
Pre-Feasibility Study

Dairy Farm (50 Cows)

Environmentally Controlled Housing (ECH) System



Small and Medium Enterprises Development Authority

Ministry of Industries & Production

Government of Pakistan

www.smeda.org.pk

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

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

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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.....	6
5.2	INSTALLED AND OPERATIONAL CAPACITIES	10
6	CRITICAL FACTORS.....	11
7	GEOGRAPHICAL POTENTIAL FOR INVESTMENT.....	12
8	POTENTIAL TARGET CUSTOMERS / MARKETS	12
9	PROJECT COST SUMMARY	13
9.1	PROJECT ECONOMICS.....	13
9.2	PROJECT FINANCING	13
9.3	PROJECT COST	14
9.4	SPACE REQUIREMENT	14
9.5	MACHINERY & EQUIPMENT REQUIREMENT.....	16
9.6	OFFICE VEHICLE	16
9.7	FURNITURE & FIXTURES REQUIREMENT.....	17
9.8	OFFICE EQUIPMENT REQUIREMENT	17
9.9	HUMAN RESOURCE REQUIREMENT	18
9.10	RAW MATERIAL REQUIREMENT	18
9.11	UTILITIES AND OTHER COSTS.....	20
9.12	REVENUE GENERATION	21
10	CONTACT DETAILS.....	21
10.1	MACHINERY SUPPLIERS	21
10.2	RAW MATERIAL SUPPLIERS	22
10.3	TECHNICAL EXPERTS / CONSULTANTS.....	23
11	USEFUL WEB LINKS	24
12	ANNEXURES.....	26
12.1	INCOME STATEMENT	26
12.2	BALANCE SHEET	27
12.3	CASH FLOW STATEMENT	28
13	KEY ASSUMPTIONS	29
13.1	OPERATING COST ASSUMPTIONS	29
13.2	PRODUCTION COST ASSUMPTIONS	29
13.3	REVENUE ASSUMPTIONS.....	30
13.4	FINANCIAL ASSUMPTIONS	30

1 DISCLAIMER

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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 50 cows needs a total investment of approximately Rs. 36.79 million out of which, capital cost of the project is Rs. 35.61 million with working capital of Rs. 1.18 million. The project is assumed to be working on a 50:50 debt and equity ratio. It is assumed that starting from 50 animals in year 1, the herd of animals will increase to approximately 223 animals, out of which, 118 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 32%, 4.90 years and Rs. 47.440 million respectively. The farm will provide employment opportunity to 7 individuals initially which will increase to 12 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. 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 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 purpose built shed constructed on Environmentally Controlled Housing (ECH) system. The farm will begin operations with 50 cows to achieve milk production of 419,020 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.

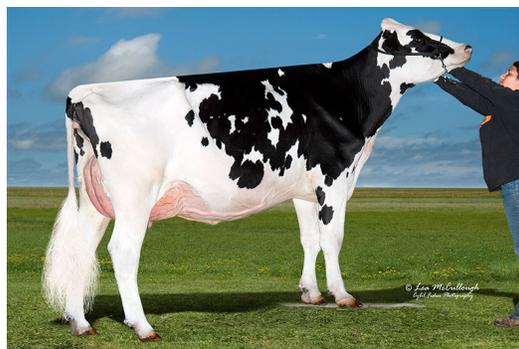


Figure 1: A typical Holstein Cow

- 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 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. 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;



- ✓ 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°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 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, 50 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 223, among which, 118 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. 419,020 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 judicious 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. 26.49 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)	32%
Payback Period (yrs.)	4.90
Net Present Value (Million Rs.)	47.44

9.2 Project Financing

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

Table 2: Project Financing

Description	Details
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Total Equity (50%)	Rs. 18.39 M
Bank Loan (50%)	Rs. 18.39 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	3,450,607
Building and infrastructure	9,055,469
Machinery and Equipment	2,219,900
Cows	20,000,000
Furniture & Fixture	228,540
Office Equipment	63,000
Office Vehicles	63,000
Pre-operating Cost	533,000
Total Capital Cost	35,613,516
Working Capital	
Raw Material Inventory	549,660
Upfront Insurance Payment	114,145
Cash	514,221
Total Working Capital	1,178,026
Total Project Cost	36,791,542

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 Requirement

Description	Estimated Area (Sq.ft)	Unit Cost (Rs.)	Total Cost (Rs.)
Shed for Wet Cows	4,000	1,000	4,000,000
Open Paddock for Wet Cows	8,000	10	80,000
Shed for Dry Cows	4,000	500	2,000,000
Open Paddock for Dry Cows	8,000	10	80,000
Shed for Calves	2,000	500	1,000,000
Open Paddock for Calves	4,000	10	40,000
Stores (fodder, concentrate & machines)	400	700	280,000
Room (chillers, utensils & milk storage)	144	1,000	144,000
Silage Bunker (sq.ft.)	1,711	500	855,469
Residence (Manager)	120	1,500	180,000
Admin / Accounts Room	120	1,000	120,000
Washroom (Executives)	24	2,000	48,000
Rooms (Workers)	180	1,000	180,000
Washrooms (Workers)	48	1,000	48,000
Total Infrastructure	32,747		9,055,469

Total investment in building and infrastructure is approximately Rs. 9.05 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 2 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)	6	1,200	7,200
Calf Cages	9	12,000	108,000
Cooling System	1	300,000	300,000
Water Turbine	1	350,000	350,000
Milking Line	3	150,000	450,000
Generator (50 KVA)	1	300,000	300,000
Milk Chiller (2,300 litres)	1	500,000	500,000
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	8	400	3,200
Miscellaneous	1	100,000	100,000
Total Machinery & Equipment			2,219,900

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	4	150	540
Miscellaneous Furniture for Workers	1	100,000	100,000
Air Conditioner (2 ton split)	1	80,000	80,000
Total Furniture & Fixtures			228,540

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 Requirement

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	4	13,000	624,000
Security Guard	1	15,000	180,000
Total	7		1,704,000

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 (NAVTTTC), 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./ Clalf)
Milk Replacer (First 3 months of age per calf)	6 litres	40	240	21,600
TMR (from 4 th to 12 th 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	41	10,999,275	34	10,042,338
Female Calves (younger than one year)	24	2,129,484	16	2,192,151
Heifers (Female calves older than one year)	-		18	4,389,725
Total	63	13,128,759	68	16,624,214

****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	63,088
Artificial Insemination (AI)	5,000	205,000
Total	6,000	268,088

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. 109,347 per month i.e. Rs. 1,312,168 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 50 cows.

The indirect or regular electricity expense for management building and staff residence is assumed to be approximately Rs. 5000 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. 4,415 and Rs. 1,950 respectively. Professional fees related to any legal, audit or technical consultation is assumed to be Rs. 2, 207 per month.

Insurance of equipment, machinery and office vehicle is assumed to be 5% of total cost, which is Rs. 9,512 per month in first year of operations.

9.12 Revenue Generation

Based on capacity utilization of 80% for revenues from milk production from 50 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	419,020	60*	25,141,200
Sale of male calves	No.	22	10,000	220,875
Sale of culled cows	No.	8	150,000	1,125,000
Total				26,487,075

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. Veeopro 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										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Rs. in actuals Year 10
Revenue	26,487,075	26,128,209	38,244,964	47,513,807	62,595,576	79,795,775	102,828,089	132,238,896	161,752,029	211,219,119
Cost of goods sold	16,264,215	19,966,654	24,050,795	29,164,219	36,619,274	46,075,356	57,543,392	70,756,773	89,045,287	113,256,478
Gross Profit	10,222,860	6,161,555	14,194,169	18,349,588	25,976,302	33,720,418	45,284,697	61,482,123	72,706,742	97,962,641
<i>General administration & selling expenses</i>										
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	52,974	52,256	76,490	95,028	125,191	159,592	205,656	264,478	323,504	422,438
Insurance expense	114,145	102,731	91,316	79,902	68,487	57,073	45,658	34,244	22,829	11,415
Professional fees (legal, audit, etc.)	26,487	26,128	38,245	47,514	62,596	79,796	102,828	132,239	161,752	211,219
Depreciation expense	710,217	710,217	710,217	710,217	1,189,377	1,189,377	1,189,377	1,189,377	1,189,377	1,189,377
Amortization expense	106,600	106,600	106,600	106,600	106,600	-	-	-	-	-
Property tax expense	-	-	-	-	-	-	-	-	-	-
Miscellaneous expense	-	-	-	-	-	-	-	-	-	-
Subtotal	1,993,824	2,077,553	2,208,124	2,340,489	2,980,802	3,054,169	3,265,311	3,510,606	3,772,696	4,112,749
Operating Income	8,229,036	4,084,002	11,986,045	16,009,099	22,995,500	30,666,249	42,019,386	57,971,517	68,934,046	93,849,893
Other income	-	-	-	-	-	-	-	-	-	-
Gain / (loss) on sale of assets	-	-	-	-	-	-	-	-	-	-
Earnings Before Interest & Taxes	8,229,036	4,084,002	11,986,045	16,009,099	22,995,500	30,666,249	42,019,386	57,971,517	68,934,046	93,849,893
Interest expense	2,126,275	1,959,473	1,819,175	1,661,084	1,750,195	1,533,495	1,289,311	1,014,159	704,111	354,741
Earnings Before Tax	6,102,761	2,124,529	10,166,870	14,348,015	21,245,305	29,132,755	40,730,075	56,957,358	68,229,935	93,495,152
Tax	1,355,465	269,406	2,777,904	4,241,305	6,655,356	9,415,963	13,475,025	19,154,574	23,099,976	31,942,802
NET PROFIT/(LOSS) AFTER TAX	4,747,295	1,855,123	7,388,966	10,106,710	14,589,949	19,716,791	27,255,049	37,802,783	45,129,958	61,552,349
Balance brought forward	-	2,373,648	4,228,771	5,808,868	15,915,579	30,505,528	50,222,319	77,477,368	115,280,152	160,410,110
Total profit available for appropriation	4,747,295	4,228,771	11,617,737	15,915,579	30,505,528	50,222,319	77,477,368	115,280,152	160,410,110	221,962,459
Dividend	2,373,648	-	5,808,868	-	-	-	-	-	-	-
Balance carried forward	2,373,648	4,228,771	5,808,868	15,915,579	30,505,528	50,222,319	77,477,368	115,280,152	160,410,110	221,962,459

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											
<i>Current assets</i>											
Cash & Bank	514,221	2,526,552	4,150,142	5,016,089	9,182,879	22,874,097	41,190,168	66,568,582	101,524,417	143,056,494	213,725,016
Accounts receivable	-	482,160	467,725	692,802	872,674	1,149,865	1,465,853	1,891,023	2,429,226	2,971,460	3,880,059
Finished goods inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment spare part inventory	-	-	-	-	-	-	-	-	-	-	-
Raw material inventory	549,660	765,389	1,020,656	1,381,226	1,929,747	2,700,096	3,763,802	5,126,509	7,183,776	10,099,500	-
Pre-paid annual land lease	-	-	-	-	-	-	-	-	-	-	-
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Pre-paid insurance	114,145	102,731	91,316	79,902	68,487	57,073	45,658	34,244	22,829	11,415	-
Total Current Assets	1,178,026	3,876,831	5,729,840	7,170,018	12,053,787	26,781,130	46,465,481	73,620,358	111,160,248	156,138,869	217,605,075
<i>Fixed assets</i>											
Land	3,450,607	3,450,607	3,450,607	3,450,607	3,450,607	3,450,607	3,450,607	3,450,607	3,450,607	3,450,607	3,450,607
Building/Infrastructure	9,055,469	8,602,695	8,149,922	7,697,148	16,827,575	15,895,642	14,963,708	14,031,775	13,099,841	12,167,908	11,235,974
Animals	20,000,000	18,608,750	21,736,509	27,561,694	34,977,854	45,155,653	57,989,131	73,482,719	92,935,398	118,431,141	152,671,090
Machinery & equipment	2,219,900	1,997,910	1,775,920	1,553,930	1,331,940	1,109,950	887,960	665,970	443,980	221,990	-
Furniture & fixtures	228,540	205,686	182,832	159,978	137,124	114,270	91,416	68,562	45,708	22,854	-
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	35,080,516	32,979,049	35,396,590	40,511,558	56,800,701	65,789,122	77,433,222	91,737,433	110,000,734	134,307,100	167,357,671
<i>Intangible assets</i>											
Pre-operation costs	533,000	426,400	319,800	213,200	106,600	-	-	-	-	-	-
Legal, licensing, & training costs	-	-	-	-	-	-	-	-	-	-	-
Total Intangible Assets	533,000	426,400	319,800	213,200	106,600	-	-	-	-	-	-
TOTAL ASSETS	36,791,542	37,282,280	41,446,230	47,894,776	68,961,088	92,570,252	123,898,703	165,357,791	221,160,983	290,445,968	384,962,746
Liabilities & Shareholders' Equity											
<i>Current liabilities</i>											
Accounts payable	-	1,079,076	1,366,374	1,656,165	2,037,114	2,587,187	3,290,726	4,170,717	5,163,138	6,577,164	8,405,753
Export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Short term debt	-	-	-	-	-	-	-	-	-	-	-
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Total Current Liabilities	-	1,079,076	1,366,374	1,656,165	2,037,114	2,587,187	3,290,726	4,170,717	5,163,138	6,577,164	8,405,753
<i>Other liabilities</i>											
Lease payable	-	-	-	-	-	-	-	-	-	-	-
Deferred tax	-	-	-	-	-	-	-	-	-	-	-
Long term debt	18,395,771	16,825,035	15,718,805	14,472,277	15,351,214	13,642,558	11,717,201	9,547,661	7,102,968	4,348,228	1,244,117
Total Long Term Liabilities	18,395,771	16,825,035	15,718,805	14,472,277	15,351,214	13,642,558	11,717,201	9,547,661	7,102,968	4,348,228	1,244,117
<i>Shareholders' equity</i>											
Paid-up capital	18,395,771	18,395,771	18,395,771	18,395,771	20,679,326	20,679,326	20,679,326	20,679,326	20,679,326	20,679,326	20,679,326
Gain / Loss on Net value of Animals	-	(1,391,250)	1,736,509	7,561,694	14,977,854	25,155,653	37,989,131	53,482,719	72,935,398	98,431,141	132,671,090
Retained earnings	-	2,373,648	4,228,771	5,808,868	15,915,579	30,505,528	50,222,319	77,477,368	115,280,152	160,410,110	221,962,459
Total Equity	18,395,771	19,378,169	24,361,051	31,766,334	51,572,759	76,340,507	108,890,776	151,639,414	208,894,876	279,520,577	375,312,875
TOTAL CAPITAL AND LIABILITIES	36,791,542	37,282,280	41,446,230	47,894,776	68,961,088	92,570,252	123,898,703	165,357,791	221,160,983	290,445,968	384,962,746
<i>Note: Total assets value will differ from project cost due to first installment of leases paid at the start of year 0</i>											

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	-	4,747,295	1,855,123	7,388,966	10,106,710	14,589,949	19,716,791	27,255,049	37,802,783	45,129,958	61,552,349
Add: depreciation expense	-	710,217	710,217	710,217	710,217	1,189,377	1,189,377	1,189,377	1,189,377	1,189,377	1,189,377
amortization expense	-	106,600	106,600	106,600	106,600	106,600	-	-	-	-	-
Deferred income tax	-	-	-	-	-	-	-	-	-	-	-
Accounts receivable	-	(482,160)	14,435	(225,076)	(179,873)	(277,190)	(315,988)	(425,171)	(538,203)	(542,234)	(908,599)
Finished good inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment inventory	-	-	-	-	-	-	-	-	-	-	-
Raw material inventory	(549,660)	(215,729)	(255,267)	(360,570)	(548,521)	(770,349)	(1,063,706)	(1,362,707)	(2,057,267)	(2,915,724)	10,099,500
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Advance insurance premium	(114,145)	11,415	11,415	11,415	11,415	11,415	11,415	11,415	11,415	11,415	11,415
Accounts payable	-	1,079,076	287,298	289,792	380,949	550,073	703,539	879,991	992,422	1,414,025	1,828,590
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Cash provided by operations	(663,805)	5,956,714	2,729,821	7,921,343	10,587,498	15,399,874	20,241,428	27,547,955	37,400,527	44,286,817	73,772,632
<i>Financing activities</i>											
Change in long term debt	18,395,771	(1,570,736)	(1,106,230)	(1,246,528)	878,937	(1,708,656)	(1,925,357)	(2,169,540)	(2,444,692)	(2,754,740)	(3,104,110)
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	18,395,771	-	-	-	2,283,555	-	-	-	-	-	-
Purchase of (treasury) shares	-	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financing act	36,791,542	(1,570,736)	(1,106,230)	(1,246,528)	3,162,492	(1,708,656)	(1,925,357)	(2,169,540)	(2,444,692)	(2,754,740)	(3,104,110)
<i>Investing activities</i>											
Capital expenditure	(35,613,516)	-	-	-	(9,583,200)	-	-	-	-	-	-
Acquisitions	-	-	-	-	-	-	-	-	-	-	-
Cash (used for) / provided by investing act	(35,613,516)	-	-	-	(9,583,200)	-	-	-	-	-	-
NET CASH	514,221	4,385,978	1,623,591	6,674,815	4,166,790	13,691,218	18,316,071	25,378,414	34,955,835	41,532,077	70,668,522
Cash balance brought forward		514,221	2,526,552	4,150,142	5,016,089	9,182,879	22,874,097	41,190,168	66,568,582	101,524,417	143,056,494
Cash available for appropriation	514,221	4,900,199	4,150,142	10,824,958	9,182,879	22,874,097	41,190,168	66,568,582	101,524,417	143,056,494	213,725,016
Dividend	-	2,373,648	-	5,808,868	-	-	-	-	-	-	-
Cash carried forward	514,221	2,526,552	4,150,142	5,016,089	9,182,879	22,874,097	41,190,168	66,568,582	101,524,417	143,056,494	213,725,016

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	4,415

13.2 Production Cost Assumptions

Description	Unit	Details
Annual installed capacity	No. of cows	50
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.	24
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	419,020
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