
| Butterfat), % | 26.0 | |
| Protein of lactic origin, in% | 22.0 | |
| Total solids, in% | 55.0 | |
| pH | 5.0 | 5.5 |
| Total ash in% | | 6.5 |
| Sodium chloride in% | | 3.0 |

**Table 1** Physical and chemical specifications of Chihuahua type cheese
*Source: Own elaboration, data obtained from the Mexican Standard NMX-F-209-1985*

In addition to the physical and chemical specifications, Chihuahua-type cheese must meet the following microbiological specifications as shown in Table 2:

| Specs | Maximum CFU / g |
|---|---|
| Coliforms | 10,000 |
| Staphylococcus aureus | 100 |
| Escherichia Coli | 1,000 |
| Salmonella in 25 g | Negativo |

**Table 2** Microbiological specifications of Chihuahua type cheese
*Source: Own elaboration, data consulted in the Mexican Standard NMX-F-209-1985*

**Additives for Chihuahua type cheese**

The additives allowed by the Secretary of Health and Assistance according to the Mexican Standard NMX-F-209-1985, are:

- Lactic cultures.
- Sodium chloride.
- Vegetable or animal rennet.

ISSN-On line: 2531-2987

- Annatto (achiote seed and carotene in proportion with greater than 6%).
- Calcium chloride (CaCl2) in a proportion not greater than 0.02%.
- Sorbic acid or its sodium or potassium salts 1 g / kg.
- Sodium or potassium nitrate in a proportion not greater than 0.03%.
- Pimaricin at a maximum concentration of 300 mg / kg in solution.

**Methodology**

**Research approach**

Research can be carried out in very diverse areas, on the other hand, there are endless areas of opportunity, such as the family, social, educational, technological, business, cultural, political, in the area of health, among others; This implies that the research is not closed to the possibility of a single research approach, since it cannot be merely quantitative or qualitative, it can be mixed due to the nature of the variables considered in the research. There are those who think that research should be based on quantifiable variables, that is, on indicators that allow them to be assigned a discrete or continuous value, ruling out the possibility that the variables may be non-quantifiable and, therefore, the research can be of qualitative character, or it can be mixed failing that.

It is true that in order to understand, verify, verify and pay for knowledge, it is strictly necessary to subject the investigation to a series of steps or processes, processes that can lead to the implementation of the scientific method, a method that science has used for many years ago and At present, for problem solving, however, not all research requires a method with such rigor, because there are investigations that do not require certain experiments to pay for knowledge. Or they are simply mixed or qualitative investigations.

There are different types of research approaches, such as the quantitative and qualitative approach. From the combination of both approaches, the mixed approach is derived (Sampieri, Fernández Collado, & Baptista Lucio, 2014).

Gómez (2006) says that “the quantitative approach uses data collection and analysis to answer research questions and test previously established hypotheses, and relies on numerical measurement, counting, and the use of statistics to try to establish with pattern accuracy in a population".

In addition, the essence of the quantitative approach is to quantify and provide evidence to a theory that exists to explain something (Gómez, 2006). In this research, the aim is to identify the profile of the Chihuahua-type cheese consumer for the company Villa Guadalupe de Río Grande, Zac. Through quantifiable studies where demand, supply, tastes and preferences are determined. Torres (2010) supports that the quantitative method is properly justified in measuring the characteristics of social phenomena. This confirms what has already been mentioned by the author Marcelo M. Gómez.

"Descriptive statistics is understood as the set of methods to process information in quantitative terms" this is pointed out by the author (Baray, 2006). This allows variables characterized by their nature as quantitative (Bravo, 2001) to be measurable and quantifiable. Sampieri et al., (2014) say that the quantitative approach is sequential and evidential, so that each of the stages of this approach should not go unnoticed, since the approach in question is rigorous. The process is determined from the idea to the preparation of the results report. So quantitative studies try to explain and predict the phenomena investigated.

On the other hand, the qualitative approach according to (Gómez, 2006) consists of detailed descriptions, events, people, interactions, observed behaviors and their manifestations”. Based more on an inductive process, since it explores and describes and subsequently generates theoretical perspectives as well, the author states (Gómez, 2006). As already mentioned, there is the qualitative approach that according to (Torres, 2010) seeks to understand a social situation as a whole. Hence, Sampieri et al. (2014) call it holistic. This approach as such tries to approach directly to inquire about the behavior of the objects of study, using instruments such as interviews and observation.

ISSN-On line: 2531-2987

For the purposes of this article, the authors consider that the research approach is quantitative, derived from the variables of the object of study in question. Since it is a question of knowing from a market research the characteristics or the profile of the consumer, such as needs, tastes and preferences when making a purchase decision regarding Chihuahua type cheese.

**Research scope**

There are different types of research scope, such as: exploratory, descriptive, correlational and explanatory according to (Sampieri et al., 2014).

Sampieri et al. (2014) consider that an exploratory research scope consists of a research problem that has been little studied; while a descriptive study is one that seeks to specify the properties, characteristics and profiles of the study objects. Similarly, it specifies that a correlational scope is one that allows the relationship between the study variables, where these relationships can be supported by hypotheses tested. Finally, it says that an explanatory scope is one that goes beyond a simple description of phenomena, since this scope is aimed at responding to the causes of the phenomena under study.

Due to the nature of the variables, the authors of this document argue that the scope of the study is considered descriptive, since it describes the characteristics of the consumption profile of Chihuahua-type cheese.

**Research design**

"Once the problem statement was specified, the initial scope of the research was defined and the hypotheses were formulated, the researcher must visualize the practical and concrete way of answering the research questions, in addition to covering the set objectives" (Sampieri et al. 2014). The design of an investigation is very important, since without it the purpose of answering the research question or questions will not be achieved, in the same way the objectives set in the investigation will not be achieved, as a consequence there will be no necessary elements to reach to test the hypothesis or hypotheses formulated.

Talking about the research design is talking about the strategies that the research subject plans to obtain the information he needs for his research, there are different types of design, these can be quantitative or qualitative (Sampieri et al. 2014), in turn the The author, referring to the quantitative ones, classifies them as pure, quasi-experimental and non-experimental experiment, while the qualitative ones are classified as grounded theory, ethnographic, narrative designs, and action research designs. Sampieri et al. (2014) defines quantitative non-experimental research as "research that is carried out without deliberately manipulating variables. In other words, these are studies where we do not intentionally vary the independent variables to see their effect on other variables".

Sampieri et al. (2014) cites Mertens (2005) who points out that non-experimental research is appropriate for variables that cannot or should be manipulated or it is difficult to do so. "Transsectional or cross-sectional research designs collect data in a single moment, in a single time" (Sampieri et al., 2014). Likewise, they say that descriptive transectional designs are intended to investigate the occurrence of the modalities or levels of one or more variables in a given population.

In the present study, the authors focus, due to the nature of the research, on the non-experimental design, which in turn is divided into transectional and longitudinal according to (Sampieri et al., 2014). Properly, the transectional or transversal is classified as descriptive and correlational / casual, so it says (Sampieri et al., 2014). Consequently, the design for this study is considered by the authors as non-experimental, transectional or cross-sectional and descriptive, because there is no manipulation of independent variables, the study is carried out at a specific moment and only tries to describe the phenomena about the consumption of Chihuahua type cheese; as well as to identify in the objects of study the acceptance of a new brand.

ISSN-On line: 2531-2987

## Description of the population and sample

Sampieri et al. (2014) point out that within an investigation the population has to be defined in order to subsequently identify the unit of analysis, therefore, to define the population it is considered that according to the census (INEGI, 2010) in Río Grande, Zac., There are a total of 62,693 inhabitants, while in the municipal seat 32,944 and a total 15,968 dwellings. In the calculation, the decision is made to carry out the surveys in 15 neighborhoods, of which 24 surveys per neighborhood are determined, where when calculating the sample, a sample of 367 people are obtained, considered housewives who belong to the city from Río Grande, Zac., the type of sampling that has been used is multistage and the unit of analysis was determined based on the corresponding Urban Basic Geo-statistical Areas (AGEB), where the 15 colonies were identified, taking into account that the surveys have been applied based on the odd numbers of the dwellings.

## Calculation of the reliability of the data collection instrument

There are different procedures to calculate the reliability of the data collection instrument, they all use procedures and formulas that allow identifying the reliability coefficients, as considered by Sampieri et al. (2014); Cronbach's alpha coefficient is used for the purposes of this research. For the question related to the frequency of consumption of different brands of Chihuahua type cheese, the reliability is as follows:

| Cronbach's alpha | No. of elements |
|---|---|
| .982 | 6 |

**Table 3** Reliability on the frequency of consumption of Chihuahua type cheese
*Source: Own elaboration, (2020)*

As shown in Table 3, Cronbach's alpha coefficient is very high, since it tends to be highly reliable. The reliability for the question regarding the degree of importance given by the consumer when buying Chihuahua-type cheese is obtained as follows:

| Cronbach's alpha | No. of elements |
|---|---|
| .810 | 6 |

**Table 4** Reliability on the degree of importance that the consumer gives to certain factors when buying Chihuahua type cheese
*Source: Own elaboration, (2020)*

ISSN-On line: 2531-2987


In Table 4 the reliability is good, therefore it is sufficient to justify the reliability. Regarding the question related to the frequency of the place of purchase of the Chihuahua type cheese, we have:

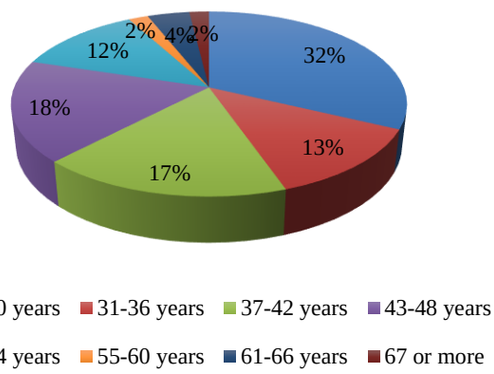
| Cronbach's alpha | No. of elements |
|---|---|
| .882 | 5 |

**Table 5** Reliability of the frequency of the place where housewives buy Chihuahua type cheese
*Source: Own elaboration, (2020)*

In Table 5 the reliability is very good, therefore it is enough to justify the reliability.

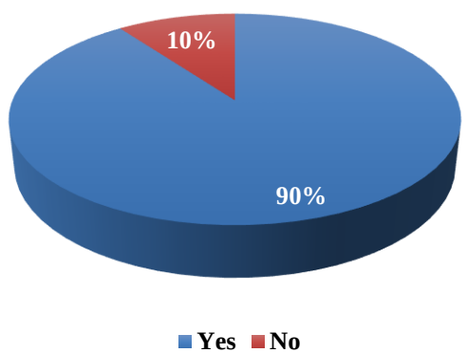
## Results

Below are the results obtained from the application of 367 surveys to housewives:



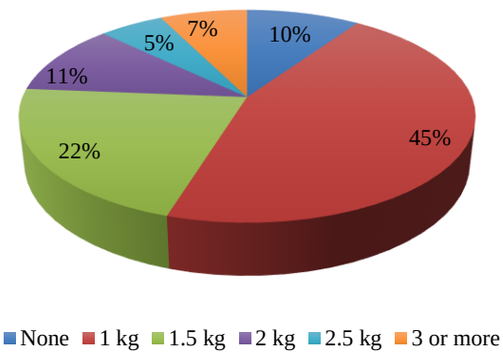

**Graphic 1** Age percentage of surveyed housewives
*Source: Own elaboration, (2020)*

Among the consumer profile data, Graphic 1 shows that 32% of the people surveyed are between 25-30 years old; while 18% are 43-48 years old; 17% are between 37 and 42 years old and 12% are between 49-54 years old. Of the total of the 367 surveys applied, it is identified that the majority of housewives are young.



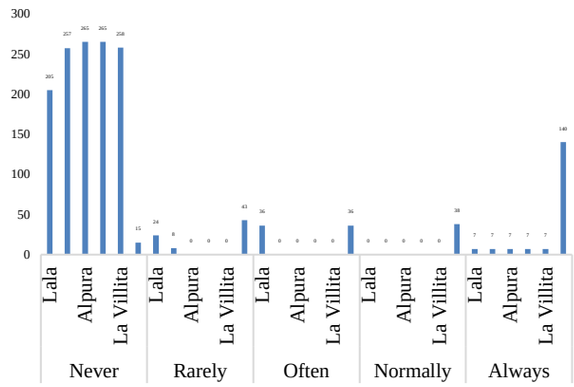

**Graphic 2** Percentage of housewives who work
*Source: Own elaboration, (2020)*

Graphic 2 shows that of the 367 surveys applied to housewives, 90% work and 10% do not work.



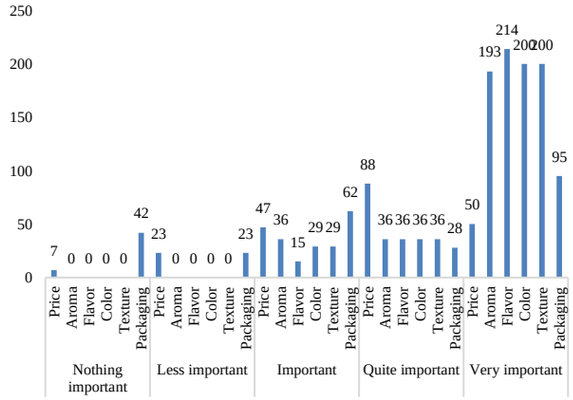

**Graphic 3** Percentage of consumption in kilograms of Chihuahua type cheese
*Source: Own elaboration, (2020)*

Graphic 3 shows the results obtained on the information related to the weekly consumption of Chihuahua-type cheese in housewives. 45% consume one kilogram per week, 22% consume 1.5 kilograms, 11% consume 2 kilograms per week, 10% do not consume cheese, 7% consume 3 or more kilograms and 5% consume 2.5 kilograms.



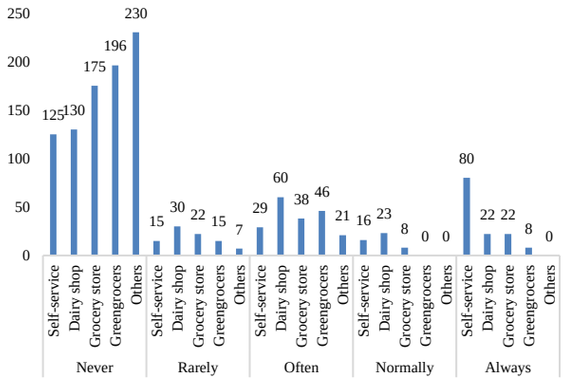

**Graphic 4** Frequency of consumption of different brands of Chihuahua type cheese
*Source: Own elaboration, (2020)*

In Graphic 4 it is identified that 140 housewives very frequently consume cheese from the region; quite frequently 38 consume cheese from the region; with regular frequency 36 consume cheese from the region and infrequently consume cheese from the region. The other brands are consumed but less frequently.




**Graphic 5** Degree of importance given by the consumer to different variables when buying Chihuahua-type cheese
*Source: Own elaboration, (2020)*

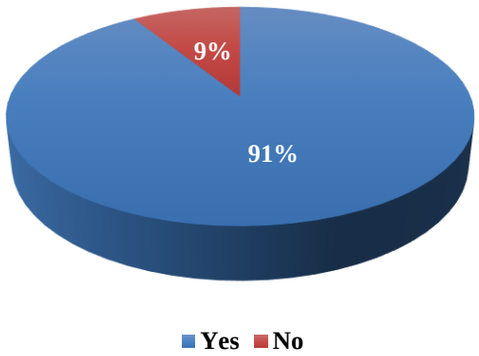
As can be seen in Graphic 5, according to housewives, the most important factors when buying Chihuahua type cheese are the aroma with 193; the flavor with 214; the color with 200 and the texture with 200, the price with 88 is quite important and the packaging with 95 is very important.




**Graphic 6** Frequency of the place of purchase of the Chihuahua type cheese
Source: Own elaboration, (2020)

Graphic 6 shows the following information: infrequently 15 housewives who consume in self-service stores; 30 in dairy shop; 22 in small stores or corner stores; 15 in greengrocers and 7 in other places that may be in street shops. Whereas with regular frequencies 29 she consumes in self-service stores; 60 in cremerias; 38 in small shops or corner stores; 46 in greengrocers and 21 elsewhere. Quite often 16 she consumes in self-service stores; 23 in dairy shop; 8 in small stores or corner stores; 0 in greengrocers and 0 in other places, finally, very frequently 80 consumes in self-service stores; 22 in dairy shop; 22 in small stores or corner stores; 8 in greengrocers and 0 elsewhere.

ISSN-On line: 2531-2987

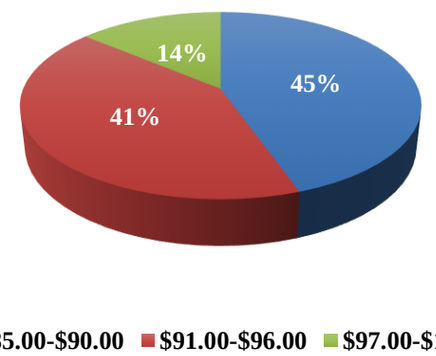



**Graphic 7** Percentage of housewives who are willing to consume a new brand of Chihuahua-type cheese
*Source: Own elaboration, (2020)*

In Graphic 7 of 325 housewives who said they consume from one kilogram of Chihuahua-type cheese to more than 3 kilograms per week, 91% are willing to consume a new brand of Chihuahua-type cheese and 9% affirm that they are not willing to consume a brand new.

Of 325 housewives who are the ones who consume Chihuahua-type cheese according to Graphic 8, 45% of housewives responded that they are willing to pay for a kilogram of Chihuahua-type cheese from $ 85.00 to $ 90.00 Mexican pesos; 41% answered that they are willing to pay from $ 91.00 to $ 96.00 Mexican pesos, while 14% from $ 97.00 to $ 102.00 Mexican pesos.

The results show the data that make up the profile of the Chihuahua-type cheese consumer, it is worth mentioning that the data was collected from a total of 367 housewives surveys, of which 325 consume at least one kilogram of Chihuahua-type cheese weekly.




**Graphic 8** Percentage of what housewives are willing to pay for a kilogram of Chihuahua-type cheese
*Source: Own elaboration, (2020)*

## Conclusions

91% of 325 housewives are willing to consume a new brand of Chihuahua-type cheese, they can consume from one kilogram of Chihuahua-type cheese to more than 3 kilograms weekly, as has already been shown in the results, with respect to the frequency of the consumption of Chihuahua-type cheese according to the brands you consider, it is identified that they mostly consume cheese from the region, this brings the possibility of the company "Villa Guadalupe" to be part of the cheese market, since in less consideration they consume the cheeses industrialized, such as Lala, Chilchota, Alpura, Nestle and la Villita, which are cheeses that are regularly sold in self-service stores such as Soriana, Aurrera, Farmacias Guadalajara, Oxxo, among others.

It is very important that aspects such as aroma, flavor, color and texture are considered in production, since these are decisive for making decisions related to the purchase of Chihuahua type cheese, packaging is also a decisive factor, for Therefore, a design is recommended that above all promotes consumer confidence so that they decide to purchase the product. In the same way, the possible places where housewives buy cheese must be taken into account, a latent possibility of distributing the cheese in self-service stores, but also in cremarías, greengrocers and small stores is identified. Regarding the price, housewives are willing to pay from $ 85.00 to $ 102.00 Mexican pesos respectively, this means that a quality differentiation can be made in the Chihuahua-type cheese, to cover the needs of the consumer according to their possibilities, capacity economic and demands of such standards. And in this way the company can grab more customers in the dairy market.

Finally, it is concluded that it is of utmost importance that for the purposes of launching new brands in the market, a study is carried out where the consumer's profile is identified, because through it relevant information is obtained based on the needs, tastes and preferences; it also allows the identification of supply and demand; the status of the consumer, places of distribution, economic capacity among other variables or indicators; and existing market niches.

ISSN-On line: 2531-2987

**Acknowledgments**

The authors thank the company Villa Guadalupe and the Autonomous University of Zacatecas for the facilities granted to develop this research. Also, to the National Technological Institute of Mexico, Campus Zacatecas Norte (Instituto Tecnológico Superior Zacatecas Norte) for their contribution.

**References**

Baray, H. L. (2006). Introducción a la metodología de la investigación. México. Recuperado el 25 de Marzo de 2018, de www.eumed.net/libros/2006c/203/

Bravo, R. S. (2001). Técnicas de investigación social. Madrid: Paraninfo.

Corona, L. L., Paz Gómez, C. A., & Camacho Gómez, M. (2016). Plan de sucesión en empresas familiares, el caso de una panificadora. 114-139.

Economía, S. d. (Marzo de 2012). economía. Obtenido de http://www.economia.gob.mx/files/comunidad_negocios/industria_comercio/informacionSectorial/analisis_sector_lacteo.pdf

Gante, A. V., & Cervantes Escoto, F. (Diciembre de 2011). Obtenido de http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0188-45572011000200006

Gómez, M. M. (2006). Introducción a la metodología de la investigación científica. Argentina: Brujas.

Herrera, J. E. (2013). Investigación de mercados. Bogotá: Ecoe ediciones.

Inadem. (2013). Recuperado el 2013 de Octubre de 24, de https://www.inadem.gob.mx/sectores_estrategicos.html

INEGI. (2010). Recuperado el 08 de Enero de 2018, de http://www3.inegi.org.mx/sistemas/mexicocifras/default.aspx?src=487&e=32

Kotler, P. (2002). Dirección de marketing, Conceptos generales. México: Pearson Educación.

Kotler, P., & Gary, A. (2001). Marketing. México: Pearson Educación.

Kotler, P., & Gary, A. (2003). Fundamentos de Marketing (6° ed.). México: Pearson Prentice Hall.

Martínez, E., & Montaner, T. (2007). Análisis del perfil psicográfico de los consumidores propensos a las promociones de productosde compra frecuente. Cuadernos de Economía y Dirección de la Empresa, 10(30), 63-92. doi:DOI: 10.1016/S1138-5758(07)70074-9

Medina, E. A., Zúñiga Hernández, Y. E., Mireles Medina, A., & Mancillas Medina, J. (2017). Propuesta de estandarización en la tecnología de elaboración de queso Chihuahua. Revista de la Alta Tecnología y la Sociedad, 9(4), 174-180.

Mucci, O. O. (2008). Empresas Familiares: Funcionamiento e identidad. Argentina: Universidad Nacional de Mar del Plata.

Pelayo, C. A., & Cavazos Arroyo, J. (2015). Investigación de merdados para pequeñas y medianas empresas. México: Editorial Universitaria.

Ríos, V. R. (2018). Investigación de mercados. España: ESIC EDITORIAL.

Sampieri, R. H., Fernández Collado, C., & Baptista Lucio, P. (2014). Metodología de la Investigación. México: Mc Graw Hill, Education.

Torres, C. A. (2010). Metodología de la investigación. Bogotá: Prentice Hall.

Urbina, G. B. (2013). Evaluación de proyectos (Séptima ed.). México: Mc Graw Hill.

Cesín-Vargas, A. (2014). La leche y los quesos artesanales en México. Agricultura, sociedad y desarrollo, 11(2), 243–248.

Gutiérrez, R. (2018). Estudio de Perfil del Consumidor en el Mercado Informal en la ciudad de Chiclayo. Recuperado de https://books.google.com.mx/books?id=yEFPDwAAQBAJ

Vázquez, G. C. (2012). Comportamiento del consumidor. México: Red Tercer Milenio S.C.

ISSN-On line: 2531-2987

Article **Journal-Microeconomics**
June 2020 Vol.4 No.6 24-30

# Application of the AIDS model in hass avocado consumption in Mexico

# Aplicación del modelo AIDS en el consumo de aguacate hass en México

GÓMEZ-GÓMEZ, Alma Alicia†*, LUQUEZ-GAITAN, Carlos Ernesto and LÓPEZ-VELÁZQUEZ, Lessly Gabriela

ID 1st Author: *Alma Alicia, Gómez-Gómez* / **ORC ID:** 0000-0002-7820-6629, **CVU CONACYT ID:** 15624

ID 1st Co-author: *Carlos Ernesto, Luquez-Gaitan* / **ORC ID:** 0000-0002-2863-0851, **CVU CONACYT ID:** 631756

ID 2nd Co-author: *Lessly Gabriela, López-Velázquez* / **ORC ID:** 0000-0003-0062-8810

**DOI:** 10.35429/JM.2020.6.4.24.30 Received January 20, 2020; Accepted June 2020, 2020

**Abstract**

Avocado is a product of national importance because it is exported, but part of its production is dedicated to national consumption, in this study the behavior of the demand for this product at the national level was analyzed, involving seven additional products that were: corn, green chili, tomato, lemon, beef, pork and chicken; For the study, the model of the almost ideal demand system (AIDS) was used and the method of apparently unrelated equations (SUR) was used with the support of the SUR / SYSNLIN function of the SAS system; The Marshallian, Hicksian and Expenditure elasticities were obtained for monthly consumption from 2004 to 2015 reported in the agricultural and fishing information system (SIAP), it was concluded that avocado has a normal inelastic demand with respect to expenditure, in addition to being a good substitute for corn, green chili, lemon, beef and chicken; and complementary to tomato and pork.

**Substitute goods, Complementary goods, Marshallian elasticity, Hicksian elasticity, SUR funct**

**Resumen**

El aguacate es un producto de importancia nacional debido a que se exporta, pero parte de su producción se dedica al consumo nacional, en este estudio se analizó el comportamiento de la demanda de este producto a nivel nacional, involucrando a siete productos adicionales que fueron: maíz, chile verde, jitomate, limón, carne de res, cerdo y pollo; para el estudio se usó el modelo del sistema de demanda casi ideal (AIDS) y se empleó el método de ecuaciones aparentemente no relacionadas (SUR) con apoyo de la función SUR/SYSNLIN del sistema SAS; se obtuvieron las elasticidades Marshallianas, Hicksianas y de Gasto para el consumo mensual de 2004 a 2015 reportado en el sistema de información agropecuaria y pesca (SIAP), se concluyó que el aguacate tiene una demanda inelástica normal respecto al gasto, además de ser un bien sustituto del maíz, chile verde, limón, carnes de res y pollo; y complementario del jitomate y la carne de cerdo.

**Bienes sustitutos, Bienes complementarios, Elasticidad Marshalliana, Elasticidad Hicksiana, Función SUR**

**Citation:** GÓMEZ-GÓMEZ, Alma Alicia, LUQUEZ-GAITAN, Carlos Ernesto and LÓPEZ-VELÁZQUEZ, Lessly Gabriela. Application of the AIDS model in hass avocado consumption in Mexico. RINOE Journal-Microeconomics. 2020. 4-6:24-30.

† Researcher contributing first author.

## Introduction

The avocado (*Persea americana*) is native to Mesoamerica, where there are approximately 90 species of this genus distributed from central Mexico to Central America. The avocado is of great economic importance in Mexico, being the main producer and exporter worldwide, more than 50% of the production is destined to this sector, mainly for the United States and Canada. In total, the country has approximately a planted area of 150 thousand hectares of avocado and an approximate production of 1.5 million tons per year (FND, 2014).

In this study, the almost ideal demand model (AIDS) was applied to avocado consumption in Mexico to know the behavior before the consumption of corn, lemon, green chili, tomato, pork, beef and chicken.

The objective of the research is to estimate an AIDS system with eight elements of the basic basket to analyze the behavior of the demand for avocado in Mexico.

This work seeks to verify the following hypotheses: Avocado is a product with inelastic national demand. Avocado is a product with normal national spending demand. Avocado is a complementary product to corn, green chili, tomato, lemon, beef, pork and chicken.

## Materials and methods

### Applications of the Near Ideal Demand System (AIDS)

The AIDS model was developed in 1980 by Deaton and Muellbauer, it was derived under the assumption of separability. This model derives from the expenditure function that represents an order of preferences, expenditure is minimized with the restriction of a fixed utility level. This model allows corresponding theoretical restrictions to be imposed and verified (Fernández, 2007). The AIDS model was designed for application in the analysis of the demand for goods such as food, clothing and housing, it has been adapted to the study of demand for differentiated products (Arellano, 2015).

The Almost Ideal Demand System (AIDS) model is a system of equations defined as follows (Deaton & Muellebauer, 1996):

$$w_{it} = \alpha_i + \sum_{j=1}^{m} \gamma_{ij} \log(p_{it}) + \beta_i \log\left(X_t / P_t^S\right) + \varepsilon_{ij} \quad (1)$$

Where:

$w_{it}$ → It is the participation of the i-th good in the total expenditure of the group of goods considered, defined as:

$$w_{it} = Q_{it} p_i / \sum_{j=1}^{m} Q_{jt} p_{jt}$$

$Q_{it}$ → It is the consumed quantity of the i-th good.

$p_{it}$ → It is the price of the i-th good.

$\alpha_i$ → It is the regression estimator of the ordinate to the origin.

$\beta_i$ → It is the regression estimator of the budget relation and the price index of the i-th good.

$\gamma_{ij}$ → It is the price regression estimator of the i-th good with respect to that of the j-th good.

$P_t^S$ → It is the Stone Price Index, defined by its logarithm:

$$\log(P_t^S) = \sum_{i=1}^{n} w_{it} \log(p_{it})$$

$X_t$ → It is the total expenditure of the goods considered, defined as:

$$X_t = \sum_{j=1}^{m} Q_{jt} p_j$$

$t$ → It is the evaluated period.

$i$ → It is the good considered, from the first to the n-th good.

$j$ → It is the good considered, from the first to the m-th good.

$\varepsilon_{ij}$ → It is the estimation error.

For the present work, the Stone Price Index (P_t ^ S) was used, defined by its aforementioned logarithm. This is due to the fact that in different previous works such as those of Martínez-Damián et al. (2016), González (2013), Pastor and Gómez (2018) and Kido-Cruz & Kido-Cruz (2013), to mention some examples where the AIDS model has been used, this price index has been used following the approach of Deaton & Muellebauer's solution, (1996), to facilitate the calculation, since the use of another index implies using non-linear models.

ISSN-On line: 2531-2987

The system of equations has certain restrictions or conditions suggested by the demand theory that are introduced into the process of estimating parameters, which must meet the following:

1. Aggregation:

$$\sum_{i=1}^{n} \alpha_i = 1, \qquad \sum_{i=1}^{n} \gamma_{ij} = \sum_{i=1}^{n} \beta_i = 0$$

2. Homogeneity:

$$\sum_{j=1}^{m} \gamma_{ij} = 0$$

3. Symmetry:

$$\gamma_{ij} = \gamma_{ji}$$

## Information used

In order to develop the AIDS model, monthly consumption data for each of the i-th goods considered were obtained from the Agrifood and Fisheries Information Service (SIAP), consulted online at www.gob.mx/siap, considering the following goods:

– Avocado.

– Green chile.

– Tomato.

– Corn.

– Lemon.

– Pork Meat.

– Chicken meat.

– Beef.

For which the following were consulted: prices (MXN / t), production (t), exports (t) and imports (t) in order to obtain apparent consumption using the following formula:

Apparent Consumption (Q) = Production (Y) + Imports (I) - Exports (E)

## Results and Discussion

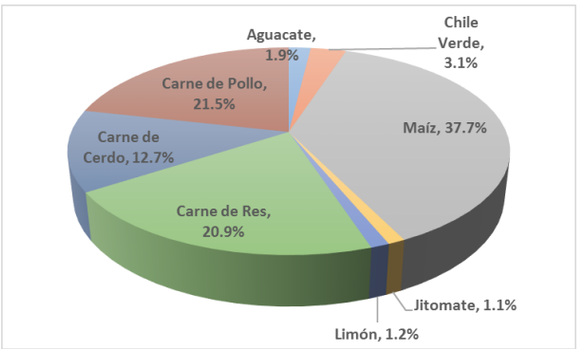
The average consumption of the selected basic basket of eight products amounts to just over 3.35 million tons per month, representing just over 55 billion pesos, where the product with the highest proportion of budget allocation is corn, followed by meats chicken and beef, as can be seen in table 1.

| Product | Price / ton | Consumption tons | Monthly spending millions | Monthly expenditure % |
|---|---|---|---|---|
| Avocado | $ 20,553.00 | 54998 | $ 1,130.37 | 2.0% |
| Green chile | $ 13,906.00 | 127566 | $ 1,773.93 | 3.2% |
| Corn | $ 8,584.00 | 2443023 | $ 20,970.91 | 37.3% |
| Tomato | $ 8,195.00 | 79575 | $ 652.12 | 1.2% |
| Lemon | $ 5,604.00 | 127165 | $ 712.63 | 1.3% |
| Beef | $ 78,998.00 | 154430 | $ 12,199.66 | 21.7% |
| Pork Meat | $ 54,714.00 | 127925 | $ 6,999.29 | 12.4% |
| Chicken meat | $ 50,037.00 | 236565 | $ 11,837.00 | 21.0% |

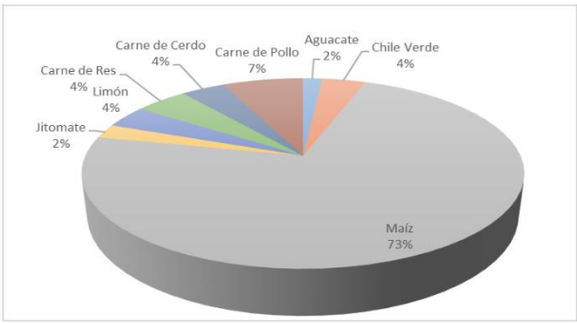
**Table 1** Summary of Average Monthly Spending for families from 2014–2015
*Source: SIAP, 2018*

Avocado represents just 1.9% of the monthly expenditure for the consumption of this product, being the third smallest, and the sixth in order of budget allocation, just below corn and meat, as can be seen in Graphic 1.

However, consumption in tons of avocado barely covers 1.6%, while that of corn is 72.9%, which is fully consistent with the Mexican diet, which has a strong base in this good, as observed in the Graphic 2.




**Graphic 1** Distribution of Average Spending for each Good
*Source: Own elaboration with data from SIAP 2016*




**Graphic 2** Distribution of Average Consumption in Tons for each Good
*Source: Own elaboration with data from SIAP 2016*

The results of the procedure in SAS to be able to generate the regression estimators for the almost ideal demand model (AIDS) using the Stone Price Index, meet the following additivity, homogeneity and symmetry conditions:

$$\sum_{i=1}^{n} \alpha_i = 1, \qquad \sum_{i=1}^{n} \gamma_{ij} = \sum_{i=1}^{n} \beta_i = 0, \qquad \sum_{j=1}^{m} \gamma_{ij} = 0, \qquad \gamma_{ij} = \gamma_{ji}$$

Because the result obtained from R2 is very low, we proceeded to validate the model based on the analysis of individual estimators using the t-Student estimator. The regression estimators to build the model, obtained through the SYSLIN / SUR functions of SAS, are summarized in Table 3. The main results are for Chile, Corn and Tomato.

From the above results we have that only the origin estimator for avocado is significant with respect to the origin estimators, as is the budget estimator. Therefore, the obtained model is valid for the analysis of this product, the objective of this work. As for the other estimators, most of those related to avocado have statistical relevance.

| Estimator | Value | Variance | T-Student | Probability |
|---|---|---|---|---|
| A1 | 0.1587 | 0.0414 | 3.83 | 0.0002 |
| A2 | 0.3373 | 0.0525 | 6.42 | <.0001 |
| A3 | -3.476 | 0.0846 | -41.1 | <.0001 |
| A4 | 0.1249 | 0.0247 | 5.05 | <.0001 |
| A5 | 0.0752 | 0.021 | 6.26 | <.0001 |
| A6 | 1.558 | 0.0322 | 48.35 | <.0001 |
| A7 | 0.8333724 | 0.0238 | 35.09 | <.0001 |
| B1 | -0.00955 | 0.0028 | -3.42 | 0.0009 |
| B2 | -0.018011 | 0.00359 | -5.05 | <.0001 |
| B3 | 0.27864 | 0.00526 | 52.95 | <.0001 |
| B4 | -0.00841 | 0.00165 | -5.09 | <.0001 |
| B5 | -0.00414 | 0.000754 | -5.49 | <.0001 |
| B6 | -0.09575 | 0.00151 | -63.48 | <.0001 |
| B7 | -0.05278 | 0.00116 | -45.32 | <.0001 |
| Y11 | 0.008584 | 0.00497 | 1.73 | 0.0864 |
| Y12 | 0.000204 | 0.00407 | 0.05 | 0.9602 |
| Y13 | -0.00283 | 0.00696 | -0.41 | 0.6846 |
| Y14 | -0.00642 | 0.00238 | -2.7 | 0.008 |
| Y15 | 0.004204 | 0.00132 | 3.19 | 0.0018 |
| Y16 | 0.006501 | 0.00279 | 2.33 | 0.0215 |
| Y17 | -0.00954 | 0.0022 | -4.34 | <.0001 |
| Y22 | 0.021266 | 0.00675 | 3.15 | 0.0021 |
| Y23 | 0.003319 | 0.0089 | 0.37 | 0.7097 |
| Y24 | 0.004529 | 0.00271 | 1.67 | 0.0974 |
| Y25 | -0.00006 | 0.00136 | -0.04 | 0.9658 |
| Y26 | 0.003755 | 0.00279 | 1.35 | 1804 |
| Y27 | -0.01404 | 0.00215 | -6.54 | <.0001 |
| Y33 | 0.141754 | 0.023 | 6.16 | <.0001 |
| Y34 | -0.00847 | 0.00495 | -1.71 | 0.0897 |
| Y35 | -0.00858 | 0.00323 | -2.66 | 0.0089 |
| Y36 | -0.01077 | 0.0117 | -0.92 | 0.3581 |
| Y37 | -0.03318 | 0.00831 | -3.99 | <.0001 |
| Y44 | 0.00398 | 0.00235 | 1.7 | 0.0924 |
| Y45 | 0.000445 | 0.000972 | 0.46 | 0.6475 |
| Y46 | 0.004927 | 0.00206 | 2.4 | 0.018 |
| Y47 | 0.002851 | 0.00162 | 1.76 | 0.0816 |
| Y55 | 0.005777 | 0.000958 | 6.03 | <.0001 |
| Y56 | -0.00171 | 0.00173 | -0.99 | 0.3247 |
| Y57 | 0.002337 | 0.00135 | 1.73 | 0.0869 |

**Table 2** List of Estimators of the AIDS Model and their t-Student values
*Source: Own elaboration with data from SIAP 2017*

In Table 3, the estimators of the AIDS model are grouped, in addition to checking the restrictions presented for their validation. Based on the fact that the AIDS model for the basic basket of eight basic products that are: Avocado, Lemon, Corn, Green Chile, Tomato, Beef, Pork and Chicken, which are an essential part of the daily diet of the population Mexicana proceeded to calculate the Hicksian, Marshallian and Expenditure / Income elasticities, based on the average proportion of expenditure assigned to them.

The elasticities obtained are summarized in a grouped manner in Table 5, in order to perform a more agile and visual analysis, to qualify each of the elasticities obtained. Once the elasticities were obtained, the results were classified, to define what type of products they are, summarizing the classification in Table 5.

ISSN-On line: 2531-2987

The main observation that results from seeing the classifications of the Hicksian elasticities is that all the products considered within the basic basket have an inelastic demand, which means that an increase in the budget generates in proportion a lower relative response towards consumption. of these products.

| Product | Intercept αi | Avocado γ1j | green chile γ2j | Corn γ3j | Tomato γ4j | Lemon γ5j | Beef γ6j | Pork Meat γ7j | Chicken meat γ8j | Budget / Price Index βi |
|---|---|---|---|---|---|---|---|---|---|---|
| Avocado | 0.15872 | 0.008584 | 0.000204 | -0.00283 | -0.00642 | 0.004204 | 0.006501 | -0.00954 | -0.00703 | -0.00955 |
| green chile | 0.33730 | 0.000204 | 0.021266 | 0.003319 | 0.004529 | -0.00006 | 0.003753 | -0.01404 | -0.018973 | -0.01811 |
| Corn | -3.4761 | -0.00283 | 0.003319 | 0.141754 | -0.00847 | -0.00858 | -0.01077 | -0.03318 | -0.081243 | 0.27864 |
| Tomato | 0.12491 | -0.00642 | 0.004529 | -0.00847 | 0.00398 | 0.000445 | 0.004927 | 0.002851 | -0.001842 | -0.00841 |
| Lemon | 0.07522 | 0.004204 | -0.00006 | -0.00858 | 0.000443 | 0.005777 | -0.00171 | 0.002337 | -0.002413 | -0.00414 |
| Beef | 1.53882 | 0.006501 | 0.003755 | -0.01077 | 0.004927 | -0.00171 | 0.12626 | -0.04703 | -0.081933 | -0.09575 |
| Pork Meat | 0.83374 | -0.00954 | -0.01404 | -0.03318 | 0.002851 | 0.002337 | -0.04703 | 0.101622 | -0.00302 | -0.05278 |
| Chicken meat | 1.38744 | -0.009703 | -0.018973 | -0.081243 | -0.001842 | -0.002413 | -0.081933 | -0.00302 | 0.190127 | -0.0899 |
| Aggregation and homogeneity | | | | | | | | | | |

**Table 3** Results of the estimators with validations of the assumptions of the AIDS model
*Source: Own elaboration with data from SIAP 2017*

| Hicksian elasticities | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Product | | Avocado | Green chile | Corn | Tomato | Lemon | Beef | Pork Meat | Chicken meat |
| | Average proportion of spending | 1.92% | 3.11% | 37.68% | 1.07% | 1.16% | 20.91% | 12.68% | 21.47% |
| Avocado | 1.92% | -0.5722 | 0.0417 | 0.2295 | -0.3237 | 0.2305 | 0.5477 | -0.37 | 0.1781 |
| green chile | 3.11% | 0.0258 | -0.3462 | 0.4837 | 0.1565 | 0.0097 | 0.3301 | -0.3254 | -0.3963 |
| Corn | 37.68% | 0.0117 | 0.0399 | -1.0007 | -0.0118 | -0.0112 | 0.1806 | 0.0387 | -0.0008 |
| Tomato | 1.07% | -0.5834 | 0.4562 | -0.4182 | -0.6371 | 0.0534 | 0.6716 | 0.3944 | 0.0419 |
| Lemon | 1.16% | 0.3815 | 0.0259 | -0.3626 | 0.049 | -0.5137 | 0.0618 | 0.3282 | 0.0068 |
| Beef | 20.91% | 0.0503 | 0.049 | 0.3254 | 0.0342 | 0.0034 | -0.6054 | -0.0981 | -0.177 |
| Pork Meat | 12.68% | -0.0561 | -0.0797 | 0.1151 | 0.0331 | 0.03 | -0.1619 | -0.3251 | 0.1909 |
| Chicken meat | 21.47% | 0.0159 | -0.0573 | -0.0015 | 0.0021 | 0.0004 | -0.1724 | 0.1127 | -0.3294 |

**Table 4** Calculation of Hicksian Elasticities of the AIDS Model
*Source: Own elaboration with data from SIAP 2017*

| Product | Average proportion of spending | Avocado 1.92% | Green chile 3.11% | Corn 37.68% | Tomato 1.07% | Lemon 1.16% | Beef 20.91% | Pork Meat 12.68% | Chicken meat 21.47% |
|---|---|---|---|---|---|---|---|---|---|
| Avocado | 1.92% | Inelastic demand | Good substitute | Good substitute | Complementary good | Good substitute | Good substitute | Complementary good | Good substitute |
| green chile | 3.11% | Good substitute | Inelastic demand | Good substitute | Good substitute | Good substitute | Good substitute | Complementary good | Complementary good |
| Corn | 37.68% | Good substitute | Good substitute | Inelastic demand | Complementary good | Complementary good | Good substitute | Good substitute | Complementary good |
| Tomato | 1.07% | Complementary good | Good substitute | Complementary good | Inelastic demand | Good substitute | Good substitute | Good substitute | Good substitute |
| Lemon | 1.16% | Good substitute | Good substitute | Complementary good | Good substitute | Inelastic demand | Good substitute | Good substitute | Good substitute |
| Beef | 20.91% | Good substitute | Good substitute | Good substitute | Good substitute | Good substitute | Inelastic demand | Complementary good | Complementary good |
| Pork Meat | 12.68% | Complementary good | Complementary good | Good substitute | Good substitute | Good substitute | Complementary good | Inelastic demand | Good substitute |
| Chicken meat | 21.47% | Good substitute | Complementary good | Complementary good | Good substitute | Good substitute | Complementary good | Good substitute | Inelastic demand |

**Table 5** Qualification of the Marshallian Elasticities of the AIDS model
*Source: Own elaboration with data from SIAP 2017*

The main observation that results from seeing the classifications of the Hicksian elasticities is that all the products considered within the basic basket have an inelastic demand, which means that an increase in the budget generates in proportion a lower relative response towards consumption. of these products.

Also highlighting that the consumption of avocado can be substituted for green chili, corn, lemon or beef and chicken, with only tomatoes and pork being their supplements, which has a certain coincidence with the current behavior of diet consumption. current nutritional status of the Mexican population, being also the second most substitutable product of the analyzed basket, just after the lemon.

Lemon is the product of the basic basket analyzed with the highest propensity to be substituted, since only corn complements it, while the other products are its substitutes. In second place, the products with the highest propensity to be substituted are the tomato, green chili and beef, together with avocado. Corn and pork and chicken are complementary products, since four out of seven products substitute them and three out of seven complement them.

From the expenditure elasticities of demand of the basic basket, we observe that all products are normal, except corn, indicating that if the budget is increased in the same way, the increase in demand for these is reflected, however in the case of corn, this is classified as luxury or giffen, the above can be assumed to have a double component of increase, since part of the consumption of corn in Mexico is for animal consumption, for meat production, and the other is for produce tortillas for direct consumption, as an essential part of the nutritional diet of the Mexican population.

This can be seen in Table 6, where the elasticities and their classification according to their value can be observed.

| Product | Spending Elasticity | Type of Property |
|---|---|---|
| Avocado | 0.5027 | Normal Goods |
| Green chile | 0.4168 | Normal Goods |
| Corn | 1.7394 | Superior or luxury good |
| Tomato | 0.2106 | Normal Goods |
| Lemon | 0.6432 | Normal Goods |
| Beef | 0.5422 | Normal Goods |
| Pork Meat | 0.5836 | Normal Goods |
| Chicken meat | 0.5814 | Normal Goods |

**Table 6** Expenditure elasticities and classifications of goods
*Source: Own elaboration with data from SIAP 2015*

Avocado, having a budget elasticity of 0.5027, remains a normal good, since an increase of 1% in the budget will only generate an increase in consumption of about 0.5%.

On the other hand, the results for the Marshallian elasticities are summarized in Table 8, also a result of the AIDS analysis. In the same way, the elasticities were classified, which are summarized in Table 9.

ISSN-On line: 2531-2987

From the previous results we can see that both the Hicksian and Marshallian elasticities tell us that avocado complements the same two products (Tomato and Pork) and he is substituted by the others. However, under the Marshallian analysis we find that corn and chicken meat are products that complement almost all the products of the basic basket evaluated, which is very consistent with the reality of the Mexican diet.

On the other hand, lemon is substitutable for all other products, which at the time when lemon prices rose, practices of this nature were confirmed, substituting its consumption for other products from both the analyzed basket and others such as sour orange. . In this case, the tomato is the second product with the highest possibility of being substituted by one of the five six of the basic basket analyzed and only complements corn and avocado, the above may be a result of the drastic price variation that it suffers this product throughout the year, and throughout the years. Green chili and beef are products of intermediate propensity to be substituted as three out of seven products are substitutes and four out of seven are complementary.

From the above discussion it can be seen that both the Hicksian and Marshallian elasticities obtained under the almost ideal demand model for a basic basket of eight products, which includes avocado consumption, reveal that avocado has an inelastic national demand and that It is also a complementary product of tomato and pork; and in turn, a substitute product for corn, green chili, lemon and beef and chicken.

The foregoing helps us to infer the following: In the announced change to the increase in the minimum wage from $ 73.04 to $ 80.04, which represents 9.6%, an increase in avocado consumption of only 5.5% would be expected. With which if this crop benefited. However, in the case of price elasticity, it can help us to infer the behavior that could have two political events of great interest, which are the change of government of the United States, with which the price elasticity of demand tells us the next:

– If there were any political change that would put a tariff barrier on this product, the supply to Mexico would be very high, thus generating an oversupply and lowering its prices, thus generating only an increase in the quantity demanded of barely 0.57% for every 1% of decrease in the price, therefore we could not absorb the sufficient quantity and the price would fall to very low levels, promoting in less quantity the consumption of substitute goods that are corn, green chili, lemon and beef and chicken.

– On the other hand, an increase in the exchange rate would make it more attractive to send the product abroad, generating scarcity and increasing prices for national consumption, generating or discouraging avocado consumption by 0.57% for every 1% increase in price, promoting the consumption of substitute goods that are corn, green chili, lemon, and beef and chicken.

**Conclusions**

The AIDS model obtained meets the conditions of additivity, homogeneity and symmetry. Avocado has inelastic national demand with an average expenditure of 1.92% of the budget assigned to a proposed basic basket made up of corn, green chili, tomato, lemon, beef, pork and chicken.

Avocado has a normal national spending demand with an elasticity of 0.5027. Both the Hicksian and Marshallian elasticities obtained indicate that avocado is a good that complements the same two products (Tomato and Pork) and is substituted for the others.

It is inferred that the application of tariff barriers promotes avocado consumption by lowering the price, while an increase in the price of the dollar increases the price and decreases national consumption. The increase in the minimum wage may increase the expectation of an increase in avocado consumption, however it would not be elastic or unitary.

ISSN-On line: 2531-2987

**References**

Arellano, M. 2015. Consumo, pobreza y bienestar. Mesa Redonda en torno a la obra científica del Premio Nobel en Economía 2015, Angus Deanton. Fundación Ramón Areces. España. 22p. Disponible en: http://www.cemfi.es/~arellano/deaton-areces-2015-tr.pdf [acceso en 15.05.19]

Deaton, A. y J. Muellbauer. 1999. Economics and consumer behavior. Ed. Cambridge. 450 p.

Fernández, S. 2007. Comportamiento del Consumidor y Estimaciones de demanda de alimentos. Universidad Nacional de Mar del Plata. Argentina. 69 p. Disponible en: http://nulan.mdp.edu.ar/1384/1/01223.pdf [acceso en 16.11.18]

Financiera Nacional de Desarrollo Agropecuario, Rural, Forestal y Pesquero. 2014. Panorama de Aguacate. Disponible en: http://www.financierarural.gob.mx/informacionsectorrural/Panoramas/Ficha%20Aguacate.pdf [acceso en 14.11.18]

Gómez Gómez, Alma 2018. Estrategias de los Productores de Carne de Cerdo Mexicanos en el Mercado Japonés. Revista de Administración y Finanzas 2018. Disponible en http://www.ecorfan.org/bolivia/researchjournals/Administracion_y_Finanzas/vol5num17/Revista_de%20_Administraci%C3%B3n_y_Finanzas_V5_N17_2.pdf

González, A. 2013. UN SISTEMA DE DEMANDA CASI IDEAL (AIDS) APLICADO A CINCO GRANOS EN MÈXICO, 1980-2012. Tesis. Universidad Autónoma Chapingo. México. 115 p.

Kido-Cruz, A. y M.T. Kido-Cruz. S/f. Estimación de un Modelo de Demanda Casi Ideal para Determinar Cambios en la Estructura de Consumo de Carnes en los Estados Unidos de América. Revista CIMEXUS. Clasificación JEL: B23, C52. Disponible en: https://cimexus.umich.mx/index.php/cim1/article/view/151 [acceso en 16.01.19]

Miguel Ángel Martínez-Damián, M. A., J. S. Mora-Flores y R. Téllez-Delgado. 2016. DEMANDA POR CARNE DE PAVO: EFECTO PRECIO O EFECTO GASTO. Tropical and Subtropical Agroecosystems, 19 (2016): 139 - 144. Disponible: http://www.revista.ccba.uady.mx/ojs/index.php/TSA/article/view/2127/1016 [acceso en 20.11.18]

ISSN-On line: 2531-2987

Article **Journal-Microeconomics**
June 2020 Vol.4 No.6 31-37

# Cost analysis in reverse logistics of grade 2 asparagus

# Análisis de costos en la logística inversa del esparrago de grado 2

QUINTERO-RAMÍREZ, Juan Manuel†*

*Cathedra, Consejo Nacional de Ciencia y Tecnología, Mexico City, Mexico.*

ID 1st Author: *Juan Manuel, Quintero-Ramírez* / **ORC ID:** 0000-0002-1040-2690, **CVU CONACYT ID:** 292056

**DOI:** 10.35429/JM.2020.6.4.31.37 Received January 20, 2020; Accepted June 2020, 2020

**Abstract**

This investigation makes observations in the reception of raw material, warehouse and production, to define the percentage of scrap or waste that is had. It is intended to solve these losses, since the percentage of waste adds up to 10%, financially affecting the volume of production of finished product and the costs of farmers who supply said raw material. The objective is to propose an economic valuation of grade 2 asparagus, which helps to reduce monetary losses for farmers and increase profits for the collecting company. Delivery quantities of five asparagus producers are recorded during the months of May to July that supplies the collector who selects and packs the final product. With cost analysis, a comparison is made of values such as incoming kilograms, kilograms usable for export, prices at which farmers are paid and the price at which it is intended to sell in the local market in addition to presenting monetary amounts of recovery to the apply reverse logistics in the company. The result obtained represents the loss of asparagus and a proposal for use is proposed to be sold and how much it would contribute per season when implementing this proposal.

**Asparagus, Cost analysis, Reverse logistics**

**Resumen**

Esta investigación realiza observaciones en la recepción de materia prima, almacén y producción, para definir el porcentaje de scrap o desechos que se tienen. Se pretende dar solución a estas pérdidas, pues el porcentaje de desperdicio suma 10%, afectando financieramente el volumen de producción de producto terminado y los costos de agricultores que surten dicha materia prima. El objetivo es proponer una valoración económica al esparrago de grado 2, que apoye a reducir las pérdidas monetarias a los agricultores y aumente las ganancias a la empresa acopiadora. Se registran cantidades de entrega de cinco productores de espárragos durante los meses de mayo a julio que abastece a la acopiadora quien selecciona y empaca el producto final. Con análisis de costos, se realiza una comparación de los valores como los kilogramos entrantes, los kilogramos aprovechables para exportación, precios en que se paga a los agricultores y precio al cual se pretende vender en el mercado local además de presentar cantidades monetarias de recuperación al aplicar la logística inversa en la empresa. El resultado obtenido representa la merma del espárrago y se propone una propuesta de utilización para ser vendido y cuanto aportaría por temporada al implementar esta propuesta.

**Esparrago, Análisis de costos, Logística inversa**

**Citation:** QUINTERO-RAMÍREZ, Juan Manuel. Cost analysis in reverse logistics of grade 2 asparagus. RINOE Journal-Microeconomics. 2020. 4-6:31-37.

* Correspondence to Author (Email: quintauro82@gmail.com)
† Researcher contributing first author.

## Introduction

The constant search to position itself within the preference of customers, has led large corporations in the food sector not only to develop new market strategies and variety in their products, but also to innovate in techniques for quality processes, manufacturing and reverse logistics to achieve an advantage over their competitors, many of whom have taken advantage of this opportunity for knowledge that has permeated towards them and through an internal application of these techniques have been able to solidify their positions in the market.

Day by day, companies generate large amounts of waste in their production processes (equipment and machinery, supplies and raw materials, work, time, capacity and knowledge of human resources, etc.) due to inadequate control of these and the lack of a well-defined, implemented and executed operating method.

One of the ways in which companies lose competitiveness and productivity is due to the waste generated by the quality of the raw material presented by each of the farmers who supply the company with asparagus in order to satisfy the demand of the international market, affecting directly the financial situation of the organizations.

The food industry has been from its birth one of the main economic pillars of the world, due to this the farmers are in search of new products and likewise of the fertility of the farmland causing a rotation of the products the asparagus is discovered and the benefits regarding a cost-benefit capturing the attention of farmers due to its great resistance to both high and low temperatures, the durability of the vegetable and the price in the international market.

Guanajuato, one of the 5 main producers of said product in the Mexican Republic (SAGARPA, 2017), bringing with it the creation of companies of this same nationality dedicated to the processing of this product.

This research is developed within an asparagus production and collection company and seeks to offer dialogue and a beneficial proposal for both the company and the farmers, taking advantage of grade 2 asparagus, which is one that does not meet the physical quality required for export this impacting the financial indicators of each of these.

## Selection of asparagus

The idea arose through observation in the production lines, in which the asparagus that does not meet the international qualitative properties required by customers is removed, this product is discarded for the consumption of farm animals, therefore it is not obtained no monetary value of it.

Focusing on the area of the asparagus process which includes from when it is washed, it is selected by quality, size selection, cutting process, the packaging process and cooling process until the product distribution process, how it is made. Strategies for the sale and distribution of each one of the presentations, as well as the preparation and growth of the personnel that works within the company, solidifying the market so that the brands for which the company works can enter different parts of the world based on the history of hygiene and zero bioterrorism in the products that are made.

The problem that is generated within the company is the inadequate way of disposing of the waste generated by not obtaining the quality required by the company's foreign clients, that is, there is no good reverse logistics that is beneficial for it.

To begin the process, the raw material is received, samples are taken from each of the tables of the associated ranches from which the raw material comes, said samples are 3.6 kg per table in which the percentage of sludge is reviewed, leg, flowery, crooked / misshapen, scarred, insect damage, mechanical damage, rot, slush, dehydrated, less than 8 mm, cut 8 ”, less than 8”, fungus, rust; in order to obtain the usable percentage of each batch that arrives at the factory and that is used for production.

ISSN-On line: 2531-2987

This is due to the fact that quality of appearance is required by the foreign client, within said parameters that are established for the quality of asparagus determined under certain international food standards.

Finishing this process of reception and sampling of raw material, the selection of product continues, for example those that are curved, flowered or that for some reason suffered damage and no longer have what is the head of the asparagus, these are separated and continued with its elimination from the company, without taking into account how much this waste represents monetarily per day, per week or per month and without thinking that these can still be used by Mexican consumers and in the monetary amount it represents are these waste that at being sold in other establishments such as restaurants, local vendors, or retail distributors such as the surrounding supply centers can make a profit and instead of just representing a waste or loss, they could represent an extra income of money for the company.

For these wastes, there is no control and as stated by the general management of the company, what is not measured is not improved. This has a strong impact on the profit of the company considering that each kilogram of asparagus has an average cost of $ 1.5 dollars.

The difference that exists in the different measures and qualities in the reception of asparagus from the different producers, causes the classification to be determined at the time of selecting, which entails having second-hand asparagus, which, in turn, use it as food for livestock and that it can be for human consumption, since it carries the required safety but not the necessary measure and specifications to be exported.

By identifying the problem as second-hand asparagus and knowing that this has a beneficial use for both the company and the farmer and for the Mexican market, an analysis is carried out to determine how much money can be recovered from this waste from its sale in the local market for human consumption.

When carrying out reverse logistics, it is possible to see how much income can be returned from the sale of this product that can still be consumed by humans and that determines an additional income towards the company; so, it is understood that, according to Cabeza (2012):

- “Reverse logistics encompasses the set of logistics activities for the collection, disassembly and dismemberment of already used products or their components, as well as materials of different types and nature, with the aim of maximizing the use of their value, in the broad sense of their sustainable use and, ultimately, its destruction”.

- “Reuse or resale: It consists of recovering the product to give it a new use, since it maintains its shape and has little or no deterioration. In this case, the product is subjected to cleaning and maintenance operations that allow it to be fully utilized, although there are minimal differences from similar but new products”.

While the Food and Agriculture Organization of the United Nations (FAO, 2007), determines that: “Asparagus grade 2 or category 2: This category includes shoots that cannot be classified in the higher categories, but meet the minimum requirements specified. Compared to category 1, the shoots may not be as well formed and more curved, their tips are slightly split. Traces of soy stains caused by non-pathogens are allowed and can be removed by the consumer through normal peeling. Green asparagus must be green for at least 60% of its length. The shoots may be slightly fibrous. The cut at the base of the shoots may be slightly oblique”.

Another important concept indicated by Juran (1967) is: “Scrap: This indicator measures the amount of non-conforming product that cannot be recovered, reworked or repaired to bring it to normal conditions of sale. This type of product is considered a waste and directly impacts the cost of poor quality".

ISSN-On line: 2531-2987

**Materials and methods**

To carry out this research, the data was taken and analyzed in 2017, when the authorization and approach with the collecting company was obtained; as well as having information on the 5 producers with the highest harvest in the region in Guanajuato who supply the collector, which allowed data processing.

The research is based on the asparagus packaging area, which consists of 4 lines and these in turn have different areas such as: washing area, selection 1 (quality), selection 2 (size: Extra jumbo or colossal jumbo, extra large, large, standard, small and extra small).

Observations are made on the asparagus packaging line in order to know the entire production process within the company that is carried out to export quality products, as well as observations that lead to the determination of the quality of the grade 2 product to evaluate the differences between the asparagus of first and the asparagus of second and in this way to determine the properties that differentiate them and if it is usable for export.

The next step is to establish the variables that serve to identify a series of data, these were taken daily within the harvest period that goes from May to July, which are:

- Kilograms of incoming asparagus.
- Kilograms of asparagus usable for export.
- Kilograms of second-rate asparagus.
- Kilograms of asparagus leg that is cut.

With the acquisition of data according to the determined variables, they were captured day by day for approximately 3 months.

In addition to the aforementioned, periodic tours were made to each section of the line to observe the development of the process and identify areas for improvement; for the analysis of the data, the support of office packages was used in which the Microsoft Excel tool to capture the data day by day. With the information structured in the spreadsheet, the data analysis is obtained that determines the competitiveness of said organization around the loss of asparagus.

Finally, with the analysis and processing of the data, the research results were obtained.

The fundamental objective of a check of the volume of asparagus that enters a day corresponds to establish what percentage is usable for the international market, how much waste exists and how much product is for grade 2; this requires a strategic acquisition of data, theoretical application, movement of resources and even economic investments. Therefore, it is worth considering a number of conditions that limit the scope of a swing of the so-called grade 2 stud.

From the results of the analysis that was carried out, the incoming quantities of fresh asparagus, asparagus usable for export, asparagus trimmed leg and asparagus that is discarded because it does not meet quality requirements (grade 2 asparagus) were obtained, the prices with which farmers are paid, the average price with which it is intended to enter the local market, in order to reach the total amount of profit that could be obtained if the company applies the project.

When obtaining the kilograms of asparagus that arrive daily at the company, a comparison was continued, of each half of the month, as well as showing the percentages of product that is used for export, percentage that is removed from the asparagus and based on to that, how much percentage is grade 2 for the local market.

It began by taking the daily incoming kilograms to the company through a format that counts them, in which it is filled in by sections, each of the farmers who supply the company with the product are mentioned, it also has a section that represents each day of the month that is being observed, in order to have control of the kilograms that each farmer brings to the company daily, the total kilograms per supplier during the 15-day period and from this information to be able to obtain a total of total daily kilograms and a total of kilograms per 15-day period.

This format is very useful to carry out the research since it was used for filling during the research months, from the second half of May, which is when the asparagus harvest begins, and until the end of the first half of July, which is when it ends.

ISSN-On line: 2531-2987

From the information obtained, it is captured in other formats where certain information is emptied, such as the total number of incoming kilograms to the company and within the packaging area, information such as the amount of product that can be exported is obtained, the product that is considered as scrap or garbage and from this the amount of cut leg of the raw material (asparagus) and the amount of grade 2 asparagus are obtained, from this the product percentages are obtained.

From this last format, the quantities of incoming product to the company, the quantity of usable product for export, the quantity of leg cut from the raw material (asparagus), as well as the quantity of grade 2 asparagus are established, and the calculate the monetary value invested for the payment of raw material according to kilograms.

In this way, the usable kilograms for export are also obtained by calculating the total amount that is invested to pay farmers for the supply of raw material, paying per kilogram average of $ 1.50 dollars, continuing with the kilograms of grade 2 asparagus with a sale price in the local market of $ 0.5 dollars and thus obtain a total profit for this product.

## Results

The time of the procedure that was carried out to obtain the information was per fortnight from the second of May to the first of July (4 fortnights-2 months), which is when the asparagus production in this area of Guanajuato is highest and carry out exports.

In the collection center, every fortnight data was taken from the kilograms of the different producers and they were captured in each of the established formats, which allowed a control of the quantities that were entered, how much was accepted for export and how much amount was rejected as scrap, in order to make the production payments and how much waste was collected; leaving the results of those kilograms as:

- For the second half of May, the total amount received was 205,436.16 kilograms (from only four producers), of which 75% was destined for export and of the remaining 51,359.04 kilograms, 26% was leg waste, and 74% (38,005.69 kilograms) is grade 2 with the opportunity to sell to the local market.

- The sum of asparagus collected in the first half of June with five producers was 396,209.89 kilograms from five suppliers, resulting in 293,195.32 kilograms (74%) for export and with 75,279.88 kilograms (19%) of grade 2 and with 7% that of leg cut (27,734.69 kilograms).

- In the second half of June, 368,620.08 kilograms were collected from the five producers, which with 20% (73,724.02 kilograms) were grade 2, 269,092.66 kilograms (73%), it was destined for export and 25,803.41 kilograms (7%) was leg cut from the asparagus.

- In the first half of July it represented 300,930.18 kilograms in total, which 70% was destined for export (210,651.13 kilograms) and for grade 2 and short leg it represented 15% in each one (45,139.50 kilograms), supplied by the five producers of the region.

- Throughout this harvest and supply season of the five main producers of asparagus in Guanajuato, 1,271.20 tons of this product were added, which was processed in the collecting company

From the totality of asparagus received, in table 1, the summary of the quantities received is shown to later be broken down the quantities for grade 2 asparagus, which represents 18.26% of the total received; while, for asparagus leg it represents 8.81% of the total. The amount that was exported represented the total, 72.92%, while 27.08% is non-exportable quantity.

| | Export quantity | Grade 2 asparagus quantity | Asparagus leg quantity |
|---|---|---|---|
| 2nd half May | 154,077.12 | 38,005.69 | 13,353.35 |
| 1st half June | 293,195.31 | 75,279.88 | 27,734.69 |
| 2nd half of June | 269,092.66 | 73,724.02 | 25,803.41 |
| 1st half of July | 210,651.13 | 45,139.50 | 45,139.50 |
| Total | 927,016.22 | 232,149.11 | 112,030.97 |

**Table 1** Summary of asparagus quantities and their distribution
*Source: Own elaboration with processed data, 2017*

ISSN-On line: 2531-2987

Towards the year of 2017, which is when the information was obtained to calculate the sale prices of asparagus, being for export of $ 1.50 dollars and the payment for grade 2 of $ 0.50 dollars, which Table 2 shows the prices that they recovered for the sale, being 1,390 thousand dollars the payment to the five producers and 116 thousand dollars, which is estimated to be recovered if grade 2 asparagus were sold in the local market, since its use is suitable for human consumption.

| | Payment to suppliers (Dlls) | Recovery in grade 2 (Dlls) |
|---|---|---|
| 2nd half May | 231,115.68 | 19,002.84 |
| 1st half June | 439,792.98 | 37,639.94 |
| 2nd half of June | 403,638.99 | 36,862.01 |
| 1st half of July | 315,976.69 | 22,569.76 |
| Total | 1’390,524.33 | 116,074.56 |

**Table 2** Economic summary of the sale of asparagus and its distribution
*Source: Own elaboration with processed data, 2017*

## Conclusions

Within the cost analysis carried out, it is concluded that the implementation of the research will be feasible to increase the profits of the company without investing in extra labor to enhance the sale of second-hand asparagus in the national market, since it will be to a concessionaire which will have the product to be able to sell it and deliver the respective profits from the sale of the asparagus, adding more profits to the collecting company.

For the internal process in the company it is observed that more importance should be given in the selection area since it is the one that has the greatest loss within the company.

Key points were identified in the losses in raw material and a proposal is offered to reduce the waste generated by the company's raw material, one of the key proposals is: the implementation of the sale of grade 2 asparagus in the wand centrals within the cities near the factory such as Celaya, Salamanca, Irapuato and Silao, as well as the sale in different restaurants in the cities mentioned above.

The proposal presented results in an impact of its main financial indicators, reducing the loss of asparagus by 8.81% when it is sold for use in animal feeding processes and not thrown away without using it or as compost.

It is expected that, with these indicators, the company will have greater training for the handling of asparagus, from its harvest to comply with export standards.

With this research, it is concluded that it is convenient to sell grade 2 asparagus for human consumption at the national level, since it does not present any change in flavor or nutrients compared to the premium asparagus that is marketed and exported, as the only the disappointment of the product is due to its size, color or straightness of the asparagus stick, which does not lose anything to sell it locally.

With the application of reverse logistics to grade 2 asparagus, it is extremely attractive, since it will generate 116,074.56 dollars in the months of production, contributing to the recovery of the investment, it should be well defined that the monetary recovery does not imply any risk for the company since the demand for the vegetable to be marketed at the national level is high and the price is high.

In addition to these conclusions, there are the following recommendations:

- The application and execution of this research, from a financial point of view, does not represent any investment risk. In its different sections, the reasons that predict its success are duly supported and analyzed.

- At the same time, having different marketing strategies that do not imply very high costs, but on the contrary, that encourage the entry of greater income.

- The suggestion of the sale of grade 2 asparagus in the supply centers promotes greater and faster marketing, likewise, keeping in mind different marketing strategies that make the service more attractive and that do not imply very high costs but on the contrary that it encourages the entry of higher income.

ISSN-On line: 2531-2987

- Another area of opportunity is to support the farmer who supplies the company with raw material, since by reducing the waste, the external farmer can be supported with a percentage of what is recovered by carrying out social work which benefits to both parties, since with the percentage assigned to farmers they will be able to make different investments with the money obtained from the sale of this product.

**References**

Alvarez Botello, J., Morales Mondragón, J. L., & Hernández Martínez, R. (2013). La logística inversa como estrategia competitiva. Capítulo de libro titulado Retos en la formación de profesionales logísticos: servicio y competitividad. Ed. UAEM.

Asociación Española para la Calidad (AEC). (2015). Retrieved from Asociación Española para la Calidad (AEC): http://www.aec.es/web/guest/centro-conocimiento/calidad-total

Bejarano, W. (1992). Manual del espárrago. Quito, Ecuador: Proexant.

Cabeza, Domingo (2012). Logística inversa en la gestión de la Cadena de Suministro. Primera Edición. Ed. Marge Books. Barcelona, España.

CODEX STAN 225. (201). Norma para el espárrago.

González A, M. I., & Del Pozo L, A. (1999). Cultivo del espárrago. Cillán, Chile: INIA QUILAMAPU.

NORMA PARA EL ESPÁRRAGO. (2001). CODEX STAN 225.

Organización mundial de la Salud, & Organización de las Naciones Unidas Para la Agricultura. (2007). Codex Alimentarius. Frutas y Hortalizas. Roma.

Pleguezuelos, T. (1999). aiteco.com. Retrieved from aiteco.com: http://www.aiteco.com/que-es-un-diagrama-de-flujo/

Secretaria de agricultura, ganadería, desarrollo rural, pesca y alimentación (SAGARPA). (30 de ENERO de 2017). Retrieved from http://www.sagarpa.gob.mx/Delegaciones/queretaro/boletines/2017/enero/Documents/2017b011.PDF.

# [Title in Times New Roman and Bold No. 14 in English and Spanish]

Surname (IN UPPERCASE), Name 1st Author†*, Surname (IN UPPERCASE), Name 1st Coauthor, Surname (IN UPPERCASE), Name 2nd Coauthor and Surname (IN UPPERCASE), Name 3rd Coauthor

*Institutional Affiliation of Author including Dependency (No.10 Times New Roman and Italic)*

*International Identification of Science - Technology and Innovation*

ID 1st author: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 1st author: (Scholar-PNPC or SNI-CONACYT) (No.10 Times New Roman)

ID 1st coauthor: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 1st coauthor: (Scholar or SNI) (No.10 Times New Roman)

ID 2nd coauthor: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 2nd coauthor: (Scholar or SNI) (No.10 Times New Roman)

ID 3rd coauthor: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 3rd coauthor: (Scholar or SNI) (No.10 Times New Roman)

(Report Submission Date: Month, Day, and Year); Accepted (Insert date of Acceptance: Use Only RINOE)

**Abstract (In English, 150-200 words)**

Objectives
Methodology
Contribution

**Keywords (In English)**

Indicate 3 keywords in Times New Roman and Bold No. 10

**Abstract (In Spanish, 150-200 words)**

Objectives
Methodology
Contribution

**Keywords (In Spanish)**

Indicate 3 keywords in Times New Roman and Bold No. 10

**Citation:** Surname (IN UPPERCASE), Name 1st Author†*, Surname (IN UPPERCASE), Name 1st Coauthor, Surname (IN UPPERCASE), Name 2nd Coauthor and Surname (IN UPPERCASE), Name 3rd Coauthor. Paper Title. Journal-Microeconomics. Year 1-1: 1-11 [Times New Roman No.10]

* Correspondence to Author (example@example.org)
† Researcher contributing as first author.

## Introduction

Text in Times New Roman No.12, single space.

General explanation of the subject and explain why it is important.

What is your added value with respect to other techniques?

Clearly focus each of its features

Clearly explain the problem to be solved and the central hypothesis.

Explanation of sections Article.

## Development of headings and subheadings of the article with subsequent numbers

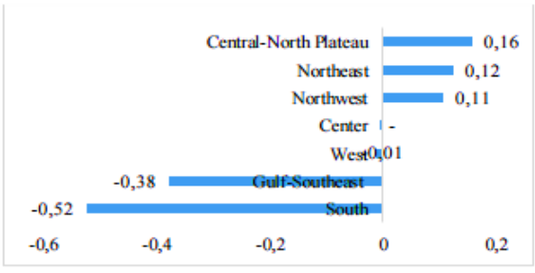
[Title No.12 in Times New Roman, single spaced and Bold]

Products in development No.12 Times New Roman, single spaced.

## Including graphs, figures and tables-Editable

In the article content any graphic, table and figure should be editable formats that can change size, type and number of letter, for the purposes of edition, these must be high quality, not pixelated and should be noticeable even reducing image scale.

[Indicating the title at the bottom with No.10 and Times New Roman Bold]




**Graphic 1** Title and Source (in italics).

Should not be images-everything must be editable.

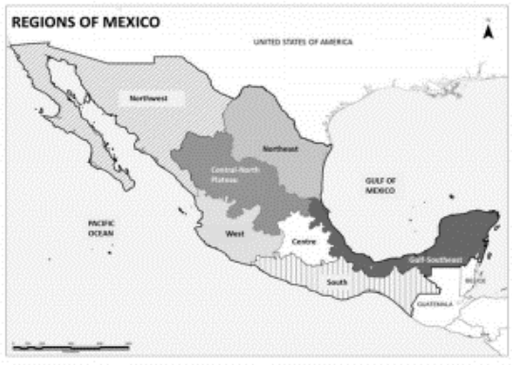



**Figure 1** Title and Source (in italics).

Should not be images-everything must be editable.

| REGION | STATE | Participation (%) on Surface | Population | Gross Production |
|---|---|---|---|---|
| 1. Northwest. | Baja California; Chihuahua; Sonora; Baja California Sur; Sinaloa. | 32.1% | 11.1% | 13.1% |
| 2. Northeast. | Coahuila; Nuevo León; Tamaulipas. | 15.1% | 9.3% | 15.6% |
| 3.Center North Plateau. | Aguascalientes; Durango; Guanajuato; San Luis Potosí; Zacatecas. | 15.1% | 10.9% | 9.2% |
| 4. West. | Colima; Jalisco; Michoacán; Nayarit. | 8.7% | 11.9% | 10.2% |
| 5. Center. | Distrito Federal; Hidalgo; México; Morelos; Puebla; Querétaro; Tlaxcala. | 5.1% | 33.7% | 34.8% |
| 6. South. | Chiapas; Guerrero; Oaxaca. | 11.8% | 10.0% | 4.7% |
| 7. Southeast Gulf. | Campeche; Quintana Roo; Tabasco; Veracruz; Yucatán. | 12.1% | 12.4% | 13.0% |
| TOTAL | MEXICO | 100% | 100% | 100% |

**Table 1** Title and Source (in italics**).**

Should not be images-everything must be editable.

Each article shall present separately in **3 folders**: a) Figures, b) Charts and c) Tables in .JPG format, indicating the number and sequential Bold Title.

**For the use of equations, noted as follows:**

$$Y_{ij} = \alpha + \sum_{h=1}^{r} \beta_h X_{hij} + u_j + e_{ij} \quad (1)$$

They must be editable and number aligned on the right side.

## Methodology

Develop give the meaning of the variables in linear writing and important is the comparison of the used criteria.

ISSN-On Line: 2531-2987

## Results

The results shall be by section of the article.

## Annexes

Tables and adequate sources thanks to indicate if they were funded by any institution, University or company.

## Conclusions

Explain clearly the results and possibilities of improvement.

## References

Use APA system. Should not be numbered, nor with bullets, however if necessary numbering will be because reference or mention is made somewhere in the Article.

Use Roman Alphabet, all references you have used must be in the Roman Alphabet, even if you have quoted an Article, book in any of the official languages of the United Nations (English, French, German, Chinese, Russian, Portuguese, Italian, Spanish, Arabic), you must write the reference in Roman script and not in any of the official languages.

## Technical Specifications

Each Article must submit your dates into a Word document (.docx):

Journal Name
Article title
Abstract
Keywords
Article sections, for example:

*1. Introduction*
*2. Description of the method*
*3. Analysis from the regression demand curve*
*4. Results*
*5. Thanks*
*6. Conclusions*
*7. References*

Author Name (s)
Email Correspondence to Author
References

## Intellectual Property Requirements for editing:

-Authentic Signature in Color of Originality Format Author and Coauthors

-Authentic Signature in Color of the Acceptance Format of Author and Coauthors

ISSN-On Line: 2531-2987

**Reservation to Editorial Policy**

RINOE Journal-Microeconomics reserves the right to make editorial changes required to adapt the Articles to the Editorial Policy of the Journal. Once the Article is accepted in its final version, the Journal will send the author the proofs for review. RINOE® will only accept the correction of errata and errors or omissions arising from the editing process of the Journal, reserving in full the copyrights and content dissemination. No deletions, substitutions or additions that alter the formation of the Article will be accepted.

**Code of Ethics - Good Practices and Declaration of Solution to Editorial Conflicts**

**Declaration of Originality and unpublished character of the Article, of Authors, on the obtaining of data and interpretation of results, Acknowledgments, Conflict of interests, Assignment of rights and Distribution**.

The RINOE® Management claims to Authors of Articles that its content must be original, unpublished and of Scientific, Technological and Innovation content to be submitted for evaluation.

The Authors signing the Article must be the same that have contributed to its conception, realization and development, as well as obtaining the data, interpreting the results, drafting and reviewing it. The Corresponding Author of the proposed Article will request the form that follows.

Article title:

- The sending of an Article to RINOE Journal-Microeconomics emanates the commitment of the author not to submit it simultaneously to the consideration of other series publications for it must complement the Format of Originality for its Article, unless it is rejected by the Arbitration Committee, it may be withdrawn.

- None of the data presented in this article has been plagiarized or invented. The original data are clearly distinguished from those already published. And it is known of the test in PLAGSCAN if a level of plagiarism is detected Positive will not proceed to arbitrate.

- References are cited on which the information contained in the Article is based, as well as theories and data from other previously published Articles.

- The authors sign the Format of Authorization for their Article to be disseminated by means that RINOE® in its Holding Spain considers pertinent for disclosure and diffusion of its Article its Rights of Work.

- Consent has been obtained from those who have contributed unpublished data obtained through verbal or written communication, and such communication and Authorship are adequately identified.

- The Author and Co-Authors who sign this work have participated in its planning, design and execution, as well as in the interpretation of the results. They also critically reviewed the paper, approved its final version and agreed with its publication.

- No signature responsible for the work has been omitted and the criteria of Scientific Authorization are satisfied.

- The results of this Article have been interpreted objectively. Any results contrary to the point of view of those who sign are exposed and discussed in the Article.

**Copyright and Access**

The publication of this Article supposes the transfer of the copyright to RINOE® in its Holding Spain for its RINOE Journal-Microeconomics, which reserves the right to distribute on the Web the published version of the Article and the making available of the Article in This format supposes for its Authors the fulfilment of what is established in the Law of Science and Technology of the United Mexican States, regarding the obligation to allow access to the results of Scientific Research.

Article Title:

| Name and Surnames of the Contact Author and the Coauthors | Signature |
|---|---|
| 1. | |
| 2. | |
| 3. | |
| 4. | |

**Principles of Ethics and Declaration of Solution to Editorial Conflicts**

**Editor Responsibilities**

The Publisher undertakes to guarantee the confidentiality of the evaluation process, it may not disclose to the Arbitrators the identity of the Authors, nor may it reveal the identity of the Arbitrators at any time.

The Editor assumes the responsibility to properly inform the Author of the stage of the editorial process in which the text is sent, as well as the resolutions of Double-Blind Review.

The Editor should evaluate manuscripts and their intellectual content without distinction of race, gender, sexual orientation, religious beliefs, ethnicity, nationality, or the political philosophy of the Authors.

The Editor and his editing team of RINOE® Holdings will not disclose any information about Articles submitted to anyone other than the corresponding Author.

The Editor should make fair and impartial decisions and ensure a fair Double-Blind Review.

**Responsibilities of the Editorial Board**

The description of the peer review processes is made known by the Editorial Board in order that the Authors know what the evaluation criteria are and will always be willing to justify any controversy in the evaluation process. In case of Plagiarism Detection to the Article the Committee notifies the Authors for Violation to the Right of Scientific, Technological and Innovation Authorization.

**Responsibilities of the Arbitration Committee**

The Arbitrators undertake to notify about any unethical conduct by the Authors and to indicate all the information that may be reason to reject the publication of the Articles. In addition, they must undertake to keep confidential information related to the Articles they evaluate.

Any manuscript received for your arbitration must be treated as confidential, should not be displayed or discussed with other experts, except with the permission of the Editor.

The Arbitrators must be conducted objectively, any personal criticism of the Author is inappropriate.

The Arbitrators must express their points of view with clarity and with valid arguments that contribute to the Scientific, Technological and Innovation of the Author.

The Arbitrators should not evaluate manuscripts in which they have conflicts of interest and have been notified to the Editor before submitting the Article for Double-Blind Review.

**Responsibilities of the Authors**

Authors must guarantee that their articles are the product of their original work and that the data has been obtained ethically.

Authors must ensure that they have not been previously published or that they are not considered in another serial publication.

Authors must strictly follow the rules for the publication of Defined Articles by the Editorial Board.

The authors have requested that the text in all its forms be an unethical editorial behavior and is unacceptable, consequently, any manuscript that incurs in plagiarism is eliminated and not considered for publication.

Authors should cite publications that have been influential in the nature of the Article submitted to arbitration.

**Information services**

**Indexation - Bases and Repositories**

LATINDEX (Scientific Journals of Latin America, Spain and Portugal)
RESEARCH GATE (Germany)
GOOGLE SCHOLAR (Citation indices-Google)
MENDELEY ((Bibliographic References Manager)

**Publishing Services**

Citation and Index Identification H
Management of Originality Format and Authorization
Testing Article with PLAGSCAN
Article Evaluation
Certificate of Double-Blind Review
Article Edition
Web layout
Indexing and Repository
Article Translation
Article Publication
Certificate of Article
Service Billing

**Editorial Policy and Management**

38 Matacerquillas, CP-28411. Moralzarzal - Madrid - Spain. Phones: +52 1 55 1260 0355, +52 1 55 6159 2296, +52 1 55 6034 9181; E-mail: contact@rinoe.org www.rinoe.org

**RINOE® Journal-Microeconomics**



**Site Licences**

03-2010-032610094200-01-For printed material, 03-2010-031613323600-01-For Electronic material,03-2010-032610105200-01-For Photographic material,03-2010-032610115700-14-For the facts Compilation,04-2010-031613323600-01-For its Web page,19502-For the Iberoamerican and Caribbean Indexation,20-281 HB9-For its indexation in Latin-American in Social Sciences and Humanities,671-For its indexing in Electronic Scientific Journals Spanish and Latin-America,7045008-For its divulgation and edition in the Ministry of Education and Culture-Spain,25409-For its repository in the Biblioteca Universitaria-Madrid,16258-For its indexing in the Dialnet,20589-For its indexing in the edited Journals in the countries of Iberian-America and the Caribbean, 15048-For the international registration of Congress and Colloquiums. financingprograms@rinoe.org

**Management Offices**

38 Matacerquillas, CP-28411. Moralzarzal - Madrid – Spain.

# Journal-Microeconomics


"Consumer profile and purchase preference of Farmacias G I in San Mateo Atenco, State of Mexico"
**ORDOÑEZ-HERNÁNDEZ, Lucía, CALDERÓN-RÍOS, Norma Otilia, PALOMAR-FUENTES, María del Pilar and DOMINGUEZ-VILLA, Elide Ana Korac**
*Tecnológico Nacional de México/Campus Toluca*

"Identification of the consumer profile for the industrialization of Chihuahua type cheese"
**MIRELES-MEDINA, Antonia, MIRELES-MEDINA, Manuel Patricio, PAREDES-BERUMEN, Luis Enrique, DE ÁVILA-MARQUEZ, Francisco**
*Instituto Tecnológico Superior Zacatecas Norte*
*Universidad Autónoma de Zacatecas*

"Application of the AIDS model in hass avocado consumption in Mexico"
**GÓMEZ-GÓMEZ, Alma Alicia, LUQUEZ-GAITAN, Carlos Ernesto and LÓPEZ-VELÁZQUEZ, Lessly Gabriela**

"Cost analysis in reverse logistics of grade 2 asparagus"
**QUINTERO RAMÍREZ, Juan Manuel**
*Consejo Nacional de Ciencia y Tecnología*



2531-2987
ISSN 2531-2987
www.rinoe.org