Pre-Feasibility Study

Dairy Farm (100 Cows)

Environmentally Controlled Housing (ECH) System

Small and Medium Enterprises Development Authority

Ministry of Industries & Production

Government of Pakistan

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2 EXECUTIVE SUMMARY

This pre-feasibility study is based upon the business analysis of setting up a dairy farm where cows with proven pedigree and high genetic worth are kept primarily for milk production in an Environmentally Controlled Housing (ECH) system. The animals are fed Total Mixed Ration (TMR), which is a high energy and protein rich nutritionally balanced formulated feed. The cows are bred by proven pedigreed genetics through the Artificial Insemination method to attain maximum genetic potential ('Net Merit' in terms of profits).

Dairy production is an all-inclusive activity, related to dairy animal care, reproduction, feeding and 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 100 cows needs a total investment of approximately Rs. 70.55 million out of which, capital cost of the project is Rs. 68.55 million with working capital of Rs. 1.99 million. The project is assumed to be working on a 50:50 debt and equity ratio. It is assumed that starting from 100 animals in year 1, the herd of animals will increase to approximately 446 animals, out of which, 236 would be lactating cows in 10th year of the project. The culling rate is assumed to be 15% per annum.

The Internal Rate of Return (IRR), Payback Period and Net Present Value (NPV) of the project, based upon stated assumptions, are 35%, 4.55 years and Rs. 108.90 million respectively. The farm will provide employment opportunity to 9 individuals initially which will increase to 20 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, Sheikhupura, Sargodha, Multan, Bahawalpur, Hyderabad, Quetta, Ziarat, Peshawar etc. which are major markets of milk. The rural and peri-urban areas around the major cities with abundant water and availability of fodder 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.

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 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.

5 BRIEF DESCRIPTION OF PROJECT & PRODUCT

The proposed dairy farm will be established on owned land with purpose built shed constructed on Environmentally Controlled Housing (ECH) system. The farm will begin operations with 100 cows to achieve milk production of 838,040 litres in first year of the project. The initial capacity utilization of milk production for sales revenue is 80% increasing up to a maximum of 95%. 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) for the rest of their productive life. Breeding of animals will be planned through 'Artificial Insemination' method. Female calves will be given special attention and raised as 'Heifers' whereas male calves are to be sold in the market around the age of one month. The milk will be primarily sold to bulk buyers at the rate of Rs. 60 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/ superior 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 live body weight). Gestation period of the animal is nine months with normal productive life of 4-5 years.

Figure 1: A typical Holstein Cow

- 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 Aassociation 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. May also list genetic and performance records for each animal, when applicable.

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.
- 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) Dairy Farm is a new and remarkable revolution in Pakistan's dairy sector by creating a self-sufficient temperature in dairy house. Following are some of the features of this system which are quite different from traditional dairy housing;

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 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 pedigreed Holstein cows does not suffer in hot weather resulting in optimum productivity utilization in summers.
  - ✓ Self-sufficient to produce coal free electricity from manure of cows.
  - ✓ 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 with 60% concentrate and 40% roughages containing 16% Crude Protein (CP) and

Figure 4: A Typical TMR wagon

energy to increase animal productivity. It is better to use Total Mixed Ration (TMR) wagon for feeding the cows.

- 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 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 proposed 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 period is taken as 305± 5 days. This pre-feasibility study has taken 50-65% 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 ^{0}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 vvaccines 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 information of animal such as breed, age, date of birth/ purchase, number of lactations, vaccination etc. The records for daily milk yields, 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 15% per annum in the total herd is desirable for a successful dairy farm.
- 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, 100 cows are recommended to obtain optimum milk production in first year of project. It is assumed that on average, 60-65 % of total animals present at farm would be 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 446, among which, 236 animals will be in lactation in 10th year of project. The male calves will be sold in open market. Average milk production of cows during one lactation period is estimated to be 12,000 litres. The dairy farm will have the capacity to generate revenues at 80% capacity utilization of total milk produced at farm i.e. 834,040 litres in its first year of operation.

The annual mortality rate is assumed to be 7% for newborn calves, 3% for heifers and 2% for adult cows. The project will operate at 100% of its installed capacity from the first 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 timely feeding, watering and vaccination 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 use of capital and management. Successful dairy farming harnesses all available resources for productive and profitable unit. Dairy farming is highly complex as it includes breeding, management, feeding, housing, disease control and hygienic production of milk on farm. The judicial use of means and resources to achieve clearly defined goals is the key success factor in modern dairy farming i.e. the art of maximization and optimal utilization of resources and means for maximizing productivity and profits.

Low yield animals are uneconomical to keep; hence they should be culled as early and efficiently as possible. Overall genetic improvement of all dairy animals is necessary for improved milk production. It involves milking records at equal intervals, selection of semen from progeny-tested bulls from high producing dams (mothers) and then making its extensive use in well-organized Artificial Insemination (AI) program.

Feeding dairy animals on nutritious and high yielding hybrid varieties of forages can be adopted. Surplus forage should be preserved as silage or hay.

Other farm management practices include feeding for growth, lactation, pregnancy or maintenance, hygienic milk production, comfortable and ventilated barns, spraying of animals in summer, timely detection of heat and AI service. If animals are bred within the 60-90 days of calving provided, overall performance of herd can be improved.

Timely vaccination against mentioned diseases such as Rinderpest, 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, Sakkar Lahore, Faisalabad, Sheikhupura, Bahawalpur, Multan, Jhang, Sahiwal, Pakpattan, Okara, Jehlum, Peshawar, Charsadda, D.I. Khan, Quetta, etc. across the country; hence, the said project offers good investment opportunities for potential investment in all provinces of country. The 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.

Apart from Lahore, Sialkot, Kasur, Gujranwala, Bahawalpur, Okara, Quetta, D I. Khan etc., commercial dairy farming in peri-urban locations takes place around all major cities. Metropolitan cities are considered major markets for the sale of milk. 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. 52.97 million in first year of the project. The capacity utilization during year one is 100%, which will remain the same throughout the life of the project.

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)	35%
Payback Period (yrs.)	4.55
Net Present Value (Million Rs.)	108.90

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 (50%)	Rs. 35.27 M
Bank Loan (50%)	Rs. 35.27 M
Markup to the Borrower (%age / annum)	12%
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	6,878,992
Building and infrastructure	17,230,938
Machinery and Equipment	3,523,900
Cows	40,000,000
Furniture & Fixture	228,900
Office Equipment	63,000
Office Vehicles	63,000
Pre-operating Cost	559,000
Total Capital Cost	**68,547,730**
Working Capital	
Raw Material Inventory	1,099,321
Upfront Insurance Payment	179,345
Cash	721,166
Total Working Capital	**1,999,832**
Total Project Cost	**70,547,562**

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

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 Requirment

Description	Estimated Area (Sq.ft)	Unit Cost (Rs.)	Total Cost (Rs.)
Shed for Wet Cows	8,000	1,000	8,000,000
Open Paddock for Wet Cows	16,000	10	160,000
Shed for Dry Cows	8,000	500	4,000,000
Open Paddock for Dry Cows	16,000	10	160,000
Shed for Calves	4,000	500	2,000,000
Open Paddock for Calves	8,000	10	80,000
Stores (fodder, concentrate & machines)	400	700	280,000
Room (chillers, utensils & milk storage)	144	1,000	144,000
Silage Bunker (sq.ft.)	3,422	500	1,710,938
Residence (Manager)	120	1,500	180,000
Admin / Accounts Room	120	1,000	120,000
Washroom (Executives)	24	2,000	48,000
Rooms (Workers)	300	1,000	300,000
Washrooms (Workers)	48	1,000	48,000
Total Infrastructure	**64,578**		**17,230,938**

Total investment in building and infrastructure is approximately Rs. 17.23 million in year 1. Shed space has been increased with the increase in number of animals in the herd; hence an expansion is suggested in year 4.

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 3 acres at an average price of Rs. 2 million per acre.

9.5 Machinery & Equipment Requirement

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

Table 5: Machinery & Equipment

Description	Quantity (Nos)	Unit Cost (Rs)	Total Cost (Rs.)
Calf Feeder (New born calves)	12	1,200	14,400
Calf Cages	17	12,000	204,000
Cooling System	1	750,000	750,000
Water Turbine	1	350,000	350,000
Milking Line	6	150,000	900,000
Generator (50 KVA)	1	300,000	300,000
Milk Chiller (5,000 litres)	1	800,000	800,000
Milk Testing Machines	1	20,000	20,000
Velocity Meter	1	1,500	1,500
Surgery Kit	1	10,000	10,000
AI Equipment	1	50,000	50,000
Dystocia Kit	1	20,000	20,000
Energy Savers-Farm	10	400	4,000
Miscellaneous	1	100,000	100,000
Total Machinery & Equipment			**3,523,900**

It is assumed that electricity infrastructure and installations along with a transformer are already available, hence calculations do not include these costs.

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	60,000	60,000
Registration fee*			3,000
Total cost			**63,000**

**5 % of office vehicles cost*

It is assumed that Rs. 5,000 per month will be required to cover travelling expenses in order to carry out essential operations of the farm, translating to an expense of Rs.60,000 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	2	10,000	20,000
Chairs	4	3,000	12,000
Fans (75 W)	4	4,000	16,000
Energy Savers	6	150	900
Miscellaneous Furniture for Workers	1	100,000	100,000
Air Conditioner (2 ton split)	1	80,000	80,000
Total Furniture & Fixtures			**228,900**

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.)
Computer	1	60,000	60,000
Cell Phone	1	3,000	3,000
Total			**63,000**

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 Requirment

Description	No. of Employees	Monthly Salary (Rs.)	Total Salary Year 1 (Rs)
Owner/ Farm Manager	1	50,000	600,000
Farm Supervisor	1	25,000	300,000
Farm Labour	6	13,000	936,000
Security Guard	1	15,000	180,000
Total	**9**		**2,016,000**

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 (NAVTTC), www.navttc.org).

9.10 Raw material Requirement

Following tables show raw material requirement to run the proposed dairy farm in first year of production;

Table 10: **Daily Feeding Requirements for one Cow* in Year 1**

Description	Daily Feed Allowance (Kgs)	Rate Rs./ Kg.	Daily Feed Cost (Rs.)	Total Cost in Year 1 (Rs./ Cow)
Total Mixed Ration (TMR)	24.5 (@ 3.5 % of Live BW)	30	735	268,275

**Average adult Live Body Weight (BW) of cow is assumed to be 700 kg with 35 liters of daily milk production for one lactation. For the calculation purpose, the total milk production of 12,000 litres in one lactation period is distributed in 365 days. One lactation period of Holstein Friesian cow is estimated to be 305 +_ 5 days.*

Table 11: Daily Feeding Requirements of One Female Calf (from birth till one year of age) in year 1**

Description	Daily Feed Allowance (Kgs)	Rate Rs./ Kg	Daily Feed Cost (Rs.)	Total Cost in Year 1 (Rs./ Calf)
Milk Replacer (First 3 months of age per calf)	6 litres	40	240	21,600
TMR (from 4th to 12th months of age)	8.3 (@ 3 % of live BW)	30	248	68,062.5
Total				**89,662.5**

***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.*

Table 12: Daily Feeding Requirements of One Heifer (Older than 1 year)* in year 2**

Description	Daily Feed Allowance (Kgs)	Rate (Rs./ Kg)	Daily Feed Cost (Rs.)	Total Cost in year 1 (Rs./ Heifer)
TMR	16.5 (@3% of Live BW)	30	495	180,675

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

Table 13: Total Cost of Feeding in Year 1 and 2

Description	Total Cost (Rs.)****			
	No. of Animals	Year 1	No. of Animals	Year 2
Lactating Cows	82	21,998,550	68	20,084,676
Female Calves (younger than one year)	44	4,258,969	36	4,384,302
Heifers (Female calves older than one year)	-		33	8,779,450
Total	**126**	**26,257,519**	**137**	**33,248,428**

*****Prices are rounded off to near decimal point for 365 days of feeding. The number of animals are calculated after mortality count which is 7% in new born, 3 % in female calves older than one year and 2% in adult cows.*

Table 14: **Total Cost of Vaccination, Medication and AI in Year 1**

Description	Rs./ animal	Total Cost in year 1 (Rs.)
Vaccination and Medication	1,000	126,175
Artificial Insemination (AI)	5,000	410,000
Total	**6,000**	**536,175**

9.11 Utilities and other costs

An essential cost to be borne by the project is the cost of electricity. Direct electricity expenses of the dairy farm are estimated to be approximately Rs. 115,179 per month i.e. Rs. 1,382,147 annually. The type of electricity connection is Industrial B-1 Category and one time connection charges are Rs. 35,000. It is further assumed that within the cooling system, the cone exhaust 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 will operate for 7 hours daily (average) to carry out three milking sessions daily for a herd of 100 cows.

The indirect or regular electricity expense for management building and staff residence is assumed to be approximately Rs. 5,000 per month or Rs. 60,000 in year one of the project.

The fuel cost (diesel) for running generator set in case of absence of electricity is assumed at an average 4 hours daily; for a monthly expense of Rs. 42,600 or Rs. 511,200 annually in first year of operations.

Machinery maintenance expense is assumed to be Rs. 10,000 per month or Rs 120,000 in year one.

Monthly expenses related to travelling, communication and office vehicle running are Rs. 5,000, 3000 and 2,000 respectively.

Similarly, monthly expenses related to business promotion and office routine tasks are Rs. 8,830 and Rs. 1,950 respectively. Professional fees related to any legal, audit or technical consultation is assumed to be Rs. 4,415 per month.

Insurance of equipment, machinery and office vehicle is assumed to be 5% of total cost, which is Rs. 14,946 per month in first year of operations.

9.12 Revenue Generation

Based on capacity utilization of 80% for revenues from milk production from 100 cows, sales revenue during the first year of operations are shown in the following table. However, capacity has been increased at 5% for a maximum utilization of 95%.

Table 15: Revenue Generation – Year 1

Description	Unit	Annual Production	Price (Rs./Unit)	Total Revenue in Year 1 (Rs.)
Sale of Milk	No. of Liters	838,040	60*	50,282,400
Sale of male calves	No.	44	10,000	441,750
Sale of culled cows	No.	15	150,000	2,250,000
Total				**52,974,150**
The annual culling rate is 15% applicable to all animals in the herd.				

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

Profarm Pakistan Pvt. Ltd.
Plot No. 52, Block R-1,
M. A. Johar Town, Lahore, Pakistan.
T: +92 (0)42 35291992-4 (3 lines), F: +92 (0)42 35291995
E: info@profarm.com.pk, Customer Service (24/7): +92 323 8888 211

Dairy Solution Pvt. Ltd.
177/B- Johar Town, Lahore
Ph: +92-42-35169450 +92-42-35169451
Fax +92-042-35169449

Cattle Kit Pvt. Ltd. Pakistan
104-A, Punjab Government Servants Housing Society Near Mohlan Waal, Lahore
Ph: +92 (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. 1-A, Shadman Chowk, Jail Road, Lahore. Ph: 042-37564503
Shareef Feeds Pvt. Ltd. 7-A, New Muslim Town, Lahore. Ph: 04235758233-5
National Feeds Pvt. Ltd. 171- Shadman – II Lahore. Ph: 042 37551405-8
Anmol Vanda c/o Livestock and Dairy Development Department, Govt. of Punjab, 16-Cooper Road, Lahore Free Landline: 0800-78685, 0800-78686
Big Feed Pvt. Ltd. 2-A, Ahmad Block, New Garden Town, Lahore. Ph: 042-35835374-35835373
AI / Semen Suppliers
Ghazi Brothers B-35 KDA Scheme No 1, Mian Muhammad Shah Road, Karachi. Ph: 021-4543579
World Wire Sires by Maxim International Pvt. Ltd. 69-A, Sector-XX, Khayaban-e-Iqbal, DHA, Lahore. Ph: 042-35693993
Altaf & Co., Altaf & Co Plaza, 16/1, Out Fall Road, Lahore. Ph: 042-35763411-4
Milk Contractors/ Processors
Engro Foods Pvt. Limited 5th, 6th Floor, Harbor Front Building Marine Drive, Block 4, Clifton, Karachi. Ph: +92 21 3529-6000 (10 lines)
Nestle Pakistan 308, Upper Mall, Lahore, Ph: 042-35757082-95, UAN +92-42-111637853

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)* 3. Veepro Netherland (www.veepro.nl) 4. Mr. Berg, Berg Exports, Netherlands (info@bergexport.nl) 5. Mrs. Karin, Ugerup Cattle Exports Sweden (Karin@ugerup.mu) 6. Mr. Johan, Hun land Exports from Holland (www.hunland.com) **7.** Mrs. Renee, Strickland Global, USA (www.stricklandglobal.com)

10.3 Technical Experts / Consultants

Dr. Sami Ullah. Farm Manger Infinite Dairy Farm, Sargodha. Cell: 0323-4360006
Dr. Rami Hamad Farm Manager, Nishat Dairy Farm, Sukheki, Cell: 0302-8556301
Dr. Nasir Javed Consultant Lead Foundation, West wood Colony, Lahore Cell: 0300-8432595
Dr. Zafar Ullah Khan Manager, Livestock Altech Pvt. Ltd. Cell: 0302-8543005

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.

Table 16: 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,	www.uaar.edu.pk

Rawalpindi	
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

Rs. in actuals

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue	52,974,150	52,256,417	76,489,928	95,027,614	125,191,153	159,591,549	205,656,178	264,477,793	323,504,058	422,438,238
Cost of goods sold	30,043,041	37,543,371	45,285,672	55,232,376	69,834,472	88,159,732	110,971,684	136,690,106	173,443,958	221,043,367
Gross Profit	22,931,109	14,713,046	31,204,256	39,795,238	55,356,681	71,431,817	94,684,493	127,787,687	150,060,101	201,394,871
General administration & selling expenses										
Administration expense	780,000	855,942	939,278	1,030,727	1,131,080	1,241,204	1,362,049	1,494,660	1,640,182	1,799,873
Rental expense	-	-	-	-	-	-	-	-	-	-
Utilities expense	60,000	66,000	72,600	79,860	87,846	96,631	106,294	116,923	128,615	141,477
Travelling & Comm. expense (phone, fax, etc.)	96,000	105,600	116,160	127,776	140,554	154,609	170,070	187,077	205,785	226,363
Office vehicles running expense	24,000	26,400	29,040	31,944	35,138	38,652	42,517	46,769	51,446	56,591
Office expenses (stationary, etc.)	23,400	25,678	28,178	30,922	33,932	37,236	40,861	44,840	49,205	53,996
Promotional expense	105,948	104,513	152,980	190,055	250,382	319,183	411,312	528,956	647,008	844,876
Insurance expense	179,345	161,411	143,476	125,542	107,607	89,673	71,738	53,804	35,869	17,935
Professional fees (legal, audit, etc.)	52,974	52,256	76,490	95,028	125,191	159,592	205,656	264,478	323,504	422,438
Depreciation expense	1,249,427	1,249,427	1,249,427	1,249,427	2,207,747	2,207,747	2,207,747	2,207,747	2,207,747	2,207,747
Amortization expense	111,800	111,800	111,800	111,800	111,800	-	-	-	-	-
Property tax expense	-	-	-	-	-	-	-	-	-	-
Miscellaneous expense	-	-	-	-	-	-	-	-	-	-
Subtotal	2,682,894	2,759,027	2,919,429	3,073,080	4,231,278	4,344,526	4,618,245	4,945,253	5,289,362	5,771,295
Operating Income	20,248,215	11,954,020	28,284,827	36,722,158	51,125,403	67,087,291	90,066,249	122,842,434	144,770,739	195,623,576
Other income	-	-	-	-	-	-	-	-	-	-
Gain / (loss) on sale of assets	-	-	-	-	-	-	-	-	-	-
Earnings Before Interest & Taxes	20,248,215	11,954,020	28,284,827	36,722,158	51,125,403	67,087,291	90,066,249	122,842,434	144,770,739	195,623,576
Interest expense	4,082,978	3,771,529	3,501,489	3,197,201	3,272,469	2,861,121	2,397,605	1,875,303	1,286,760	623,575
Earnings Before Tax	16,165,237	8,182,490	24,783,338	33,524,957	47,852,934	64,226,170	87,668,644	120,967,132	143,483,979	195,000,001
Tax	4,877,332	2,083,371	7,893,668	10,953,234	15,968,026	21,698,659	29,903,525	41,557,995	49,438,892	67,469,500
NET PROFIT/(LOSS) AFTER TAX	11,287,905	6,099,119	16,889,671	22,571,723	31,884,908	42,527,511	57,765,119	79,409,136	94,045,087	127,530,502
Balance brought forward		5,643,952	11,743,072	14,316,371	36,888,094	68,773,002	111,300,513	169,065,632	248,474,769	342,519,856
Total profit available for appropriation	11,287,905	11,743,072	28,632,742	36,888,094	68,773,002	111,300,513	169,065,632	248,474,769	342,519,856	470,050,357
Dividend	5,643,952	-	14,316,371	-	-	-	-	-	-	-
Balance carried forward	5,643,952	11,743,072	14,316,371	36,888,094	68,773,002	111,300,513	169,065,632	248,474,769	342,519,856	470,050,357

12.2 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
Assets											
Current assets											
Cash & Bank	721,166	5,617,151	11,059,127	12,020,602	20,552,431	50,536,462	90,282,572	144,339,311	218,127,442	305,081,211	450,984,058
Accounts receivable	-	964,320	935,451	1,385,603	1,745,349	2,299,729	2,931,706	3,782,047	4,858,453	5,942,920	7,760,118
Finished goods inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment spare part inventory	-	-	-	-	-	-	-	-	-	-	-
Raw material inventory	1,099,321	1,530,778	2,041,312	2,762,452	3,859,494	5,400,193	7,527,604	10,253,018	14,367,551	20,199,000	-
Pre-paid annual land lease	-	-	-	-	-	-	-	-	-	-	-
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Pre-paid insurance	179,345	161,411	143,476	125,542	107,607	89,673	71,738	53,804	35,869	17,935	-
Total Current Assets	1,999,832	8,273,659	14,179,365	16,294,199	26,264,880	58,326,056	100,813,620	158,428,179	237,389,315	331,241,066	458,744,175
Fixed assets											
Land	6,878,992	6,878,992	6,878,992	6,878,992	6,878,992	6,878,992	6,878,992	6,878,992	6,878,992	6,878,992	6,878,992
Building/Infrastructure	17,230,938	16,369,391	15,507,844	14,646,297	32,951,150	31,131,283	29,311,416	27,491,549	25,671,683	23,851,816	22,031,949
Animals	40,000,000	37,217,500	43,473,018	55,123,388	69,955,708	90,311,306	115,978,261	146,965,439	185,870,795	236,862,281	305,342,179
Machinery & equipment	3,523,900	3,171,510	2,819,120	2,466,730	2,114,340	1,761,950	1,409,560	1,057,170	704,780	352,390	-
Furniture & fixtures	228,900	206,010	183,120	160,230	137,340	114,450	91,560	68,670	45,780	22,890	-
Office vehicles	63,000	56,700	50,400	44,100	37,800	31,500	25,200	18,900	12,600	6,300	-
Office equipment	63,000	56,700	50,400	44,100	37,800	31,500	25,200	18,900	12,600	6,300	-
Total Fixed Assets	67,988,730	63,956,803	68,962,894	79,363,837	112,113,131	130,260,981	153,720,190	182,499,620	219,197,230	267,980,969	334,253,120
Intangible assets											
Pre-operation costs	559,000	447,200	335,400	223,600	111,800	-	-	-	-	-	-
Legal, licensing, & training costs	-	-	-	-	-	-	-	-	-	-	-
Total Intangible Assets	559,000	447,200	335,400	223,600	111,800	-	-	-	-	-	-
TOTAL ASSETS	70,547,561	72,677,662	83,477,659	95,881,637	138,489,811	188,587,037	254,533,810	340,927,799	456,586,545	599,222,035	792,997,296
Liabilities & Shareholders' Equity											
Current liabilities											
Accounts payable	-	2,158,152	2,732,747	3,312,331	4,074,228	5,174,374	6,581,452	8,341,433	10,326,277	13,154,327	16,811,507
Export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Short term debt	-	-	-	-	-	-	-	-	-	-	-
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Total Current Liabilities	-	2,158,152	2,732,747	3,312,331	4,074,228	5,174,374	6,581,452	8,341,433	10,326,277	13,154,327	16,811,507
Other liabilities											
Lease payable	-	-	-	-	-	-	-	-	-	-	-
Deferred tax	-	-	-	-	-	-	-	-	-	-	-
Long term debt	35,273,781	32,384,277	30,255,041	27,855,766	28,725,101	25,481,676	21,826,904	17,708,616	13,068,025	7,838,891	1,946,572
Total Long Term Liabilities	35,273,781	32,384,277	30,255,041	27,855,766	28,725,101	25,481,676	21,826,904	17,708,616	13,068,025	7,838,891	1,946,572
Shareholders' equity											
Paid-up capital	35,273,781	35,273,781	35,273,781	35,273,781	38,846,680	38,846,680	38,846,680	38,846,680	38,846,680	38,846,680	38,846,680
Gain / Loss on Net value of Animals	-	(2,782,500)	3,473,018	15,123,388	29,955,708	50,311,306	75,978,261	106,965,439	145,870,795	196,862,281	265,342,179
Retained earnings	-	5,643,952	11,743,072	14,316,371	36,888,094	68,773,002	111,300,513	169,065,632	248,474,769	342,519,856	470,050,357
Total Equity	35,273,781	38,135,233	50,489,870	64,713,540	105,690,482	157,930,987	226,125,454	314,877,750	433,192,243	578,228,817	774,239,216
TOTAL CAPITAL AND LIABILITIES	70,547,561	72,677,662	83,477,659	95,881,637	138,489,811	188,587,037	254,533,810	340,927,799	456,586,545	599,222,035	792,997,296

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

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
Operating activities											
Net profit	-	11,287,905	6,099,119	16,889,671	22,571,723	31,884,908	42,527,511	57,765,119	79,409,136	94,045,087	127,530,502
Add: depreciation expense	-	1,249,427	1,249,427	1,249,427	1,249,427	2,207,747	2,207,747	2,207,747	2,207,747	2,207,747	2,207,747
amortization expense	-	111,800	111,800	111,800	111,800	111,800	-	-	-	-	-
Deferred income tax	-	-	-	-	-	-	-	-	-	-	-
Accounts receivable	-	(964,320)	28,869	(450,153)	(359,745)	(554,380)	(631,977)	(850,341)	(1,076,406)	(1,084,468)	(1,817,197)
Finished good inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment inventory	-	-	-	-	-	-	-	-	-	-	-
Raw material inventory	(1,099,321)	(431,457)	(510,534)	(721,141)	(1,097,042)	(1,540,699)	(2,127,412)	(2,725,413)	(4,114,534)	(5,831,449)	20,199,000
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Advance insurance premium	(179,345)	17,935	17,935	17,935	17,935	17,935	17,935	17,935	17,935	17,935	17,935
Accounts payable	-	2,158,152	574,595	579,583	761,898	1,100,145	1,407,078	1,759,981	1,984,844	2,828,050	3,657,180
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Cash provided by operations	(1,278,666)	13,429,441	7,571,212	17,677,122	23,255,994	33,227,456	43,400,882	58,175,028	78,428,722	92,182,902	151,795,165
Financing activities											
Change in long term debt	35,273,781	(2,889,504)	(2,129,235)	(2,399,276)	869,335	(3,243,425)	(3,654,772)	(4,118,289)	(4,640,591)	(5,229,134)	(5,892,319)
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	35,273,781	-	-	-	3,572,899	-	-	-	-	-	-
Purchase of (treasury) shares	-	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financing act	70,547,561	(2,889,504)	(2,129,235)	(2,399,276)	4,442,234	(3,243,425)	(3,654,772)	(4,118,289)	(4,640,591)	(5,229,134)	(5,892,319)
Investing activities											
Capital expenditure	(68,547,730)	-	-	-	(19,166,400)	-	-	-	-	-	-
Acquisitions	-	-	-	-	-	-	-	-	-	-	-
Cash (used for) / provided by investing acti	(68,547,730)	-	-	-	(19,166,400)	-	-	-	-	-	-
NET CASH	721,166	10,539,937	5,441,976	15,277,846	8,531,828	29,984,031	39,746,110	54,056,739	73,788,131	86,953,769	145,902,847
Cash balance brought forward		721,166	5,617,151	11,059,127	12,020,602	20,552,431	50,536,462	90,282,572	144,339,311	218,127,442	305,081,211
Cash available for appropriation	721,166	11,261,103	11,059,127	26,336,973	20,552,431	50,536,462	90,282,572	144,339,311	218,127,442	305,081,211	450,984,058
Dividend	-	5,643,952	-	14,316,371	-	-	-	-	-	-	-
Cash carried forward	721,166	5,617,151	11,059,127	12,020,602	20,552,431	50,536,462	90,282,572	144,339,311	218,127,442	305,081,211	450,984,058

13 KEY ASSUMPTIONS

13.1 Operating Cost Assumptions

Description	Unit	Details
Machinery Maintenance	Rs./ Month	10,000
Direct Electricity	Rs./ Month	5,000
Office vehicle running expenses	Rs./ Month	2,000
Office Expenses (entertainment, janitorial, stationery etc.)	Rs./ Month	1,950
Communication Expenses	Rs./Month	3,000
Promotional Expenses	Rs./ Month	8,830

13.2 Production Cost Assumptions

Description	Unit	Details
Annual installed capacity	No. of cows	100
Capacity utilization	%.	100
Milk production starting capacity Utilization	%	80
Maximum production capacity utilization	%	95
Total milk production	Litres/ cow/ lactation cycle	12,000
Number of female calves in year 1	No.	44
Average number of days in Lactation	No. of days	305+_5
Purchase price of pregnant cow	Rs. per cow	400,000
Cost of Artificial Insemination (AI)	Rs/ animal/ year	5,000
Cost of vaccination and medication	Rs./animal/year	1,000
Mortality in new born calves	% of total animals/ year	7
Mortality in adult cows	% of total animals/ year	2
Mortality in heifers (females calves older than one year)	% of total animals/ year	3
Shed space per cow	Sq. Ft. per animal	80
Open paddock space per cow	Sq. Ft. per animal	160

13.3 Revenue Assumptions

Description	Unit	Details
Total Milk Production	No. of Liters/ year	838,040
Sale Price of Milk	Rs./ Litre	60
Sale Price Growth Rate	% per annum	10
Capacity Utilization	%	80
Maximum Capacity	%	95

13.4 Financial Assumptions

Description	Unit	Details
Debt: Equity Ratio	Ratio	50:50
Interest Rate	% per annum	12
Debt Tenure	Years	10