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Quality and Organizational Innovation: Competitiveness Tools in the Table Grape System

Calidad e innovación organizacional: herramientas de competitividad en el sistema uva de mesa

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ABSTRACT

The research analyzes quality management strategies as organizational innovation practices incorporated by table grape-producing organizations and their relationship with competitiveness. The data was obtained by elaborating a semi-structured interview script, which was applied to the managers or responsible people of the Sonoran table grape-producing organizations. The results allow us to recognize the main innovations organizations incorporate, specifically those related to organizational innovation. It was concluded that quality and organizational innovation are considered essential practices to generate competitive advantages in organizations since they generate knowledge, learning, and skills that drive decision-making aimed at business success.

Keywords: Quality Management; Organizational Innovation; Certifications; Competitiveness

JEL code: L2, M10, M11

RESUMEN

La investigación busca analizar las estrategias de gestión de calidad como prácticas de innovación organizacional incorporadas por las organizaciones productoras de uva de mesa y su relación con la competitividad. Se realizaron entrevistas semiestructuradas a los gerentes o responsables de las organizaciones productoras de uva de mesa sonorenses. Los resultados encontrados permiten reconocer las principales innovaciones incorporadas por las organizaciones, específicamente las relacionadas a la innovación organizacional. Se concluyó que la calidad y la innovación organizacional se conciben como prácticas indispensables para generar ventajas competitivas en las organizaciones, pues genera conocimientos, aprendizajes y habilidades que impulsan la toma de decisiones encaminadas al éxito empresarial.

Palabras clave: gestión de calidad; innovación organizacional; certificaciones; competitividad

Código JEL: L2, M10, M11

INTRODUCTION

Currently, agricultural organizations need to adapt their organizational practices to meet the quality demands of a globalized and dynamic market. Adaptation occurs by searching for strategies that allow them to maintain their competitiveness. Table grape production in the state of Sonora is one of the agricultural activities with a good position in international markets; hence, the relevance of analyzing the strategies that have led these organizations to achieve said positioning.

To enter new markets, organizations and their leaders must have clear management strategies. A key to this is to know the organizational innovation approach that allows handling their management practices, reconfiguring their organizational structure, and strengthening their relations with the outside world by incorporating new procedures that enable them to meet market demands efficiently.

Quality management, an organizational innovation practice that includes planning, control, assurance, and improvement actions, can become an advantage over its competitors and achieve an adequate position in the markets. Therefore, this study aims to analyze quality management strategies as organizational innovation practices implemented by table grape-producing organizations in Sonora and their relationship with competitiveness, allowing them to position themselves in increasingly demanding markets.

IMPORTANCE OF THE TABLE GRAPE SYSTEM FOR MEXICO

According to the Servicio de Información Agroalimentaria y Pesquera (SIAP, 2022), Mexico produced 358,791 tons of grapes to be consumed fresh in 2021 and ranked number 26 as a world producer. Of this amount, 53% was sold internationally; the United States was its primary customer. Belize, Guatemala, Honduras, El Salvador, Ecuador, Panama, Costa Rica, Nicaragua, Japan, Australia, Canada, and Europe are other destinations where Mexico sells its fresh grapes. Sonora is the country's leading table grapes producer, followed by Zacatecas and Aguascalientes (SIAP, 2022). See Table 1.

Table 1
Production volume of the leading entities

Federal entity	Volume (tons)
Sonora	287,913
Zacatecas	54,589
Aguascalientes	7,179
Baja California	5,367
Jalisco	2,015

Coahuila	966
San Luis Potosí	325
Puebla	239
Guanajuato	95
Baja California Sur	78
Others	25

Source: Adapted from SIAP (2022).

Importance of the table grape system for Sonora

In 2021, Sonora contributed 92.4% of the value of national grape production and represents first place in production value, followed by asparagus, wheat, and potatoes. The central municipalities where grapes are harvested are Hermosillo, Caborca, San Miguel de Horcasitas, Carbó, and Guaymas (SIAP, 2022). The behavior of table grapes in Sonora in recent years is shown in Table 2.

Table 2
Behavior of table grapes in Sonora

Year	Planted area (ha)	Harvested area (ha)	Production (t)	Yield obtained (t/ha)	Average rural price ($/t)	Production value (thousands of pesos)
2017	18,696.00	17,416.50	310,926.30	35.73	41,845.86	6,100,897.37
2018	19,710.00	18,705.00	319,028.77	34.06	48,090.17	7,641,951.20
2019	19,999.00	19,201.00	350,816.80	36.55	56,332.27	9,578,296.50
2020	20,351.00	19,523.00	320,990.10	33.32	59,677.91	9,296,739.69
2021	16,821.00	16,413.00	287,913.13	52.45	91,531.02	8,637,581.45

Note: The data published by the SIAP through the SIACON platform show the behavior of table grapes in Sonora in the last five years.

Source: Adapted from SIAP (2022).

According to Terán, Robles, and Paz (2023), the table grape system comprises approximately forty organizations that allocate 95% of their production for export. The entity's production is around 25.4 million boxes. Hence, the table grape system is essential in the national and regional panorama due to the foreign exchange it generates and the labor employment rate since tens of thousands of day laborers from the entity and the countries south arrive to harvest the grapes. (Bañuelos-Flores et al., 2019).

Table grape varieties harvested in Sonora are red, green, and black; some are traditional varieties such as Perlette, Flame, Red Globe, Sugraone, or Superior and Black Seedless. Others are new patented varieties incorporated because of market demands, such as Sweet Celebration, Cotton Candy, and Sugar Crisp. It has given approximately forty seedless varieties, harvested and marketed mainly in May, June, and July (Herrera-Cebreros et al., 2022).

Sonora's Export Market

Around 95% of the grapes produced in Sonora are destined for the export market, and 5% are for the national market. The United States is the leading consumer of Sonoran grapes, with 82% of the production destined (Bañuelos-Flores et al., 2019). According to data from the United States Department of Agriculture (USDA), Mexican grapes are distributed in cities such as Atlanta, Baltimore, Boston, Columbia, Chicago, Dallas, Detroit, Los Angeles, Miami, New York, Philadelphia, and San Francisco (USDA, 2021).

During the commercial window from May to July, the Sonoran grape competes with the Californian table grape that markets it between July and December. It competes with the Chilean and Brazilian grapes during May, whose commercial window is from January to May (Bañuelos-Flores et al., 2019).

The product must meet each country's quality and safety requirements. In the United States, the United States Food and Drug Administration (FDA) and the USDA are the bodies that demand the requirements for introducing food into their country about size, Brix degrees/level of sugar, color, absence of pests, and exact weight.

The Fresh Trends study on American consumers' preferences shows that grapes are the third most demanded fruit and are mainly consumed as snacks. Purchasing preferences by variety also stand out: green seedless grapes are the most preferred, followed by red seedless and black seedless in third position (The Packer, 2022).

Other characteristics of the US grape market are that women mostly buy it; that the population that consumes it the most is the one that is in an age range of 59 years or older; those who purchase it have an annual income of between 50-99.9 thousand dollars (The Packer, 2022). This study emphasizes the concern of consumers for the use of pesticides and all those aspects that include environmental and social responsibility (The Packer, 2017).

In general, the Sonoran grape has had to advance in compliance not only with the intrinsic attributes of the product but also with those that are not visible to it.

QUALITY

For the consumer, quality is based on various criteria, including their needs, expectations, experiences, price, advertising, and perception of the company's image. If these consumers perceive that their criteria have been met, they will be pleased (Gutiérrez, 2010). Some quality dimensions are objective and do not change over time; others change with fashions; some characteristics are inherent to the product, and others are added (Garvin, 1984).

Cuatrecasas and González (2017) and Evans and Lindsay (2008) list some of the definitions of quality made by scholars on the subject over time: Deming conceptualizes it as satisfying consumer needs; Juran as suitability for use and lack of defects; Ishikawa considers that the quality of a product goes from the design until it is delivered to the client and seeks that it be economical, beneficial and satisfactory for the consumer; for Crosby, it means compliance with the requirements; Feigenbaum, the precursor of total quality, promulgated that quality is a business lifestyle in which the entire company participates from the design of the product until it is in the hands of the consumer; for Taguchi, it is the minimum loss that the use of a product or service causes to society.

The term quality has evolved, and this evolution has been based on the present needs of each era. It has gone from the control stage to the assurance stage to reach what is currently known as total quality, which includes the two previous phases. Quality is no longer considered just a final product or manufacturing process characteristic. It is now a philosophy based on the commitment and leadership of senior management. It extends to all areas of the company, guided by a set of guiding principles of continuous improvement and innovation of the organization, whose purpose is the satisfaction of the needs and expectations of all interest groups: customers, shareholders, workers, and society, among others (Gutiérrez, 2010).

Authors such as Prieto and others (2008) add the ethical or emotional adjective to the concept of quality (ethical or emotional quality) when they speak of intangible attributes. These attributes group a set of characteristics that matter to the consumer and influence their purchase decision. They have to do with social and environmental sustainability, to which Maycotte and others (2022) call quality as the market's intangible demand. The purchase decision includes concepts such as environmental protection, worker protection, regional development, fair trade, the use of agrochemicals, or environmental improvement.

In summary, it can be said that quality is "the degree to which a set of tangible and intangible characteristics of a product or service are adapted to the demands of the market and together offer the consumer the satisfaction of their explicit and implicit needs" (Maycotte et al., 2022, p.120).

In an agri-food system, the market trend is dynamic since it is subject to changes in consumption habits (Rincón et al., 2015). Consumers are concerned about purchasing products they trust that the information on their label is truthful, that they do not risk their health, and that they meet their quality requirements (Araya-Pizarro & Araya, 2020). Globally, quality has become a priority for organizations, with emphasis on the complete satisfaction of customer needs and expectations, which has led to the emergence of certifiable standards that certify compliance with established parameters and provide the necessary

confidence in customers about the products they purchase, as well as the way they are produced (Berges et al., 2009).

In turn, agri-food product consumers have become more demanding and informed. Not only does it demand quality in compliance with specifications, but it also requires compliance with safety and health aspects for workers and care for the environment (Hernández & Villaseñor, 2014).

Quality management

Quality management is defined as a company management philosophy and a set of activities that determine the quality policy, objectives, and responsibilities to demonstrate that the organization can offer a product that constantly satisfies the requirements of the client, consumer, or user (Aguado et al., 2022; Amaya et al., 2020).

Managing quality is a strategic decision to face the accelerated changes in the market and adapt to consumers' expectations (Bonales et al., 2015). For Onegina and others (2022), quality management has become a strategic tool for the management of organizations, guided by current trends related to innovation and new technologies, changes in consumption habits towards healthy lifestyles, greater attention to environmental impacts, the use of communication networks, new markets, adaptation to new cultures and consumer preferences, and the quality standards of foreign countries.

Having a quality management system is a practice of organizational innovation that allows directing work through the organization of human resources in a structure that allows planning, control, assurance, and continuous improvement of the quality of the goods offered in a sustained manner (Aguado et al., 2022; Hernández et al., 2018).

Management tends to focus on quality from the perspective of systems, that is, to satisfy the organization's internal and external customers. In other words, the quality strategy ensures that the customer values compliance with product requirements. Service is the conditions in which the product or service is produced (Hernández et al., 2018).

Due to the above, work should not be done in isolation. However, it should be integrated into other management systems such as safety, environment, occupational health, and safety. That is, management systems have evolved within the framework of a globalized market to also focus on more human aspects (Evans & Lindsay, 2008; Hernández et al., 2018).

Certifications as a quality management strategy

In recent decades, distributors of the agri-food industry have promoted measures such as private certifications, standards, or quality and safety seals due to the growth of international trade in agricultural products, various outbreaks of diseases caused by the consumption of unhealthy food that have put public health at risk, the growth of the retail industry, consumer demands for quality and safe food and the inefficiency of public institutions to guarantee safety (Hu et al., 2023; Jin et al., 2023; Oppong & Kwasi, 2022).

The requirements for compliance with quality standards have also increased, certifications have been expanded to cover issues of social and environmental responsibility, and other links in the supply chain have been included to be in tune with consumer needs, meet their expectations, and stay in the market (De Castro et al., 2021).

These certifications can be voluntary and others mandatory and cover characteristics of products and processes, including quality, safety, security, environmental impacts, workers' working conditions, and other social impacts (Masakure et al., 2011). It agrees with the point of view of Hernández and others (2018), who argue that quality must be seen from a comprehensive approach that meets the health and safety of workers and cares for the environment to obtain economic growth for the organization.

For Berges and others (2009), certifications mean that the producer must differentiate themselves from their competitors and obtain a profit. For the consumer, they mean a way to confirm that a third party has endorsed the quality of the product and can place their trust in it (Jin et al., 2023).

In the agri-food system, certifications, standards, and seals are part of quality management strategies. Certifications such as Global GAP, BRC, ISO 22000, or IFS regarding Good Agricultural Practices and food safety are promoted by the large distributors of the agri-food chain, and others such as SMETA, Fairtrade, or Rain Forest Alliance, referring to aspects of social, economic, and environmental sustainability, are promoted by social movements, producer associations and non-governmental organizations (De Castro et al., 2021; Jin et al., 2023).

The primary quality standards used in the agricultural industry are those related to the application of Good Agricultural Practices and food safety in the preparation of products. These procedures are applied from the planning stage, harvest, and packaging to transportation, guaranteeing food safety and product traceability (Gómez et al., 2021).

There are internationally known and used standards for quality management systems, such as ISO 9001. However, agricultural organizations seek customer satisfaction through certifications with a quality and safety approach, such as those mentioned in the previous paragraph, which complies with the product's physical attributes and the preparation of safe food.

They also incorporate social responsibility standards that focus on ethical, social, and environmental aspects such as worker safety, decent working conditions, not hiring minors, respect for human and labor rights, and caring for the environment. Use soil, water, and resources (Contreras-Valenzuela et al., 2018).

For example, GlobalGAP is the most widely used standard globally and covers not only aspects of food safety but also environmental care, traceability, safety, and economic well-being of workers. Primus GFS is the most widely used food safety standard in the United States (Hu et al., 2023).

Agri-food certifications represent a guarantee of quality and safety for consumers and innovation in the market, which allow access to new and demanding markets through product differentiation, also satisfying retailers seeking a higher standard than that of the public norm (Hu et al., 2023; Rincón et al., 2015).

When organizations adopt the standards, it will bring them some advantages, such as defining policies and objectives, employee training, market analysis, and feedback from customers and suppliers to satisfy their requirements. The organization will benefit from the adopted standard according to the degree of commitment of senior management. Otherwise, it would only be fulfilled symbolically (Tarí et al., 2020).

As benefits of adopting certifications, the following are listed: access to demanding markets, export channels, increased market share, greater export volume and value, vertical integration, greater productivity, better company management, higher wages, and better conditions for workers, among others (Hu et al., 2023; Onegina et al., 2022).

On the other hand, Hu and others (2023), Jin and others (2023), and Rabadán and Triguero (2021) point out that certifications can represent a disadvantage for small farmers and small businesses because many retailers require their suppliers to be certified in a recognized standard, which represents a cost if desired. Enter export markets, which reduces their production volume and increases the possibility of exiting the market.

ORGANIZATIONAL INNOVATION

When talking about innovation, one should not only think about technological issues, but this concept can also refer to various aspects such as processes, products, marketing methods, or the organization itself. Organizational innovation is a non-technological innovation that helps organizations adapt to the environment; it implies the generation of new practices, processes, and structures, new skills, improvement of communication and decision-making, and the creation of new positions and strategic alliances (Lozano & Robles, 2022).

Arraut (2010) defines innovation as "the driving force that drives companies towards ambitious long-term goals and that leads to the renewal of organizational structures" (p. 24). Avila and Morales (2019), Garcia and others (2021), Martínez and Padilla (2020), and Ramírez and Ampudia (2018) highlight the classification of innovation made in the Oslo Manual proposed by the Organization for Economic Cooperation and Development (OECD), where it is divided into four types:

1) Product innovation: the introduction to the market of a new or improved product or service implies changes in its characteristics.
2) Marketing innovation: a new marketing method that highlights the product's price, presentation, or differences compared to others to increase sales.
3) Process innovation: changes or new manufacturing or distribution processes or methods that are more productive, efficient, reduce costs, or improve product quality.
4) Organizational innovation: It is oriented towards changes and improvements in the internal practices of the organization, human resources management, and any action that helps to increase knowledge management, employee productivity, and cost reduction.

Jia and others (2018) define organizational innovation as implementing new organizational structures, practices, and processes essential to achieving business growth and sustainability over time. Afcha (2011) postulates that it is the product of an evaluation of companies about their environment, that is, their strengths, weaknesses, opportunities, and threats, and in response to this analysis, companies generate changes that allow them to reconfigure themselves to meet the needs.

Market demands efficiently and gain a competitive advantage over competitors. It coincides with Lozano and Robles (2022), who consider that organizational innovation contributes to the growth and competitiveness of companies since it is linked to the ability to respond to market demands. In turn, organizational innovations are grouped into three categories that may or may not coincide. See Table 3.

Table 3
Organizational innovation categories

Organizational innovation categories	Indicators
Organization management practices	Work direction and management
	Strategic planning
	Study and search for new markets
	Quality management
	Environmental management
	Health and security management
	Financial management
	Employee development
	Flexible work
	Decision making
	Innovation and development
	Knowledge management
	Managerial leadership
Structure of the organization	Organizational forms
	Work division methods
	Organizational policies
	Labor structure
	Creation of positions
	Definition of roles and responsibilities
	Staff Pick
	Training
	Promotion and incentive policies
	Motivation
	Diffusion
External relations	Sales
	Service and customer support
	collaboration with clients
	Commercialization
	Acquisitions
	Relación con proveedores
	Associativity with public or private institutions
	Relationship with competitors
	Relationship with government

Source: Own elaboration based on Arraut (2008); Ávila and Morales (2019); García and others (2021); Martínez and Padilla (2020); Pérez and others (2022); Ramírez and Ampudia (2018).

ORGANIZATIONAL QUALITY AND INNOVATION COMPETITIVENESS TOOLS

Innovation and quality management influence an organization's competitiveness (Bonales et al., 2015). The literature indicates that quality management is related to the competitiveness of the organization since implementing quality management systems promotes continuous improvement, the creation of training programs, teamwork, leadership, innovation, motivation, new ways of working, and the focus on customer satisfaction, which gives organizations a competitive advantage (Reyes et al., 2022).

It is also shown in the literature analysis that innovation is a crucial strategy to achieve the competitiveness of companies (Martínez & Padilla, 2020). It is worth noting the point of view of Zúñiga-Collazos (2016) on the importance of understanding organizational innovation not only as changes in organizational structures and employee practices but also the strategic approach in the direction and management of the organization since the way of running an organization can make the difference between being competitive or not. Business competitiveness has been defined in various ways, including:

> *"The company's ability helps the organization offer products and services that know specific quality standards at competitive prices in local and world markets and provide an adequate return for the resources used or consumed in their production." (Oyarce, 2013, p. 60).*
> *"The company needs to produce more attractive goods and sell at better prices or reduce costs: cost system, market and customer management, productivity, associativity, and others" .(Cabrera et al., 2011, p. 37*)

The concept of competitiveness or competitive success is closely linked to the concept of organizational performance; in fact, the generation of income produced by competitive advantages will result in higher performance and, therefore, a better relative position of the company concerning its competition (Martínez et al., 2010, p. 175). According to various authors, Table 4 lists some of the main organizational competitiveness strategies and their advantages.

These ideas show that organizations immersed in a complex and changing context must be competitive in the market through innovation practices and continuous improvement that incorporate and manage the needs and expectations of all interested parties around the organization since "the companies that do not innovate will soon be caught up and surpassed by their competitors" (Rodríguez et al., 2014, p. 83).

Table 4
Strategies and competitive advantages for organizations

Competitive strategy	Competitive advantage
Quality management/certifications	Products and services that meet the quality standards specified by the client.
Innovation	More efficient, more attractive products, processes, and services.
Competitive prices	Increased market share and sales.
Technology	Technical progress, increase in productive efficiency.
Costs reduction	Adequate resource management, financial management and greater profitability.
Market and customer management	Knowledge of the market, customers and distribution channels, market research, market penetration.
Productivity	Greater productivity implies greater responsiveness or delivery of results.
Corporate social responsibility	Positive impact on the social, economic, and environmental sphere of society, public image, reputation of the company.
Association	Cooperation between various public and/or private organizations that promotes the development of the organization.
Intellectual capital	Trained, motivated, committed human team.

Source: Own elaboration based on Musik and Romo (2004); Bada and others (2013); Bonales and others (2015); Cabrera and others (2011); Ramírez and Ampudia (2018).

Being competitive is, for Rambe and Khaola (2023), producing and selling quality products, both in local and international markets, at competitive prices that generate returns for the organization since the quality of the product improves its position in the market, its reputation and increases the market share of the company.

Organizations' changes require strategies that position them in a degree of advantage over their competitors to achieve their survival and a sustained position over time. Within these strategies, quality management and social responsibility become competitive advantages of differentiation for companies, allowing them to develop high-quality products and services, as well as focus on aspects of social and environmental well-being (Arraut, 2010; Heras et al., 2008; Ramírez & Ampudia, 2018).

For Núñez-Lira and others (2023) and Sierra-Parada and others (2022), organizations that have carried out an analysis of their environment (strengths, opportunities, weaknesses, and threats) will have the advantage of knowing their suppliers, customers, competitors, and substitute products, and will be able to make strategic decisions, innovate and define

objectives that adapt to the changes, and will be the ones with the most significant possibility of increasing their competitiveness.

METHODOLOGY

The research design is qualitative, non-experimental, and descriptive in scope. The unit of analysis was the organization that produces table grapes in the state of Sonora. The population is made up of 33 organizations. The sample size was obtained by simple random sampling for a finite population's equation where all the elements have the same probability of being chosen (Hernández et al., 2014) through the following formula:

$$n = \frac{Z^2 * N*p*q}{[E^2(N-1)]+[Z^2*p*q]} \quad (1)$$

where:
n= sample size
N= population size
Z= statistical parameter that depends on the confidence level
E= estimation error
p= probability of success
q= (1-p) = probability of failure

The following values were established:
90% confidence level, *Z* value is 1.645
The population *N* is 33 organizations
The estimated error *E* was set to 7%
The probability of being chosen *p* is 97%
The probability of not being chosen *q* is 3%

The resulting sample size was 11 organizations. The study subjects were the managers or persons responsible for some high command with general organization knowledge. The selection procedure of the organizations was based on suitability; that is, the sample was made up of the available or arranged elements (Elorza, 2008).

The elaboration of the data collection instrument consisted of a semi-structured interview script comprising forty items. Through this instrument, the interviewer can guide the conversation with the interviewee toward the topics that interest them the most, giving them the freedom to express themselves (Díaz-Bravo et al., 2013).

A committee of experts carried out the instrument's content validity, and later, a pilot test was carried out applying the instrument to four managers of organizations that export agricultural products other than table grapes. The information collection stage was carried out from November 2021 to April 2022.

The interviews were processed through the MAXQDA v. 2022 qualitative data analysis software, through which the coding and categorization processes were carried out, the information was organized, and data matrices were obtained that helped to relate the information.

The categorization process was deductive-inductive (Vives & Hamui, 2021), allowing the actions or events related to the same topic to be classified (Osses et al., 2006). First, the theoretical framework was used to define the categories at the macro level; that is, it started from pre-established categories (deductive) such as innovation, organizational innovation, quality strategies, and competitiveness.

Subsequently, the text was reanalyzed to determine the similarities and differences within the categories and establish emerging categories and subcategories (inductive) such as types of innovation, quality management strategies, incorporation of certifications, type of certifications, quality characteristics of the grape, safety characteristics of the grape, compliance with environmental and social management requirements, competitive advantages. The text was repeatedly analyzed, and the theoretical saturation of the categories was reached when significant information or properties that contributed something new were no longer found (Osses et al., 2006).

The coding process was open type (Vives & Hamui, 2021); that is, the data was segmented line by line, word labels were placed, and the text was repeatedly analyzed to group the codes into the established categories.

RESULTS

Innovations incorporated by organizations.

Innovation is present in the Sonoran table grape system through various strategies, including product innovations, processes, marketing, and organizational innovation aimed at complying with the characteristics of the grapes the client demands (see Table 5).

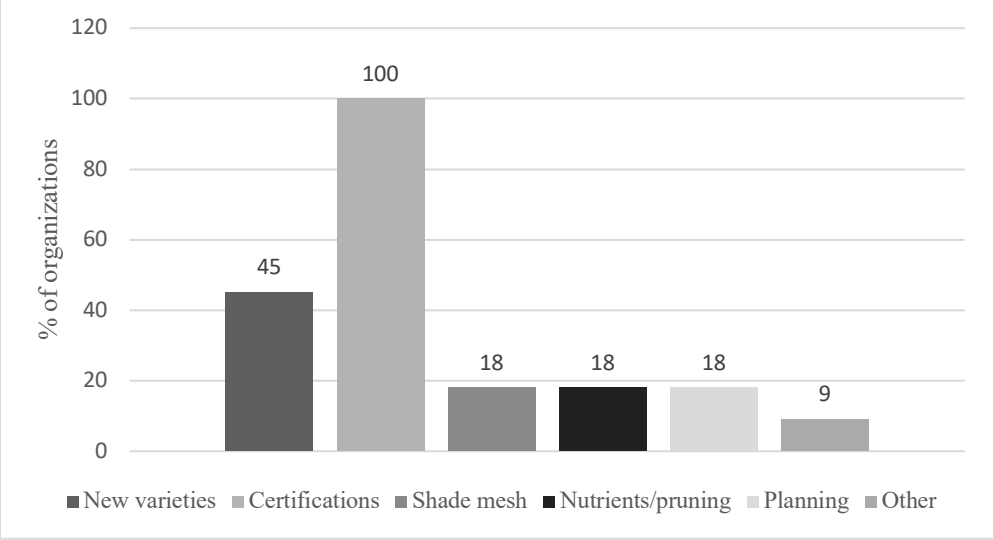
Table 5
Innovations incorporated by Sonoran table grape organizations

1. Incorporation of new varieties
2. Incorporation of certifications
3. Incorporation of new technologies
4. Use of shade mesh
5. Market research
6. Transport and cold chain
7. Use of nutrients from the roots
8. Pruning techniques
9. Hiring of advisers
10. Planning ahead

Source: Own elaboration based on results of interviews.

Graph 1 shows the percentage of organizations that have implemented each innovation. The investigation results show that 45% of the producers have incorporated new varieties of grapes. Among the reasons are that they are most productive, provide a higher yield, have constant production year after year, better withstand climate changes, are more resistant, more fruitful, take a higher degree of sweetness, have higher nutritional values and distinctive flavors, all previous improves its quality and competitiveness. The rest of the organizations continue producing traditional grape varieties.

Graph 1
Percentage of organizations that have implemented each innovation



Source: Own elaboration based on interview results.

In the case of incorporating certifications, 100% of the organizations have some certification. The 18% of the organizations have applied strategies such as the use of shade mesh to protect

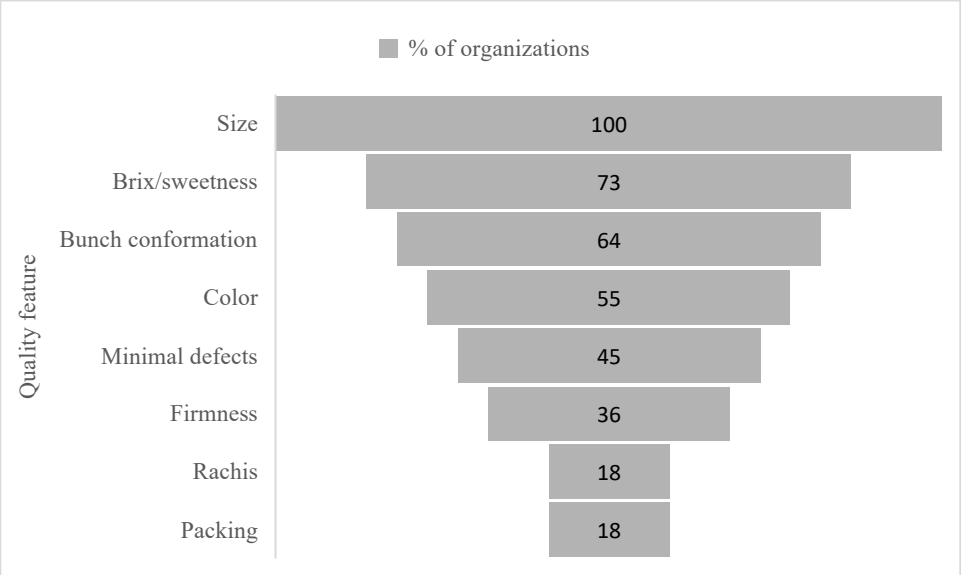
crops, the use of nutrients from the roots and new pruning techniques to obtain the required size and sweetness, production planning with activities such as programming from a previous year, marketing strategies before the strong season or saving grapes if demand conditions are not favorable.

The 9% of the organizations carry out other actions such as the use of technological applications to monitor crops on a day-to-day basis, market research to determine customer demands and consumption trends, improvements in the transport and cooling chain of the grape that extend its shelf life, contracting external advisors who are experts in quality issues, safety, marketing, legal aspects, among others.

Determinants of a Quality Grape

Table grape-producing organizations have clearly defined the quality characteristics their clients require to enter the export market (the primary market for table grapes in Sonora). See Graph 2.

Graph 2
Main quality characteristics of table grapes



Source: Own elaboration based on interview results.

It should be noted that 100% of the producers mention the size of the berry as the primary attribute required by the client; that is, the size is required according to the grape variety. It can range from 9/16 to 15/16 of an inch in diameter. The flavor depends on the grape variety, measured in degrees Brix. In general, they are handled from 16 to 23 degrees Brix.

The sweetness is most significant at a greater number of degrees. The conformation of the bunch refers to the fact that it is complete, that it does not break apart, that there are no holes to be seen, and that it is not too tight. Within the color attribute, it is requested that it be

uniform. Minimal defects refer to grapes not bearing scars, streaks, wrinkles, blemishes, sunburn, cracks, ruptures, or rotten berries.

The firmness indicates that the grape has crunchy pulp. The rachis must be green and mold-free, which shows that the fruit is fresh and has not lost moisture. The packaging is essential for the client since it must contain the exact weight that is requested, as well as the type of container, either "clamshell" or plastic bag.

Organizational innovation practices related to quality.

The results showed that 100% of the organizations had implemented actions for planning, controlling, assurance, and improving both quality and safety, including incorporating certifications, standards, or distinctive. These allow compliance with the physical characteristics of the product required by the client (see Graph 2), in addition to compliance with aspects related to safety such as hygiene and safety procedures, cross-contamination control, pest control, soil health, use of permitted fertilizers and pesticides, equipment cleaning or product traceability.

Table 6
Certifications of grape producing organizations

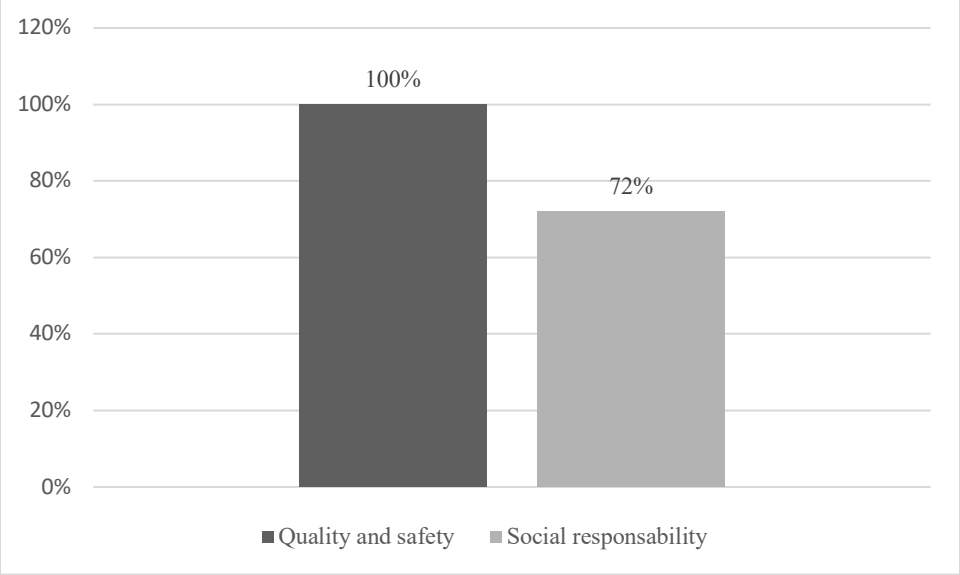
Of quality and safety	Of social responsibility
Global GAP	Distintivo Empresa Agrícola Libre de Trabajo Infantil (DEALTI)
Primus GFS	Fairtrade
USDA and FDA requirements	SMETA
Walmart Certifications	GRASP
Kroger Certifications	
FSSC 22000	
SENASICA	
México Calidad Suprema	
CCOF Organic	
OMRI Listed	
Pesticide Residue Free	
Orgánico SAGARPA México	

Source: Own elaboration based on interview results.

A finding was that Sonoran table grape-producing organizations also have invested in incorporating social and environmental responsibility certifications as they have become another requirement of their customers. These cover aspects related to not hiring minors, fair trade, respect for workers' labor rights, health and security, ethical behavior, use of energy, and care of the soil, water, and biodiversity. Table 6 lists the certifications incorporated. It stands out that 100% of the organizations have certifications with a quality and safety approach, and 72% also have social responsibility certifications (see Graph 3).

Graph 3

Percentage of organizations that have integrated certifications

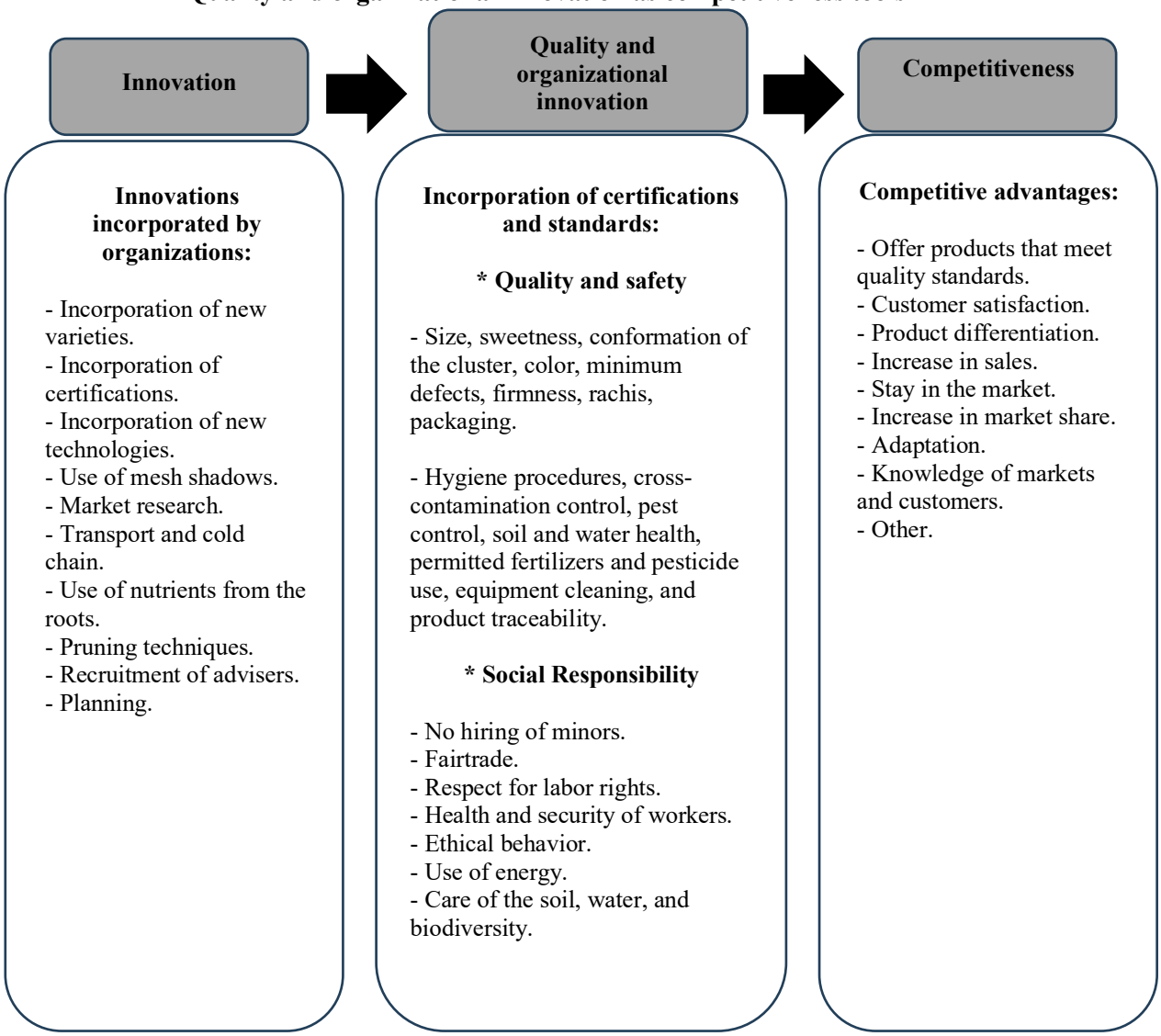


Source: Own elaboration based on results of interviews.

Competitiveness in Sonoran table grape producing organizations

Regarding the competitiveness factor, the interviewees were asked questions about the competitive advantages they perceived in their organization because of the implementation of the quality management strategies they mentioned. The responses stand out: compliance with quality standards, innovation, staying in the market, customer satisfaction, increased sales, and adaptation. Figure 1 shows the model that guides this research, with the concentration of all the answers.

Figure 1
Quality and organizational innovation as competitiveness tools



Source: Own elaboration based on results of interviews.

DISCUSSION

According to Núñez-Lira and other (2023) and Sierra-Parada and others (2022), organizations that analyze their environment have the advantage of knowing their customers, suppliers, and competitors, which gives them the advantage of being able to establish strategies to direct the company towards the demands of new markets. In this sense, the Sonora table grape-producing organizations have the advantage of knowing their customers, marketing companies such as Walmart, Kroger, and Costco, and their competitors, large

South American grape producers who also export to the USA and the same state of California, USA. Grape growers are in a constant relationship with their environment.

They are in a dynamic and competitive environment and constantly seek to satisfy customer demands. The environment is dynamic in that production depends a lot on weather factors, which affect the product's yield, quality, and sale, coupled with strict safety and quality standards (Rincón et al., 2015).

This adaptation to the environment generates changes in organizations, according to Afcha (2011), including incorporating various innovation strategies. The interest of this study focuses on organizational innovation strategies. According to Ávila and Morales (2019), García and others (2021), and Ramírez and Ampudia (2018), quality management practices are part of organizational innovation since they originate from external customers.

The results of this research show the types of innovations incorporated by organizations, where product and organizational innovations stand out (Arraut, 2008; Ávila & Morales, 2019; García et al., 2021; Martínez & Padilla, 2020; Pérez et al., 2022; Ramírez & Ampudia, 2018).

Product innovations are due to incorporating new grape varieties in 45% of the organizations that made up the sample. Organizational innovations are due to the incorporation of certifications in 100% of the companies, which are framed in quality management activities as management practices of the organization (Ávila & Morales, 2019; García et al., 2021; Martínez & Padilla 2020; Ramírez & Ampudia 2018).

The data showed that the incorporated certifications obey 100% quality and safety issues, while others obey social, economic, and environmental sustainability issues (72%). The GlobalGAP and Primus GFS certifications related to quality and safety issues stand out as the most frequently implemented, which coincides with Hu and others (2023).

The certifications and standards related to quality and safety found in this study, such as Global GAP, Primus GFS, FSSC 22000, México Calidad Suprema, FDA, and USDA, allow compliance with physical and safety characteristics of the grape, such as size, sweetness, conformation of the bunch, color, cleanliness, health, and in general that they are suitable for human consumption without generating a negative impact on health (Gómez et al., 2021).

The certifications related to social responsibility, such as DEALTI, Fairtrade, GRASP, and SMETA, allow compliance with demands that have to do with the labor rights of workers, the non-hiring of minors, ethical behavior, and care for the environment, which agrees with Masakure and others (2011). According to De Castro and others (2021) and Jin and others

(2023), distributors of the agri-food industry have expanded the required standards to cover environmental and social management issues. This study has shown that most of the producers of the table grape system have adapted to these requirements (Bonales et al., 2015).

These certifications have contributed to the growth of Sonoran companies and their introduction to export markets in the USA, South America, Europe, and Asia since they represent a guarantee of compliance with the requirements (Aguado et al., 2022; Amaya et al., 2020; Araya-Pizarro & Araya, 2020; De Castro et al., 2021). It coincides with the research by Contreras-Valenzuela and others (2018) on the vid de mesa system of the state of Sonora, where it is revealed that companies have sought a series of certifications and recognitions as a strategic conduct to meet market demand conditions and adapt to the requirements of their customers.

Quality management through certifications and organizational innovation has brought competitive advantages for grape producers, as indicated by the study subjects (Rambe & Khaola, 2023). The competitive advantages mentioned by the study subjects coincide with some of those established in the literature review (Table 4).

Precisely, the competitive advantages of compliance with quality standards and customer satisfaction correspond to a quality management strategy; product differentiation corresponds to an innovation strategy; the increase in sales and increase in market share respond to a competitive pricing strategy, knowledge of markets and customers respond to a market and customer management strategy (Musik & Romo, 2004; Bada et al., 2013; Bonales et al., 2015; Cabrera et al., 2011; Ramírez & Ampudia, 2018).

The competitive advantages mentioned, such as staying in the market and adapting to the environment, do not respond to a specific strategy in Table 4. However, they are supported by authors such as Núñez-Lira and others (2023) and Sierra-Parada and others (2022). Cruz and others (2020) relate the implementation of quality strategies with the impact on the competitiveness of companies, which empirical data have demonstrated for the table grape system.

CONCLUSIONS

This research analyzed quality management strategies as organizational innovation practices implemented by table grape-producing organizations in Sonora and their relationship with competitiveness. It was possible to determine a list of innovative actions implemented by the organizations. Among them, quality management was analyzed by incorporating certifications and standards as a practice of organizational innovation. It was concluded that

organizational innovation is conceived as an essential practice to generate competitive advantages in organizations since it generates knowledge, learning, and skills that drive decision-making aimed at business success.

Within the certifications, those quality and safety issues are accentuated to allow compliance with the leading quality characteristics of the export grape, which are the size, sweetness, and conformation of the bunch, as well as with the safety demands: clean, healthy products, suitable for human consumption, free of pests and agrochemicals. In turn, they are always awaiting the new requirements that will arise from the client, which makes them in the process of continuous improvement and innovation, such as the incorporation of social responsibility certifications along with quality management systems to deal with aspects that have to do with people and the environment. These quality management strategies influence the adaptation of management practices and the structure and internal processes of the organization, that is, in organizational innovation.

Regarding the impact of quality strategies as organizational innovation on the competitiveness of companies, the perception of producers for having invested in these issues is positive since all related these actions with one or more competitive advantages, among which are compliance with quality standards, innovation, staying in the market, customer satisfaction, increased sales, adaptation, opportunities for improvement, among others, which has cost them a significant investment and great care.

As a recommendation for future research, it is suggested to analyze the impact of other types of strategies in organizations, such as knowledge management, supplier management, organizational leadership, government support, collaboration with universities, international agreements, and treaties on the competitiveness and growth of the sector.

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