In the name of God

Pre-feasibility study form

Plan Name: Production of dairy starters

Employer: Chaharmahal and Bakhtiari Industrial Estates Co.

Consulting Company: Kavosh Consultants Co.

Project Address: Shahrekord Industrial Estate

Date: ۲۰۲۲

Update:۲۰۲٤

SUMMARY OF THE FEASIBILITY STUDY

general information
Project title: Feasibility studies for the Production of dairy starters
Project capacity: ٥٠٠ tons per year
Employment rate: ٢٤ people
Working days: ٢٨٨ days
Product uses: food industry
Market
Global price of the product: about ٣ dollars
Domestic demand: about ١,٥ million tons in the next five years
Domestic production: about one million tons
Import: -
Export: ٤٣٠ thousand tons
Technical study
Land area: ٥٠٠٠
Building area: ٢٣٩٠
Main raw materials: acetic acid bacteria and...
How to supply raw materials: internal-external
Required electricity: ١،٠٠٠،٠٠٠ kilowatt hours
Required water: ٧٠,٠٠٠ cubic meters
Required fuel: ١/١٠٠/٠٠٠ cubic meters
Financial and economic study
Fixed investment amount: ٧٧٨٠١٩ million rials- ١،٤١٧،١٥٧ euro
Working capital: ٧٨٥٩٢ million rials- ١٤٣،١٥٥ euro
Total investment: ٨٥٦٦١١ million rials- ١،٥٦٠،٣١١ euro
Annual profit: ٢٢١٥٠٠ million rials- ٤٠٣،٤٦١ euro
Net Present Value (NPV): ٧١٣٨٤٣ million rials- ١،٣٠٠،٢٦٠ euro
Breakeven point (BEP): ٧٤٤٠٠٠ million rials- ١،٣٥٥،١٩١ euro
Internal rate of return (IRR): ٢٦٪
Payback period: ٤ years
Investment Sources Ratio Equity: ٣٠٪ Financing: ٧٠٪

CONTENTS	PAGE
INTRODUCTION	۵
۱- PRODUCT INTRODUCTION	۵
۱-۱-PRODUCT NAME AND CODE (ISIC ۳)	۷
۱-۲-CUSTOMS TARIFF NUMBER	۷
۱-۳-IMPORT AND EXPORT CONDITIONS	۷
۱-٤- REVIEW AND PRESENTATION OF STANDARDS (NATIONAL OR INTERNATIONAL)	۷
۱-٥- REVIEWING AND PROVIDING NECESSARY INFORMATION ON DOMESTIC AND GLOBAL PRODUCTION PRICES AS WELL AS GLOBAL PRODUCT PRICES	۸
۱-٦- EXPLAIN THE USES OF THE PRODUCT	۸
۱-۷-EXAMINE ALTERNATIVE PRODUCTS AND ANALYZE THEIR EFFECTS ON PRODUCT CONSUMPTION	۸
۱-۸-STRATEGIC IMPORTANCE OF GOODS IN IRAN AND COUNTRIES OF THE REGION	۹
۱-۹-MAJOR MANUFACTURING AND CONSUMER COUNTRIES	۱۰
۲- SUPPLY AND DEMAND SITUATION IN IRAN AND COUNTRIES IN THE REGION	۱۱
۲-۱-AN EXAMINATION OF EXPLOITATION CAPACITY AND PRODUCTION PROCESS FROM THE BEGINNING OF THE THIRD DEVELPOMENT PLAN TO NOW	۱۱
۲-۲-CHECK THE STATUS OF NEW PROJECTS AND ONGOING DEVELOPMENT PLANS	۱۲
۲-۳-REVIEWING THE PROCESS OF PRODUCT IMPORTATION	۱۲
۲-٤-MONTORING CONSUMPTION TRENDS	۱۳

۲-۵-INVESTIGATE THE EXPORT AND THE POSSIBILITY OF ITS DEVELOPMENT	۱۳
۲-٦- PRODUCT REQUIREMENT CHECK WITH EXPORT PRIORITY	۱۳
۳-OVERVIEW OF TECHNOLOGY AND METHODS OF PRODUCTION AND SUPPLY IN THE COUNTRY AND COMPARISON WITH OTHER COUNTRIES	۱۴
٤-DETERMINING THE STRENGTHS AND WEAKNESSES OF CONVENTIONAL TECHNOLOGIES IN THE PRODUCT MANUFACTURING PROCESS	۱۵
۵- INVESTIGATE AND DETERMINE THE MINIMUM ECONOMIC CAPACITY, INCLUDING ESTIMATING THE VOLUME OF FIXED INVESTMENT IN RIAL AND FOREIGN CURRENCY	۱۶
٦-THE AMOUNT OF RAW MATERIAL NEEDED ANNUALLY AND WHERE IT IS SUPPLIED	۲۱
۷-RISK ANALYSIS OF PROJECT IMPLEMENTATION	۲۱
۸- HUMAN RESOURCES AND NUMBER OF JOBS	۲۱
۹- CHECK AND DETERMINE THE AMOUNT OF WATER, ELECTRICITY, FUEL AND ...	۲۲
۱۰- CONDITIONS OF ECONOMIC AND COMMERCIAL SUPPORT	۲۳
۱۰-۱- CUSTOMS TARIFF SUPPORT (PRODUCTS AND MACHINES) WITH GLOBAL TARIFFS	۲۳
۱۰-۲- FINANCIAL SUPPORT (EXISTING UNITS AND PLANS) OF BANKS - INVESTOR COMPANIES	۲۳
۱۱-ANALYZING AND PRESENTING FINAL CONCLUSIONS AND PROPOSALS FOR THE CONSTRUCTION OF NEW UNITS	۲۴

Introduction

Feasibility studies are expert studies that are carried out prior to the implementation of economic investment plans. In these studies, from the market, technical, financial and economic point of view, the plan is analyzed and its results used as a basis for investor decision making.

The present report is a feasibility study of Production of dairy starters. These studies have been prepared in the framework of feasibility studies methodology and according to the above methodology, the economic capacities and volume of investments required to execute the project will be estimated and presented so that investors and interested stakeholders can obtain all the information needed. Earn money and start investing in open-ended, open-minded economic investment. It is hoped that these auxiliary studies, however small, will contribute to the development of our country.

۱ -Product Introduction

Starters are used in various industries such as dairy industry, beer production, pickles, pickles and bread fermentation. The starter is the microorganisms that change the smell, taste and shape of the ingredients, causing the production of a new food item. This raw material in the production of dairy products such as cheese, yogurt, etc. is known as starter culture.

In general, the microorganisms that initiate a fermentation process are called dairy starters or culture starters. Dairy starter uses lactose in milk and causes lactic acid production; which will also cause milk fermentation and production of dairy products; In this text from the eig-shop website, the types of dairy starters and the use of each in this industry are discussed.

Lactic acid bacteria used in the dairy industry are:

Lactococcus

Lukonostok

pediococcus

Streptococcus

Lactobacillus

It should be noted that these starters are also used to some extent in other food industries.

Types of dairy starter

Starters are usually produced in two types: Direct and Indirect (Bulk). The direct starter does not need any preparation and is added directly to the milk. But in order to use the indirect starter, it is necessary to pass and prepare it first.

This indirect starter has a lower cost than direct starters, but due to the difficulty of passage work and its preparation and the need for experienced staff, most dairy industry producers have turned to using direct starters.

Our starter

In order to turn milk into yogurt, a starter is used, which in addition to aroma and taste, also gives a suitable concentration to the primary milk. Generally, for this purpose, Streptococcus and Lactobacillus are added to Stator's milk and then sent to the greenhouse. This starter produces a thicker and jelly-like solution by consuming milk sugar (lactose) and acidifying it (which is called yogurt).

In this case, the harmful bacteria are not allowed to work and the beneficial bacteria produce yogurt with a different taste and smell than milk. For the production of this dairy product, thermophilic bacteria are used, which start working at a temperature of ٤٠ to ٤٥ degrees Celsius; For this reason, it is necessary to transfer the solution to the greenhouse or process tank after adding the starter to the milk; to provide the necessary temperature for milk fermentation.

Special molds are usually used to produce molded yogurt, and process tanks can be used to produce stirred yogurt.

Buttermilk starter

In order to produce buttermilk, starters are used to produce a sour and carbonated product by acidifying milk. In the production of buttermilk, like yogurt, it is necessary to use greenhouses. Yeast starters start working at high temperature.

It should be noted that you can also use buttermilk to produce buttermilk in a traditional way! For this purpose, pour yogurt and water into the butter machine and then get sour and natural butter and buttermilk.

Sour cream starter

Mesophilic bacteria such as Streptococcus turn milk into sour cream by reducing the pH of milk and producing diacetyl. These bacteria work at a temperature of ١٢ to ١٥ degrees Celsius.

Cheese starter

Unlike other dairy products, mold starters are used in cheese production. This dairy starter also causes the production of lactic acid by changing and reducing the pH of milk. With the growth of this mold,

water is separated from the tissue and the tissues stick to each other. After that, a soft texture with a pleasant aroma and taste is produced, which is the same as cheese.

kaffir

Kefir is a sour, acidic and carbonated drink that is similar to carbonated buttermilk. For the production of this product, kefir seeds, which originated in the Caucasus, are used. This kefir yeast is added to milk and in less than ٢٤ hours, curd with low concentration and different taste is produced. Kefir buttermilk has more probiotics than other dairy products.

١-١-Product Name and Code (ISIC ٣)

According to the information obtained from the Ministry of Industry, Mining and Trade, the ISIC code of the products mentioned in this plan is ١٥٤٩٤١٢٥٣٦.

١-٢-Customs Tariff Number

According to the book of export and import regulations of ٢٠٢٤ and the service and information portal of industry, mining and trade, the product of this project is in the category of customs tariff code ٠٤٠٥.

١-٣- IMPORT AND EXPORT CONDITIONS

Basic rights include customs duties, taxes, the right to register goods, various duties and other funds received from imported goods. The sum of these receipts and commercial profit, which is determined by the Cabinet of Ministers according to the relevant laws, is referred to as input rights. The import duty for the products of this plan is ٣٢٪.

١-٤- REVIEW AND PRESENTATION OF STANDARDS (NATIONAL OR INTERNATIONAL)

There is no direct standard for Electric converters (inverters) and controllers. The standards are similar to this plan as follows:

Standard Name	Standard Number	Description
National standard	١۴٠٩۴	Milk fermentation products - bacterial starter cultures - identification
National standard	١٠١۵۴	Milk and its products - Counting of mold or yeast colony forming units - Colony count in a plate at ٢۵C٠

National standard	۹۶۱۵	Milk and its products - Mesophilic starter cultures - Enumeration of citrate fermenting lactic acid bacteria - Colony counting method at ۲۵C۰

Source: http://www.isiri.org/

۱-۵- REVIEWING AND PROVIDING NECESSARY INFORMATION ON DOMESTIC AND GLOBAL PRODUCTION PRICES AS WELL AS GLOBAL PRODUCT PRICES

According to the announcement of the Chamber of Commerce, Industries, Mines and Agriculture, the export price of this product was about ۳ dollars per kilogram, and its global price is also the same.

۱-۶- EXPLAIN THE USES OF THE PRODUCT

Starters are the main raw material in dairy production. By changing the texture and taste of milk, these bacteria produce a variety of dairy products and even add many properties to them. In general, the shape, taste and aroma of yogurt, cheese, buttermilk, etc. are created by adding starter to milk. By adding starter culture to the milk, the following changes will occur:

Create lactic acid

Create texture

Create flavor

Addition of beneficial microorganisms

۱-۷-EXAMINE ALTERNATIVE PRODUCTS AND ANALYZE THEIR EFFECTS ON PRODUCT CONSUMPTION

Bacterial starters are generally divided into ۳ categories:
Mesophilic starters
Thermophilic starters
Traditional mixed starters
Each of these starter bacteria is also divided into two types: Defined and Undefined. Defined types are a mixture of known strains. Traditional starters are obtained by keeping milk or cheese under certain conditions and are usually of the Undefined type. In addition to the above starters, there are also special starters, including fungi (mold and yeast) and probiotic starters.
What microorganisms are used to produce primers?
The acetic acid bacteria that are used in the preparation of starter bacteria include ۹ genera. The constituent members of these genera also include:
Streptococcus
Lactobacillus

Lukonostek
Lactococcus
Enterococcus (which is used to a much lesser extent than others)
All these genera are gram positive and catalase negative, and sugar fermentation in them is done anaerobically. The product of this fermentation is lactate or a mixture of CO۲, lactate, ethanol and acetate. In some cases, Propionibacterium and Bifidobacterium species are used for some products.
Since lactose is the main precursor in the dairy industry, lactic starters are often used today. Also, starter culture and fermentation process are used in other parts of the food industry, such as meat products and fruits and vegetables.
Commercial dairy starters
Business starters in the world can be divided into two general categories:
Direct type (Direct or DVS)
Bulk type
DVS dairy starter does not require any preparation steps when used and can be added directly to the growth medium. The growth medium is actually the raw material that will later become the desired product, such as making yogurt from milk. This process is called inoculation.
It is necessary to prepare indirect dairy starters before use. This means that it should be reproduced in several stages. Usually, the first stage dairy starter is obtained by adding powdered starter to the growth medium and it is called mother or primary starter. The dairy starter of the second stage is also obtained by spreading the starter of the first stage in the growth medium. This dairy starter is called secondary or intermediate. The third stage dairy starter is also obtained by spreading the second stage starter in the growth medium. The initiator of the third stage is called bulk or industrial starter.
Comparison of direct and bulk dairy starters
Tudeh starters have a lower cost than the types of setqim. However, today we see an increase in the interest of dairy product manufacturers in using direct starters, the reason for this is:
Propagation of bulk primers is an expensive process.
It requires professional and trained personnel as well as special conditions.
Controlling the multiple multiplication steps is also very difficult due to the possibility of contaminating the primers with undesirable microorganisms. Therefore, it needs special tanks and places under control.
Due to these cases, the use of direct dairy starters, even though they have a higher cost, has received more attention. Choosing between the use of industrial or direct starter is one of the most important strategic decisions of the management department of a factory producing fermented dairy products.

۱-۸-STRATEGIC IMPORTANCE OF GOODS IN IRAN AND COUNTRIES OF THE REGION

These products can be used in all dairy industries of the country. Dairy starter is known as one of the basic raw materials of the dairy industry and has a strategic application in the food industry. The domestic production of this product can also have a significant currency gain while preventing the outflow of foreign currency. One of the unique aspects of the production of this product will be the strategic independence of the country's dairy industry. Because dairy producers necessarily need starters, and therefore the foreign supplier of these products actually dominates the country's food industry, and due to the good per capita consumption of dairy products in the country, it will also be in charge of controlling people's diet.

Reasons for using the starter

١- Technological

Create lactic acid

Create flavor

Create texture

٢- nutritional

There is no need for microorganisms to be alive in the intestine.

Starters are used in buttermilk, yogurt, cheese, kefir, sour cream, kombucha tea, fermentation and bread production industries. These microorganisms have done a great service to mankind by producing useful bacteria and preventing the growth of harmful bacteria

Some of these starters are added to produce a pleasant taste and smell, while others are added to the milk to achieve a suitable concentration.

Due to the increasing population and the beginning of the industrial revolution and the mechanization of people's lives, the need for food in the world, especially animal proteins (dairy and meat), has grown significantly in recent centuries. One of the strategic and widely used food sources during this time, food sources containing calcium, especially dairy products.

١-٩-MAJOR MANUFACTURING AND CONSUMER COUNTRIES

The largest producing country:

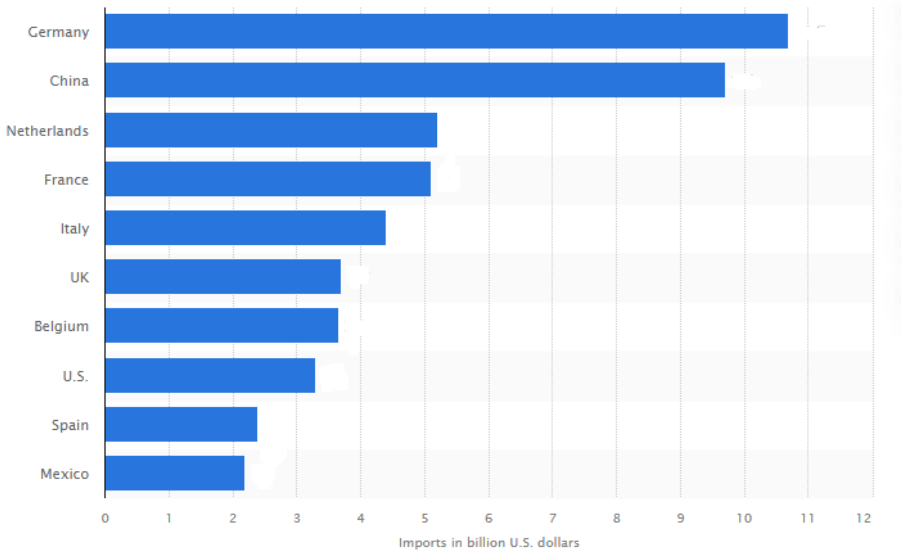
Denmark

Netherlands

France

Italy

The largest importing countries:



Although the names of some commercial starter manufacturers may have been missed in the list below, the most famous commercial starter manufacturers in the world are as follows:

١) Danisco company that produces the starter under the Danisco brand name (Denmark)

٢) Danish Christian Hansen company, which produces starters under the brand name CHR-Hansen.

٣) The DSM company in Holland, which produces the starter under the Delvo brand (Netherlands)

٤) Bio Prox company that produces the starter under the Bio Prox brand name (France)

٥) Dalton, Italy, which produces the starter under the Dalton brand (Italy)

٦) Clerice Sacco company that produces the starter under the Sacco brand (Italy)

٧) Lactina company that produces the starter under the Lactina brand (Bulgaria)

٨) Maysa company that produces the starter under the Maysa brand name (Turkey)

٩) Caminux company that produces the starter under the Caminux brand name (Spain)

٢- SUPPLY AND DEMAND SITUATION IN IRAN AND COUNTRIES IN THE REGION

٢-١-AN EXAMINATION OF EXPLOITATION CAPACITY AND PRODUCTION PROCESS FROM THE BEGINNING OF THE THIRD DEVELPOMENT PLAN TO NOW

The following figure and table show the specifications and capacity of units active in the field of Production of dairy starters based on the statistics of the Ministry of Industry, Mines and Trade:

Province/City/Region	Number of units	capacity (tons)
Tehran	۳	۱,۰۴۵
Chaharmahal va Bakhtiari	۱	۵۰
Total	۴	۱,۰۹۵

Source: Ministry of Industry, Mining and Commerce - Statistics and Information Center

۲-۲-CHECK THE STATUS OF NEW PROJECTS AND ONGOING DEVELOPMENT PLANS

By referring to the industrial database of the Ministry of Industry, Mines and Trade, the status and specifications of new projects creating Production of dairy starters have been collected and entered in the following table:

Province/City/Region	Number of units	capacity (tons)
Qom	۱	۲،۰۰۰
Khorasan Razavi	۱	۲،۰۰۰
Mazandaran	۱	۵۰۰
Semnan	۱	۳۰۰
Central	۱	۱۰۰
Chaharmahal va Bakhtiari	۱	۵۰
Qazvin	۱	٤٤
Esfahan	۱	۲۵
Alborz	۱	١٤
Total	۹	۵،۰۳۳

۲-۳-REVIEWING THE PROCESS OF PRODUCT IMPORTATION

According to the Chamber of Commerce, Industries, Mines and Agriculture, the import statistics for the last five years are as follows:

Year	Weight (kg)	Rial value	Dollar value
۲۰۱۹	۵۰،۰۵۷،۶۳۲	۳۸،۴۵۵،۷۹۱،۳۷۵،۰۰۰	۳۰۷،۵۵۰،۶۴۲
۲۰۲۰	۹،۸۰۱،۲۷۵	۲،۰۶۴،۸۴۳،۶۵۰،۶۹۵	۵۱،۴۶۲،۹۵۲
۲۰۲۱	۴۲۳،۰۵۰	۱۱۰،۰۳۷،۳۰۰،۱۱۱	۲،۶۱۹،۹۳۷

۲۰۲۲	۰	۰	۰
۲۰۲۳	۰	۰	۰

Source: Tehran Chamber of Commerce, Industries, Mines and Agriculture

۲-٤-MONTORING CONSUMPTION TRENDS

According to the latest statistics available in ۲۰۲۳, the amount of import was ۰ ton, and the amount of export was about ۱٦ thousand tons, and we had about one million tons of production. The consumption of this product has been increasing in recent years due to the country's industrial development and is expected to reach ۱,٥ million tons per year in the near future.

۲-٥-INVESTIGATE THE EXPORT PROCESS OF THE PRODUCT AND THE POSSIBILITY OF ITS DEVELOPMENT

According to the Chamber of Commerce, Industries, Mines and Agriculture, the export statistics for the last five years are as follows:

Year	Weight (kg)	Rial value	Dollar value
۲۰۱۹	٦۳.۴۴۷	۳٦.۴۸۱.۳۴۳.۲۳۷	۲۹۱.۸٥۱
۲۰۲۰	۷۷.۴٥۱	٥۳.٥۹٦.۰۹۷.۹٦٥	۲۴٦.٥۰٥
۲۰۲۱	۴.۲۹۱.۷٦۹	۳.۸۸۷.۹۱۳.۷۰۸.۹۸۳	۱٦.۴۸۳.۳۷۱
۲۰۲۲	۱٥.۰۳۴.۸۷۱	۱٥.۲٦۹.۸۲۷.۸۰٥.۸٦٥	٥۳.۳٦۳.۰۱۰
۲۰۲۳	۱٥.۷۲۲.۹۳۹	۲۱.۲٦٦.۰٦۲.۴۱۲.٦۱۸	٥٥.۳۲۳.٦۲۸

Source: Tehran Chamber of Commerce, Industries, Mines and Agriculture

۲-٦- PRODUCT REQUIREMENT CHECK WITH EXPORT PRIORITY

With the investigations carried out in the market sector (dairy starter justification plan), it is quite clear that the production of starters is internally justified due to its strategic nature in the production of dairy products and the absence of an active unit, which actually shows the high dependence of this product on imports. And in terms of the product market, the problem will not threaten the production units.

Also, according to the amount of demand in the coming years, it is clear that there will be a growing trend, and the domestic market always needs this strategic product in the dairy industry. It is considered a threat, perhaps because of the upcoming sanctions, more efforts should be made to produce it in the country.

It is hoped that with the support of this industrial unit, while being self-sufficient in its production, Iran's dairy industry will achieve great power in the country and the region.

In many advanced countries, export is the main axis of development and is very important in the presence of that country in the world markets. Domestic production and its arena in the global competition market or in other words export is one of the factors that can make countries independent. The importance and necessity of the presence of a country's products in the world market and the international economic environment is one of the most important development factors. The role of export is so important that many experts consider export to be the only successful path to the economic development of a country in the world market.

Therefore, here, while proving the possibility of exporting in the coming years, it can be said that in case of marketing and adopting appropriate strategies, there is also the possibility of exporting.

۳-OVERVIEW OF TECHNOLOGY AND METHODS OF PRODUCTION AND SUPPLY IN THE COUNTRY AND COMPARISON WITH OTHER COUNTRIES

The dairy starter produced in this project is obtained from the bacteria Streptococcus thermophilus, Lactobacillus bulgarius and Bifidobacterium lactis, which is one of the best live and active microorganisms used in the dairy industry. These bacteria cause the production of products with a pleasant aroma and consistency and compatible with Iranian taste.

Isolation of the basic microorganisms that produce dairy products (Lactobacillus delbruecki subsp. bulgaricus and Streptococcus thermophilus) including ۱- initial culture of colony isolation, PCR molecular tests and sequencing and bioinformatics, confirmatory and biochemical tests according to the national standard of Iran from the first stage of this process Is.

In the second stage, screening tests of the best yogurt producing strain and examining the internal factors of the strains include measuring the amount of lactic acid production and measuring the amount of aromatic compounds production, measuring the amount of exopolysaccharide (EPS) production, and measuring the ability to ferment lactose sugar. And the investigation of the strains containing the plasmid carrying the citrate permease gene, the investigation of the comparison of the gene composition of the investigated strain with the control sample was done by bioinformatics method and the design of growth curves. ۲-External factors, performing clot tests, checking the rheological characteristics (viscosity and hardness) and physical characteristics (watering-۵-level hedonic sensory evaluation-taste-color-spooning) is another stage of the production line process.

In the third stage, optimization of the culture medium and in the fourth stage of lyophilization include "use of research lyophilizer - preparation of industrial lyophilizer, preparation of industrial

lyophilizer is done. Also, in the fifth stage of formulation including "optimization of inoculation ratio - final cant - industrial production - lyophilization is done.

٤-DETERMINING THE STRENGTHS AND WEAKNESSES OF CONVENTIONAL TECHNOLOGIES IN THE PRODUCT MANUFACTURING PROCESS

Efficiency, high quality and ease of production are among the most important advantages of the mentioned methods. The production of this product requires a strict quality management process, which is mentioned below.

The growth and development of the world's industries is largely due to the competition between industrial units. In this regard, every industrial unit tries to gain a greater share of the market by increasing the quality of its products, and this trend over time has improved the quality of products and, as a result, the growth of industrial societies. Quality control is performed to determine the correctness of the production process, according to the technical specifications determined for the product. This operation causes to prevent the production of defective products, the wastage of capital is prevented and the finished price of the product is reduced.

In general, the objectives of quality control can be summarized as follows:

• Maintaining the established standards
• Diagnosing and improving deviations in the production process
• Diagnosing and improving non-standard products
• Evaluating the efficiency of the people of the units

In other words, it can be said that quality control means ensuring the supply and production of goods and services according to the standards.

It is determined and inspection is performed as one of the inseparable components of quality control in order to identify defects and provide the information needed for the quality control system in all industrial units.

The general inspection steps according to the status of each industry are as follows:

١) In the phase of handing over raw materials
٢) In the stage of starting production
٣) Before the start of operations
٤) Before starting irreversible operations
٥) Before the start of the operation that causes defects to be covered
٦) In the final stage of the work

Each of these inspection steps may be done at the operation site or laboratory.

In this unit, according to the characteristics of this industry, each of the necessary stages of quality control and the location of these tests are determined.

will be. According to what was said, quality control should be applied in three stages.

١) Quality control of raw materials
٢) control during production
٣) Final control
٤) Quality control of raw materials

٥- INVESTIGATE AND DETERMINE THE MINIMUM ECONOMIC CAPACITY, INCLUDING ESTIMATING THE VOLUME OF FIXED INVESTMENT IN RIAL AND FOREIGN CURRENCY

Explanation: Euro exchange rate based on the national exchange – Dated: september ٢٠٢٤ - amount: ٥٤٩٠٠٠ rials

Project Investment Schedule:

Description	Cost (Million Rials)	Cost (Euro)
Land	٧٥٠٠٠	136,612
Landscaping	٥٠٤٥٠	91,894
Construction	٢٢٦٥٠٠	412,568
Production line machinery and equipment	٣٢٩٠٠٠	599,271
laboratory equipment	٦٠٠٠	10,929
Utilities	١٥٠٠٠	27,322
transportation	٣٤٠٠٠	61,931
Office equipment	٥٠٢٠	9,144
Miscellaneous and unforeseen	٣٧٠٤٩	٩٥،٠٩٨
Total	٧٧٨٠١٩	1,417,157

The ground specification of the project implementation is as follows:

Description	Area (m ٢)	Unit Price (Rials)	Total (Million Rials)	Total (Euro)

Land	٦٠٠٠	١٥/٠٠٠/٠٠٠	٧٥٠٠٠	136,612

The cost of landscaping is as follows:

Description	Area	Unit Price (Rials)	Total (Million Rials)	Total (Euro)
Digging and leveling	۶۰۰۰	۹۰۰۰۰۰۰	۴۵,۰۰۰	۸۱,۹۶۷
Fencing	۳۲۰	۸۰۰۰۰۰۰	۲,۴۰۰	۴,۳۷۲
Asphalt and pavement paving	۳۲۰	۶۵۰۰۰۰۰	۱,۹۵۰	۳,۵۵۲
Green space and lighting	۲۳۰	۵۵۰۰۰۰۰	۱,۱۰۰	۲,۰۰۴
Total			۵۰,۴۵۰	۹۱,۸۹۴

Building Information:

Description	Building type	Area	Unit Price (Rials)	Total (Million Rials)	Total (Euro)
Production	Niches	۱۵۰۰	۹۰۰۰۰۰۰۰	۱۳۵,۰۰۰	۲۴۵,۹۰۲
Raw materials and supplies	Niches	۶۵۰	۹۰۰۰۰۰۰۰	۵۸,۵۰۰	۱۰۶,۵۵۷
Office building and services	Official	۱۶۰	۱۵۰۰۰۰۰۰۰	۲۴,۰۰۰	۴۳,۷۱۶
Utilities	Niches	۵۰	۱۲۰۰۰۰۰۰۰	۶,۰۰۰	۱۰,۹۲۹
Guard		۳۰	۱۰۰۰۰۰۰۰۰	۳,۰۰۰	۵,۴۶۴
Total		۲۳۹۰		۲۲۶,۵۰۰	۴۱۲,۵۶۸

Utilities:

Description	Cost (Million Rials)	Cost (Euro)
Power Supply	۴۰۰۰	۷,۲۸۶

Water and Wastewater	۱۵۰۰	۲,۷۳۲
Fuel	۲۰۰۰	۳,۶۴۳
Heating and cooling equipment	۳۰۰۰	۵,۴۶۴
Protective equipment and security system	۱۰۰۰	۱,۸۲۱
Compressed air supply	۳۵۰۰	۶,۳۷۵
Total	۱۵۰۰۰	۲۷,۳۲۲

Transportation:

Description	Technical Specifications	Cost (Million Rials)	Cost (Euro)
Forklifts	۵ ton	۲۲۰۰۰	40,073
Pickup	Nissan	۶۰۰۰	10,929
Riding	Samand	۶۰۰۰	10,929
Total		۳۴۰۰۰	61,931

Equipment and Machinery:

Manufacturing machinery is the most important part of industrial investment. The machinery of each manufacturing complex determines the quality and variety of products, production technology, raw materials, and many of the methods, costs of production, and even the finished product price. Machinery selection is a critical and influential factor in the macroeconomic indicators of the plan. The cost of producing the machinery and equipment of the production line is estimated on the basis of inquiries from major manufacturing companies or reputable agencies. It also calculates the cost of procuring machinery, including shipping, installation, customs duties, and so on.

The world's leading companies producing the main equipment for the Production of dairy starters process can be listed as follows:

The prices of all companies are almost in the same range and finally with a difference of ۱۰٪. The price of machines for this process is shown in the following table:

Number	Name	Required amount	Currency (Euro)	cost (million rials)	Rial sum (million rials)	supply (domestic foreign)
۱	Primary culture machines for colony isolation,	۱	127,505	۷۰۰۰۰	۷۰۰۰۰	

	molecular PCR and sequencing and bioinformatics tests, confirmatory and biochemical tests					Local-Foreign
٢	Machines for the screening tests of the top strain of the yogurt producer and checking the internal factors of the strains	١	89,253	۴۹۰۰۰	۴۹۰۰۰	
٣	Machines for optimizing the cultivation environment	١	102,004	۵۶۰۰۰	۵۶۰۰۰	
٤	Lyophilization machines	١	114,754	۶۳۰۰۰	۶۳۰۰۰	
٥	The formulation machine includes "optimization of inoculation ratio - final cant - industrial production - lyophilization	١	89,253	۴۹۰۰۰	۴۹۰۰۰	
٦	other	١	76,503	۴۲۰۰۰	۴۲۰۰۰	
Total (million rials)				۳۲۹۰۰۰		
Total (Euro)				۵۹۹,۲۷۱		

laboratory equipment:

Number	Name	Currency (Euro)	Rial Cost (Million Rials)	Rial sum million) (rials
١	laboratory equipment	10,929	٦۰۰۰	٦۰۰۰
٢				
Total		٦۰۰۰		

Office equipment:

Number	Name	The required amount	Currency (Euro)	Rial cost per unit	Rial Cost (Million Rials
١	All kinds of tables and chairs	٢۰	۱۰,۹۴۹	۱۵۰	۵,۴۶۴

٢	All kinds of computers, printers and scanners	٥	٢,٢٩٩	١٥٠	١,٣٦٦
٣	Phone and fax	٥	٥٤٧	٥٠	٤٥٥
٤	Fingerprint attendance device	١	٢٥٥	١٢٠	٢١٩
٥	Wireless network and internet equipment	١	١٨٢	٧٠	١٢٨
٦	Office stationery	٤	١٤٦	٢٠	١٤٦
٧	Central control system	١	٥٤٧	٢٥٠	٤٥٥
٨	other	-	١,٠٩٥	٥٠٠	٩١١
Total (Million Rials)		٥٠٢٠			
Total (Euro)		٩١٤٤			

Working Capital Costs:

Name	Description	Cost (Million Rials)	Cost (Euro)
Raw materials and packaging	٦٠ Days	٦٦٦٦٧	١٢١,٤٣٤
salary	٣٠ Days	٦٨٧٤	١٢,٥٢١
Energy costs	٣٠ Days	١٠٧٦	١,٩٦٠
revolving fund	١٥ Days	٣٩٧٥	٧,٢٤٠
Total		٧٨٥٩٢	١٤٣,١٥٥

Production costs:

Description	Cost (Million Rials)	Cost (Euro)
Cost of raw materials and packaging	٤٠٠٠٠٠	٧٢٨,٥٩٧
Salary Cost	٨٢٤٩٢	١٥٠,٢٥٩
Energy costs	١٢٩٠٦	٢٣,٥٠٨
Cost of maintenance	٥١٤٠٠	٩٣,٦٢٥
Unforeseen cost of production	٧٣٨٠	١٣,٤٤٣
Administrative and sales costs	٥٥٤٢	١٠,٠٩٥

Costs of financial facilities	۵۵۹۷	۱۰,۱۹۵
Insurance costs	۷۷۸۰	۱۴,۱۷۱
Depreciation cost	۵۰۰	۹۱۱
Depreciation expense before operation	۵۱۴۰	۹,۳۶۲
Total	۵۷۸,۷۳۷	۱,۰۵۴,۱۶۶

۶-THE AMOUNT OF RAW MATERIAL NEEDED ANNUALLY AND WHERE IT IS SUPPLIED

Number	Description	Consumption per unit product	Unit of consumption	Amount of Consumption Required for Total Capacity	Currency prices (Euro)	Rial equivalent (per unit)	Place of supply	Cost (Million Rials)
۱	Actic acid bacteria (streptococcus Lactobacillus Lukonostek Lactococcus enterococcus)	۰,۸	Kg	۴۰۰	۱,۱۳۸	۶۲۵/۰۰۰/۰۰۰	Local	۲۵۰۰۰۰
۲	Other required additives	۰,۲	Kg	۱۰۰	۲,۷۳۲	۱۵۰۰/۰۰۰/۰۰۰	Import	۱۵۰۰۰۰
Total (Million Rials)								۴۰۰۰۰۰
Total (Euro)								۷۲۸,۵۹۷

۷-RISK ANALYSIS OF PROJECT IMPLEMENTATION

Studies show that in the next year the market will be in short supply and there will be a greater need for imports. So it can be said that the implementation of new projects in this field is not very

risky because in addition to the domestic market there is easily good potential to export this product to neighboring countries and if for any reason the applicant intends to undertake this plan, it is necessary to act with caution and superiority over other industrial units and by examining further the weaknesses and strengths as internal factors as well as opportunities and opportunities. Threats as external factors minimize project risk.

۸- HUMAN RESOURCES AND NUMBER OF JOBS

One important aspect of any industrial unit is its job creation, which is thoroughly examined in the market segment. Due to the nature of the industry and the need for ۲ shifts to work, it has been attempted to select the number of personnel in a manner that addresses the production needs of the two shifts. It has also been tried to use related specialties in different parts of production.
To calculate the amount of annual salaries and benefits, three shifts and other benefits have been added to the annual salary. For this purpose, the annual salary is set at ۱٦,٤ months per year

.

Description	Gender	Number	Monthly salary per person (Million Rials)	Monthly salary (Million Rials)	Annual salaries (Million rials)	Annual salaries (Euro)
Managing Director	Man	۱	۴۰۰	۴۰۰	۶۵۶۰	۱۱,۹۴۹
financial manager	Man	۱	۲۲۰	۲۲۰	۳۶۰۸	۶,۵۷۲
Marketing Manager	Man	۱	۲۲۰	۲۲۰	۳۶۰۸	۶,۵۷۲
Financial, sales and administrative personnel	Female	۱	۱۶۰	۱۶۰	۲۶۲۴	۴,۷۸۰
warehouse keeper	Man	۲	۱۵۰	۳۰۰	۴۹۲۰	۸,۹۶۲
Line Administrator	Man	۲	۱۵۰	۳۰۰	۴۹۲۰	۸,۹۶۲
skilled worker	Man	۲	۱۳۰	۲۶۰	۴۲۶۴	۷,۷۶۷
Semi-skilled worker	Man	۲	۱۲۰	۲۴۰	۳۹۳۶	۷,۱۶۹
worker	Man	۵	۱۰۰	۵۰۰	۸۲۰۰	۱۴,۹۳۶
Service	Female	۱	۹۰	۹۰	۱۴۷۶	۲,۶۸۹
Guard	Man	۲	۱۰۰	۲۰۰	۳۲۸۰	۵,۹۷۴
Driver	Man	۲	۱۲۰	۲۴۰	۳۹۳۶	۷,۱۶۹

Secretary	Female	۲	۹۵	۱۹۰۰	۳۱۱۶۰	۵۶,۷۵۸
Total		۲۴			۸۲۴۹۲	۱۵۰,۲۵۹

۹- CHECK AND DETERMINE THE AMOUNT OF WATER, ELECTRICITY, FUEL AND ...

Description	Unit	annual consumption	Cost per unit in Rials	Total Cost (Million Rials)	Total Cost (Euro)
Power Consumption	KWh	۱/۰۰۰/۰۰۰	۵۰۵۲	۵۰۵۲	۹,۲۰۲
Water Consumption	Cubic meters	۷۰/۰۰۰	۳۳۶۲۲	۲۳۵۴	۴,۲۸۸
Gas	Cubic meters	۱/۱۰۰/۰۰۰	۵۰۰۰	۵۵۰۰	۱۰,۰۱۸
Total			۱۲۹۰۶		۲۳,۵۰۸

۱۰- CONDITIONS OF ECONOMIC AND COMMERCIAL SUPPORT

۱۰-۱- CUSTOMS TARIFF SUPPORT (PRODUCTS AND MACHINES) WITH GLOBAL TARIFFS

The customs tariff support includes two parts of the import tariff for machinery and materials required by the export customs rights plan for the products of the production unit, which should be selected and applied for the growth of the industry. The import duty of foreign machines required by the project is about ۱۰٪, like most industrial machines, which is a suitable tariff and does not impose a high cost on investors. On the other hand, in recent years, the government has provided incentives for products that have the ability to compete in international markets and can be exported abroad, and gives export awards to these units, this has caused the volume of non-oil exports to increase. The country has enjoyed good growth in recent years despite the problems and obstacles. Therefore, in the case with good quality and reasonable price, you can benefit from government incentives.

۱۰-۲- FINANCIAL SUPPORT (EXISTING UNITS AND PLANS) OF BANKS - INVESTOR COMPANIES

Financial support for production units includes the granting of bank facilities and how to repay them, as well as tax exemptions, which, if appropriate, facilitate the implementation of the plan and provide conditions for the investment of entrepreneurial people. Some of these conditions are discussed below.

-One of the important banking facilities for production units is the payment of bank loans up to ٧٠٪ of fixed investment by the country's state banks. This amount can be increased for deprived areas.

-The interest rate of riyal facilities in the industrial sector is ١٢٪, and for some cooperative companies and units built in deprived areas, a part of the facility interest is paid by the government to the banks as a subsidy.

-The repayment period of long-term bank facilities, according to the nature of the production plan, the type of technology and the possibility of exporting the product, is up to ٨ years.

-Another important banking facility is short-term bank loans (٦ to ١٢ months) to be used as working capital needed to carry out production processes, which the banking network provides up to ٧٠٪ of. Obtaining short-term facilities up to this amount depends on winning the trust of the operating banks and having a favorable record in repaying the previously received facilities.

-In addition to the bank facilities that exist for the construction of new production units, to encourage investors and guide them to build factories, the following tax exemptions have been considered:

- Tax exemption for up to ١٠ years for project implementation in deprived areas
- Tax exemptions for up to ٤ years for project implementation in industrial towns
- The tax for normal areas is defined as ٢٥٪ of gross profit.

١١-ANALYZING AND PRESENTING FINAL CONCLUSIONS AND PROPOSALS FOR THE CONSTRUCTION OF NEW UNITS

According to the details of the studies, it can be concluded that the creation of new units for the production of this product is justified, the causes of which can be stated as follows:

- The market situation in the future is evaluated as a lack of supply.
- Every year, a part of the country's needs is met through imports.
- In the past years, exports have enjoyed a good increasing trend, and therefore it is expected that the amount of exports can continue to increase in the coming years due to the existence of a relative advantage in our country compared to some countries in the region.
-

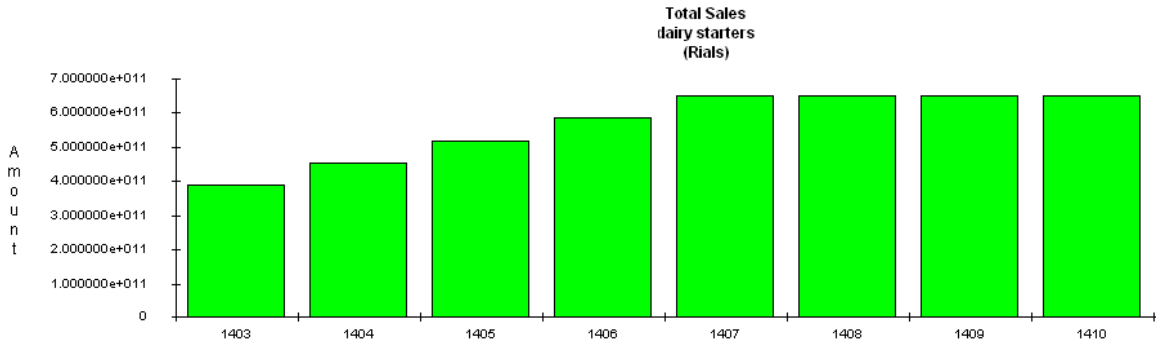
- The plan is to start operating at ٦٠ percent capacity in the first year and increase below capacity in the following years, respectively.

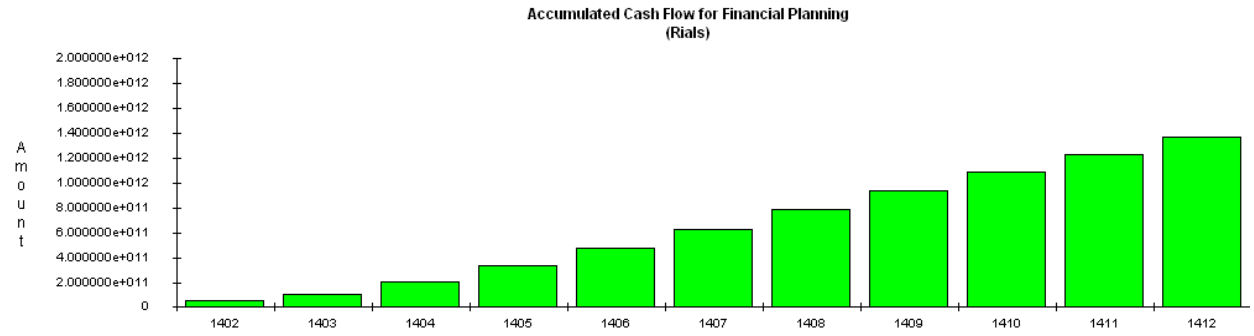
Year	First Year	Second Year	third year	forth year	Fifth year
Capacity(%)	٦٠ %	٧٠ %	٨٠ %	٩٠ %	١٠٠ %
Production capacity (ton)	٣٠٠	٣٥٠	٤٠٠	٤٥٠	٥٠٠

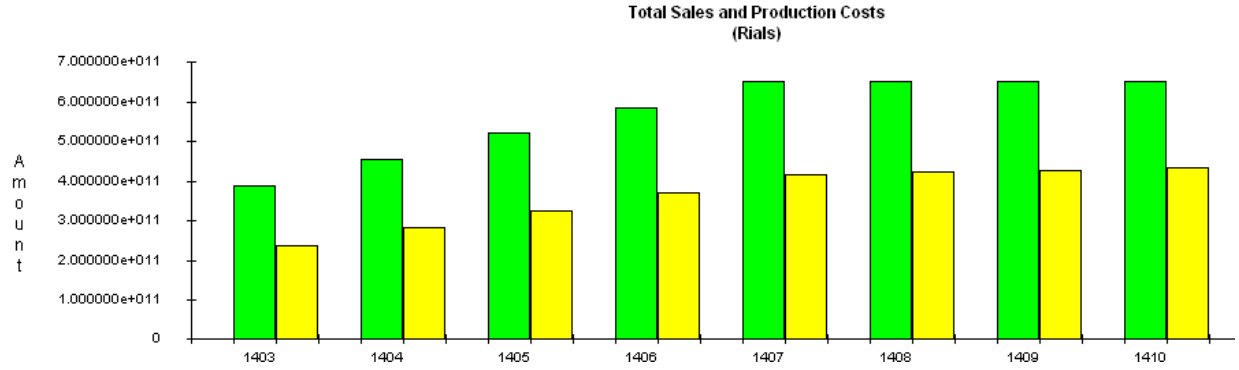
prime cost	١١٥٧ million rials/Per Ton –٢١٠٧ Euro
Selling prices of products	١٦٠٠ million rials/Per Ton – ٢٩١٤ Euro
Total Sales (Million Rials)	٨٠٠,٠٠٠ million rials - ١,٤٥٧,١٩٥ euro
Percentage of sales at the point head to head	٩٣
Profit (Million Rials)	٢٢١,٥٠٠ million rials - ٤٠٣,٤٦١ euro
Gross Value Added (Million Rials)	٥٦،٦١١ million rials - ١٠٣،١١٧ euro
Net Value Added (Million Rials)	٥١٤٧١ million rials - ٩٣,٧٥٤ euro

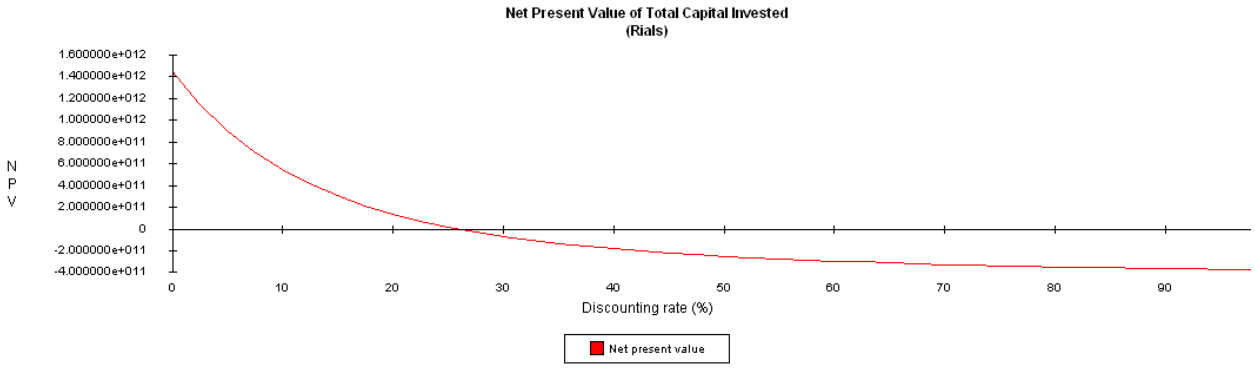
Ratio of gross value added to total sales	۰/۰۷
Ratio of net added value to total sales	۰/۰٦
Ratio of gross value added to investment	۰/۰۷
Return of capital	٤

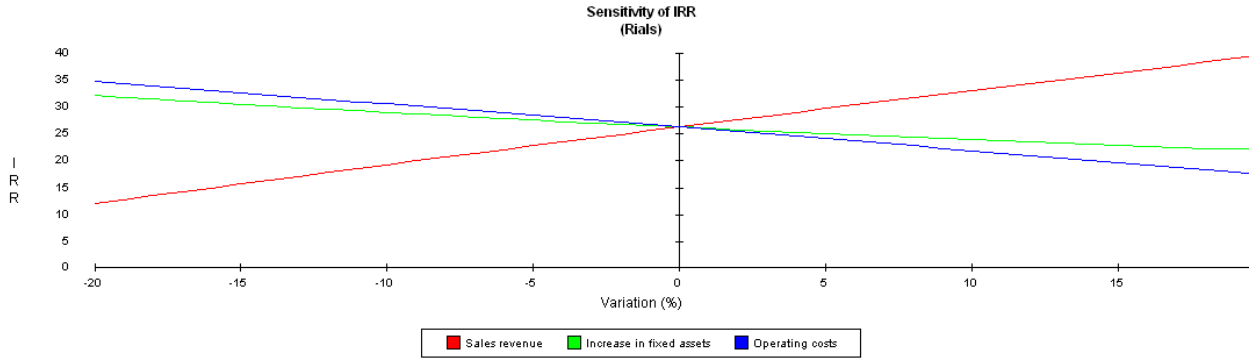
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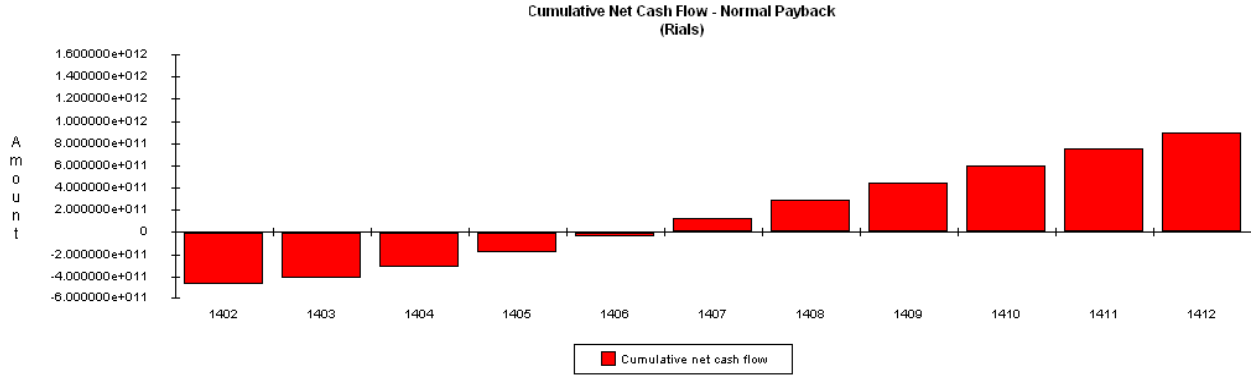


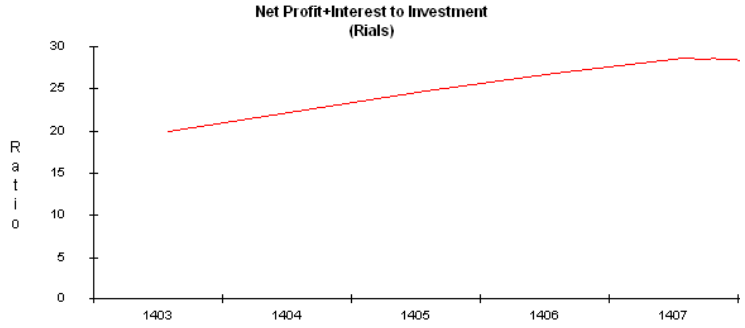

Accumulated Cash Flow for Financial Planning
(Rials)
Amount
2.000000e+012
1.800000e+012
1.600000e+012
1.400000e+012
1.200000e+012
1.000000e+012
8.000000e+011
6.000000e+011
4.000000e+011
2.000000e+011
0
1402
1403
1404
1405
1406
1407
1408
1409
1410
1411
1412

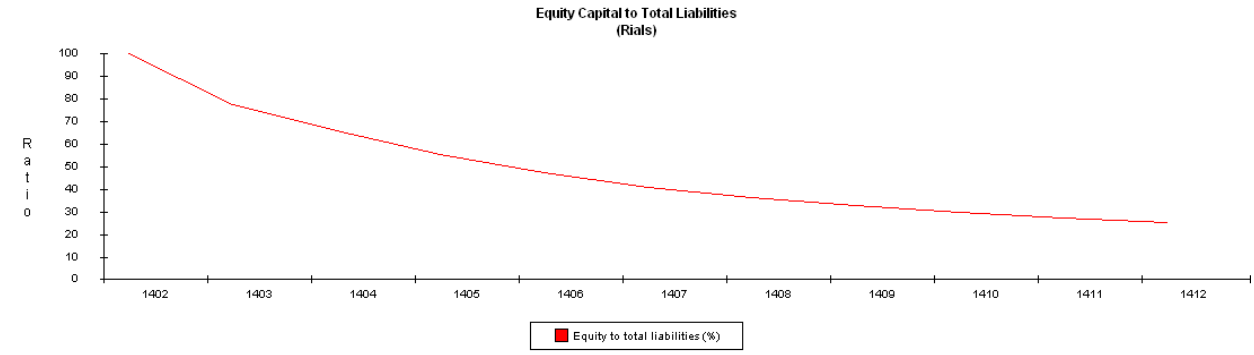

Total Sales and Production Costs
(Rials)
Amount
7.000000e+011
6.000000e+011
5.000000e+011
4.000000e+011
3.000000e+011
2.000000e+011
1.000000e+011
0
1403
1404
1405
1406
1407
1408
1409
1410


Net Present Value of Total Capital Invested
(Rials)
NPV
1.600000e+012
1.400000e+012
1.200000e+012
1.000000e+012
8.000000e+011
6.000000e+011
4.000000e+011
2.000000e+011
0
-2.000000e+011
-4.000000e+011
0
10
20
30
40
50
60
70
80
90
Discounting rate (%)
Net present value


Sensitivity of IRR
(Rials)
IRR
40
35
30
25
20
15
10
5
0
-20
-15
-10
-5
0
5
10
15
Variation (%)
Sales revenue
Increase in fixed assets
Operating costs


Cumulative Net Cash Flow - Normal Payback
(Rials)
Amount
1.600000e+012
1.400000e+012
1.200000e+012
1.000000e+012
8.000000e+011
6.000000e+011
4.000000e+011
2.000000e+011
0
-2.000000e+011
-4.000000e+011
-6.000000e+011
1402
1403
1404
1405
1406
1407
1408
1409
1410
1411
1412
Cumulative net cash flow


Net Profit+Interest to Investment
(Rials)
Ratio
30
25
20
15
10
5
0
1403
1404
1405
1406
1407



	Production 1403	Production 1404	Production 1405	Production 1406	Production 1407	Production 1408
Sales to total capital investment	0.76	0.86	0.96	1.06	1.16	1.15
Investment to personnel cost	22.27	17.85	14.49	11.96	10.00	9.13
Inventory to sales	0.19	0.18	0.18	0.18	0.18	0.19
Net cash flow to total sales	0.14	0.24	0.25	0.24	0.24	0.25