Pre-Feasibility Study

Mini Dairy Processing Plant

(Pasteurized Milk, Yogurt and Cheese)

Small and Medium Enterprises Development Authority

Ministry of Industries & Production

Government of Pakistan

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1 EXECUTIVE SUMMARY

This pre-feasibility study is based upon the business analysis of setting up a Mini Dairy Processing Plant where processing and value addition of milk with all-inclusive activity is done for dairy products such as pasteurized milk, yogurt and cheese.

A Mini Dairy Processing Plant with processing of 2,000 litres of milk per hour needs total investment of approximately Rs. 39.96 million out of which, capital cost of the project is Rs. 37.75 million with working capital of Rs. 2.21 million. The project is assumed to be working on a 50:50 debt: equity ratio. It is assumed that starting from 50% capacity utilization in first year of the project, the production of value added products will increase to approximately 80% in 10th year of the project, with 5% annual growth rate.

The Internal Rate of Return (IRR), Payback Period and Net Present Value (NPV) of the project, based upon stated assumptions, are 44%, 3.01 years and Rs. 77.01 million respectively. The plant will provide employment opportunity to 19 individuals initially which will remain same till year 10. The legal status of the project is proposed to be a sole proprietorship.

The project is proposed to be located in peri-urban areas around metropolitan cities like Karachi, Lahore, Islamabad, Faisalabad, Okara, Sahiwal, Sheikhupura, Sargodha, Multan, Bahawalpur, Hyderabad, Quetta, Ziarat, Peshawar etc. which are major markets of milk and dairy products. The rural and peri-urban areas around the major cities with abundant milk supply make a better choice for project; provided access to markets and consumers is ensured. The milk and other dairy products may be sold directly in urban market.

Most critical considerations or factors for success of the project are background knowledge and related experience for application of Modern Food Safety Management System with well-practiced Hazzard Analysis Critical Control Point (HACCP) Plan, market / demand of milk and dairy products, plant and labour management etc.

2 INTRODUCTION TO SMEDA

The Small and Medium Enterprises Development Authority (SMEDA) was established in October 1998 with an objective to provide fresh impetus to the economy through development of Small and Medium Enterprises (SMEs).

With a mission "to assist in employment generation and value addition to the national income, through development of the SME sector, by helping increase the number, scale and competitiveness of SMEs", SMEDA has carried out ‘sectoral

research' to identify policy, access to finance, business development services, strategic initiatives and institutional collaboration and networking initiatives.

Preparation and dissemination of prefeasibility studies in key areas of investment has been a successful hallmark of SME facilitation by SMEDA.

Concurrent to the prefeasibility studies, a broad spectrum of business development services is also offered to the SMEs by SMEDA. These services include identification of experts and consultants and delivery of need based capacity building programs of different types in addition to business guidance through help desk services.

3 PURPOSE OF THE DOCUMENT

The objective of the pre-feasibility study is primarily to facilitate potential entrepreneurs in project identification for investment. The project pre-feasibility may form the basis of an important investment decision and in order to serve this objective, the document/study covers various aspects of project concept development, start-up, and production, marketing, finance and business management.

The purpose of this document is to facilitate potential investors in setting up **Mini Dairy Processing Plant** on commercial basis by providing them a general understanding of the business with the intention of supporting potential investors in crucial investment decisions.

The need to come up with pre-feasibility reports for undocumented or minimally documented sectors attains greater imminence as the research that precedes such reports reveal certain thumb rules; best practices developed by existing enterprises by trial and error, and certain industrial norms that become a guiding source regarding various aspects of business set-up and it's successful management.

Apart from carefully studying the whole document one must consider critical aspects provided later on, which form basis of any Investment Decision.

4 BRIEF DESCRIPTION OF PROJECT & PRODUCT

Milk is a primary commodity of dairy sector with around 15% annual increase in demand. The dairy sector requires uninterrupted milk production to keep pace with the growing demand of the human population through maintaining efficient supplies. Not only milk but other value added dairy products are also necessary to fulfil nutritional requirements of consumers such as butter, cheese, ghee, yogurt etc. made through the use of traditional as well as modern methods. Traditional methods are mostly employed by farmers to fulfil their subsistence requirements. They also sell these products to support their household income. Within the organized segment, these products are produced and packed through use of industrial processes and sold on commercial scales to consumers located in various parts of the country. Most of the dairy products manufacturers are located mainly in Punjab province and have efficient distribution networks across the country.

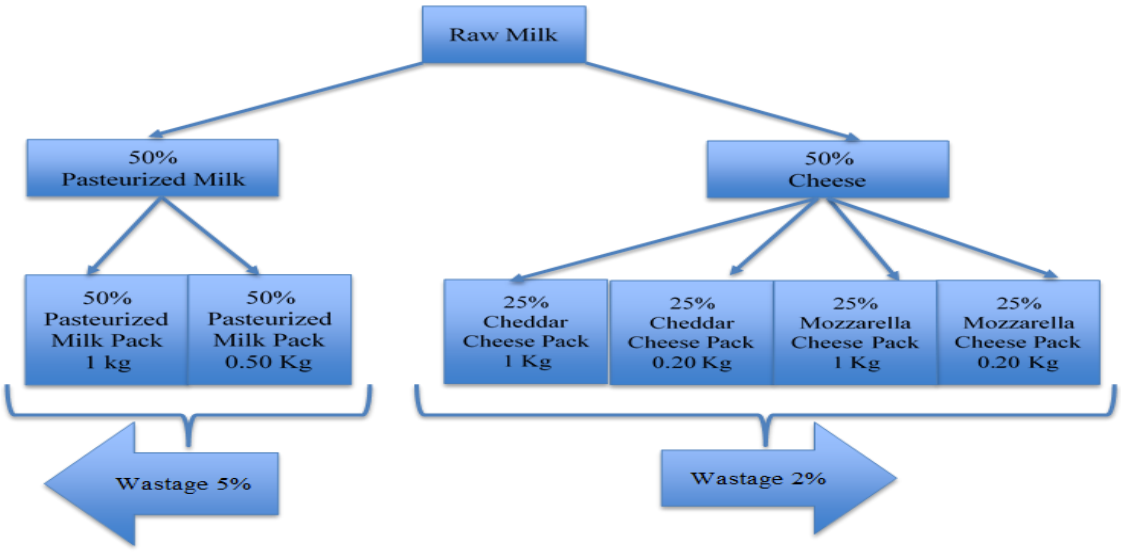
On the other hand, there is much dependence on imported dairy products such as cheese due to the fact that the quantity, quality and variety of locally produced cheeses do not cater to the needs of consumers. Imported cheese, mostly in processed powder form, is used as an ingredient by many restaurants. Furthermore, imported cheese products are used to bridge domestic demand and supply gap in cheese consumption.

Realizing the increasing demand and supply gap of value added dairy products such as pasteurized milk, yogurt and cheese, setting up a Mini Dairy Processing Unit is proposed in this prefeasibility study. This project will be established on owned land with purpose-built plant constructed on modern lines. The plant would process raw milk into pasteurized milk throughout the year; however, yogurt and cheese would be produced for 120 and 240 days respectively. The plant will begin operations with 50% installed capacity utilization and 2.88 million litres of raw milk is to be processed in year 1. The product mix will be Pasteurized Milk: Yogurt: Cheese in ratio of 12:8:4[1]. Approximately 1.37 million litres of pasteurized milk, 912,000 Kgs of yogurt and 47,000 Kgs of cheese will be processed in the first year of production. With 50% capacity utilization in first year of production and annual increase of 5 %, the project will be utilizing its capacity for a maximum of 80% i.e. processing of approx.4.61 million litres in year 10.

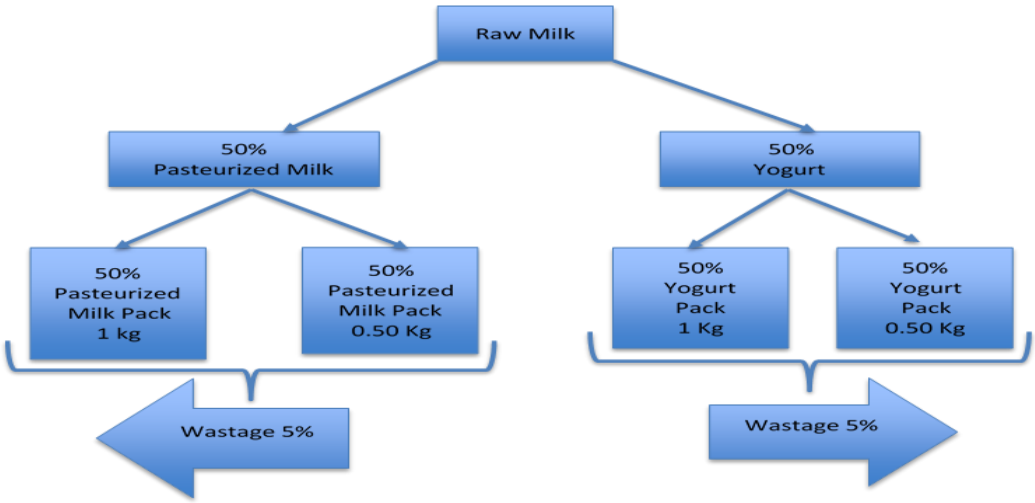
[1] Here, the 12, 8 and 4 represents the number of months per year for which milk, yogurt and cheese are being produced respectively.

The products sold are pasteurized milk (50%) and Yogurt (50%) for 240 days (or 8 months) of summer. Similarly, pasteurized milk (50%) and Cheese (50%) is proposed to be sold in rest of 120 days (or 4 months) in winter. The milk will be primarily sold to wholesalers and retailers. There would be three types of product mix throughout the year;

Product Mix in Winter (120 Days)



Product Mix in Summer Months (240 Days):



A. Pasteurized Milk: It is obtained by treating raw whole milk through 'Pasteurization Process' to destroy pathogens present in milk and dangerous for human consumption. It includes heating every particle of milk or milk product, in properly designed and operated equipment, to one of the temperatures given in the following chart and held continuously at or above that temperature for at least the corresponding specified time.

Table 1: Pasterization Process: Temperature and Corresponding Time

Sr.#	Temperature	Time	Pasteurization Type
1	63ºC (145ºF)*	30 minutes	Vat Pasteurization
2	72ºC (161ºF)*	15 seconds	High temperature short time Pasteurization (HTST)
3	89ºC (191ºF)	1.0 second	Higher-Heat Shorter Time (HHST)
4	90ºC (194ºF)	0.5 seconds	Higher-Heat Shorter Time (HHST)
5	94ºC (201ºF)	0.1 seconds	Higher-Heat Shorter Time (HHST)
6	96ºC (204ºF)	0.05 seconds	Higher-Heat Shorter Time (HHST)
7	100ºC (212ºF)	0.01seconds	Higher-Heat Shorter Time (HHST)
8	138ºC (280ºF)	2.0 seconds	Ultra-Pasteurization (UP)

**If the fat content of the milk product is 10% or more, or if it contains added sweeteners, or if it is concentrated (condensed), the specified temperature shall be increased by 3ºC (5ºF). Ref: www.idfa.org / International Dairy Foods Association.*

B. Yogurt: Plain yogurt is a dairy product made by blending fermented milk with various ingredients that provide it a typical flavor and color. It is made with a variety of ingredients including milk, sugars, stabilizers and a bacterial culture. The general process of making yogurt includes modifying the composition of milk through pasteurization, fermentation at warm temperatures, cooling it and adding sugar and other ingredients to achieve its typical taste and texture.

C. Cheese (Mozzarella and Cheddar): Mozzarella cheese is one of the most popular cheese varieties due to its primary use as pizza topping. It is included in the group of "Pasta filata" or stretched cheese in which the curd is produced as normal process of cheese making then kept in hot water or whey to consolidate into a solid mass, subsequently, stretching of this mass converts the curd into a uniform and elastic cheese in consistency. Stretching is a treatment that renders the curd elastics which is a unique quality attribute of Mozzarella cheese. Its physical characteristics such as body, texture, melting ability, stretch ability and colour are altered by the factors like milk composition, starter culture and ripening conditions prevalent during the cheese preparation process. Cheddar Cheese is a hard type of cheese and has high nutritional value owing to the concentration of milk protein 'Casein' which contains various levels of all essential amino acids, fat and small

amounts of minerals (calcium, sodium, potassium) and vitamins (retinol, riboflavin, pyridoxine and Cyanocobalamin). Quality of Cheddar cheese depends upon starter cultures, manufacturing technology and composition of milk. During ripening, it goes through biochemical modifications due to different biochemical activities resulting in fresh curd having typical flavor and smooth texture. It varies in flavor depending on the length of aging and their origin.

The subject project can be set-up at any appropriate location that ensures easy availability of all related raw material and easy marketing and transportation of finished products. Also other services such as water, electricity and road infrastructure are important as well. Establishing a small sized Dairy Processing Plant with various value added dairy products is a relatively new concept in dairy sector. Metropolitan cities like Lahore, Karachi, Multan, Rawalpindi and Faisalabad etc. are major markets of milk, yogurt and cheese as project plants established around these cities fulfil their daily dairy products demand. There is a year-round market of milk, however, the demand of other dairy products in project i.e. yogurt increases in summer months (April to November) and that of cheese increases in winter months.

4.1 Dairy Processing Plant Production Process

Following production process will be followed on project plant;

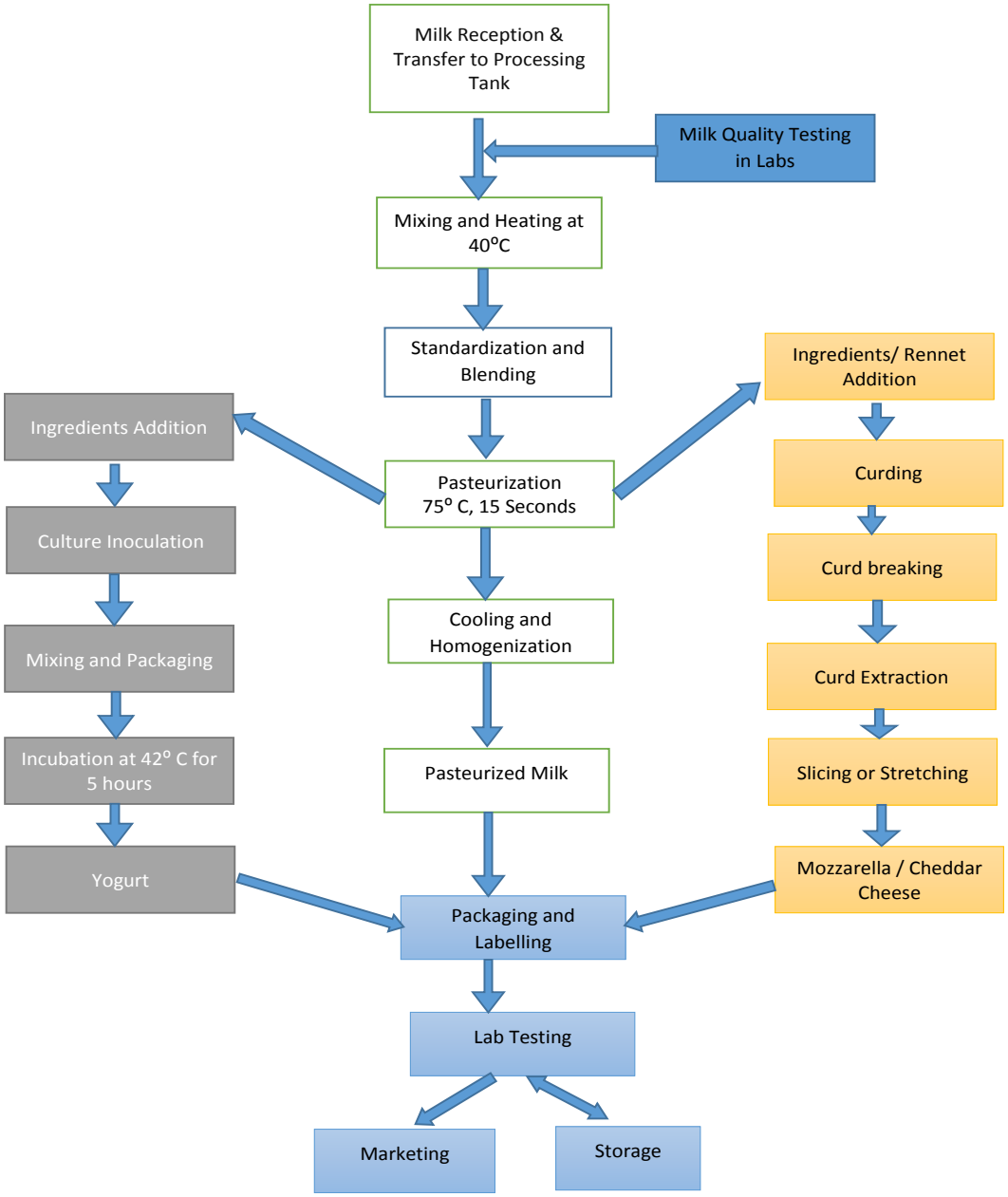
4.1.1 Milk Quality Control:

Milk processing is subject to a variety of safety testing. Some of these include tests for microbial quality, degree of pasteurization and various forms of contaminants. The microbial quality of the incoming milk is determined by using a dye reaction test. This method shows the number of organisms present in the incoming milk. If the microbial count is too high at this point, the milk may not be used for further processing. Since complete pasteurization inactivates most organisms in milk, the degree of pasteurization is determined by measuring the level of an enzyme in the milk called phosphatase. Government regulations require that the test be conducted to ensure that pasteurization is done properly. Beyond microbial contamination, raw milk is subject to other kinds of contaminants such as antibiotics, pesticides or even radioactivity. These can be found through safety testing and the milk is treated accordingly. In addition to safety tests, the final yogurt product is also evaluated to ensure that it meets the specifications set by the manufacturer for characteristics such as pH, rheology[2], taste, color, and

[2] Rheology is the study of the flow of matter, primarily in a liquid state, but also as "soft solids" or solids under conditions in which they respond with plastic flow rather than deforming elastically in response to an applied force. (Source: Wikipedia)

odor. These factors are tested using various laboratory equipment such as pH meters and viscometers and also human panelists.

Milk Processing Flow Diagram



4.1.2 Milk Pasteurization Process:

After the receipt of raw and fresh milk at reception area, it is filtered and pumped into a chiller tank where it is chilled to stop the growth of harmful bacteria. On average, fresh milk contain 4.5% fats which will be reduced to 3.5% with the help of a cream separator. The milk will then undergo the pasteurization process i.e. heating of milk to 72-75ºC for at least 15-20 seconds, ensuring the destruction of harmful micro-organisms and bacteria. At this stage, 50% of total milk is shifted to pasteurized milk line and rest 50% will be directed to yogurt line simultaneously for 240 days (summer) and 120 days (winter) in a year. Only one line i.e. yogurt or cheese would be operational at one time.

During the production of pasteurized milk, the temperature is dropped to 4ºC as it helps stop further growth of bacteria. After this, 50% of the pasteurized milk would be packed in sealed pouched packing of one litre and the rest 50% in 0.5 litre packed volume. Shortly after this, finished pasteurized packs are ready for distribution in the market. After the completion of pasteurization process, the milk line is cleansed and sterilized through steam and regular clean-in-place (CIP) for next batch of milk.

4.1.3 Yogurt Production Process:

Before the entry into yogurt line, milk composition has already been modified through standardization process by reducing its fat content, increasing total solids and pasteurization process to kill harmful bacteria and then homogenized to consistently disperse fat molecules.
The pasteurization of milk will do the following;

- Destroy microorganisms that may interfere with the controlled fermentation process
- Denature whey proteins so that final yogurt product has better thickness and texture
- Change the flavor of milk
- Release the compounds in milk that will stimulate growth of the starter culture.

When pasteurization and homogenization are complete, the milk is cooled to 109.4-114.8° F (43-46° C) and the fermentation culture is added in a concentration of about 2%. It is held at this temperature for about 3 to 4 hours while the incubation process takes place. During this time, the bacteria metabolizes certain compounds in the milk producing the characteristic yogurt flavor. An important byproduct of this process is lactic acid.
The fat content is reduced by using a standardizing clarifier and a separator (a device that relies upon centrifugation to separate fat from milk). From the

separator, the milk is placed in a storage tank and tested for fat and solids content. For yogurt manufacturing, the solid content of the milk is increased to 16% with 1-5% being fat and 11-14% being solids-not-fat (SNF). This is accomplished either by evaporating off some of the water, or adding concentrated milk or milk powder. Increasing the solids content improves the nutritional value of the yogurt, makes it easier to produce a firmer yogurt and improves the stability of yogurt. The milk substance is fermented until it becomes yogurt. After the solids composition is adjusted, stabilizers are added in pasteurized milk.

Depending on the type of yogurt, the incubation process is done either in a large tank of several hundred gallons or in the final individual containers. Stirred yogurt is fermented in bulk and then poured into the final selling containers or pouches. The lactic acid level is used to determine when the yogurt is ready[3]. When the yogurt reaches the desired acid level, it is cooled, modified as necessary and dispensed into final packings of 1 kg and 0.5 kg. The finished yogurt packing is delivered to market through refrigerated vehicle.

4.1.4 Cheese Making Process:

Two types of products would be produced in this line i.e. Mozzarella and Cheddar Cheese. Basic technology for production of all types of cheese is the same with relatively small changes resulting in significant differences in the final product. The skill of cheese manufacturing consists of some key factors such as composition of milk, extent of acid production, moisture, curd handling and ripening conditions of cheese.

Pasteurized milk enters the cheese making line for curdling at which, the separation of milk into solid (Curd) and liquid (Whey) is done through acidification (souring) of the pasteurized milk and then addition of Rennet enzyme. Rennet sets the cheese into a strong and rubbery gel compared to the fragile curds produced by acidic coagulation alone. More commonly used starter bacteria are added which convert milk sugars into lactic acid. Mostly, cheeses are made with starter bacteria from the Lactococcus, Lactobacillus, or Streptococcus families.

At this point, the cheese has set into a very moist gel. The curd is cut into small cubes to allow the excess water to drain from the individual pieces of curd.

[3] The acid level is found by taking a sample of the product and titrating it with sodium hydroxide. A value of at least 0.9% acidity and a pH of about 4.4 are the current minimum standards for yogurt manufacturing.

It is then heated to temperatures in the range of 35–55 °C (95–131 °F) which forces more whey from the cut curd. It also changes the taste of the finished cheese, affecting both the bacterial culture and the milk chemistry.

Brining or addition of salt plays important role in cheese production besides adding flavor. It preserves cheese from spoiling, draws moisture from the curd, and firms' cheese's texture in an interaction with its proteins. The cheese now has the salt mixed directly into the curds. From here, 50% cheese would be treated through Stretching techniques to give it a texture and flavor of Mozzarella Cheese i.e. the curd is stretched and kneaded in hot water, developing a stringy, fibrous body.

Rest of 50% cheese would be treated through cheddaring to give it a texture of cheddar cheese i.e. the cut curd is repeatedly piled up, pushing more moisture away. The curd is also mixed (or milled) for a long time to get the final product's texture. Cheddar cheese achieves its final shape when the curds is pressed into a mold or form. More the pressure applied, the harder the cheese becomes as the pressure drives out moisture. Special molds are designed to allow water to escape and the curd is unified into a single solid body.

Regarding ripening and aging, newly formed hard cheese is usually salty yet bland in flavor and soft rubbery in texture. Normally cheeses are left to rest under controlled conditions that may last from a few days to several weeks.

4.2 Implementation of Modern Food Safety Management (MFSM) System

4.2.1 Standardization and Compliance

The presence of an appropriate and well placed standardization and monitoring regime is key to enhance growth potential of the project by quality and standardization principles. The principal standardization regime 'The Codex Alimentarius' focus on international food standards, guidelines and codes of practice with the goal to protect the health of consumers and ensure fair practices in food preparation. The laws that specifically deal with food safety from production to processing and marketing are;

a) The Pure Food Ordinance 1960: aims to ensure purity of food being supplied to people in the market and, therefore, provides base for prevention of adulteration.
b) Pakistan Standards and Quality Control Authority (PSQCA) Act, 1996.

Pakistan's national standards cover food products mandatory for human safety and public health reasons, under the Compulsory Certification Mark License

Scheme. These products whether imported or domestic, must meet Pakistani standards, which are generally harmonized with international requirements and have a certification Mark issued by the Pakistan Standards and Quality Control Authority (PSQCA). It is national standardization body with which domestic manufacturers and exporters must be registered to ensure compliance and is governed by the PSQCA Act, 1996.

Currently, food safety standards are regulated by Provincial Governments (e.g. Punjab Food Law, Annex 1). The Pure Food Laws (PFL) of 1963, revised as Pakistan Pure Food Laws, 2011 is the basis for existing trade-related food quality and safety legislative framework. It covers 104 food items including 'Milk and Milk Products Category'. These regulations also address purity issues in raw food and deal with additives, food preservatives, synthetic colors, antioxidants and heavy metals.

4.3 Installed and Operational Capacities

In the proposed study, initially, processing of 2.88 million litres of milk (50% of installed capacity) is recommended to obtain optimum plant processing capacity in first year of project. It is assumed that on average, 50 % of total milk at plant would be processed through pasteurization throughout the year. The remaining 50% milk would be processed to yogurt for 240 summer days and cheese in 120 winter days on plant. The project will have the capacity to generate revenues of Rs. 232.17 million in its first year of operation through sale of pasteurized milk, yogurt and cheese. The annual loss rate is assumed to be 5% for milk, 5% for yogurt and 2 % for cheese. The plant capacity would be increased up to 80% which is processing of 4.61 million litres of milk in 10^{th} year of the project.

5 CRITICAL FACTORS

The critical factors for success and viability of this project are;

A. Uninterrupted and regular supply of required bulk milk quantity at least possible or minimum price throughout the year.
B. Regular quality checks at different stages of production process for ensured quality of products as per food laws and regulations.
C. Aggressive marketing efforts to establish brand name.
D. Continuous research & development as per market demand.
E. Raw material and finished product storage management as per international standards to avoid any deterioration in quality of dairy products.

F. Background knowledge and related experience of the entrepreneur in Mini Dairy Processing Plant operations as well as regular capacity building of staff and management for updating technical skills.
G. Application of Modern Food Safety Management System, HACCP plans and other certification systems essential for whole value addition process.

The operations of Mini Dairy Processing Plants depend on continuous year round supply of raw material i.e. quality milk, skilled manpower for dairy value addition and other major resources. Successful project harnesses all available resources for productive and profitable unit. The judicial use of means and resources to achieve clearly defined goals is the key success factor for project.

6 GEOGRAPHICAL POTENTIAL FOR INVESTMENT

Mini Dairy Processing Plant is a viable business proposition for peri-urban areas of Pakistan. There is higher demand for milk in peri urban areas around the major cities such as Karachi, Hyderabad, Sakkar Lahore, Faisalabad, Sheikhupura, Bahawalpur, Multan, Jhang, Sahiwal, Pakpattan, Okara, Jehlum, Peshawar, Charsadda, D.I. Khan, Quetta, etc. across the country; hence, the said project offers good investment opportunities for potential investment in all provinces of country. The areas around major cities with road infrastructure, water and electricity supply make a better choice for plan; provided there is ready access to consumer related marketing services.

7 POTENTIAL TARGET CUSTOMERS / MARKETS

This pre-feasibility study suggests that raw milk from dairy farms will be collected and processed in value added dairy products such as pasteurized milk, yogurt and cheese will be sold to the wholesalers and retailers through proper marketing strategy primarily in urban market. Some of the target clients of the project are domestic consumers, milk wholesalers, retailers, catering and hoteling industry etc. Usually, the demand for milk and yogurt increases during summer months as consumption of whey (lassi) rises due to hot weather. These are high value products however with relatively short shelf life. On the other hand, demand of cheese is increasing due to its vibrant use in pizza and other cousins. Processed milk market has increased its share in quality conscious consumers. Processed milk has achieved 4% share in Lahore milk market during the last two decades. Milk supply is increasing at the rate of 4% annually, however demand is increasing at 15% annually. Metropolitan cities are considered major markets for the sale of milk.

8 PROJECT COST SUMMARY

8.1 Project Economics

The financial model for this pre-feasibility study indicates estimated revenue of Rs. 232.17 Million in year one. The capacity utilization during year one is 50 % which increases maximum to 80% at 10th year of project at 5% growth rate per annum. The following table shows internal rate of return, payback period and net present value of the proposed venture;

Table 2: Project Economics

Description	Details
Internal Rate of Return (IRR)	44%
Payback Period (Years)	3.01
Net Present Value (Million Rs.)	77.01

8.2 Project Financing

Following table provides details of equity required and variables related to bank loan;

Table 3: Project Financing

Description	Details
Total Equity (50%)	Rs. 19.98 Million
Bank Loan (50%)	Rs. 19.8 Million
Markup to the Borrower (% per annum)	15%
Tenure of the Project (Years)	10

8.3 Project Cost

Following fixed and working capital requirements have been identified for operations of the proposed business.

Table 4: Project Cost

Description	Amount (Rs.)
Capital Cost	
Land	2,694,444
Building/Infrastructure	7,870,000
Machinery & equipment	21,913,000

Furniture & fixtures	225,000
Office vehicles	3,979,400
Office equipment	52,000
Pre-operating costs	1,018,010
Total Capital Cost	**37,751,854**
Working Capital	
Raw Material Inventory	1,538,724
Equipment spare part inventory	91,304
Cash	578,453
Total Working Capital	**2,208,481**
Total Project Cost	**39,960,336**

The proposed pre-feasibility is based on the assumption of 50% debt and 50% equity. However this composition can be changed as per requirements of the investor.

8.4 Space Requirement

Space requirement for the proposed plant is calculated considering requirements for management building, production plant area for milk, yogurt and cheese processing, store, washrooms and pavements. Details of space requirement and cost are given below;

Table 5: Space Requirment

Description	Estimated Area (Sq.ft.)	Unit Cost (Rs./Sq.ft)	Total Cost (Rs.)
Management building	500	2,500	1,250,000
Store room	250	1,200	300,000
Factory/ Production plant	3,000	2,000	6,000,000
Washrooms	100	1,200	120,000
Pavement/driveway	1,000	200	200,000
Total Infrastructure			**7,870,000**

Total investment in building and infrastructure is approximately Rs. 7.87 million. Land is to be purchased as per maximum space requirements of the plant for 10 years. Total land requirement is approximately 1.08 Kanal at an average price of Rs. 2.5 million per Kanal.

8.5 Machinery & Equipment Requirement

Following plant machinery and equipment are needed to run daily plant operations;

Table 6: Machinery & Equipment

Specifications	Quantity	Cost / Unit (Rs.)	Total Amount (Rs.)
Milk Pasteurization			
Raw milk reception tank (Capacity 2,000 litres of milk)	1	600,000	600,000
Processing plant (PHE, Homo, Separator)	1	4,000,000	4,000,000
Generator (70 KVA)	1	1,225,000	1,225,000
Packaging machine (Milk & Yogurt)	2	300,000	600,000
Milk chillers for retail shops	38	45,000	1,710,000
Cheese / Yogurt Production			
Cheese vat	1	1,000,000	1,000,000
Cheese machine	1	4,000,000	4,000,000
Vacuum pack machine	1	350,000	350,000
Cheese cutter	4	5,000	20,000
Cheese hop dye	10	4,000	40,000
SS. Cheese tray	6	6,000	36,000
Electric cream separator	1	80,000	80,000
SS. Tank (5000 Litres)	1	3,000,000	3,000,000
Slice cutter machine	1	150,000	150,000
SS. Cheese cutting table	2	9,000	18,000
Cheese block cutting machine	1	175,000	175,000
Cold store for cheese aging	1	1,250,000	1,250,000
Steam boiler	1	2,000,000	2,000,000
Curd pail	2	7,000	14,000
Air compressor machine for cheese press	1	1,000,000	1,000,000
Water chilling unit for bringing (Capacity 1000 litres)	1	360,000	360,000
Cheese rack for ageing	1	50,000	50,000
Lab equipment	1	50,000	50,000
SS. Cheese trolley	1	85,000	85,000

Yogurt storage tank	1	50,000	50,000
Misc. equipment and tools	Lump sum		50,000
Total Machinery and Equipment			**21,913,000**

Note: SS stands for Stainless Steel

The Cleaning-In-Place (CIP[4]) cost for the plant is assumed to be Rs. 10,000 per month or Rs. 120,000 for first year of production.

8.6 Office Vehicle

Following vehicles are needed for the project;

Table 7: Office Vehicles

Description	No.	Cost / Unit (Rs.)	Amount (Rs.)
Motor Cycle (70cc)	1	40,000	40,000
Suzuki Ravi*	2	1,200,000	2,400,000
Shahzore (Hyundai)**	1	1,500,000	1,500,000
Registration fee***			39,400
Total cost			**3,979,400**

**With insulation and a refrigerator for supply of finished product*
***with installation of a milk drum*
****1 % of office vehicles cost*

It is assumed that transportation cost for milk collection from farm to plant would be Rs. 4 per litre of Milk collected or Rs. 11.52 Million for collecting 2.88 million litres of milk in 1st year of project. Similarly, the cost of distribution of finished products from farm to market would be Rs. 5,000 per day for two vehicles i.e. Rs. 1.8 million in 1st year.

8.7 Furniture & Fixtures Requirement

Details of furniture and fixtures required for the project are given below;

Table 8: Furniture & Fixture

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Furniture	Lump sum	50,000	50,000

[4] Cleaning in Place (CIP) refers to the use of a mix of chemicals, heat and water to clean machinery, vessels or pipe work without dismantling plant. The process can be one shot, where everything goes to drain, or recovery, which recycles most of the liquid. CIP is commonly used in hygiene critical industries, such as Food, Beverage and Pharmaceutical, to clean a wide range of plant.

Fans	10	2,500	25,000
LED Lights (18 W)	50	600	30,000
Air Conditioner (1.5 ton split)	2	60,000	120,000
Total Furniture & Fixtures			**225,000**

8.8 Office Equipment Requirement

Following office equipment will be required for the project;

Table 9: Office Equipment

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Laptop computer	1	50,000	50,000
Telephone/ Cell phone	2	1,000	2,000
Total			**52,000**

8.9 Human Resource Requirement

In order to run operations of the plant smoothly, following human resources along with required number and monthly salary are recommended;

Table 10: Human Resource Requirment

Post	No.	Monthly Salary (Rs)	Total Salary in Year 1 (Rs.)
CEO	1	60,000	720,000
Marketing Manager	1	30,000	360,000
Plant Operator	1	30,000	360,000
In-Charge Procurement / inventory	1	30,000	360,000
Admin/Accounts Officer	1	30,000	360,000
Operator's Helpers	5	20,000	240,000
Sales Persons	2	20,000	240,000
Loaders	2	15,000	180,000
Drivers	3	18,000	216,000
Guard	1	15,000	180,000
Office Boy	1	15,000	180,000
Total	**19**	**283,000**	**3,396,000**

It is recommended that the plant supervisor should have comprehensive practical and theoretical knowledge within Mini Dairy Processing Plant with the responsibility for supervision of various critical activities at plant related to improvement of plant productivity. He should also provide inputs to review and develop targets for sub-ordinate plant workers. (For further details on qualifications, please visit Pakistan National Vocational Qualifications Framework (NVQF), National Vocational and Technical Training Commission (NAVTTC), www.navttc.org).

8.10 Raw material Requirement

Following tables show raw material requirement to run the proposed Mini Dairy Processing Plant in first year of production;

Table 11: Total Cost of Raw Materials in Year 1

Costs	No.	Unit	Rate Rs,/unit	Total Cost in Year 1 (Rs.)
Raw Milk	2,880,000	Litres	60	172,800,000
Ingredients-Cheese		Req. Rs/ kg of Cheese	4.3	2,022,720
Ingredients- Yogurt		Req. Rs/ kg of Yogurt	3.0	2,736,000
Packaging- Pasteurized Milk		Rs./Litre	5	6,840,000
Packaging- Yogurt		Rs./kg	5	4,560,000
Packaging- Cheese		Rs./kg	9.5	446,880
Total				**189,405,600**

8.11 Utilities and other costs

An essential cost to be borne by the project is the cost of electricity. The direct or variable electricity cost is estimated to be Rs. 287,676 per month i.e. Rs 3.45 million in first year of production. It is assumed that electricity infrastructure and installations along with a transformer are already available, hence calculations do not include these costs. The indirect or regular electricity expense for management and staff building is assumed to be approximately Rs. 5,000 per month or Rs. 60,000 in 1st year of the project.

It is further assumed that in a shift of 8 hours, plant would be operated on electricity for 5 hours and for rest of 3 hours, generator would be run (probably due to load shedding). The consumption of diesel for generator will be 3 litres / hour

hence, total diesel cost[5] in year 1 would be Rs. 259,200. Similarly, boiler would be run on furnace oil for 8 hours daily with consumption of 7 litres/ hour, hence cost of furnace oil[6] in year 1 would be Rs. 1.1 million. The total cost of fuel including diesel and furnace to run the plant would be Rs. 1.32 Million in year 1.

The fuel cost (petrol) for running vehicles for collection and transportation of milk from farm to plant is assumed to be Rs. 11.52 million (@Rs 4 per litre of milk collected) in first year of operations. Similarly, the cost of fuel for transportation of finished products to retailers and market is assumed to be Rs. 1.8 million per annum (@ Rs 5000 per day for two vehicles).

The laboratory charges for analysis of milk testing and analyses include Rs. 5,000 per month i.e. Rs, 60,000 in year 1.

The milk chiller, energy savers, fans and air conditioners will operate for 8 hours per day (average) throughout the year. Monthly maintenance of machinery is calculated at 5% of total machinery cost i.e. Rs. 1.09 million in year 1.

Monthly expenses related to communication such as internet, phone, fax etc. are 2% of administrative expense, hence Rs. 79,440 per year.

The office expenses including routine office work e.g. stationary, entertainment, janitorial services, etc. is 3% of administrative expense, hence Rs. 119,160 per year.

Business promotion expense is assumed to be 0.5% of revenues generated in year 1, hence Rs. 1.16 million.

Professional fees e.g. for documentation related to legal and audit matters and consultants charges for getting certifications is assumed to be 0.1% of revenue in year 1 hence Rs. 232,170.

8.12 Revenue Generation

The total milk to be processed in 1st year is assumed to be 2.88 million litres. Sales revenue during the first year of operations are shown in the following table;

Table 12: Revenue Generation – Year 1

Particulars	Rate/Unit (Rs.)	Units (No.)	Total Revenue -Year 1 (Rs.)
Pasteurized Milk- 1 Litre Pack	74.40	684,000	50,889,600
Pasteurized Milk- 0.5 Litre Pack	42.20	1,368,000	57,729,600

[5] Diesel Price: Rs. 80/ Litre as of September 2017
[6] Furnace Oil Price: Rs 53/ Litre as of September, 2017

Cheddar Cheese- 1 Kg Pack	651.00	11,760	7,655,760
Cheddar Cheese- 200 grams Pack	180.20	58,800	10,595,760
Mozzarella Cheese- 1 Kg Pack	790.50	11,760	9,296,280
Mozzarella Cheese- 200 grams Pack	208.10	58,800	12,236,280
Yogurt- 1 Kg Pack	83.70	456,000	38,167,200
Yogurt- 0.5 Kg Pack	50.00	912,000	45,600,000
Total Revenue			**232,170,480**

The wastage for milk, yogurt and cheese are 5%, 5% and 2% per annum respectively. Project itself would market its finished dairy products.

9 CONTACT DETAILS

In order to facilitate potential investors, contact details of private sector Service Providers relevant to the proposed project are given hereunder.

9.1 Technical Experts/ Consultants

Department of Dairy Technology
National Institute of Food Science and Technology (NIFSAT)
University of Agriculture, Faisalabad.
Ph: 041-9200161-70: Ext., 3011
Fax: 041-9201439
Web: www.uaf.edu.pk

Department of Dairy Technology
Faculty of Animal Production and Technology
University of Veterinary and Animal Sciences (UVAS)
Out Fall Road, Lahore.
Ph: 042-99211374, 99211449 (Ext 5029)
Web: www.uvas.edu.pk

Dairy Technology Section
Animal Product Improvement Programme (APIP
Animal Science Institute
National Agricultural Research Centre
Park Road, Islamabad.
Ph: 051-90733957 & 58

9.2 Machinery Suppliers

Mr. Abdul Qadir
House No. 7, Street No. 2, Near Hussain Sugar Mills,
Jaranwala, Faisalabad.
Cell # 03027261159
E-mail: abdulqadir322@gmail.com

ESET Private Limited
24-A-2, Pakistan Expatriates Co-Operative Housing Society Limited,
Valencia Housing Scheme, Lahore.
Ph: 0321 5286070
Email: info@eset.com.pk
Web: www.eset.com.pk

Azhar and Co.
Display: 19 - Main Brandeth Road, Lahore.
Office: Suite # 4, 1st Floor, Al-Karim Center, Rehman Street # 5,
Main Brandeth Road, Lahore.
Ph: 042-3764 1060/ 3763 6437.
Fax: 042-37661379.
E-mail : info@azharco.com , professionalinterest@hotmail.com
Web: www.azharco.com

Al-Madina Engineering & Dairy Equipment
near Canal Bridge G.T Road, District Okara, Punjab
Ph: 044-2527118/ 2528818/
Cell: 0301-73-11-730
Fax: 044-2525818
E-mail: al_madina75@hotmail.com , al_madina75@yahoo.com
Web: www.al-madina.net.pk

10 USEFUL WEB LINKS

Links of Federal & Provincial Government, Semi Government and other (sector & Cluster based) Development organizations are given under to get benefit from the services offered.

Table 13: Useful Web Links

Small & Medium Enterprises Development Authority (SMEDA)	www.smeda.org.pk
Government of Pakistan	www.pakistan.gov.pk
Ministry of Industries & Production	www.moip.gov.pk
Ministry of National Food Security & Research	www.mnfsr.gov.pk
Government of Punjab	www.punjab.gov.pk
Government of Sindh	www.sindh.gov.pk
Government of Khyber Pakhtunkhwa	www.khyberpakhtunkhwa.gov.pk
Government of Balochistan	www.balochistan.gov.pk
Government of Gilgit Baltistan	www.gilgitbaltistan.gov.pk
Government of Azad Jamu Kashmir	www.ajk.gov.pk
Trade Development Authority of Pakistan (TDAP)	www.tdap.gov.pk
Security Commission of Pakistan (SECP)	www.secp.gov.pk
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	www.fpcci.com.pk
State Bank of Pakistan (SBP)	www.sbp.org.pk
Punjab Small Industries Corporation	www.psic.gop.pk
Sindh Small Industries Corporation	www.ssic.gos.pk
Punjab Board of Investment & Trade (PBIT)	www.pbit.gop.pk
Sindh Board of Investment (SBI)	www.sbi.gos.pk
Pakistan Agricultural Research Council (PARC)	www.parc.gov.pk
Balochistan Agricultural Research Centre (BARC)	www.parc.gov.pk
Southern-zone Agricultural Research Centre (SARC)	www.parc.gov.pk
Arid Zone Research Institute (AZRI)	www.parc.gov.pk
Punjab Livestock & Dairy Development Board (PLDDB)	www.plddb.pk
University of Agriculture, Faisalabad,	www.uaf.edu.pk
Lasbela University of Agriculture, Water & Marine Sciences, Lasbela	www.luawms.edu.pk
Sindh Agriculture University, Tondojam	www.sau.edu.pk
Gomal College of Veterinary Sciences, Dera Ismail Khan	www.gu.edu.pk
KPK Agricultural University, Peshawar	www.aup.edu.pk
Pir Mehr Ali Shah Arid Agricultural University, Rawalpindi	www.uaar.edu.pk
University College of Veterinary & Animal Sciences, Islamia University Bahawalpur (IUB),	www.iub.edu.pk
University of Veterinary & Animal Sciences (UVAS), Lahore	www.uvas.edu.pk
Bahauddin Zakariya University (BZU), Multan	www.bzu.edu.pk
Veterinary Research Institute (VRI), Punjab	

Agribusiness Support Fund (ASF), Lahore,	www.asf.org.pk
Directorate of Livestock Plants, L&DD, Punjab	
Livestock & Fisheries Department, Government of Sindh	www.sindh.gov.pk
Agriculture & Livestock Department, Government of KPK	www.khyberpakhtunkhwa.gov.pk
Livestock & Dairy Development, Government of Balochistan	www.balochistan.gov.pk

11 ANNEXURES

11.1 Income Statement

Statement Summaries — **SMEDA**

Income Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue	232,170,480	280,926,281	337,111,537	401,724,582	475,889,120	560,869,320	658,086,668	723,895,335	796,284,869	875,913,356
Cost of goods sold	211,171,807	254,384,471	304,127,967	361,276,335	426,813,117	501,844,515	587,614,085	646,364,436	710,988,745	782,074,303
Gross Profit	20,998,673	26,541,810	32,983,570	40,448,246	49,076,002	59,024,805	70,472,583	77,530,899	85,296,124	93,839,053
General administration & selling expenses										
Administration expense	3,972,000	4,358,720	4,783,091	5,248,779	5,759,808	6,320,591	6,935,972	7,611,268	8,352,312	9,165,505
Rental expense	-	-	-	-	-	-	-	-	-	-
Utilities expense	60,000	66,000	72,600	79,860	87,846	96,631	106,294	116,923	128,615	141,477
Travelling & Comm. expense (phone, fax, etc.)	79,440	87,174	95,662	104,976	115,196	126,412	138,719	152,225	167,046	183,310
Office vehicles running expense	-	-	-	-	-	-	-	-	-	-
Office expenses (stationary, etc.)	119,160	130,762	143,493	157,463	172,794	189,618	208,079	228,338	250,569	274,965
Promotional expense	1,160,852	1,404,631	1,685,558	401,725	475,889	560,869	658,087	723,895	796,285	875,913
Insurance expense	-	-	-	-	-	-	-	-	-	-
Professional fees (legal, audit, etc.)	232,170	280,926	337,112	401,725	475,889	560,869	658,087	723,895	796,285	875,913
Depreciation expense	3,408,380	3,408,380	3,408,380	3,408,380	3,408,380	4,144,634	4,144,634	4,144,634	4,144,634	4,144,634
Amortization expense	203,602	203,602	203,602	203,602	203,602	-	-	-	-	-
Property tax expense	-	-	-	-	-	-	-	-	-	-
Miscellaneous expense	-	-	-	-	-	-	-	-	-	-
Subtotal	9,235,605	9,940,195	10,729,496	10,006,509	10,699,404	11,999,623	12,849,872	13,701,179	14,635,747	15,661,718
Operating Income	11,763,068	16,601,614	22,254,074	30,441,737	38,376,598	47,025,181	57,622,711	63,829,720	70,660,377	78,177,335
Other income	-	-	-	-	-	-	-	-	-	-
Gain / (loss) on sale of assets	-	-	-	-	1,591,760	-	-	-	-	-
Earnings Before Interest & Taxes	11,763,068	16,601,614	22,254,074	30,441,737	39,968,358	47,025,181	57,622,711	63,829,720	70,660,377	78,177,335
Interest expense	2,864,143	2,630,589	2,466,005	2,274,962	2,053,209	1,952,380	1,645,592	1,289,487	876,137	396,338
Earnings Before Tax	8,898,925	13,971,025	19,788,069	28,166,775	37,915,149	45,072,801	55,977,119	62,540,233	69,784,241	77,780,997
Tax	2,334,123	4,109,358	6,145,323	9,077,871	12,489,802	14,994,980	18,811,491	21,108,581	23,643,984	26,442,848
NET PROFIT/(LOSS) AFTER TAX	6,564,802	9,861,667	13,642,746	19,088,904	25,425,348	30,077,822	37,165,628	41,431,652	46,140,257	51,338,149
Balance brought forward		1,312,960	2,234,925	3,175,534	4,452,888	29,878,235	59,956,057	97,121,685	138,553,337	184,693,594
Total profit available for appropriation	6,564,802	11,174,627	15,877,671	22,264,439	29,878,235	59,956,057	97,121,685	138,553,337	184,693,594	236,031,743
Dividend	5,251,842	8,939,702	12,702,137	17,811,551	-	-	-	-	-	-
Balance carried forward	1,312,960	2,234,925	3,175,534	4,452,888	29,878,235	59,956,057	97,121,685	138,553,337	184,693,594	236,031,743

11.2 Balance Sheet

Statement Summaries **SMEDA**
Balance Sheet

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assets											
Current assets											
Cash & Bank	2,018,453	2,709,997	4,822,307	6,000,295	6,780,406	24,073,116	52,537,434	87,097,384	124,852,030	166,774,267	214,295,526
Accounts receivable	-	4,452,585	4,920,106	5,926,390	7,084,730	8,415,474	9,941,519	11,688,619	13,251,882	14,577,070	16,034,777
Finished goods inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment spare part inventory	91,304	105,456	121,802	140,681	162,487	187,672	216,762	250,360	289,165	333,986	-
Raw material inventory	98,724	131,402	173,450	227,364	296,273	384,097	495,741	599,847	725,815	878,236	-
Pre-paid annual land lease	-	-	-	-	-	-	-	-	-	-	-
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Pre-paid insurance	-	-	-	-	-	-	-	-	-	-	-
Total Current Assets	2,208,482	7,399,439	10,037,665	12,294,731	14,323,896	33,060,359	63,191,456	99,636,209	139,118,892	182,563,559	230,330,303
Fixed assets											
Land	2,694,444	2,694,444	2,694,444	2,694,444	2,694,444	2,694,444	2,694,444	2,694,444	2,694,444	2,694,444	2,694,444
Building/Infrastructure	7,870,000	7,476,500	7,083,000	6,689,500	6,296,000	5,902,500	5,509,000	5,115,500	4,722,000	4,328,500	3,935,000
Machinery & equipment	21,913,000	19,721,700	17,530,400	15,339,100	13,147,800	13,460,111	11,018,450	8,576,789	6,135,128	3,693,467	1,251,806
Furniture & fixtures	225,000	202,500	180,000	157,500	135,000	112,500	90,000	67,500	45,000	22,500	-
Office vehicles	3,979,400	3,183,520	2,387,640	1,591,760	795,880	6,408,863	5,127,091	3,845,318	2,563,545	1,281,773	-
Office equipment	52,000	46,800	41,600	36,400	31,200	26,000	20,800	15,600	10,400	5,200	-
Total Fixed Assets	36,733,844	33,325,464	29,917,084	26,508,704	23,100,324	28,604,419	24,459,785	20,315,151	16,170,517	12,025,883	7,881,250
Intangible assets											
Pre-operation costs	1,018,010	814,408	610,806	407,204	203,602	-	-	-	-	-	-
Legal, licensing, & training costs	-	-	-	-	-	-	-	-	-	-	-
Total Intangible Assets	1,018,010	814,408	610,806	407,204	203,602	-	-	-	-	-	-
TOTAL ASSETS	39,960,336	41,539,312	40,565,555	39,210,639	37,627,822	61,664,778	87,651,241	119,951,360	155,289,410	194,589,442	238,211,553
Liabilities & Shareholders' Equity											
Current liabilities											
Accounts payable	-	3,566,728	4,313,595	5,174,267	6,164,057	7,300,214	8,602,147	10,090,977	11,101,604	12,213,600	13,409,388
Export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Short term debt	-	-	-	-	-	-	-	-	-	-	-
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Total Current Liabilities	-	3,566,728	4,313,595	5,174,267	6,164,057	7,300,214	8,602,147	10,090,977	11,101,604	12,213,600	13,409,388
Other liabilities											
Lease payable	-	-	-	-	-	-	-	-	-	-	-
Deferred tax	-	(1,314,436)	(2,933,198)	(4,900,983)	(7,371,490)	(10,426,900)	(13,911,769)	(18,050,897)	(22,583,811)	(27,551,367)	(32,998,727)
Long term debt	19,980,168	17,993,892	16,970,065	15,781,653	14,402,199	13,867,026	11,958,603	9,743,393	7,172,078	4,187,412	722,947
Total Long Term Liabilities	19,980,168	16,679,455	14,036,866	10,880,670	7,030,709	3,440,126	(1,953,166)	(8,307,504)	(15,411,734)	(23,363,955)	(32,275,780)
Shareholders' equity											
Paid-up capital	19,980,168	19,980,168	19,980,168	19,980,168	19,980,168	21,046,202	21,046,202	21,046,202	21,046,202	21,046,202	21,046,202
Retained earnings	-	1,312,960	2,234,925	3,175,534	4,452,888	29,878,235	59,956,057	97,121,685	138,553,337	184,693,594	236,031,743
Total Equity	19,980,168	21,293,128	22,215,093	23,155,702	24,433,056	50,924,438	81,002,259	118,167,888	159,599,540	205,739,797	257,077,945
TOTAL CAPITAL AND LIABILITIES	39,960,336	41,539,312	40,565,555	39,210,639	37,627,822	61,664,778	87,651,241	119,951,360	155,289,410	194,589,442	238,211,553

Note: Total assets value will differ from project cost due to first installment of leases paid at the start of year 0

11.3 Cash Flow Statement

Statement Summaries **SMEDA**
Cash Flow Statement

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Operating activities											
Net profit	-	6,564,802	9,861,667	13,642,746	19,088,904	25,425,348	30,077,822	37,165,628	41,431,652	46,140,257	51,338,149
Add: depreciation expense	-	3,408,380	3,408,380	3,408,380	3,408,380	3,408,380	4,144,634	4,144,634	4,144,634	4,144,634	4,144,634
amortization expense	-	203,602	203,602	203,602	203,602	203,602	-	-	-	-	-
Deferred income tax	-	(1,314,436)	(1,618,762)	(1,967,785)	(2,470,507)	(3,055,410)	(3,484,869)	(4,139,128)	(4,532,915)	(4,967,555)	(5,447,361)
Accounts receivable	-	(4,452,585)	(467,521)	(1,006,284)	(1,158,340)	(1,330,744)	(1,526,045)	(1,747,100)	(1,563,263)	(1,325,188)	(1,457,707)
Finished good inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment inventory	(91,304)	(14,152)	(16,346)	(18,879)	(21,806)	(25,185)	(29,089)	(33,598)	(38,806)	(44,821)	333,986
Raw material inventory	(98,724)	(32,678)	(42,049)	(53,914)	(68,909)	(87,824)	(111,644)	(104,106)	(125,968)	(152,421)	878,236
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Advance insurance premium	-	-	-	-	-	-	-	-	-	-	-
Accounts payable	-	3,566,728	746,867	860,671	989,791	1,136,156	1,301,933	1,488,830	1,010,627	1,111,997	1,195,787
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Cash provided by operations	(190,028)	7,929,662	12,075,839	15,068,537	19,971,116	25,674,323	30,372,741	36,775,160	40,325,962	44,906,902	50,985,724
Financing activities											
Change in long term debt	19,980,168	(1,986,276)	(1,023,827)	(1,188,412)	(1,379,454)	(535,173)	(1,908,423)	(2,215,210)	(2,571,315)	(2,984,666)	(3,464,464)
Change in short term debt	-	-	-	-	-	-	-	-	-	-	-
Change in export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Add: land lease expense	-	-	-	-	-	-	-	-	-	-	-
Land lease payment	-	-	-	-	-	-	-	-	-	-	-
Change in lease financing	-	-	-	-	-	-	-	-	-	-	-
Issuance of shares	19,980,168	-	-	-	-	1,066,034	-	-	-	-	-
Purchase of (treasury) shares	-	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financing act	39,960,336	(1,986,276)	(1,023,827)	(1,188,412)	(1,379,454)	530,861	(1,908,423)	(2,215,210)	(2,571,315)	(2,984,666)	(3,464,464)
Investing activities											
Capital expenditure	(37,751,855)	-	-	-	-	(8,912,474)	-	-	-	-	-
Acquisitions	-	-	-	-	-	-	-	-	-	-	-
Cash (used for) / provided by investing acti	(37,751,855)	-	-	-	-	(8,912,474)	-	-	-	-	-
NET CASH	2,018,453	5,943,385	11,052,012	13,880,125	18,591,662	17,292,710	28,464,318	34,559,950	37,754,646	41,922,237	47,521,259
Cash balance brought forward		2,018,453	2,709,997	4,822,307	6,000,295	6,780,406	24,073,116	52,537,434	87,097,384	124,852,030	166,774,267
Cash available for appropriation	2,018,453	7,961,839	13,762,009	18,702,432	24,591,957	24,073,116	52,537,434	87,097,384	124,852,030	166,774,267	214,295,526
Dividend	-	5,251,842	8,939,702	12,702,137	17,811,551	-	-	-	-	-	-
Cash carried forward	2,018,453	2,709,997	4,822,307	6,000,295	6,780,406	24,073,116	52,537,434	87,097,384	124,852,030	166,774,267	214,295,526

12 KEY ASSUMPTIONS

12.1 Production Cost Assumptions

Description	Price Rs./Unit	Total Price Rs.
Maximum Production Capacity (100%)	Litres/Hour	2,000
Total Production Capacity (100%)	Litres/Year	5,760,000
Initial Capacity Utilization (50%)	Litres/Hour	1,000
Initial Capacity Utilization (50%)	Litres/Year	2,880,000
Milk Purchase Price	Rs./Litre	60
Milk Pouch Packing	Rs./Litre	5
Packing Cost Cheese	Rs./Kg	9.5
Packing Cost Yogurt	Rs./Kg	5
Transportation cost per Litre of Milk Transported from Farm to Plant	Rs./Litre of Milk	4
Transportation cost of Two Vehicles (Distribution of finished Products)	Rs./Day	5,000

Yogurt Ingredients	Price (Rs. /Kg)	Inclusion Rate %	Requirement (Rs./L)
Culturing	100	0.01	1.0
Enzymes	100	0.01	1.0
Flavoring	100	0.01	1.0
Total Cost	**300**		3.0

Cheese Ingredients	Price (Rs./Kg)	Inclusion Rate %	Requirement (Rs./Kg)
Culturing	100	0.01	1.0
Enzymes	100	0.01	1.0
Flavoring	100	0.01	1.0
Coloring	100	0.01	1.0
Salt	30	0.01	0.3
Total Cost	**430**		4.3

12.2 Revenue Assumptions

Description	Unit	Total
Installed Capacity	No. of Litres/ Hour	2,000
Starting Capacity Utilization	%/ year	50
Maximum Capacity	%/ year	80

Total Milk to be Processed	No. of Litres/ year	2,280,000
Sale price growth rate	% per year	10
Sale price of Pasteurized Milk	Rs./ 1 Litre Unit	74
Sale price of Pasteurized Milk	Rs./0.5 Litre Unit	42
Sale price-Cheddar Cheese	Rs/ 1 Kg Unit	651
Sale Price-Cheddar Cheese	Rs./0.2 Kg Unit	180
Sale Price-Mozzarella Cheese	Rs./1Kg Unit	791
Sale Price-Mozzarella Cheese	Rs./0.2 Kg Unit	208
Sale Price-Yogurt	Rs./1 Kg Unit	84
Sale Price-Yogurt	Rs./0.5 Kg Unit	50

12.3 Financial Assumptions

Description	Unit	Details
Debt: Equity Ratio	Ratio	50:50
Interest Rate	% per annum	15
Debt tenure	Years	10

12.4 Operating Cost Assumptions

Description	Unit	Total Rs.
Cleaning in Process (CIP) Costs @ Rs. 10000/month	Rs./Year	120,000
Lab testing cost of milk @ Rs.5000/month	Rs./Year	60,000
Machinery Maintenance @5% of Total Machinery Cost	Rs./ Month	1,095,650
Direct Electricity @ Rs. 5000/month	Rs./ Year	60,000
Vehicle running expenses (Milk Collection from farm to plant @ Rs. 4/ Litre of Milk)	Rs./ Year	11,520,000
Vehicle running expenses (sale of finished products @ Rs. 5,000/month	Rs./Year	60,000
Office Expenses (entertainment, janitorial, stationery etc.@ 3% of Administrative Expense)	Rs./ Year	119,160
Communication Expenses @ 2.0% of administration expense	Rs./Year	79,440
Promotional expenses (Year 1-3) @ 0.5% of Revenue	Rs./Year	1,160,852
Promotional expense (Year 4-10) @0.1% % of revenue	Rs./Year	401,725
Professional fees (legal, audits, consultants) @ 0.1% of revenue	Rs./Year	232,170

Note: Operating Cost Growth Rate is 10% per year.