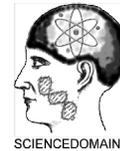


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## **Competitiveness's Determinants in the Avocado Export Sector's Value Chain**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Author JB was responsible for the initial idea and study design. Author JAM managed the literatura searches. Authors JAM and JB collected and compiled all information and preliminary analysis. Authors AGZ and JG worked with authors JAM and JB in data analysis and interpretation. Author JB wrote the first draft of the manuscript. All authors contributed to the editing, revision, and final preparation of the manuscript.*

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### **ABSTRACT**

This article discusses the importance of innovation and knowledge as a sustainable competitive advantage in the value chain of avocado exporters located in Uruapan, Michoacán. The measurement of these dimensions is made to indicators used in this research model, in bringing the measure up to this level of analysis allows us to know the source of competitive advantage. The results of the measurement of innovation and knowledge generated by operators of the avocado value chain (growers, producers, packers, and transporters). Thus, the objective of the research is to determine to what extent innovation and knowledge are the main variables that affect the competitive advantage in the value chain avocado Michoacan's exporters.

The article is generated from scientific research and has a descriptive-correlational design, describes the subject matter and determines the correlation of the independent variables with the dependent variable competitive advantages in the value chain of export companies' avocado in Michoacan. The sample size was: Nurserymen 51, 354 Producers,

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Packers 29 and Transporters 8. The general hypothesis is: innovation and knowledge are the main variables that affect the competitive advantage of the links in the value chain avocado exporting Michoacan's companies and will be contrasted with the Likert Scale, using a questionnaire to obtain information of the object of study field.

*Keywords: Value chain; competitive advantage; innovation; knowledge.*

**1. INTRODUCTION**

Today's business environment is more competitive and hostile, so that each company's competitive advantage is rapidly eroding and is overtaken by the rapid pace of competition [1]. The markets are in a constant state of flux and imbalance. The current business environment is far from stable and predictable.

However, most emerging economies have a comparative advantage in the supply of labor and land and exploitation of certain natural resources and climatic advantages over more developed countries. With the possible exception of China and some Asian economies. By exploiting these comparative advantages, the dominant industries in emerging economies tend to be characterized by high levels of participation of micro and small enterprises. A competitive sector in Mexico, which in many cases their competitiveness based on comparative advantages. Agribusiness is the area in which it emphasizes the cultivation and export of avocado, which enjoys a high demand in the national and international market.

The development of the avocado industry in Mexico in recent years has increased significantly and with great development opportunities especially with the diversification of markets and final product presentation. Mexico is the largest producer, exporter and consumer of avocados in the world, producing over one million tons per year and produces 42% of avocados grown worldwide. Avocado exports in 2008 exceeded 200 thousand tons of fresh avocados [2]. And in the next period 2009 exported more than 300,000 tons to the United States, Japan, Canada and Central America (Table 1).

**Table 1. Avocado mexican exports (tons)**

Country	2006	2007	2008	2009	Jan-Aug 2009	Jan-Aug 2010	Growth 09-10
USA	118,809	228,362	249,592	309,928	220,551	179,583	-19%
Japan	28,808	24,829	23,756	27,246	19,466	28,179	45%
Canada	17,148	19,604	18,095	22,583	14,588	17,526	20%
El Salvador	10,965	9,298	8,200	10,199	5,961	4,153	-30%
Costa Rica	5,694	5,979	6,468	6,991	4,878	5,506	13%
Others	26,932	22,167	20,559	21,207	11,998	11,249	-6%
<b>Total</b>	<b>208,346</b>	<b>310,260</b>	<b>326,670</b>	<b>398,153</b>	<b>277,442</b>	<b>246,198</b>	<b>-11%</b>

*Source: IQOM Business Intelligence <http://0-www.iqom.com.mx.millennium.itesm.mx/index>, economy secretariat*

Therefore, the objective of the research is to determine to what extent innovation and knowledge are the main variables that affect the competitive advantage of the links in the value chain avocado exporters located in Uruapan, Michoacan.

## 2. OVERVIEW OF LITERATURE

The concept of "value chain" is relatively new in the global food industry, perhaps the most recent and illustrative examples of value chain training as a competitive strategy, come from Holland, with the formation of the Foundation Chain Competition Agrifood in 1995. However, a forecast of the importance of value chains will have to improve the competitive advantages of agribusiness companies in the short term is that conducted by Dr. David Bell Director of agribusiness program at Harvard University and which states the following. "The future will not be a farmer competing against another farmer or a distributor competing with another distributor or a retailer competing against another retailer or a value chain will be competing with other value chain" [3].

It must be emphasized that the analysis of the value chain is a method used to break the chain in each of the activities that form and that looks for activities that add value to the final product. The focus of the value chain analyzes the characteristics between the different links that compose and aims to understand the factors that are affecting the competitive advantages, assessing their relative impact, in order to define priorities and strategies of concerted action between different actors. It is therefore very important to consider the identification of the bases of the competitive advantages of the avocado value chain to facilitate performance of different economic agents. Not enough for a link in the chain reaches the desired competitiveness, since it requires that the entire chain or system will achieve [4]. Put another way, the analysis of the value chain is essentially a system of creating value is an analytical tool that facilitates the identification and evaluation of strategic alternatives [5]. The value chain is an important unit of analysis to understand the competitive advantages of the company [6]. Fig. 1 shows the agents that make up the avocado value chain.



**Fig. 1. Avocado value chain**  
*Source: Compilation, based on fieldwork*

The concept of competitive advantage has taken center stage in discussions of business strategy. The competitive advantage that some companies have achieved through the adoption of the strategy has its beginnings in the basic concept of the late 1930's, called "competitive adaptation" [7], in which intellectual activities supplier relationships are the main sources of competitive advantage. It is one of the early literatures on competition in which the author claimed that a fundamental aspect of competitive adaptation is the specialization of suppliers to meet the change in demand of the buyer.

Competitive advantage is defined as "sustained profitability above normal". [8] Similarly [9] argues that competitive advantage is achieved when a firm implements a value-creating strategy that is not simultaneously implemented by any current or potential competitors. Therefore, the competitive advantage is not something you "have" but "enough", not just something that makes us different from the competition but get a higher return than their. The competitive advantage can be created in many ways, for example, by company size, location, access to resources [10].

The sustained competitive advantage, Understanding the sources of sustained competitive advantage for firms has become the largest area of research in the field of strategic management [11]. So that sustained competitive advantage organizations seek and try to develop it [12]. This is defined by [13] as "one that the competition can not copy or simulate". Similarly, [9] conceptualized as "the prolonged benefit of implementing some unique strategies for creating value not simultaneously implemented by any current or potential competitor and the inability to duplicate the benefits of this strategy". Additionally, they must possess four attributes: rareness, value, inability to be imitated and inability to be replaced.

The resources of the company includes: all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc., which allow the organization to implement strategies to make it more efficient [14]. However, not all resources have the potential to create a sustained competitive advantage. The dynamic nature of the business environment, especially in relation to the influence of competitors, customers, regulation, technology and the availability of financing is such that the achievement of competitive advantage is dynamic, in the sense that some companies in some circumstances are able to achieve a sustained competitive advantage and some companies in some industries only achieve a temporary competitive advantage.

One argument that has been presented is that the uncertain elements of the environment do not act in the same direction over strategic resources, competitive advantage and organizational performance [15]. Permanently sustain a competitive advantage; it is very difficult, particularly in an era of uncertainty, of the crisis and the impact of the Internet on consumer behavior and transaction capabilities.

About the economic industrial organization, the school of the dominant strategy until the 1980's was the Industrial Organization Economics (IOE) [16]. It is a field of economics that deals with the structure of markets, corporate behavior and social benefits and costs associated with the various forms of market structure and the behavior of the firm [17]. Income is determined by the structure of the industry in which the company operates and then success will be the result of an attractive position in the market.

A company with an attractive market position can exercise market power [18] and the monopoly profits [19]. Monopoly profits resulting from the deliberate restriction of production [8] so that the sustainability of earnings is closely linked to the structure of the industry, which changes relatively slowly. In order to gain market power over its rivals, competing companies can form cartels [20] or enter into agreements collusion, both could be considered as forms of cooperation between companies, within the framework OIE.

From the perspective of the OIE, the cooperation among businesses is the source of a more favorable position in the market and get power of relationships in the market. In sum, the OIE proposes that in order for companies to gain competitive advantage must seek positions in which they can harness the influence of monopoly power over other players in the market. While the competitive landscape has become much more dynamic substantially in recent decades.

The Theory of Resource-Based Company, talks about the company is a set of activities, the central tenet of the resource-based theory (RBT) is that a company is a set of idiosyncratic resources and capabilities [8,21]. Similarly [22], mentions that the resource-based theories have a theoretical framework that encompasses several broad currents of thought, which should suit the traditional theories, the theory based on knowledge (TBC) and the theory of

dynamic capabilities (TDC). The resource-based theory (RBT), describes the competitive advantage as follows: firms are heterogeneous with respect to resources and capabilities they have [9].

The competitive advantage of a company is based on the resources valuable, rare, imperfectly imitable and non-substitutable resources possessing the attributes of some of the factors of production, in this case, resources are more efficient thus are superior others and endowed with these resources companies are able to produce more economically to better meet customer needs and to obtain higher profits [23,24]. The remedies provided this approach are the company's assets, knowledge, skills, processes and attributes that enable the organization to develop and implement their strategies more effectively and efficiently [21].

The Relations Theory, this theory refers to the relationships between companies and also simultaneously be a source of advantage. Therefore, the unit of analysis is not resources or capabilities of the company are the relationships between the companies. [25] Identified four sources of competitive advantage of organizational relationships: 1) the specific ratio of assets; 2) complementary resources and capabilities, 3) routines for knowledge sharing, y 4) effective authority. The competitive advantage obtained through these sources, it can be argued with networks between companies that offer a lot of barriers to imitation, as interconnection organizational assets, the indivisibility of resources, and the institutional environment.

Relations theory draws attention to cooperation between companies as a source of competitive advantage by taking relationships between firms as the unit of analysis focuses exclusively on the level of relationship, which is its main difference from previous schools.

The knowledge variable, which decides a country's comparative advantage and competitive advantage, competitiveness, is knowledge, which refers to the ability to achieve sustained economic growth, based on the production, dissemination and application knowledge, innovation through knowledge and innovation [26]. Therefore, the competitive advantage of a country will inevitably be reflected in the advantage of knowledge. The expansion and complexity of knowledge on the dynamics of the competitive environment, have made it increasingly difficult for a single company and capitalize contain all relevant knowledge [27]. So that companies specialize and use business relationships and networking to complement their knowledge [28]. Learning should be reciprocal, where the goal is to develop new knowledge and innovation [29]. Knowledge "is a dynamic human process of justifying personal belief in search of the truth". States that the information is material means necessary to extract and build knowledge [30].

Companies can get knowledge by observing other companies and trying to learn from their experiences [31]. So, knowledge can be classified as a strategic resource, which should be actively managed if you will provide companies with a sustainable competitive advantage. Unlike other resources, the value increases with the persistence to share and exchange knowledge [32].

The innovation variable, technological changes and competitive pressures increase the need for businesses to adapt to improve and innovate [33]. Companies that generate most successful innovations will respond to changes in the environment and develop new skills for better performance [34].

The National Innovation Initiative in the United States (NII) defines innovation as "The intersection of invention and insight led to the creation of economic and social value" [35]. Innovation plays a crucial role in today's global competition and is the main source of competitiveness of a country. That is, it has become a major differentiator in the competitive race [36] and innovative companies have learned to sustain themselves for long periods of time. At the same time, one of the sources of innovation is knowledge, which is widely recognized as a strategic asset that enables companies to maintain distinctive competencies and uncover innovation opportunities [37].

Innovation is generated in an interactive process in which several specialists participate in the exchange, absorption and assimilation of knowledge shared on a social and physical context [38]. It is clear that organizations learn and create innovations through share and combine knowledge [39]. So that, sharing knowledge contributes to innovation because it creates collective knowledge and generates synergies charities, which improves the stock of knowledge available in the company [40].

Additionally, successful innovation requires a combination and association of recent knowledge and existing knowledge. Innovation is a social process where strategic choices are not simple as it involves the exercise of control of the communication of knowledge [41]. In such a way, that the knowledge gained will allow individuals time to respond to environmental demands with innovative new performance [42]. The literature mentions that the innovation strategy helps businesses in three ways: providing new jobs or experiences that stimulate customer, stay ahead of the competition in the market and enter new market segments or the creation of new businesses [43].

### **3. PROBLEM STATEMENT AND OBJECTIVES**

#### **3.1 Problem**

According [44], the avocado industry is characterized by poor organization, which is one of its main weaknesses and it is clear that some comparative advantages translated into competitive advantages of avocado producers and exporters have been emulated and sometimes improved by some producing countries and competitors in international markets avocado [45], for example, according to the industry producing avocado Israel and according to the information presented at the World Congress held in Viña del Mar, Chile on 13 November 2007, this producer has planned to achieve yields of around 20 tons per hectare in 2010 [46], while in Michoacan avocado producers just manage to pass the ten tons per hectare. Furthermore, when analyzed in detail the successful export performance of this product are discovered weaknesses against other foreign competitors, especially in the U.S. market, among which are most noticeable mainly in terms of technological development and modernization of production.

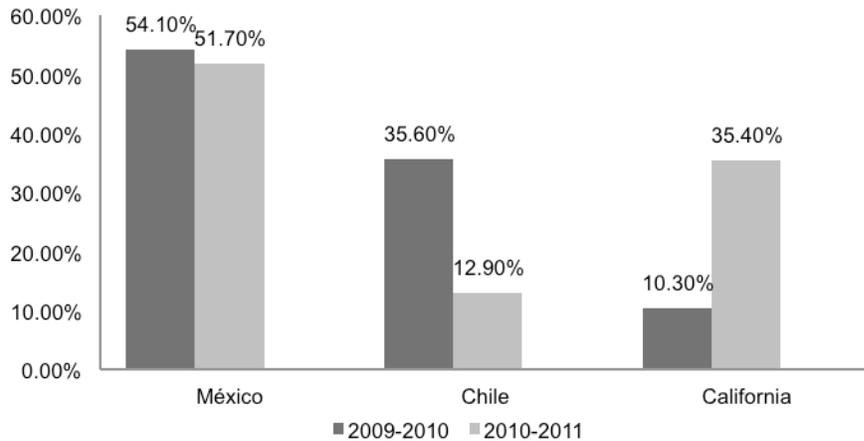
An example of this is the inspection conducted by the Department of Agriculture of the United States of America (USDA) certified avocado orchards for export located in Uruapan Michoacan. We found the presence of screwworm in 1800 hectares [47], representing violations of breach of safety standards governing good agricultural practices (GAP) agreed by both governments and what resulted that the same amount hectares are phased export program by viewers or inspectors from the Ministries of Agriculture of the United States and Mexico. This represents a decrease in the export of fruit and result in a reduction in foreign exchange earnings for the population. Another factor affecting exports Michoacan were

internal conflicts between producers and packers mainly due to the lack of agreement about the price of avocado and also by the change of administration in APEAM.

In the period 2009-2010 it had a 54.1% share of the market but for the 2010-2011 periods, the percentage was 51.7% share of Michoacan avocado exporters in the U.S. Market. Therefore, to the problem posed, are the results of the measurement of innovation and knowledge generated by operators of the avocado value chain (growers, producers, packers and transporters). It is noteworthy that for this purpose a questionnaire was applied to members of the chain, therefore, which were measured attitudes you have towards innovation and knowledge.

### 3.2 Research Objectives

According to members of the Association of Producers and Exporting Packers Michoacan Avocado, AC (APEAM) has detected increased competition in the U.S. market with the entry of competitors in this market as Peru, Colombia, New Zealand and Spain. Finally, in February of this year chemical residues were detected in the fruit disallowed sent for marketing in Japan and the United States. All of the above has affected the quality and quantity of export of this fruit. As shown by the latest reports. Similarly although avocado is exported to the U.S. market more in the 2010-2011 has lost market share in this market (Fig. 2). The objective of the research is to determine to what extent innovation and knowledge are the main variables that affect the competitive advantage of the links in the value chain avocado exporters located in Uruapan, Michoacan.



**Fig. 2. Market share of USA**

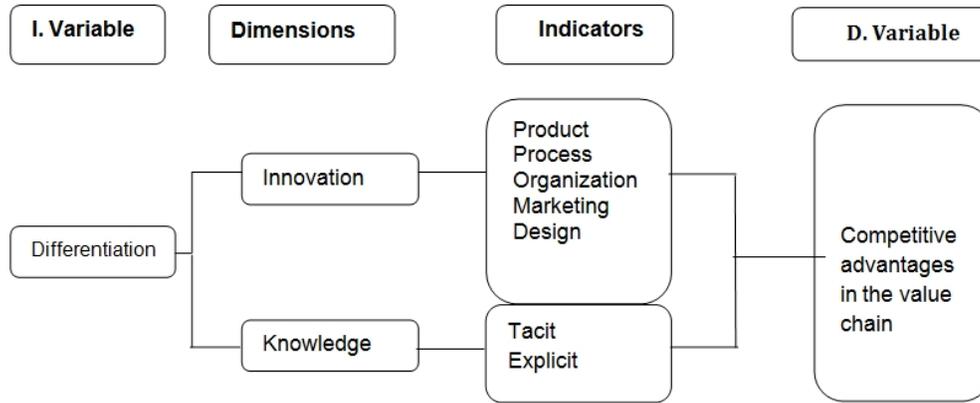
Source: IQOM business Intelligence <http://0-www.iqom.com.mx.millennium.itesm.mx/index>,

## 4. MATERIALS AND METHODS

### 4.1 Methods

The article is generated from scientific research and has a descriptive-correlational design because, describes the subject matter and because it determines the correlation of the independent variables with the dependent variable competitive advantages in the value chain of export companies located in Uruapan Michoacan avocado. The Fig. 3, shows the

model variables used in this research as well as the dimensions and indicators. The application of the questionnaire was conducted personally at four traders (growers, producers, packers and shippers) to obtain the information sought in this investigation.



**Fig. 3. Model variables**  
 Source: Compilation, based on fieldwork

#### 4.2 Hypothesis

Innovation and knowledge are the main variables that affect the competitive advantage of the links in the value chain avocado exporting companies located in Uruapan, Michoacan.

#### 4.3 Population

The study population consists of the links in the value chain, farmers, growers, packers and shippers, represented by the owners, managers, administrators or production manager avocado exporting companies located in Uruapan, Michoacan. Once identified the population representative sample was selected, which was established a confidence level of 95% and an error level of 5%.

#### 4.4 Sampling

There is a climate of insecurity in the region avocado, because of this distrust and barriers existed to implement measurement tools in order to study. So, the sample size was: Nurserymen 51, 354 Producers, Packers 29 and Transporters 8.

#### 4.5 Materiales

The measuring instrument used was the Likert Scale. Added a supplementary question to the questionnaire (Table 2).

**Table 2. Likert scale measuring**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	Important	-----
Lower	Low	Medium	High	Upper	Significant	-----
					Unimportant	-----

Source: Compilation, based on fieldwork

#### 4.6 Reliability

The following aspects of the development of the questionnaire are measuring the reliability and validity. A questionnaire is reliable when measured with the same precision gives the same results, in subsequent applications made in similar situations [48]. The reliability of the measurement instrument is 0.932, and measures of the reliability of the variables studied are: innovation and knowledge 0.942, 0.920 (Table 3).

**Table 3. Cronbach's Alpha**

	<b>Questionnaire applied</b>	<b>Innovation</b>	<b>Knowledge</b>
<b>Reability</b>	.962	.942	.920

Source: Compilation, based on fieldwork

The Table 3, shows the measurement of the reliability of the instrument was measured first and then individually independent variables innovation and knowledge, in order to know the level of reliability for each variable, these results show the internal consistency of questionnaire which according to a theory the results should always run instrument checks the reliability of each variable. The questionnaire consists of 159 questions and was applied to 120 companies. To measure innovation, this section consists of 27 questions and the knowledge dimension was 22 questions.

### 5. RESULTS AND DISCUSSION

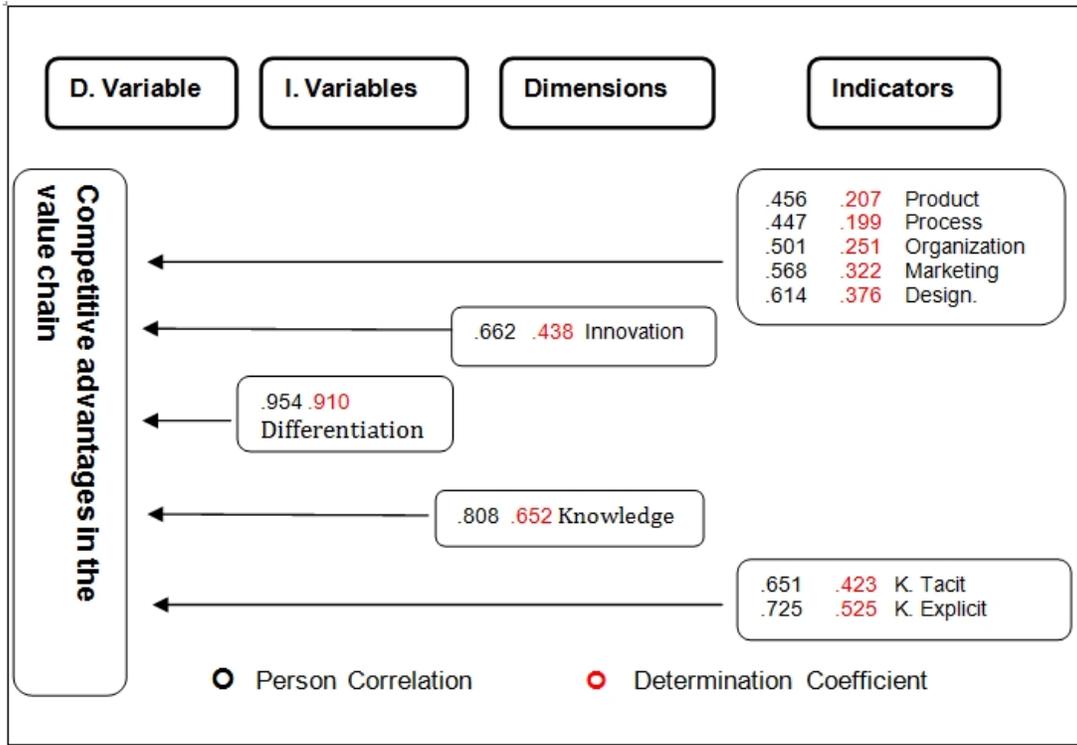
#### 5.1 Correlation Index

The Fig. 4 shows the Pearson Correlation Coefficient and determination of model variables. Moreover, the correlation indicators having the dimensions and the independent variable and the dependent variable and the coefficient of determination. While taking measurements, we see the origin of the results; this allows decisions with greater certainty.

This figure shows the measurement of the correlation and the coefficient of determination of the model used in this research, the relationship of the measures, dimensions and independent variable with the dependent variable in this way is determined more accurately than element has a closer relationship with the problem. The dependent variable to know this information decisions will more certainly because it has been determined in a particular way and results in general when only measures the relationship of the independent variable with the dependent variable.

The results of the indicators show a greater relationship with the dependent variable design innovation and marketing and explicit knowledge, which is inferred to have the most impact on the generation of competitive advantages in the value chain. Regarding dimensions, showing greater relationship with the dependent variable is the knowledge dimension 0.808

equally infers that this dimension is what greatly affects competitive advantage and ultimately the independent variable differentiation shows a result of 0.954.



**Fig. 4. Pearson Correlation Coefficient and Determination of Model Variables.**  
 Source: Compilation, based on fieldwork

## 5.2 Innovation Dimension Results

The questionnaire was administered to the four agents of the value chain, which aims to determine the attitude that companies have with regard to innovation and knowledge as a way to improve their competitiveness. Results are shown innovation questions in Fig. 4.

The innovation dimension is operationalized by indicators: innovation of products, services, marketing, organizational and design. Therefore, analyzing the collected information with respect to the sample innovation dimension having an average of 87.6, being located in the range corresponding to regular, however, with a trend toward high-range as shown in table 4, indicating that the overall level of innovation developed in all links of the value chain is relatively acceptable avocado.

**Table 4. Variable results innovation**

	1 Lower	2 Low	3 Medium	4 High	5 Upper
	27	48.6	70.2	91.8	113.4
			87.6		135

This scale is constructed by multiplying the total number of questions for the minimum range of the scale and the range of higher value.  $1 \times 27 = 27$   $5 \times 27 = 135$  then subtracts  $27 - 135 = 108$ ,  $108 / 5 = 21.6$  for setting the ranges, therefore, the scale starts with the minimum value is  $27 + 21.6 = 48.6$ ,  $48.6 + 21.6 = 70.2$  and so on up to 135. The result of this dimension is similar to the dimension of knowledge, however, the difference in the scale is determined by the total number of questions used to measure each dimension, it is for this reason that the scales are different in their ranks.

### 5.3 Knowledge Dimension Results

The analysis of the collected information to show that the average dimension of knowledge is 69.9 (Table 5) being located on the scale in the range of regulating, with a tendency toward high range. So, the knowledge used along the links of the avocado value chain shows a regular activity, which can be understood as a small chance to obtain a competitive advantage through this activity.

**Table 5. Variable results knowledge**

1	2	3	4	5
Lower	Low	Medium	High	Upper
22	39.6	57.2	74.8	92.4
		69.9		110

Source: Compilation, based on fieldwork

## 6. CONCLUSION

Organizations face massive competition avocado producing internal and external and compete for a better position in the market and to survive, employing known techniques, routines are time-honored customs based on experience. The decision making process is based on past experience that gives the work, trust and instinct. As regards the innovation, there is a substantial body of knowledge. Innovation and knowledge are considered in the current literature as the only source of sustained competitive advantage.

It is important that businesses in the avocado value chain understand that knowledge and innovation must be managed successfully, currently, these strategies are required to survive and compete.

It is clear that companies have different abilities to manage knowledge and create innovations, which are transformed in the delivery of benefits to customers. It is important that companies understand that when you innovate a product or service are required to have a clear understanding of what the customer wants and is interested and what you expect, so that they derive mutual benefit.

It is important that businesses in the avocado value chain understand that knowledge and innovation must be managed successfully, in these times in which these strategies are required to survive and compete. Activities aimed at the poor and sporadic innovation are therefore agents must consider these activities as priorities to be more competitive.

An important aspect that brings this research is that effect measurement of the independent variables, dependent, dimensions and indicators, this allows to know the origin of the investigated phenomenon results as measuring the impact of the indicators on the dimensions and those in the independent variables clearly shows their level of influence.

It is noteworthy that there is a strong relationship between knowledge and innovation generated, because the creation and sharing of knowledge are drivers of innovation in the organization.

As mentioned earlier, avocado exporting companies have comparative advantages based on natural resources where this fruit is grown, such as climate, terrain, water, wind are factors that allow in that region have up to two blooms per year, ie it has avocados all year, unlike other countries such as Chile and the United States has only avocado over a period of time per station. However, with the constant threat of new competitors on the international scene as well as national is necessary to continue the search for sustained competitive advantage.

If we analyze the natural resources of the strip avocado, some meet with some of the features that should have the resources to create a sustained competitive advantage, such as, valuable, rare, imperfectly imitable and non-substitutable resources it possesses. The double flowering each season is unique in the world, volcanic terrain, the weather, the huge amount of water, etc., they provide a competitive advantage to those producers. However you need to convert them into sustainable competitive advantage. Therefore, it is necessary to change the level of analysis to achieve the stated objective, which is to achieve a sustained competitive advantage.

Avocado quality depends on a lot of factors, but mainly those related to climate, soil and water. Then we can infer that most of the components of avocado come from these factors. Furthermore, natural resources avocado producing countries, competitors Michoacan producers are very different (Chile, Israel, California, Peru, Dominican Republic, etc.). Therefore, could produce different avocados to local in relation to certain components of the fruit.

Based on the above, it is proposed to conduct a study of the components of Michoacan avocado and compare with avocado grown in Chile, Israel and California.

If we start from the principle that the resources where they grow avocados are special, these resources may transmit any component in the physiology of avocado and also may have beneficial properties for human health or beauty etc. and obviously, the other fruits grown in other countries do not have. Therefore, by an advertising campaign that difference would be promoted, resulting in the establishment of a sustained competitive advantage for Michoacan avocado, which could never be imitated or matched, which are part of the features that the theory based on reference resources and under those conditions would promote the establishment of the designation of origin and also the creation of a distinctive mark, in order to make a real difference to others avocados from Mexico and other countries. Likewise, implement an advertising campaign in the United States which would revolve around Michoacan avocado differentiating factor.

The technical name of this proposal is a Bromatological study, in which components are determined at the molecular complex fruit and flavor qualities, fat level, color which are shaped by the weather. It is also necessary to emphasize that this comparative study could be replicated in a lot of fruit.

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## **COMPETING INTERESTS**

The authors have declared that no competing interests exist.

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