In the Name of God

Pre-feasibility study form

Plan Name: Production of Lactic Acid from Whey

Employer: Chaharmahal and Bakhtiari Industrial Estates Co.

Consulting Company: Kavosh Consultants Co.

Project Address: Shahrekord Industrial Estate

Initial date: ۲۰۲۱

Update ۲

SUMMARY OF THE FEASIBILITY STUDY

General Specification
Name of The Project: Feasibility studies of Lactic Acid from Whey
Project Capacity: ۱۰۰ Ton per year
Personnel Number: ٤۳ people
Working Days: ۲۸۹ Days
Product Usage: Food industries
Marketing
Product Global Price: ۳۰۰۰ $ per Ton
Domestic Demand: ۱۵۰۰ ton (Next ۵ Years)
Domestic Production: ۱۰۰ ton
Import: ۱۰۰۰ Ton
Export: -
Technical Study
Land Area: ۵۰۰۰
Building Area: ۲۰۰۰
Main Raw Materials: Whey - Additives
Supplying Place of Raw Materials: Local
Power Requirement: ۸۵۰،۰۰۰ (kwh)
Water Requirement: ۱۳۰۰۰۰(m^3)
Fuel Requirement: ۹۲۰،۰۰۰ (m^3)
Economical & Financial Study
Fixed investment amount: ۳٦۷،۲۹٤ million rials - ۱،۲۷۵،۳۲٦ euro
Circulating capital: ۲۵۳۹٤ million rials - ۸۸،۱۷٤ euro
Total investment: ۳۹۲،٦۸۸ million rials - ۱،۳٦۳،۵۰۰ euro
Annual sales: ۲۵۰،۰۰۰ million rials - ۸٦۸،۰۵٦ euro
Net present value (NPV): ۳۰٦،۰۷۸ million rials - ۱،۰٦۲،۷۷۱ euro
Breakeven point (BEP): ۲۷،۵۰۰ million rials - ۹۵،٤۸٦ euro
Internal Rate of Return(IRR): ۳٤٪
Investment Return Period: ۳ Years
Investment Sources Ratio Equity: ۳۰٪ Financing: ۷۰٪

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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 Lactic Acid from Whey production. 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

Lactic acid is a colorless organic acid that is soluble in water and ethanol. This acid is the result of the fermentation of lactose, which is abundant in sour roots and fermented dairy products such as yogurt, cheese, and. Lactic acid is also produced in the muscles due to intense physical activity. Lactic acid is a chiral alpha-hydroxy acid that is one of the metabolic products of sugars in human cells. At body pH, lactic acid is present in its ionic form, lactate. Too much of this compound in muscle cells can cause muscle cramps and pain. Calcium lactate, which is actually a water-soluble salt of lactic acid, is used as a good source of calcium in the diet.

Lactic acid is commercially produced for use in the food and drug industry, leather tanning, fabric dyeing, plastics, solvents, inks and varnishes.

Production of lactic acid

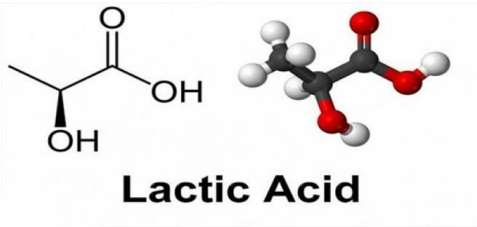
Cheese is obtained from the selective concentration of insoluble compounds in milk. Acidity, salt and bacteria play an important role in converting milk into cheese. In other words, cheese is separated from other parts of the body by the coagulation of casein by means of cheese or lactic acid. What is coagulated with casein and remains on the strainer is called fresh curd or cheese, which changes into different types of cheese after changes during the next operation. Milk is made up of a variety of fats and proteins. Some of these substances are solids and solutes, others are liquids. The process of separating the solids of milk from its liquid materials is called sour milk (cutting milk). The solid white matter that remains is later

turned into cheese. The remaining green liquid is whey. Whey with a high pollution index (about ٥٠،٠٠٠ PPM) is considered a dangerous environmental pollutant, and this important and rich source of lactose (with about ٤ to ٥٪ lactose) is used as a useful substrate in the preparation of many valuable materials. Lactic acid is one of these materials that has many applications in various industries.

Whey is a by-product of dairy factories and is defined as the aqueous or serum portion of milk after the milk coagulation has been separated by acid or proteolytic enzymes.

Whey lactic acid

The amount of lactic acid in whey depends on the type of process as well as the conditions. It should be pasteurized immediately after the curd is separated and cooled before storage. Depending on the process to be performed on whey, preservatives can also be used to prevent the spread of acid. Although lactic acid can also be synthesized by chemical methods, it can be produced by the fermentation of glucose and other process materials. It is cheaper.



١-١-Product Name and Code (ISIC ٣)

According to information obtained from the Ministry of Industry, Mines and Trade, the production ISIC code of Lactic Acid from Whey is ٢٤١١٥١٢٧٩٥.

١-٢-Customs Tariff Number

According to the Export and Import Regulations Book of ٢٠٢٠ and the Chamber of Commerce, Industries, Mines and Agriculture website, the customs tariff code of Lactic Acid from Whey is ٢٩١٨١١٠٠.

١-٣- IMPORT AND EXPORT CONDITIONS

Basic salaries include customs duties, taxes, patents, types of duties and other remuneration received from imported goods and are equivalent to ٤٪ of the customs value of the goods. In sum, this is the

income received from the business determined by the Board of Ministers in accordance with the relevant rules. The entry fee for Lactic Acid from Whey is ٥٪.

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

There is no direct standard for Lactic Acid from Whey. The standards are similar to this plan as follows:

Standard Name	Standard Number	Description
National standard	١٣٥٥٩	Milk and its products - Determining the minimum inhibitory concentration of antibiotics used for bifidobacteria and non-enterococcal lactic acid bacteria
National standard	١٣٨٦٣	Lactic Cheese - Features and Test Methods
National standard	١۴٥١	Milk and its products - Dry milk - Determining the amount of lactic acid and lactates
National standard	۴۶١٨	Permitted oral additives - Lactic acid - Features and test methods
National standard	۴٧٢١	Counting Mesophilic Lactic Acid Bacteria by Colon Counting at ٣٠ ° C in Food
National standard	٩۶١٥	Milk and its products-Mesophilic primer cultures-Counting of lactic acid bacteria fermenting citrate-Colony counting method at ٢٥C٠
National standard	A١-١٣٨٦٣	Lactic Cheese - Features and Test Methods (Amendment No. ١)

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

International standards related to the title of this project are as follows:

Standard Name	Standard Number	Description
ISO	٨٠۶٩:١٩٨۶	Dried milk — Determination of lactic acid and lactates content — Enzymatic method
ISO	١٩٣۴۴:٢٠١٥	Milk and milk products — Starter cultures, probiotics and fermented products — Quantification of lactic acid bacteria by flow cytometry

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

The price of lactic acid from whey abroad is about $ ۳،۰۰۰ per ton. In the country, it is about ۲۵۰۰ million rials per ton.

۱-۶- EXPLAIN THE USES OF THE PRODUCT

This acid is naturally present in many foods. It is used as an acidifying, preserving and modifying agent for pimples. In addition, this substance has no toxic effects and is classified as a GRAS substance. Here are some uses for lactic acid:

:: Bakery products

Used for direct acidification of some breads. Lactic acid is a natural acid found in sourdough. The use of bacterial lactic acid also increases the volume and improves the color of the bread crust. Adding lactic acid also increases the shelf life of the product because it delays the growth of molds.

:: Confectionery products

Lactic acid is used as an acidifying agent in the confectionery industry and its acidic properties are better than citric acid because if this acid is used for chocolates that are processed at high temperatures, the inversion rate of sugars is less. Which does not produce citric acid in the mouth. Its taste is usually mildly sour.

:: Meat-protein products

Meat-protein products (sausages and sausages) are widely used in meat products as an antimicrobial agent. It is also used to reduce salmonella contamination in slaughterhouses. Also, spraying lactic acid with high temperature is effective in reducing the amount of Coli by ۹۹٪.

:: diary

Direct acidification of some dairy products, such as cottage cheese, is done by lactic acid. This is preferred to risk fermentation and prevent contamination. This also saves cheese ripening time. This acid is also used as an acidifying agent in some dairy products, including yogurt powder and cheese.

:: drinks

Due to its mildly acidic nature, it is used in flavored beverages and juices. It has no masking or aggravating effect on the natural taste of the food and improves the taste of the drink and improves its acceptance by the consumer.

:: Pickles and olives

These products are usually immersed in a solution of salt and lactic acid. Lactic acid in these products acts as a preservative, clarifier and flavor enhancer. Usually a combination of acetic and lactic acid is used to give a milder taste and microbial stability in pickles.

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

Lactic acid is very important today and there is no specific alternative to it, but to meet the growing demand for this substance, a number of different strategies to improve productivity, speed up production rates and reduce the cost of lactic acid production through Increasing cell density, other systems are used. Such as fermentation of bacterial or fungal strains. Lactobacillus spa (bacteria) and Rhizopus sp (fungi) are commonly used strains.
Although industrial lactic acid fermentation is currently performed mainly by squatomic bacteria in SMF and increased fungal production with Rhizopus uronza and for lactic acid production due to its unique ability to produce pure optics L (+) - lactic acid from glucose, xylose And the starch used is, however, important for controlling the morphology of micelles and bronchial fungi for fungal fermentation.

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

According to research, due to the small number of lactic acid production units in Iran, almost all the needs for this product are met from abroad. Therefore, it is predicted that in case of construction of this production unit in the country and especially its production from whey (which is a waste of many dairy factories), its sale will enjoy a suitable market. In addition to the use of the product in yogurt production, this substance in the leather industry in leather tanning, in cosmetics to moisturize the skin, in the textile industry to stabilize the color of fabrics, in the preparation of pickles in the food industry, in the pharmaceutical industry as a raw material for production Many of the materials needed in this industry are also used in the production of varnishes, inks and preservatives for food additives. As can be seen, the growing need of various industries on the one hand and the lack of production of this material in the country indicates that the production of this product has a good market.

The increasing development of cheese factories due to population growth and the supply of protein needed by humans, has caused significant amounts of whey to enter the sewer system and cause many problems. Lack of economic techniques to reduce pollution (BOD) high (about ٥٠،٠٠٠ PPM) from the effluent of these plants, which requires a ١٠٠-fold reduction in BOD to enter the sewer system, has caused problems in controlling environmental pollution. Therefore, providing methods to treat such wastewater, especially in order to produce other valuable products, is important both economically and in terms of environmental issues. Today, the construction and operation of these units in different countries of the world is in the program of governments and investors.

١-٩-MAJOR MANUFACTURING AND CONSUMER COUNTRIES

The following figure shows the top countries producing lactic acid from whey in the world, along with the names of the companies:



The names of domestic companies active in this industry are stated in the next section.

The following is the market outlook for this project:



The largest importers and consumers of lactic acid from whey:

Country	Amount (million)
Netherlands	۷۹.۳
America	۵۲
South Korea	۴۲.۸
Germany	۳۹.۸
Japan	۳۳.۲

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

۲-۱-AN EXAMINATION OF EXPLOITATION CAPACITY AND PRODUCTION PROCESS FROM THE BEGINNING OF THE THIRD DEVELPOMENT PLAN TO NOW

The following table presents the specifications and capacity of units active in the field of fiber optic production based on the statistics of the Ministry of Industry, Mines and Trade:

Row	Name	Province	Capacity
۱	Bahan Sar	Markazi	۱۰۰
	Total		۱۰۰

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 in the production of lactic acid can be seen in the following table:

Row	Name	Province	Capacity
۱	Exir Darman Yas	Chaharmahal va Bakhtiari	۲
	Parsa Exir	Lorestan	۳۰
	Total		۳۲

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
۲۰۱۶	۸۲۹.۳۴۲	۹۰.۳۴۰.۷۰۴.۸۷۴	۳.۰۲۰.۹۵۰
۲۰۱۷	۸۲۹.۵۵۸	۶۳.۳۴۶.۶۰۰.۷۸۷	۲.۰۳۴.۹۴۵
۲۰۱۸	۸۱۳.۶۸۷	۷۳.۹۲۰.۸۳۴.۰۰۶	۲.۱۴۷.۲۶۵
۲۰۱۹	۶۳۶.۶۶۷	۶۶.۳۹۱.۷۰۵.۶۴۶	۱.۵۸۴.۷۳۹
۲۰۲۰	۱.۰۵۶.۱۷۰	۲۹۹.۳۷۳.۷۵۰.۰۰۰	۲.۳۹۳.۷۱۰

Source: Tehran Chamber of Commerce, Industries, Mines and Agriculture http://www.tccim.ir

۲-٤-MONTORING CONSUMPTION TRENDS

The best way to determine the consumption of Lactic Acid from Whey is to use the balance of supply and demand. In such a way that the amount of domestic consumption is equal to the product of the difference between supply (total domestic production and imports) and exports. According to the latest statistics available in ۲۰۲۰, the amount of import was ۱۰۰۰ Ton and the amount of export was ۰ and we had a production of about ۱۰۰ tons. Consumption of this product has increased in recent years due to the industrial development of the country and is expected to reach nearly ۱۵۰۰ tons per year in the future.

۲-۵-INVESTIGATE THE EXPORT PROCESS OF THE PRODUCT AND THE POSSIBILITY OF ITS DEVELOPMENT

According to the Chamber of Commerce, Industries, Mines and Agriculture, no exports have taken place in the last five years.

۲-۶- PRODUCT REQUIREMENT CHECK WITH EXPORT PRIORITY

Many countries that in the contemporary period, especially in the past few decades, have been able to follow the path of progress and development, have accurately implemented specific economic, social and political programs, and after going through medium- or long-term programs. Progress and development have been achieved.

The first proposed development plan after the Islamic Revolution for the years ۱۹۸۳-۱۹۸۷ was prepared. The last development plan (Sixth Development Plan) was approved by the Islamic Consultative Assembly in March ۲۰۱۷.

In many developed countries, exports are the main focus of development and are very important in the presence of that country in global markets. Domestic production and its arena in the global competitive market, or in other words, exports, is one of the factors that can make countries independent. The importance and necessity of the presence of goods made by a country in the world market and the atmosphere of the international economy are among the most important factors of development. The role of exports in this regard is so important that many export experts consider the only successful path to economic development of a country in the global market.

The most important issue for any country like Iran is to achieve economic development and to have an economic, productive and export-oriented system. In order to achieve this, first of all, it is necessary to meet the domestic needs of the country and to expand the export of goods and services in excess of domestic consumption. To achieve a society where there is no poverty, unemployment and backwardness, efforts must be made for its economic growth. Along with economic growth, there must be justice and empowerment of the people of the society to manage their lives.

Exports play an important role in production and employment, so they require a lot of attention to expand and have an active presence in global markets. Exporters in the economic field should also be encouraged.

At present, we can see a very good export of Lactic Acid from Whey. Because there is a lot of demand in different countries and each of them is trying to get in touch with first-hand producers. This can help Iran's non-oil exports and boost production in the country.

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

Whey is refined in the factory to separate some of the salts and all the proteins in it and the whey is free of casein (milk protein) and fat. Because the protein in whey is not a protein that can be

used by the rhizomes, heat the whey to remove any protein that remains after the refining process. In the heating process, the proteins in it form white clots on floating or sedimentary surfaces. These particles and clots are then separated by a vacuum or filter.

The resulting whey is very clear and has a yellowish green color. After de-proteinization, whey is poor in nutrients and does not have a sufficient source of nutrients for the growth of microorganisms, and it is necessary to use an additive food source. Primary whey has a pH of about ٦,٥. In order for the sugar in lactose to be hydrolyzed to glucose and galactose, sulfuric acid (٢ ml per liter of water) is added to the whey to hydrolyze the ingredients and make it usable for the rhizomes. Come on. After one day with ١ M sodium hydroxide, the whey is neutralized (pH = ٧) to be ready for use for testing.

Culture medium To start the fermentation process under anaerobic conditions, a certain volume of whey is combined with ٣٪ to ٥٪ by volume of the pre-culture medium. This medium is placed in a stirred incubator (optimum temperature of ٣٢ ° C and ١٨٠ rpm) until the rhizomes grow and produce lactic acid from the lactose in whey during reactions.

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

High efficiency and quality and ease of production of prepared Lactic Acid from Whey are the most important advantages of the mentioned methods. The production of this product requires a precise quality management process, which is mentioned below.
The growth and development of the world's industries is largely due to competition between industrial units. In this regard, each industrial unit by increasing the quality of its products, tries to gain more market share and this trend over time has improved the quality of products and as a result the quality growth of industrial communities. Quality control to determine the accuracy of the production operation, according to the technical specifications specified for the product. This operation helps to prevent the production of defective products, waste capital and reduce the cost of the product.
In general, quality control objectives can be summarized as follows:
• Maintaining the set standards
• Detection and improvement of deviations in the production process
• Identify and improve non-standard products
• Evaluate the efficiency of individuals in units
In other words, quality control is the assurance of the supply and production of goods and services, according to standards

Determined and inspected as one of the integral 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 situation of each industry are as follows:
١) In the stage of delivery of raw materials
٢) At the beginning of production
٣) Before starting the operation
٤) Before starting the irreversible operation
٥) Before starting the operation that causes the defects to be covered
٦) In the final stage of work
Each of these inspection steps may be performed on site or in a laboratory.

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

EXPLANATION: EXCHANGE RATE BASED ON NIMA SYSTEM - DATED ٢٠٢٢-٠٨ - AMOUNT: ٢٨٨٠٠٠ RIALS

Project Investment Schedule:

Description	Cost (Million Rials)	Cost (Euro)
Land	١٢٥٠٠	٤٣،٤٠٢/٧٨
Landscaping	٧٦٣٠	٢٦،٤٩٣/٠٦
Construction	١١٧٨٠٠	٤٠٩،٠٢٧/٧٨

Production line machinery and equipment	۱۶۵۰۰۰	۵۷۲،۹۱۶/۶۷
laboratory equipment	۳۵۰۰	۱۲،۱۵۲/۷۸
Utilities	۵۳۲۰	۱۸،۴۷۲/۲۲
transportation	۳۱۵۰۰	۱۰۹،۳۷۵/۰۰
Office equipment	۱۲۱۹	۴،۲۳۲/۶۴
Miscellaneous and unforeseen	۲۲۸۲۵	۷۹،۲۵۳/۴۷
Total	۳۶۷۲۹۴	۱،۲۷۵،۳۲۶/۳۹

The ground specification of the project implementation is as follows:

Description	Area (m ۲)	Unit Price (Rials)	Total (Million Rials)	Total (Euro)
Land	۵۰۰۰	۲/۵۰۰/۰۰۰	۱۲۵۰۰	۴۳،۴۰۲/۷۸

The cost of landscaping is as follows:

Description	Area	Unit Price (Rials)	Total (Million Rials)	Total (Euro)
Digging and leveling	۵۰۰۰	۱۲۵۰۰۰۰	۶۲۵۰	۲۱،۷۰۱/۳۹
Fencing	۳۰۰	۱۵۰۰۰۰۰	۴۵۰	۱،۵۶۲/۵۰
Asphalt and pavement paving	۴۰۰	۱۱۰۰۰۰۰	۴۴۰	۱،۵۲۷/۷۸
Green space and lighting	۳۵۰	۱۴۰۰۰۰۰	۴۹۰	۱،۷۰۱/۳۹
Total			۷۶۳۰	۲۶،۴۹۳/۰۶

Building Information:

Description	Building type	Area	Unit Price (Rials)	Total (Million Rials)	Total (Euro)
Production	Niches	۱۲۰۰	۵۰۰۰۰۰۰۰	۶۰۰۰۰	۲۰۸،۳۳۳/۳۳
Raw materials and supplies	Niches	۵۰۰	۶۰۰۰۰۰۰۰	۳۰۰۰۰	۱۰۴،۱۶۶/۶۷
Office building and services	Official	۲۰۰	۱۰۵۰۰۰۰۰۰	۲۱۰۰۰	۷۲،۹۱۶/۶۷
Utilities	Niches	۷۰	۷۱۴۲۹۰۰۰	۵۰۰۰	۱۷،۳۶۱/۱۱
Guard		۳۰	۶۰۰۰۰۰۰۰	۱۸۰۰	۶،۲۵۰/۰۰
Total		۲۰۰۰		۱۱۷۸۰۰	۴۰۹،۰۲۷/۷۸

Utilities:

Description	Cost (Million Rials)	Cost (Euro)
Power Supply	۱۲۰۰	۴،۱۶۶/۶۷
Water and Wastewater	۴۰۰	۱،۳۸۸/۸۹
Fuel	۳۵۰	۱،۲۱۵/۲۸
Heating and cooling equipment	۲۲۰۰	۷،۶۳۸/۸۹
Protective equipment and security system	۳۲۰	۱،۱۱۱/۱۱
Compressed air supply	۸۵۰	۲،۹۵۱/۳۹
Total	۵۳۲۰	۱۸،۴۷۲/۲۲

Transportation:

Description	Technical Specifications	Cost (Million Rials)	Cost (Euro)
Forklifts	۳ ton	۷۵۰۰	۲۶،۰۴۱/۶۷
Pickup	Nissan	Factory ۲۶۰ million Tomans Free market ۳۵۰ million Tomans	۱۲،۱۵۲/۷۸
Riding	Samand	Factory ۱۶۰ million Tomans Free market ۳۰۰ million tomans	۱۰،۴۱۶/۶۷
Total		۳۱۵۰۰	۱۰۹،۳۷۵/۰۰

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 Lactic Acid from Whey production process can be listed as follows:

Hubei , Shanghai Chun Nuo, Fujiwara and... But due to the capabilities of domestic specialists, the machinery of this project including reactors, furnaces, etc. can easily be supplied from Iran at a more reasonable cost. The price range for all of these companies is about ۱۰ percent. The price of machines for this process is given in the table below.

Number	Name	Required amoun	Currency (Euro)	cost (million rials)	Rial sum (million rial	supply (domestic foreign)
۱	The smoothing process	۱	۷۹،۸۶۱/۱۱	۲۳۰۰۰	۲۳۰۰۰	Foreign
۲	Thermal process	۱	٦۹،٤٤٤/٤٤	۲۰۰۰۰	۲۰۰۰۰	
۳	Vacuum pump or strainer	۲	۳٤،۷۲۲/۲۲	۱۰۰۰۰	۲۰۰۰۰	
٤	Hydrolysis process	۱	۱۲۱،٥۲۷/۷۸	۳٥۰۰۰	۳٥۰۰۰	
٥	Fermentation process	۱	۱۱۱،۱۱۱/۱۱	۳۲۰۰۰	۳۲۰۰۰	
٦	Stirrer incubator	۱	٦۹،٤٤٤/٤٤	۲۰۰۰۰	۲۰۰۰۰	
۷	Other cases	۱	٥۲،۰۸۳/۳۳	۱٥۰۰۰	۱٥۰۰۰	
Total (million rials)				۱۶٥۰۰۰		
Total (Euro)				٥۷۲،۹۱٦/٦۷		

laboratory equipment:

Number	Name	Currency (Euro)	Rial Cost (Million Rials)	Rial sum million) (rials
١	laboratory equipment	١٢،١٥٢/٧٨	٣٥٠٠	٣٥٠٠
٢				
Total		٣٥٠٠		

Office equipment:

Number	Name	The required amount	Currency (Euro)	Rial cost per unit	Rial Cost (Million Rials
١	Management desk with chairs	١	٢٧٧/٧٨	٨٠/٠٠٠/٠٠٠	٨٠
٢	Conference table and conference chair	١	٢٢٥/٦٩	٦٥/٠٠٠/٠٠٠	٦٥
٣	Computer desk and chair	٣	١٠٤/١٧	١٠/٠٠٠/٠٠٠	٣٠
٤	Staff desk and chair	٦	١٦٦/٦٧	٨/٠٠٠/٠٠٠	٤٨
٥	Secretary desk and chair	٢	٤٨/٦١	٧/٠٠٠/٠٠٠	١٤
٦	Showcase	٢	٩٠/٢٨	١٣/٠٠٠/٠٠٠	٢٦
٧	Library	٢	١٣٨/٨٩	٢٠/٠٠٠/٠٠٠	٤٠
٨	Four-slider file	٣	٦٢/٥٠	٦/٠٠٠/٠٠٠	١٨
٩	Waiting armchair	٧	٧٢/٩٢	٣/٠٠٠/٠٠٠	٢١
١٠	Dining table and chairs	١ Series	٦٩/٤٤	٢٠/٠٠٠/٠٠٠	٢٠
١١	Computer	٦	١،٣٥٤/١٧	٦٥/٠٠٠/٠٠٠	٣٩٠
١٢	Printers and scanners	٣	٤١٦/٦٧	٤٠/٠٠٠/٠٠٠	١٢٠
١٣	fax	٢	٢٠٨/٣٣	٣٠/٠٠٠/٠٠٠	٦٠
١٤	Phone	٦	١٠٤/١٧	٥/٠٠٠/٠٠٠	٣٠
١٥	Fingerprint attendance device	١	١٠٤/١٧	٣٠/٠٠٠/٠٠٠	٣٠
١٦	Wireless network and internet equipment	١	٥٢/٠٨	١٥/٠٠٠/٠٠٠	١٥
١٧	Office stationery	٤ Series	١١١/١١	٨/٠٠٠/٠٠٠	٣٢
١٨	Central system	١	٢٤٣/٠٦	٧٠/٠٠٠/٠٠٠	٧٠
١٩	Other	١	٣٨١/٩٤	١١٠/٠٠٠/٠٠٠	١١٠
Total (Million Rials)		١٢١٩			
Total (Euro)		٤٦١٠/٤٤			

Working Capital Costs:

Name	Description	Cost (Million Rials)	Cost (Euro)
Raw materials and packaging	٦٠ Days	٢٠٠٠٠	٦٩،٤٤٤/٤٤
salary	٣٠ Days	٣٠٠٥	١٠،٤٣٤/٠٣
Energy costs	٣٠ Days	٨١٤	٢،٨٢٦/٣٩
revolving fund	١٥ Days	١٥٧٥	٥،٤٦٨/٧٥
Total		٢٥٣٩٤	٨٨،١٧٣/٦١

Production costs:

Description	Cost (Million Rials)	Cost (Euro)
Cost of raw materials and packaging	١٢٠٠٠٠	٤١٦،٦٦٦/٦٧
Salary Cost	٣٦٠٦٣	١٢٥،٢١٨/٧٥
Energy costs	٩٧٦٩	٣٣،٩٢٠/١٤
Cost of maintenance	١٩٣١٧	٦٧،٠٧٢/٩٢
Unforeseen cost of production	٢٣١٧	٨،٠٤٥/١٤
Administrative and sales costs	١٧٩٤	٦،٢٢٩/١٧
Costs of financial facilities	١٨١٢	٦،٢٩١/٦٧
Insurance costs	٧٧٢٢	٢٦،٨١٢/٥٠
Depreciation cost	٥٠٠	١،٧٣٦/١١
Depreciation expense before operation	٤٨١	١،٦٧٠/١٤
Total	١٩٩٧٧٥	٦٩٣،٦٦٣/١٩

٦-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)
١	Whey	٤	Ton	٨٠٠	٣٦٤/٥٨	١٠٥/٠٠٠/٠٠٠	Local	٨٤٠٠٠
٢	Additives	٠/٢	Ton	٢٠	٣،١٢٥/٠٠	٩٠٠/٠٠٠/٠٠٠	Import	١٨٠٠٠
٣	Other	٠/٢	Ton	٢٠	٣،١٢٥/٠٠	٩٠٠/٠٠٠/٠٠٠	Local	١٨٠٠٠
Total (Million Rials)								١٢٠٠٠٠
Total (Euro)								٤١٦،٦٦٦/٦٧

٧-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.

٨- 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 ٢ 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 ١٦،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	۸۰	۸۰	۱۳۱۲	٤،٥٥٥/٥٦
financial manager	Man	۱	۶۵	۶۵	۱۰۶۶	۳،۷۰۱/۳۹
Marketing Manager	Man	۱	۶۵	۶۵	۱۰۶۶	۳،۷۰۱/۳۹
Financial, sales and administrative personnel	Female	۲	۵۵	۱۱۰	۱۸۰۴	٦،٢٦٣/٨٩
warehouse keeper	Man	۲	۴۵	۹۰	۱۴۷۶	٥،١٢٥/٠٠
Line Administrator	Man	۲	۵۳	۱۰۶	۱۷۳۸	٦،٠٣٤/٧٢
skilled worker	Man	۵	۴۹	۲۴۵	۴۰۱۸	١٣،٩٥١/٣٩
Semi-skilled worker	Man	۶	۴۵	۲۷۰	۴۴۲۸	١٥،٣٧٥/٠٠
worker	Man	۱۴	۴۰	۵۶۰	۱۳۱۲۰	٤٥،٥٥٥/٥٦
Service	Female	۳	۴۰	۱۲۰	۱۹۶۸	٦،٨٣٣/٣٣
Guard	Man	۲	۴۰	۸۰	۱۳۱۲	٤،٥٥٥/٥٦
Driver	Man	۲	۴۴	۸۸	۱۴۴۳	٥،٠١٠/٤٢
Secretary	Female	۲	۴۰	۸۰	۱۳۱۲	٤،٥٥٥/٥٦
Total		۴۳			۳۶۰۶۳	١٢٥،٢١٨/٧٥

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	۸۵۰/۰۰۰	۹۳۹	۷۹۸	٢،٧٧٠/٨٣
Water Consumption	Cubic meters	۱۳۰/۰۰۰	۳۳۶۲۲	۴۳۷۱	١٥،١٧٧/٠٨
Gas	Cubic meters	۹۲۰/۰۰۰	۵۰۰۰	۴۶۰۰	١٥،٩٧٢/٢٢

Total	۹۷۶۹	۳۳،۹۲۰/۱٤

۱۰- CONDITIONS OF ECONOMIC AND COMMERCIAL SUPPORT

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

Support for fertilizer producers, especially Lactic Acid from Whey, is part of the Agricultural Support Service Company program and is monitored periodically by a technical working group on behalf of the company and the Ministry of Agriculture and Water and Soil to monitor the quality of fertilizers. The agricultural support services company relies on domestic production and a significant reduction in fertilizer imports, including the supply of fertilizers, organic fertilizers, biofertilizers, microbes and more. Also, in most petrochemical companies, unfortunately, some of the raw materials and machinery needed are supplied from abroad, which come to Iran after initial tests and technical examinations, and in the absence of problems. Therefore, the customs duty received is about ۱۰٪ of the total imported genus. It also requires payment of customs duties if the product is exported. Although in recent years appropriate incentives have been adopted to encourage domestic producers to export their products, which has led to increased exports, but more attention must be paid to this issue by the authorities.

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

Long-term facilities to finance part of the investment costs for the creation or development of industrial, mining and tourism units or to provide the necessary conditions for optimal utilization of these units, the facility bank in foreign currency and rial in the form of an Islamic contract Grants.

Terms:

۱- Only financial facility projects that have the necessary technical, financial and economic justification are granted.

۲- The granting of facilities to natural persons up to one billion rials shall be permitted and the payment of such facilities shall be exclusively permitted to legal persons.

۳- The Bank typically finances up to ۷۰٪ of the project's fixed capital investment as a facility, while ۳۰٪ of the total project investment (including fixed capital and working capital) must be provided by the applicant as paid-in company capital. .

٤- The repayment period of the facility is typically a maximum of ٥ years. It was the Bank's authority to change this period to suit the status of the plans.
٥- When applying for a facility, the applicant shall open a loan account.
٦-In general, ٣٠٪ of the total project investment must be financed by the investor and the bank can invest up to the remaining ٧٠٪.
Steps:
١-Acceptance: At this stage the applicant can apply to any bank branch and submit his / her application. If the plan is not on the priority list, the Bank agrees to provide the justification.
٢- Compilation of project justification report: Applicant prepares justification report through Bank Consulting Engineer companies.
٣- Acceptance: At this stage, the project justification report will be delivered to the branch with the required documentation.
٤- Evaluation and approval: The Bank's justification report will be reviewed and if approved, the facility payment will be approved by the competent authority.
٥- Contract: After providing the required documents and guarantees, the contract for granting the facility will be concluded.
٦- Payment: The project progress report will be prepared at the time specified by the consulting engineer and submitted to the bank. Once the progress report has been approved by the bank, payment is made as appropriate to the progress of the plan.

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

- One of the basic principles of sustainable production is to improve soil quality from fertility and to return nutrients absorbed by plants to the soil. Fortunately, we are very successful in the field of biofertilizers in the country. The use of these fertilizers not only contributes to environmental sustainability, but also to food security. Due to the growing of the agricultural industry, the need for farmers to use different fertilizers such as Lactic Acid from Whey is very high. Although the process of this product is not complicated, for unknown reasons this product is produced in small quantities in Iran and according to the Chamber of Commerce, Industry, Mines and Agriculture, its imports amounted to about ٤٧،٥٤٩،٣٦٢ kg in ٢٠١٨. Therefore, if access to the raw material, applicants are suggested to build one (or several) ٢٠،٠٠٠ tonnes (or even more) units in different areas (especially deprived areas). The plan is to start operating at ٦٠ percent capacity in the first year and increase below capacity in the following years, respectively.
- 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)	٦٠	٧٠	٨٠	٩٠	١٠٠

prime cost	١٩١٧ million rials/Per km –٦٦٥٦ Euro
Selling prices of products	٢٥٠٠ million rials/Per km – ٨٦٨١ Euro
Total Sales (Million Rials)	٢٥٠,٠٠٠ million rials-٨٦٨,٠٥٦ euro
Percentage of sales at the point head to head	١١
Profit (Million Rials)	٥٨٣٠٠ million rials - ٢٠٢,٤٣١ euro
Gross Value Added (Million Rials)	٢٥،٧٩٩ million rials - ٨٩،٥٨٠ euro
Net Value Added (Million Rials)	٦٤٨٢ million rials - ٢٢,٥٠٧ euro
Ratio of gross value added to total sales	٠/١٠
Ratio of net added value to total sales	٠/٠٣
Ratio of gross value added to investment	٠/٠٩
Return of capital	٣