



Pre-feasibility Study

Dairy Farm (25 Cows) Environmentally Controlled Housing (ECH) System

June 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

Table of Contents

1. DISCLAIMER	3
2. EXECUTIVE SUMMARY	4
3. INTRODUCTION TO SMEDA.....	5
4. PURPOSE OF THE DOCUMENT.....	5
5. BRIEF DESCRIPTION OF PROJECT & PRODUCT	6
5.1 DAIRY FARM PRODUCTION PROCESS.....	7
5.2 INSTALLED AND OPERATIONAL CAPACITIES	11
6. CRITICAL FACTORS	11
7. GEOGRAPHICAL POTENTIAL FOR INVESTMENT	12
8. POTENTIAL TARGET CUSTOMERS / MARKETS	12
9. PROJECT COST SUMMARY.....	14
9.1 PROJECT ECONOMICS.....	14
9.2 PROJECT FINANCING	14
9.3 PROJECT COST	15
9.4 SPACE REQUIREMENT.....	16
9.5 MACHINERY & EQUIPMENT REQUIREMENT.....	17
9.6 OFFICE VEHICLE	18
9.7 FURNITURE & FIXTURES REQUIREMENT.....	18
9.8 OFFICE EQUIPMENT REQUIREMENT	19
9.9 HUMAN RESOURCE REQUIREMENT	19
9.10 RAW MATERIAL REQUIREMENT	20
9.11 UTILITIES AND OTHER COSTS.....	22
9.12 REVENUE GENERATION	23
10. CONTACT DETAILS.....	24
10.1 MACHINERY SUPPLIERS	24
10.2 RAW MATERIAL SUPPLIERS	24
10.3 TECHNICAL EXPERTS / CONSULTANTS.....	26
10.4 SOLAR SOLUTION COMPANIES	26
11. USEFUL WEB LINKS.....	27
12. ANNEXURES.....	29
12.1 INCOME STATEMENT	29
12.2 BALANCE SHEET	30
12.3 CASH FLOW STATEMENT	31
13. KEY ASSUMPTIONS	32
13.1 OPERATING COST ASSUMPTIONS	32
13.2 PRODUCTION COST ASSUMPTIONS	32
13.3 REVENUE ASSUMPTIONS.....	33
13.4 FINANCIAL ASSUMPTIONS	33

1. DISCLAIMER

This information memorandum is to introduce the subject matter and provide a general idea and information on the said matter. Although, the material included in this document is based on data/information gathered from various reliable sources; however, it is based upon certain assumptions, which may differ from case to case. The information has been provided on as is where is basis without any warranties or assertions as to the correctness or soundness thereof. Although, due care and diligence has been taken to compile this document, the contained information may vary due to any change in any of the concerned factors, and the actual results may differ substantially from the presented information. SMEDA, its employees or agents do not assume any liability for any financial or other loss resulting from this memorandum in consequence of undertaking this activity. The contained information does not preclude any further professional advice. The prospective user of this memorandum is encouraged to carry out additional diligence and gather any information which is necessary for making an informed decision, including taking professional advice from a qualified consultant/technical expert before taking any decision to act upon the information.

For more information on services offered by SMEDA, please contact our website: www.smeda.org.pk

Document Control

Document No.	PREF-107
Revision	7
Prepared by	SMEDA-BSDS
Revision Date	June, 2023
For information	<u>adnan@smeda.org.pk</u>

2. EXECUTIVE SUMMARY

This pre-feasibility study is based upon the business analysis of setting up a dairy farm where cows with proven pedigree¹ and genomics², hence having high genetic worth are kept primarily for milk production in dairy sheds constructed on Environmentally Controlled Housing (ECH) system. The dairy cows are fed Total Mixed Ration (TMR), which is a high energy and protein rich nutritionally balanced formulated feed. The cows are bred by pedigreed genetics (preferably sexed semen) through Artificial Insemination method to attain maximum genetic potential.

Dairy production is an all-inclusive activity, related to dairy animal housing and comfort, reproduction, feeding and farm management. It encompasses all aspects and activities related to raising dairy animals during various phases of life to get maximum productivity in terms of hygienic milk.

A dairy farm with 25 cows needs a total investment of approximately Rs. 51.75 million out of which, capital cost of the project is Rs. 50.93 million with working capital of Rs. 0.82 million. The project is assumed to be working on a 30:70 debt and equity ratio. It is assumed that starting from 25 animals in year 1, the herd will increase to approximately 317 animals, out of which, 131 would be adult cows (wet and dry) of various age groups, 106 female calves and 80 heifers in 10th year of the project. The culling rate is assumed to be 20% per annum for adult cows below 7 years of age and 100% for cows above 7 years of age.

The Internal Rate of Return (IRR), Payback Period and Net Present Value (NPV) of the project, based upon stated assumptions, are 34%, 4.43 years and Rs. 49.81 million respectively. The farm will provide employment opportunity to 3 individuals initially which will increase to 7 at year 10, with the increase in size of the farm. 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 consumption. The rural and peri-urban areas around the major cities with abundant water and availability of feed make a better choice for farming; provided access to livestock markets and veterinary services is ensured. The milk may be sold at the farm gate or directly sold in the urban market.

¹ Pedigree: A registered record of sire (father) and dam (mother) of a cow for three generations.

² Genomic Selection: refers to selection decisions based on Genomic Estimated Breeding Values (GEBV). It allows farmers to identify genetically superior heifers at younger age through DNA test, hence an accurate GEBV is determined before they reach sexual maturity.

Most critical considerations or factors for success of the project are background knowledge and related experience for application of Good Animal Husbandry Practices (GAHP), market / demand of milk, understanding of ECH dairy system, importance of feeding regimes for getting optimum results from good genetics, farm and labour management etc.

3. 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.

4. 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 **Dairy Farm** with Environmentally Controlled Housing (ECH) system 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 its successful management.

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

5. BRIEF DESCRIPTION OF PROJECT & PRODUCT

The proposed dairy farm will be established on owned land with shed constructed on Environmentally Controlled Housing (ECH) system. The farm will begin operations with 25 cows to achieve milk production of 191,625 litres in first year of the project. The initial capacity utilization of milk production for sales revenue is 75% increasing up to a maximum of 90%. Female calves will be raised on milk replacer for first three months of age. Upon weaning at 4th month of age, calves will be offered Total Mixed Ration (TMR) depending on their live body weights and different physiological phases of their productive life until culling.

Breeding of animals will be planned through 'Sexed-Semen Artificial Insemination' method allowing the farmer to breed their best animals giving 70% probability or chance to produce female calves, hence developing strong replacement heifers and future dairy herd with distinguished genomics.

Female calves will be given special attention and raised as 'Heifers' whereas male calves will be sold in the market around the age of two weeks. The milk will be sold primarily at farm gate to bulk buyers at the rate of Rs. 140 with 10% annual growth rate in selling price.

The subject business can be set-up at any appropriate location that ensures easy availability of feed, water and other related services. The development of urban or peri-urban commercial dairy farms is a relatively new concept in dairy production. Metropolitan cities like Lahore, Karachi, Multan, Rawalpindi and Faisalabad etc. are major markets of milk as dairy farms established around these cities fulfil their daily milk demand. There is a year-round market of milk, however, the demand increases in summer (April to November).

5.1 Dairy Farm Production Process

- Selection of dairy cattle breed such as Holstein Friesian with proven pedigree and high genetic worth from elite and renowned sires: Holstein cows are recognized by their distinctive color markings and outstanding milk production, having large body stature with typical color patterns of black & white or red & white. Holstein heifers can be bred at around 15 months of age as they gain 65% of their adult body weight (approx. 550 kgs). Gestation period of the animal is nine months with normal productive life of 6-7 years.
- The pedigree and genetic worth of cows must be considered on top priority, i.e. proper pedigree paper and documentation containing all identifications and registrations of dairy cows by Holstein Association from USA or EU. Pedigree is a document showing an animal's lineage, a record of their ancestry; a typical Holstein pedigree shows three generations - the animal itself, its sire and dam, along with their sires and dams. It may also list genetic and performance records for each animal, when applicable.



Figure 1: A typical Holstein Cow



Figure 2: A typical Pedigree

The pedigree is very important as it can be useful to farmers and breeders in providing information about the cow's ancestors and thereby helping to predict how well that animal may perform later in life e.g. how much milk might be produced or how they will look in their body stature and conformation etc., based on the performance of their ancestors. Aside from providing owners and breeders with detailed information about their animals, official Holstein pedigrees also serve as a verified source of ancestry, performance and genetic information when selling animals, giving the buyer trusted documentation ensuring that information presented on the animal is accurate.

- Selection of animals with excellent body condition and udder health: average daily milk production of 35 litres or above for cows in first lactation, essentially with no disease history is desirable.
- Housing: Good housing leads to good management practices and ultimately optimum production. Generally, housing should be;

- I. Pre-engineered building
- II. Tunnel-type, ventilated, comfortable and dry with hygienic environment
- III. Designed with the probability of future expansion when required

The housing should facilitate;

- Easy drainage and removal of dung, urine and waste material
 - Apparent (or feels like) temperature not exceeding 27 °C
 - Minimum sun exposure: axis of length to be east to west
 - Availability of feed and water round the clock
- The Environmental Controlled Housing (ECH) system is a new and remarkable revolution in Pakistan's dairy sector by creating a self-sufficient temperature and humidity level in dairy house.

Following are some of the features of this system which are quite different from traditional;



Figure 3: A typical ventilation system in ECH system

- ✓ Concrete structure is preferred over steel with low roof height for easy maintenance and access.
- ✓ Proper insulation to prevent heat from all sides. Optimum temperature of 26°C should be maintained inside the shed area. Temperature may be reduced up to 20°C at certain places if required.
- ✓ Proper Heating, Ventilation & Air Conditioning Control (HVAC) designed and planned as per-engineering principles as such type of structure is designed to utilize minimum possible electricity. Electricity cost is much less than traditional fans barns as only 4 fans of 1.5 HP and 4 storm fans are used. Negative pressure fans utilize 18~20 fans of same capacity in the same size.
- ✓ No gases, odor or smell inside the barn due to proper ventilation system, hence, animals are comfortable in cool breeze passing through them from all sides. In this way, the production efficiency of pedigree Holstein cows does not suffer in hot weather resulting in optimum productivity utilization in summers.
- ✓ May be self-sufficient if energy is produced from biogas produced from farmyard manure.

- ✓ The structure of the farm is designed in a way to allow natural flow of water resulting in minimum human efforts for cleanliness.
 - ✓ There is limited need for extra lighting sources at the farm house in day light due to semi closed nature of the housing system.
 - ✓ Electricity cost is markedly less than traditional fan barns.
 - ✓ The animals should be dehorned, as they are easier to handle in barns, causing less accidental injuries to other animals and attendants.
- Feeding: The lactating Holstein cows are fed 1 kg of Dry Matter (DM) feed per 1.75 litres of milk produced. The ration allows nutritionally balanced feed in 24 hours. It includes dry matter derived from 60% roughages and 40% concentrate containing 17-18% Crude Protein (CP) and energy to increase animal productivity. This prefeasibility study suggests to offer cows with commercially prepared and formulated TMR to sustain the protein and energy levels required to maintain milk yields.
 - Watering: Supply of clean drinking water in clean troughs i.e. 50 to 80 litres of water consumption per adult animal per day, round the clock, maintains milk production capacity of the animal.
 - Breeding: Efficient and timely Artificial Insemination (AI) of good genetic worth preferably sexed-semen is a key to success in good breeding programs of herd.
 - Calving: Pregnant animals should be given special attention in third trimester of pregnancy and should be separated in pregnancy pens. Veterinary assistance should be sought out in case of emergency. Calf care and heifer management is very important in maintaining dairy farm production. The farmer will raise female calves as future breeding heifers which will replace culled dairy animals. The first generation (F1) will be capable of breeding at age of 14 months; hence producing milk at about 23-24 months of age.
 - Lactation Period: lactation period is the period during which animals yield milk after calving. The animals producing milk are called 'Wet Animals'. Generally standard lactation and dry period are taken as 305 \pm 5 and 60 days respectively. This pre-feasibility study has taken 80% of the total number of animals as wet cows. The calving interval (interval between two calving) in Holstein cows is 12-14 months. The average daily milk yield of a cow is 35 litres.
 - Udder health: Hygienic and clean milking three times a day (morning/afternoon/evening) lowers chances of mastitis as udder health and hygiene is most important in dairy animals.

- Proper storage of milk should be done preferably at temperature of 4 °C.
- Disease management: Vaccination & medicine is required to prevent any disease outbreak in the dairy herd. Each animal will be vaccinated before entering the farm. Procurement of vaccines from reliable sources should be sought.

Following is a tentative vaccination schedule;

Table 1: Tentative Vaccination Schedule

Disease	Vaccine	Time for vaccination	Dose/ Administration
Foot & Mouth Disease	FMD	February/March & September/October	5 ml sub cut.
Black Quarter	BQ	March/April	5 ml sub cut.
Haemorrhagic Septicemia	HS	May/June & November/December	5 ml / 300 kg body wt. sub cut.
Anthrax	Anthrax	August	1 ml sub cut.
Brucella Abortus	BA	Once in life for heifers (4-12 months of age)	1ml sub cut.

- Record keeping: The animals should be ear-tagged with essential information of animal such as date of birth/ purchase. The records for daily milk yields, number of lactations, vaccination, body weight, Artificial Inseminations (AI), calving, vaccination and medication etc. are also important.
- Culling: Good productive animals should be selected and uneconomical animals should be culled. Low yielding culled animals may be sold in the regular livestock market. On an average, cows are productive for 7 to 8 years. The culling rate of 20% per annum in the total herd is desirable for a successful dairy farm. However, all cows above 7 years of age should be culled.
- Regular technical assistance from dairy and livestock professionals, experts and technical consultants is advised.

Returns on the proposed business and its profitability are highly dependent on the efficiency of above mentioned factors. In case a dairy farm is not able to attain its target milk production or implement effective husbandry practices, it will not be able to cover the potential market and recover payments; hence, cost of operating the business will increase.

5.2 Installed and Operational Capacities

In the proposed study, initially, 25 cows are recommended to obtain optimum milk production in first year of project. It is assumed that on average, 80 % of total animals present at farm would be 'Wet' i.e. in lactation on farm. The female calves born at farm will be added to the milking herd through heifer management; hence total number of animals to be 317, among which, 131 animals will be in lactation as wet cows as well as dry cows, 106 female calves and 80 heifers in 10th year of project. The male calves will be sold in open market within two weeks of age. Average milk production of cows during one lactation period is estimated to be 11,000-12,000 litres. The dairy farm will have the capacity to generate revenues at 75% capacity utilization of total milk produced at farm i.e. 191,625 litres in its first year of operation.

The annual mortality rate is assumed to be 5% for new born calves, 1% for heifers and 1% for adult cows. The project will attain 90% of its installed capacity till 10th year of operations.

6. CRITICAL FACTORS

The most critical considerations or factors for success of the project are:

- Background knowledge and related experience of the entrepreneur in dairy farm operations.
- Application of good husbandry practices such as housing, breeding, feeding, watering, vaccination and medication to ensure animal's health and disease-free environment.
- Awareness about supply and demand of milk in the market as demand of milk is relatively higher in summer as compared to winter season.
- Efficient marketing of the project and bulk supply to wholesalers.

Commercial dairy farmers depend on land, labor and animals as the major resources. Modern dairy farming practices emphasize increased yet focused use of capital and management which harness all available resources for productive and profitable unit. The judicious use of resources to achieve clearly defined goals is the key success factor in modern dairy farming.

Low yield animals are uneconomical to keep; hence they should be culled efficiently as early as possible. Overall genetic improvement of dairy animals is necessary for improved milk production on farm hence, milking records of all lactating cows at equal intervals is very important.

The selection of best sources for continuous supply of sexed-semen from elite bulls for well-organized Artificial Insemination (AI) program is an essential part of herd improvement and planning a replacement heifer program at farm.

Feeding dairy animals on nutritionally balanced ration having high energy forages and good quality protein sources along with vitamin supplements should be adopted. Total Mixed Ration (TMR) serves best example of balanced ration for all types of phases in a cow's productive life.

The important farm management practices include feeding for growth, lactation, pregnancy or maintenance, hygienic milk production, comfortable and ventilated barns, temperature and relative humidity level maintenance in sheds during hot and humid summer months, timely detection of heat within 60-90 days after calving and AI service with sexed-semen. If animals are bred within the 60-90 days of calving, overall performance of herd can be improved.

Timely vaccination against mentioned diseases such as Rinder pest, Black Quarter, Foot and Mouth Disease, Brucellosis along with the prevention of mastitis and parasitic control will also improve overall performance of the dairy herd.

7. GEOGRAPHICAL POTENTIAL FOR INVESTMENT

Commercial dairy farming 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, Sukkar, 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 peri-urban areas around major cities with abundant water and availability of fodder make a better choice for farming; provided there is ready access to livestock related marketing and veterinary services.

8. POTENTIAL TARGET CUSTOMERS / MARKETS

This pre-feasibility study suggests that milk will be sold at the farm gate directly to the consumers or milk contractors. It can also be sold directly to milk centers in the urban market or may be pasteurized at farm by the farmer and delivered to the nearest city, however it involves extra investment which is not included in this prefeasibility study. Milk contractors collect milk from farmers and deliver it to the consumer's doorstep. Milk collection networks of different processing companies also collect milk directly from the farm and transport it to the processing facilities.

Although metropolitan cities like Lahore, Sialkot, Kasur, Gujranwala, Bahawalpur, Okara, Quetta, D. I. Khan etc are considered major markets for the sale of milk, yet commercial dairy farming in peri-urban locations takes place around all major cities.

Following are some of the target clients for a dairy farmer;

- Domestic consumers
- Milk contractors and suppliers
- Milk collection and processing companies
- Dairy products manufacturing companies
- On-farm Processing by farmer (however, it requires minimum viable capacity of 40,000 liters of milk daily)

The cost of production per litre of raw milk should be lower than its sale price so that the farmer finds it economical. The daily milk intake of Lahore & Karachi is 3 million litres and 5 million litres respectively. The demand for milk increases during summers as consumption of whey (lassi) increases due to hot weather. Yogurt or curd is another popular product. These are high value products however with relatively short shelf life.

Milk processing companies use milk as a raw material to formulate different types of milk i.e. pasteurized milk, UHT treated milk, condensed milk, skim milk & milk powder, etc. Different value added products like ghee, khoya, yogurt, ice cream, butter and cheese are also prepared from raw milk. 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.

9. PROJECT COST SUMMARY

9.1 Project Economics

The financial model for this pre-feasibility study indicates estimated revenue of Rs. 80.48 million in first year of the project. The capacity utilization during year one is 75%, which will be increased to 90% as the project proceeds.

The following table shows Internal Rate of Return, payback period and Net Present Value of the proposed venture.

Table 1: Project Economics

Description	Details
Internal Rate of Return (IRR)	34%
Payback Period (Years.)	4.43
Net Present Value (Million Rs.)	49.81

9.2 Project Financing

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

Table 2: Project Financing

Description	Details
Total Equity (70%)	Rs. 36.225 M
Bank Loan (30%)	Rs. 15.525 M
Markup to the Borrower (% per annum)	26%
Tenure of the Project (Years)	10

9.3 Project Cost

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

Table 3: Project Cost

Description	Cost (Rs.)
Capital Cost	
Land	1,316,833
Building and Infrastructure	10,511,000
Machinery and Equipment	13,445,000
Cows	25,112,500
Furniture & Fixture	280,130
Office Equipment	20,000
Office Vehicles	105,000
Pre-operating Cost	145,000
Total Capital Cost	50,935,463
Working Capital	
Raw Material Inventory	297,964
Cash	516,892
Total Working Capital	814,856
Total Project Cost	51,750,319

The proposed pre-feasibility is based on the assumption of 30% debt and 70% equity, however this composition can be changed as per requirements of the investor.

9.4 Space Requirement

Space requirement for the proposed dairy farm is calculated considering requirements for management office, sheds for cows, calves and dry animals, milk chiller rooms, storage, open paddocks etc.

Details of space requirement and cost related to land & building are given below;

Table 4: Space Requirement in Year 1

Description	Unit Area (Sq.ft.)	Est. Area (Sq.ft)	Unit Cost (Rs.)	Total Cost (Rs.)
Shed for Wet Cows	80	2,000	1,500	3,000,000
Open Paddock for Wet Cows	160	4,000	100	400,000
Shed for Dry Cows	80	2,000	1,250	2,500,000
Open Paddock for Dry Cows	160	4,000	100	400,000
Shed for Calves	40	1,000	1,250	1,250,000
Open Paddock for Calves	80	2,000	100	200,000
Stores (fodder, TMR & machines)		400	2500	1,000,000
Room (chillers, utensils & milk storage)		144	2,500	360,000
Residence (Manager)		120	4,000	480,000
Admin / Accounts Room		120	4,000	480,000
Washroom (Executives)		24	4,000	96,000
Rooms (Workers)		90	2,500	225,000
Washrooms (Workers)		48	2,500	120,000
Total Infrastructure		15,946		10,511,000

Total investment in building and infrastructure is approximately Rs. 10.51 million. Shed space has been increased with the increase in number of animals especially lactating cows in the herd; hence an expansion is suggested in after year 10.

The housing of labor & management staff and room for chiller utensils and milk storage would be constructed on the first floor.

Land is to be purchased as per maximum space requirements of the farm for 10 years. Total land requirement is approximately 0.5 acres at an average price of Rs. 3 million per acre.

9.5 Machinery & Equipment Requirement

Following farm machinery and equipment are needed to run daily farm operations in year 1;

Table 5: Machinery & Equipment

Description	Quantity (Nos)	Unit Cost (Rs)	Total Cost Year 1 (Rs.)
Calf Feeder (New born calves)	11	4,000	44,000
Calf Cages	2	50,000	100,000
Cooling System: Cone Fans	4	150,000	600,000
Cooling System: Storm Fans	2	250,000	500,000
Cooling System Pads (6 Pads/cone fan)	24	3,000	72,000
Water Turbine (6" bore, 15HP Motor)	1	500,000	500,000
Milking Line (Buckets)	1	200,000	200,000
Generator (25 KVA) Hyundai	1	1,200, 000	1,200,000
Solar Energy System (40KW) on-grid	1	5,500,000	5,500,000
Solar Back up System (10KW)	1	3,000,000	3,000,000
Milk Chiller (3000 litres)	1	1,400,000	1,400,000
Milk Testing Machines	1	40,000	40,000
Velocity Meter	1	10,000	10,000
Surgery Kit	1	75,000	75,000
AI Equipment	1	50,000	50,000
Dystocia Kit	1	50,000	50,000
Energy Savers-Farm (50 W)	4	1,000	4,000
Miscellaneous	1	100,000	100,000
Total Machinery & Equipment			13,445,000

It is assumed that electricity infrastructure such as transformer of 100 KVA power along with connection, wires and installations are already in place, hence project does not include its cost.

A 'Solar on Grid System' of 40KW with Net Metering facility is suggested in this pre-feasibility study. Cost of this system may vary according to selection of equipment (e.g., type of solar panel, type of batteries for backup or customized mounting structure). The solar energy system will produce an average 4 KWH /day which may vary due to inappropriate system design, selection of solar panels, inverter and climate conditions.

In case of load shedding, solar backup system including 24 dry cell batteries with sufficient storage capacity (1600Ah, 2V) will operate to generate 10KW load (for essential equipment such as chiller, cooling system etc.) for 3 hours. Furthermore, a diesel generator set (25 KVA) is also suggested for emergency such as in the event of long duration load shedding, power break down or weather conditions affecting the efficiency of solar system.

9.6 Office Vehicle

Following office vehicle is needed for the farm;

Table 6: Office Vehicle

Description	No.	Cost / Unit (Rs.)	Total Cost (Rs.)
Motor Cycle	1	100,000	100,000
Registration fee*			5,000
Total cost			105,000

*5 % of office vehicles cost

It is assumed that Rs. 15,000 per month will be spent on running of this vehicle in a radius of 50 km around farm premises i.e. Rs. 180,000 per annum. However, an additional expense of Rs. 25,000 per month will be required to cover long distance travelling expenses to carry out essential operations of farm, translating to an expense of Rs. 300,000 per annum.

9.7 Furniture & Fixtures Requirement

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

Table 7: Furniture & Fixture

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Tables	1	12,000	12,000
Chairs	4	5,000	20,000
Fans (75 W)	3	7,500	22,500
Electric Wiring & Lighting	Lump Sum	100,000	100,000
Energy Savers	2	315	630
Miscellaneous Furniture for Workers	1	125,000	125,000
Total Furniture & Fixtures			280,130

9.8 Office Equipment Requirement

Following office equipment will be required for the dairy farm;

Table 8: Office Equipment

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Cell Phone	1	20,000	20,000
Total			20,000

9.9 Human Resource Requirement

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

Table 9: Human Resource Requirement in Year 1

Description	No. of Employees	Monthly Salary (Rs.)*	Total Salary Year 1 (Rs)
Farm Owner/ Supervisor	1	40,000	480,000
Farm Labour (Cows and Calves)	1	30,000	360,000
Security Guard	1	30,000	360,000
Total	3		1,200,000

*Note: The annual growth in salary is estimated to be 10% per annum.

It is recommended that the farm supervisor be categorized as 'NVQF Certificate Level-3 OR Level-4' having comprehensive practical and theoretical knowledge within dairy farming with the responsibility for supervision of various critical activities at farm related to improvement of farm productivity. He should also provide inputs to review and develop targets for sub-ordinate farm workers. (For further details on qualifications, please visit Pakistan National Vocational Qualifications Framework (NVQF), National Vocational and Technical Training Commission (NAVTTTC), www.navttc.org).

9.10 Raw material Requirement

Following tables show raw material requirement for individual animal at different stages on the proposed dairy farm during first year of project;

Table 10: Daily Feeding Requirements (CP 17.5%) for One Wet Cow*

Description	Daily Feed Allowance (Kgs)	Rate Rs./ Kg.	Feed Cost (Rs./Day)	Milk Days (No.)	Total Cost (Rs./ Cow)
Total Mixed Ration (TMR)	21 (@ 3 % of Live BW)	74	1,554	305	473,970

*Average adult Live Body Weight (BW) of cow is assumed to be 700 kg. One lactation period of cow is estimated to be 305 +_ 5 days and dry period is 60 days.

Table 11: Daily Feeding Requirements (CP 12%) for One Dry Cow*

Description	Daily Feed Allowance (Kgs)	Rate Rs./ Kg.	Feed Cost (Rs./Day)	Dry Days (No.)	Total Cost (Rs./ Cow)
Total Mixed Ration (TMR)	17.5 (@ 2.5 % of Live BW)	47	822.5	60	49,350

*Average adult Live Body Weight (BW) of cow is assumed to be 700 kg. One lactation period of cow is estimated to be 305 +_ 5 days and dry period is 60 days.

Table 12: Daily Feeding Requirements of One Female Calf
(birth till One Year age)**

Description	Daily Feed Allowance	Rate Rs./ Kg	Feeding Days (No.)	Feed Cost (Rs./Day)	Total Cost in Year 1 (Rs./ Calf)
Milk Replacer (1-90 days age)	6 litres	80	90	480	43,200
TMR (4-12 months age)	8.25 Kgs (3 % of Live Body Wt.)	59.2	275	488.4	134,310
Total					177,510

**Average birth weight of the new born calf is 35-40 kgs. At the time of weaning at three months of age, it is 150 kgs which increases up to 400 kgs at the age of one year.

**Table13: Daily Feeding Requirements of One Heifer
(One Year+ Age)*****

Description	Feed Allowance (Kgs/ Day)	Rate (Rs./ Kg)	Days (No.)	Feed Cost (Rs./ Day)	Total Cost in (Rs./ Heifer)
TMR	16.5 (@3% of Live BW)	59.2	365	977.6	356,833

***Average Live body weight (BW) of heifer, older than one year is assumed to be 550 kgs.

When planning on herd basis, following table shows the maximum expenses on nutritionally balanced Total Mixed Ration (TMR). The Crude Protein (CP) content of feed would vary depending upon wet and dry status of cows as well as live body weights.

Table14: Total Cost of Feeding (Year 1 & 2)

Description	Total Cost (Rs.)****			
	No. of Animals	Year 1	No. of Animals	Year 2
Lactating Cows (80% of herd)	20	11,344,200	20	12,478,620
Dry Cows (20% of herd)	4	1,200,850	4	1,320,935
Female Calves Younger than 1 Yr (3 months) age)	17	718,200	16	740,956
Female Calves Younger than 1 Yr (4-12 months) age)		2,232,904		2,456,194
Heifers-Female calves older than 1 Yr age	0	0	16	6,194,075
Total	41	15,496,154	56	23,190,780

****Prices are rounded off to near decimal point for 365 days of feeding. The number of animals are calculated after mortality count which is 5% in new born, 1 % in female calves older than one year and 1% in adult cows.

Table15: Total Cost of Vaccination, Medication and AI in Year 1

Description	Rs./ Animal/ Year	Total Cost in Year 1 (Rs.)
Vaccination and Medication	1,000	40,544
Artificial Insemination (AI)	10,000	247,500
Total	11,000	288,044

9.11 Utilities and other costs

An essential cost to be borne by the project is the cost of electricity. The electricity expenses of the dairy farm will be met by solar energy system with back up system. It is assumed that a transformer (100 KVA) including wires, connection and installation is already in place, hence no cost is included in this project.

The direct electricity cost is estimated to be around Rs. 5,500 per month during first year of operation.

It is further assumed that within the cooling system, the cone fans and storm fans with water motor will operate for 12 hours per day. The milk chiller and energy savers will operate for 12 hours per day (average) throughout the year. The water turbine will operate for 2 hours daily (average). The milking line with buckets will operate for 6 hours daily (average) to carry out three milking sessions daily.

The project is supported with solar energy system of 40KW, with a back up system of 10 KW. In addition, a generator of 25 KW is also installed for back up support for smooth running of farm operations through out the year

Machinery maintenance expense is assumed to be Rs. 20,000 per month or Rs 240,000 in year one.

Monthly expenses related to long distance official travelling, communication and office vehicle running are Rs. 25,000, 10,000 and 15,000 respectively.

Similarly, monthly expenses related to miscellaneous farm routine activities and business promotion are Rs. 5,000 and Rs. 5,000 respectively.

The general administration expenses are Rs. 30,000 per month.

The professional fees related to any legal, audit or technical consultation is assumed to be Rs. 10,800 per annum.

.

9.12 Revenue Generation

Based on capacity utilization of 75% for revenues from milk production from 25 cows, sales revenue during the first year of operations are shown in the following table. However, capacity has been increased at 10% for a maximum utilization of 90% till year 10.

Table16: Revenue Generation – Year 1

Description	Unit	Annual Production	Price (Rs./Unit)	Total Revenue in Year 1 (Rs.)
Sale of Milk	No. of Liters	191,625	140*	26,827,500
Sale of male calves	No.	6 to 7	10,000	67,688
Total				26,895,188

The annual culling rate is 20% applicable to all adult cows and heifers below 7 years of age. However, there will be zero culling of adult lactating cows during first and second year of the farm operation.

10. CONTACT DETAILS

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

10.1 Machinery Suppliers

Happy Cattle Dairy Farm Pvt. Ltd. Address: C-2 Building, 3 rd Floor, D-Block Commercial Market, Valencia Town, Lahore. Ph: 0307-6664300, 0300-5553699
Profarm Pakistan Pvt. Ltd. Address: Plot No. 52, Block R-1, M. A. Johar Town, Lahore. Ph: 042 35291992-4 (3 lines) Customer Service (24/7): 0323-8888211
Dairy Solution Pvt. Ltd. Address: 177/B, Johar Town, Lahore. Ph: 042-35169450 +92-42-35169451 Fax: 042-35169449
Cattle Kit Pvt. Ltd. Pakistan Address: 104-A, Punjab Govt. Servants Housing Society, Mohlan Waal, Lahore Ph: 042-35978500-3 Email: info@cattlekit.com.pk , Web: www.cattlekit.com.pk

10.2 Raw Material Suppliers

Feed Suppliers

Hi-Tech Feeds Pvt. Ltd. (for TMR) Address: 1-A, Shadman Chowk, Jail Road, Lahore. Ph: 042-37564503
Panjnad Feeds (TMR Supplier) Address: Head Office: 171 Shadman II, Lahore. Ph: 042-35961021-28
Maxim Agri Address: 7-B, Aziz Ave, Gulberg V, Lahore Ph: 0323-4007000
ICI Corporate Office Address: 63-Mozang Road, Lahore UAN: 042-111-100-200
Shareef Feeds Pvt. Ltd. Address: 7-A, New Muslim Town, Lahore. Ph: 04235758233-5
Dairy Lac Pvt. Ltd. Head Office: Plot No. 317, Road No. 5, Landhi Cattle Colony, Bin Qasim Town, Karachi Feed Mill: Chak 112, Wangay Wala Pull, Jaranwala, Faisalabad. Ph: 0334-3433333, 0300-8274874

National Feeds Pvt. Ltd.
Address: 171- Shadman – II Lahore.
Ph: 042 37551405-8

AI / Semen Suppliers

Ghazi Brothers
Address: B-35 KDA Scheme No 1, Mian Muhammad Shah Road, Karachi.
Ph: 021-4543579

World Wire Sires by Maxim International Pvt. Ltd.
Address: 69-A, Sector-XX, Khayaban-e-Iqbal, DHA, Lahore.
Ph: 042-35693993

DRDF/ Prime Genetics Pvt. Ltd.
DHA Phase VIII, Lahore.
Ph: 0344-4472155

Matra Asia Pvt. Ltd.
Address: 4th Floor, Plazo 100, Block B-II, MM Alam Road, Gulberg III, Lahore.
Ph: 042-35790031

Milk Contractors/ Processors

Engro Foods Pvt. Limited
Address: 5th, 6th Floor, Harbor Front Building
Marine Drive, Block 4, Clifton, Karachi.
Ph: +92 21 3529-6000 (10 lines)

Nestle Pakistan
Address: 308, Upper Mall, Lahore,
Ph: 042-35757082-95, UAN +92-42-111637853

Millac Foods
Address: 309-310, 3rd Floor, Beaumont Plaza, Beaumont Road,
Civil Lines Quarters, Karachi.
UAN: 092-111-MILLAC (645-522)

Adams Milk Foods Pvt. Ltd.
Address: 128/1-M, Quaid-e-Azam Industrial Estate, Kot Lakpat, Lahore
Ph: 042-35117104

Accha Foods Pvt. Ltd.
Address: C-1, Main Boulevard, Green Forts 2, Canal Road, Lahore
Ph: 042-35451076

Holstein Cow Suppliers

The pedigreed Holstein breed cows with average daily milk production capacity of 35 liters of EU and USA origin may be found from following sources;

1. Holstein Association USA (www.holsteinusa.com)
2. United States Livestock Exporters Association (USLEA)
(www.livestockexportersusadotcom.wordpress.com)

Holstein Cow Local Suppliers

Happy Cattle Dairy Farm Pvt. Ltd.
Address: C-2 Building, 3rd Floor, Block-D, Commercial Market, Valencia Town Lahore.

Ph: 0307-6664300, 0300-5553699

Bovi Tech

Address: Property # W-95-R-16/1, Sheikh Abdul Qadir Jillani (Outfall) Rd, Lahore.

Ph: 0310-0508485

HRM Dairies Pvt. Ltd.

Address: HRM Dairies, Arifwala, Pakpattan

Ph: 0313-5220980

10.3 Technical Experts / Consultants

Dr. Sami Ullah.

Farm Manger

Infinite Dairy Farm, Sargodha.

Ph: 0323-4360006, 0300-4360453

Dr. Nasir Javed

Consultant

Lead Foundation, West wood Colony, Lahore

Ph: 0300-8432595

Dr. Sattar

Farm manager

JK Dairies, RYK

Ph: 0300-8416682

Mr. Waqas Khan

Pak Dairies, Sargodha

Ph: 0303-4444909

Dr. Abid

Mk dairies, Kassowal, Chichawatni

Ph: 0345-7634947, 0303-7431450

10.4 Solar Solution 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

11. 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.

Table17: 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	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
Animal Husbandry In-Service Training Institute (AHITI), Peshawar	
Veterinary Research Institute (VRI), Punjab	
Agribusiness Support Fund (ASF), Lahore,	www.asf.org.pk
Livestock and Dairy Development Department, Punjab	www.livestockpunjab.gov.pk
Livestock & Fisheries Department, Sindh	www.sindh.gov.pk
Agriculture & Livestock Department, KPK	www.khyberpakhtunkhwa.gov.pk
Livestock & Dairy Development, Balochistan	www.balochistan.gov.pk

12. ANNEXURES

12.1 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	26,895,188	33,514,782	55,421,226	64,185,850	95,784,220	115,016,196	161,759,628	228,278,459	305,781,170	433,677,920
Cost of goods sold	16,929,505	24,950,369	32,888,495	42,636,009	58,341,876	71,353,911	101,635,055	136,084,811	188,886,370	255,535,121
Gross Profit	9,965,683	8,564,413	22,532,731	21,549,841	37,442,344	43,662,286	60,124,572	92,193,648	116,894,801	178,142,799
<i>General administration & selling expenses</i>										
Administration expense	360,000	395,050	433,513	475,720	522,037	572,863	628,638	689,843	757,007	830,710
Rental expense	-	-	-	-	-	-	-	-	-	-
Utilities expense	-	-	-	-	-	-	-	-	-	-
Travelling & Comm. expense (phone, fax, etc.)	420,000	462,000	508,200	559,020	614,922	676,414	744,056	818,461	900,307	990,338
Office vehicles running expense	180,000	198,000	217,800	239,580	263,538	289,892	318,881	350,769	385,846	424,431
Office expenses (stationary, etc.)	60,000	66,000	72,600	79,860	87,846	96,631	106,294	116,923	128,615	141,477
Promotional expense	60,000	66,000	72,600	79,860	87,846	96,631	106,294	116,923	128,615	141,477
Insurance expense	-	-	-	-	-	-	-	-	-	-
Professional fees (legal, audit, etc.)	10,758	13,406	22,168	25,674	38,314	46,006	64,704	91,311	122,312	173,471
Depreciation expense	1,910,563	1,910,563	1,940,813	1,974,088	2,010,691	2,050,953	2,104,100	2,162,562	2,226,869	2,297,608
Amortization expense	29,000	29,000	29,000	29,000	29,000	-	-	-	-	-
Property tax expense	-	-	-	-	-	-	-	-	-	-
Miscellaneous expense	-	-	-	-	-	-	-	-	-	-
Subtotal	3,030,321	3,140,019	3,296,694	3,462,802	3,654,193	3,829,390	4,072,966	4,346,792	4,649,573	4,999,512
Operating Income	6,935,361	5,424,394	19,236,037	18,087,038	33,788,151	39,832,896	56,051,607	87,846,856	112,245,228	173,143,287
Other income	-	-	-	-	-	-	-	-	-	-
Gain / (loss) on sale of assets	-	-	-	-	-	-	-	-	-	-
Earnings Before Interest & Taxes	6,935,361	5,424,394	19,236,037	18,087,038	33,788,151	39,832,896	56,051,607	87,846,856	112,245,228	173,143,287
Interest expense	3,966,632	3,822,145	3,681,550	3,499,714	3,264,539	2,960,380	2,567,000	2,058,228	1,400,216	549,187
Earnings Before Tax	2,968,730	1,602,249	15,554,486	14,587,324	30,523,612	36,872,516	53,484,607	85,788,628	110,845,012	172,594,100
Tax	457,182	155,450	4,809,070	4,470,563	10,048,263	12,270,380	18,084,612	29,391,019	38,160,753	59,772,934
NET PROFIT/(LOSS) AFTER TAX	2,511,548	1,446,799	10,745,417	10,116,761	20,475,348	24,602,136	35,399,995	56,397,609	72,684,258	112,821,166
Balance brought forward		1,255,774	1,351,286	6,048,352	8,082,557	14,278,952	19,440,544	27,420,270	41,908,939	57,296,599
Total profit available for appropriation	2,511,548	2,702,573	12,096,703	16,165,113	28,557,905	38,881,088	54,840,540	83,817,879	114,593,198	170,117,765
Dividend	1,255,774	1,351,286	6,048,352	8,082,557	14,278,952	19,440,544	27,420,270	41,908,939	57,296,599	85,058,882
Balance carried forward	1,255,774	1,351,286	6,048,352	8,082,557	14,278,952	19,440,544	27,420,270	41,908,939	57,296,599	85,058,882

12.2 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	Rs. in actuals Year 10
Assets											
<i>Current assets</i>											
Cash & Bank	516,891	3,663,794	5,204,202	10,878,010	13,801,942	20,738,180	25,694,129	33,282,543	46,092,800	59,207,964	99,609,409
Accounts receivable	-	514,500	641,410	971,170	1,150,463	1,717,477	1,938,941	2,898,469	4,030,512	5,426,152	7,642,934
Finished goods inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment spare part inventory	-	-	-	-	-	-	-	-	-	-	-
Raw material inventory	297,964	490,505	708,898	1,017,571	1,546,987	2,088,397	3,276,257	4,854,987	7,419,702	11,059,775	-
Pre-paid annual land lease	-	-	-	-	-	-	-	-	-	-	-
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Pre-paid insurance	-	-	-	-	-	-	-	-	-	-	-
Total Current Assets	814,856	4,668,800	6,554,511	12,866,751	16,499,392	24,544,055	30,909,328	41,035,998	57,543,014	75,693,891	107,252,343
<i>Fixed assets</i>											
Land	1,316,833	1,316,833	1,316,833	1,316,833	1,316,833	1,316,833	1,316,833	1,316,833	1,316,833	1,316,833	1,316,833
Building/Infrastructure	10,511,000	9,985,450	9,459,900	8,934,350	8,408,800	7,883,250	7,357,700	6,832,150	6,306,600	5,781,050	5,255,500
Animals	25,112,500	22,459,063	36,582,700	45,967,804	65,338,387	90,521,348	113,809,266	162,115,441	220,868,389	308,945,351	419,046,340
Machinery & equipment	13,445,000	12,100,500	11,058,500	10,016,500	8,974,500	7,932,500	6,979,078	6,025,656	5,072,234	4,118,812	2,387,268
Furniture & fixtures	280,130	252,117	224,104	196,091	168,078	140,065	112,052	84,039	56,026	28,013	-
Office vehicles	105,000	94,500	84,000	73,500	63,000	52,500	42,000	31,500	21,000	10,500	-
Office equipment	20,000	18,000	16,000	14,000	12,000	10,000	8,000	6,000	4,000	2,000	-
Total Fixed Assets	50,790,463	46,226,463	58,742,037	66,519,078	84,281,598	107,856,496	129,624,930	176,411,620	233,645,082	320,202,559	428,005,940
<i>Intangible assets</i>											
Pre-operation costs	145,000	116,000	87,000	58,000	29,000	-	-	-	-	-	-
Legal, licensing, & training costs	-	-	-	-	-	-	-	-	-	-	-
Total Intangible Assets	145,000	116,000	87,000	58,000	29,000	-	-	-	-	-	-
TOTAL ASSETS	51,750,319	51,011,262	65,383,548	79,443,829	100,809,990	132,400,551	160,534,257	217,447,618	291,188,097	395,896,450	535,258,283
Liabilities & Shareholders' Equity											
<i>Current liabilities</i>											
Accounts payable	-	1,273,656	1,906,091	2,504,098	3,267,202	4,515,312	5,540,573	7,902,479	10,644,558	14,789,519	20,040,338
Export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Short term debt	-	-	-	-	-	-	-	-	-	-	-
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Total Current Liabilities	-	1,273,656	1,906,091	2,504,098	3,267,202	4,515,312	5,540,573	7,902,479	10,644,558	14,789,519	20,040,338
<i>Other liabilities</i>											
Lease payable	-	-	-	-	-	-	-	-	-	-	-
Deferred tax	-	-	-	-	-	-	-	-	-	-	-
Long term debt	15,525,096	14,910,047	14,430,747	13,810,852	13,009,121	11,972,216	10,631,150	8,896,705	6,653,487	3,752,258	-
Total Long Term Liabilities	15,525,096	14,910,047	14,430,747	13,810,852	13,009,121	11,972,216	10,631,150	8,896,705	6,653,487	3,752,258	-
<i>Shareholders' equity</i>											
Paid-up capital	36,225,223	36,225,223	36,225,223	36,225,223	36,225,223	36,225,223	36,225,223	36,225,223	36,225,223	36,225,223	36,225,223
Gain / Loss on Net value of Animals	-	(2,653,438)	11,470,200	20,855,304	40,225,887	65,408,848	88,696,766	137,002,941	195,755,889	283,832,851	393,933,840
Retained earnings	-	1,255,774	1,351,286	6,048,352	8,082,557	14,278,952	19,440,544	27,420,270	41,908,939	57,296,599	85,058,882
Total Equity	36,225,223	34,827,559	49,046,709	63,128,878	84,533,667	115,913,023	144,362,534	200,648,434	273,890,052	377,354,673	515,217,945
TOTAL CAPITAL AND LIABILITY	51,750,319	51,011,262	65,383,548	79,443,829	100,809,990	132,400,551	160,534,257	217,447,618	291,188,097	395,896,450	535,258,283
Note: Total assets value will differ from project cost due to first installment of leases paid at the start of year 0											

12.3 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	Rs. in actuals Year 10
<i>Operating activities</i>											
Net profit	-	2,511,548	1,446,799	10,745,417	10,116,761	20,475,348	24,602,136	35,399,995	56,397,609	72,684,258	112,821,166
Add: depreciation expense	-	1,910,563	1,910,563	1,940,813	1,974,088	2,010,691	2,050,953	2,104,100	2,162,562	2,226,869	2,297,608
amortization expense	-	29,000	29,000	29,000	29,000	29,000	-	-	-	-	-
Deferred income tax	-	-	-	-	-	-	-	-	-	-	-
Accounts receivable	-	(514,500)	(126,910)	(329,760)	(179,293)	(567,014)	(221,464)	(959,527)	(1,132,043)	(1,395,640)	(2,216,782)
Finished good inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment inventory	-	-	-	-	-	-	-	-	-	-	-
Raw material inventory	(297,964)	(192,541)	(218,393)	(308,672)	(529,416)	(541,410)	(1,187,860)	(1,578,730)	(2,564,716)	(3,640,072)	11,059,775
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Advance insurance premium	-	-	-	-	-	-	-	-	-	-	-
Accounts payable	-	1,273,656	632,435	598,007	763,104	1,248,110	1,025,261	2,361,906	2,742,079	4,144,961	5,250,819
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Cash provided by operations	(297,964)	5,017,726	3,673,494	12,674,804	12,174,244	22,654,724	26,269,027	37,327,744	57,605,491	74,020,376	129,212,586
<i>Financing activities</i>											
Change in long term debt	15,525,096	(615,049)	(479,300)	(619,895)	(801,731)	(1,036,906)	(1,341,065)	(1,734,445)	(2,243,217)	(2,901,229)	(3,752,258)
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	36,225,223	-	-	-	-	-	-	-	-	-	-
Purchase of (treasury) shares	-	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financing	51,750,319	(615,049)	(479,300)	(619,895)	(801,731)	(1,036,906)	(1,341,065)	(1,734,445)	(2,243,217)	(2,901,229)	(3,752,258)
<i>Investing activities</i>											
Capital expenditure	(50,935,463)	-	(302,500)	(332,750)	(366,025)	(402,628)	(531,468)	(584,615)	(643,077)	(707,384)	-
Acquisitions	-	-	-	-	-	-	-	-	-	-	-
Cash (used for) / provided by investing	(50,935,463)	-	(302,500)	(332,750)	(366,025)	(402,628)	(531,468)	(584,615)	(643,077)	(707,384)	-
NET CASH	516,891	4,402,677	2,891,694	11,722,159	11,006,489	21,215,191	24,396,493	35,008,684	54,719,197	70,411,763	125,460,328
Cash balance brought forward		516,891	3,663,794	5,204,202	10,878,010	13,801,942	20,738,180	25,694,129	33,282,543	46,092,800	59,207,964
Cash available for appropriation	516,891	4,919,568	6,555,489	16,926,361	21,884,498	35,017,133	45,134,673	60,702,813	88,001,740	116,504,563	184,668,292
Dividend	-	1,255,774	1,351,286	6,048,352	8,082,557	14,278,952	19,440,544	27,420,270	41,908,939	57,296,599	85,058,882
Cash carried forward	516,891	3,663,794	5,204,202	10,878,010	13,801,942	20,738,180	25,694,129	33,282,543	46,092,800	59,207,964	99,609,409

13. KEY ASSUMPTIONS

13.1 Operating Cost Assumptions

Description	Unit	Details
Machinery Maintenance	Rs./ Month	20,000
Office vehicle running expenses	Rs./ Month	15,000
General Administration Expense	Rs./ Month	30,000
Travelling Expense	Rs./ Month	25,000
Farm Expenses (entertainment, janitorial, stationery etc.)	Rs./ Month	5000
Communication Expenses	Rs./Month	10,000
Promotional Expenses	Rs./ Month	5,000
Professional Fee	Rs./ Annum	10,800

13.2 Production Cost Assumptions

Description	Unit	Details
Annual Installed Capacity	No. of Cows	25
Initial Capacity Utilization	%	25
Maximum Production Capacity Utilization	%	90
Total Milk Production (One Lactation Cycle)	Litres/ Cow	12,000
Birth Ratio of Female: Male Calves	Ratio	70:30
Avg. Lactation Period (Individual Cow)	No. of Days	305+5
Avg. Dry Period (Individual Cow)	No. of Days	60
Purchase Price of Pregnant Cow (As of June 2023)	Rs./ Cow	1,004,500
Cost of Artificial Insemination (AI)	Rs/Cow/ Yr.	10,000
Cost of Vaccination & Medication	Rs./Animal/Yr.	1,000
Mortality- New Born Calves	% of Total Calves/ Yr	5
Mortality - Adult Cows	% of Total Cows/Yr.	1
Mortality- Heifers (Age 1 Year+)	% of Total Heifers/ Yr.	1
Shed Space per Cow	Sq. ft. per Cow	80
Open Paddock Space per Cow	Sq. ft. per Cow	160

13.3 Revenue Assumptions

Description	Unit	Details
Total Milk Production on Farm	No. of Liters/ Yr	191,625
Sale Price of Milk (Farm Gate)	Rs./ Litre	140
Sale Price Growth Rate	% per Annum	10
Capacity Utilization	%	75
Maximum Capacity	%	90

13.4 Financial Assumptions

Description	Unit	Details
Debt: Equity Ratio	Ratio	70:30
Interest Rate	% per Annum	26
Debt Tenure	Years	10

Small and Medium Enterprises Development Authority

HEAD OFFICE

4th Floor, Building No. 3, Aiwan-e-Iqbal Complex, Egerton Road, Lahore
Tel: (92 42) 111 111 456, Fax: (92 42) 36304926-7

www.smeda.org.pk, helpdesk@smeda.org.pk

REGIONAL OFFICE PUNJAB	REGIONAL OFFICE SINDH	REGIONAL OFFICE KPK	REGIONAL OFFICE BALOCHISTAN
3 rd Floor, Building No. 3, Aiwan-e-Iqbal Complex, Egerton Road Lahore, Tel: (042) 111-111-456 Fax: (042) 36304926-7 helpdesk.punjab@smeda.org.pk	5 TH Floor, Bahria Complex II, M.T. Khan Road, Karachi. Tel: (021) 111-111-456 Fax: (021) 5610572 helpdesk-khi@smeda.org.pk	Ground Floor State Life Building The Mall, Peshawar. Tel: (091) 9213046-47 Fax: (091) 286908 helpdesk-pew@smeda.org.pk	Bungalow No. 15-A Chaman Housing Scheme Airport Road, Quetta. Tel: (081) 831623, 831702 Fax: (081) 831922 helpdesk-qta@smeda.org.pk