

Evaluation of Risk and Return in the Added Value of Strawberry in Jelly Compared With Strawberry in Natura

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Summary: *The objective of this study was to identify the expectations of return and perceived risks in strawberry production, comparing the sale of the fruit and its transformation into jelly in the city of Mafra-SC, Brazil. It is an applied research as to its nature; Descriptive and explanatory about its objective and of case study regarding the marketing strategy. For the realization of the research, the initial investment, the costs of production and the sale price were raised. From this information, we estimate the profitability and risk perception indicators inherent to the business, with a capacity to process approximately 8,000 kilos / ha. The information and data collected were structured into a projected cash flow in the respective timeframes, from a TAM of 0.79% a.m. The Multiple Index Methodology was used to analyze the return and the risks involved. The confirmation of the values uses Monte Carlo simulation through the Crystal Ball software, being considered as uncertain variables, or input variables for the simulation, the quantity from 1 / hectare to 12 months and the transformation costs in the case of jelly, and The respective sales prices of each situation. The main contribution of this study is the multidimensional analysis of the risks associated with the two types of investment.*

Keywords: *Return and Risks. Strawberry. Multi-index methodology.*

I. INTRODUCTION

Agriculture had its origins already in the first civilizations, where what was planted was only for the own consumption, but with the passage of the years the barter appears and arrives today to what is called commerce, the act of the exchange of products by currency. With the evolution of technology agriculture also had great development. Currently the use of hoes and horses is rare to be seen, being replaced by tractors and pesticides. Together with the transformations agribusiness presents itself as one of the sources of wealth in Brazil, moving the economy of many regions such as the Planalto Norte Catarinense, regardless of the size of crops. The region has a mild climate, allowing the cultivation of several crops, such as strawberry. With the encouragement of cooperatives, plantations have cropped up in several properties, where in many of these are the women who run the crop. In some cases after the harvest the culture goes through a process of industrialization, where in this case stands the strawberry in natura and its transformation into the jelly. The strawberry is a fruit of European origin, in Brazil its production is more significant between June and December, or, and can be cultivated throughout the year in greenhouses.

The accomplishment of the article addressing the risk and return with respect to the strawberry is of paramount importance for people who want to invest in this fruit, for the need to know how the production and commercialization of the strawberry takes place, serving as the base for the aid in all the stages, In making decisions and in the first steps to risk a new investment as such. The main objective of this study is to analyze the commercialization of strawberry, in-natura or jelly, based on the analysis of production costs and expectation of return and risk added to the two products, highlighting the most feasible. The analysis was applied through the Multi-Index methodology of the two sets of indicators, the first being formed by NPV, VPLa, IBC and ROIA, to evaluate the perception of the return of the activity; The second set includes the IRR, TIR / TMA Index, Pay-Back / N Index, Risk Management and Business Risk, aiming to improve risk perception; With application of the Crystal Ball software simulator.

This article was divided in five sections, this being the first, a brief contextualization. The second presents important facts of the theoretical reference on strawberry production activity, and the sets of indicators associated to the work developed. The third section describes the methodological procedures used in the elaboration of this research. In section four, the calculations and analyzes are demonstrated, however, the fifth section presents the appropriate conclusions and suggestions for other studies.

II. THEORETICAL FOUNDATION

Strawberry production has evolved significantly, combining technology and work, in family agriculture. To do so, in all procedures a planning is carried out, and in this the aid tools are used, such as the cost management and evaluation of investment projects, which employs the multi-index methodology, which allows raising expectations of return and Risk for this venture. Thus, strawberry production, agricultural costs and multi-index methodology were collected in the literature, as described below.

2.1 Agribusiness And Accounting

Brazilian society as a whole has benefited in many ways from the performance that agribusiness has been presenting in the country. This sector has taken on a large proportion since the process changed, where it is not limited only in agriculture and livestock, to reach suppliers and consumers.

With the improvement that life in the field has been offering, the evolutions in the procedures of agricultural activities, besides the climate and the soil favored for a good region for the planting, the opportunities of growth follow all the evolutions and bring many benefits for those who already invests In this area, or are interested in starting. The growth of the plantation must be well structured, so as not to harm the environment and guarantee programmed crops, with pest control and high productivity.

In order to better understand the agribusiness system, it is divided into three production chains: "before the gate", "inside the gate" and "after the gate". As it defines in a general concept of Araújo (2007): The conception of agroindustrial systems or productive chains, of value chains, visualizes agribusiness in an integrated and interrelated way between the various agents that compose it, as well as the activities carried out among them. Links that are not limited only between producer and consumer, but other market divisions, essences for the development of agribusiness The following table shows the segments to which each branch participates in the process:

Table 1 - Branches in the Process.

Before the Door	Suppliers of inputs, services and machinery; Research institutions, financing agencies and government agencies.
Inside the door	Agricultural activity: from the beginning of production to the destination to the consumer or industrialization. In some cases industrialization occurs within the property.
Post-Gate	Logistics, sale or industrialization of products

Source: Santos, Santos e Catapan (2017, Adapted).

Agribusiness highlighted the agricultural activity and made it fundamental in the Brazilian economic scenario, covering new areas with good business strategies, taking into consideration that the country has a favorable climate for agriculture. The agricultural activity is divided in two crops, the temporary ones that are extinguished with the harvest needing a new planting and the permanent ones, that have been superior for a year, and that with a single planting it is possible more of a harvest needing only of tracts in the Intervals. Because it is a seasonal crop, the agricultural year that includes the period that plants and harvests and usually markets the crop. Some companies store the product for a better price, in which case the agricultural year ends in the harvest according to Marion (2014). In many properties, different types of crops are cultivated at different times of the year, with the intention of making better use of the planting areas. In this case, the crop year is the crop with the highest economic participation.

In agricultural activity, both physical and legal persons are found, prevailing in physics for the sake of being less onerous, especially in small properties. According to Marion (2014), individuals considered as small and medium producers do not need to do regular bookkeeping in accounting books, they can only use cashier's books with simplified bookkeeping for tax purposes. While those denominated as large producers, even as individuals, will be treated as legal entity for accounting purposes, and must do the bookkeeping through an accounting professional. The rural producer can also be considered as an entrepreneur, as defined by Article 966 of the Brazilian Commercial Code: "An entrepreneur is considered to be a person who professionally carries out economic activity organized for the production or circulation of goods or services". In order to be defined as a rural entrepreneur, the producer must register in the commercial board, otherwise the registration will be an autonomous rural producer. Rural accounting arose from the need to control the assets, helping the producer to better manage his business, planning and controlling his expenses, verifying the profitability of the production and applying a market analysis. For this, rural accounting provides tools and information that will contribute to decision making in rural enterprises. They are characterized as rural enterprises "those that exploit the productive capacity of the soil, through cultivation of land, cattle raising and the transformation of a given product" (MARION, 2014, p.2). Rural accounting arose from the need to control the assets, helping the

producer to better manage his business, planning and controlling his expenses, verifying the profitability of the production and applying a market analysis. With this, rural accounting provides tools and information that will contribute to decision making in rural enterprises. For effective planning and cost control, it is necessary to identify the differences between cost and expense so that they are applied correctly in controls. Knowledge of costs at any time is an essential information, not only to determine the profitability after the sale, but also, more importantly, to determine the optimum selling point (MARION, 2014). When allocating information as effectively as possible, you must correctly classify cost expenses. Expenses are those that are not identifiable with the crop as sales, administrative or financial expenses. Costs according to Marion (2014): All costs directly or indirectly identifiable with the crop (product), such as seeds, fertilizers, labor (directly or indirectly) fuel, depreciation and equipment used in the crop, agronomic and topographic services, etc. are considered as costs of cultivation. In the strawberry crop the following costs are presented: labor, acquisition of seedlings, materials for the preparation of the beds, fertilizers and fertilizers and other products for the preparation and commercialization of the products.

2.2 Strawberry

The name strawberry derives from the Latin "moru" which means mulberry, scientific name *Fragaria*. According to Rocha (2013), in the beginning the strawberry was just a fruit that was born between the mountains of Europe. Its cultivation became popular in the 18th century, when a new species emerged, which facilitated its planting, a hybrid that is cultivated to date, the species *Fragaria ananassa*, the result of the casual crossing of two other species of strawberry, this caused it to wake up great. Where they had the initiative to develop new species and new methods of cultivation. The strawberry is a fruit of the rosacea family, same as cherries. The part that is used for consumption is not the fruit itself, but the result of the swelling of the stalks of the plant. The true fruit is yellow seed that gets embedded in the fleshy surface, called achenes. It is rich in vitamins, so much that in the Roman era it was valued for its therapeutic properties, practically used for all kinds of diseases and also very used by the cooking in the preparation of pies, cakes, jellies and sweets, besides being consumed in-natura. In the country, the strawberry arrived in the 1930s, brought by the Italian settlers, in the city of Jundiá, in the interior of São Paulo. The Japanese also began to cultivate the fruit still in an imperfect way, but the productivity of this time was not more than 300 grams per square meter.

It began to be cultivated in several regions with varied soils and climates, from the 60's, where the crop expanded. Currently it is possible to obtain a production of up to seven kilos per square meter. In Santa Catarina the strawberry develops very well, due to the milder climate. The cultivation is encouraged by cooperatives, where the producers seek the necessary inputs for planting and resale the product. It is worth mentioning the city of Rancho Queimado, region of the great Florianópolis, that conquered the title of Santa Catarina capital of the strawberry. For Besen, estimates that the municipality produces almost half of the strawberry production of SC, that the cultivation in the city reaches 2 thousand tons per year. (Apud CANAL DO PRODUCER, 2012). Strawberry varieties are divided into two groups: for industry and for in-natura consumption. For the industry we have the following species: Santa Clara, Burlkey and Dover, they have acid flavor, high productivity with early cycle, medium to large fruits (SANTOS, 2005).

For in-natura consumption, the following stand out: Tangi, Campinas, Osogrande, Tudla, Selva and Seascape, characterized by the production of large fruits and good flavor (SANTOS, 2005). The Vila Nova species has dual purposes, both for in-natura consumption and for industrialization. With early cycle and high productivity, it has subacid flavor, intense aroma, pulp of medium texture and red color (SANTOS, 2005).

The strawberry adapts better in the mild or cool climate, but can be grown in warm regions as well, but influences the taste of the strawberry, in regions with higher climates, the fruits tend to be less tasty in high acidity, Sweet, firm and with accented aromas are characteristic regions with temperate climate. In regions that are not cold in the winter, the seedlings should be placed in a refrigerated environment at approximately 4° C for 15 to 20 days, before being planted in the nursery. With regard to flowerbeds, they should be protected, as frost and hail can damage the fruit, especially the immature ones that are not yet protected by the leaves. The heat is important and helps for vegetative growth, while the cold helps for fruiting, the number of hours of day with light also influence on productivity. For strawberry cultivation, besides the pertinent care of the agricultural activity, it is also necessary to follow some steps, starting from the soil until the harvest. The following steps are demonstrated:

a) Soil: it is necessary that the site chosen for planting be well drained, fertile and rich in organic matter taking into account soil ph as Santos says (2005): The pH level of the soil, which seems to be the most appropriate For the strawberry crop, is one that varies from high to medium (pH in water, from 5.0 to 6.0, pH in CaCl₂, from 4.4 to 5.4).

b) Beds: after the soil must be plowed with a depth of 20 to 25 cm, the beds are raised, more bulging on the sides for the water flow, after the irrigation of the beds, mark the pits with a manual marker, Usually 30 cm by 30 cm.

c) Seedlings: at the end of the preparation of the soil the producer can choose to produce his own seedlings or buy them in establishments specialized in the production of these or the option to produce through seeds.

The seedlings are stolons, a kind of creeping stem, that the strawberry itself loosens a kind of branch, which is transplanted giving rise to a new plant. The following figure shows an estolho ready to be transplanted

Figure 1 - Strawberry seedlings - stolons



Source:Galhos & Bugalhos (2011)

In the present study the producer acquires the seedlings through a cooperative of producers of the city.

d) Preparation of the bed: The beds are like a cradle for the strawberries, because that is where they will be produced. The soil chosen for planting must be well drained, fertile and rich in organic matter and also taking into account soil pH as Santos (2005) says: The pH level of the soil, which seems to be the most suitable for the cultivation of Strawberry, is one that varies from high to medium (pH in water, from 5.0 to 6.0, pH in CaCl₂, from 4.4 to 5.4). After choosing the site, it should be plowed with a depth of 20 to 25 cm, raising the beds, more bulging on the sides for the water flow. After irrigation of the beds, the pits should be marked with a manual marker, usually 30 cm by 30 cm.

e) Preparation of tunnel and plastic film: the cultivation of strawberry in protected tunnels is a more frequent practice, it is rare to see a strawberry or vegetable plantation that is not used, this protection can be said. Antunes and Duarte Filho (2005) highlight the importance of this technique: "A plastic film has a high efficiency and a high quality of the plastic film. The use of a technique called Mulching is applied after the planting of the stolons, where a plastic film is placed over the beds. Induction of resistance and control of fungal development; It may have, in addition to such a doubly protective action, an important component for the ecological management program of integrated disease control. " So the fruits do not come into contact with the soil. The following figure shows the strawberry with protected tunnel and also with the Mulching already placed.

Figure 2 - Mulch Protected Strawberry



Source Authors (2017)

The following chart shows all the processes of a strawberry plantation:

Table 2 - Strawberry planting

Planting	The seedlings are planted manually, placing them in small open pits with the hand. Before fertilization, fertilization should be carried out, the first with limestone after soil analysis. With 10 to 12 days before the planting will be made an application of bed of poultry or manure of chicken, together with compost, both must be well mixed with the earth.
Maintenance	Fertilization: After planting fertilization should be carried out per plant, the second should be at the beginning of the first flowering and the third at the beginning of the second flowering. Foliar application is also recommended every 20 days Irrigation: For all procedures to happen correctly, good irrigation is essential for the strawberry to reach high levels of productivity. The drip system used today, is the most efficient and economical. Excess water should be avoided and guidelines should be followed for how many days and hours there should be irrigation. Another advantage of this system is the placement of fertilizers in the water itself. For due control and prevention of pests and diseases, use pesticides registered for the crop and duly authorized by the competent bodies. The practice of removing leaves that are dried or attacked by disease helps to reduce the spread of disease-causing agents.
Harvest	Harvesting usually occurs two to three months after planting. The harvesting point occurs when the fruit presents from 50% to 75% of the reddish color. Depending on the weather conditions the harvest can occur every day or the house three days. The strawberry is detached from the plant by the peduncle (fruit tree).
Preparation for in-natura marketing	The fruits are properly sized by size. Being arranged queued in cartons that can be of cardboard, styrofoam or clear plastic. The commercialization must take place on the same day of the harvest, because, being a perishable product, they must be consumed in up to five days, yet maintained in temperatures of 0 °C to 5 °C.

Source: Authors (2017)

The following figure demonstrates strawberry growing grounds:

Figure 3 - Strawberry Beds



Source: Authors (2017)

The strawberry when marketed has a Rural Social Contribution, is a social contribution intended to cover the general social security (INSS) and this is called Funrural. This tax is levied on the gross result of rural marketing (from 2.3% to 2.85%) and discounted by the purchaser of the production at the time of sale. However, the strawberry can be marketed also through jelly which consists of a cooking process of the same, following the steps:

Table 3 - Processing for jelly

Reception of fruits	When they arrive to the environment for the production of the jelly must take into consideration that the strawberries are very mature, in this step will be the weighing of the same.
Selection and washing	The fruits must necessarily be healthy, excessively green fruits rotten, rotten, attacked by insects or larvae must be removed from the preparation. After this classification they are washed in running water for removal of soil or other impurities.
Cooking	Baking takes place in a large saucepan, with low heat with sugar until the jelly point.
Packing	The jelly should be placed in properly sterilized glass jars with an identification label, where the origin of the product, weight, ingredients for preparation, date of manufacture and validity must be identified.

Source Authors (2017)

2.3 Risk And Return

The relationship risk-return is one of the most important concepts about an investment, because when you bet on a product, at first the initial perspective is its profitability, after being obtained, it comes to a conclusion as a fundamental aspect to evaluate The performance of what has been invested. In the case of the strawberry that is the object of study of this article, are two types of merchandise, in this case the fruit and its transformation to jelly, where the risk offered by the two is the same, but the return may be different than expected.

Risk in Assaf Neto's view (2010, p.10) can be understood as a measure of uncertainty associated with the expected returns of an investment decision. Therefore, risk is a cost that is always present in the business and should therefore be quantified. Therefore, it can be understood as the possibility of a loss, and the return is the gain or loss that the individual obtains through the realization of an investment.

According to Assaf Neto (2010, p.11), every rational financial decision is made based on the analysis of the risk and return relationship. Investments do not usually give certainty about their future results, and can generate high and low returns. When the results do not fluctuate a lot, it is understood that the decision presents low risk. For example, fixed income securities tend to produce returns that are more stable and predictable than stock returns, and are therefore admitted as having lower risk.

It is extremely important to analyze the sales strategies, the production differentiation and the tools that will be used in both processes, evaluating the processes and thus opting for the most viable and profitable

2.4 Multi-Index Methodology

The multi-index methodology consists of using as an analytical tool several indicators The combined use of several indicators results in more consistent information than the isolated use of any one of them or a subset of them is characterized by the deepening of the risk assessment and its confrontation with the expectation of return (SOUZA; CLEMENTE, 2008, p. 124). The multi-index methodology is divided into two sets of indicators, one of which aims to identify the return perception, consisting of the PV (present value), VPL (net present value), VPLA (annual net present value), IBC Benefit / cost ratio) and ROIA (additional return on investment). Table 4 shows the definition of return indicators:

Table 4 - Definition of return indicators

VP	Is the present value of a future receipt
VPL	It is able to determine the present value of discounted investments at an interest rate, less the cost of the initial investment. Basically, it is the calculation of how much future payments added to an initial cost would be currently worth.
VPLA	It is a variation of the NPV, whose function is to demonstrate how much of an investment project's net gain can be generated from period to period.
IBC	It is a measure of how much is earned per unit of capital invested. If: IBC > 1 = the project must be accepted; IBC < 1 = the project should be rejected
ROIA	It represents, in percentage terms, the wealth generated by the project.

Source: BENDLIN, VICHINHESKI3, SCHERER, e SPAUTZ (2017, Adapted).

The other group has the function of improving the perception of risks, it is composed of the TMA (minimum attractiveness rate), TIR (internal rate of return), PAY-BACK / N (investment recovery period, revenue).

Table 5 shows the definition of risk indicators.

TMA	It is an interest rate that represents the minimum that an investor proposes to earn when making an investment, or the maximum that a person proposes to pay when he makes a financing.
TIR	Represents the discount rate that equates, in a single moment, the inflows with the cash outflows. It is the rate that produces an NPV equal to zero. When calculated from a discounted cash flow at a given attractiveness rate, the IRR is considered attractive when it is greater than or equal to zero.
Payback	It is the period of recovery of an investment and consists in the identification of the period in which the amount of the capital expenditure effected is recovered through the net cash flows generated by the investment.
Management Risk	It is associated with the level of competence and knowledge of managers. It is verified under functional evaluations of the company.
Business Risk	It is associated with cyclical and uncontrollable factors (competitors, market trends, inputs and outputs) that affect the environment of the project invested.

Source: Bendlin, Vichinheski3, Scherer E Spautz (2017, Adapted).

2.5 Crystal Ball

Crystal Ball is an effective decision-making tool, an easy program that performs forecasting and risk analysis eliminating uncertainties. It is an easy methodology to learn and to use, for the beginning it is necessary to elaborate a datasheet (CHARNES, 2007).

The Crystal Ball program is intended to help executives, analysts, and other stakeholders make decisions through simulations in spreadsheet models. The results of these simulations help quantify risk areas. It works with models in spreadsheets in Microsoft Excel, a model represents the relationship between input and output variables using a combination of functions, formulas, and data (CHARNES, 2007). To overcome both limitations of using Excel the Monte Carlo simulation is used by Crystal Ball, it generates random values for uncertain variables repeatedly. A simulation in Crystal Ball calculates hundreds or thousands of scenarios in just a few seconds, and the distributions and input values are called assumptions (CHARNES, 2007). Crystal Ball also determines the predictions for each scenario, remembers the value of each cell for all interactions (scenarios), and generates statistical information of the results and certainty of any other value. The results obtained show not only the different values for each forecast, but also the probability of obtaining these values. Crystal Ball normalizes these probabilities to calculate another important number: the certainty (CHARNES, 2007). With Monte Carlo simulation, Crystal Ball demonstrates the results in a forecast chart that shows all possible outcomes and the likelihood of achieving each of these results, in addition to presenting all the predicted scenarios (CHARNES, 2007). Google Tradutor para empresas:Google Toolkit de tradução para appsTradutor de sitesGlobal Market Finder Sobre o Google TradutorComunidadeCelularSobre o GooglePrivacidade e TermosAjudaEnviar feedback

III. METHODOLOGICAL PROCEDURES

This research aims to demonstrate and analyze strawberry production costs, risk and return prospects and identify the best way to market the strawberry, whether in-natura or in the form of jelly. According to Gil (2010) it is characterized as applied in relation to its nature, since it aims to generate knowledge for practical applications directed to the solution of specific problems. As for its objective, it is characterized as descriptive, presenting the investments, costs and main activities necessary for the exploration of strawberry agribusiness, aiming to study the expectation of return and risk of such crop. This type of research intends to describe the characteristics of a certain population or phenomenon or to establish relations among variables (GIL, 2010). It is characterized as a survey of survey, by direct interrogation, requesting information to a significant group of people. With the application of quantitative analysis to obtain conclusions (GIL, 2010). In the present study were carried out approach to a producer of strawberries, which does the processing in jelly in the interior of Mafra-SC About the temporal aspect of the research has a longitudinal form, because it is a snapshot of an ongoing situation, it is a research that studies a phenomenon and its changes for a certain period of time.

3.1 Collection, Treatment And Analysis Of The Data.

Data collection was done through interview and documents, such a method that consists in seeing, hearing and examining the phenomena that are in the research objective (Beuren, 2008). Data collection was first performed through documentary research (entry and exit tax notes), personal testimonials and spontaneous observations, where visits were made to the property. Information about the process of production, processing and commercialization of the fruit is collected, such as purchase and sale prices, prices of inputs, and everything else related to the cycles. For the purposes of data collection, the costs related to the production of 1 hectare of strawberry were analyzed.

According to Gil (1999, apud BEUREN 2008, page 57):

The objective of the analysis is to organize and summarize the data in a way that allows the supply and answers to the problem proposed for the investigation. The interpretation, however, has as its objective the search for the broader meaning of the answers, which is done through its connection with other knowledge previously obtained. For the purposes of the property cost analysis, spreadsheets were prepared in Excel, including investment, fixed and variable costs, expenses. For the analysis and interpretation of the data, the costs were collected, classified into categories, interpreted and analyzed the results found. After analyzing the data, the economic return obtained and the risks were calculated. The costs were analyzed based on the literature, and the results were analyzed based on the multi-index methodology and the Crystal Ball program.

IV. RESULTS

The present study identifies first the costs of strawberry production, the added value of its implantation and later the analysis of the best form of commercialization, whether the strawberry in-natura or in jelly. It is understood the operational costs of labor and equipment for the preparation of the land, the formation of the beds, the planting, post-planting care and the consumed inputs, these are measured for the production of 1 hectare of strawberry. For the survey of production and maintenance costs, mechanized and manual operations related to the production itself were added. In the first month is the implantation of the cultivation, in the second

and third month is made the maintenance of the beds, this phase of three months unproductive, because only in the fourth month that the production begins.

Table 1 shows the mechanized operations, in this case a third-party tractor was used.

Description	Specification	Unitary value (R\$)	Amount	Unproductive phase Training (R\$)
Soil preparation	Machine time			
Deep Plowing	Tractor 100 hp + scarifier	110,00	2	220,00
Gradation grader	Tractor 100 hp + grade leveler	110,00	4	440,00
SUBTOTAL				660,00

Source Authors (2017)

For the calculation of the labor force was used according to collective agreement 2016/2017, as basic salary the amount R \$ 908.00 plus charges. The rural worker must work 8 hours a day and 44 hours a week according to CF / 88. In this case it was worked with days / man, where it reached the value of R \$ 41.86.

Below are the manual operations for implantation of the crop, highlighting the implantation and the cultural dealings shown in tables 2 and 3.

Table 2 - Manual operations for deployment

Description	Specification	Unitary value (R\$)	Amount	Unproductive phase (R\$)
Cultivation				
Planting / replanting	Days / man	41,86	8	334,88
Muching's collation	Days / man	41,86	2	83,72
Drip Installation	Days / man	41,86	2	83,72
Tunnel Installation	Days / man	41,86	4	167,44
SUBTOTAL				669,76
TOTAL				669,76

Source Authors (2017)

Table 3 - Manual operations for cultural dealings in the deployment

Description	Specification	Unitary value (R\$)	Amount	Unproductive phase (R\$)
Cultivation				
Cleaning beds	Days / man	41,86	12	502,32
Manual felling	Days / man	41,86	2	83,72
Application of fertilizers	Days / man	41,86	1,5	62,79
Phytosanitary Treatment	Days / man	41,86	1,5	62,79
SUBTOTAL				711,62
TOTAL				711,62

Source Authors (2017)

Tables 4 and 5 list the equipment needed to start planting, in this case the tunnel beds and drip irrigation system, the use of plastic films known as Mulching, as well as the equipment for manual operations.

Table 4 - Hand tools

Description	Unit	Unitary value R\$	Amount	Unproductive phase Formação ano (R\$)
Sprayer costal 20lt	Unit	215,00	1	215,00
Hoe	Unit	20,00	1	20,00
Creep	Unit	20,00	1	20,00
Gloves	Unit	8,00	4	32,00
Artesian well	Unit	6.000,00	1	6.000,00
SUBTOTAL				6.287,00
TOTAL				6.287,00

Source Authors (2017)

In the following table the equipments used in the preparation of the soil and of every process for the cultivation of the strawberry are described:

Table 5 - Equipment for preparation of beds

Description	Unit	Unitary value (R\$)	Amount	Unproductive phase Formação (R\$)
Drip	Filter	0,22	2235	491,70
Connectors	Record	35,00	1	35,00
Adapter	Hose	0,75	95	71,25

Motobom	Water tank	Unit e		18,00	1	18,00
Wire No. 16	Iron Arches	Unit		0,75	7	5,25
Plastic film 2,20m and 100m	Plastic fasteners	m		0,80	240	192,00
Muiching		Unit		850,00	1	850,00
Drip	Filter	Unit de		3,00	340	1.020,00
Connectors	Record	m		8,00	24	192,00
Adapter	Hose	Kg		6,00	532	3.192,00
Motobom		Water tank		1,80	3000	5.400,00
Wire No. 16		Iron Arches		100,00	0,8	80,00
Plastic film 2,20m and 100m		Plastic fasteners	0,40		2300	920,00
SUBTOTAL						12.467,20
TOTAL						12.467,20

Source Authors (2017)

In the preparation of the soil fertilizers and fertilizers are used, and in the first month insecticides and fungicides are also applied for the prevention of pests and diseases, shown in table 6:

Tabela 6 – Fertilizantes e Fitossanitários

Description	Specification	Unitary value (R\$)	Amount	Unproductive phase (R\$)
Fertilizantes				
Super fosfato simples	Sacks of 25kg / ha	35,00	9,5	332,50
Nitrato de Cálcio	Sacks of 25kg / ha	66,00	4	264,00
Sulfato de Potássio	Sacks of 25kg / ha	165,00	4	660,00
Nitrato de Potássio	25kg / ha bags	150,00	3,75	562,50
MAP	Sacks of 25kg / ha	113,00	4	452,00
Fertilizante Supra Solo	Kg	45,00	1,7	76,50
Fertilizante foliar Starter	Kg	31,00	0,6	18,60
Fertilizante supra Fol	Kg	32,00	0,3	9,60
Fertilizante Supramix	Kg	27,00	0,6	16,20
Fertilizante Calmax	Kg	30,00	0,6	18,00
SUBTOTAL				2.489,90
Fitossanitários				
Fungicida Native	kg	3,52	1,9	6,69
Inseticida Actara	kg	9,75	0,1	0,98
Fungicida Dioxiplus	Lt	55,00	0,8	44,00
Calda Sulfocálcica	Lt	9,00	0,3	2,70
Fungicida BTT090	Lt	34,00	1,5	51,00
Fungicida Amistar WG	kg	30,00	0,7	21,00
Duo	Lt	38,00	1,5	57,00
SUBTOTAL				183,36
TOTAL				2.673,26

Source Authors (2017)

Table 7 presents the acquisition of the seedlings, in this case were acquired 4,670 units, since the creation of two new seedlings from one, through the creeping stem that the strawberry loose. With this method comes the production of 14,000 feet of strawberry.

Table 7 - Acquisition of strawberry seedlings

Description	Specification	Unitary value (R\$)	Amount	Unproductive phase (R\$)
Strawberry stems	Un	0,65	4670	3.035,50
SUBTOTAL				3.035,50
TOTAL				3.035,50

Source Authors (2017)

From the second month onwards, the maintenance costs are presented, which includes the manual and input operations, shown in table 8

Table 8 - Manual operations and inputs

Manual operations Description	Specification	Unitary value (R\$)	1 a 3 month		4 month		5 ao 12 month	
			Qta	Unproductive phase (R\$)	Qta	Unproductive phase (R\$)	Qta	Productive phase (R\$)
Cultivation								
Cleaning beds	Days / man	41,86	40	1.674,40	20	800,00	20	837,20
Manual felling	Days / man	41,86	4	167,44	2	8,00	2	83,72
Application of fertilizers	Days / man	41,86	3	125,58			1,5	62,79
Phytosanitary Treatment	Days / man	41,86	3	125,58	1,5	4,50	1,5	62,79
SUBTOTAL				2.093,00		812,50		1.046,50
Fertilizantes				297,00		214,56		214,56
SUBTOTAL				297,00		214,56		214,56

Fitossanitários				330,73		94,45		94,45
SUBTOTAL				330,73		94,45		94,45
TOTAL				2.720,73		1.121,51		1.355,51

Source Authors (2017)

The table below shows the costs of harvesting and packaging for the commercialization of in-natura strawberry together with the cost of the packaging machine.

Table 9 - Costs with harvest, packaging and cost / machine

Harvest cost and packaging material					
Description	Specification	Unitary value	Amount	Productive phase	
		(R\$)		(R\$)	
Cambuca	Unit	0,05	26920	1346,00	
Cardboard box	Unit	0,70	6730	4711,00	
PVC film stretchable	Unit	0,05	26920	1346,00	
Wrapping machine	Unit	600,00	1	600,00	
Hang tags	Unit	0,10	26920	2692,00	
Harvest	Days / man	41,86	101	4227,86	
SUBTOTAL				14922,86	
TOTAL				14922,86	

Source Authors (2017)

Table 10 shows the costs of producing the jelly using the cultivated strawberry.

Table 10 - Cost of transformation in jelly

Description	Specification	Unitary value	Amount	Productive phase
		(R\$)		(R\$)
Preparation of jam	Days / man	41,86	69	2.888,34
Packing	Days / man	41,86	31	1.297,66
Glass bottle with label	Unit	1,5	19382	29.073,00
Furniture and utensils	Unit		1250	1.250,00
installations	M²	788	1	788,00
Ingredients (sugar)	KG	2	4482	8.964,00
Inputs (Gas)	Unit	65	1430	92.950,00
SUBTOTAL				137.211,00
TOTAL				137.211,00

Source Authors (2017)

The present study analyzes two ways of marketing the fruit: if in-natura or jelly, the following table lists the sale of strawberry production. Sales prices collected from producers in the region, already discounted Funrural, also for production Of jelly, shown in tables 11 for strawberry and table 12 for jelly.

Table 11 - Priced selling price of in-natura strawberry

Description	Specification	Unitary value	Amount	Productive phase
		(R\$)	(Kg)	(R\$)
Strawberry in-natura	Kg	10,00	8.076,00	80.760,00
SUBTOTAL				80.760,00
TOTAL				80.760,00

Source Authors (2017)

Table 12 - Priced selling price for jelly

Description	Specification	Unitary value	Amount	Productive phase
		(R\$)	(Kg)	(R\$)
Strawberry jam	Kg	16,00	8.076,00	129.216,00
SUBTOTAL				129.216,00
TOTAL				129.216,00

Source Authors (2017)

Table 13 shows the net cash flow from the strawberry production, where the investment was R \$ 26,504.00, where the sales of each month can be compared, even with the operational costs and especially the flows In the respective months, totaling the balances, as shown below:

Table 13 - In-natura Strawberry Cash Flow:

Months	INVESTMENT (R\$)	GROSS REVENUE (R\$)	TAXES (R\$)	OPERATING COST (R\$)	CASH FLOW (R\$)	BALANCE (R\$)
0	(26.504,34)				(26.504,34)	26.504,34
1				(906,91)	(906,91)	(27.411,25)
2				(906,91)	(906,91)	(28.318,16)
3				(906,91)	(906,91)	29.225,07)
4		6.000,00	(138,00)	(2.206,39)	3.655,61	24.662,55)
5		6.960,00	(160,08)	(2.644,11)	4.155,81	(20.506,74)
6		7.680,00	(176,64)	(2.137,97)	5.365,39	(15.141,36)
7		9.240,00	(212,52)	(2.374,83)	6.652,65	(8.488,71)
8		10.320,00	(237,36)	(2.509,83)	7.572,81	(915,90)
9		10.440,00	(240,12)	(2.524,83)	7.675,05	6.759,15
10		9.960,00	(229,08)	(2.464,83)	7.266,09	14.025,24
11		10.200,00	(234,60)	(3.514,83)	6.450,57	20.475,80
12		9.960,00	(229,08)	(3.780,37)	5.950,55	26.426,36

Source Authors (2017)

Table 14 shows the net cash flow from the transformation of the fruit into jelly and its profitability, making a more detailed analysis it is noticeable that the balance practically doubled in relation to the cash, because even if a little more work the jelly is more profitable than The fruit:

Table 14 - Strawberry Jelly Cash Flow:

Months	INVESTMENT (R\$)	GROSS REVENUE (R\$)	TAXES (R\$)	OPERATING COST (R\$)	CASH FLOW (R\$)	BALANCE (R\$)
0	(26.504,34)				(26.504,34)	(26.504,34)
1				(906,91)	(906,91)	(27.411,25)
2				(2.944,91)	(2.944,91)	(30.356,16)
3				(4.982,91)	(4.982,91)	(35.339,07)
4		9.600,00	(220,80)	(8.349,48)	1.029,72	(29.326,44)
5		11.136,00	(256,13)	(7.341,84)	3.538,03	(25.788,41)
6		12.288,00	(282,62)	(4.438,03)	7.567,34	(18.221,07)
7		14.784,00	(340,03)	(4.948,02)	9.495,95	(8.725,12)
8		16.512,00	(379,78)	(5.254,48)	10.877,74	2.152,62
9		16.704,00	(384,19)	(5.283,88)	11.035,93	13.188,55
10		5.936,00	(366,53)	(5.103,49)	10.465,98	23.654,53
11		16.320,00	(375,36)	(6.117,29)	9.827,35	33.481,88
12		15.936,00	(366,53)	(6.354,03)	9.215,44	42.697,32

Source Authors (2017)

4.1 Feasibility Analysis By The Multi-Index Methodology

Initially, the return and risk indicators of the Multi-index Methodology will be presented for cash flows in the production of strawberries for in-natura sale, in 1 / ha, for 12-month production. Subsequently the data refer to the production of the strawberry for sale in jelly also in a period of 12 months. The strawberry investment analysis was elaborated from a TMA of 9.48 a.a., 0.79% a.m. The return and risk indicators of the Multi-index Methodology are presented in table 15

Table 15 - Indicators

	Indicators	In-Natura	Jelly
RETURN	PRESENT VALUE	48.580,97	59.506,37
	NET PRESENT VALUE	22.076,62	33.002,02
	VALUE PRESENTED LIQUID ANNUALIZED	1.935,55	2.893,43
	INDEX BENEFIT / COST (IBC)	1,83	2,25
	ROIA / YEAR	5,18%	6,97%
RISK	INTERNAL RETURN RATE (IRR)	8,17%	9,45%
	TMA / TIR INDEX	1,16%	1,00%
	PAY BACK / N	8,44	4,32
	RISK OF MANAGEMENT	0,50	0,50
	RISK OF BUSINESS	0,51	0,51

Source Authors (2017)

As the general objective was to deepen the perception of the return and the risks involved in the strawberry cultivation and transformation activity and the interpretation of the indicators, it follows:

NPV - Net Present Value: NPV is considered the value of money in time, when one opts for the investment of cultivating the fruit, or, opting to commercialize the jelly, the expectations are that the realized investments of R \$ 22,076, 00 (for the fruit), of R \$ 158,103.00 (jelly).

VPLa - Equivalent Net Present Value Year: represents the business gain distributed in annual amounts. The Annual Net Present Value of this activity is estimated at R \$ 1,935.00 for strawberry production, and for the process of transformation into jelly the value was R \$ 2,893. Although the significant return is already perceived mainly by the transformation process, it is necessary to continue the analysis to better evaluate this variable.

IBC - Index of Benefit / Cost: it is an indicator that measures the expectation of return for each unit of capital immobilized in the exploitation of 1 / ha of strawberry planting, is to obtain R \$ 1.83 for each R \$ 1.00 invested In the process of producing the strawberry for in-natura sale, of R \$ 2.25 for each R \$ 1.00 invested for the transformation processes for jelly. A project is considered feasible when it presents superior IBC.

ROIA - Additional Return Due to the Investment: associated with the exploitation of 1 / ha, in this case calculated annually, is estimated at 5.18% for the strawberry production process and 6.97% for the jelly transformation process. It is observed that the profitability is more expressive by the transformation process.

TIR - Internal Rate of Return: The transformation process obtained a higher internal rate of return with a rate of 9.45% for the in-natura production process of 8.17%.

TMA / TIR - Minimum Rate of Attraction / Internal Rate of Return: allows a better visualization of the risk, in a scale of 0 to 1, where 1 represents maximum risk and 0 minimum, in the strawberry production process the TMA / TIR was 1 , 16%, thus shows that the investment has a medium / high risk, and in the process of transformation into jelly the indicator found was 1% presenting low risk. By checking only this type of risk is visible the advantage of the decision to undertake using the processes of transformation of the fruit.

Pay Back: represents the time necessary for the recovery of the investment, where the greater the time, the greater the risk. In this case, the Pay Back found was 8.44 months for the production processes, of 4.32 months for the process by transformation. In relation to the Pay Back / N Index, on a risk scale between 0 and 1, the index of 0.70 found in the production process, 0.36 in the transformation process, the production process risk greater than the transformation process .

Management Risk: In relation to the risk of management that is associated with the experiences and knowledge of the production and marketing process that the producer has on the subject, it can be considered as 0.50, depending on the availability of technical guidance published Private sector in this segment. Return and risk are two variables that go together in the investment world. The greater the possibilities of return the greater the risks involved, as shown in table 16.

Table 16 - Management Risk

Competencies Perception	Perception
Economic Aspects	0,45
Industry Trends and Segment	0,55
Production Process and Innovation	0,50
Negotiation with Stakeholders	0,45
Positioning strategy	0,50
Average per area	0,41
Perceived Management Risk	0,50

Source Authors (2017)

Business risk: In relation to business risk, it is characterized to problems that may affect the project environment, enters the risk market and its possible threats that may affect during the process, for example, we can mention the climate, If during the process was favorable, the better for the business to succeed, where many variations occur can cause the commitment to the result of the business. The same can also be considered as 0.51 because it is mainly related to the climate shown in table 17.

Table 17 - Business Risk

PEST		5 FORÇAS DE PORTER		SWOT	
ASPECTO	PERCEPÇÃO	ASPECTO	PERCEPÇÃO	ASPECTO	PERCEPÇÃO
POLITICO LEGAL	0,30	ENTRANTES	0,55	FRAQUEZAS	0,45
ECONOMICO	0,50	SUSBTITUTOS	0,50	AMEAÇAS	0,65
SOCIO-CULTURAL	0,45	FORNECEDORES	0,60		
TECNOLOGICO	0,30	CLIENTES	0,45		
DEMOGRAFICO	0,30	CONCORRENTES	0,65		
MEDIA	0,37	MEDIA	0,55	MEDIA	0,55
RISCO DO NEGOCIO PERCEBIDO					0,51

Source: Souza and Clemente (2012, Adapted).

4.1.1 Simulation Monte Carlo

In the simulation, the uncertainty variables or input variables for the simulation were the strawberry quantity 1 / ha for 12 months for the two processes with the respective sale price of each situation, called assumptions.

For the definition of the variables: amount of kg / ha, the triangular probability density functions were chosen, being considered the most probable the values originally raised, being estimated the minimum and the maximum in 10%, not being necessary the use of historical data To base the distribution.

Regarding the variable sale price, we opted for the probability density function, since all values between the minimum and the maximum are equally likely to occur, characterizing as a continuous probability distribution.

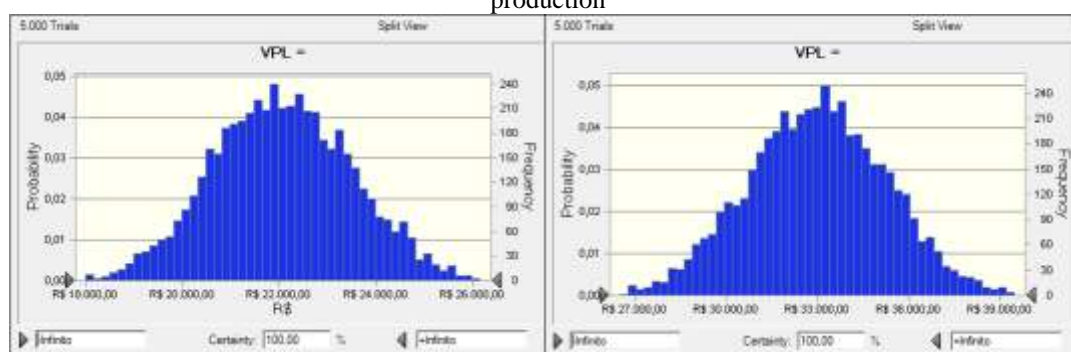
For forecast variables, the NPV (Net Present Value) and ROIA (Additional Return Due to Investment) were chosen.

The number of replicates considered for the executed result was 5,000.

After the simulation was carried out, it was possible to obtain the frequency graphs, with the minimum, mean and maximum values of the variables, median, variance and standard deviation, among other information.

Figure 4 shows that the average for NPV (Net Present Value) is R \$ 22,074.00 for strawberry production in 1 / ha, with a minimum value of R \$ 16,252.00 and a maximum of R \$ 27,247.00, while For the transformation into jelly of all production 1 / ha is R \$ 32,994.34 with a minimum value that was R \$ 23,874.84 and maximum of R \$ 40,910.16.

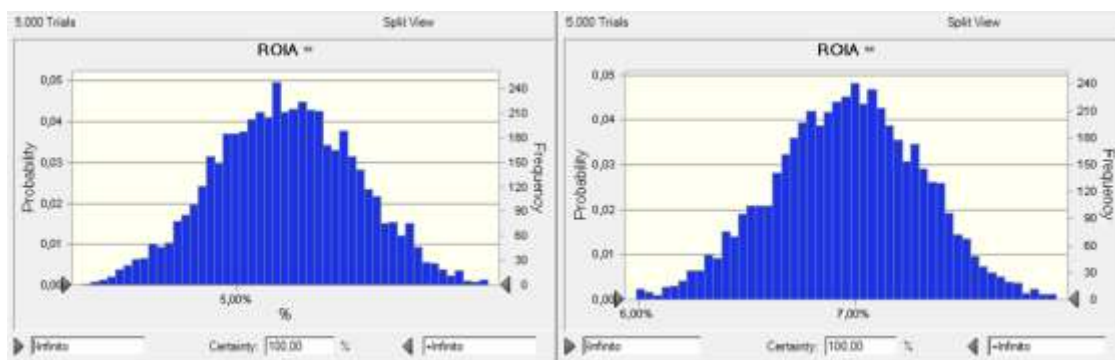
Figure 4 - Frequency graphs and statistics of the output variable NPV - Net Present Value for strawberry production



Source Authors (2017)

Figure 5 shows that the average for ROIA (Additional Return Due to Investment) is 5.17% for strawberry production 1 / ha, with a minimum value of 4.07% and a maximum of 6.07%, while For the transformation of jelly from the production of 1 / ha is 6.97%, with a minimum value that was 5.50% and maximum of 8.09%.

Figure 5 - Frequency graph and statistics of the ROIA output variable - Additional return for strawberry production and its transformation into jelly



Source Authors (2017)

V. CONCLUSION

In the strawberry investment purpose, the expectations of return and risks that are determinant to the production and comparison of the best fruit commercialization in the northern plateau region of Santa Catarina were highlighted, according to the multiple index analysis proposed by Souza and Clemente (2008), along with the Monte Carlo simulation through Crystal Ball Software. The use of indicators in decision making is a way of evaluating investments, thus improving the perception of rural producers in their field of activity.

It was identified that the characteristics of this agribusiness were expected a more significant profitability to be able to maintain the balance and the associated associated risks, being possible to analyze a return that could be considered as advantage in adding value to the product in the case of the transformation of strawberry into jelly.

The processes studied showed that the strawberry production strategies for ROIA sales of 5.17% per year did not present a big difference when measured to the results of the transformation strategy with ROIA of 6.97%. It should be noted that a little caution is needed in analyzing the return of production.

With respect to the risk of non-recovery of invested capital is confirmed by the Pay-Back / N index of 8.44% and 4.32%. Risk indices were considered high level. The high Risk of Management would imply in the competence to manage the investment process, as well as the Business Risk that indicated an average risk for the strawberry segment, which is worth highlighting the interference of the climate and prices practiced in the market.

The data obtained from the Monte Carlo simulation, using the Crystal Ball software, according to the uncertain or variable variables for the simulation, the quantity of 1 / ha for 12 months, the respective selling prices of each product, each situation called assumptions It is possible to notice that the average NPV of the most profitable option is jelly, the same occurs with IRR / average in 8.17% for strawberry and 9.45% for jelly and ROIA / medium in 5.18% for The strawberry and 6.97% for the jelly.

The results obtained for the quantity 1 / ha for 12 months, that the probability of the occurrence of the calculated values is average, demonstrating that the choice of one relative to the other will consist of the opportunity presented in relation to mutation of the value. The simulation proposed the identification of the probability that the NPV > 0 is 100%, as well as the IRR < TMA.

The results evidenced according to the simulation demonstrate that it provides a more concrete analysis to manage the risks of this business, even if it is not yet absolute truth.

This study was carried out in the interior of Santa Catarina, where the production and processing of strawberries is of great importance. However, this study was carried out in other regions, or small farms, under the possibility of obtaining different results, as there may be variations, such as inputs, Seedlings, which undergo market changes, and even the weather elsewhere.

However, it is concluded based on the situations dealt with in this article, where strawberry cultivation possesses a high rich and the transformation in jelly that obtained more significant indexes and a better return.

REFERÊNCIAS

- [1]. ANTUNES, Luis Eduardo Correa; DUARTE FILHO, Jaime. Sistema de produção do morango: produção de mudas. Nov. 2005. Disponível em: <<http://sistemasdeproducao.cnptia.embrapa.br/FontesHTML/Morango/SistemaProducaoMorango/cap01.htm>>. Acesso em: 10 out. 2015.
- [2]. ARAUJO, Massilon J. Fundamentos do agronegócio. 2.ed. São Paulo: Atlas, 2007.
- [3]. ASSAF NETO, Alexandre. Finanças corporativas e valor. 5. ed. São Paulo: Atlas, 2010.
- [4]. ASSOCIAÇÃO BRASILEIRA DO AGRONEGÓCIO DA REGIÃO DE RIBEIRÃO PRETO. Agronegócio: conceito. Disponível em: <www.abagrp.org.br/agronegocioConceito.php>. Acesso em: 10 out. 2015.

- [5]. BENDLIN, Luciano; VICHINHESKI, K. A. ; SOUZA, A. . Methodology for the Construction of the Efficient Border For Selecting Investment Projects: A Multi-Index Approach. *International Journal of Modern Engineering Research*, v. 6, p. 1-15, 2016.
- [6]. BENDLIN, LUCIANO; SOUZA, A. ; SENFF, C. O. ; STAFIN, O. O. ; PEDRO, J. J. . Custos de produção, expectativas de retorno e riscos associados ao plantio de eucalipto na região do Planalto Norte Catarinense/ Brasil.. *Custos e @gronegocio Online JCR*, v. 2, p. 2-33-33, 2016.
- [7]. BENDLIN, Luciano; VICHINHESKI, K. A. ; SCHERER, V. M. ; SPAUTZ, N. P. M. . Evaluation of Returns and Risks in the Forms of Garlic Market: Seed Versus in Natura. *International Journal of Environment, Agriculture and Biotechnology (IJEAB)*, v. 2, p. 510-524, 2017.
- [8]. BRASIL. Lei n. 10.406, de 10 de janeiro de 2002. Institui o Código Civil. Disponível em: <http://www.planalto.gov.br/ccivil_03/leis/2002/l10406.htm>. Acesso em: 10 out. 2015.
- [9]. BEUREN, Ilse Maria (Org.). Como elaborar trabalhos monográficos em contabilidade: teoria e prática. 3 ed. São Paulo: Atlas, 2008.
- [10]. CHARNES, John. Financial modeling with crystal ball and excel. John Wiley & Sons, Inc, 2007.
- [11]. CANAL DO PRODUTOR. Metade do morango de SC. 30 mar. 2012. Disponível em: <<http://www.canaldoprodutor.com.br/comunicacao/noticias/metade-do-morango-de-sc>>. Acesso em 10 out. 2015.
- [12]. CANTILLANO, Rufino Fernando Flores. Sistemas de produção de morango: colheita e pós colheita. nov. 2005. Disponível em : <<http://sistemasdeproducao.cnptia.embrapa.br/FontesHTML/Morango/SistemaProducaoMorango/cap12.htm>>. Acesso em: 10 out. 2015.
- [13]. FROTA, Maria Cristina. As diferentes variedades existentes já permitem que o morango seja cultivado em várias regiões do país. *Globo Rural*, 2015. Disponível em: <<http://revistagloborural.globo.com/GloboRural/0,6993,EEC921364-1641,00.html>>. Acesso em: 10 out. 2015.
- [14]. GALHOS & BUGALHOS. Pequenas notas sobre morangos: ... despreziosamente falando. 2011. Disponível em: <<http://galhosbugalhos.blogspot.com.br/2011/11/pequenas-notas-sobre.html>>. Acesso em: 13 out. 2015.
- [15]. GIL, Antonio Carlos. Como elaborar projetos de pesquisa. 4. ed. São Paulo: Atlas, 2010.
- [16]. HAGAN. Por que o agronegócio é tão importante para a economia do Brasil?. 19 abr. 2013. Disponível em: <<http://www.hagah.com.br/especial/rs/agricultura-e-pecuaria/19,1646,4112617,Por-que-o-agronegocio-e-tao-importante-para-a-economia-do-Brasil.html>>. Acesso em: 10 out. 2015.
- [17]. HORTAS. Como plantar morango. Disponível em: <<http://www.hortas.info/como-plantar-morango>>. Acesso em 10 out. 2015.
- [18]. LEITE, Terezinha. Dados confirmam que cultivo de morango cresce cada vez mais na agricultura familiar. 21 jul. 2011. Disponível em: <http://www.emater.mg.gov.br/porta.cgi?flagweb=site_tpl_paginas_internas&id=7916#.VkGIJL-2phM>. Acesso em: 20 out. 2015.
- [19]. MARION, José Carlos. Contabilidade rural. 14.ed. São Paulo: Atlas, 2014.
- [20]. MOSS, Lucas Rezende; SPAGNOL, Ludymilla. O fundo de assistência ao trabalhador rural: FUNRURAL. mar. 2014. Disponível em: <http://www.fiscosoft.com.br/main_artigos_index.php?PID=300466&printpage=>>. Acesso em: 23 set. 2015.
- [21]. PRATES, Marcos. Os números mostram o poder do agronegócio brasileiro. *Exame.com*, 03 jun. 2014. Disponível em: <<http://exame.abril.com.br/economia/noticias/os-numeros-que-mostram-o-poder-do-agronegocio-brasileiro>>. Acesso em: 10 out. 2015.
- [22]. SANTOS, Daniel Ferreira dos; SANTOS, Renato da Costa dos; CATAPAN, Anderson. Administração do agronegócio no Brasil. Curitiba: CRV, 2014.
- [23]. SANTOS, Paulo Eduardo Telles dos. Sistema de produção de morango: características básicas das principais cultivares de morango plantadas no Brasil. nov. 2005. Disponível em: <<http://sistemasdeproducao.cnptia.embrapa.br/FontesHTML/Morango/SistemaProducaoMorango/cap02.htm>>. Acesso em: 02 out. 2015.
- [24]. SOUZA, Alceu; CLEMENTE, Ademir. Decisões financeiras e análise de investimentos. São Paulo: Atlas, 2008.