



**Pre-feasibility Study**

# **MINI DAIRY PROCESSING PLANT**

**(Pasteurized Milk, Cheese, Yogurt)**

**September 2023**

*The figures and financial projections are approximate due to fluctuations in exchange rates, energy costs, and fuel prices etc. Users are advised to focus on understanding essential elements such as production processes and capacities, space, machinery, human resources, and raw material etc. requirements. Project investment, operating costs, and revenues can change daily. For accurate financial calculations, utilize financial calculators on SMEDA's website and consult financial experts to stay current with market conditions*

**Small and Medium Enterprises Development Authority**  
Ministry of Industries and 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 1,000 litres of milk per hour needs total investment of approximately Rs. 82.28 million out of which, capital cost of the project is Rs. 79.31 million with working capital of Rs. 2.97 million. The project is assumed to be working on 100% equity financing. It is assumed that starting from 55% capacity utilization in first year of the project, the production of value added products will increase to approximately 85% in 10<sup>th</sup> 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 32%, 3.73 years and Rs. 9.87 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, Sheikhpura, 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 55% installed capacity utilization and 1.58 million litres of raw milk will be processed in first year of project. The product mix will be Pasteurized Milk: Yogurt: Cheese in ratio representing the number of months of production i.e. 12:8:4.<sup>1</sup>

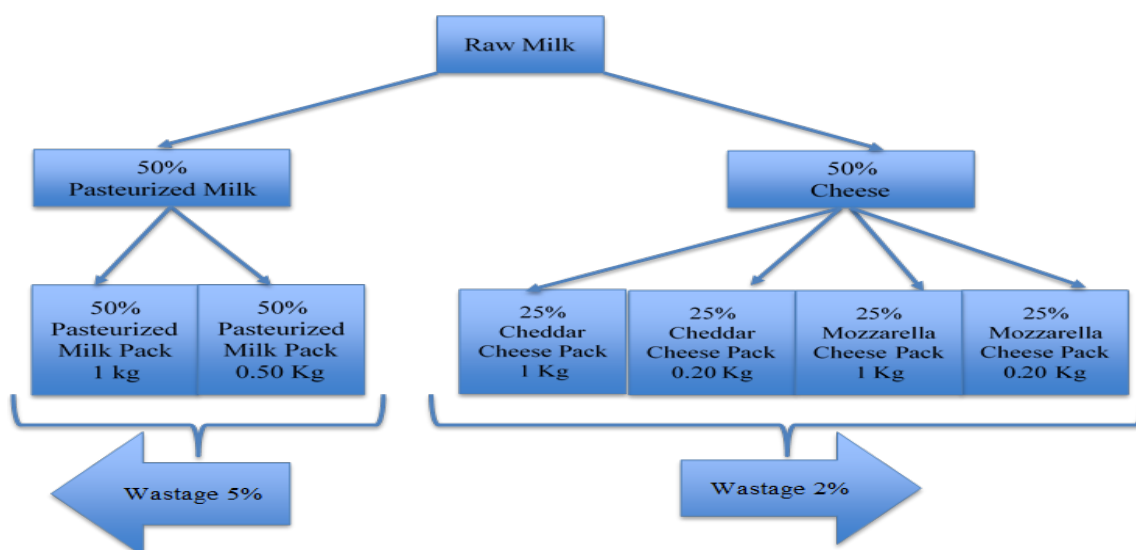
With 55% capacity utilization in first year of production and annual increase of 5 %, the project will be utilizing its capacity for a maximum of 85%.

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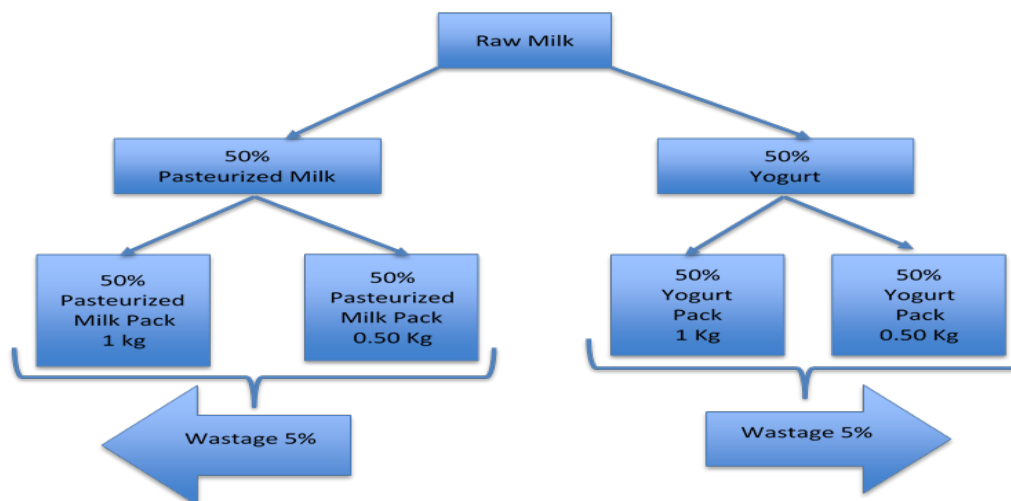
<sup>1</sup> Here, the 12, 8 and 4 represents the number of months per year for which milk, yogurt and cheese are being produced respectively.

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	63°C (145°F)*	30 minutes	Vat Pasteurization
2	72°C (161°F)*	15 seconds	High temperature short time Pasteurization (HTST)
3	89°C (191°F)	1.0 second	Higher-Heat Shorter Time (HHST)
4	90°C (194°F)	0.5 seconds	Higher-Heat Shorter Time (HHST)
5	94°C (201°F)	0.1 seconds	Higher-Heat Shorter Time (HHST)
6	96°C (204°F)	0.05 seconds	Higher-Heat Shorter Time (HHST)
7	100°C (212°F)	0.01seconds	Higher-Heat Shorter Time (HHST)
8	138°C (280°F)	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 3°C (5°F). Ref: [www.idfa.org](http://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.

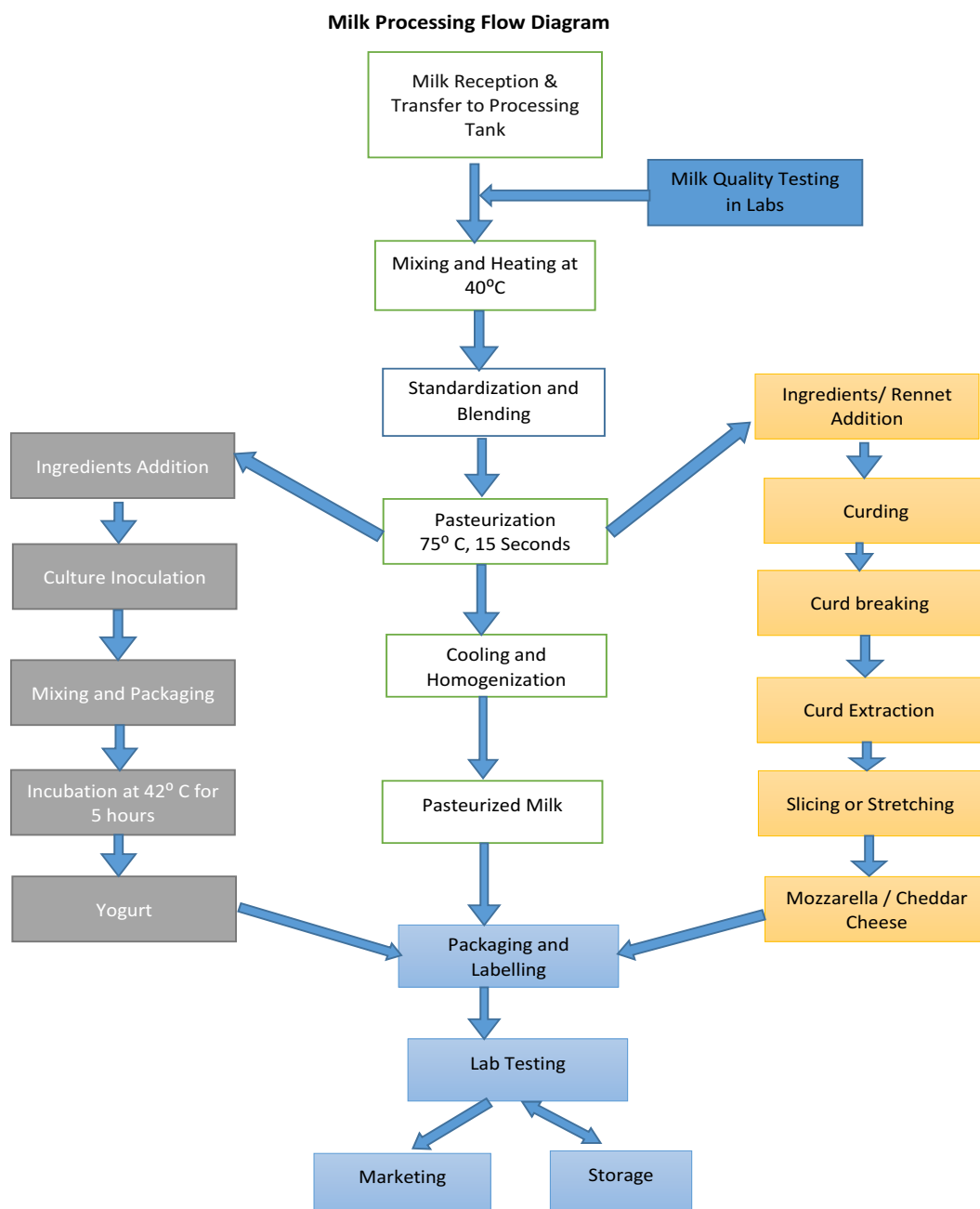
The subject project can be set-up at any appropriate location that ensures easy availability of all related raw material and easy marketing and transportation of finished products. Also other services such as water, electricity and road infrastructure are important as well. Establishing a small sized 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 such as 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 which shows the microorganisms count present in incoming milk. If the count is too high at this point, 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 contaminants such as antibiotics, pesticides or even radioactivity which can be found through safety testing. In addition, the final yogurt product is also evaluated to ensure that it meets the specifications set by the manufacturer for characteristics such as pH, liquid/ semi-solid state, taste, color, and odor through various lab equipment e.g. pH meters, viscometers and human panelists.



#### 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 contains 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 72-75°C 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 4°C 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 large tank or in final individual containers. Stirred yogurt is fermented in bulk and then poured into the final selling pouches. The lactic acid level is used to determine when the yogurt is ready<sup>2</sup>. When the yogurt reaches the desired acid level, it is cooled, modified as necessary and dispensed into final packing 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 skills of cheese manufacturing consist 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 Lacto-coccus, 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. 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.

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<sup>2</sup> 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.

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 soft and rubbery in texture. Normally cheese is left to rest under controlled conditions for 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 and Punjab Pure Food Regulations, 2018 are 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, the installed production capacity of the plant is to process 2.88 million litres of milk annually, however, the starting capacity utilization is 55% i.e. processing of 1.58 million litres of milk, 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.

**Table 2: Product Mix in One Year**

Season	Raw Product	Processing	Product Mix	Volume	% age
Winter (120 Days)	Raw Milk	Pasteurized Milk	Pasteurized Milk	1 – Litre 0.5 - Litre	50%
			Cheddar Cheese	0.2- Kg 1-Kg	25%
			Mozzarella Cheese	0.2- Kg 1 - Kg	25%
Summer (240 Days)	Raw Milk	Pasteurized Milk	Pasteurized Milk	1 – Litre 0.5 - Litre	50%
			Yogurt	1-Kg 0.5 - Kg	50%

The project will generate revenues of Rs. 298.95 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's capacity would be increased up to 85% till year 10 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 judicious 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, Sheikhpura, 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 around 5% share in Lahore milk market during the last two decades. Milk supply is increasing at the rate of 3-4% annually, however demand is increasing at 15% annually. Metropolitan cities are considered major markets for the sale of milk.

## 8 PROJECT COST SUMMARY

A detailed financial model has been developed to analyze the commercial viability of Mini Dairy Processing Plant. Various cost and revenue related assumptions along with results of the analysis are outlined in this section.

The projected Income Statement, Cash Flow Statement and Balance Sheet are attached as annexures.

### 8.1 Project Economics

In order to financially appraise the project, a 100% Equity Based Business Model has been assumed. The following tables show Internal Rate of Return, Payback Period Net Present Value and Breakeven of the proposed venture:

**Table 3: Project Economics (Equity Financed)**

Description	Details
Internal Rate of Return (IRR)	32%
Payback Period (Years)	3.73
Net Present Value (Million Rs.) @discounted rate of 29%	9.87

Calculation of break-even analysis is as follows:

**Table 4: Breakeven (100% Equity Based)**

MINI DAIRY PROCESSING PLANT (PASTEURIZED MILK, CHEESE, YOGURT)										
BREAKEVEN ANALYSIS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Break Even Point (Sales)	161,992,258	168,626,083	177,661,653	181,881,755	194,721,222	209,870,260	226,295,983	246,630,546	269,016,140	293,652,344
Break Even Point (Unit)	693,523	656,294	628,601	585,029	569,389	557,897	546,874	541,832	537,283	533,170
Margin of Safety	45.8%	53.0%	58.4%	64.1%	67.4%	70.0%	72.4%	72.6%	72.8%	73.0%



However, for the purposes of further explanation, the Project Economics based on Debt: Equity (i.e. 50:50) Model has also been computed. On the basis of Debt: Equity model, the Internal Rate of Return, Payback Period and Net Present Value of the proposed project are provided as follow;

**Table 5: Project Economics Based on Debt (50%) : Equity (50%)**

Description	Details
Internal Rate of Return (IRR)	32%
Payback Period (Years.)	3.77 years
Net Present Value (Million Rs.) @discounted rate of 29%.	10.97

The financial assumptions for Debt: Equity are as follows:

**Table 6: Financial Assumptions for Debt: Equity Model**

Description	Details
Debt	50%
Equity	50%
Interest Rate on Debt	28%
Debt Tenure	5 Years
Debt Payment / Year	Annual

The projected Income Statement, Cash Flow Statement and Balance Sheet enclosed as annexures are based on 100% Equity Based Business Model.

## 8.2 Project Cost

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

**Table 7: Project Cost**

Description	Amount (Rs.)
<b>Capital Cost</b>	
Land	3,233,333
Building/Infrastructure	12,200,000
Machinery & equipment	54,168,000
Furniture & fixtures	487,000
Office vehicles	7,680,750
Office equipment	55,000
Pre-operating costs	1,485,000
<b>Total Capital Cost</b>	<b>79,309,083</b>
<b>Working Capital</b>	
Raw Material Inventory	2,010,140
Equipment spare part inventory	225,700
Cash	738,056
<b>Total Working Capital</b>	<b>2,973,896</b>
<b>Total Project Cost</b>	<b>82,282,979</b>

The proposed pre-feasibility is based on the assumption of 100% equity. However, this composition can be changed as per requirements of the investor.

## 8.3 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 8: Space Requirement**

Description	Estimated Area (Sq.ft.)	Unit Cost (Rs./Sq.ft)	Total Cost (Rs.)
Management building	500	4,000	2,000,000
Store room	250	2,000	500,000

Factory/ Production plant	3,000	3,000	9,000,000
Washrooms	100	2,000	200,000
Pavement/driveway	1,000	500	500,000
<b>Total Infrastructure</b>			<b>12,200,000</b>

Total investment in building and infrastructure is approximately Rs. 12.20 million. It is recommended to purchase the land for building the plant as per space requirements for 10 years. Total land requirement is approximately 1.08 acre at an average price of Rs. 3.0 million per acre.

#### 8.4 Machinery & Equipment Requirement

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

**Table 9: Machinery & Equipment**

Description	No.	Price (Rs./ Unit)	Total (Rs.)
Milk Pasteurization			
Milk pasteurization plant (1000) Liter	1	4,500,000	4,500,000
Ice bank (7000) Liter	1	6,000,000	6,000,000
Generator - 70 KVA	1	2,000,000	2,000,000
Milk chillers for retail shops (Varioline Visi Cooler)	21	70,000	1,463,000
Milk pouch packing machine	1	1,150,000	1,150,000
Homogenizer Refurbish 1000 liter	1	3,800,000	3,800,000
Milk chiller (2300) liter	1	1,150,000	1,150,000
Silo tank (2000) liter	1	595,000	595,000
Milk yogurt tank (500) liter	1	475,000	475,000
Steam Generator (500kg)	1	1,650,000	1,650,000
Pipe Line fitting	1	1,000,000	1,000,000
Laboratory Glass ware and chemical	1	700,000	700,000
Transport Cold Container for Shahzore	1	1,600,000	1,600,000
Cold Room + Incubation Room	1	5,000,000	5,000,000
Cheese vat (Round Shape)	1	650,000	650,000
Cheese Mold (Stainless Steel)	1	350,000	350,000
Cheese Press (Pneumatic)	1	700,000	700,000
Cheese Cutter (Manual)	1	80,000	80,000
Cheese Kettle	1	300,000	300,000
Transformer (100 KVA) (incl. price, wire, connection, installation)	1	2,055,000	2,055,000

Solar Energy System (70 KW) On-grid	1	10,500,000	10,500,000
Backup System 20 KW (14 Li Ion 48V 100mAh + 12Kw 2 Hybrid Inverters)	1	8,400,000	8,400,000
Misc. equipment and tools			50,000
<b>Total Machinery and Equipment</b>			<b>54,168,000</b>

Note: SS stands for Stainless Steel

Solar On-Grid Solution of 70 Kw is suggested in this pre-feasibility study with net metering. Additionally, this system also includes backup support system of 20 Kw. The backup system will include 14 Lithium Ion batteries and 2 hybrid inverter of 12 Kw. Each Lithium Ion battery will be of 48 V and 100 Ah. It is assumed that there will be 3 hours of load shedding on average daily basis which will be covered by the solar backup support system. In case of emergency there is a provision of Generator set of 70 KVA is available.

The Cleaning-In-Place (CIP<sup>3</sup>) cost for the plant is assumed to be Rs. 25,000 per month or Rs. 300,000 for first year of production. The expense on lab testing of milk is estimated at Rs. 10,000 per month.

## 8.5 Office Vehicle

Following vehicles are needed for the project;

**Table 10: Office Vehicles**

Description	No.	Cost / Unit (Rs.)	Amount (Rs.)
Motor Cycle ( 70cc)	1	115,000	115,000
Suzuki Ravi*	2	2,000,000	4,000,000
Pick-up Shahzore (Hyundai)**	1	3,200,000	3,200,000
Registration fee***			365,750
<b>Total cost</b>			<b>7,680,750</b>

\*With insulation and a refrigerator for supply of finished product

\*\*with installation of a milk drum

\*\*\*5 % of office vehicles cost

The cost of distribution of finished products for above mentioned vehicles from plant to market would be Rs. 12,000 per day.

<sup>3</sup> 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.

## 8.6 Transportation Cost

Following table shows the cost of transportation in first year of project;

**Table 11: Total Cost of Raw Materials in Year 1**

Description	Total Cost in Year 1 (Rs.)
Transportation cost (Milk Collection farm to factory)	12,672,000
Transportation cost (Distribution of finished goods)	4,320,000
<b>Total</b>	<b>16,992,000</b>

## 8.7 Furniture & Fixtures Requirement

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

**Table 12: Furniture & Fixture**

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Furniture	Lump sum	50,000	50,000
LED Lights (18 W) for plant	50	600	30,000
Ceiling Fans	10	9,500	95,000
Air Conditioner (1.5 ton split)	2	156,000	312,000
<b>Total Furniture &amp; Fixtures</b>			<b>487,000</b>

## 8.8 Office Equipment Requirement

Following office equipment will be required for the project;

**Table 13: Office Equipment**

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Laptop computer	1	50,000	50,000
Telephone	1	5,000	5,000
<b>Total</b>			<b>55,000</b>

## 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 14: Human Resource Requirement**

Description	No.	Monthly Salary/ Person (Rs.)	Total Salary in Year 1 (Rs.)
Owner/ CEO	1	120,000	1,440,000
Plant Operator	1	80,000	960,000
Operator's Helper	5	45,000	2,700,000
Loaders	2	40,000	960,000
Procurement/ Inventory Incharge	1	40,000	480,000
Marketing Manager	1	55,000	660,000
Sales Persons	2	45,000	1,080,000
Admin/Accounts Officer	1	45,000	540,000
Guard	1	40,000	480,000
Office Boy	1	40,000	480,000
Drivers	3	40,000	1,440,000
<b>Total</b>	<b>19</b>		<b>11,220,000</b>

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 (NAVTTTC), [www.navttc.org](http://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 15: Total Cost of Raw Materials in Year 1**

Description	Total Cost in Year 1 (Rs.)
Raw Milk (Litres) (@Rs.140/Litre for 1.58M litres)	221,760,000
Packaging (Rs.)	19,456,800
Ingredients (Cheese & Yogurt) (Rs.)	2,247,528
<b>Total</b>	<b>243,464,328</b>

## 8.11 Utilities and Other Costs

An essential cost to be borne by the project is the cost of electricity. A Solar On-Grid Solution of 70 Kw is suggested in this pre-feasibility study with net metering. Additionally, this system also includes backup support system of 20 Kw. The backup system will include 14 Lithium Ion batteries and 2 hybrid inverter of 12 Kw. Each Lithium Ion battery will be of 48 V and 100 Ah. It is assumed that there will be 3 hours of load shedding on average daily basis which will be covered by the solar backup support system. In case of emergency there is a provision of Generator set of 70 KVA is available. The direct or variable electricity cost is estimated to be Rs. 14,900 per month.

A transformer of 100 KVA power along with connection, wires and installations is suggested in this project, hence calculations include these costs.

Similarly, boiler would be run on furnace oil for 8 hours daily with consumption of 8 litres/ hour, hence cost of diesel and furnace oil in year 1 would be Rs. 4.84 million in year 1.

The laboratory charges for analysis of milk testing and analyses include Rs. 10,000 per month i.e. Rs, 120, 000 in year 1.

Monthly expenses related to communication such as internet, phone, fax etc. are 2% of administrative expense, hence Rs. 132,000 per year.

The office expenses including routine office work e.g. stationary, entertainment, janitorial services, etc. is 3% of administrative expense, hence Rs. 198,000 per year.

Business promotion expense is assumed to be 0.5% of revenues generated in year 1-3, hence in year 1, it is Rs.1.50 M. However, from project year 4 to 10, as

the revenues increase, the business promotion expense is assumed to be 0.1% of revenues from year 4 to 10.

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. 298,950.

## 8.12 Revenue Generation

The total milk to be processed in 1<sup>st</sup> year is assumed to be 1.58 million litres. Sales revenue during the first year of operations are shown in the following table;

**Table16: Revenue Generation – Year 1**

Particulars	Sale Price (Rs./ Unit)	No. of Units Produced
Pasteurized Milk- 1 Litre Pack	170	376,200
Pasteurized Milk- 0.5 Litre Pack	90	752,400
Cheddar Cheese- 1 Kg Pack	1,358	6,468
Cheddar Cheese- 200 grams Pack	321	32,340
Mozzarella Cheese- 1 Kg Pack	1,552	6,468
Mozzarella Cheese- 200 grams Pack	360	32,340
Yogurt- 1 Kg Pack	252	250,800
Yogurt- 0.5 Kg Pack	126	501,600
	<b>Year 1</b>	<b>Year 2</b>
Total milk Processed (Litres)	1,584,000	1,728,000
Total Revenue (Rs.)	298,950,960	358,741,152

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



## 9 CONTACT DETAILS

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

### Technical Experts

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](http://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](http://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

### Machinery Suppliers

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](mailto:info@eset.com.pk), Web: [www.eset.com.pk](http://www.eset.com.pk)

Azhar and Co.  
Display: 19 - Main Brandeth Road, Lahore.  
Office: Suite # 4, 1<sup>st</sup> 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](mailto:info@azharco.com) , Web: [www.azharco.com](http://www.azharco.com)

Al-Madina Engineering & Dairy Equipment  
near Canal Bridge G.T Road, District Okara, Punjab  
Ph: 044-2527118/ 2528818/ Cell: 0301-7311-730  
Fax: 044-2525818  
E-mail: [al\\_madina75@hotmail.com](mailto:al_madina75@hotmail.com) , [al\\_madina75@yahoo.com](mailto:al_madina75@yahoo.com)  
Web: [www.al-madina.net.pk](http://www.al-madina.net.pk)

Mr. Abdul Qadir

House No. 7, Street No. 2, Near Hussain Sugar Mills,  
Jaranwala, Faisalabad.

Cell # 0302-7261159

E-mail: [abdulqadir322@gmail.com](mailto:abdulqadir322@gmail.com)

### Solar Companies

Beams Energy

Address: Plot No. 1508, Murad Colony, Samundri Road, Coca Cola Factory,  
Faisalabad

Ph: 03478666861

Solaris Engineering:

Address: Plot No. 164, Block D2, Phase 1, Johor Town, Lahore

Ph: 0312 6606309

Zi Solar

Address: Mezanian Floor, Block D, FTC, Shahrah-e-Faisal, Karachi Cantt., Karachi

Ph: 03459440202

## 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.

Small & Medium Enterprises Development Authority (SMEDA)	<a href="http://www.smeda.org.pk">www.smeda.org.pk</a>
Government of Pakistan	<a href="http://www.pakistan.gov.pk">www.pakistan.gov.pk</a>
Ministry of Industries & Production	<a href="http://www.moip.gov.pk">www.moip.gov.pk</a>
Ministry of National Food Security & Research	<a href="http://www.mnfsr.gov.pk">www.mnfsr.gov.pk</a>
Government of Punjab	<a href="http://www.punjab.gov.pk">www.punjab.gov.pk</a>
Government of Sindh	<a href="http://www.sindh.gov.pk">www.sindh.gov.pk</a>
Government of Khyber Pakhtunkhwa	<a href="http://www.khyberpakhtunkhwa.gov.pk">www.khyberpakhtunkhwa.gov.pk</a>
Government of Balochistan	<a href="http://www.balochistan.gov.pk">www.balochistan.gov.pk</a>
Government of Gilgit Baltistan	<a href="http://www.gilgitbaltistan.gov.pk">www.gilgitbaltistan.gov.pk</a>
Government of Azad Jamu Kashmir	<a href="http://www.ajk.gov.pk">www.ajk.gov.pk</a>
Trade Development Authority of Pakistan (TDAP)	<a href="http://www.tdap.gov.pk">www.tdap.gov.pk</a>
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	<a href="http://www.fpcci.com.pk">www.fpcci.com.pk</a>
State Bank of Pakistan (SBP)	<a href="http://www.sbp.org.pk">www.sbp.org.pk</a>
Punjab Small Industries Corporation	<a href="http://www.psic.gop.pk">www.psic.gop.pk</a>
Sindh Small Industries Corporation	<a href="http://www.ssic.gos.pk">www.ssic.gos.pk</a>
Punjab Board of Investment & Trade (PBIT)	<a href="http://www.pbit.gop.pk">www.pbit.gop.pk</a>
Sindh Board of Investment (SBI)	<a href="http://www.sbi.gos.pk">www.sbi.gos.pk</a>
Pakistan Agricultural Research Council (PARC)	<a href="http://www.parc.gov.pk">www.parc.gov.pk</a>
University of Agriculture, Faisalabad,	<a href="http://www.uaf.edu.pk">www.uaf.edu.pk</a>
Lasbela University of Agriculture, Water & Marine Sciences, Lasbela	<a href="http://www.luawms.edu.pk">www.luawms.edu.pk</a>
Sindh Agriculture University, Tondojam	<a href="http://www.sau.edu.pk">www.sau.edu.pk</a>
Gomal College of Veterinary Sciences, Dera Ismail Khan	<a href="http://www.gu.edu.pk">www.gu.edu.pk</a>
KPK Agricultural University, Peshawar	<a href="http://www.aup.edu.pk">www.aup.edu.pk</a>
Pir Mehr Ali Shah Arid Agricultural University, Rawalpindi	<a href="http://www.uaar.edu.pk">www.uaar.edu.pk</a>
University College of Veterinary & Animal Sciences, Islamia University Bahawalpur (IUB),	<a href="http://www.iub.edu.pk">www.iub.edu.pk</a>
University of Veterinary & Animal Sciences (UVAS), Lahore	<a href="http://www.uvas.edu.pk">www.uvas.edu.pk</a>
Bahauddin Zakariya University (BZU), Multan	<a href="http://www.bzu.edu.pk">www.bzu.edu.pk</a>
Veterinary Research Institute (VRI), Punjab	
Agribusiness Support Fund (ASF), Lahore,	<a href="http://www.asf.org.pk">www.asf.org.pk</a>
Directorate of Livestock Plants, L&DD, Punjab	
Livestock & Fisheries Department, Government of Sindh	<a href="http://www.sindh.gov.pk">www.sindh.gov.pk</a>
Agriculture & Livestock Department, Government of KPK	<a href="http://www.khyberpakhtunkhwa.gov.pk">www.khyberpakhtunkhwa.gov.pk</a>
Livestock & Dairy Development, Government of Balochistan	<a href="http://www.balochistan.gov.pk">www.balochistan.gov.pk</a>

## 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	Rs. in actuals Year 10
Revenue	298,950,960	358,741,152	427,499,873	506,422,926	596,855,592	700,310,561	818,487,968	900,336,765	990,370,441	1,089,407,485
Cost of goods sold	276,224,994	329,748,936	391,215,448	461,677,809	542,320,527	634,475,052	739,637,324	813,579,769	894,914,387	984,380,192
Gross Profit	22,725,966	28,992,216	36,284,424	44,745,117	54,535,065	65,835,509	78,850,644	86,756,995	95,456,054	105,027,294
<i>General administration &amp; selling expenses</i>										
Administration expense	6,600,000	7,242,585	7,947,734	8,721,536	9,570,677	10,502,492	11,525,029	12,647,123	13,878,464	15,229,691
Travelling & Comm. expense (phone, fax, etc.)	132,000	144,852	158,955	174,431	191,414	210,050	230,501	252,942	277,569	304,594
Office expenses (stationary, etc.)	198,000	217,278	238,432	261,646	287,120	315,075	345,751	379,414	416,354	456,891
Promotional expense	1,494,755	1,793,706	2,137,499	2,506,423	2,996,856	3,500,311	4,088,488	4,769,337	5,490,370	6,289,407
Professional fees (legal, audit, etc.)	298,951	358,741	427,500	506,423	596,856	700,311	818,488	900,337	990,370	1,089,407
Depreciation expense	7,617,150	7,617,150	7,617,150	7,617,150	7,617,150	8,769,183	8,769,183	8,769,183	8,769,183	8,769,183
Amortization expense	297,000	297,000	297,000	297,000	297,000	-	-	-	-	-
Subtotal	16,637,856	17,671,312	18,824,270	18,084,609	19,157,072	21,197,421	22,507,440	23,849,335	25,322,311	26,939,174
Operating Income	6,088,110	11,320,905	17,460,155	26,660,508	35,377,993	44,638,088	56,343,205	62,907,660	70,133,743	78,088,120
Other income	-	-	-	-	-	-	-	-	-	-
Gain / (loss) on sale of assets	-	-	-	-	3,072,300	-	-	-	-	-
Earnings Before Interest & Taxes	6,088,110	11,320,905	17,460,155	26,660,508	38,450,293	44,638,088	56,343,205	62,907,660	70,133,743	78,088,120
Interest expense	-	-	-	-	-	-	-	-	-	-
Earnings Before Tax	6,088,110	11,320,905	17,460,155	26,660,508	38,450,293	44,638,088	56,343,205	62,907,660	70,133,743	78,088,120
Tax	1,495,838	3,327,316	5,476,054	8,696,177	12,822,602	14,988,330	19,085,121	21,382,680	23,911,809	26,695,841
<b>NET PROFIT/(LOSS) AFTER TAX</b>	<b>4,592,272</b>	<b>7,993,589</b>	<b>11,984,101</b>	<b>17,964,331</b>	<b>25,627,691</b>	<b>29,649,758</b>	<b>37,258,084</b>	<b>41,524,980</b>	<b>46,221,934</b>	<b>51,392,279</b>
Balance brought forward		4,592,272	12,585,861	24,569,963	42,534,293	68,161,984	97,811,742	135,069,826	176,594,806	222,816,740
Total profit available for appropriation	4,592,272	12,585,861	24,569,963	42,534,293	68,161,984	97,811,742	135,069,826	176,594,806	222,816,740	274,209,018
Dividend	-	-	-	-	-	-	-	-	-	-
Balance carried forward	4,592,272	12,585,861	24,569,963	42,534,293	68,161,984	97,811,742	135,069,826	176,594,806	222,816,740	274,209,018

## 11.2 Balance Sheet

Statement Summaries											SMEDA
Balance Sheet											Rs. in actuals
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<b>Assets</b>											
<i>Current assets</i>											
Cash & Bank	2,586,056	15,455,264	34,942,516	60,024,700	94,251,641	125,690,341	178,605,023	243,185,811	313,930,270	392,242,515	481,006,731
Accounts receivable	-	5,733,306	6,306,637	7,539,297	8,955,424	10,579,383	12,438,580	14,563,822	16,481,881	18,130,069	19,943,076
Finished goods inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment spare part inventory	225,700	260,684	301,089	347,758	401,661	463,918	535,826	618,879	714,805	825,599	-
Raw material inventory	162,140	214,025	280,551	365,579	473,947	611,708	786,427	951,577	1,151,408	1,393,204	-
Pre-paid annual land lease	-	-	-	-	-	-	-	-	-	-	-
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Pre-paid insurance	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Assets</b>	<b>2,973,896</b>	<b>21,663,278</b>	<b>41,830,793</b>	<b>68,277,335</b>	<b>104,082,674</b>	<b>137,345,350</b>	<b>192,365,856</b>	<b>259,320,089</b>	<b>332,278,364</b>	<b>412,591,387</b>	<b>500,949,807</b>
<i>Fixed assets</i>											
Land	3,233,333	3,233,333	3,233,333	3,233,333	3,233,333	3,233,333	3,233,333	3,233,333	3,233,333	3,233,333	3,233,333
Building/Infrastructure	12,200,000	11,590,000	10,980,000	10,370,000	9,760,000	9,150,000	8,540,000	7,930,000	7,320,000	6,710,000	6,100,000
Machinery & equipment	54,168,000	48,751,200	43,334,400	37,917,600	32,500,800	29,225,978	23,594,980	17,963,983	12,332,985	6,701,987	1,070,989
Furniture & fixtures	487,000	438,300	389,600	340,900	292,200	243,500	194,800	146,100	97,400	48,700	-
Office vehicles	7,680,750	6,144,600	4,608,450	3,072,300	1,536,150	12,369,925	9,895,940	7,421,955	4,947,970	2,473,985	-
Office equipment	55,000	49,500	44,000	38,500	33,000	27,500	22,000	16,500	11,000	5,500	-
<b>Total Fixed Assets</b>	<b>77,824,083</b>	<b>70,206,933</b>	<b>62,589,783</b>	<b>54,972,633</b>	<b>47,355,483</b>	<b>54,250,236</b>	<b>45,481,053</b>	<b>36,711,870</b>	<b>27,942,688</b>	<b>19,173,505</b>	<b>10,404,322</b>
<i>Intangible assets</i>											
Pre-operation costs	1,485,000	1,188,000	891,000	594,000	297,000	-	-	-	-	-	-
Legal, licensing, & training costs	-	-	-	-	-	-	-	-	-	-	-
<b>Total Intangible Assets</b>	<b>1,485,000</b>	<b>1,188,000</b>	<b>891,000</b>	<b>594,000</b>	<b>297,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>TOTAL ASSETS</b>	<b>82,282,979</b>	<b>93,058,211</b>	<b>105,311,576</b>	<b>123,843,968</b>	<b>151,735,157</b>	<b>191,595,586</b>	<b>237,846,909</b>	<b>296,031,959</b>	<b>360,221,051</b>	<b>431,764,892</b>	<b>511,354,129</b>
<b>Liabilities &amp; Shareholders' Equity</b>											
<i>Current liabilities</i>											
Accounts payable	-	4,687,122	5,619,582	6,691,818	7,922,499	9,332,637	10,945,871	12,787,716	14,069,148	15,479,246	16,980,363
Export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Short term debt	-	-	-	-	-	-	-	-	-	-	-
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Liabilities</b>	<b>-</b>	<b>4,687,122</b>	<b>5,619,582</b>	<b>6,691,818</b>	<b>7,922,499</b>	<b>9,332,637</b>	<b>10,945,871</b>	<b>12,787,716</b>	<b>14,069,148</b>	<b>15,479,246</b>	<b>16,980,363</b>
<i>Other liabilities</i>											
Lease payable	-	-	-	-	-	-	-	-	-	-	-
Deferred tax	-	1,495,838	4,823,154	10,299,207	18,995,384	31,817,986	46,806,316	65,891,437	87,274,118	111,185,927	137,881,768
Long term debt	-	-	-	-	-	-	-	-	-	-	-
<b>Total Long Term Liabilities</b>	<b>-</b>	<b>1,495,838</b>	<b>4,823,154</b>	<b>10,299,207</b>	<b>18,995,384</b>	<b>31,817,986</b>	<b>46,806,316</b>	<b>65,891,437</b>	<b>87,274,118</b>	<b>111,185,927</b>	<b>137,881,768</b>
<i>Shareholders' equity</i>											
Paid-up capital	82,282,979	82,282,979	82,282,979	82,282,979	82,282,979	82,282,979	82,282,979	82,282,979	82,282,979	82,282,979	82,282,979
Retained earnings	-	4,592,272	12,585,861	24,569,963	42,534,293	68,161,984	97,811,742	135,069,826	176,594,806	222,816,740	274,209,018
<b>Total Equity</b>	<b>82,282,979</b>	<b>86,875,252</b>	<b>94,868,841</b>	<b>106,852,942</b>	<b>124,817,273</b>	<b>150,444,964</b>	<b>180,094,722</b>	<b>217,352,806</b>	<b>258,877,785</b>	<b>305,099,719</b>	<b>356,491,998</b>
<b>TOTAL CAPITAL AND LIABILITY</b>	<b>82,282,979</b>	<b>93,058,211</b>	<b>105,311,576</b>	<b>123,843,968</b>	<b>151,735,157</b>	<b>191,595,586</b>	<b>237,846,909</b>	<b>296,031,959</b>	<b>360,221,051</b>	<b>431,764,892</b>	<b>511,354,129</b>
<i>Note: Total assets value will differ from project cost due to first installment of leases paid at the start of year 0</i>											

## 11.3 Cash Flow Statement

Statement Summaries											SMEDA
Cash Flow Statement											Rs. in actuals
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<i>Operating activities</i>											
Net profit	-	4,592,272	7,993,589	11,984,101	17,964,331	25,627,691	29,649,758	37,258,084	41,524,980	46,221,934	51,392,279
Add: depreciation expense	-	7,617,150	7,617,150	7,617,150	7,617,150	7,617,150	8,769,183	8,769,183	8,769,183	8,769,183	8,769,183
amortization expense	-	297,000	297,000	297,000	297,000	297,000	-	-	-	-	-
Deferred income tax	-	1,495,838	3,327,316	5,476,054	8,696,177	12,822,602	14,988,330	19,085,121	21,382,680	23,911,809	26,695,841
Accounts receivable	-	(5,733,306)	(573,331)	(1,232,661)	(1,416,127)	(1,623,959)	(1,859,196)	(2,125,242)	(1,918,059)	(1,648,188)	(1,813,007)
Finished good inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment inventory	(225,700)	(34,984)	(40,406)	(46,669)	(53,903)	(62,257)	(71,907)	(83,053)	(95,926)	(110,795)	825,599
Raw material inventory	(162,140)	(51,885)	(66,526)	(85,028)	(108,368)	(137,761)	(174,719)	(165,150)	(199,831)	(241,796)	1,393,204
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Advance insurance premium	-	-	-	-	-	-	-	-	-	-	-
Accounts payable	-	4,687,122	932,460	1,072,237	1,230,681	1,410,137	1,613,234	1,841,845	1,281,432	1,410,098	1,501,117
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Cash provided by operations	(387,840)	12,869,208	19,487,252	25,082,183	34,226,942	45,950,603	52,914,682	64,580,788	70,744,458	78,312,245	88,764,216
<i>Financing activities</i>											
Change in long term debt	-	-	-	-	-	-	-	-	-	-	-
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	82,282,979	-	-	-	-	-	-	-	-	-	-
Purchase of (treasury) shares	-	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financing	82,282,979	-	-	-	-	-	-	-	-	-	-
<i>Investing activities</i>											
Capital expenditure	(79,309,083)	-	-	-	-	(14,511,903)	-	-	-	-	-
Acquisitions	-	-	-	-	-	-	-	-	-	-	-
Cash (used for) / provided by investing :	(79,309,083)	-	-	-	-	(14,511,903)	-	-	-	-	-
<b>NET CASH</b>	<b>2,586,056</b>	<b>12,869,208</b>	<b>19,487,252</b>	<b>25,082,183</b>	<b>34,226,942</b>	<b>31,438,700</b>	<b>52,914,682</b>	<b>64,580,788</b>	<b>70,744,458</b>	<b>78,312,245</b>	<b>88,764,216</b>
Cash balance brought forward		2,586,056	15,455,264	34,942,516	60,024,700	94,251,641	125,690,341	178,605,023	243,185,811	313,930,270	392,242,515
Cash available for appropriation	2,586,056	15,455,264	34,942,516	60,024,700	94,251,641	125,690,341	178,605,023	243,185,811	313,930,270	392,242,515	481,006,731
Dividend	-	-	-	-	-	-	-	-	-	-	-
Cash carried forward	2,586,056	15,455,264	34,942,516	60,024,700	94,251,641	125,690,341	178,605,023	243,185,811	313,930,270	392,242,515	481,006,731

## 12 KEY ASSUMPTIONS

### 12.1 Production Cost Assumptions

Description	Unit	Price (Rs.)
Maximum Production Capacity (100%)	Litres/Hour	1,000
Total Production Capacity (100%)	Litres/Year	2,880,000
Initial Capacity Utilization (55%)	Litres/Year	1,584,000
Milk Purchase Price	Rs./Litre	140
Milk Pouch Packing	Rs./Litre	15
Packing Cost Cheese	Rs./Kg	25
Packing Cost Yogurt	Rs./Kg	15
Transportation Cost of Raw Milk (Farm to Plant)	Rs./Litre of Milk	8

Yogurt Ingredients	Rate (Rs./kg)	Inclusion Rate % per kg	Price (Rs./ kg)
Culturing	200	1	2
Enzymes	200	1	2
Flavoring	200	1	2
<b>Total</b>	<b>600</b>		<b>6</b>

Cheese Ingredients	Rate (Rs./kg)	Inclusion Rate % per kg	Price (Rs./ kg)
Culturing	200	1	2
Enzymes	200	1	2
Flavoring	200	1	2
Coloring	200	1	2
Salt	65	1	0.65
<b>Total</b>	<b>865</b>		<b>8.65</b>

### 12.2 Revenue Assumptions

Description	Unit	Detail
Installed Capacity	No. of Litres/ Hour	1,000
Installed Capacity	No. of Litres/ Year	2,880,000
Starting Capacity Utilization	%	55
Maximum Capacity	% per year	85
Sale Price Growth Rate	% per year	10
Sale price of Pasteurized Milk	Rs./ Litre	170

Sale price of Pasteurized Milk	Rs./0.5 Litre	90
Sale price-Cheddar Cheese	Rs/ 1 Kg	1,358
Sale Price-Cheddar Cheese	Rs./0.2 Kg	321
Sale Price-Mozzarella Cheese	Rs./1Kg	1,552
Sale Price-Mozzarella Cheese	Rs./0.2 Kg	360
Sale Price-Yogurt	Rs./1 Kg	252
Sale Price-Yogurt	Rs./0.5 Kg	126

### 12.3 Operating Cost Assumptions

Description	Price Rs./ Month
Cleaning in Process (CIP) Cost	25,000
Cost-Lab Testing of Milk	10,000
Machinery Maintenance @5% of Total Machinery Cost	224,575
Transportation for Milk Collection (farm to plant)	1,056,000
Transportation Expenses (sale of finished products)	360,000

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



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