



**THE ROLE OF INNOVATION IN THE COMPETITIVENESS OF  
BRAZILIAN ORGANIC PRODUCTS**

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**ABSTRACT**

This research aimed at identifying the influence of the innovation in the competitiveness of organic agriculture and food industries in Brazil, seeking to create adhesion between a review of the literature and an empirical research about the strategies for innovation and competitiveness in the area. The trend in the globalized market indicates favorable prospects for organic food industries and, for this reason, they have realized the need for restructuration in order to meet the demands. The food industry has been searching for market differentials in order to add value to their products and make profit. As for the methodology, an exploratory research conducted with 54 managers of companies in the organic food sector, the result noted was that innovation had a positive influence over the competitiveness of organic products and that the research confirmed the theoretical base, showing that companies should focus on innovation in order to generate competitive advantages.

**Keywords:** Innovation, Competitiveness, Agribusiness, Organic Products.



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## 1. INTRODUCTION

The changes in consumer habits, created due to their needs and desires, result in transformations in companies of the food and drinks sector, which focus their management strategies to seek success (GUNDERSON; BOEHLJE; NEVES; SONKA, 2014). The development of this theme is motivated by the observation of changes in the feeding habits of the population and growing concerns regarding the health of Brazilians. Thus, the population developed a strong tendency to consume natural products, without preservatives or agrottoxins, in order to improve the quality of their lives.

Considering the rooting of this new culture in Brazil, the market for organic agribusiness tends to grow according to this new demand and prosper as time passes (I-UMA, 2013). Therefore, organic agribusinesses need to offer differentials that add quality to the lives of these demanding consumers. This study aims at showing that innovation may become an excellent strategy in order to achieve competitive advantage over the other businesses in the sector.

Agribusinesses need to understand the preferences of these consumers and the impacts of this tendency for health and sustainability over the shopping behaviors and decisions.

The organic agribusiness market is inside a very competitive environment given that the characteristics of this sector are the same for all agribusinesses, such as exemption in the purchase of fertilizers or agrottoxins and the need of proper certification (GUNDERSON; BOEHLJE; NEVES; SONKA, 2014).

The survival of a business is the result of proper strategic planning for the competitive reality of the segment. The most important point for a competitive strategic planning is seeking a position in which the competitive strengths of the business act in its favor or finding a better defense alternative (PORTER, 1980).

The organics market grows significantly since 2012 and this is due to a Law 10.831 of December 23, 2003 regulated by Decree-Law 6.323 of December 27, 2007 governing the production and marketing of organics products in Brazil. Investments in the segment and the creation of innovative products following the population trends



also help increase the expected growth of the segment for the next few years, with an expected turnover of 2 billion BRL (I-UMA, 2013).

In the complex agribusiness segment, innovation has become important for the Brazilian economy as it affects competitiveness in all segments. This innovation standard is a characteristic of this particular segment, presenting a positive effect and adding value to the product (FURTADO, 2004). Therefore, this study focused on the following question: how much influence does innovation has over competitiveness in the Brazilian organic agribusiness segment? Considering this scenario, this study aimed at answering this question.

The study is justified by the fact that the segment of organic products is based on the respect for the environment, discouraging the use of agrotoxins (GIL; GRACIA; SANCHEZ, 2000). Another point that justifies this study is the fact that 8% of the Brazilian organic products are destined for the internal market while 92% is destined to exportation. The United States represents the world's largest market for products such as soy, coffee, sugar, cashew nuts, concentrated orange and tangerine juice, palm oil, urucum oil, babaçu oil, honey, fruit jam, powdered guaraná and rice (BUAINAIN; BATALHA, 2007; MADAIL; BERLARMINO; BINI, 2011).

Taking this into account, we established the hypothesis to be tested: H1 – Innovation has a positive effect over the competitiveness of companies in the Brazilian organic agribusiness segment.

This study has been structured in six sections. After this introduction, we conduct a review of the literature about corporate innovation and competitive strategies. Then, we present the methodology and analyze the results. Finally, we explain the discussion and conclusions drawn from the study and suggest future studies in the field of organic agribusiness.

## **2. LITERATURE REVIEW**

The existing literature was reviewed, focusing on concepts and studies conducted on the subject of this study.

### **2.1. Corporate Innovation**

According to Schumpeter (1934), economic development is a process spontaneously initiated in a discontinued manner, spontaneously generating the



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requirements for new developments. Therefore, he emphasizes the importance of large organizations as the mainstay in for economic development through the gathering of creativity, the gathering of non-transferable knowledge and mainly the capacity for innovation. However, Tidd, Bessant and Pavitt (1997) state that innovation enable changes through new ideas in the configuration of products or services so that these may be offered in a competitive environment.

Miranda and Figueiredo (2010) define innovation as process rather than isolated events. It is the implementation and combination of creative ideas inside an organization aimed at offering improvements and advances in the internal and external markets. Organic agribusinesses, aiming at better positions inside the market, engage in a creativity and innovation battle focused on understanding consumers and their tendencies. Adjusting the innovation processes to the new demands represents a great challenge for the segment (COTI-ZELATI; BATAGLIA, 2012).

Corporate innovation has a positive impact on the company's performance just as a focus on corporate marketing has a positive impact on innovations. The authors also noted that corporate learning has a positive influence on the innovation process, directly influencing results. They also emphasize that corporate learning has a greater impact on innovation than a focus on marketing and that both are requirements for the innovation process to happen (JIMÉNEZ-JIMENEZ; VALLE; HERNANDEZ-ESPALLARDO, 2008).

Also according to Jiménez-Jimenez, Valle and Hernandez-Espallardo (2008) innovation is classified in two ways by the doctrine: technical innovation and management innovation. This latter relates to the new procedures, policies and forms of organizations. Innovation technique, in turn, relates to the development of new products and / or services, introduction of these new products to market and to adopt new production methods, distribution and services.

The growth of the agribusiness segment demands constant actions to implement technologies, creates national innovation systems, creates efficient connections to exchange scientific information focused on production and conduct research spreading scientific knowledge on biochemical and physiological processes in the soil and in plantations (GONCHARAOV; RAU, 2009). However, data suggests



that the investment of Brazilian businesses in innovation is focused in tangible assets such as machinery and equipment, with only a small number of businesses dealing with research and developing a relationship with universities (CASSIOLATO, 2004).

According to Goncharov and Rau (2009), the innovation process encompasses the following factors: investment in technology through R&D projects; machinery & equipment; new technologies, including patenting rights, licensing rights and acquiring software; improvement of the production; custom training projects; marketing researches and other types of investment.

According to Cassiolato (2004), indicators for corporate innovation are related to borders (technological agreements between companies, states and countries), knowledge base (co-patenting and co-publishing), R&D infrastructure (software development, training, engineering projects, consulting, provision of inputs) and innovation characteristics in businesses (exchange of information with clients, interaction with suppliers and competitors, participation in public R&D projects, association with unions and similar organizations, participation in courses and seminars).

In the same line, Coti-Zelati and Bataglia (2012) have shown that the following factors influence the process of corporate innovation: R&D, spreading of knowledge, creation of innovative products, creation of R&D department, changes in the presentation of products, analysis of competition, software upgrades, introduction of new products in the market, new internal processes, participation in training, updating manuals, innovations in the management system and investment in processes.

On the other hand, the high level of opportunities, the moderate degree of suitability of new technologies and the time spent with their adaptation increase instability and promote the entrance of new innovative companies (RÉVILLION; PADULA; FEDERIZZI; MARTINELLI JR.; MANGEMATIN, 2004; GUEVARA, 2008). Therefore, businesses focused on knowledge are characterized by the introduction of radical innovations and products with a short lifespan, competing for highly competitive markets with potential for growth. Considering the pace of this technological race, decision makers are challenged to adopt strategic stances that develop new technologies and create marketing opportunities for their products (BIGNETTI, 2002).



## 2.2. Competitive Strategy

According to Aaker (1991), macro strategies encompass strategies of several company departments, such as positioning strategies, pricing, distribution and competition strategies. However, focusing on how to compete is not the only way to be successful and obtain competitive advantages. There are three key factors for the creation of a competitive advantage: i) the competition base should be supported by a collection of assets and capabilities as the advantage cannot be maintained without such support; ii) choosing the wrong target-market for the product or service may result in failure when the strategy is created based on assets and capabilities due to it not working in the chosen market; iii) the company should know its competitors and assess whether they are relatively weak or strong in terms of assets and capabilities (PORTER, 1980).

Competitiveness is the desired result, obtained most of the time through internal efforts, while innovation is subordinated to corporate strategies. Case studies point towards a larger link between strategy and innovation, with technology showing great influence over strategic decisions (BIGNETTI, 2002). According to Porter (1980), competitive strategy may be defined as a collection of assertive actions taken to create a favorable position inside a given company, successfully facing competition and, therefore, providing a larger turnover for the investment. Under this light, strategies should be carried out carefully, using all available resources to identify threats and make the most of opportunities in a market segment.

Still according to Porter (1980), competitive advantage emerges from the several tasks conducted by the business, from planning to implementation. Therefore, these tasks as whole allow represent the foundation for creating uniqueness, such as acquiring raw-materials at lower prices or attending to consumer needs more efficiently. As such, understanding how these tasks are conducted and how they are interrelated is crucial to understand the sources of competitive advantages for the business (AAKER, 1991; PORTER, 1996). Under this light, Porter (1980) defines three types of competitive advantages: i) cost leadership; ii) uniqueness; iii) focus.

According to Barney and Hesterly (2012), strategic managing begins with the definition of the company mission, when it defines its goals, what may be analyzed in



the company's internal and external environments and the practices allowed for attaining competitive advantage.

Competitive strategy plays a key role in the success of a business. As such, it is used by companies in their process of facing competition, occupying a privileged position in the creation of the economic discourse. Strategic success depends on the business' ability to recognize its current conjuncture, identify and neutralize threats or act on the opportunities provided. Competitive advantage is merely the ability to generate a larger economic value.

In the scope of agribusinesses, competitiveness is a result of the entire process of strategic managing and the realization of a possible competitive advantage. A business with a greater ability to generate economic value than its competitors attains a competitive advantage in its market (BARNEY; HESTERLY, 2012). That said, competitive advantage is born from pressure, challenge and adversity, which are power motives for change and innovation. In the scope of international competition, however, success is a direct result from the ability to innovate and maintain competitive advantage for decades under the light of external change.

Innovation in the production process and technical investment and innovation, as well as marketing methods, are important factors identified within competitive methods adopted by businesses (MORAES; ZILBER, 2004). One may say that the business becomes competitive when it seeks strategies that add value to the business, strengthening or creating competitiveness. According to Porter (1996), innovation processes in a business may significantly affect the behavior of that market segment, positively affect the business in the market and affect the battle for resources.

### **3. Methodology**

In this section the methodological procedures were presented.

#### **3.1. Method and Nature of the Study**

This study employs a quantitative approach and is exploratory. In what regards exploratory research, the main goal is providing a general view of a given fact and formulate more precise problems or hypotheses to be explored in later





studies (BLAIKIE, 2009). This study employs a cross-sectional research, collecting data from a single point inside a given period of time (PINSONNEAULT; KRAEMER, 1993).

### **3.2. Data Collection and Research Subject**

Data collection was conducted in a single point in time from April 2014 to May 2014. The study encompassed the organic agribusiness segment in the main production centers. A questionnaire was sent by internet with multiple-choice questions adopting the Likert scale regarding competitive strategies for companies in the segment.

The questionnaire was created based on Moraes and Zilber (2004), who identified the following dimensions for competitiveness: 1. cost leadership strategies; 2. differentiation strategies and 3. focus strategy. It was also based on Coti-Zelati and Bataglia (2012), who set dimensions for variables involved in the process of innovation basing themselves on Jiménez-Jimenez, Valle and Hernandez-Espallardo (2008): 1. production innovation; 2. process innovation; 3. management innovation.

### **3.3. Population and Samples**

This study obtained a sample of 54 respondents distributed in 10 segments of organic agribusiness. All of them are managers in their respective organizations. In order to account for the size of the organizations, 50% of the samples were obtained from organizations with 500 to 1,000 employees, 30% from organizations with 1,000 to 10,000 employees, 15% from organizations with 50 to 100 employees, 3% from companies with 101 to 500 employees and 2% from companies with more than 10,000 employees.

The average times respondents have been in the organic agribusiness segment is 8 years and the average time respondents have been employed by their respective companies is 4 years.





Table 1: Distribution of respondents per segment.

SEGMENT	SAMPLES	FREQ. (%)
Sugar & Alcohol	10	18,52
Meat	3	5,55
Pasta	5	9,25
Vegetables	4	7,41
Coffee	6	11,11
Basic Food	9	16,66
Milk	5	9,25
Grains	6	11,11
Bread	4	7,41
Sweets and Jams	2	3,73
<b>TOTAL</b>	<b>54</b>	<b>100</b>

### 3.4. Data Treatment

After obtained, the data was processed in the Smart PLS 2.0 M3 software to assess the results.

In order to validate the proposed measurement model, we used factor loading indexes, AVE, Cronbach Alpha and composite reliability. In order to validate the structural adjustment model, we used a correlation coefficient (R2) and the significance between variables.

In addition to these results, we also employed descriptive analysis techniques aiming at finding a relation between the theoretical references and the empirical study.

### 3.5. Measurement Model

According to the theoretical foundation and to the results of the described study, we established the hypothesis to be tested: H1 – Innovation has a positive effect over the competitiveness of companies in the Brazilian organic agribusiness segment.

Considering the articles analyzed, this study was based on the structural model shown in Figure 1.

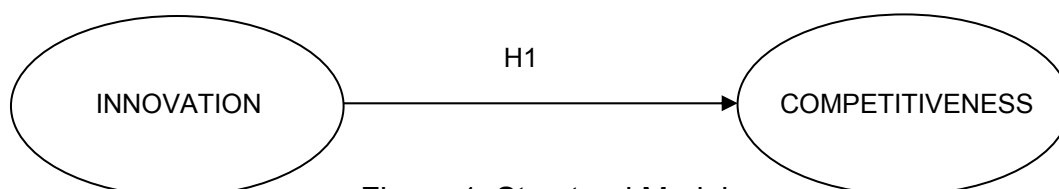


Figure 1: Structural Model.

The study employed a descriptive research of quantitative nature. In accordance with Vergara (2010), quantitative research is employed in studies seeking to compare the relationship between variables.



#### 4. RESULTS

In order to validate the proposed measurement model, we used factor loading indexes, AVE, Cronbach Alpha and composite reliability. In order to validate the structural adjustment model, we used a correlation coefficient ( $R^2$ ) and the significance between variables.

**Factor Loading** is the correlation between the original variables and the factors (HAIR JR.; BLACK; BABIN; ANDERSON, 2010). Data analysis considers that close values and values over 0,5 are significant while values over 0,41 suggest moderate association, as proposed by Hair Jr., Black, Babin and Anderson (2010).

Table 2 presents the final values regarding the factor loadings obtained.

Table 2: Factor Loading.

STATEMENT	COMPETITIVENESS
1. Our company conducts strategic planning.	0,576
2. The company analyzes more than two action alternatives in strategic decisions.	0,498
3. Our company creates partnerships and/or alliances with suppliers to develop new products or Technologies.	0,675
4. Our company keeps clients that contribute towards the development of new products or technologies.	0,522
5. Our company always tries to improve new technologies and products.	0,589
6. The increase of sales was satisfactory last year.	0,678
7. The productive ability of the company increased significantly last year.	0,712
8. We know how to identify opportunities through the weaknesses of our competitors.	0,492
9. Identified opportunities resulted in competitive advantages to the company.	0,547
10. The number of competitors entering in the organic agribusiness segment is rising in Brazil.	0,655
11. Other companies also make the products our company makes	0,661
12. New products threaten the sales of our company significantly, affecting our final results.	0,701
13. Over 50% of our sales correspond to clients who buy from us for over 2 years.	0,645
14. Our clients increasingly demand new products.	0,871
15. Our company procures its main components from more than three suppliers.	0,890
16. Our company quickly adopts new technologies available in the market.	0,805
	<b>CORPORATE INNOVATION</b>
17. Our company quickly restructures its internal resources due to threats to our sales.	0,965
18. Our company has introduced more new products than our competitors have.	0,887



19. Our company is a pioneer in the introduction of new products.	0,798
20. Efforts towards innovation are divided between teams and during training.	0,873
21. The number of changes in the innovation process of our company has been larger than our competitors' number.	0,770
22. Our company has fast responses when our competition presents new processes.	0,726
23. Our company has sought more innovations in the management system than our competitors.	0,914
24. Our company invests in new management systems.	0,901
25. Our company is a pioneer in the introduction of new management systems.	0,769

**Cronbach Alpha** assesses the consistency of the entire scale, referring to a reliability value that determines 0,7 as the acceptance index (HAIR JR.; BLACK; BABIN; ANDERSON, 2010). The values in Table 3 have shown satisfactory values for Cronbach Alpha, with all dimensions presenting values over 0,7 for the competitiveness factor and over 0,8 for corporate innovation, suggesting high reliability for the results presented, according Hair Jr., Black, Babin and Anderson (2010).

Table 3: Cronbach Alpha.

DIMENSION	CRONBACH ALPHA
Cost Leadership Strategy	0,7231
Differentiation Strategy	0,8421
Focus Strategy	0,7132
Product Innovation	0,8964
Process Innovation	0,8371
Management Innovation	0,8106

**AVE** should be higher or equal to 0,5 to be considered acceptable (HAIR JR.; BLACK; BABIN; ANDERSON, 2010). According to the results shown in Table 4, the values were satisfactory for competitiveness and innovation.

Composite reliability, according to Hair Jr., Black, Babin and Anderson (2010), should be above 0,5 to be considered acceptable.

According to Table 4, the values for composite reliability for competitiveness and innovation are above 0,8, confirming a high reliability.

Table 4: AVE and Composite Reability.

DIMENSION	AVE	COMPOSITE RELIABILITY
Cost Leadership Strategy	0,6168	0,8892
Differentiation Strategy	0,5720	0,8451
Focus Strategy	0,7622	0,8949
Product Innovation	0,8833	0,9129
Process Innovation	0,7897	0,9155
Management Innovation	0,8613	0,9044



Figure 2 continues the analysis of the measurement and structural models. R<sup>2</sup> refers to the percentage of the independent variable in relation to the dependent variable and the value should be at least 25% (HAIR JR.; BLACK; BABIN; ANDERSON, 2010).

The R<sup>2</sup> value obtained for the innovation and competitiveness variables was 0,54, as shown in Figure 2. The corporate innovation variable explains 54% if the competitiveness variable for the organic agribusiness segment.

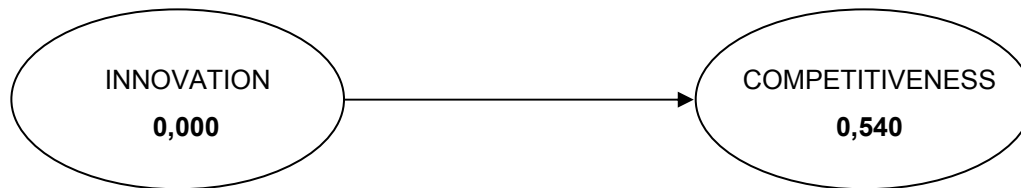


Figure 2: Structural Model (R<sup>2</sup>).

According to Hair Jr., Black, Babin and Anderson (2010), in order to significance to exist, the value of t should higher or equal to 1,96 or the value of p should be lower than 0.05. Figure 3 shows that the value for the relation between innovation and competitiveness for this study has shown to be significant, as the value of t is 36,831 (p=0).

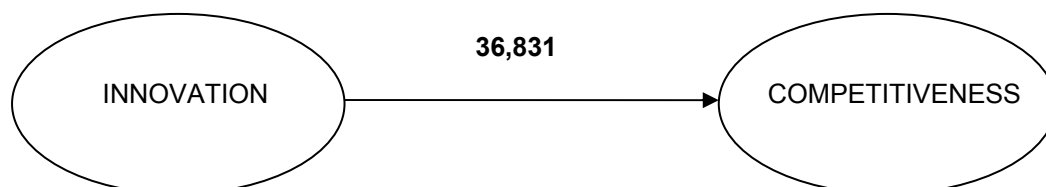


Figure 3: Structural Model (Significance).

## 5. DISCUSSION

The results show a relation of 54% and a positive significance (t = 36,831) between the corporate innovation construct and competitiveness in the organic agribusiness segment. The innovation process of a company, either in terms of products or in terms of process, creates a barrier for the entrance of new competitors, resulting in a better positioning of the organization in its Market (PORTER, 1996).

As pointed by this study, innovation plays a significant role in competitiveness between companies in the organic agribusiness segment. If the companies consider the innovation process as a priority and observe global tendencies pointing towards



the growth of the segment for the next years, they will enjoy a competitive advantage over competitors.

## 6. CONCLUSIONS

This study tried to contribute to organic agribusiness identifying whether innovation positively influences the segments competitive strategies. For the reason, we conducted a quantitative research with 54 professionals working directly with the segment.

After analyzing the data and the results, we could confirm a positive influence of the corporate innovation construct over competitiveness in the organic agribusiness segment. Therefore, the H1 hypothesis has been confirmed. The advantage attained by the organization when allocating resources to innovation is the front door for a valuable position in the market.

The relationship evidenced by this study shows that, aside from the positive influence, innovation is also responsible for a large part of the market repositioning for companies that desire to attain market leadership in the segment. Therefore, the study enables managers to reassess their strategic planning and change the focus of their competitive strategies towards investment in innovation.

As described, factors such as the insertion of new products or processes, new marketing strategies, new management models, training, new management software, new technologies, among others, are considered innovation. The study provides an area of discussion and a theme for new researches regarding innovation in competitive strategies and general knowledge regarding the segment.

As the study adopted a descriptive approach, it considered sample interference as a limitation of the research method. The questionnaire was sent to the managers of the chosen organizations under the assumption that answers would be given by them themselves. Ultimately, there may be a number of respondents below the requirement for publishing academic studies. Despite the limitations described, the study has proved to be true and reliable regarding the result. That is to say, the interpretation of data was conducted based on the hypothesis found in the theoretical references.



For the continuation of this line of research, we suggest: i) identifying the influence of imitation in the process of the segment; ii) confirm in which specific industry of corporate innovation is more frequent; iii) collecting longitudinal data so as to identify whether the opinion is managers regarding the influence of innovation over competitiveness in the segment can change over time.

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