"FEASIBILITY STUDY FOR THE IMPLEMENTATION OF A KIDNEY TOMATO DEHYDRATION COMPANY IN THE PROVINCE OF IMBABURA CANTON PIMAMPIRO"

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Abstract.

In the present research work the feasibility of the implementation of a kidney tomato dehydrator company in the province of Imbabura, Pimampiro canton, was determined, by means of which the industrialization of this vegetable is recognized so nationally, thus promoting the economy of the canton.

The diagnosis of the current situation determined the volume of production of kidney tomato in the canton Pimampiro and the way of commercialization of this vegetable.

The market study identified the unmet demand that currently exists for tomato dehydrated kidney in the province of Imbabura.

The location of the company was established in the Pimampiro parish of Pimampiro canton by applying the factor allocation method and center of gravity method, its initial production capacity will be 64.35 kg of finished product per day Which was determined using the mass balance method.

The financial study determined the feasibility of the project through the realization of cash flow and the interpretation of financial indicators such as: NPV, IRR, B / C and the period of recovery of investment.

The organizational study defined the company name and the organizational design of the company.

Keywords

Feasibility, production, Raw material

1. Introduction

The dehydrated food industry is undergoing profound transformations, due to the new trends that seek to favorably impact aspects such as, the nutritional patterns of the population, food quality and safety, adaptation to specific populations (elderly, young, female) and Demands of the world today that seek to ensure a better quality of life free of diseases based on adequate nutrition habits. (COMECYT, 2014)

In Ecuador the activity of the productive sector has maintained an average growth of 3.2%, higher than the average in Latin America. This sustained development is being affected by external shocks in the world economy, as well as in the South American region, during the last crisis. Also, the national production is characterized by being intensive in primary goods that represent 81% of the total exported. (Secretaría Nacional de Planificación y Desarrollo, 2013)

In the province of Imbabura, it has become important to strengthen production processes by providing support from public entities for their growth and development. At the intermediate level of government, it has been recognized that it is useful to boost territorial economic development. (GOBIERNO PROVINCIAL DE IMBABURA, 2013)

The strategy to strengthen productive approaches aims to: "Promote the development of the secondary and tertiary primary sectors by promoting the associativity of the actors to generate value added to agricultural and artisanal production." (GOBIERNO PROVINCIAL DE IMBABURA, 2013)

In the Canton Pimampiro the importance of developing the potential productive chains of the territory is emphasized; The production, the industrialization and the commercialization, of the agricultural products of the canton. (GOBIERNO AUTÓNOMO DESCENTRALIZADO DE PIMAMPIRO, 2011)

The kidney tomato is the emblematic product of this canton and is widely marketed in the area although at the primary level.

In Pimampiro there is a high production of kidney tomatoes which is permanent at all times of the year, is the main agricultural product of the canton, very appealing for its color and brightness, this product is marketed fresh and has a duration of 15 days from Its harvest. (Secretaría Nacional de Planificación y Desarrollo, 2013)

2. Materials and Methods

Theoretical and Methodological Framework

Documentary information was analyzed and studied to provide a theoretical knowledge and support the research work.

Diagnosis of the production, industrialization and consumption of the kidney tomato in the Pimampiro canton.

The production, industrialization and consumption of the kidney tomato were diagnosed by the first information collection in the canton and the existence of investors interested in this project was determined.

Feasibility study

- **Market study**

The market study determined the current and future demand for dehydrated kidney tomatoes through the application of household surveys in the province of Imbabura and the percentage of unsatisfied demand through the analysis of the competition.

- **Technical study**

The technical study determined the size, location, engineering of the project, the investments costs and expenses that will incur in the project. And analyzed the possible environmental impacts that can generate the project.Estudio Financiero

Financial feasibility was analyzed over time, through cash flows, income statements, break-even point and financial evaluation criteria such as: Net Present Value, Internal Rate of Return and Cost Benefit ratio. The period of recovery of the investment was also analyzed.

- **Organizational Study**

The organizational structure of the company was defined..

3. Results

The results obtained from the Feasibility Study

Diagnosis of the production, industrialization and consumption of the kidney tomato in the Pimampiro canton.

Tabla de resumen, Producción de Tomate Riñón en el cantón Pimampiro

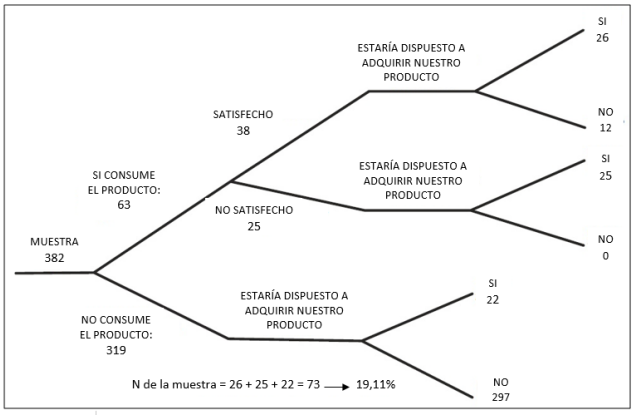
Parroquia	Total cajas 20kg	Total Toneladas/ año
San Francisco de Sigsipamba	188.400	3.768
Chugá	62.800	1.256
Pimampiro	378.150	7.563
Mariano Acosta	N/A	N/A
Total	**629.350**	**12.587**

From the analysis of the information collected in the canton Pimampiro was obtained:

The table shows the final results of the total of boxes and tons that are produced annually in the canton Pimampiro and in each one of its parishes; Resulting in the production of 188,400 boxes of 20 Kg and 3,768 Tm for the parish of San Francisco in Sigsipamba, in the parish of Chugá the production of 62,800 boxes of 20kg and 1,256 Tm, in the parish of Pimampiro a total of 378,150 boxes of 20 kg and 7.563 Tm per year, whereas in the parish of Mariano Acosta it was found that there is no production of kidney tomatoes, therefore at the canton level we obtain a total of 12,587 Tons of tomato per year in its eight varieties, which implies The existence of Raw Material for the project.

Feasibility study

Market study



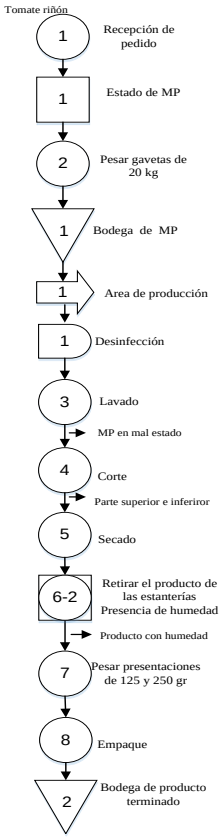
By applying the survey applied to households of economy class A, B and C + which were determined as potential customers of the product, a 19.11% market acceptance was obtained with 2.35 kg of average annual consumption per household, Of this demand was determined that in its entirety is unsatisfied demand since there is no production of dehydrated kidney tomato in the province of Imbabura.

- **Technical study**

By means of the method of assigning points by factor was determined the Macro location of the processing plant in the province of Imbabura Pimampiro canton and by means of the center of gravity method was determined the micro location in the parish Pimampiro which has the highest production of Raw material of the canton.

In order to supply the current market demand, the initial utilization rate of the machinery will be 68.8%, for which an annual growth of 6.24% is estimated, until reaching 100% of its utilization.

Graphic description of the dehydration process of Dehydrated Kidney Tomato.



- **Financial Study**

The total amount required for investments is USD 59,980.00, which will be financed by 61% of the partners' own funds and 39% by means of a loan to a banking institution.

Budget of Expenses

PRESUPUESTO DE EGRESOS					
RUBROS	**AÑO 1**	**AÑO 2**	**AÑO 3**	**AÑO 4**	**AÑO 5**
COSTOS DE PRODUCCION	**$103.933,28**	**$ 111.465,39**	**$ 119.719,19**	**$ 128.764,86**	**$ 138.679,55**
Materia Prima	$ 55.770,00	$ 61.394,90	$ 67.587,12	$ 74.403,88	$ 81.908,17
Mano de obra directa	$ 16.972,88	$ 18.124,86	$ 19.355,03	$ 20.668,69	$ 22.071,51
Costos indirectos	$ 31.190,40	$ 31.945,63	$ 32.777,03	$ 33.692,29	$ 34.699,86
GASTOS DE ADMINISTRACIÓN	**$ 21.032,30**	**$ 22.396,21**	**$ 23.852,69**	**$ 25.048,03**	**$ 26.708,93**
Gastos administrativos	$ 20.095,40	$ 21.459,31	$ 22.915,79	$ 24.471,13	$ 26.132,03
Amortizaciones diferidos	$ 540,00	$ 540,00	$ 540,00	$ 540,00	$ 540,00
Depreciaciones	$ 396,90	$ 396,90	$ 396,90	$ 36,90	$ 36,90
GASTOS DE VENTA	**$ 5.580,00**	**$ 5.580,00**	**$ 5.580,00**	**$ 5.580,00**	**$ 5.580,00**
Gastos de ventas	$ 5.580,00	$ 5.580,00	$ 5.580,00	$ 5.580,00	$ 5.580,00
GASTOS DE OPERACIÓN	$ 26.612,30	$ 27.976,21	$ 29.432,69	$ 30.628,03	$ 32.288,93
GASTOS FINANCIEROS	**$ 2.376,11**	**$ 1.948,80**	**$ 1.472,05**	**$ 940,12**	**$ 346,64**
Interés bancario	$ 2.376,11	$ 1.948,80	$ 1.472,05	$ 940,12	$ 346,64
TOTAL	**$132.921,69**	**$ 141.390,41**	**$ 150.623,92**	**$ 160.333,01**	**$ 171.315,12**

The expenditure budget has been projected to five years taking into account the value of inflation, which has been calculated according to data from the Central Bank of Ecuador by averaging the inflation value of the last five years, with a result of 3.62%; And an annual growth of 6.24%, as planned.

Budget of Revenue

Revenue is shown in the projected five years

PRESUPUESTO DE INGRESOS PROYECTADO					
	AÑO 1	**AÑO 2**	**AÑO 3**	**AÑO 4**	**AÑO 5**
Ventas	$149.250,82	$164.304,09	$180.875,61	$199.118,52	$219.201,40
Total ingresos	$149.250,82	$164.304,09	$180.875,61	$199.118,52	$219.201,40

Income Statement

The income statement is one of the main financial statements, provides important information that will identify the level of efficiency that the company is having to put in perspective the income against costs and expenses, if there is utility is determined that the company is feasible.

We get the result of the net profit that the company will have in the five years projected.

PRESUPUESTO DE RESULTADOS					
RUBROS	**Año 1**	**Año 2**	**Año 3**	**Año 4**	**Año 5**
INGRESOS	**$149.250,82**	**$164.304,09**	**$ 180.875,61**	**$ 199.118,52**	**$ 219.201,40**
VENTAS	$149.250,82	$164.304,09	$ 180.875,61	$ 199.118,52	$ 219.201,40
COSTOS DE PRODUCCIÓN	$103.933,28	$111.465,39	$ 119.719,19	$ 128.764,86	$ 138.679,55
UTILIDAD BRUTA	$ 45.317,53	$ 52.838,69	$ 61.156,43	$ 70.353,66	$ 80.521,85
GASTOS DE OPERACIÓN	$ 26.612,30	$ 27.976,21	$ 29.432,69	$ 30.628,03	$ 32.288,93
UTILIDAD OPERATIVA	$ 18.705,23	$ 24.862,48	$ 31.723,74	$ 39.725,63	$ 48.232,92
GASTOS FINANCIEROS	$ 2.376,11	$ 1.948,80	$ 1.472,05	$ 940,12	$ 346,64
UTILIDAD NETA ANTES DE REP. UTILIDAD	$ 16.329,12	$ 22.913,68	$ 30.251,69	$ 38.785,51	$ 47.886,28
REPARTO DE UTILIDADES (15%)	$ 2.449,37	$ 3.437,05	$ 4.537,75	$ 5.817,83	$ 7.182,94
UTILIDAD NETA ANTES DE IMP	$ 13.879,75	$ 19.476,63	$ 25.713,93	$ 32.967,68	$ 40.703,34
IMPUESTOS (22%)	$ 3.053,55	$ 4.284,86	$ 5.657,07	$ 7.252,89	$ 8.954,73
UTILIDAD NETA	**$ 10.826,21**	**$ 15.191,77**	**$ 20.056,87**	**$ 25.714,79**	**$ 31.748,60**

Cash flow

The cash flow was projected the inflows and outflows of money in the five years after the beginning of productive activities. The difference between these income and expenses results in the balance or net flow, this result is positive which means that The income of each of the periods will be greater than the expenses, which is an indicator of the liquidity of the company.

FLUJO DE CAJA							
RUBROS	AÑO 0	AÑO 1	AÑO 2	AÑO 3	AÑO 4	AÑO 5	AÑO 6
INGRESOS	$ 23.260,00	$ 149.250,82	$ 164.304,09	$ 180.875,61	$ 199.118,52	$ 219.201,40	$ 12.093,
VENTAS		$ 149.250,82	$ 164.304,09	$ 180.875,61	$ 199.118,52	$ 219.201,40	
VALOR DE RESCATE							$ 12.093,
PRESTAMO	$ 23.260,00						
COSTOS DE PRODUCCIÓN		$ 103.933,28	$ 111.465,39	$ 119.719,19	$ 128.764,86	$ 138.679,55	
UTILIDAD BRUTA		$ 45.317,53	$ 52.838,69	$ 61.156,43	$ 70.353,66	$ 80.521,85	
GASTOS DE OPERACIÓN		$ 26.612,30	$ 27.976,21	$ 29.432,69	$ 30.628,03	$ 32.288,93	
UTILIDAD OPERATIVA		$ 18.705,23	$ 24.862,48	$ 31.723,74	$ 39.725,63	$ 48.232,92	
GASTOS FINANCIEROS		$ 2.376,11	$ 1.948,80	$ 1.472,05	$ 940,12	$ 346,64	
UTILIDAD NETA ANTES DE REP. UTILIDAD		$ 16.329,12	$ 22.913,68	$ 30.251,69	$ 38.785,51	$ 47.886,28	
REPARTO DE UTILIDADES (15%)		$ 2.449,37	$ 3.437,05	$ 4.537,75	$ 5.817,83	$ 7.182,94	
UTILIDAD NETA ANTES DE IMP		$ 13.879,75	$ 19.476,63	$ 25.713,93	$ 32.967,68	$ 40.703,34	
IMPUESTOS (22%)		$ 3.053,55	$ 4.284,86	$ 5.657,07	$ 7.252,89	$ 8.954,73	
DEPRECIACIONES		$ 2.319,30	$ 2.319,30	$ 2.319,30	$ 1.959,30	$ 1.959,30	
AMORTIZACIONES		$ 540,00	$ 540,00	$ 540,00	$ 540,00	$ 540,00	
INVERSIONES FIJAS	$ 49.080,00						
INVERSIÓN DIFERIDA	$ 2.700,00						
CAPITAL DE TRABAJO		$ 8.199,50					
AMORTIZACIÓN CRÉDITO		$ 3.692,64	$ 4.119,94	$ 4.596,70	$ 5.128,62	$ 5.722,10	
TOTAL EGRESOS	$ 51.780,00	$ 147.457,44	$ 150.372,96	$ 162.556,14	$ 176.033,05	$ 190.675,59	
FLUJO NETO	-$ 28.520,00	$ 1.793,37	$ 13.931,13	$ 18.319,47	$ 23.085,47	$ 28.525,80	$ 12.093,

Financial Evaluation Criteria

NPV

It is a procedure that allows to calculate the present value of a certain number of future cash flows, originated by an investment. In the flows brought to present value, the NPV corresponds to USD 34,211.00; Which means that the project is viable considering that the NPV is greater than zero.

IRR

The criterion of the internal rate of return is to evaluate a project based on a single rate of return per period with which the total of the updated benefits are exactly equal to the initial disbursements (investment) updated at the rate of return. The IRR obtained is 39%, which is higher than the opportunity cost rate. Therefore it can be concluded that the project is acceptable.

B/C

This relationship reflects the value of the project in relation to benefits and costs, determining a ratio of 1.05 which exceeds one, this means that for each dollar invested 1.05 is recovered therefore the project if acceptable .

- **Organizational Study**

The organizational structure will be based on a simple structure where the delegation of authority comes directly from the manager of the company, which allows defining the responsibilities of each employee, greater understanding and communication with direct orders, coordinate and designate the positions And tasks to be performed within the organization.

Having no limitation of partners or capital to contribute by these has been legally structured the company as an anonymous company. The anonymous company is a company whose capital, divided into negotiable shares, is formed by the contribution of the shareholders that only respond by the amount of their shares.

4. Conclusions

- In the analysis of the current situation, the availability of raw material was calculated by first-hand information on fiches applied to each of the producers of kidney tomato in the canton, resulting in the Pimampiro parish with the highest production (7563 Tn / year).

- From the market study, 19.11% of unsatisfied demand was obtained, mainly due to the absence of companies dedicated to the dehydration of this product in the province of Imbabura, which makes it impossible to acquire the product for the interested persons.

- In the technical study was determined; The macro location of the company in the Pimampiro canton being the most appropriate for its location, and its micro location in the parish of the same name giving priority to the proximity with the raw material; The capacity of the plant which is delimited by the maximum production capacity of the machinery of 800 kg / day, having an initial production of 64.35 kg of finished product; The engineering of the project by means of the elaboration of the map of processes establishing the management, operative and support processes, that will intervene in the elaboration of the dried kidney tomato and the activities of each one of them were represented by flow diagrams.

- The realization of the cash flow allowed to know the viability of the project through the interpretation of the criteria of financial evaluation; NVP positive of USD 34,211.00, IRR of 39% and cost benefit ratio of 1, 05.

- The type of company that best meets the requirements of the company is the company Anonymous because it is intended to attract more investors over time.

Gratitude

To God for always being with me.

To my Family for always supporting me and respecting my decisions.

To the Technical University of the North, to the race of Industrial Engineering for having formed me for my professional life.

To the Economist Winston Oviedo for having guided me in the elaboration of this work.

To my friends and fellow friends for having shared with me these five years of learning.

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